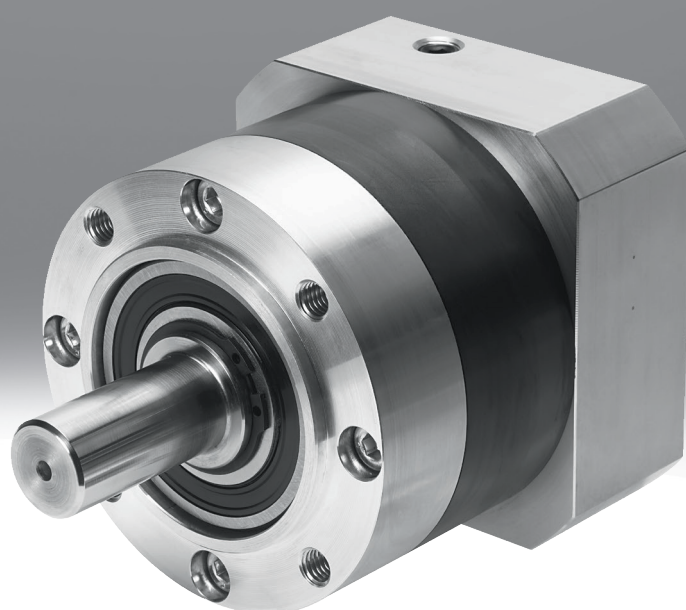


## Gear unit EMGA

**FESTO**



## Characteristics

### Gear unit type

| [P] | Planetary gear unit | [A] | Right-angle gear unit |
|-----|---------------------|-----|-----------------------|
|-----|---------------------|-----|-----------------------|

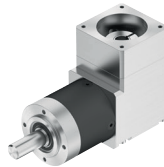


#### Characteristics:

- Gear ratio  $i = 3; 5; 8; 12; 20$  (other ratios on request)
- Lifetime lubrication
- Degree of protection: IP54

#### Suitable for:

- Servo motors: EMMT-AS, EMMT-EC
- Stepper motors: EMMT-ST, EMMB-ST



#### Characteristics:

- Gear ratio  $i = 3; 5; 8; 12; 20$  (other ratios on request)
- Lifetime lubrication
- Degree of protection: IP54

#### Suitable for:

- Servo motors: EMMT-AS, EMMT-EC

## Type code

| 001  | Series                     |  |
|------|----------------------------|--|
| EMGA | Gear unit                  |  |
| 002  | Gear unit flange size [mm] |  |
| 40   | 40                         |  |
| 60   | 60                         |  |
| 80   | 80                         |  |
| 120  | 120                        |  |
| 160  | 160                        |  |
| 003  | Gear unit type             |  |
| P    | Planetary gear unit        |  |
| A    | Right-angle gear unit      |  |
| 004  | Gear ratio                 |  |
| G3   | 3:1                        |  |
| G5   | 5:1                        |  |
| G8   | 8:1                        |  |
| G12  | 12:1                       |  |
| G20  | 20:1                       |  |

| 005 | Interface                |  |
|-----|--------------------------|--|
|     | None                     |  |
| EAS | Eco AC synchronous       |  |
| SAS | AC synchronous           |  |
| SST | Stepper motor            |  |
| 006 | Flange size, motors [mm] |  |
| 40  | 40                       |  |
| 42  | 42                       |  |
| 57  | 57                       |  |
| 60  | 60                       |  |
| 80  | 80                       |  |
| 87  | 87                       |  |
| 100 | 100                      |  |
| 140 | 140                      |  |

## Datasheet

## Technical data – Gear unit EMGA-40-P

|                                                   |                         |                         |                         |                                   |                         |
|---------------------------------------------------|-------------------------|-------------------------|-------------------------|-----------------------------------|-------------------------|
| Type of gear unit                                 | Planetary gear set      |                         |                         |                                   |                         |
| Gear unit flange size                             | 40 mm                   |                         |                         |                                   |                         |
| Gear unit ratio                                   | 3:1                     | 5:1                     | 8:1                     | 12:1                              | 20:1                    |
| Gear unit interface, output shaft                 | 40G                     |                         |                         |                                   |                         |
| Gear unit interface, drive shaft                  | 42A, 40P                |                         | 42A                     | 42A, 40P                          | 40P                     |
| Continuous output torque <sup>1)</sup>            | 11 Nm                   | 14 Nm                   | 6 Nm                    | 20 Nm                             |                         |
| Max. output torque <sup>2)</sup>                  | 17.6 Nm                 | 22 Nm                   | 10 Nm                   | 32 Nm                             |                         |
| Max. drive speed                                  | 18,000 rpm              |                         |                         |                                   |                         |
| Torsional rigidity                                | 1 Nm/arcmin             |                         | 0.8 Nm/arcmin           | 1 Nm/arcmin                       |                         |
| Torsional backlash                                | 0.25 deg                |                         |                         | 0.31 deg                          |                         |
| Mass moment of inertia of gear unit <sup>3)</sup> | 0.031 kgcm <sup>2</sup> | 0.019 kgcm <sup>2</sup> | 0.015 kgcm <sup>2</sup> | 0.025 ... 0.026 kgcm <sup>2</sup> | 0.018 kgcm <sup>2</sup> |
| Permissible radial shaft load                     | 200 N                   |                         | –                       | 200 N                             |                         |
| Permissible axial shaft load                      | 200 N                   |                         | –                       | 200 N                             |                         |
| Max. efficiency                                   | 98%                     |                         | 96%                     |                                   |                         |
| Degree of protection                              | IP54                    |                         |                         |                                   |                         |
| Operating temperature of gear unit <sup>4)</sup>  | -25 ... 90°C            |                         |                         |                                   |                         |
| Product weight                                    | 350 g                   |                         | 400 g                   | 450 g                             |                         |
| Note on materials                                 | RoHS compliant          |                         |                         |                                   |                         |
| LABS (PWIS) conformity                            | VDMA24364-B2-L          |                         |                         |                                   |                         |

1) On the output shaft.

2) The data refers to an output shaft speed of 100 rpm as well as operating mode S1 and a temperature of 30°C.

3) Related to the drive shaft.

4) Note the temperature range of the motor.

