



Solutions for a world in motion

Drives

Life-time graphs

Escalator gear units

FTS125.1, FTS160.1, FTS180.1

FTSST158.1, FTSST180.1, FTSST212.1, FTSST260.1

HYMAX FTHST156.1, FTHST168.1, FTHST182.1

Worm toothings according to DIN 3996:2012

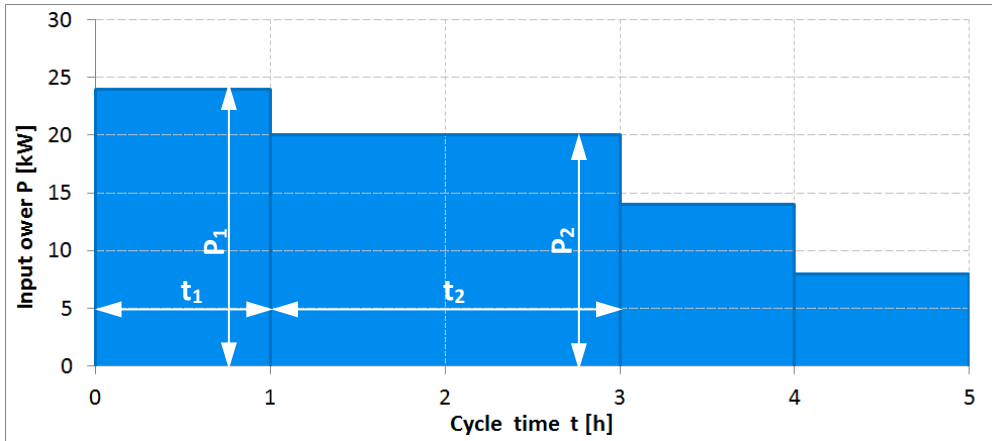
Hypoid toothings according to ISO 10300:2014

Spur gear toothings according to ISO 6336:2006

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Guideline for selection of gear unit size

1. Existing load pattern



2. Total cycle time:

$$t_{tot} = t_1 + t_2 + t_3 + \dots + t_i$$

Example:

$$t_{tot} = 5h$$

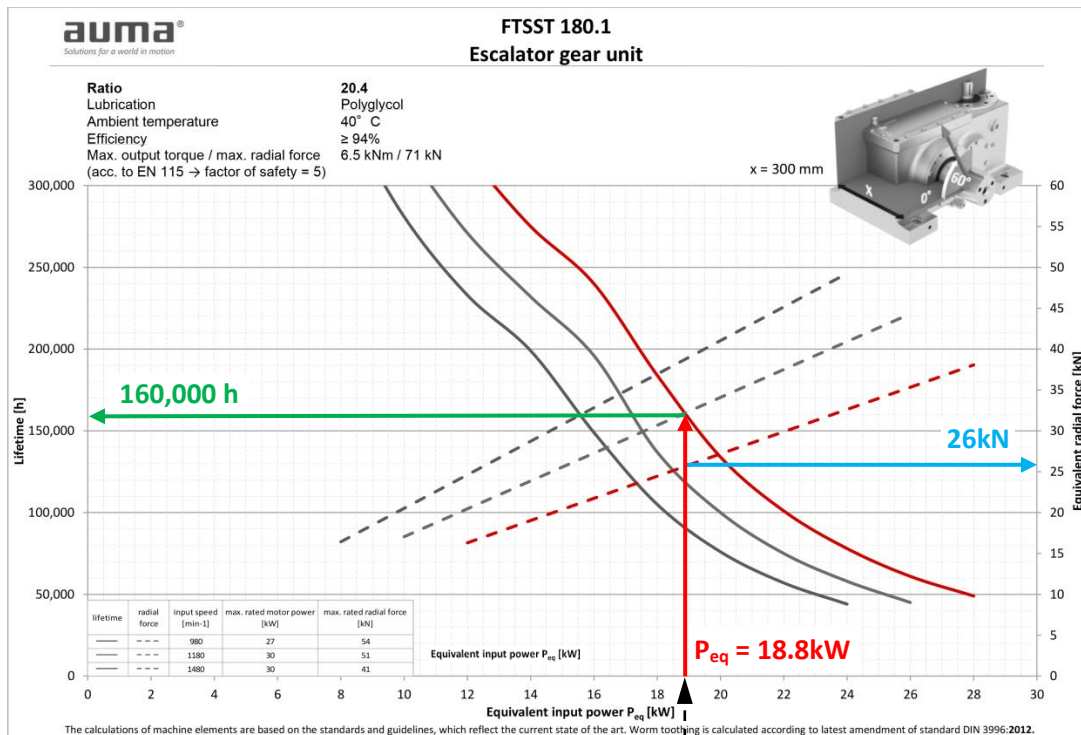
3. Equivalent input power P_{eq} :

$$P_{eq} = \sqrt[3]{P_1^3 \cdot \frac{t_1}{t_{tot}} + P_2^3 \cdot \frac{t_2}{t_{tot}} + P_3^3 \cdot \frac{t_3}{t_{tot}} + \dots + P_i^3 \cdot \frac{t_i}{t_{tot}}}$$

$P_{eq} = 18.8kW$

4. Graphical determination of resulting lifetime and permissible radial force on output shaft

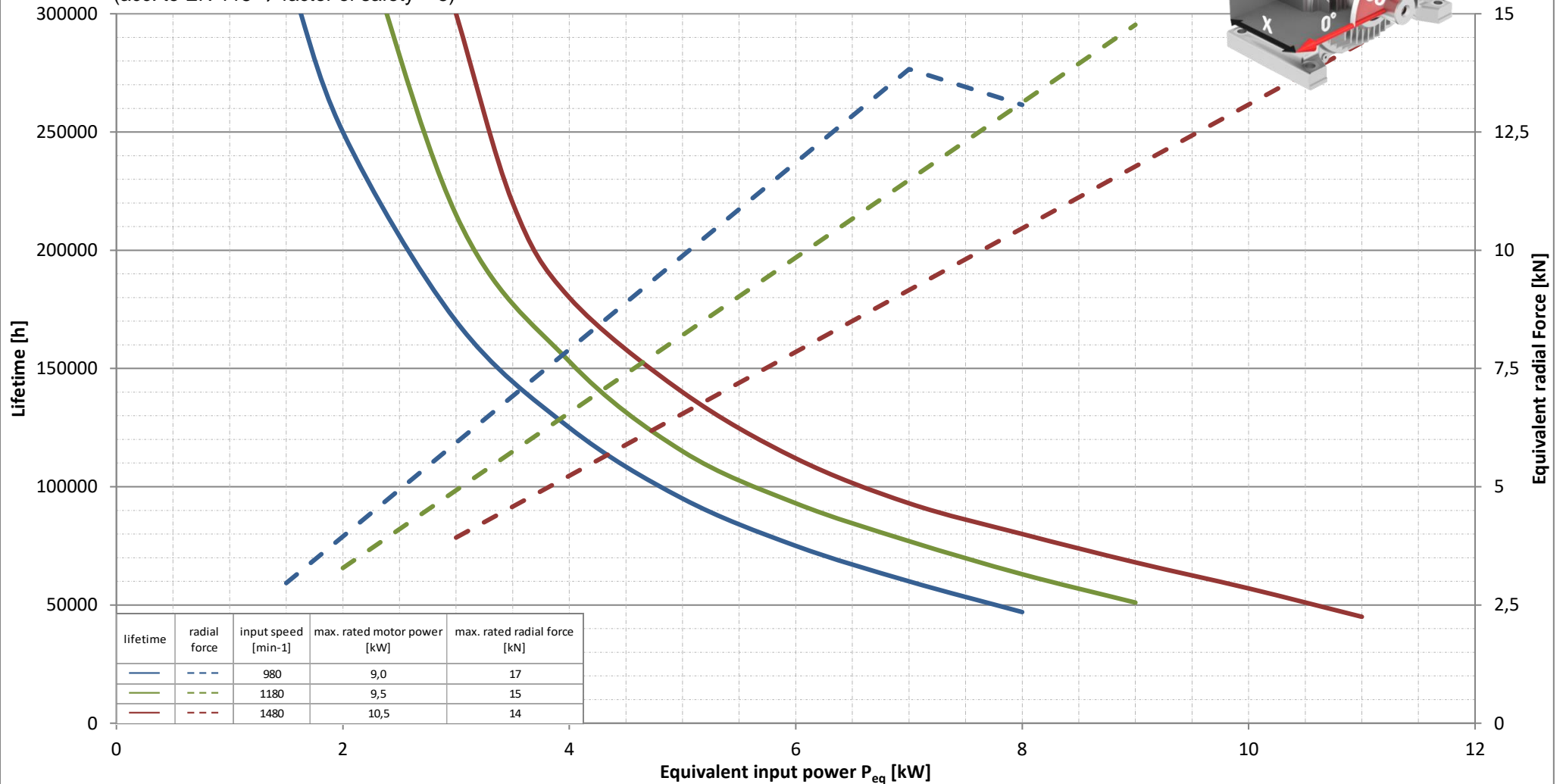
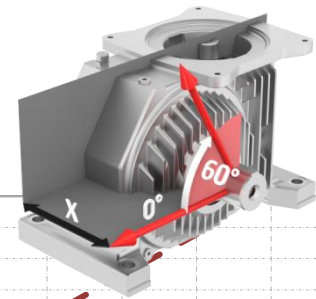
Exemplarily selected drive: FTSST180.1 with ratio i=20.4 and motor speed 1480rpm:



FTS 125.1 Escalator gear unit

Ratio 20.5
Lubrication Polyglycol
Ambient temperature 40° C
Efficiency ≥ 91%
Max. output torque / max. radial force 2.0 kNm / 17 kN
 (acc. to EN 115 → factor of safety = 5)

$\alpha = 0 \dots 60^\circ$
 $x = 183 \text{ mm}$

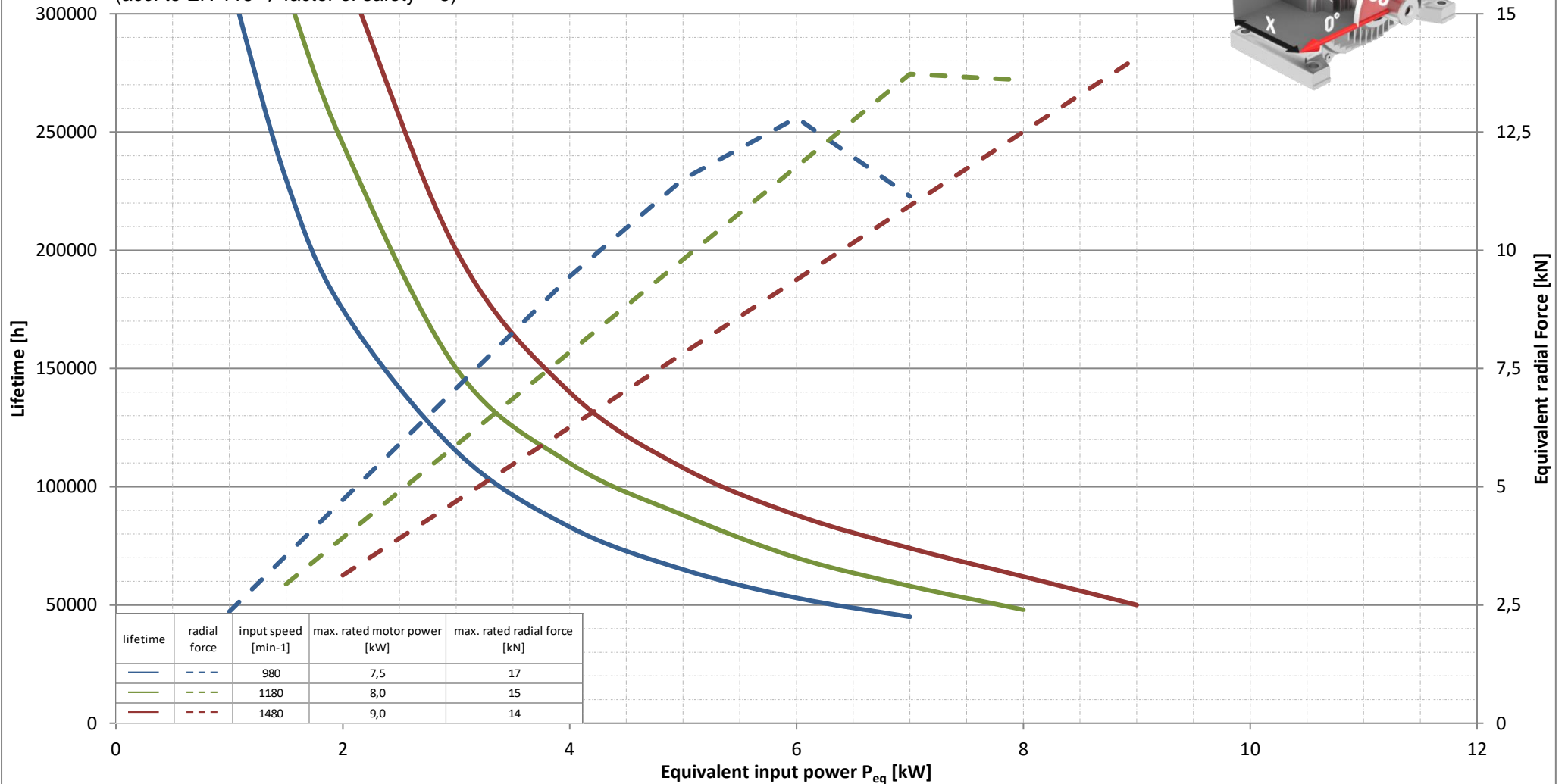
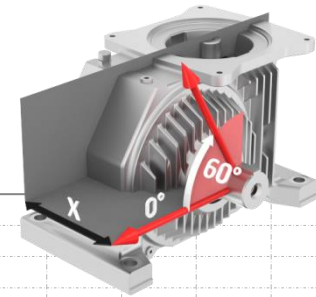


The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art. Worm toothing is calculated according to latest amendment of standard DIN 3996:2012.

