



*Solutions for a world in motion*

## Drives

### Life-time graphs

*GFC escalator gear units*

*FTS125.1, FTS160.1, FTS180.1*

*FTSST158.1, FTSST180.1, FTSST212.1*

*Worm toothings according to DIN 3996:2012*

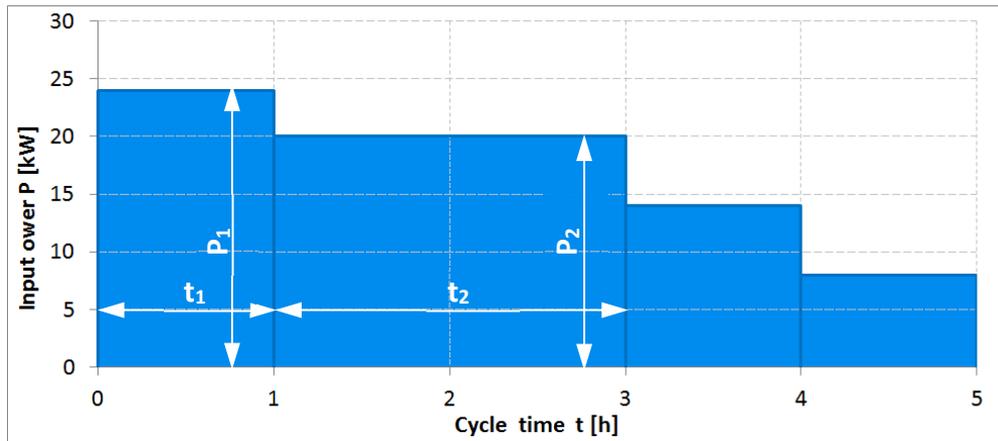
*Hypoid toothings according to ISO 10300:2014*

*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:**

$$t_{tot} = 5h$$

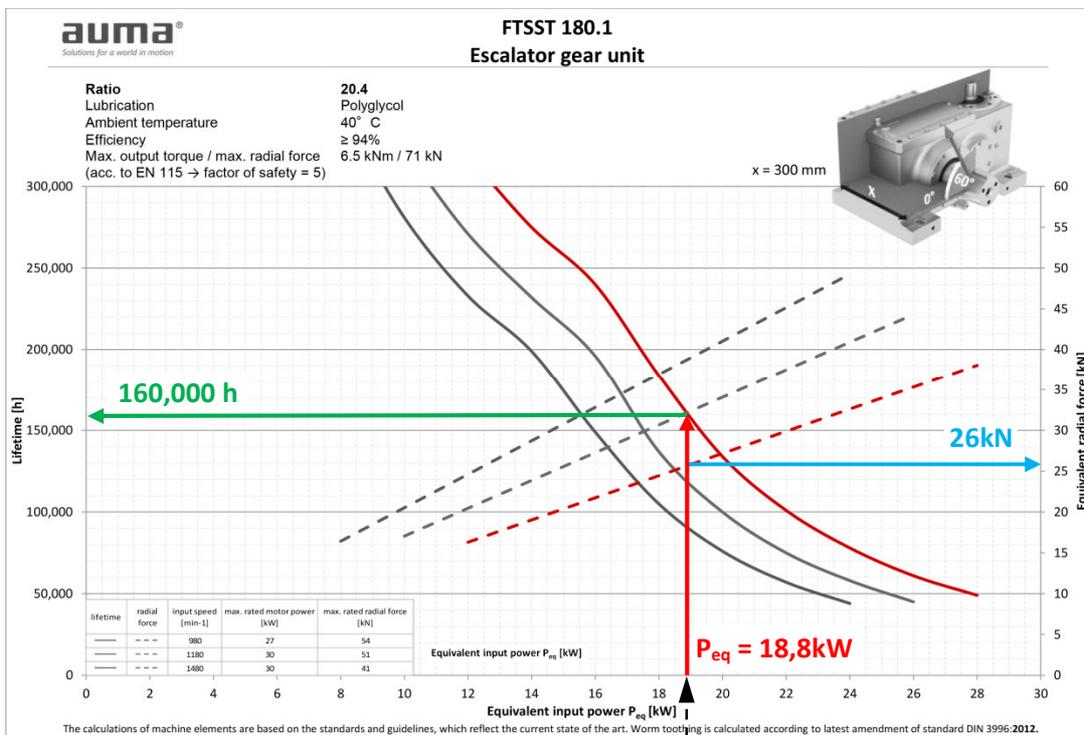
3. Equivalent input power  $P_{eq}$ :

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

$P_{eq} = 18,8$   
kW

4. Graphical determination of resulting life-time and permissible radial force on output shaft

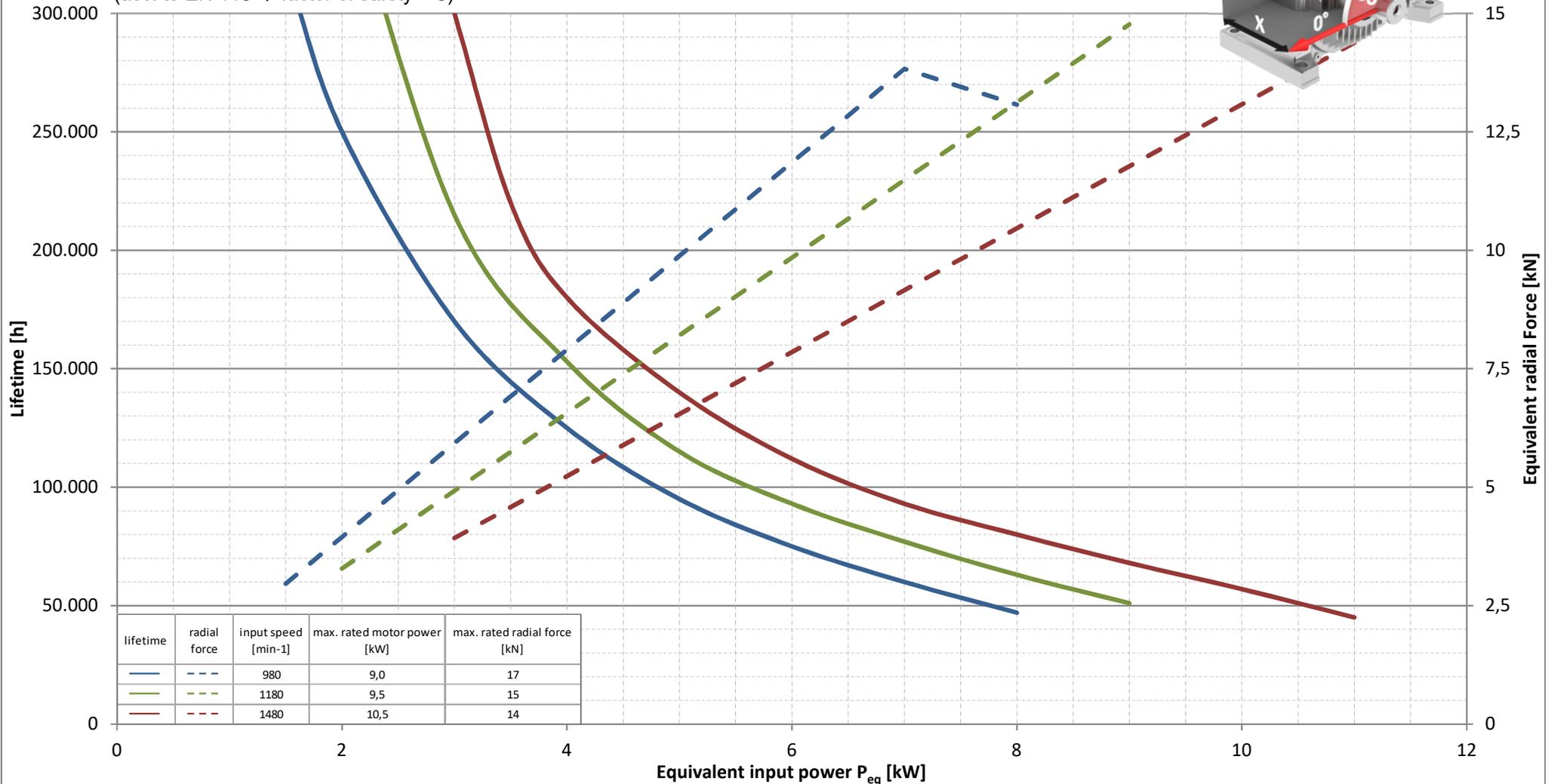
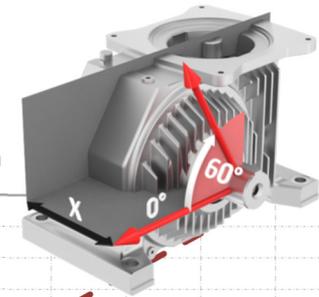
*Exemplarily selected drive: FTSST180.1 with ratio i=20.4 and motor speed 1480rpm:*