## Technical data – Gear unit EMGA-60-P

|                                                   |                    |       |             |       |               |             |               |             |             |
|---------------------------------------------------|--------------------|-------|-------------|-------|---------------|-------------|---------------|-------------|-------------|
| Type of gear unit                                 | Planetary gear set |       |             |       |               |             |               |             |             |
| Gear unit flange size                             | 60 mm              |       |             |       |               |             |               |             |             |
| Gear unit ratio                                   | 3:1                |       | 5:1         |       | 8:1           |             | 12:1          |             | 20:1        |
| Gear unit interface, output shaft                 | 60G                | 60H   | 60G         | 60H   | 60G           | 60H         | 60G           | 60H         |             |
| Gear unit interface, drive shaft                  | 57A                | 60P   | 57A         | 60P   | 57A           | 60P         | 57A           | 60P         |             |
| Continuous output torque <sup>1)</sup>            | 22 Nm              | 28 Nm | 22 Nm       | 40 Nm | 18 Nm         |             | 44 Nm         |             |             |
| Max. output torque <sup>2)</sup>                  | 35.2 Nm            | 45 Nm | 35.2 Nm     | 64 Nm | 29 Nm         |             | 70 Nm         |             |             |
| Max. drive speed                                  | 13,000 rpm         |       |             |       |               |             |               |             |             |
| Torsional rigidity                                | 2.3 Nm/arcmin      |       |             |       | 2.4 Nm/arcmin |             | 2.8 Nm/arcmin |             |             |
| Torsional backlash                                | 0.17 deg           |       |             |       |               |             |               |             | 0.2 deg     |
| Mass moment of inertia of gear unit <sup>3)</sup> | 0.135 kgcm²        |       | 0.078 kgcm² |       | 0.067 kgcm²   | 0.088 kgcm² | 0.118 kgcm²   | 0.138 kgcm² | 0.096 kgcm² |
| Permissible radial shaft load                     | 400 N              |       |             |       |               |             |               |             |             |
| Permissible axial shaft load                      | 500 N              |       |             |       |               |             |               |             |             |
| Max. efficiency                                   | 98%                |       |             |       | 97%           |             | 96%           |             |             |
| Degree of protection                              | IP54               |       |             |       |               |             |               |             |             |
| Operating temperature of gear unit <sup>4)</sup>  | -25 ... 90°C       |       |             |       |               |             |               |             |             |
| Product weight                                    | 900 g              |       |             |       |               |             | 1,100 g       |             |             |
| Note on materials                                 | RoHS compliant     |       |             |       |               |             |               |             |             |
| LABS (PWIS) conformity                            | VDMA24364-B2-L     |       |             |       |               |             |               |             |             |

1) On the output shaft.

2) The data refers to an output shaft speed of 100 rpm as well as operating mode S1 and a temperature of 30°C.

3) Related to the drive shaft.

4) Note the temperature range of the motor.

## Datasheet

## Technical data – Gear unit EMGA-80-P

|                                                   |                        |                        |                        |                         |                         |
|---------------------------------------------------|------------------------|------------------------|------------------------|-------------------------|-------------------------|
| Technical data – Gear unit LWSA 80 P              |                        |                        |                        |                         |                         |
| Type of gear unit                                 | Planetary gear set     |                        |                        |                         |                         |
| Gear unit flange size                             | 80 mm                  |                        |                        |                         |                         |
| Gear unit ratio                                   | 3:1                    | 5:1                    | 8:1                    | 12:1                    | 20:1                    |
| Gear unit interface, output shaft                 | 80G                    |                        |                        |                         |                         |
| Gear unit interface, drive shaft                  | 87A, 100A, 80P         |                        |                        | 100A                    | 100A, 80P               |
| Continuous output torque <sup>1)</sup>            | 85 Nm                  | 110 Nm                 | 50 Nm                  | 120 Nm                  |                         |
| Max. output torque <sup>2)</sup>                  | 136 Nm                 | 176 Nm                 | 80 ... 190 Nm          | 192 Nm                  | 192 ... 240 Nm          |
| Max. drive speed                                  | 7,000 rpm              |                        |                        |                         |                         |
| Torsional rigidity                                | 6 Nm/arcmin            |                        | 8.4 Nm/arcmin          | 10.2 Nm/arcmin          | 10.4 Nm/arcmin          |
| Torsional backlash                                | 0.12 deg               |                        |                        | 0.15 deg                |                         |
| Mass moment of inertia of gear unit <sup>3)</sup> | 0.77 kgcm <sup>2</sup> | 0.45 kgcm <sup>2</sup> | 0.37 kgcm <sup>2</sup> | 0.589 kgcm <sup>2</sup> | 0.406 kgcm <sup>2</sup> |
| Permissible radial shaft load                     | 750 N                  |                        |                        |                         |                         |
| Permissible axial shaft load                      | 1,000 N                |                        |                        |                         |                         |
| Max. efficiency                                   | 98%                    |                        | 97%                    | 96%                     |                         |
| Degree of protection                              | IP54                   |                        |                        |                         |                         |
| Operating temperature of gear unit <sup>4)</sup>  | -25 ... 90°C           |                        |                        |                         |                         |
| Product weight                                    | 2,000 ... 2,100 g      |                        | 2,000 ... 2,300 g      | 2,800 g                 | 2,500 ... 2,800 g       |
| Note on materials                                 | RoHS compliant         |                        |                        |                         |                         |
| LABS (PWIS) conformity                            | VDMA24364-B2-L         |                        |                        |                         |                         |

1) On the output shaft.

2) The data refers to an output shaft speed of 100 rpm as well as operating mode S1 and a temperature of 30°C.

3) Related to the drive shaft.

4) Note the temperature range of the motor.