FTS 125.1 Escalator gear unit

Ratio 24.5
Lubrication Polyglycol
Ambient temperature 40° C
Efficiency ≥ 91%
Max. output torque / max. radial force 2.0 kNm / 17 kN
 (acc. to EN 115 → factor of safety = 5)

$\alpha = 0 \dots 60^\circ$
 $x = 183 \text{ mm}$

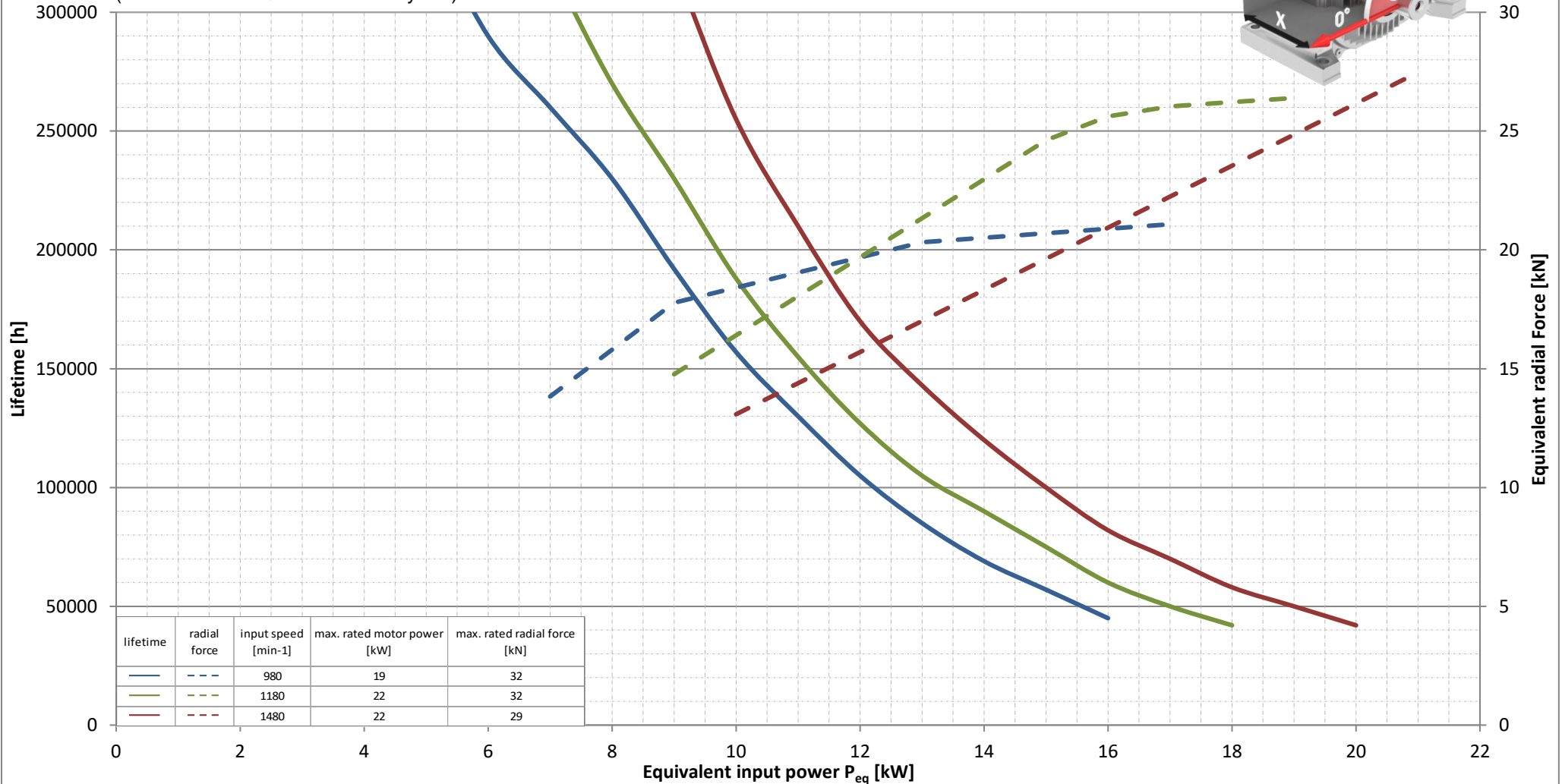
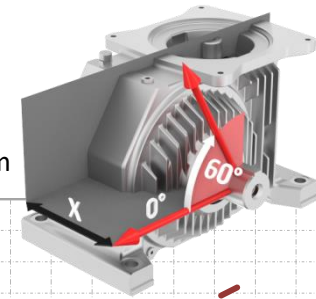


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FTS 160.1 Escalator gear unit

Ratio 20.5
Lubrication Polyglycol
Ambient temperature 40° C
Efficiency ≥ 91%
Max. output torque / max. radial force 4.0 kNm / 32 kN
 (acc. to EN 115 → factor of safety = 5)

$\alpha = 0 \dots 60^\circ$
 $x = 194.5 \text{ mm}$

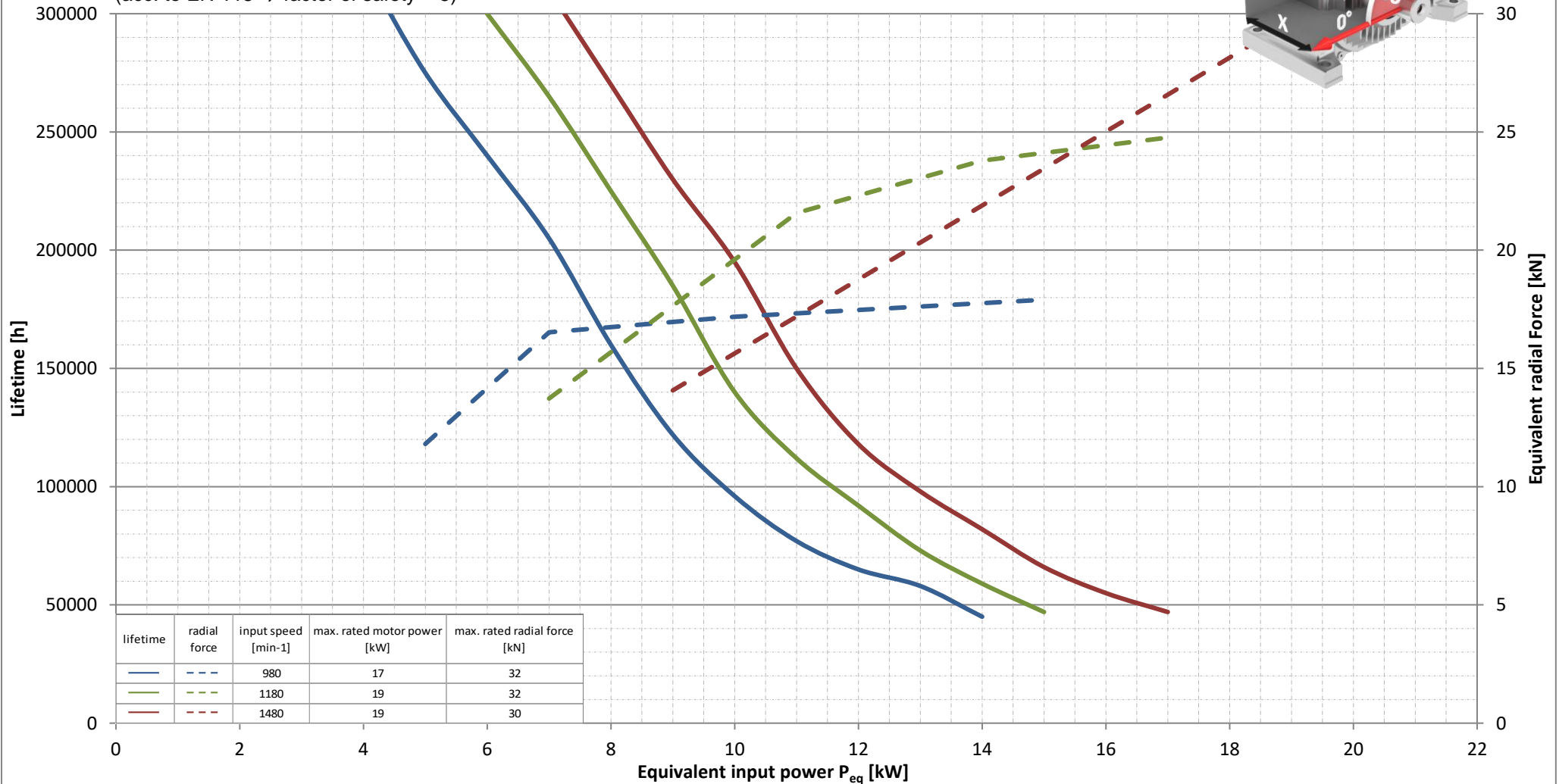
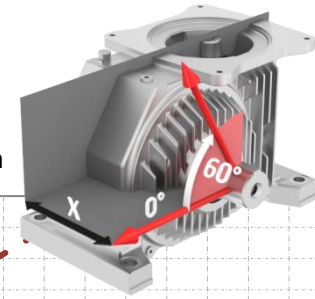


The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art. Worm toothing is calculated according to latest amendment of standard DIN 3996:2012.

FTS 160.1 Escalator gear unit

Ratio 24.5
Lubrication Polyglycol
Ambient temperature 40° C
Efficiency ≥ 91%
Max. output torque / max. radial force 4.0 kNm / 32 kN
 (acc. to EN 115 → factor of safety = 5)

$\alpha = 0 \dots 60^\circ$
 $x = 194,5 \text{ mm}$

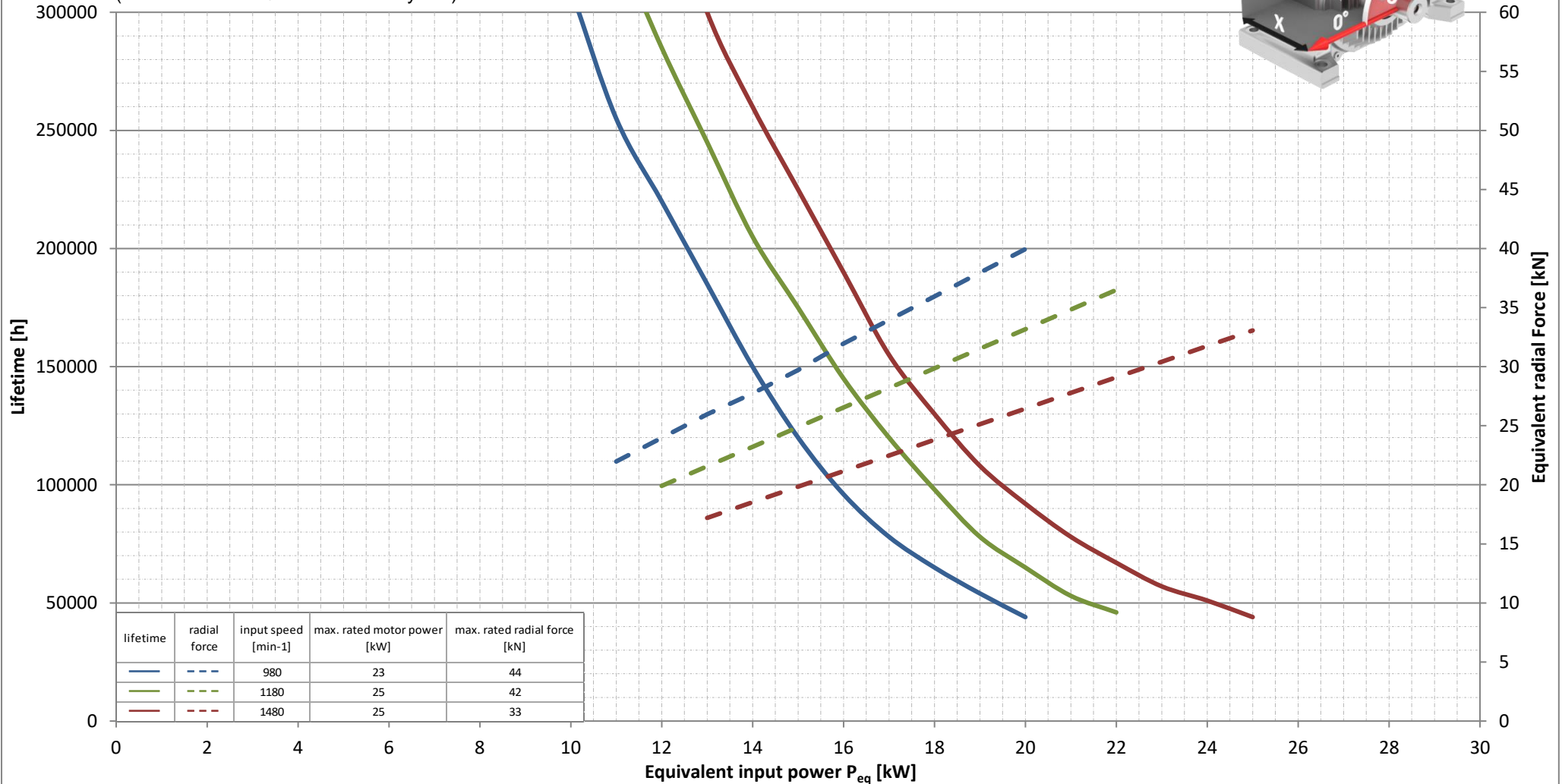
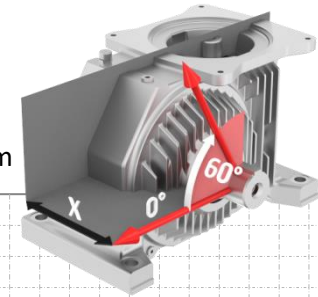


The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art. Worm toothing is calculated according to latest amendment of standard DIN 3996:2012.