## 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)

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

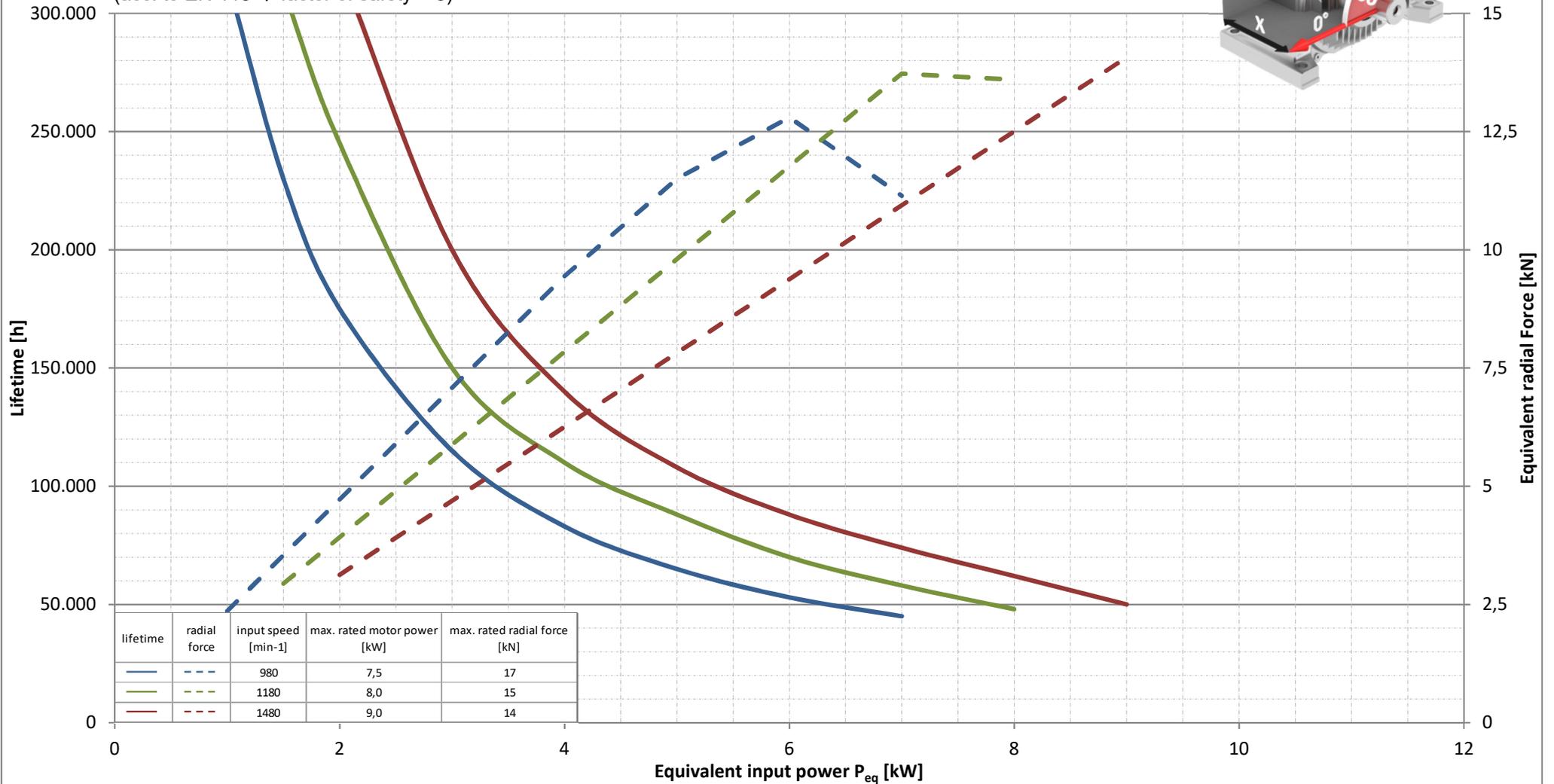
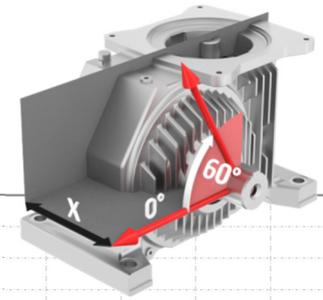


The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art. Worm toothing is calculated according to latest amendment of standard DIN 3996:2012.

## 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)

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

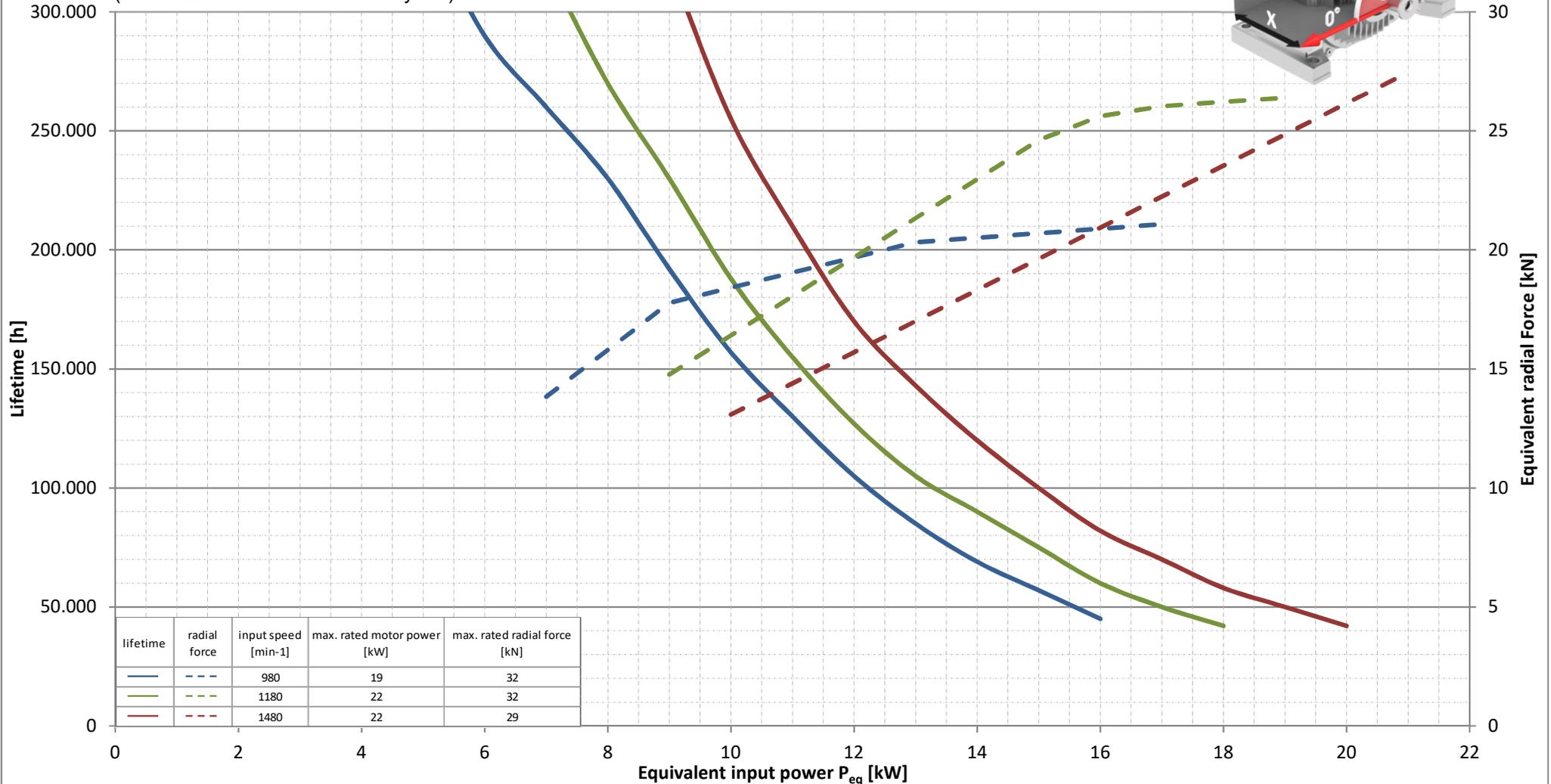
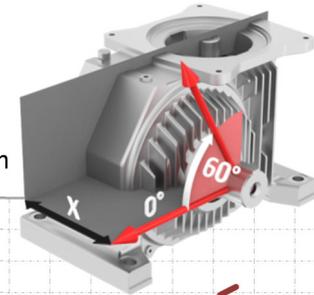