## Technical data – Gear unit EMGA-120-P

|                                                   |                        |                        |                         |                         |                         |
|---------------------------------------------------|------------------------|------------------------|-------------------------|-------------------------|-------------------------|
| Technical data – Gear unit EMR 120 A              |                        |                        |                         |                         |                         |
| Type of gear unit                                 | Planetary gear set     |                        |                         |                         |                         |
| Gear unit flange size                             | 120 mm                 |                        |                         |                         |                         |
| Gear unit ratio                                   | 3:1                    | 5:1                    | 8:1                     | 12:1                    | 20:1                    |
| Gear unit interface, output shaft                 | 120G                   |                        |                         |                         |                         |
| Gear unit interface, drive shaft                  | 140A, 100A             |                        |                         |                         |                         |
| Continuous output torque <sup>1)</sup>            | 115 Nm                 | 195 Nm                 | 120 Nm                  | 260 Nm                  |                         |
| Max. output torque <sup>2)</sup>                  | 184 Nm                 | 312 Nm                 | 192 ... 380 Nm          | 416 ... 520 Nm          |                         |
| Max. drive speed                                  | 6,500 rpm              |                        |                         |                         |                         |
| Torsional rigidity                                | 12 Nm/arcmin           |                        | 18 Nm/arcmin            | 22 Nm/arcmin            |                         |
| Torsional backlash                                | 0.12 deg               |                        |                         | 0.15 deg                |                         |
| Mass moment of inertia of gear unit <sup>3)</sup> | 2.63 kgcm <sup>2</sup> | 1.53 kgcm <sup>2</sup> | 1.431 kgcm <sup>2</sup> | 2.224 kgcm <sup>2</sup> | 1.573 kgcm <sup>2</sup> |
| Permissible radial shaft load                     | 1,750 N                |                        |                         |                         |                         |
| Permissible axial shaft load                      | 2,500 N                |                        |                         |                         |                         |
| Max. efficiency                                   | 98%                    |                        | 97%                     | 96%                     |                         |
| Degree of protection                              | IP54                   |                        |                         |                         |                         |
| Operating temperature of gear unit <sup>4)</sup>  | -25 ... 90°C           |                        |                         |                         |                         |
| Product weight                                    | 6,000 g                |                        | 6,000 ... 7,000 g       | 8,000 ... 9,000 g       |                         |
| Note on materials                                 | RoHS compliant         |                        |                         |                         |                         |
| LABS (PWIS) conformity                            | VDMA24364-B2-L         |                        |                         |                         |                         |

1) On the output shaft.

2) The data refers to an output shaft speed of 100 rpm as well as operating mode S1 and a temperature of 30°C.

3) Related to the drive shaft.

4) Note the temperature range of the motor.

## Datasheet

## Technical data – Gear unit EMGA-160-P

|                                                   |                         |                        |
|---------------------------------------------------|-------------------------|------------------------|
| Type of gear unit                                 | Planetary gear set      |                        |
| Gear unit flange size                             | 160 mm                  |                        |
| Gear unit ratio                                   | 3:1                     | 5:1                    |
| Gear unit interface, output shaft                 | 160G                    |                        |
| Gear unit interface, drive shaft                  | 140A                    |                        |
| Continuous output torque <sup>1)</sup>            | 400 Nm                  | 450 Nm                 |
| Max. output torque <sup>2)</sup>                  | 640 Nm                  | 720 Nm                 |
| Max. drive speed                                  | 6,500 rpm               |                        |
| Torsional rigidity                                | 38 Nm/arcmin            |                        |
| Torsional backlash                                | 0.1 deg                 |                        |
| Mass moment of inertia of gear unit <sup>3)</sup> | 12.14 kgcm <sup>2</sup> | 6.07 kgcm <sup>2</sup> |
| Permissible radial shaft load                     | 5,000 N                 |                        |
| Permissible axial shaft load                      | 7,000 N                 |                        |
| Max. efficiency                                   | 98%                     |                        |
| Degree of protection                              | IP54                    |                        |
| Operating temperature of gear unit <sup>4)</sup>  | -25 ... 90°C            |                        |
| Product weight                                    | 18,000 g                |                        |
| Note on materials                                 | RoHS compliant          |                        |
| LABS (PWIS) conformity                            | VDMA24364-B2-L          |                        |

1) On the output shaft.

2) The data refers to an output shaft speed of 100 rpm as well as operating mode S1 and a temperature of 30°C.

3) Related to the drive shaft.

4) Note the temperature range of the motor.

## Technical data – Gear unit EMGA-40-A

|                                                   |                         |                         |                         |                         |                         |
|---------------------------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| Type of gear unit                                 | Right-angle gear unit   |                         |                         |                         |                         |
| Gear unit flange size                             | 40 mm                   |                         |                         |                         |                         |
| Gear unit ratio                                   | 3:1                     | 5:1                     | 8:1                     | 12:1                    | 20:1                    |
| Gear unit interface, output shaft                 | 40G                     |                         |                         |                         |                         |
| Gear unit interface, drive shaft                  | 40P                     |                         |                         |                         |                         |
| Continuous output torque <sup>1)</sup>            | 4.5 Nm                  | 7.5 Nm                  | 6 Nm                    | 20 Nm                   |                         |
| Max. output torque <sup>2)</sup>                  | 7 Nm                    | 12 Nm                   | 10 Nm                   | 32 Nm                   |                         |
| Max. drive speed                                  | 18,000 rpm              |                         |                         |                         |                         |
| Torsional backlash                                | 0.35 deg                |                         |                         | 0.41 deg                |                         |
| Mass moment of inertia of gear unit <sup>3)</sup> | 0.049 kgcm <sup>2</sup> | 0.035 kgcm <sup>2</sup> | 0.032 kgcm <sup>2</sup> | 0.048 kgcm <sup>2</sup> | 0.035 kgcm <sup>2</sup> |
| Permissible radial shaft load                     | 200 N                   |                         |                         |                         |                         |
| Permissible axial shaft load                      | 200 N                   |                         |                         |                         |                         |
| Max. efficiency                                   | 95%                     | 92%                     | 94%                     | 92%                     |                         |
| Degree of protection                              | IP54                    |                         |                         |                         |                         |
| Operating temperature of gear unit <sup>4)</sup>  | -25 ... 90°C            |                         |                         |                         |                         |
| Product weight                                    | 500 g                   |                         | 600 g                   |                         |                         |
| Note on materials                                 | RoHS compliant          |                         |                         |                         |                         |
| LABS (PWIS) conformity                            | VDMA24364-B2-L          |                         |                         |                         |                         |

1) On the output shaft.

2) The data refers to an output shaft speed of 100 rpm as well as operating mode S1 and a temperature of 30°C.

3) Related to the drive shaft.

4) Note the temperature range of the motor.