FTS 180.1 Escalator gear unit

Ratio 20.5
Lubrication Polyglycol
Ambient temperature 40° C
Efficiency ≥ 92%
Max. output torque / max. radial force 4.4 kNm / 44 kN
 (acc. to EN 115 → factor of safety = 5)

$\alpha = 0 \dots 60^\circ$
 $x = 252.5 \text{ mm}$

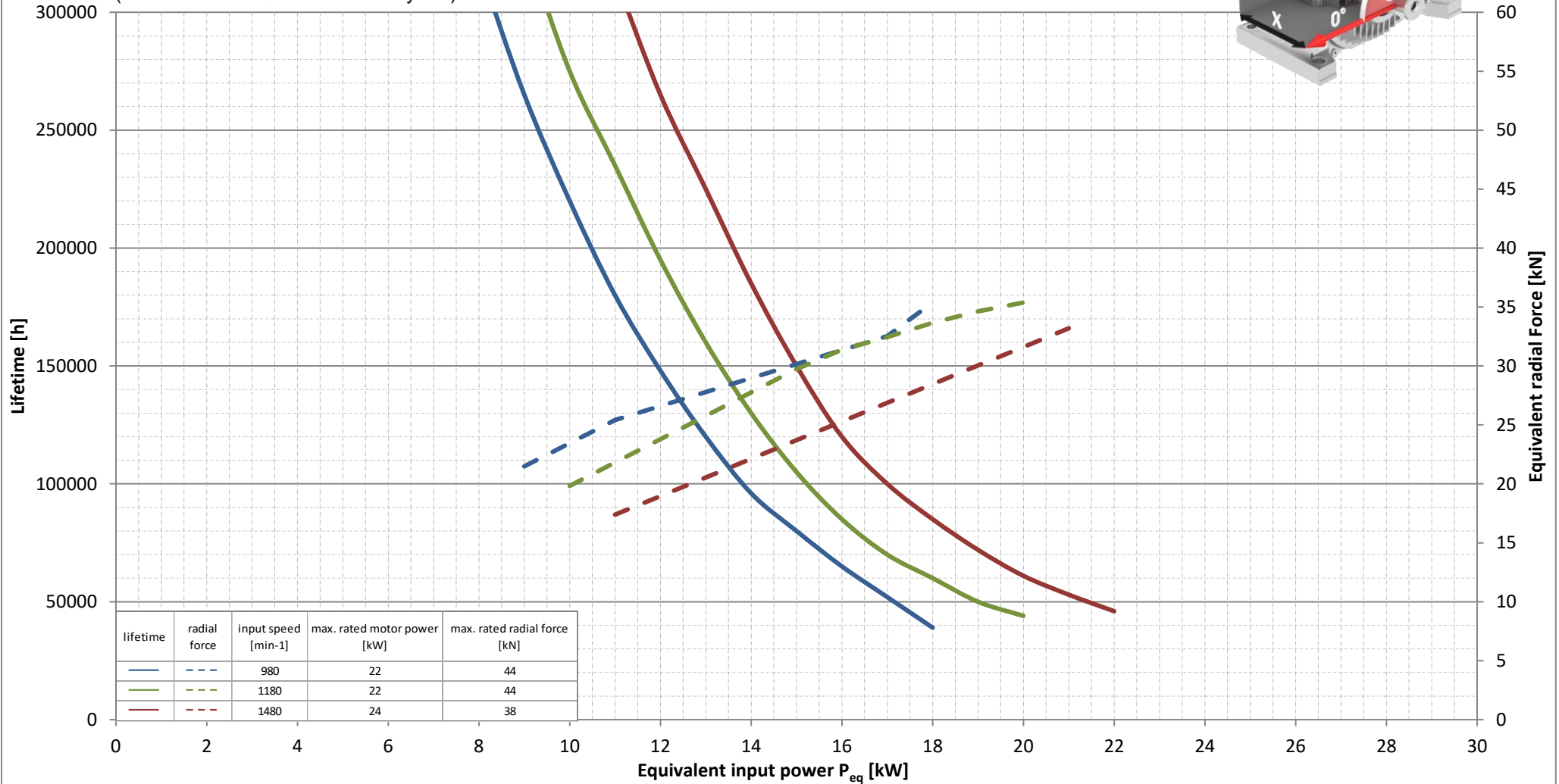
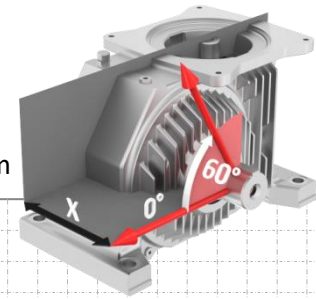


The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art. Worm toothing is calculated according to latest amendment of standard DIN 3996:2012.

FTS 180.1 Escalator gear unit

Ratio 24.5
Lubrication Polyglycol
Ambient temperature 40° C
Efficiency ≥ 92%
Max. output torque / max. radial force 4.4 kNm / 44 kN
 (acc. to EN 115 → factor of safety = 5)

$\alpha = 0 \dots 60^\circ$
 $x = 252.5 \text{ mm}$

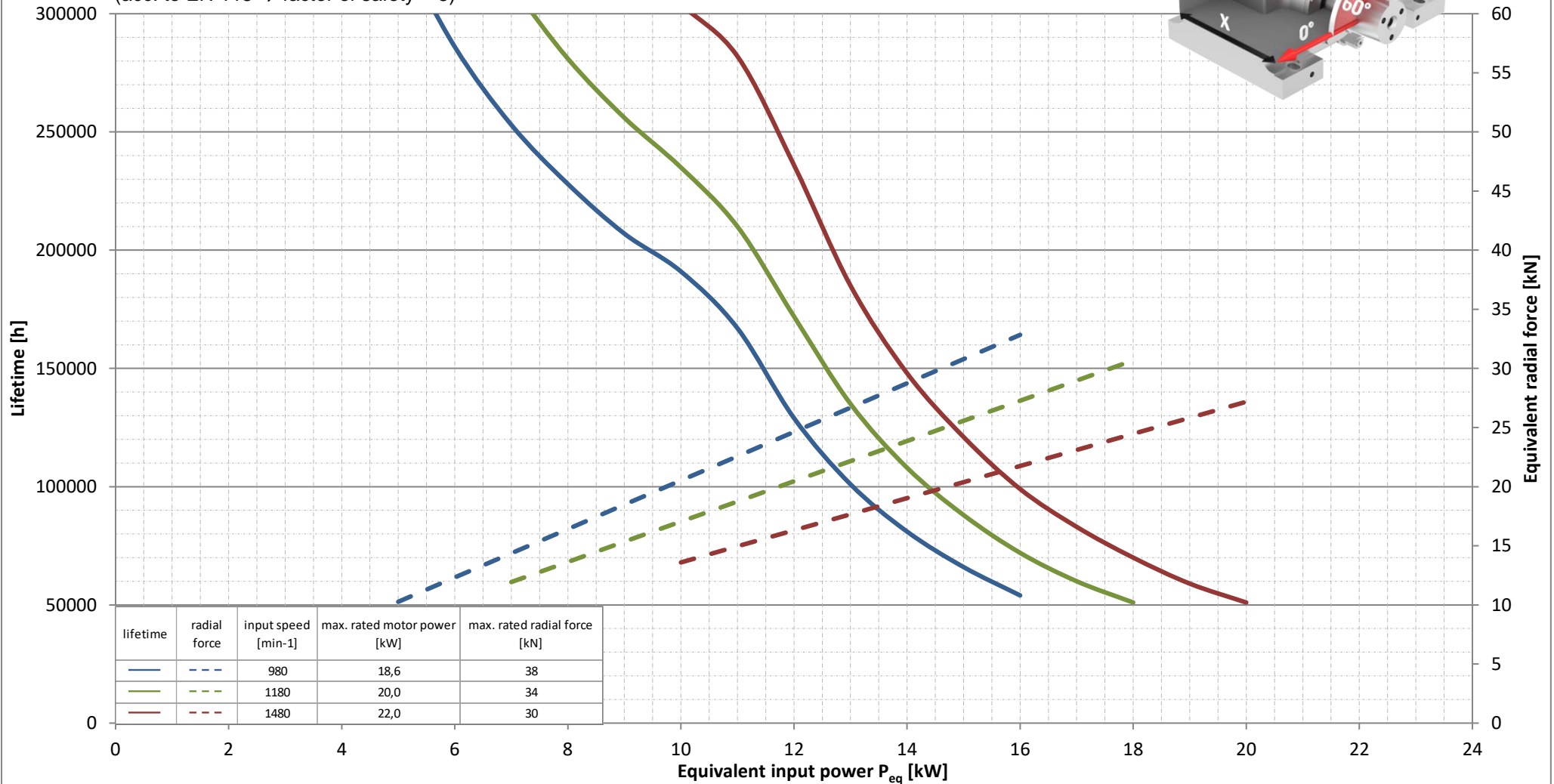
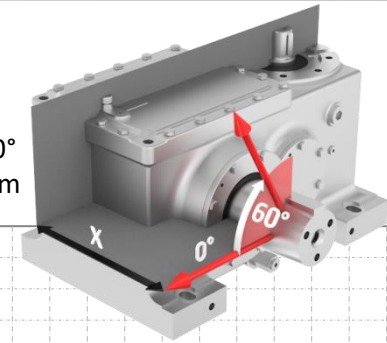


The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art. Worm toothing is calculated according to latest amendment of standard DIN 3996:2012.

FTSST 158.1 Escalator gear unit

Ratio 20.4
Lubrication Polyglycol
Ambient temperature 40° C
Efficiency ≥ 94%
Max. output torque / max. radial force 4.6 kNm / 50 kN
 (acc. to EN 115 → factor of safety = 5)

$\alpha = 0 \dots 60^\circ$
 $x = 255 \text{ mm}$

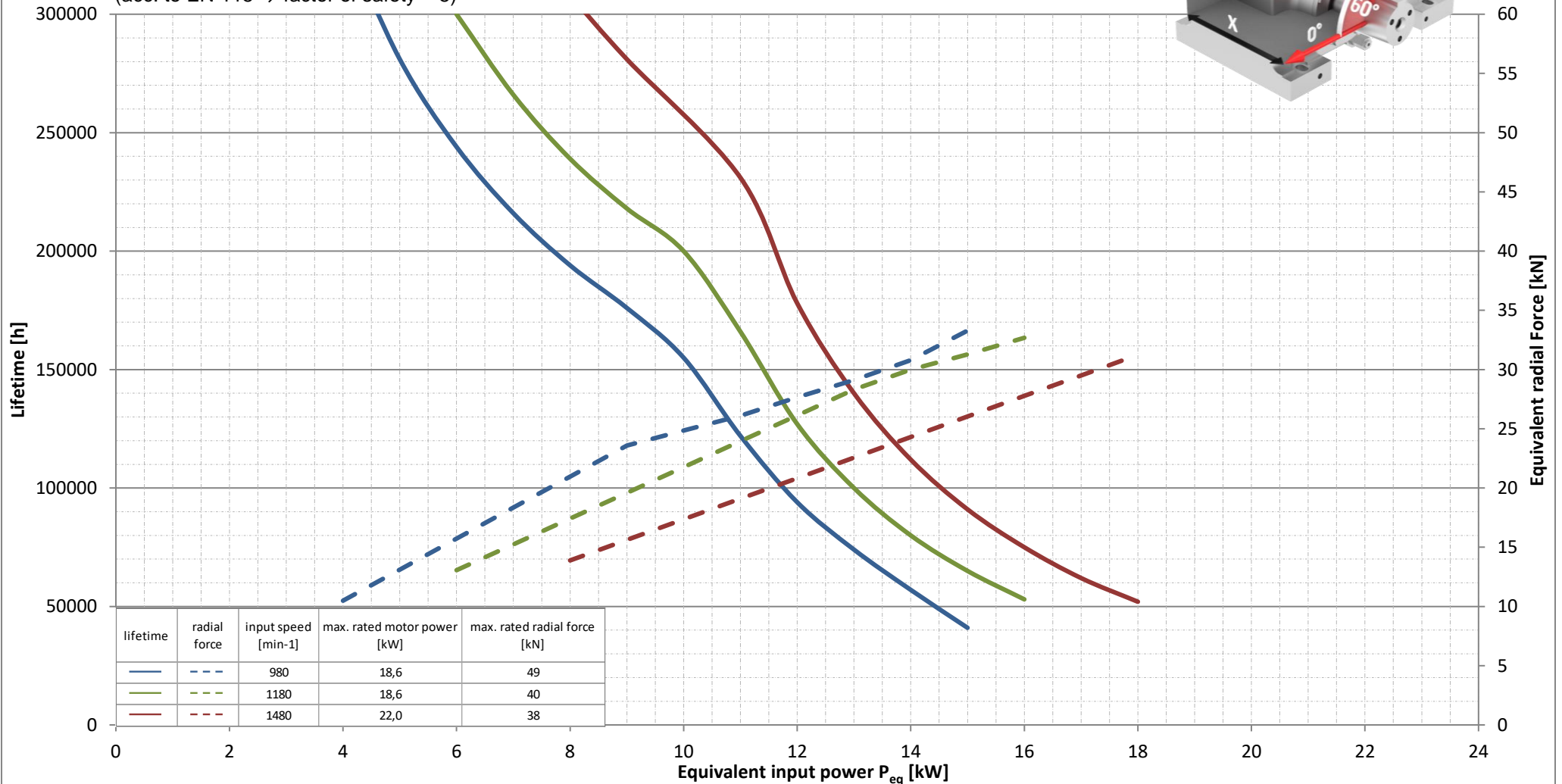
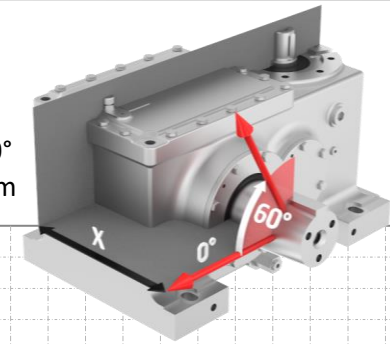


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FTSST 158.1 Escalator gear unit

Ratio 26.0
Lubrication Polyglycol
Ambient temperature 40° C
Efficiency ≥ 94%
Max. output torque / max. radial force 4.6 kNm / 50 kN
 (acc. to EN 115 → factor of safety = 5)