The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art. Worm toothing is calculated according to latest amendment of standard DIN 3996:2012.

## FTS 160.1 Escalator gear unit

**Ratio** 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)

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

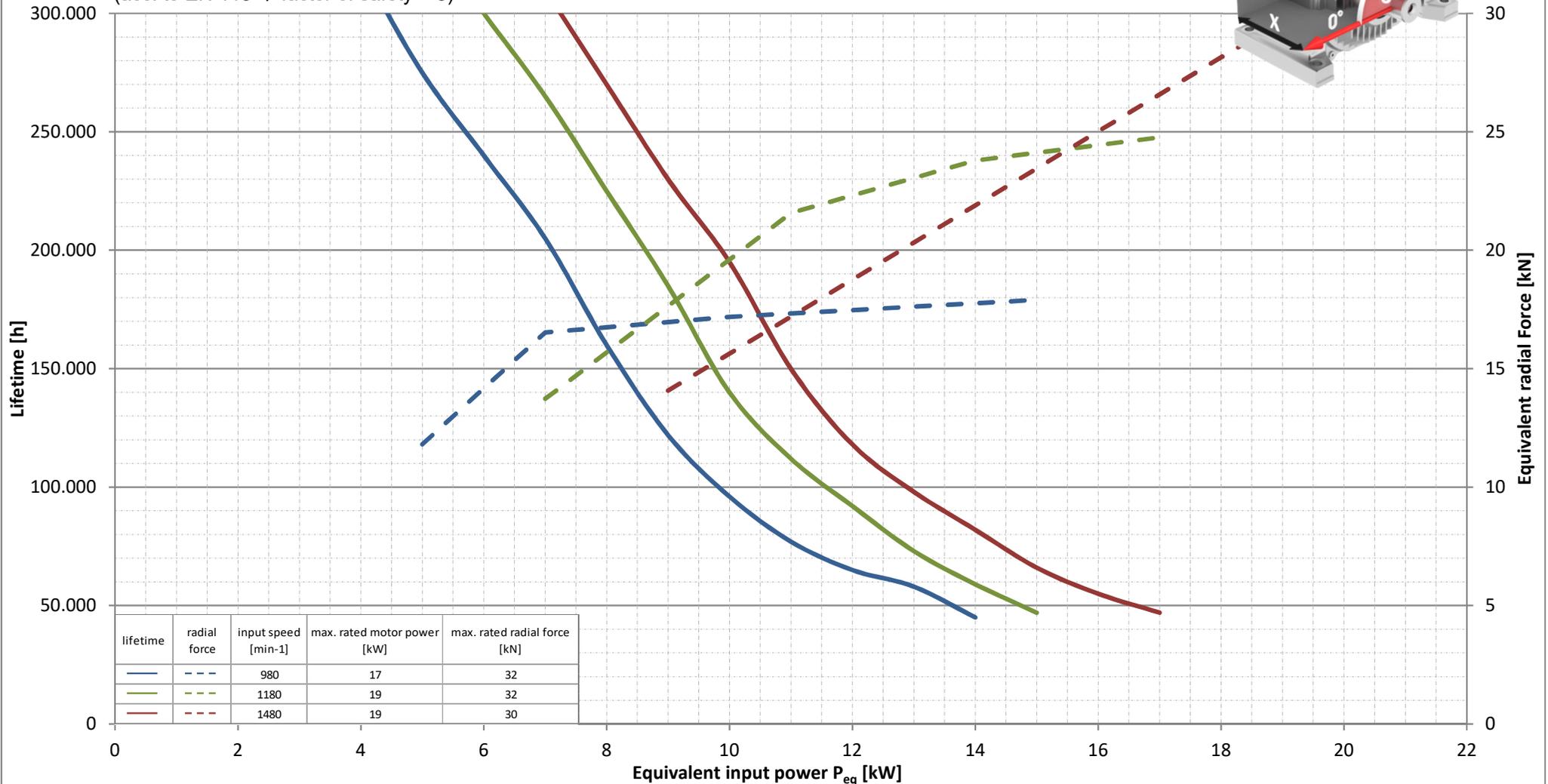
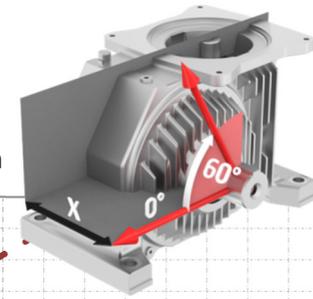


The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art. Worm toothing is calculated according to latest amendment of standard DIN 3996:2012.