## Datasheet

## Technical data – Gear unit EMGA-60-A

|                                                   |                         |                         |                         |                         |                         |
|---------------------------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| Technical data                                    |                         | Gear unit EWSA 60 A     |                         |                         |                         |
| Type of gear unit                                 | Right-angle gear unit   |                         |                         |                         |                         |
| Gear unit flange size                             | 60 mm                   |                         |                         |                         |                         |
| Gear unit ratio                                   | 3:1                     | 5:1                     | 8:1                     | 12:1                    | 20:1                    |
| Gear unit interface, output shaft                 | 60G                     |                         |                         |                         |                         |
|                                                   |                         |                         |                         |                         |                         |
| Gear unit interface, drive shaft                  | 60P                     |                         |                         |                         |                         |
| Continuous output torque <sup>1)</sup>            | 14 Nm                   | 24 Nm                   | 18 Nm                   | 44 Nm                   |                         |
| Max. output torque <sup>2)</sup>                  | 22 Nm                   | 38 Nm                   | 29 Nm                   | 70 Nm                   |                         |
| Max. drive speed                                  | 13,000 rpm              |                         |                         |                         |                         |
| Torsional backlash                                | 0.27 deg                |                         |                         | 0.3 deg                 |                         |
| Mass moment of inertia of gear unit <sup>3)</sup> | 0.394 kgcm <sup>2</sup> | 0.257 kgcm <sup>2</sup> | 0.243 kgcm <sup>2</sup> | 0.391 kgcm <sup>2</sup> | 0.256 kgcm <sup>2</sup> |
| Permissible radial shaft load                     | 400 N                   |                         |                         |                         |                         |
| Permissible axial shaft load                      | 500 N                   |                         |                         |                         |                         |
| Max. efficiency                                   | 95%                     |                         | 93%                     | 94%                     | 92%                     |
| Degree of protection                              | IP54                    |                         |                         |                         |                         |
| Operating temperature of gear unit <sup>4)</sup>  | -25 ... 90°C            |                         |                         |                         |                         |
| Product weight                                    | 1,700 g                 |                         |                         | 1,900 g                 |                         |
| Note on materials                                 | RoHS compliant          |                         |                         |                         |                         |
| LABS (PWIS) conformity                            | VDMA24364-B2-L          |                         |                         |                         |                         |

1) On the output shaft.

2) The data refers to an output shaft speed of 100 rpm as well as operating mode S1 and a temperature of 30°C.

3) Related to the drive shaft.

4) Note the temperature range of the motor.

## Technical data – Gear unit EMGA-80-A

|                                                   |                         |                         |                         |                         |                         |
|---------------------------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| Technical data Gear unit ENH 80 A                 |                         |                         |                         |                         |                         |
| Type of gear unit                                 | Right-angle gear unit   |                         |                         |                         |                         |
| Gear unit flange size                             | 80 mm                   |                         |                         |                         |                         |
| Gear unit ratio                                   | 3:1                     | 5:1                     | 8:1                     | 12:1                    | 20:1                    |
| Gear unit interface, output shaft                 | 80G                     |                         |                         |                         |                         |
| Gear unit interface, drive shaft                  | 100A, 80P               |                         |                         |                         |                         |
| Continuous output torque <sup>1)</sup>            | 40 Nm                   | 67 Nm                   | 50 Nm                   | 120 Nm                  |                         |
| Max. output torque <sup>2)</sup>                  | 64 Nm                   | 107 Nm                  | 80 ... 190 Nm           | 192 ... 240 Nm          |                         |
| Max. drive speed                                  | 7,000 rpm               |                         |                         |                         |                         |
| Torsional backlash                                | 0.22 deg                |                         |                         | 0.25 deg                |                         |
| Mass moment of inertia of gear unit <sup>3)</sup> | 1.409 kgcm <sup>2</sup> | 1.017 kgcm <sup>2</sup> | 0.934 kgcm <sup>2</sup> | 1.379 kgcm <sup>2</sup> | 1.013 kgcm <sup>2</sup> |
| Permissible radial shaft load                     | 750 N                   |                         |                         |                         |                         |
| Permissible axial shaft load                      | 1,000 N                 |                         |                         |                         |                         |
| Max. efficiency                                   | 95%                     |                         | 94%                     |                         | 93%                     |
| Degree of protection                              | IP54                    |                         |                         |                         |                         |
| Operating temperature of gear unit <sup>4)</sup>  | -25 ... 90°C            |                         |                         |                         |                         |
| Product weight                                    | 4,300 ... 4,500 g       |                         | 4,400 ... 4,500 g       | 5,000 ... 5,100 g       |                         |
| Note on materials                                 | RoHS compliant          |                         |                         |                         |                         |
| LABS (PWIS) conformity                            | VDMA24364-B2-L          |                         |                         |                         |                         |

1) On the output shaft.

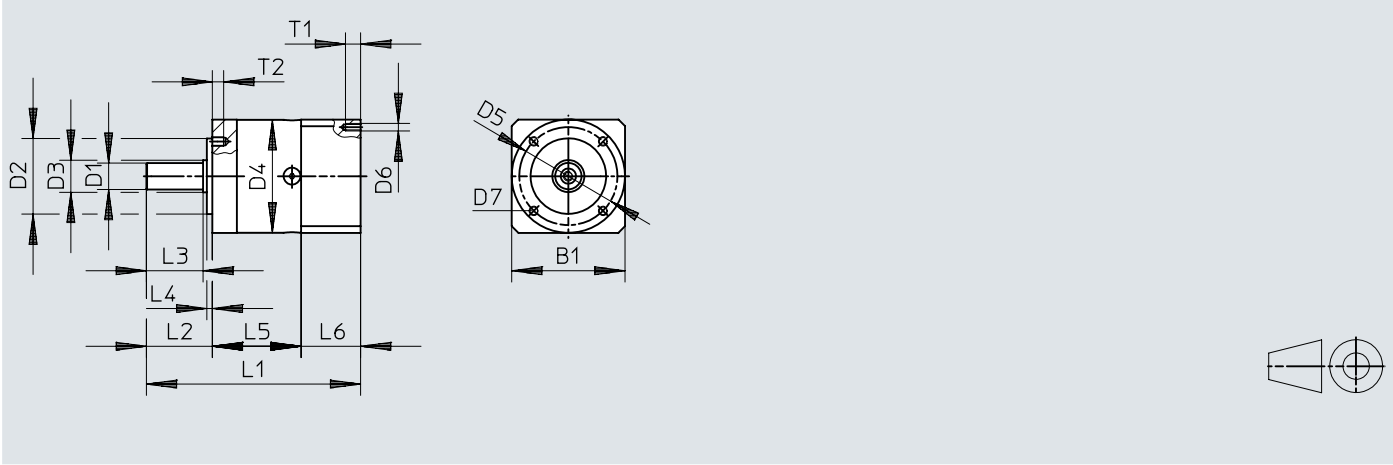
2) The data refers to an output shaft speed of 100 rpm as well as operating mode S1 and a temperature of 30°C.