$\alpha = 0 \dots 60^\circ$
 $x = 255 \text{ mm}$

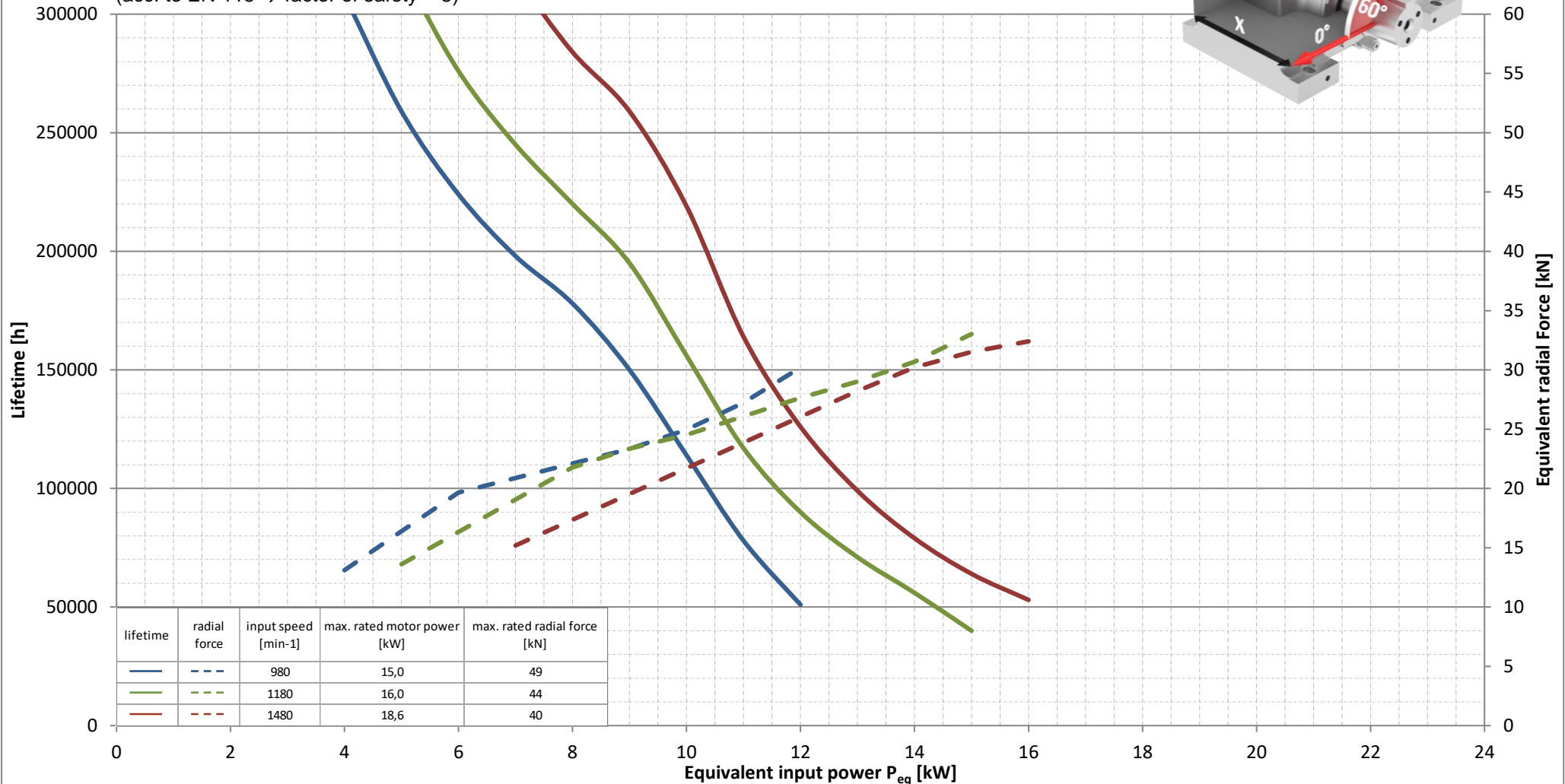
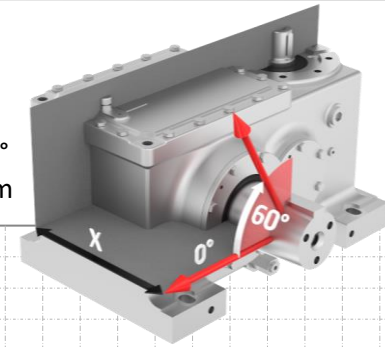


The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art. Worm toothing is calculated according to latest amendment of standard DIN 3996:2012.

FTSST 158.1 Escalator gear unit

Ratio 32.5
Lubrication Polyglycol
Ambient temperature 40° C
Efficiency ≥ 94%
Max. output torque / max. radial force 4.6 kNm / 50 kN
 (acc. to EN 115 → factor of safety = 5)

$\alpha = 0 \dots 60^\circ$
 $x = 255 \text{ mm}$

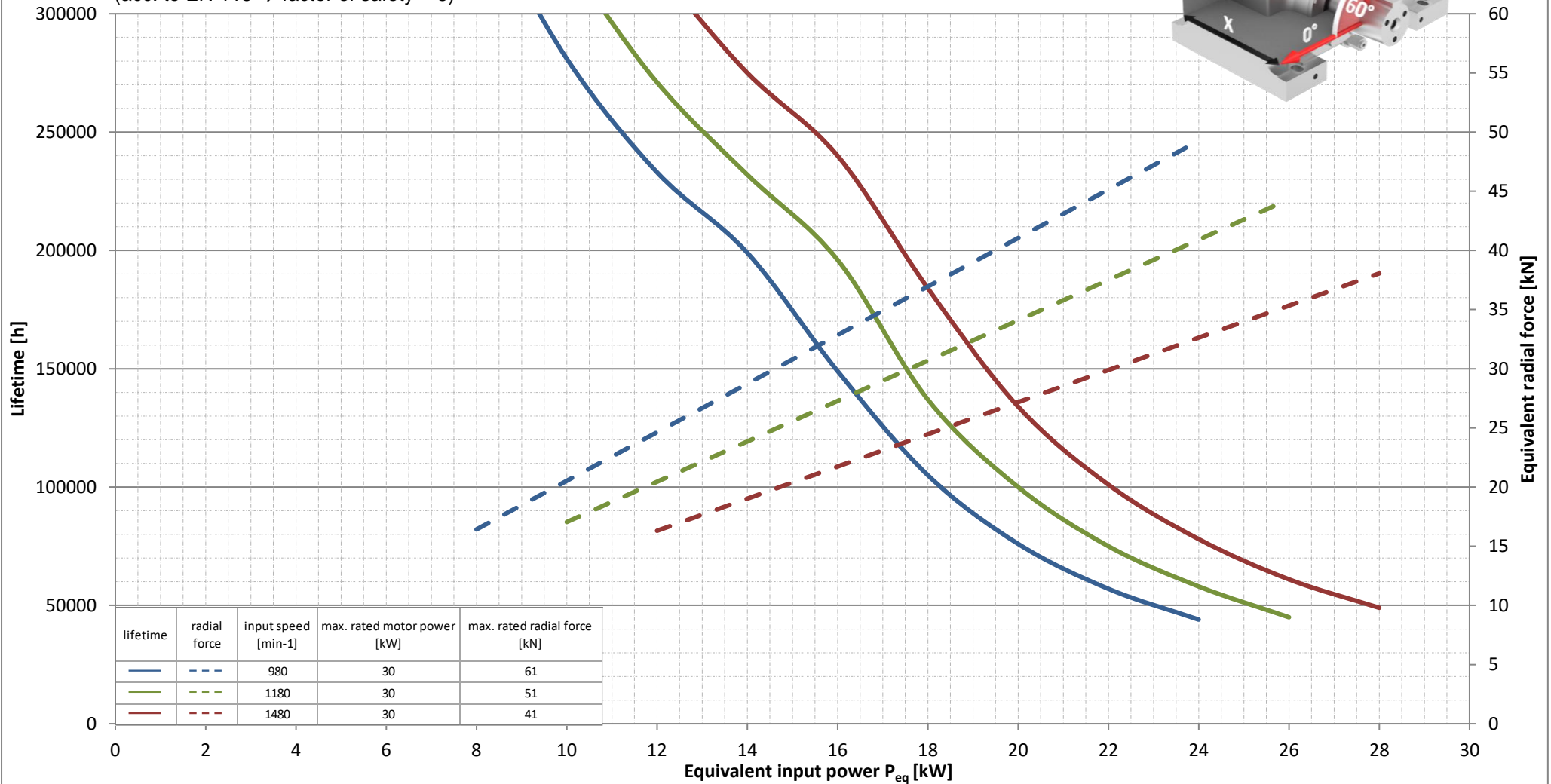
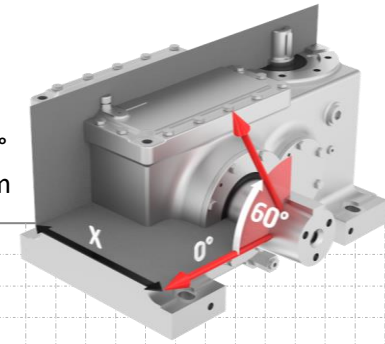


The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art. Worm toothing is calculated according to latest amendment of standard DIN 3996:2012.

FTSST 180.1 Escalator gear unit

Ratio 20.4
Lubrication Polyglycol
Ambient temperature 40° C
Efficiency ≥ 94%
Max. output torque / max. radial force 6.5 kNm / 71 kN
 (acc. to EN 115 → factor of safety = 5)

$\alpha = 0 \dots 60^\circ$
 $x = 300 \text{ mm}$

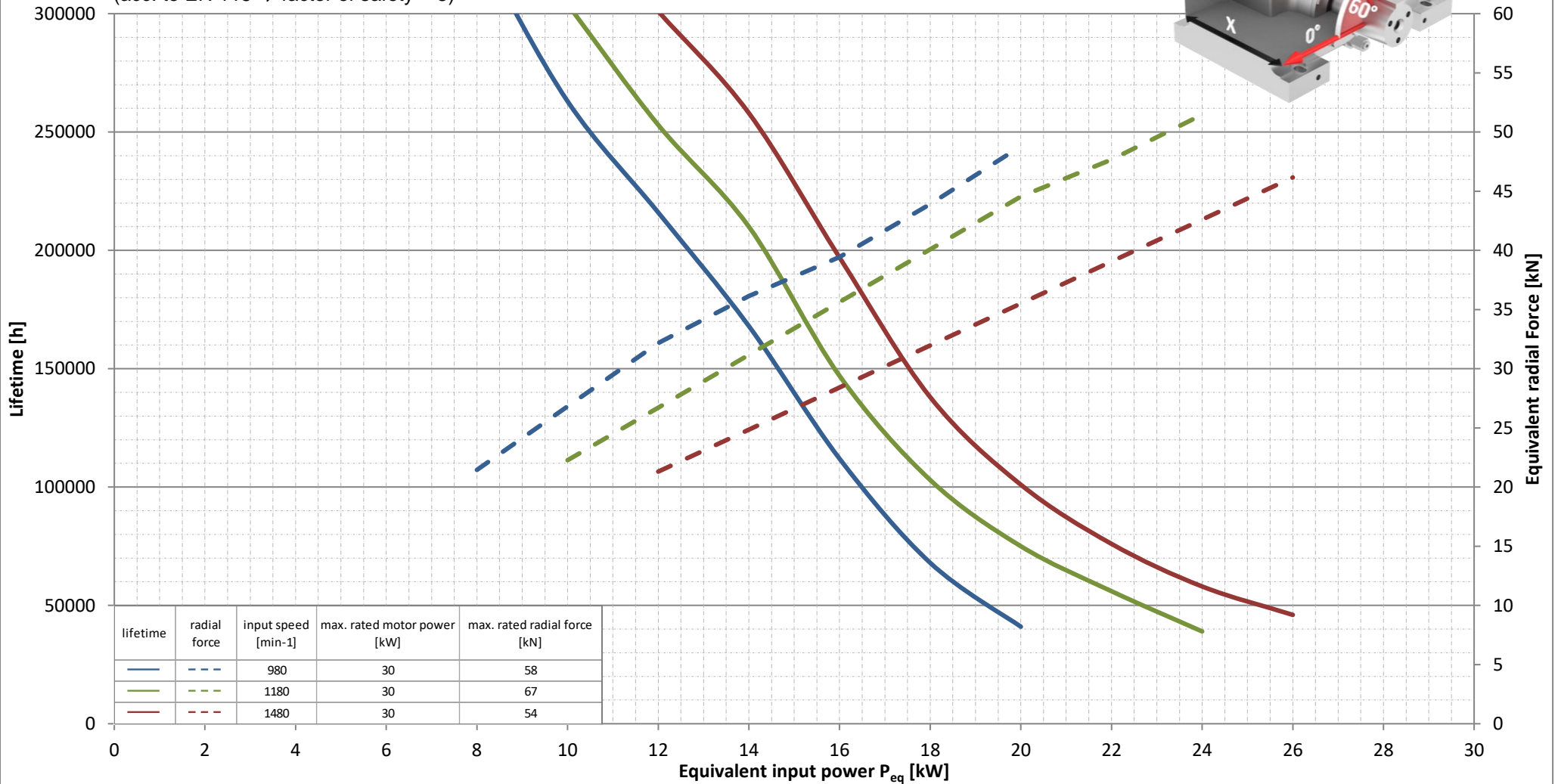
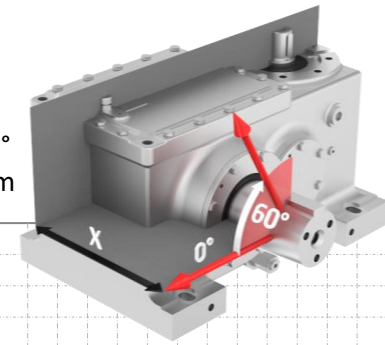


The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art. Worm toothing is calculated according to latest amendment of standard DIN 3996:2012.