## 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)

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

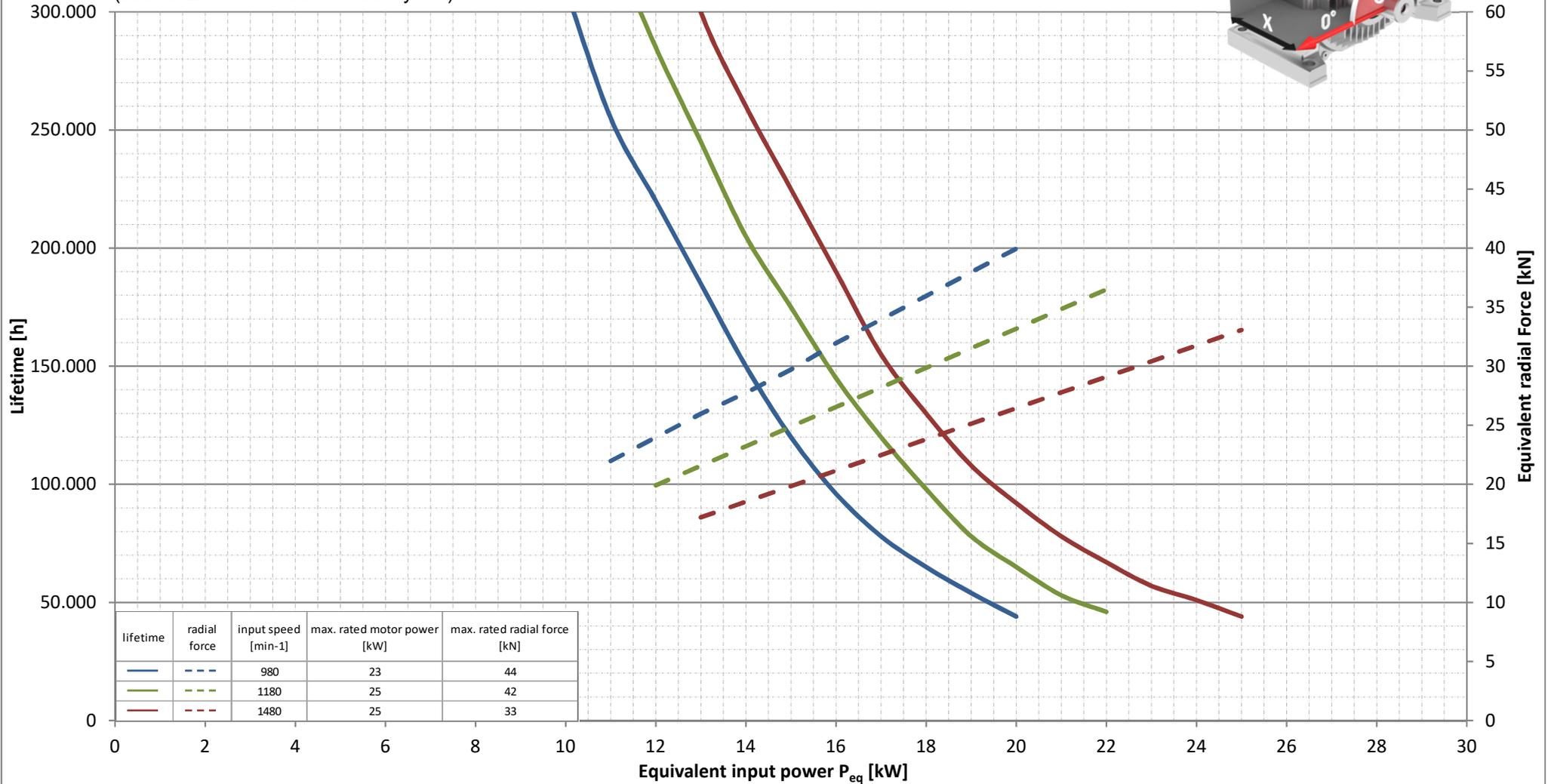
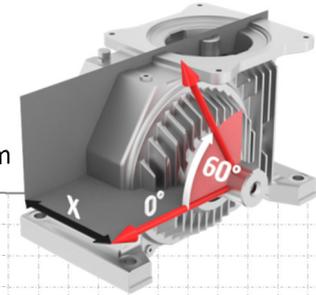


The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art. Worm toothing is calculated according to latest amendment of standard DIN 3996:2012.

## 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)

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

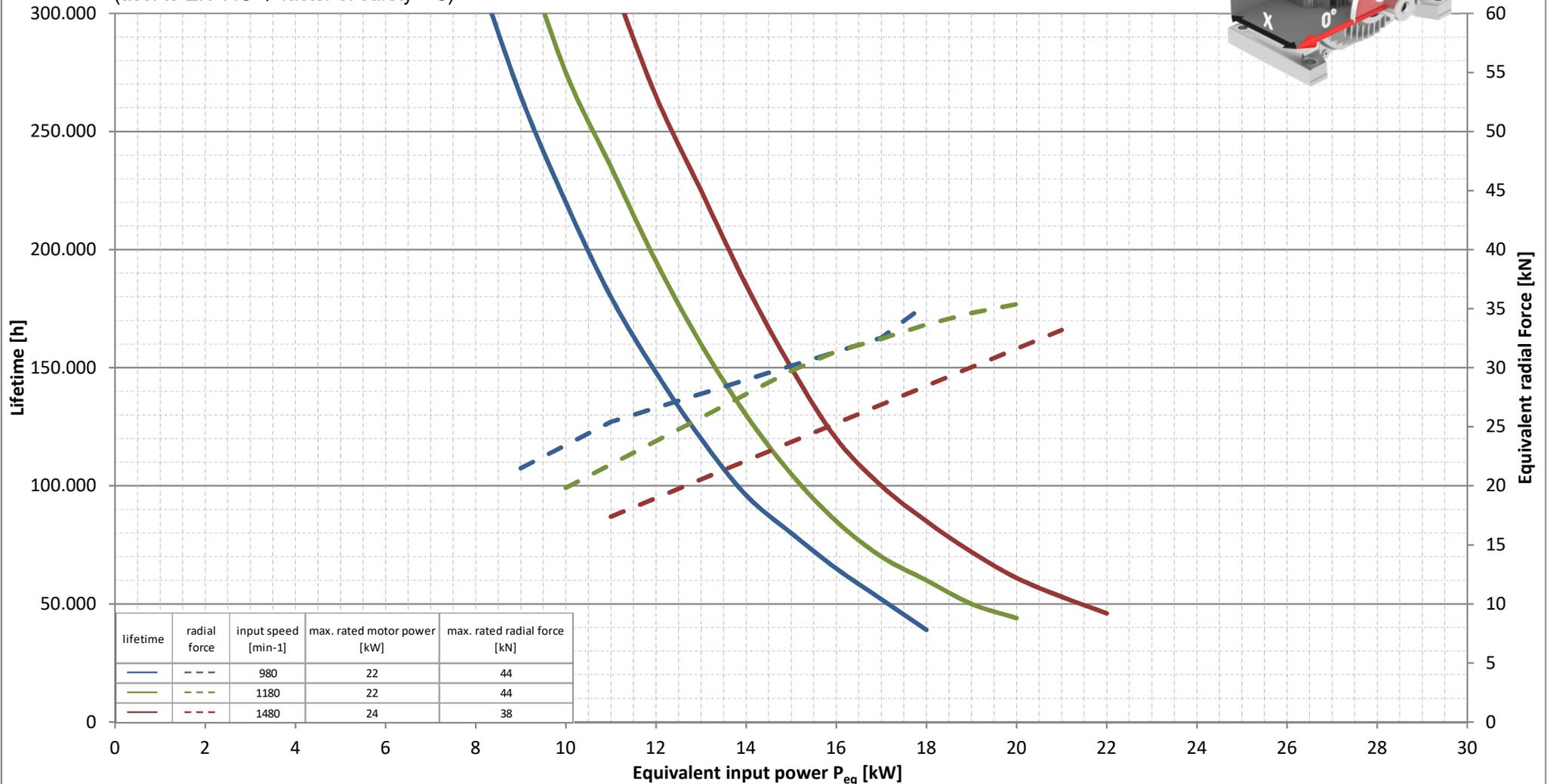
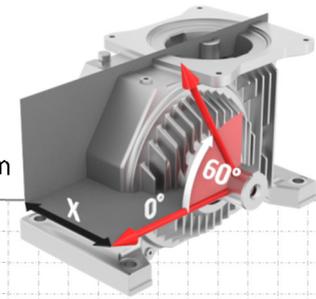


The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art. Worm toothing is calculated according to latest amendment of standard DIN 3996:2012.