3) Related to the drive shaft.

4) Note the temperature range of the motor.

Dimensions

Dimensions – EMGA-...-P (planetary gear set) [Download CAD data](#) [www.festo.com](http://www.festo.com)



## Dimensions

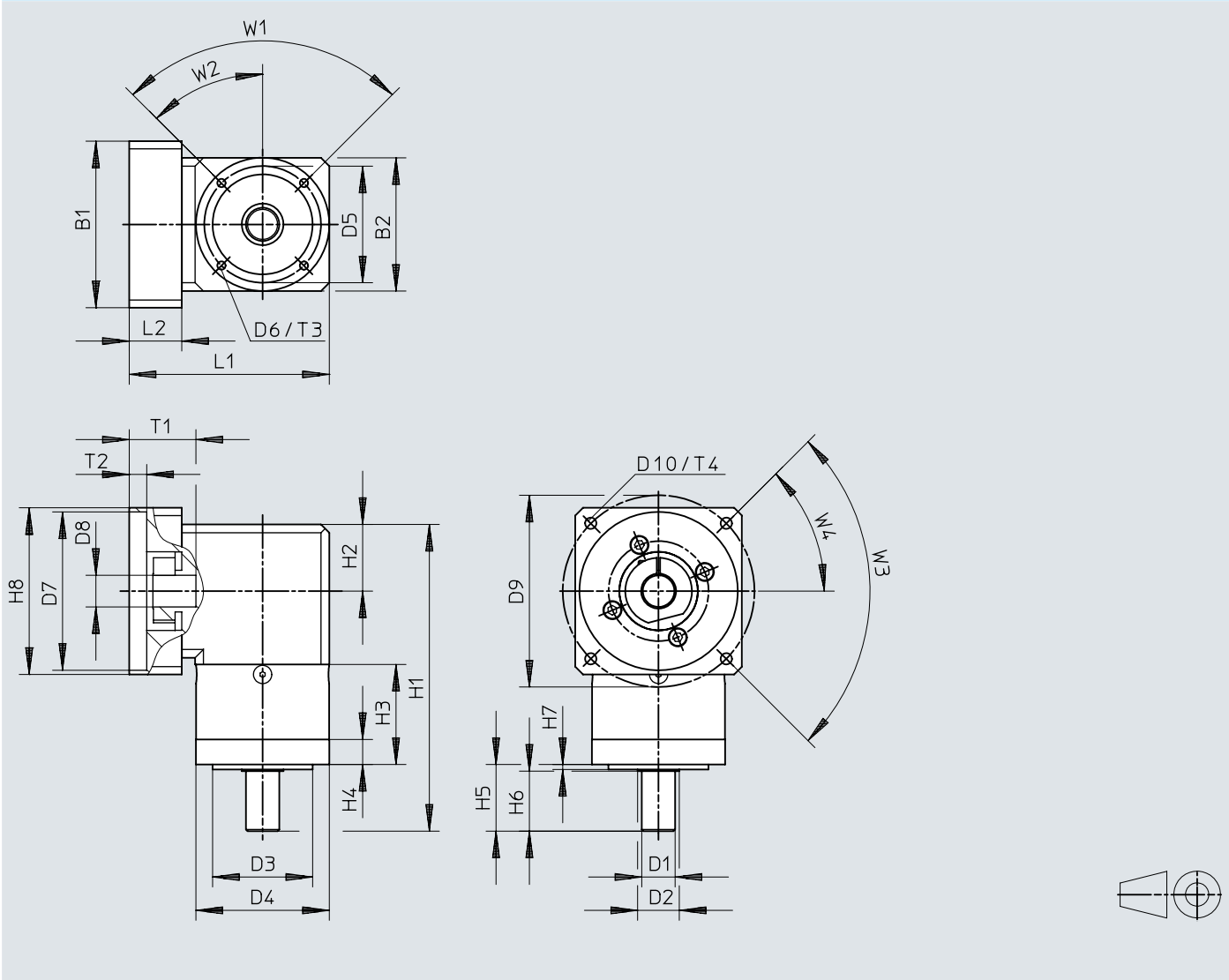
|          | 1)      | 2)   | 3)           | B1  | D1<br>ø<br>h7 | D2<br>ø<br>h7 | D3<br>ø | D4<br>ø | D5<br>ø | D6   |
|----------|---------|------|--------------|-----|---------------|---------------|---------|---------|---------|------|
| EMGA-40  | 3, 5, 8 | 40G  | 40P          | 40  | 10            | 26            | 12      | 40      | 34      | M3   |
|          | 12, 20  |      |              |     |               |               |         |         |         |      |
|          | 3, 5, 8 |      | 42A          |     |               |               |         |         |         | ø3,4 |
|          | 12      |      |              |     |               |               |         |         |         |      |
| EMGA-60  | 3, 5, 8 | 60H  | 60P          | 60  | 14            | 40            | 17      | 60      | 52      | M4   |
|          | 12, 20  |      |              |     |               |               |         |         |         |      |
|          | 3, 5, 8 | 60G  | 57A          | 60  | 11            | 40            | 17      | 60      | 52      | M4   |
|          | 12      |      |              |     |               |               |         |         |         |      |
| EMGA-80  | 3, 5, 8 | 80G  | 80P          | 80  | 20            | 60            | 25      | 80      | 70      | M5   |
|          | 12, 20  |      |              |     |               |               |         |         |         |      |
|          | 3, 5, 8 |      | 87A          | 90  |               |               |         |         |         | M5   |
|          | 12      |      |              |     |               |               |         |         |         |      |
|          | 3, 5, 8 |      | 100A         | 100 |               |               |         |         |         | M8   |
|          | 12, 20  |      |              |     |               |               |         |         |         |      |
| EMGA-120 | 3, 5, 8 | 120G | 100A         | 115 | 25            | 80            | 35      | 115     | 100     | M8   |
|          | 12, 20  |      |              |     |               |               |         |         |         |      |
|          | 3, 5, 8 |      | 140A         | 140 |               |               |         |         |         | M10  |
|          | 12, 20  |      | 150A         |     |               |               |         |         |         |      |
| EMGA-160 | 3, 5    | 160G | 140A<br>150A | 140 | 40            | 130           | 55      | 160     | 145     | M10  |