FTSST 180.1 Escalator gear unit

Ratio 26.6
Lubrication Polyglycol
Ambient temperature 40° C
Efficiency ≥ 94%
Max. output torque / max. radial force 6.5 kNm / 71 kN
 (acc. to EN 115 → factor of safety = 5)

$\alpha = 0 \dots 60^\circ$
 $x = 300 \text{ mm}$

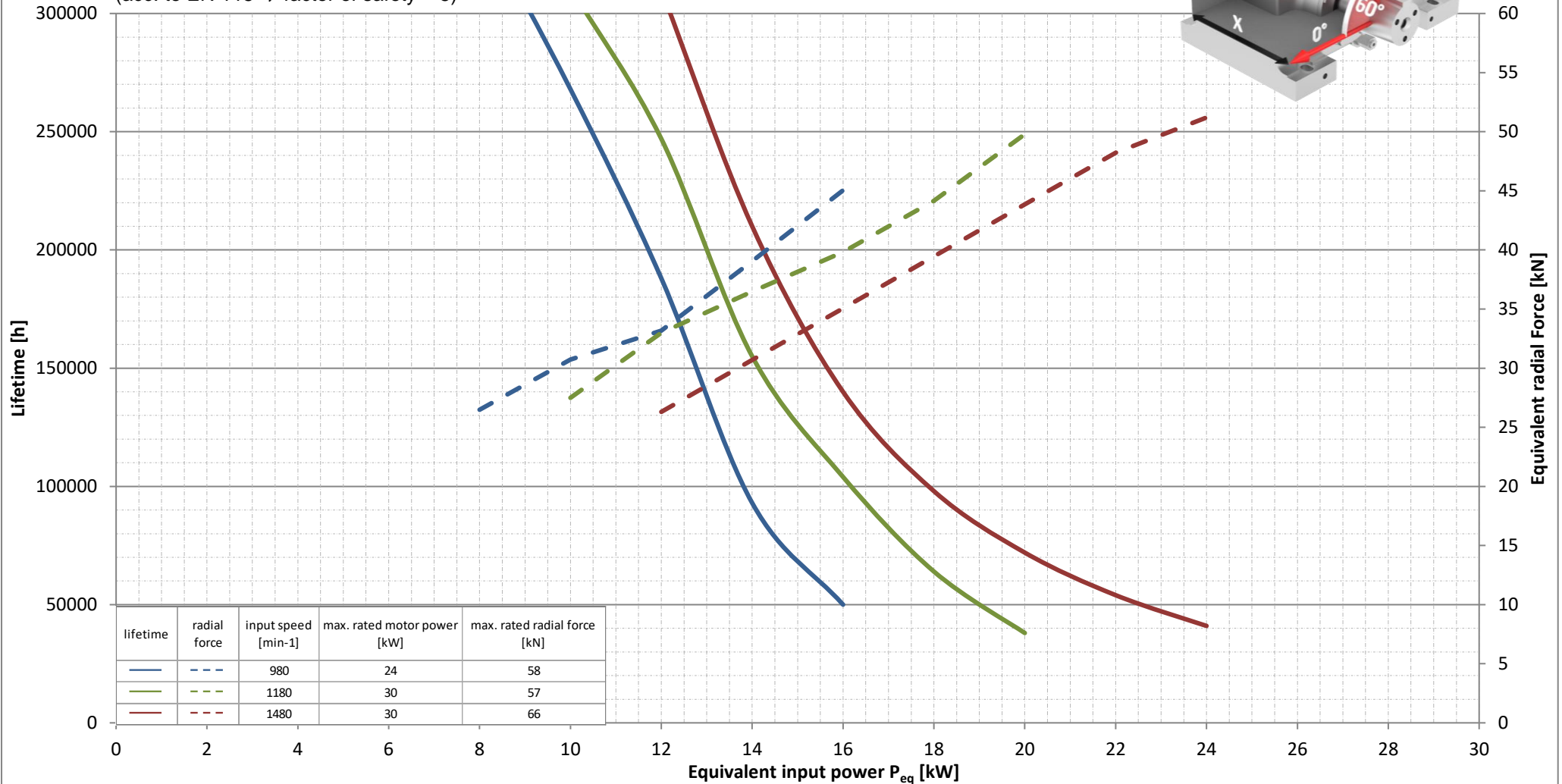
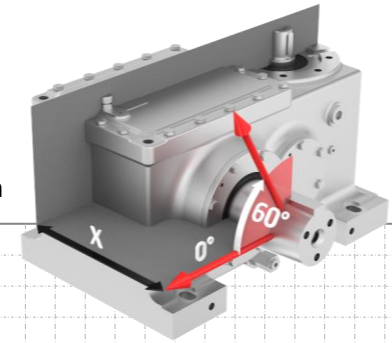


The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art. Worm toothing is calculated according to latest amendment of standard DIN 3996:2012.

FTSST 180.1 Escalator gear unit

Ratio 32.8
Lubrication Polyglycol
Ambient temperature 40° C
Efficiency ≥ 94%
Max. output torque / max. radial force 6.5 kNm / 71 kN
 (acc. to EN 115 → factor of safety = 5)

$\alpha = 0 \dots 60^\circ$
 $x = 300 \text{ mm}$

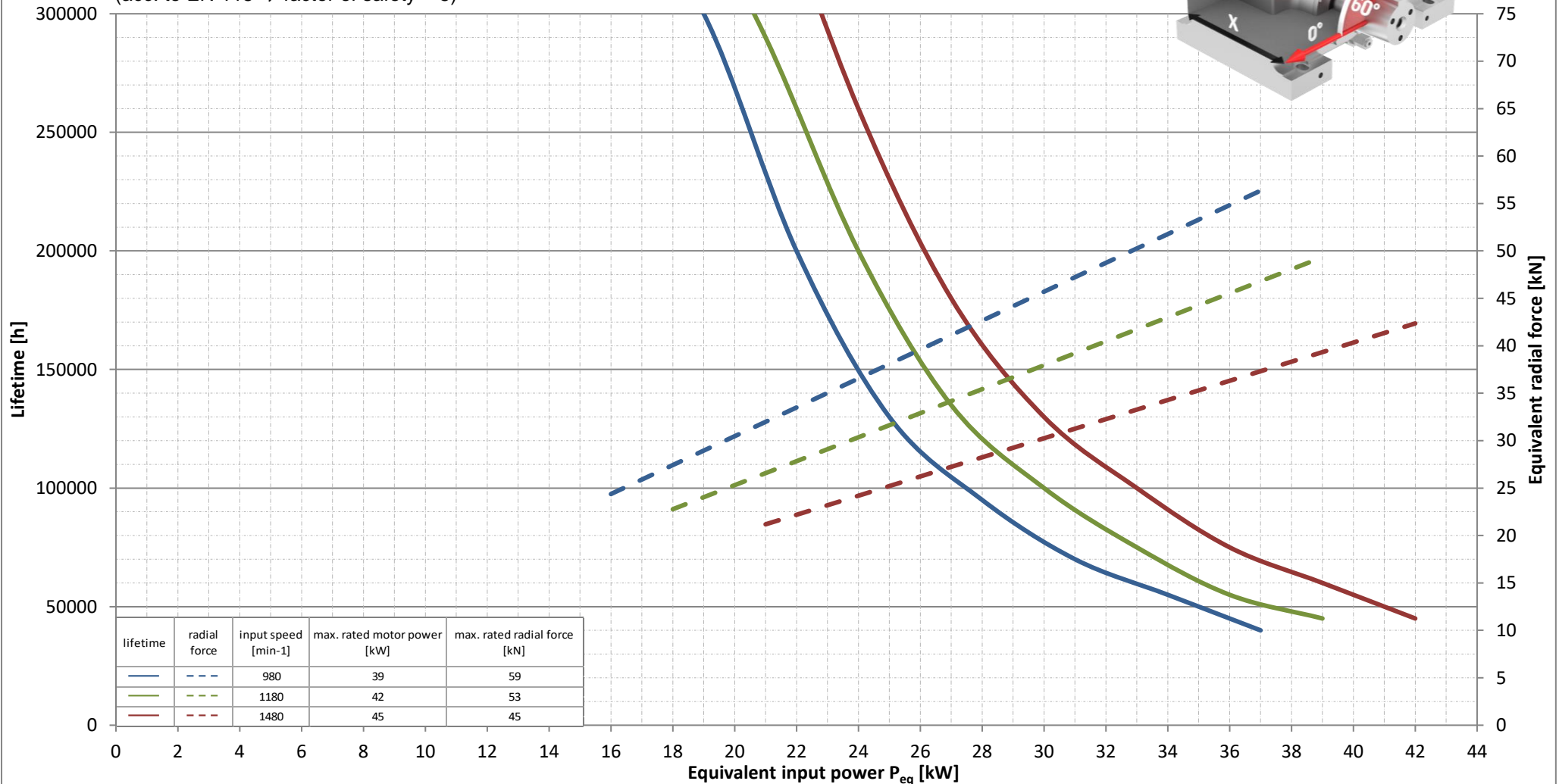
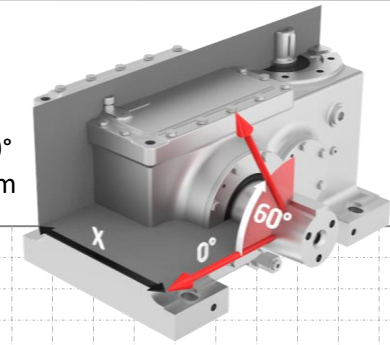


The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art. Worm toothing is calculated according to latest amendment of standard DIN 3996:2012.

FTSST 212.1 Escalator gear unit

Ratio 20.1
Lubrication Polyglycol
Ambient temperature 40° C
Efficiency ≥ 94%
Max. output torque / max. radial force 12.2 kNm / 100 kN
 (acc. to EN 115 → factor of safety = 5)

$\alpha = 0 \dots 60^\circ$
 $x = 305 \text{ mm}$

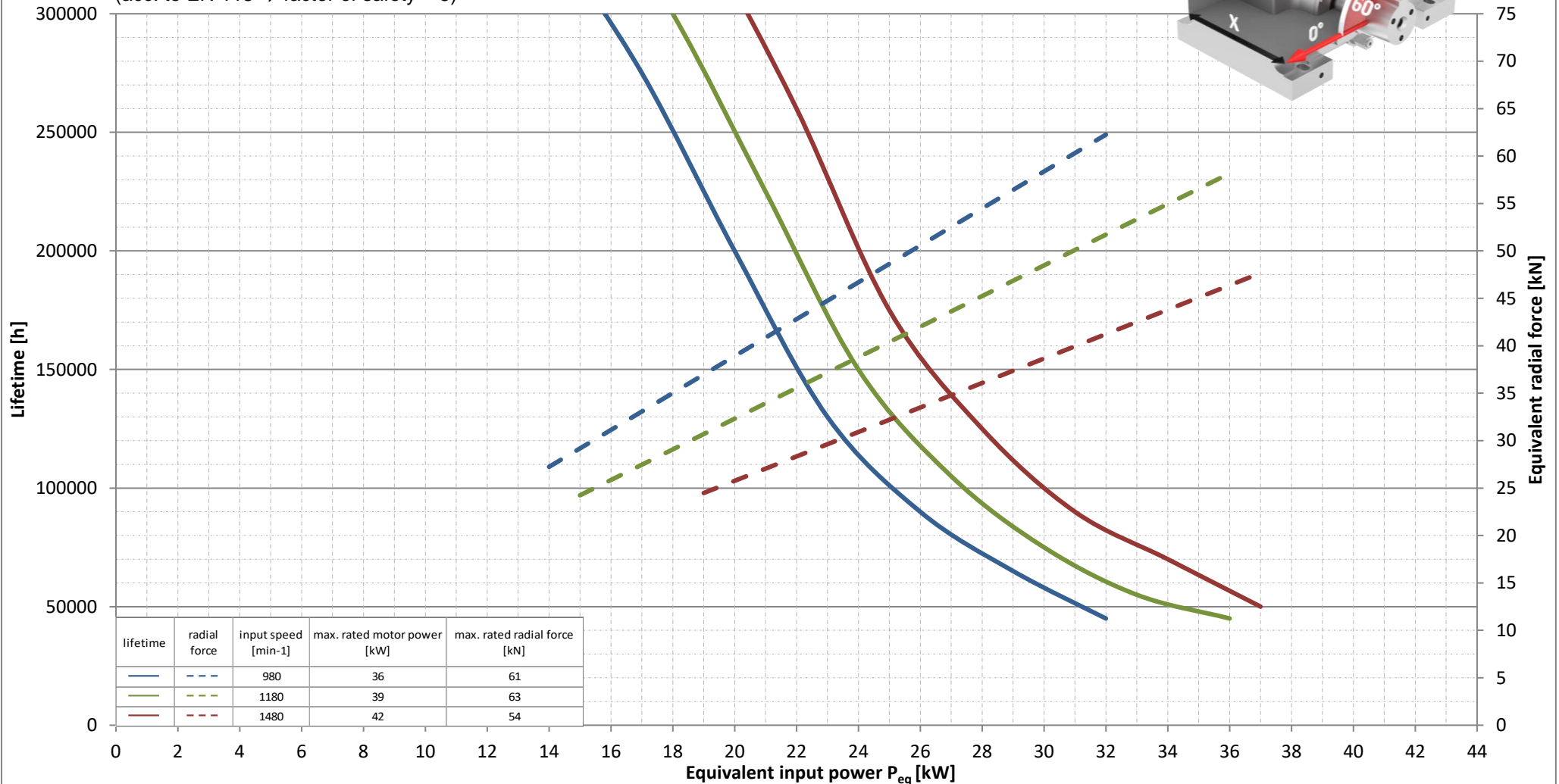
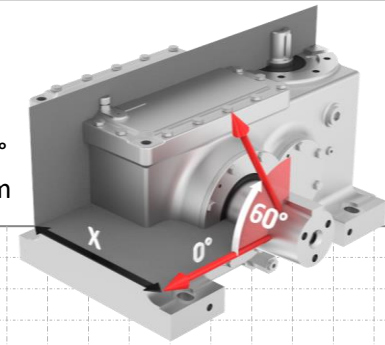


The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art. Worm toothing is calculated according to latest amendment of standard DIN 3996:2012.