## 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)

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

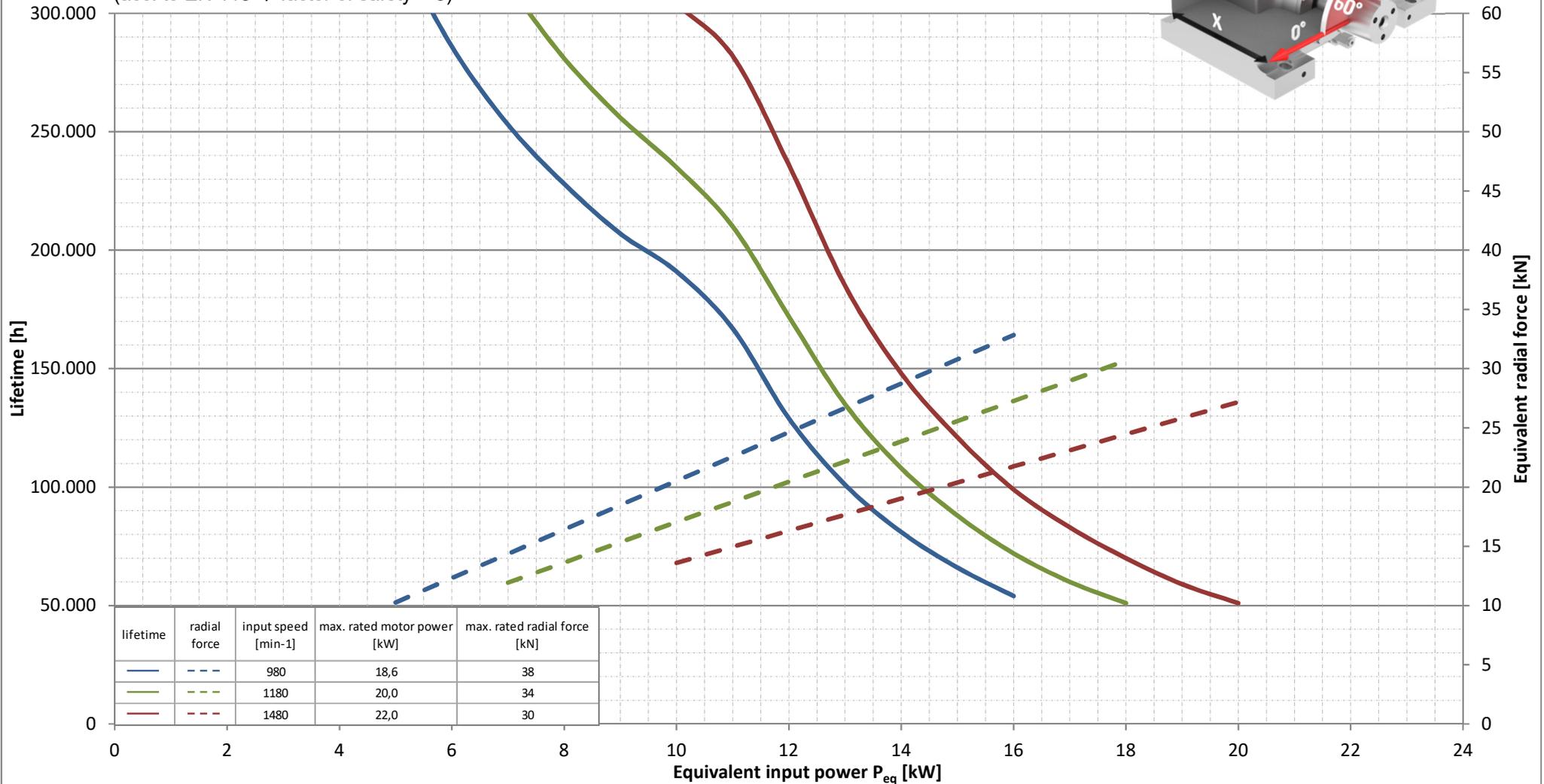
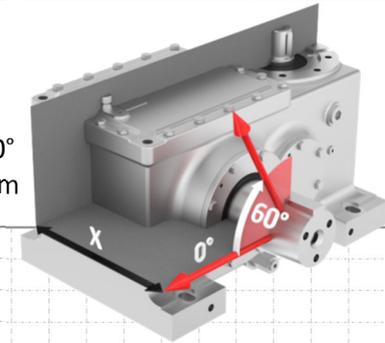


The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art. Worm toothing is calculated according to latest amendment of standard DIN 3996:2012.

## 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)

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

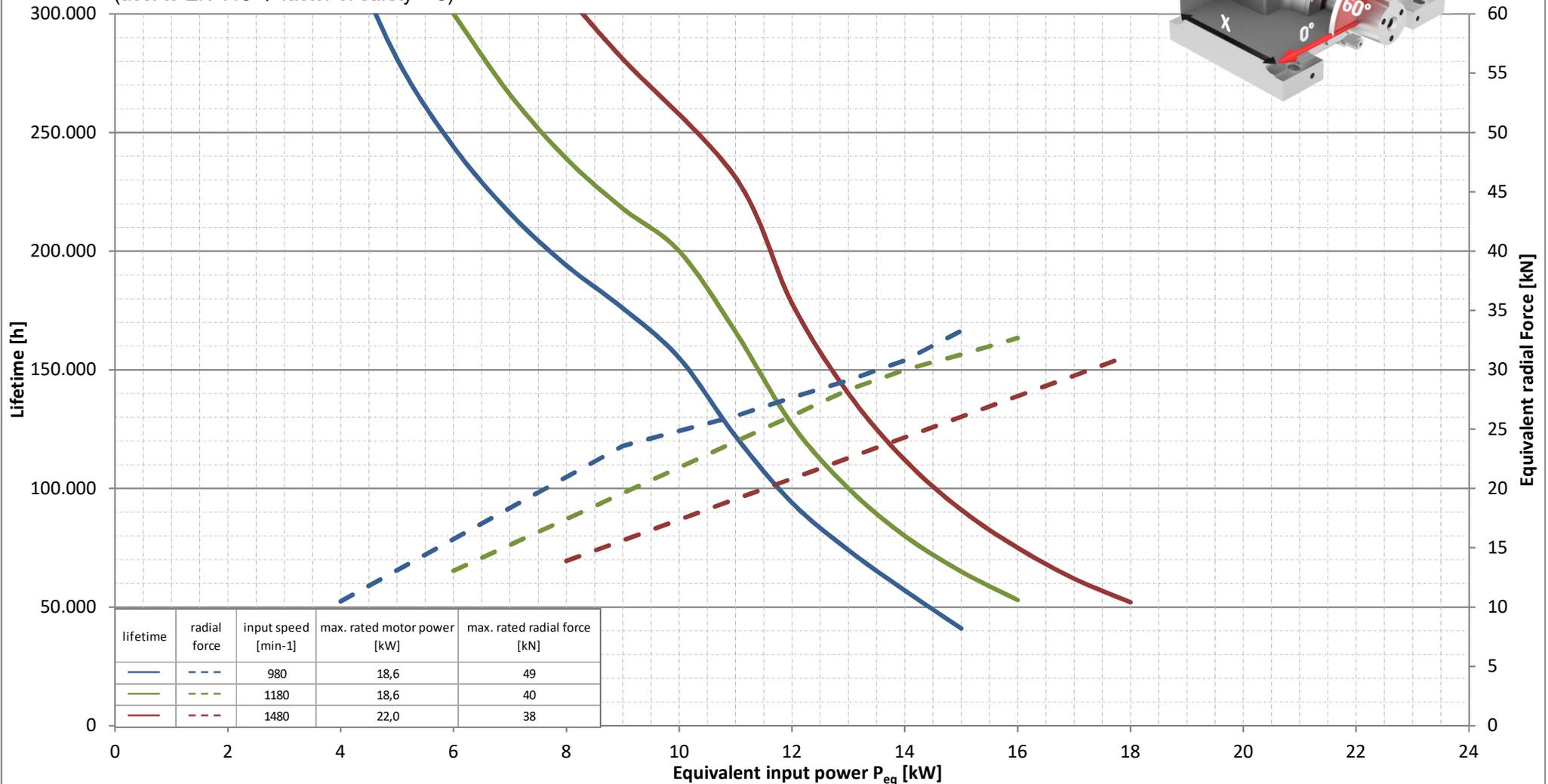
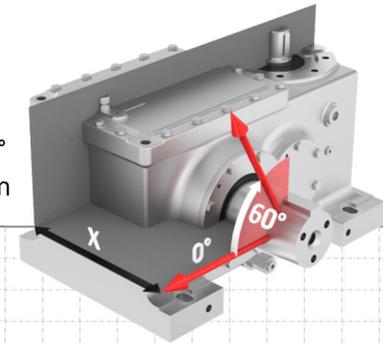


The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art. Worm toothing is calculated according to latest amendment of standard DIN 3996:2012.