|          | 1)      | 2)   | 3)           | D7  | L1    | L2 | L3<br>±0,2 | L4<br>±0,2 | L5    | L6   | T1<br>+2 | T2<br>+2 |
|----------|---------|------|--------------|-----|-------|----|------------|------------|-------|------|----------|----------|
| EMGA-40  | 3, 5, 8 | 40G  | 40P          | M4  | 93,5  | 26 | 23         | 2          | 39    | 28,5 | 8        | 6        |
|          | 12, 20  |      |              |     | 106,5 |    |            |            | 52    |      |          |          |
|          | 3, 5, 8 |      | 42A          |     | 92,5  |    |            |            | 39    | 27,5 | 5        |          |
|          | 12      |      |              |     | 105,5 |    |            |            | 52    |      |          |          |
| EMGA-60  | 3, 5, 8 | 60H  | 60P          | M5  | 113   | 35 | 30         | 3          | 47    | 31   | 10       | 8        |
|          | 12, 20  |      |              |     | 125,5 |    |            |            | 59,5  |      |          |          |
|          | 3, 5, 8 | 60G  | 57A          | M5  | 106   | 35 | 30         | 3          | 47    | 24   | 8        | 8        |
|          | 12      |      |              |     | 118,5 |    |            |            | 59,5  |      |          |          |
| EMGA-80  | 3, 5, 8 | 80G  | 80P          | M6  | 138,5 | 40 | 36         | 3          | 60    | 38,5 | 12       | 10       |
|          | 12, 20  |      |              |     | 156   |    |            |            | 77,5  |      |          |          |
|          | 3, 5, 8 | 80G  | 87A          |     | 135,5 |    |            |            | 60    | 35,5 | 12       |          |
|          | 12      |      |              |     | 153   |    |            |            | 77,5  |      |          |          |
|          | 3, 5, 8 | 80G  | 100A         |     | 143,5 |    |            |            | 60    | 43,5 | 16       |          |
|          | 12, 20  |      |              |     | 161   |    |            |            | 77,5  |      |          |          |
| EMGA-120 | 3, 5, 8 | 120G | 100A         | M10 | 176,5 | 55 | 50         | 4          | 74    | 47,5 | 20       | 16       |
|          | 12, 20  |      |              |     | 204   |    |            |            | 101,5 |      |          |          |
|          | 3, 5, 8 |      | 140A         |     | 186,5 |    |            |            | 74    | 57,5 | 25       |          |
|          | 12, 20  |      | 150A         |     | 214   |    |            |            | 101,5 |      |          |          |
| EMGA-160 | 3, 5    | 160G | 140A<br>150A | M12 | 255,5 | 87 | 80         | 5          | 104   | 64,5 | 25       | 20       |

- 1) Gear ratio  
2) Gear unit interface, output shaft  
3) Gear unit interface, drive

Dimensions

Dimensions – EMGA-...-A (right-angle gear unit) [Download CAD data](#) [www.festo.com](http://www.festo.com)



## Dimensions

|                  | 1)     | 2)  | 3)   | B1  | B2  | D1<br>Ø<br>h7 | D2<br>Ø | D3<br>Ø<br>h7 | D4<br>Ø | D5<br>Ø | D6 | D7<br>+0,05/+0,02 | D8 | D9  |
|------------------|--------|-----|------|-----|-----|---------------|---------|---------------|---------|---------|----|-------------------|----|-----|
| EMGA-40          | 3, 5   | 40G | 40P  | 40  | 40  | 10            | 12      | 26            | 40 -0,3 | 34      | M4 | 30                | 8  | 45  |
|                  | 8      |     |      |     |     |               |         |               | 40      |         |    |                   |    |     |
|                  | 12, 20 |     |      |     |     |               |         |               | 40      |         |    |                   |    |     |
| EMGA-60          | 3, 5   | 60H | 60P  | 60  | 60  | 14            | 17      | 40            | 60 -0,3 | 52      | M5 | 50                | 14 | 70  |
|                  | 8      |     |      |     |     |               |         |               | 60      |         |    |                   |    |     |
|                  | 12, 20 |     |      |     |     |               |         |               | 60      |         |    |                   |    |     |
| EMGA-80-....-80  | 3, 5   | 80G | 80P  | 80  | 80  | 20            | 25      | 60            | 80 -0,4 | 70      | M6 | 70                | 19 | 90  |
|                  | 8      |     |      |     |     |               |         |               | 80      |         |    |                   |    |     |
|                  | 12, 20 |     |      |     |     |               |         |               | 80      |         |    |                   |    |     |
| EMGA-80-....-100 | 3, 5   | 80G | 100A | 100 | 100 | 20            | 25      | 60            | 80 -0,4 | 70      | M6 | 95                | 19 | 115 |
|                  | 8      |     |      |     |     |               |         |               | 80      |         |    |                   |    |     |
|                  | 12, 20 |     |      |     |     |               |         |               | 80      |         |    |                   |    |     |

|                  | 1)     | 2)  | 3)   | D10 | H1            | H2 | H3<br>±0,2 | H4   | H5     | H6      | H7     | H8  | L1   | L2   |
|------------------|--------|-----|------|-----|---------------|----|------------|------|--------|---------|--------|-----|------|------|
| EMGA-40          | 3, 5   | 40G | 40P  | M3  | 110 ±1,5      | 20 | 39         | 10,2 | 26±0,6 | 23 ±0,2 | 2 ±0,2 | 40  | 67   | 19   |
|                  | 8      |     |      |     | 110           |    | 39         |      | 26     | 23      | 2      |     |      |      |
|                  | 12, 20 |     |      |     | 123           |    | 52         |      | 26     | 23      | 2      |     |      |      |
| EMGA-60          | 3, 5   | 60H | 60P  | M4  | 146,8<br>±1,5 | 30 | 46,8       | 12,7 | 35±0,8 | 30 ±0,2 | 3 ±0,2 | 60  | 92,5 | 23   |
|                  | 8      |     |      |     | 147           |    | 47         |      | 35     | 30      | 3      |     |      |      |
|                  | 12, 20 |     |      |     | 159,5         |    | 59,5       |      | 35     | 30      | 3      |     |      |      |
| EMGA-80-....-80  | 3, 5   | 80G | 80P  | M5  | 183,9<br>±1,5 | 40 | 59,9       | 15   | 40±0,8 | 36 ±0,2 | 3 ±0,2 | 80  | 115  | 26,5 |
|                  | 8      |     |      |     | 184           |    | 60         |      | 40     | 36      | 3      |     |      |      |
|                  | 12, 20 |     |      |     | 201,5         |    | 77,5       |      | 40     | 36      | 3      |     |      |      |
| EMGA-80-....-100 | 3, 5   | 80G | 100A | M6  | 183,9<br>±1,5 | 40 | 59,9       | 15   | 40±0,8 | 36 ±0,2 | 3 ±0,2 | 100 | 120  | 31,5 |
|                  | 8      |     |      |     | 184           |    | 60         |      | 40     | 36      | 3      |     |      |      |
|                  | 12, 20 |     |      |     | 201,5         |    | 77,5       |      | 40     | 36      | 3      |     |      |      |