FTSST 212.1 Escalator gear unit

Ratio 25.7
Lubrication Polyglycol
Ambient temperature 40° C
Efficiency ≥ 94%
Max. output torque / max. radial force 12.2 kNm / 100 kN
 (acc. to EN 115 → factor of safety = 5)

$\alpha = 0 \dots 60^\circ$
 $x = 305 \text{ mm}$

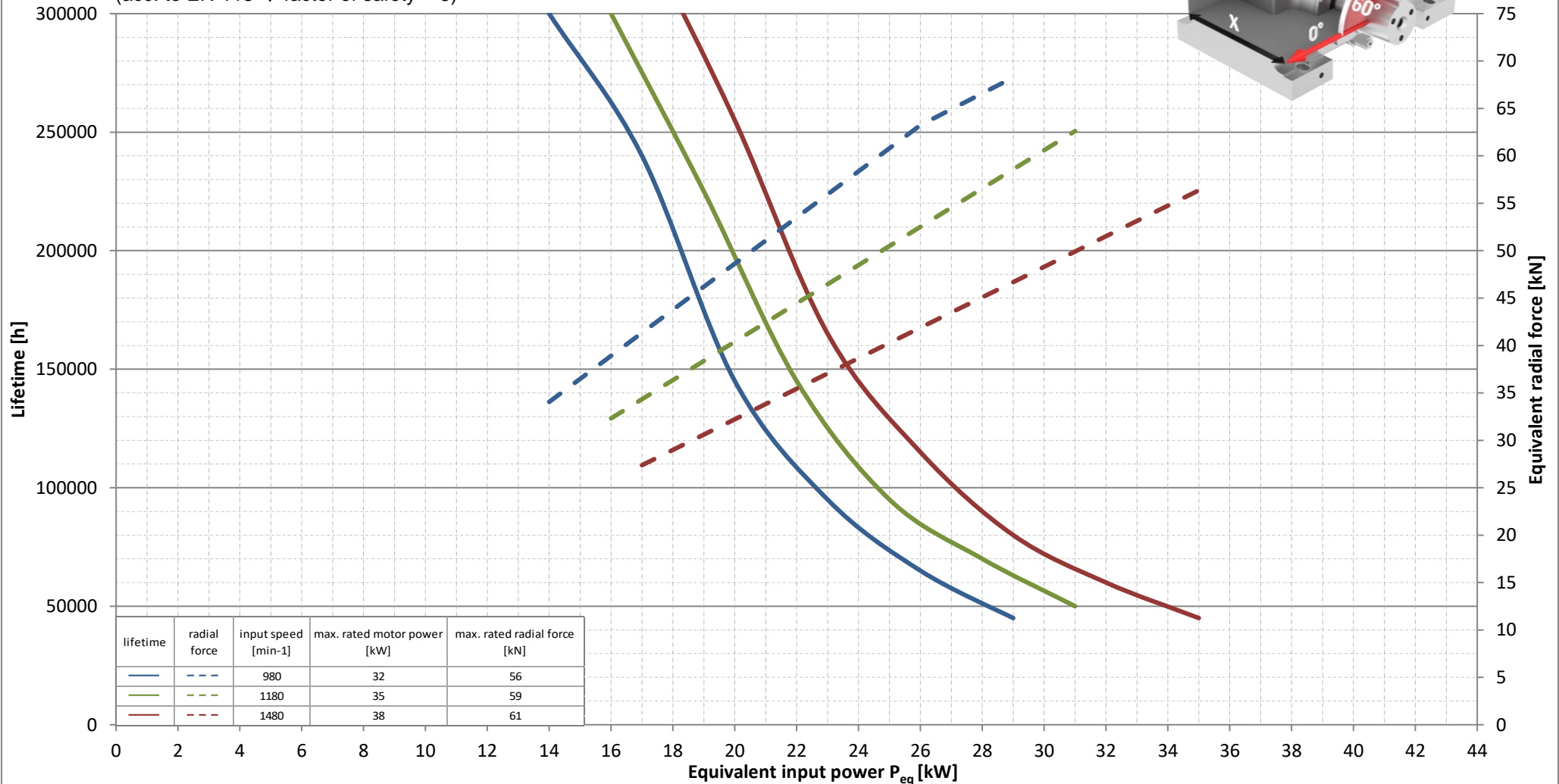
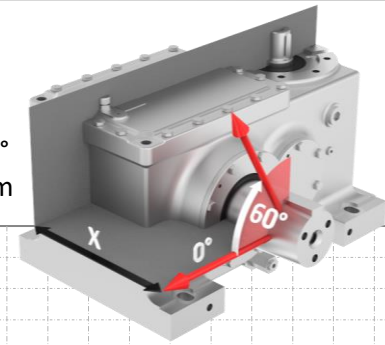


The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art. Worm toothing is calculated according to latest amendment of standard DIN 3996:2012.

FTSST 212.1 Escalator gear unit

Ratio 32.1
Lubrication Polyglycol
Ambient temperature 40° C
Efficiency ≥ 94%
Max. output torque / max. radial force 12.2 kNm / 100 kN
 (acc. to EN 115 → factor of safety = 5)

$\alpha = 0 \dots 60^\circ$
 $x = 305 \text{ mm}$

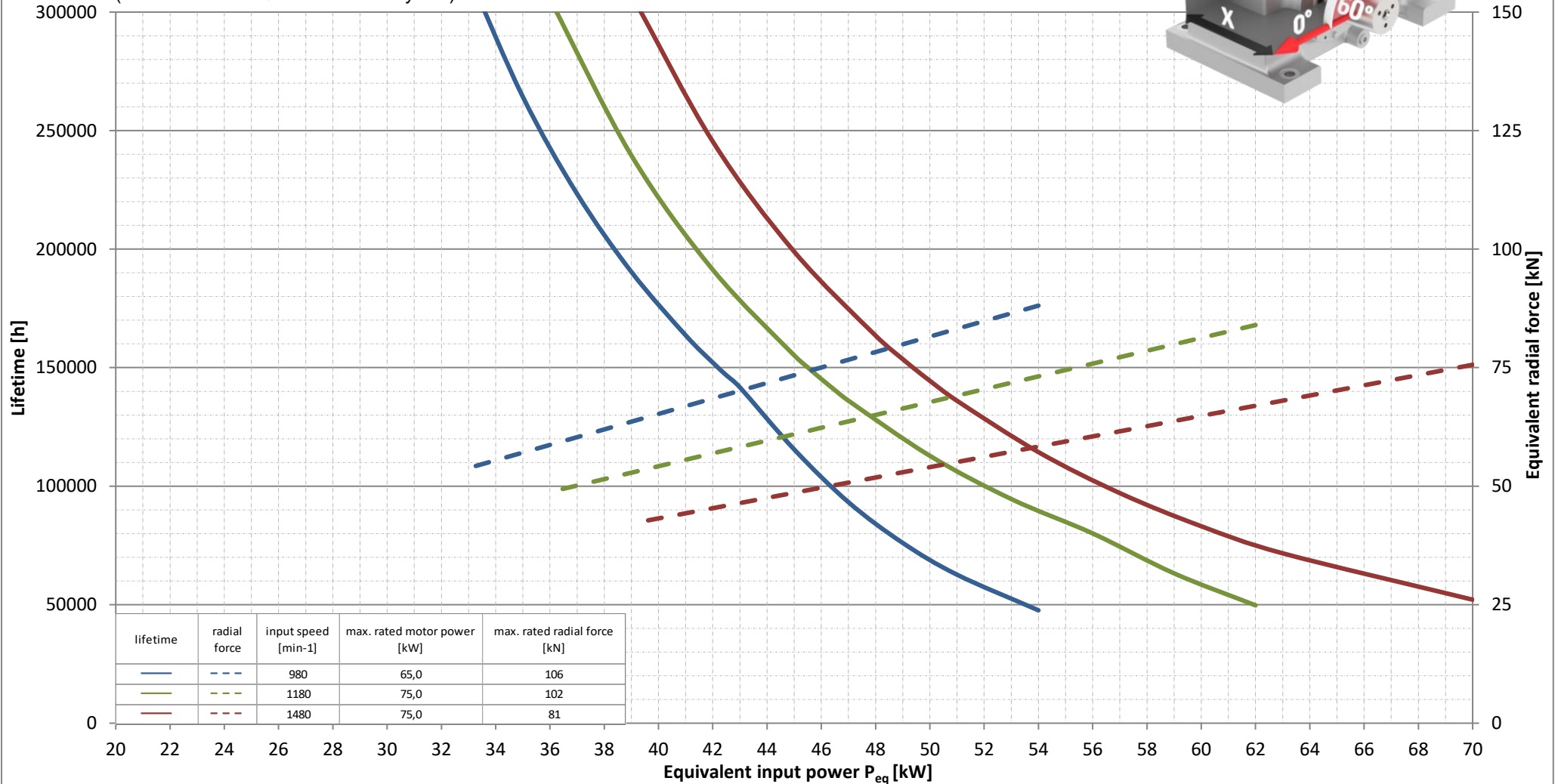
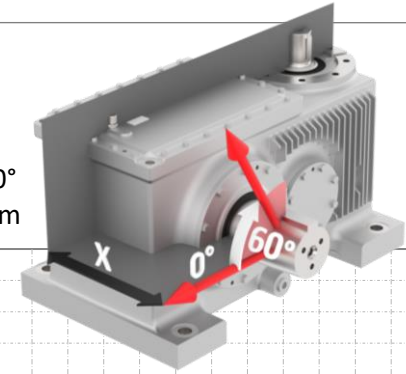


The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art. Worm toothing is calculated according to latest amendment of standard DIN 3996:2012.

FTSST 260.1 Escalator gear unit

Ratio 26.3
Lubrication Polyglycol
Ambient temperature 40° C
Efficiency ≥ 96%
Max. output torque / max. radial force 20 kNm / 135 kN
 (acc. to EN 115 → factor of safety = 5)

$\alpha = 0 \dots 60^\circ$
 $x = 360 \text{ mm}$

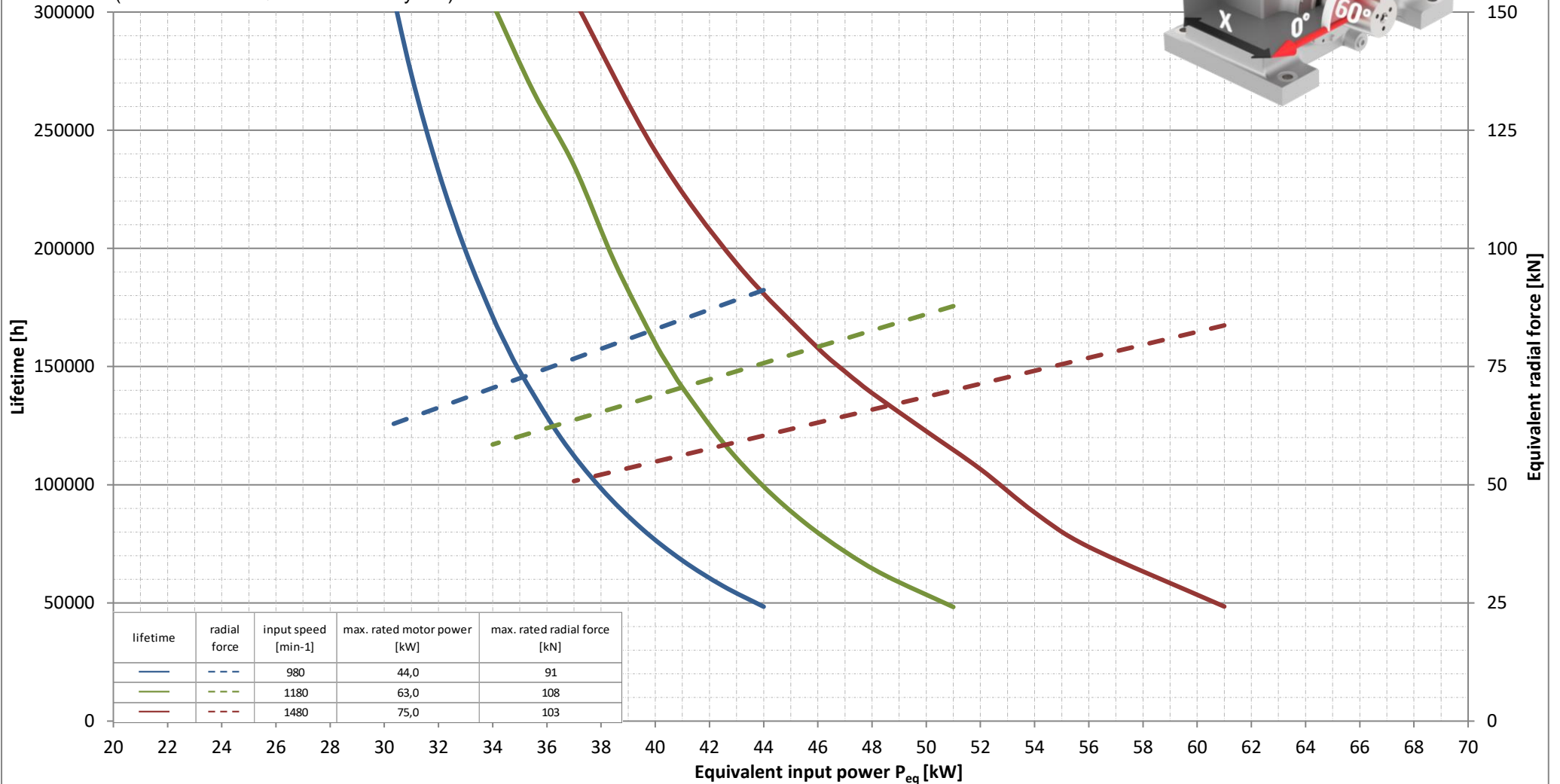
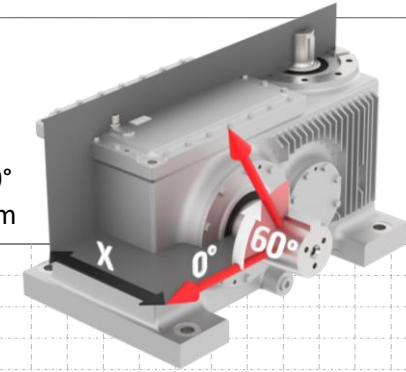


The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art. Worm toothing is calculated according to latest amendment of standard DIN 3996:2012.

