# 8GA45-089 standard

## Technical data



| Gearbox | 8GA45-089hh003klmm | 8GA45-089hh004klmm | 8GA45-089hh005klmm | 8GA45-089hh008klmm | 8GA45-089hh010klmm | 8GA45-089hh009klmm | 8GA45-089hh012klmm | 8GA45-089hh015klmm | 8GA45-089hh016klmm | 8GA45-089hh020klmm | 8GA45-089hh025klmm | 8GA45-089hh032klmm | 8GA45-089hh040klmm | 8GA45-089hh064klmm | 8GA45-089hh100klmm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number of gear stages | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Gear ratio i | 3 | 4 | 5 | 8 | 10 | 9 | 12 | 15 | 16 | 20 | 25 | 32 | 40 | 64 | 100 |
| Nominal output torque $T_{2N}$ [Nm] | 40 | 53 | 67 | 50 | 38 | 130 | 120 | 110 | 120 | 120 | 110 | 120 | 110 | 50 | 38 |
| Max. output torque $T_{2max}$ [Nm] | 64 | 85 | 107 | 80 | 61 | 208 | 192 | 176 | 192 | 192 | 176 | 192 | 176 | 80 | 61 |
| E-stop torque $T_{2stop}$ [Nm] | 180 | 240 | 220 | 190 | 170 | 260 | 240 | 220 | 240 | 240 | 220 | 240 | 220 | 190 | 170 |
| Idle torque [Nm] at 20°C and 3000 rpm | 0.85 | 0.75 | 0.65 | 0.55 | 0.5 | 0.6 | 0.55 | 0.55 | 0.55 | 0.5 | 0.5 | 0.45 | 0.45 | 0.45 | 0.45 |
| Max. average drive speed $n_{1N50\%}$ [rpm] at 50% $T_{2N}$ and S1 | 3100 | 3250 | 3350 | 4000 | 4000 | 3150 | 3750 | 4000 | 4000 | 4000 | 4000 | 4000 | 4000 | 4000 | 4000 |
| Max. average drive speed $n_{1N100\%}$ [rpm] at 100% $T_{2N}$ and S1 | 2300 | 2300 | 2350 | 3650 | 4000 | 2050 | 2600 | 3100 | 3050 | 3500 | 4000 | 4000 | 4000 | 4000 | 4000 |
| Max. drive speed $n_{1max}$ [rpm] | | | | | | | | 7000 | | | | | | | |
| Max. backlash $J_t$ [arcmin] | 13 | 13 | 13 | 13 | 13 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| Reduced backlash $J_t$ [arcmin] less than | | | | | | | | 0 | | | | | | | |
| Torsional rigidity $C_{t21}$ [Nm/arcmin] | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Tilting rigidity $C_{2K}$ [Nm/arcmin] | | | | | | | | 0 | | | | | | | |
| Max. breakdown torque $M_{2Kmax}$ [Nm] | | | | | | | | 0 | | | | | | | |
| Max. radial force $Fr_{max}$ [N] for 30,000 h | | | | | | | | 1700 | | | | | | | |
| Max. radial force $Fr_{max}$ [N] for 20,000 h | | | | | | | | 2050 | | | | | | | |
| Max. axial force $Fa_{max}$ [N] for 30,000 h | | | | | | | | 2000 | | | | | | | |
| Max. axial force $Fa_{max}$ [N] for 20,000 h | | | | | | | | 2500 | | | | | | | |
| Operating noise $L_{PA}$ [dB(A)] | | | | | | | | 73 | | | | | | | |
| Efficiency at full load η [%] | 94 | 94 | 94 | 94 | 94 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Min. operating temperature $B_{Tempmin}$ [°C] | | | | | | | | -25 | | | | | | | |
| Max. operating temperature $B_{Tempmax}$ [°C] | | | | | | | | 90 | | | | | | | |
| Mounting orientation | | | | | | | | Any | | | | | | | |
| Protection | | | | | | | | IP54 | | | | | | | |
| Weight m [kg] | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 6.1 | 6.1 | 6.1 | 6.1 | 6.1 | 6.1 | 6.1 | 6.1 | 6.1 | 6.1 |
| Moment of inertia $J_1$ [kgcm$^2$] | 1.189 | 0.939 | 0.869 | 0.809 | 0.809 | 1.159 | 1.139 | 1.129 | 0.919 | 0.859 | 0.859 | 0.809 | 0.809 | 0.809 | 0.809 |