|                  | 1)     | 2)  | 3)   | T1          | T2   | T3 | T4 | W1  | W2  | W3  | W4  |
|------------------|--------|-----|------|-------------|------|----|----|-----|-----|-----|-----|
| EMGA-40          | 3, 5   | 40G | 40P  | 25+2/+0,5   | 3,5  | 6  | 8  | 90° | 45° | 90° | 45° |
|                  | 8      |     |      |             | 3,4  |    | 7  |     |     |     |     |
|                  | 12, 20 |     |      |             | 3,4  |    | 7  |     |     |     |     |
| EMGA-60          | 3, 5   | 60H | 60P  | 30+2,5/+0,5 | 4    | 8  | 10 | 90° | 45° | 90° | 45° |
|                  | 8      |     |      |             | 4    |    | 10 |     |     |     |     |
|                  | 12, 20 |     |      |             | 4    |    | 10 |     |     |     |     |
| EMGA-80-....-80  | 3, 5   | 80G | 80P  | 30+2,5/+0,5 | 4,4  | 10 | 12 | 90° | 45° | 90° | 45° |
|                  | 8      |     |      | 35+2,5/+0,5 |      |    | 12 |     |     |     |     |
|                  | 12, 20 |     |      | 35+2,5/+0,5 |      |    | 12 |     |     |     |     |
| EMGA-80-....-100 | 3, 5   | 80G | 100A | 40+2,5/+0,5 | 10,4 | 10 | 20 | 90° | 45° | 90° | 45° |
|                  | 8      |     |      |             | 10,5 |    | 20 |     |     |     |     |
|                  | 12, 20 |     |      |             | 10,5 |    | 20 |     |     |     |     |

- 1) Gear ratio  
2) Gear unit interface, output shaft  
3) Gear unit interface, drive

## Ordering data

**EMGA-....P for EMMT-AS-40, EMMT-EC-40**

| Type of gear unit  | Gear unit ratio | Gear unit interface, output shaft | Gear unit interface, drive shaft | Part no. | Type                 |
|--------------------|-----------------|-----------------------------------|----------------------------------|----------|----------------------|
| Planetary gear set | 3:1             | 40G                               | 40P                              | 2297684  | EMGA-40-P-G3-EAS-40  |
|                    | 5:1             |                                   |                                  | 2297685  | EMGA-40-P-G5-EAS-40  |
|                    | 8:1             |                                   |                                  | 8141729  | EMGA-40-P-G8-EAS-40  |
|                    | 12:1            |                                   |                                  | 8141730  | EMGA-40-P-G12-EAS-40 |
|                    | 20:1            |                                   |                                  | 8141731  | EMGA-40-P-G20-EAS-40 |

**EMGA-....P for EMMT-AS-60**

| Type of gear unit  | Gear unit ratio | Gear unit interface, output shaft | Gear unit interface, drive shaft | Part no. | Type                 |
|--------------------|-----------------|-----------------------------------|----------------------------------|----------|----------------------|
| Planetary gear set | 3:1             | 60H                               | 60P                              | 2297686  | EMGA-60-P-G3-EAS-60  |
|                    | 5:1             |                                   |                                  | 2297687  | EMGA-60-P-G5-EAS-60  |
|                    | 8:1             |                                   |                                  | 8141735  | EMGA-60-P-G8-EAS-60  |
|                    | 12:1            |                                   |                                  | 8141736  | EMGA-60-P-G12-EAS-60 |
|                    | 20:1            |                                   |                                  | 8141737  | EMGA-60-P-G20-EAS-60 |

**EMGA-....P for EMMT-AS-80**

| Type of gear unit  | Gear unit ratio | Gear unit interface, output shaft | Gear unit interface, drive shaft | Part no. | Type                 |
|--------------------|-----------------|-----------------------------------|----------------------------------|----------|----------------------|
| Planetary gear set | 3:1             | 80G                               | 80P                              | 2297690  | EMGA-80-P-G3-EAS-80  |
|                    | 5:1             |                                   |                                  | 2297691  | EMGA-80-P-G5-EAS-80  |
|                    | 8:1             |                                   |                                  | 8141741  | EMGA-80-P-G8-EAS-80  |
|                    | 12:1            |                                   |                                  | 8141742  | EMGA-80-P-G12-EAS-80 |
|                    | 20:1            |                                   |                                  | 8141743  | EMGA-80-P-G20-EAS-80 |

**EMGA-....P for EMMT-AS-100**

| Type of gear unit  | Gear unit ratio | Gear unit interface, output shaft | Gear unit interface, drive shaft | Part no. | Type                   |
|--------------------|-----------------|-----------------------------------|----------------------------------|----------|------------------------|
| Planetary gear set | 3:1             | 80G                               | 100A                             | 552194   | EMGA-80-P-G3-SAS-100   |
|                    |                 | 120G                              |                                  | 552196   | EMGA-120-P-G3-SAS-100  |
|                    | 5:1             | 80G                               |                                  | 552195   | EMGA-80-P-G5-SAS-100   |
|                    |                 | 120G                              |                                  | 552197   | EMGA-120-P-G5-SAS-100  |
|                    | 8:1             | 80G                               |                                  | 8141750  | EMGA-80-P-G8-SAS-100   |
|                    |                 | 120G                              |                                  | 8141753  | EMGA-120-P-G8-SAS-100  |
|                    | 12:1            | 80G                               |                                  | 8141751  | EMGA-80-P-G12-SAS-100  |
|                    |                 | 120G                              |                                  | 8141754  | EMGA-120-P-G12-SAS-100 |
|                    | 20:1            | 80G                               |                                  | 8141752  | EMGA-80-P-G20-SAS-100  |
|                    |                 | 120G                              |                                  | 8141755  | EMGA-120-P-G20-SAS-100 |