## FTSST 158.1 Escalator gear unit

**Ratio** 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)

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

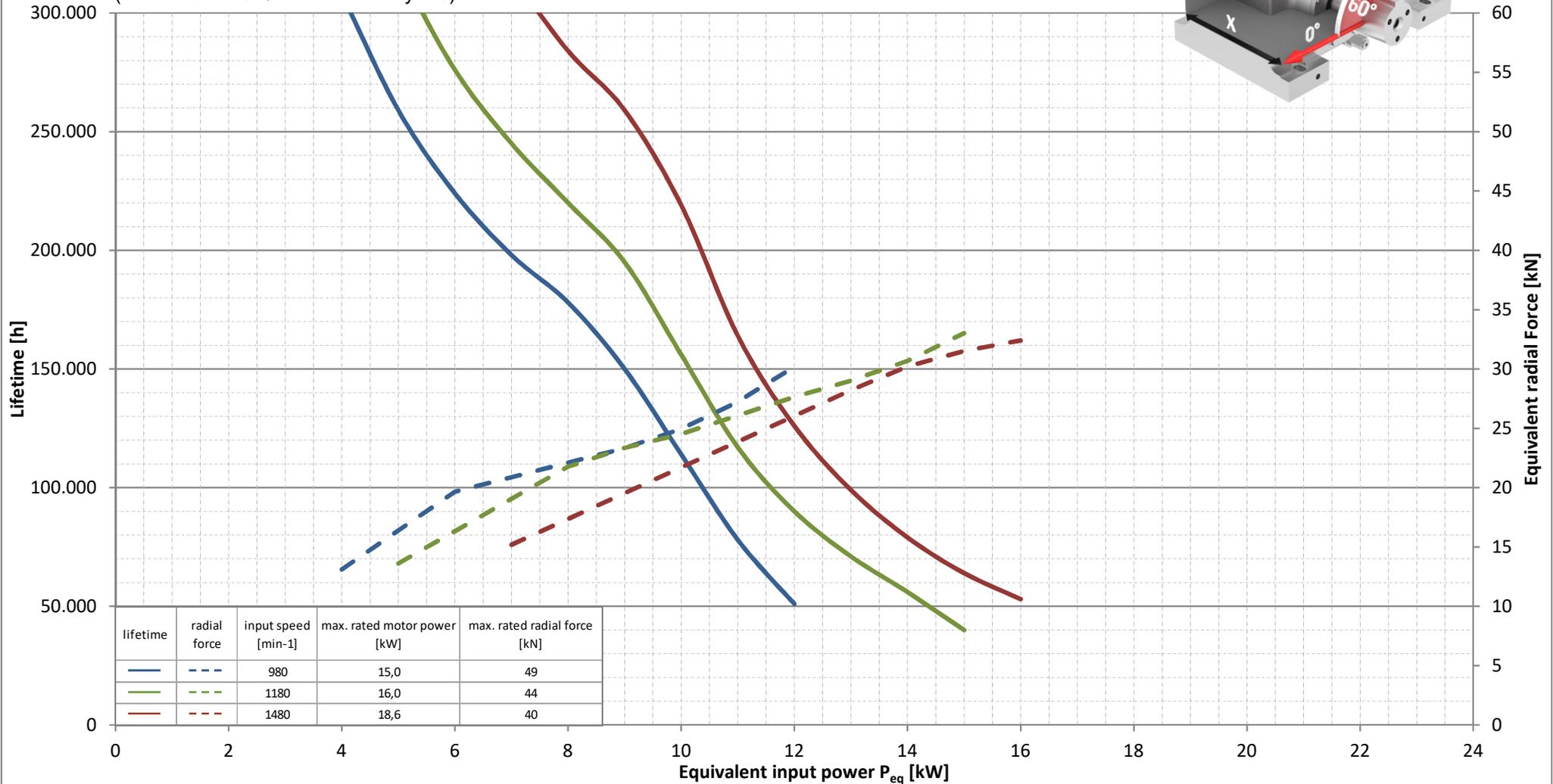
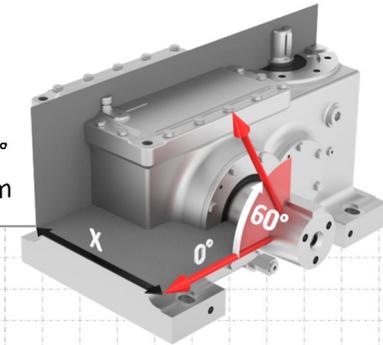


The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art. Worm toothing is calculated according to latest amendment of standard DIN 3996:2012.

## 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)

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

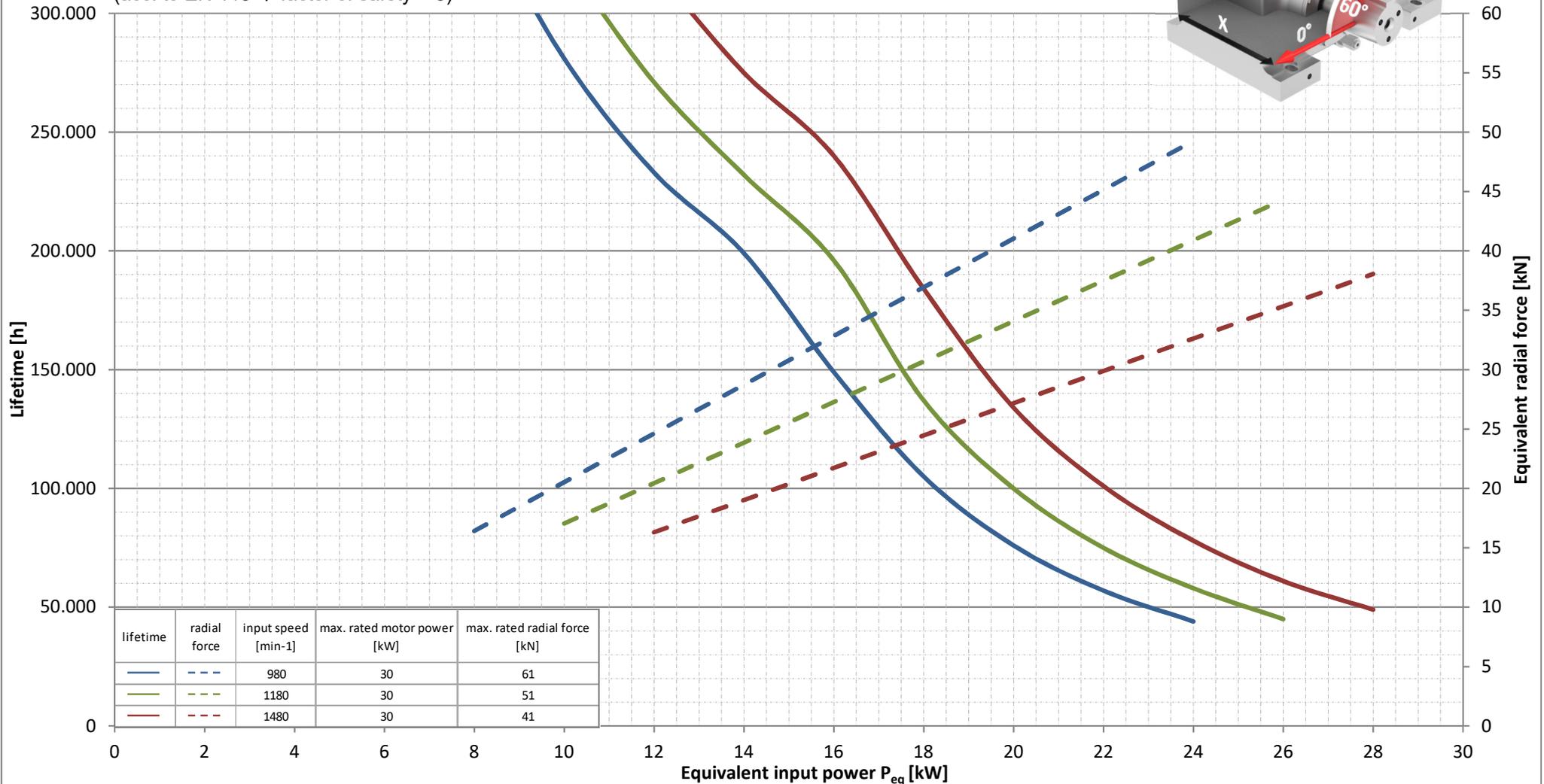
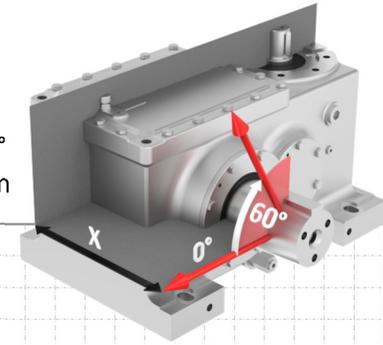