NOTE – **Output torque / Max. output torque:** This refers to an output shaft speed of $n_2$ = 100 rpm and application factor $K_A$ = 1 as well as S1 operating mode for electrical machines and T = 30°C, depending on the diameter of the motor shaft. The maximum output torque is only permissible for 30,000 revolutions!
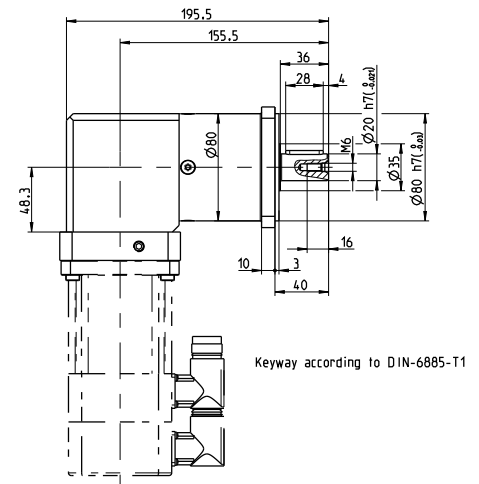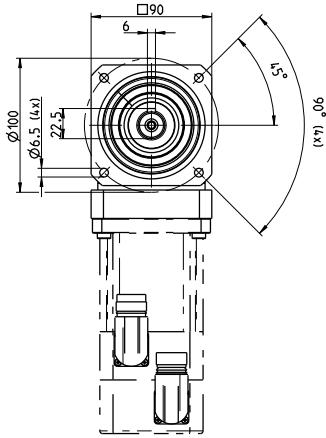NOTE – **E-stop torque:** Approved for 1000x

NOTE – **Axial / radial force:** With reference to the middle of the output shaft; the entries refer to an output shaft speed of $n_2$ = 100 rpm and application factor $K_A$ = 1 as well as S1 operating mode for electrical machines and T = 30°C

NOTE – **Running noise:** Noise level at a distance of 1 m; at an output speed of $n_1$ = 3000 rpm without a load; i = 5
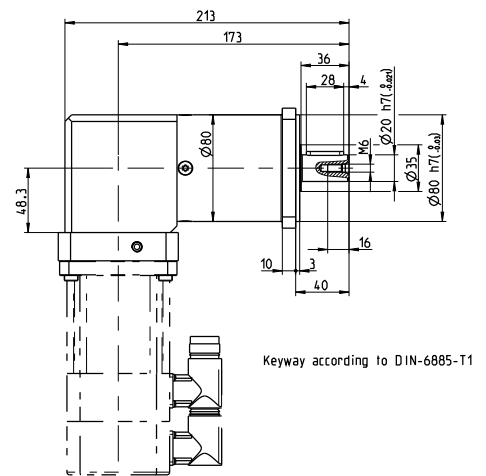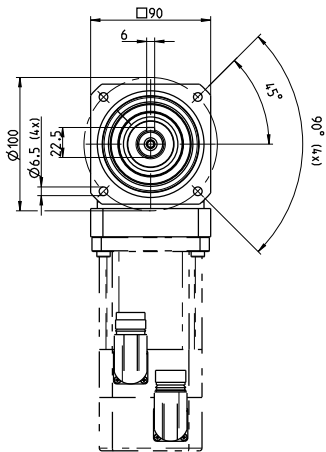NOTE – **Operating temperature:** With reference to the middle of the housing surface
NOTE – **Weight:** Planetary gearbox including universal flange (specific weight upon request)

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# 1-stage gear

□90
6
⌀100
⌀6,5 (4x)
22,5
45°
90° (4x)

195,5
155,5
36
28
4
48,3
⌀80
⌀20 h7(₋₀,₀₂₁)
M6
⌀35
⌀80 h7(₋₀,₀₃₀)
10
3
16
40

Keyway according to DIN-6885-T1

# 2-stage gear

□90
6
⌀100
⌀6,5 (4x)
22,5
45°
90° (4x)

213
173
36
28
4
48,3
⌀80
⌀20 h7(₋₀,₀₂₁)
M6
⌀35
⌀80 h7(₋₀,₀₃₀)
10
3
16
40

Keyway according to DIN-6885-T1

# Adapter flange - Overview of dimensions

The flange length L completes the diagram for determining the gearbox length.

| 8GA45-089 | 8LSA3 | 8LSA/C4 | 8LVA 2 | 8LVA3 | 8JSA3 | 8JSA4 | 8LSN4 | 80MPH |
|---|---|---|---|---|---|---|---|---|
| Flange length L [mm] | 21.2 | 31.2 | 21.2 | 31.2 | 21.2 | 31.2 | 31.2 | 23.2 |
| Flange diameter Q [mm] | 90 | 100 | 80 | 80 | 80 | 90 | 115 | 90 |