FTSST 260.1 Escalator gear unit

Ratio 33.5
Lubrication Polyglycol
Ambient temperature 40° C
Efficiency ≥ 96%
Max. output torque / max. radial force 20 kNm / 135 kN
 (acc. to EN 115 → factor of safety = 5)

$\alpha = 0 \dots 60^\circ$
 $x = 360 \text{ mm}$

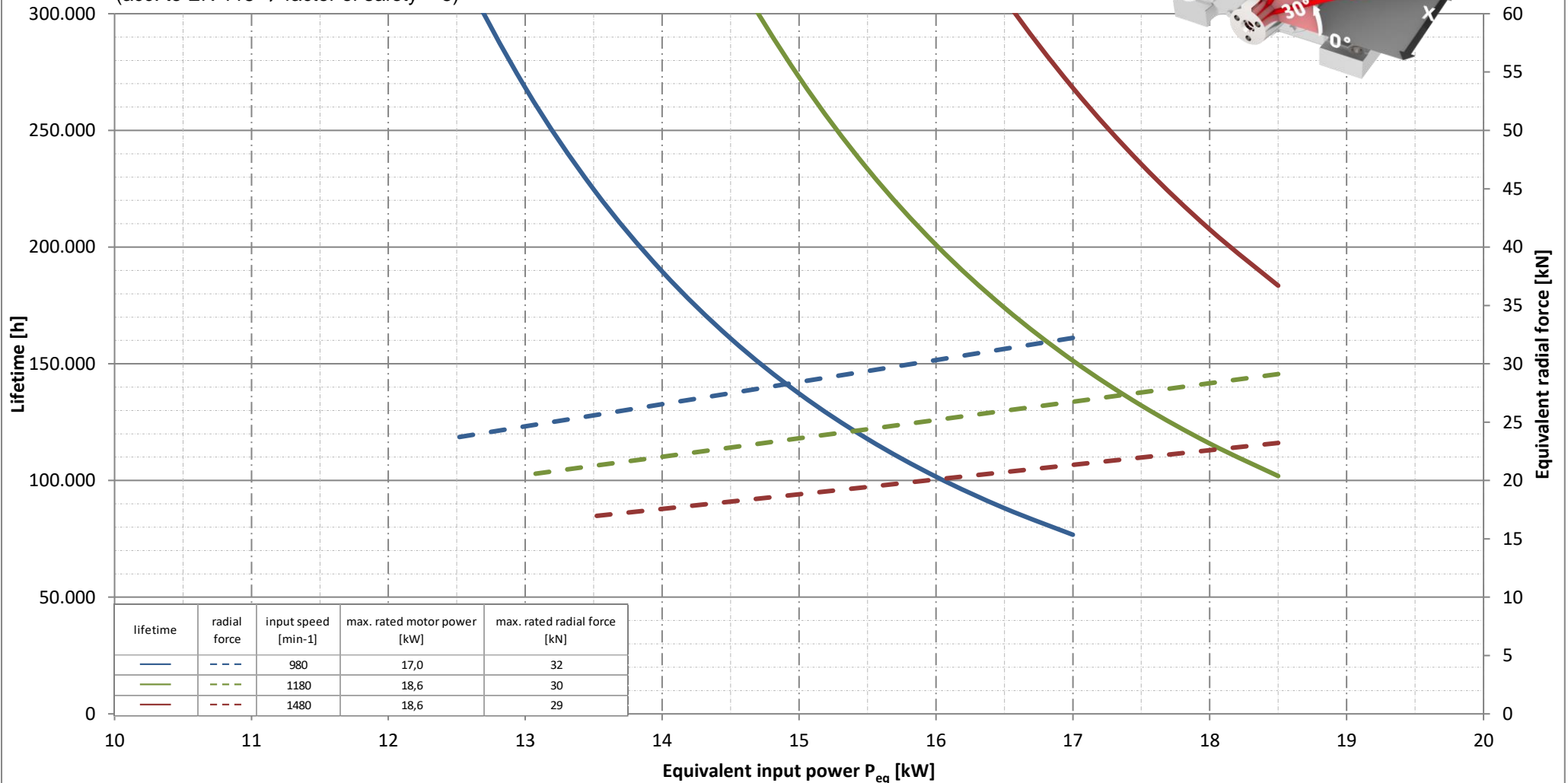
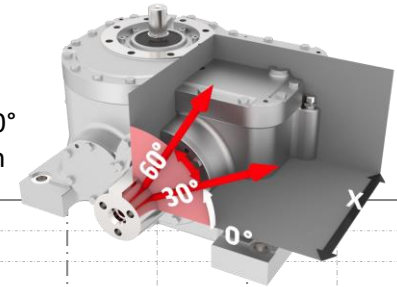


The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art. Worm tothing is calculated according to latest amendment of standard DIN 3996:2012.

FTHST 156.1 Escalator gear unit

Ratio 20.8
Lubrication Polyglycol
Ambient temperature 40° C
Efficiency ≥ 96%
Max. output torque / max. radial force 5.1 kNm / 50 kN
 (acc. to EN 115 → factor of safety = 5)

$\alpha = 30 \dots 60^\circ$
 $x = 258 \text{ mm}$

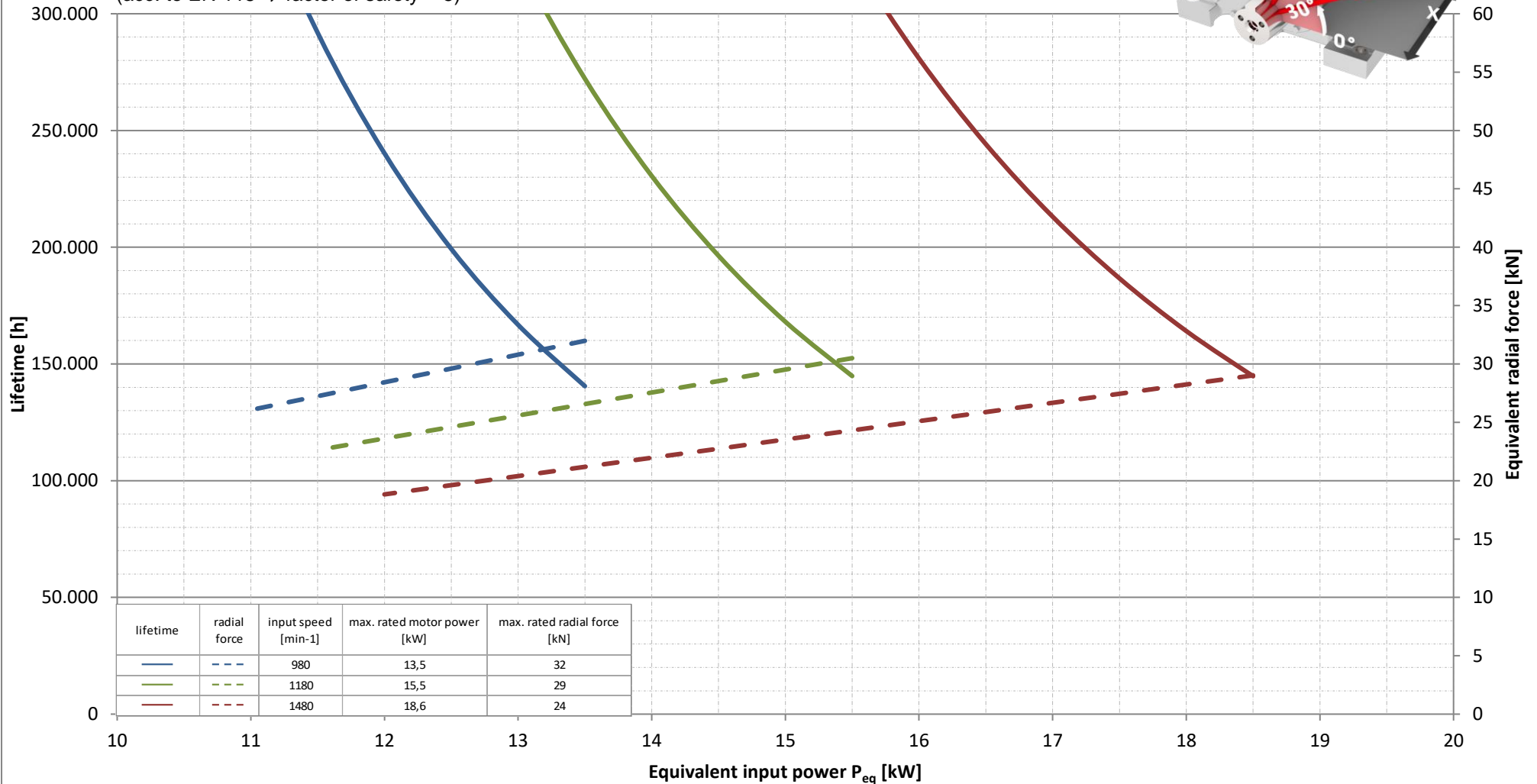
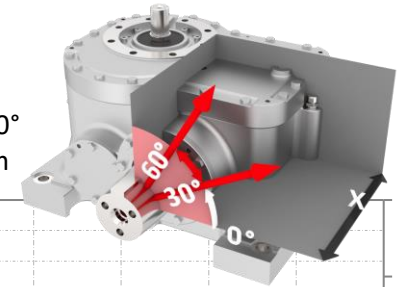


The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art.

FTHST 156.1 Escalator gear unit

Ratio 25.9
Lubrication Polyglycol
Ambient temperature 40° C
Efficiency ≥ 96%
Max. output torque / max. radial force 4.8 kNm / 47 kN
 (acc. to EN 115 → factor of safety = 5)

$\alpha = 30 \dots 60^\circ$
 $x = 258 \text{ mm}$

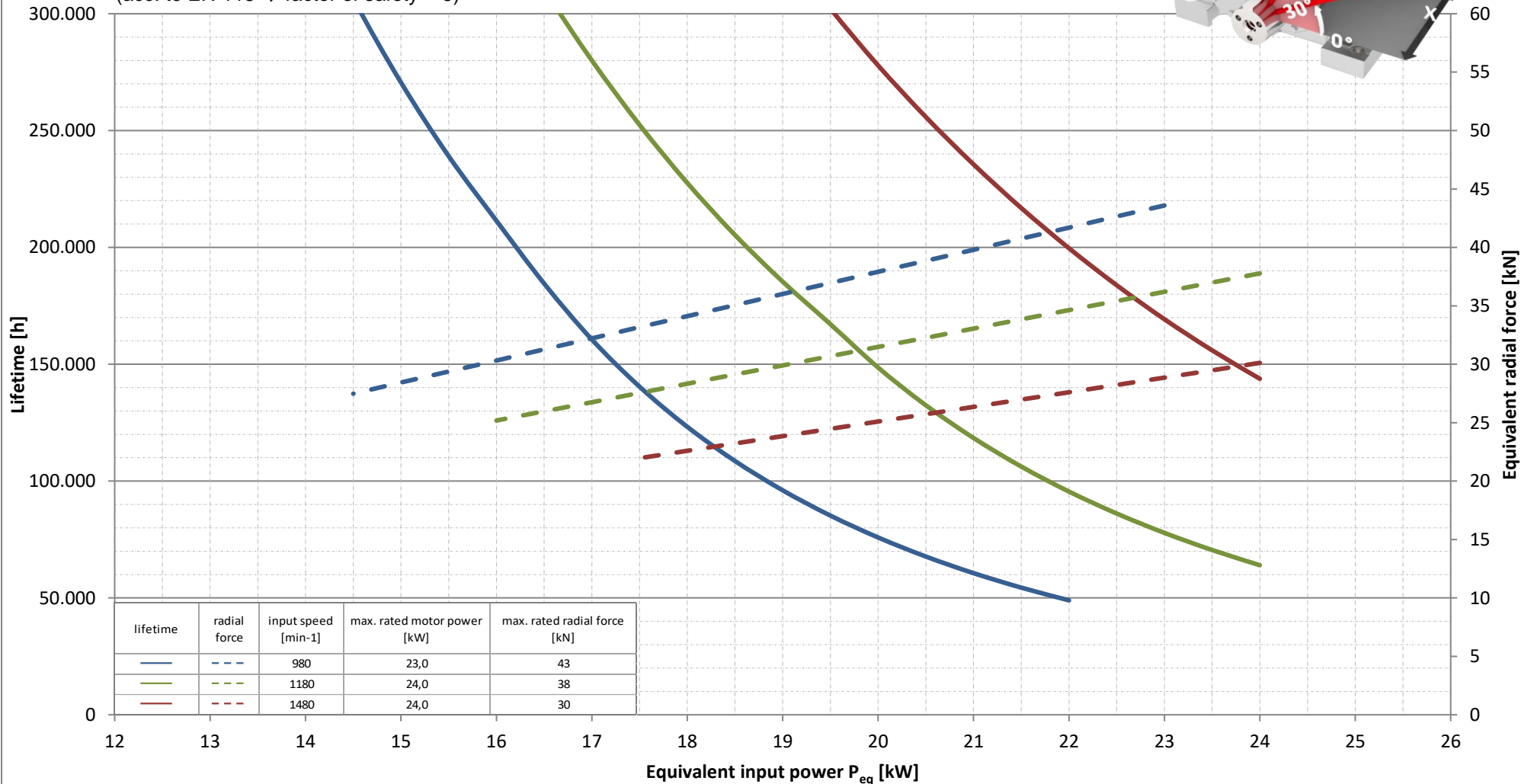
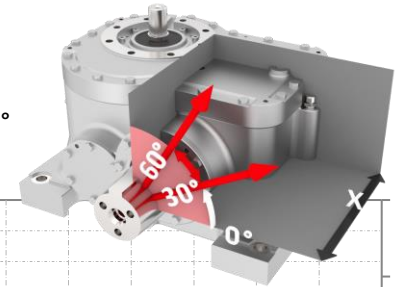


The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art.