The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art. Worm toothing is calculated according to latest amendment of standard DIN 3996:2012.

## 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)

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

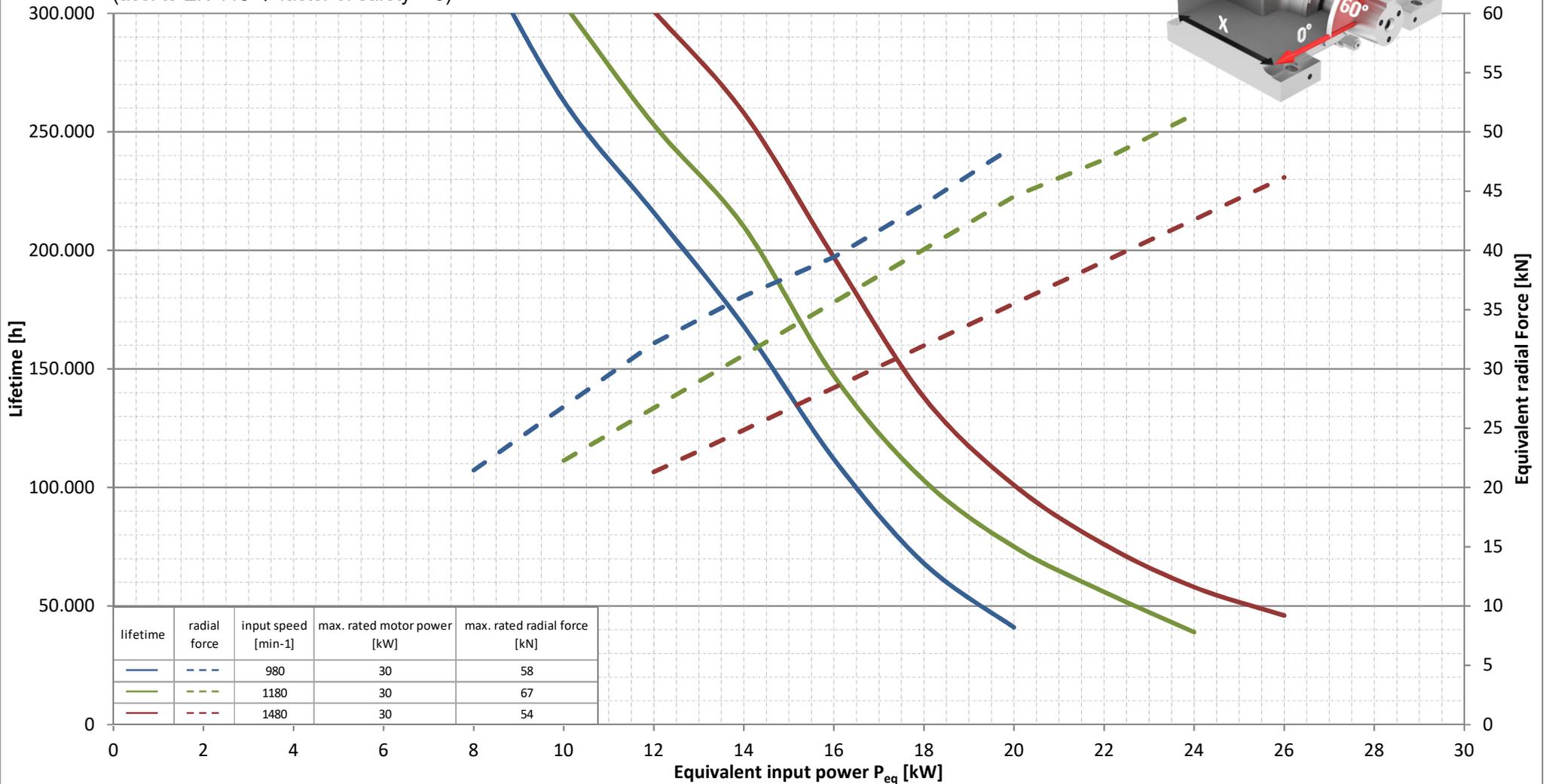
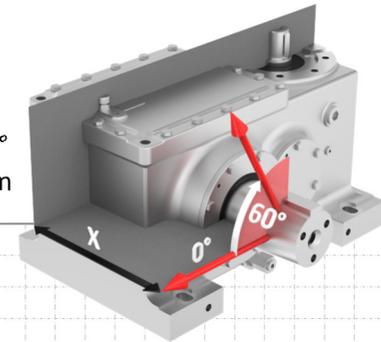


The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art. Worm toothing is calculated according to latest amendment of standard DIN 3996:2012.