**EMGA-....P for EMMT-ST-42, EMMB-ST-42**

| Type of gear unit  | Gear unit ratio | Gear unit interface, output shaft | Gear unit interface, drive shaft | Part no. | Type                 |
|--------------------|-----------------|-----------------------------------|----------------------------------|----------|----------------------|
| Planetary gear set | 3:1             | 40G                               | 42A                              | 549428   | EMGA-40-P-G3-SST-42  |
|                    | 5:1             |                                   |                                  | 549429   | EMGA-40-P-G5-SST-42  |
|                    | 8:1             |                                   |                                  | 8141762  | EMGA-40-P-G8-SST-42  |
|                    | 12:1            |                                   |                                  | 8141763  | EMGA-40-P-G12-SST-42 |

## Ordering data

| EMGA-...-P for EMMT-ST-57, EMMB-ST-57 |                 |                                   |                                  |          |                      |
|---------------------------------------|-----------------|-----------------------------------|----------------------------------|----------|----------------------|
| Type of gear unit                     | Gear unit ratio | Gear unit interface, output shaft | Gear unit interface, drive shaft | Part no. | Type                 |
| Planetary gear set                    | 3:1             | 60G                               | 57A                              | 549430   | EMGA-60-P-G3-SST-57  |
|                                       | 5:1             |                                   |                                  | 549431   | EMGA-60-P-G5-SST-57  |
|                                       | 8:1             |                                   |                                  | 8141764  | EMGA-60-P-G8-SST-57  |
|                                       | 12:1            |                                   |                                  | 8141765  | EMGA-60-P-G12-SST-57 |

| EMGA-...-P for EMMT-ST-87, EMMB-ST-87 |                 |                                   |                                  |          |                      |
|---------------------------------------|-----------------|-----------------------------------|----------------------------------|----------|----------------------|
| Type of gear unit                     | Gear unit ratio | Gear unit interface, output shaft | Gear unit interface, drive shaft | Part no. | Type                 |
| Planetary gear set                    | 3:1             | 80G                               | 87A                              | 549432   | EMGA-80-P-G3-SST-87  |
|                                       | 5:1             |                                   |                                  | 549433   | EMGA-80-P-G5-SST-87  |
|                                       | 8:1             |                                   |                                  | 8141766  | EMGA-80-P-G8-SST-87  |
|                                       | 12:1            |                                   |                                  | 8141767  | EMGA-80-P-G12-SST-87 |

| EMGA-...-A for EMMT-AS-40, EMMT-EC-40 |                 |                                   |                                  |          |                   |
|---------------------------------------|-----------------|-----------------------------------|----------------------------------|----------|-------------------|
| Type of gear unit                     | Gear unit ratio | Gear unit interface, output shaft | Gear unit interface, drive shaft | Part no. | Type              |
| Right-angle gear unit                 | 3:1             | 40G                               | 40P                              | 8085342  | EMGA-40-A-G3-40P  |
|                                       | 5:1             |                                   |                                  | 8085343  | EMGA-40-A-G5-40P  |
|                                       | 8:1             |                                   |                                  | 8141732  | EMGA-40-A-G8-40P  |
|                                       | 12:1            |                                   |                                  | 8141733  | EMGA-40-A-G12-40P |
|                                       | 20:1            |                                   |                                  | 8141734  | EMGA-40-A-G20-40P |

| EMGA-...-A for EMMT-AS-60 |                 |                                   |                                  |          |                   |
|---------------------------|-----------------|-----------------------------------|----------------------------------|----------|-------------------|
| Type of gear unit         | Gear unit ratio | Gear unit interface, output shaft | Gear unit interface, drive shaft | Part no. | Type              |
| Right-angle gear unit     | 3:1             | 60G                               | 60P                              | 8085344  | EMGA-60-A-G3-60P  |
|                           | 5:1             |                                   |                                  | 8085345  | EMGA-60-A-G5-60P  |
|                           | 8:1             |                                   |                                  | 8141738  | EMGA-60-A-G8-60P  |
|                           | 12:1            |                                   |                                  | 8141739  | EMGA-60-A-G12-60P |
|                           | 20:1            |                                   |                                  | 8141740  | EMGA-60-A-G20-60P |

| EMGA-...-A for EMMT-AS-80 |                 |                                   |                                  |          |                   |
|---------------------------|-----------------|-----------------------------------|----------------------------------|----------|-------------------|
| Type of gear unit         | Gear unit ratio | Gear unit interface, output shaft | Gear unit interface, drive shaft | Part no. | Type              |
| Right-angle gear unit     | 3:1             | 80G                               | 80P                              | 8085346  | EMGA-80-A-G3-80P  |
|                           | 5:1             |                                   |                                  | 8085347  | EMGA-80-A-G5-80P  |
|                           | 8:1             |                                   |                                  | 8141744  | EMGA-80-A-G8-80P  |
|                           | 12:1            |                                   |                                  | 8141745  | EMGA-80-A-G12-80P |
|                           | 20:1            |                                   |                                  | 8141746  | EMGA-80-A-G20-80P |

| EMGA-...-A for EMMT-AS-100 |                 |                                   |                                  |          |                    |
|----------------------------|-----------------|-----------------------------------|----------------------------------|----------|--------------------|
| Type of gear unit          | Gear unit ratio | Gear unit interface, output shaft | Gear unit interface, drive shaft | Part no. | Type               |
| Right-angle gear unit      | 3:1             | 80G                               | 100A                             | 8085348  | EMGA-80-A-G3-100A  |
|                            | 5:1             |                                   |                                  | 8085349  | EMGA-80-A-G5-100A  |
|                            | 8:1             |                                   |                                  | 8141747  | EMGA-80-A-G8-100A  |
|                            | 12:1            |                                   |                                  | 8141748  | EMGA-80-A-G12-100A |
|                            | 20:1            |                                   |                                  | 8141749  | EMGA-80-A-G20-100A |