# 8GA45-089 standard

## Technical data



| | 8GA45-089hh060klmm | 8GA45-089hh080klmm | 8GA45-089hh120klmm | 8GA45-089hh160klmm | 8GA45-089hh200klmm | 8GA45-089hh256klmm | 8GA45-089hh320klmm | 8GA45-089hh512klmm |
|---|---|---|---|---|---|---|---|---|
| **Gearbox** | | | | | | | | |
| Number of gear stages | 3 | | | | | | | |
| Gear ratio i | 60 | 80 | 120 | 160 | 200 | 256 | 320 | 512 |
| Nominal output torque $T_{2N}$ [Nm] | 110 | 120 | 110 | 120 | 110 | 120 | 110 | 50 |
| Max. output torque $T_{2max}$ [Nm] | 176 | 192 | 176 | 192 | 176 | 192 | 176 | 80 |
| E-stop torque $T_{2stop}$ [Nm] | 220 | 240 | 220 | 240 | 220 | 240 | 220 | 190 |
| Idle torque [Nm] at 20°C and 3000 rpm | 0.5 | 0.5 | 0.5 | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 |
| Max. average drive speed $n_{1N50\%}$ [rpm] at 50% $T_{2N}$ and S1 | 4000 | | | | | | | |
| Max. average drive speed $n_{1N100\%}$ [rpm] at 100% $T_{2N}$ and S1 | 4000 | | | | | | | |
| Max. drive speed $n_{1max}$ [rpm] | 7000 | | | | | | | |
| Max. backlash $J_t$ [arcmin] | 17 | | | | | | | |
| Reduced backlash $J_t$ [arcmin] less than | 0 | | | | | | | |
| Torsional rigidity $C_{t21}$ [Nm/arcmin] | 6.3 | | | | | | | |
| Tilting rigidity $C_{2K}$ [Nm/arcmin] | 0 | | | | | | | |
| Max. breakdown torque $M_{2Kmax}$ [Nm] | 0 | | | | | | | |
| Max. radial force $Fr_{max}$ [N] for 30,000 h | 1700 | | | | | | | |
| Max. radial force $Fr_{max}$ [N] for 20,000 h | 2050 | | | | | | | |
| Max. axial force $Fa_{max}$ [N] for 30,000 h | 2000 | | | | | | | |
| Max. axial force $Fa_{max}$ [N] for 20,000 h | 2500 | | | | | | | |
| Operating noise $L_{PA}$ [dB(A)] | 73 | | | | | | | |
| Efficiency at full load η [%] | 88 | | | | | | | |
| Min. operating temperature $B_{Tempmin}$ [°C] | -25 | | | | | | | |
| Max. operating temperature $B_{Tempmax}$ [°C] | 90 | | | | | | | |
| Mounting orientation | Any | | | | | | | |
| Protection | IP54 | | | | | | | |
| Weight m [kg] | 6.6 | | | | | | | |
| Moment of inertia $J_1$ [kgcm$^2$] | 0.929 | 0.919 | 1.119 | 0.809 | 0.809 | 0.809 | 0.809 | 0.809 |

**NOTE – Output torque / Max. output torque:** This refers to an output shaft speed of $n_2$ = 100 rpm and application factor $K_A$ = 1 as well as S1 operating mode for electrical machines and T = 30°C, depending on the diameter of the motor shaft. The maximum output torque is only permissible for 30,000 revolutions!
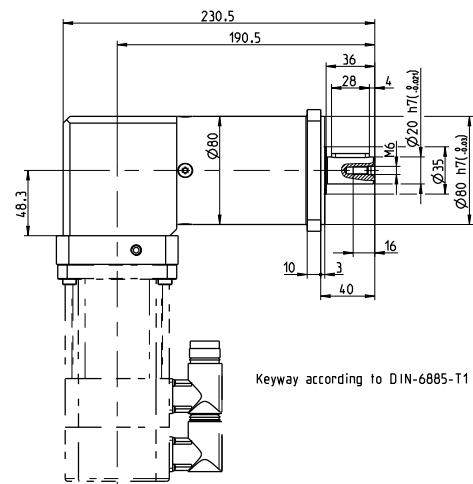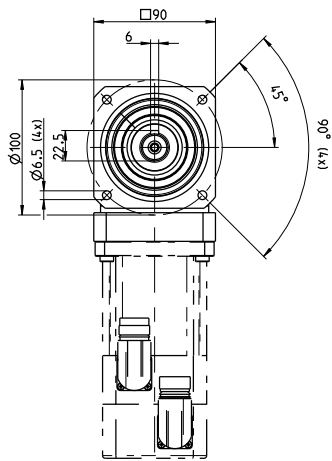
**NOTE – E-stop torque:** Approved for 1000x

**NOTE – Axial / radial force:** With reference to the middle of the output shaft; the entries refer to an output shaft speed of $n_2$ = 100 rpm and application factor $K_A$ = 1 as well as S1 operating mode for electrical machines and T = 30°C

**NOTE – Running noise:** Noise level at a distance of 1 m; at an output speed of $n_1$ = 3000 rpm without a load; i = 5

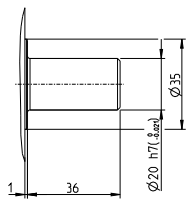**NOTE – Operating temperature:** With reference to the middle of the housing surface

**NOTE – Weight:** Planetary gearbox including universal flange (specific weight upon request)

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# 3-stage gear





Keyway according to DIN-6885-T1

## Alternative drive shaft options

Smooth shaft



## Adapter flange - Overview of dimensions

The flange length L completes the diagram for determining the gearbox length.

| 8GA45-089 | 8LSA3 | 8LSA/C4 | 8LVA 2 | 8LVA3 | 8JSA3 | 8JSA4 | 8LSN4 | 80MPH |
|---|---|---|---|---|---|---|---|---|
| Flange length L [mm] | 21.2 | 31.2 | 21.2 | 31.2 | 21.2 | 31.2 | 31.2 | 23.2 |
| Flange diameter Q [mm] | 90 | 100 | 80 | 80 | 80 | 90 | 115 | 90 |