FTHST 168.1 Escalator gear unit

Ratio 20.8
Lubrication Polyglycol
Ambient temperature 40° C
Efficiency ≥ 96%
Max. output torque / max. radial force 6.8 kNm / 66 kN
 (acc. to EN 115 → factor of safety = 5)

$\alpha = 30 \dots 60^\circ$
 $x = 280 \text{ mm}$

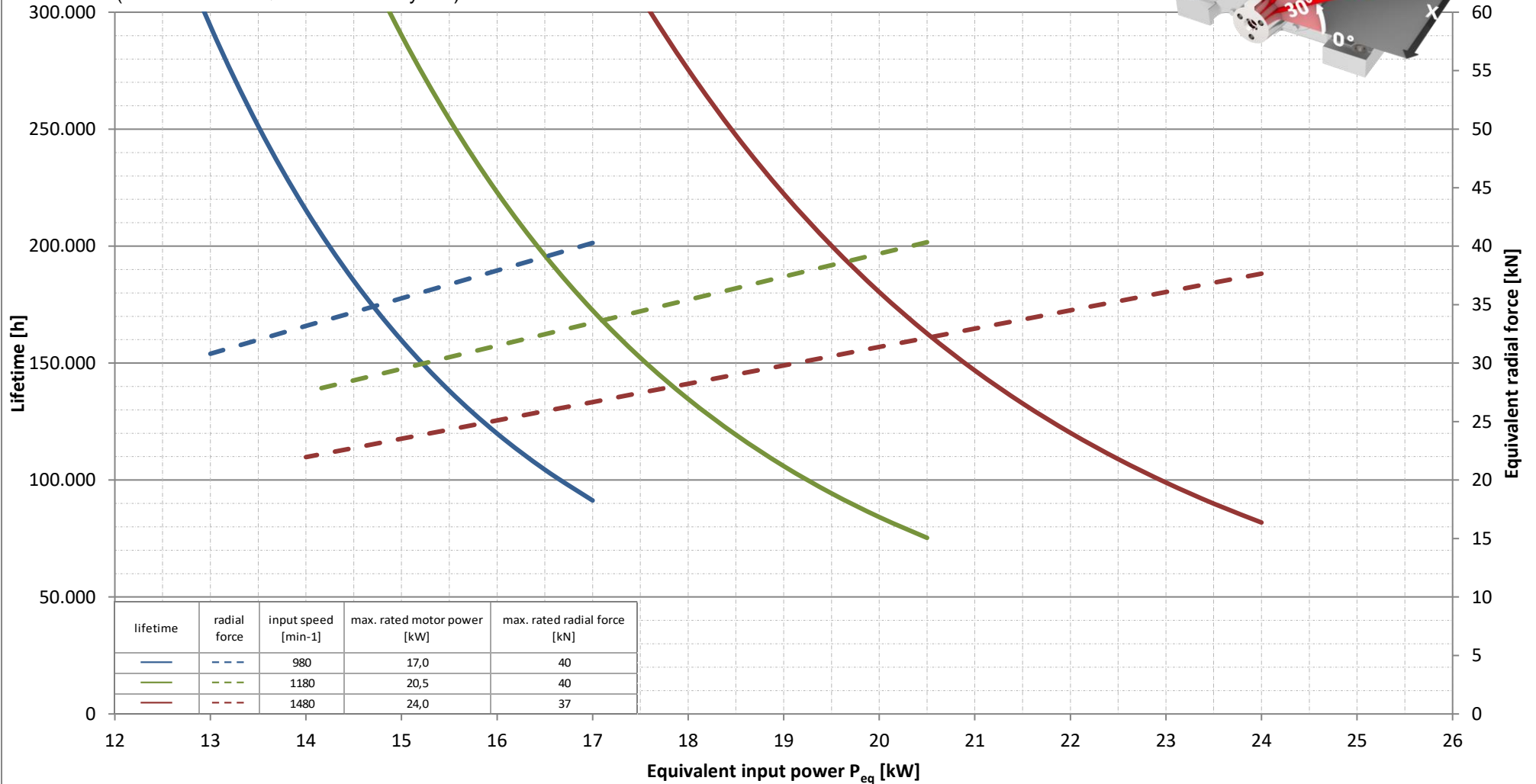
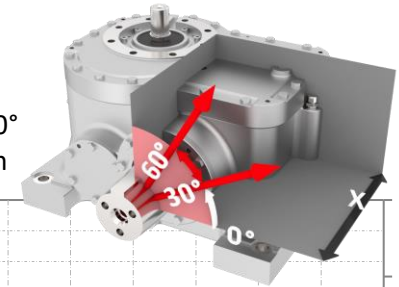


The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art.

FTHST 168.1 Escalator gear unit

Ratio 25.9
Lubrication Polyglycol
Ambient temperature 40° C
Efficiency ≥ 96%
Max. output torque / max. radial force 6.4 kNm / 62 kN
 (acc. to EN 115 → factor of safety = 5)

$\alpha = 30 \dots 60^\circ$
 $x = 280 \text{ mm}$

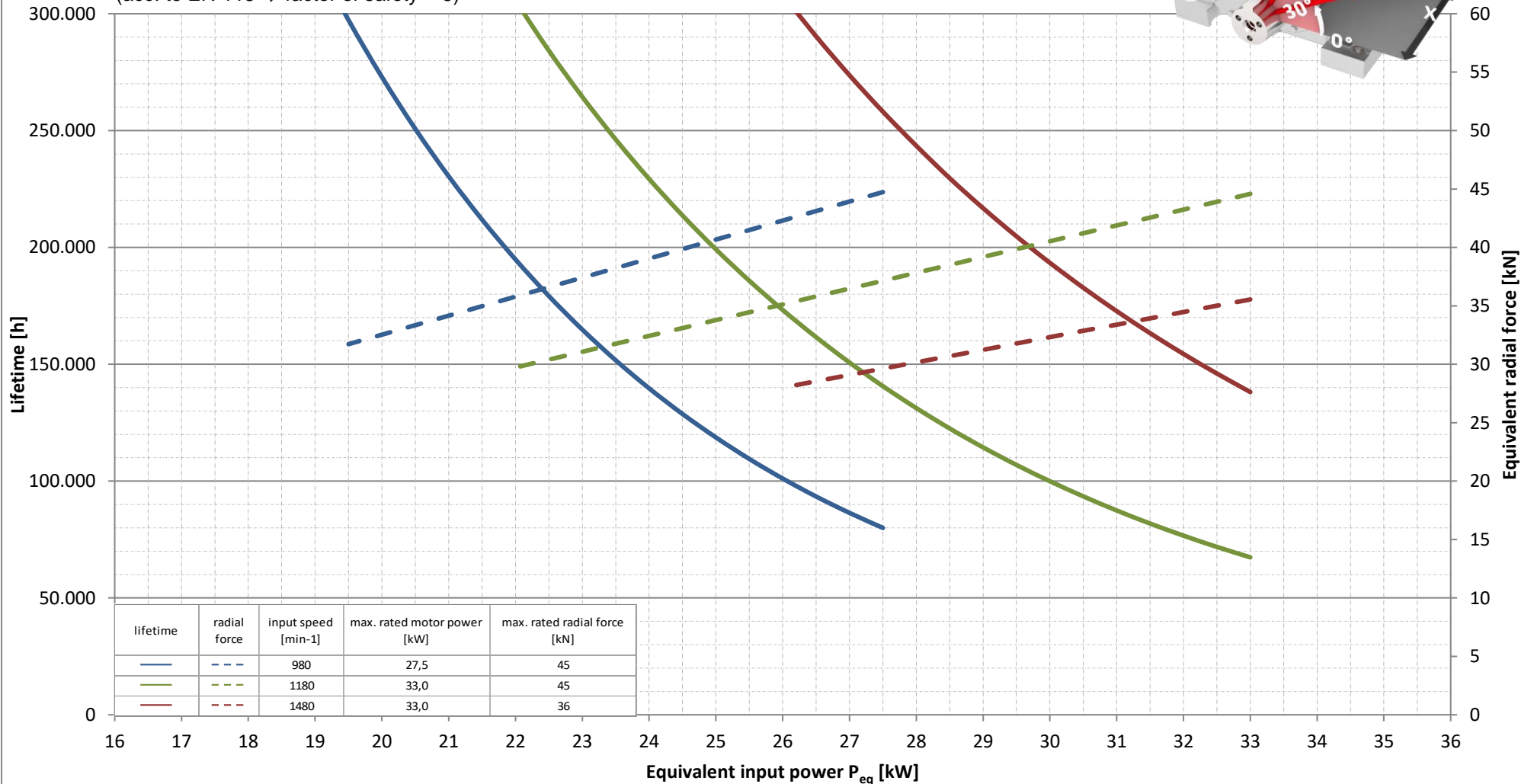
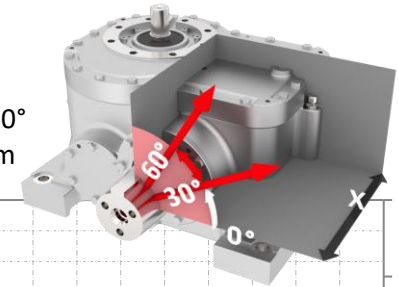


The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art.

FTHST 182.1 Escalator gear unit

Ratio 20.8
Lubrication Polyglycol
Ambient temperature 40° C
Efficiency ≥ 96%
Max. output torque / max. radial force 8.4 kNm / 70 kN
 (acc. to EN 115 → factor of safety = 5)

$\alpha = 30 \dots 60^\circ$
 $x = 300 \text{ mm}$

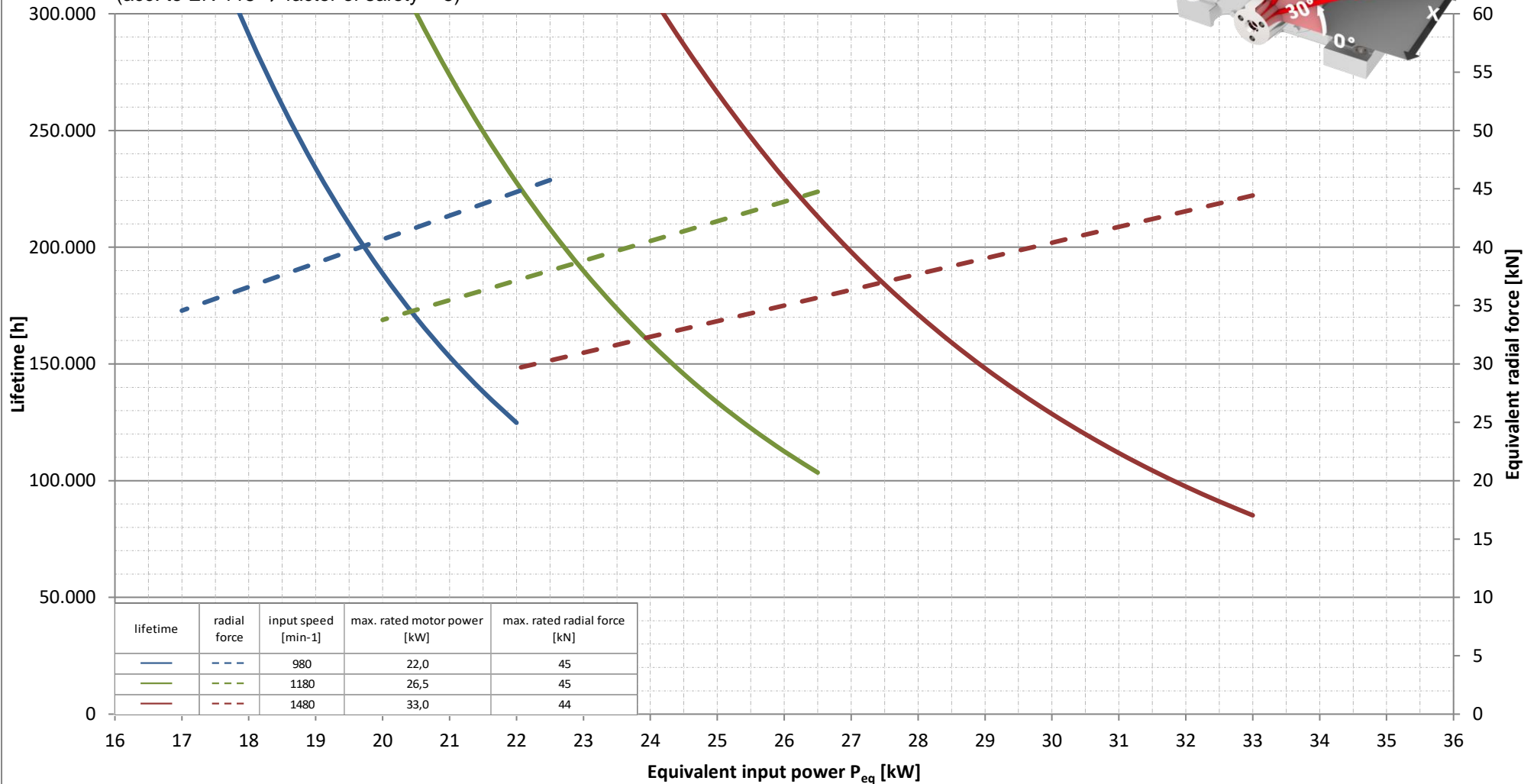
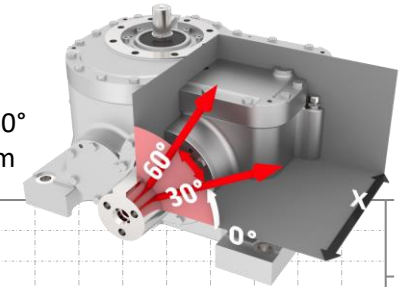


The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art.

FTHST 182.1 Escalator gear unit

Ratio 25.9
Lubrication Polyglycol
Ambient temperature 40° C
Efficiency ≥ 96%
Max. output torque / max. radial force 7.8 kNm / 65 kN
 (acc. to EN 115 → factor of safety = 5)

$\alpha = 30 \dots 60^\circ$
 $x = 300 \text{ mm}$



The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art.