## 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)

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

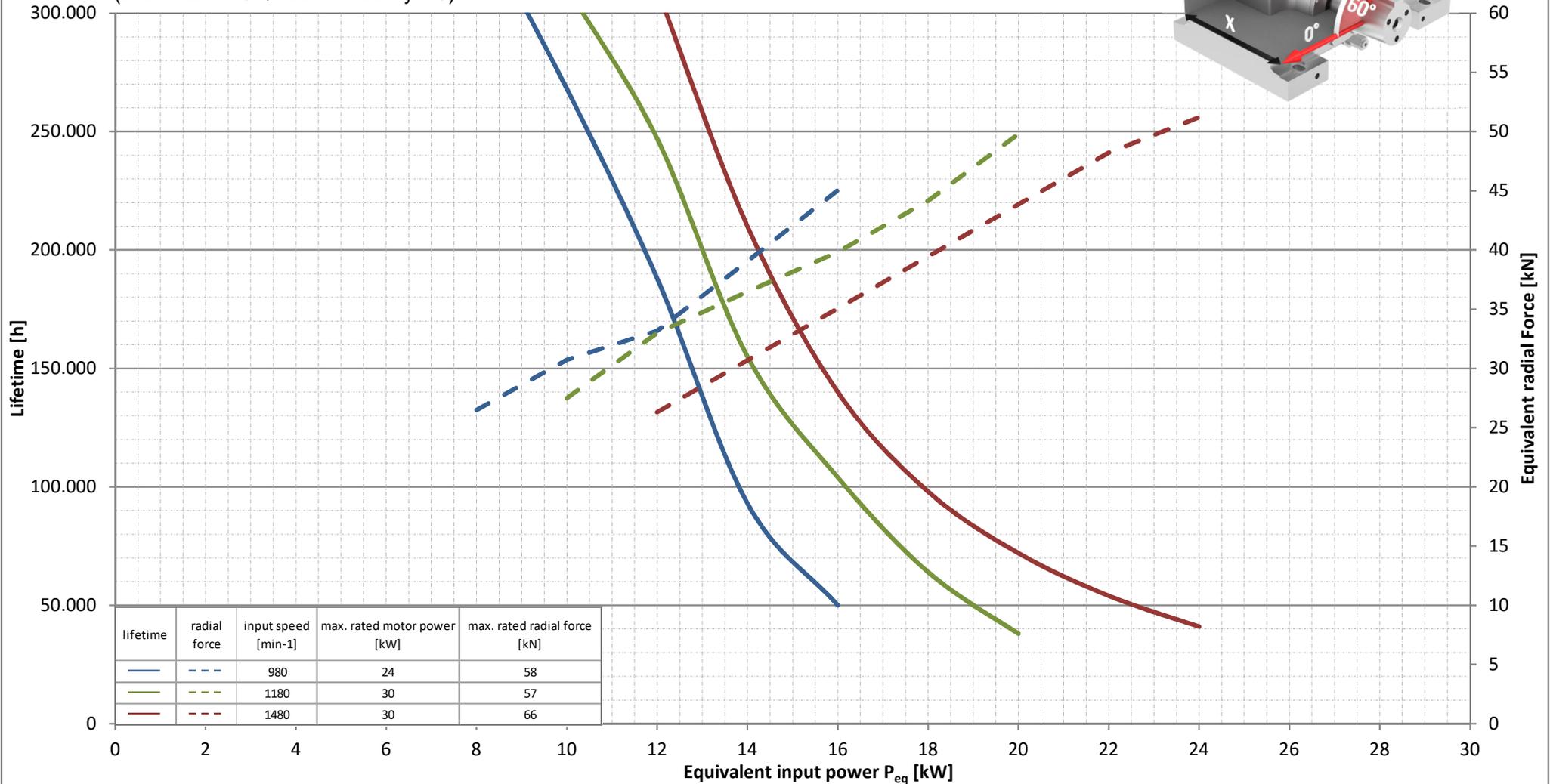
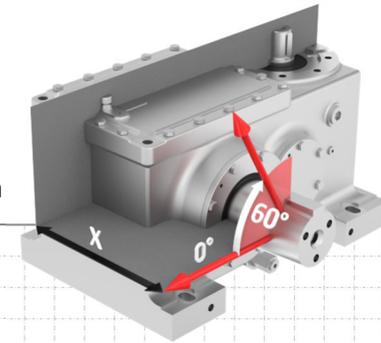


The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art. Worm toothing is calculated according to latest amendment of standard DIN 3996:2012.

## 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)

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

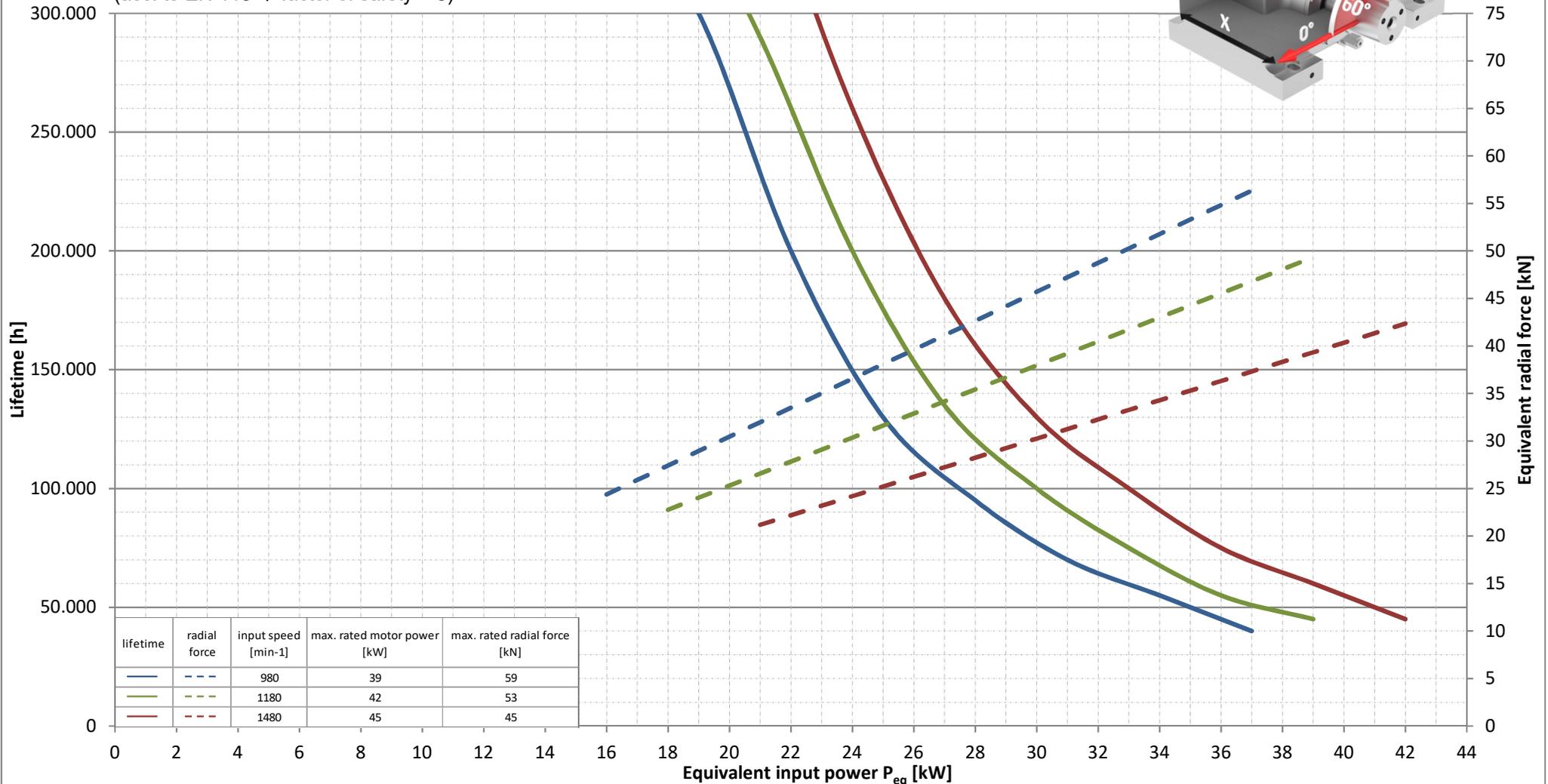
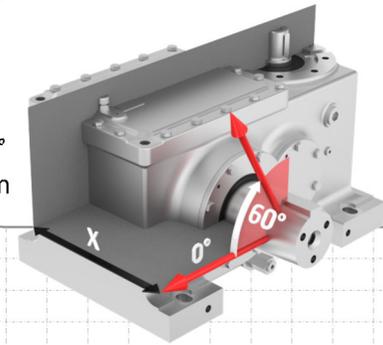


The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art. Worm tothing is calculated according to latest amendment of standard DIN 3996:2012.

## 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)

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

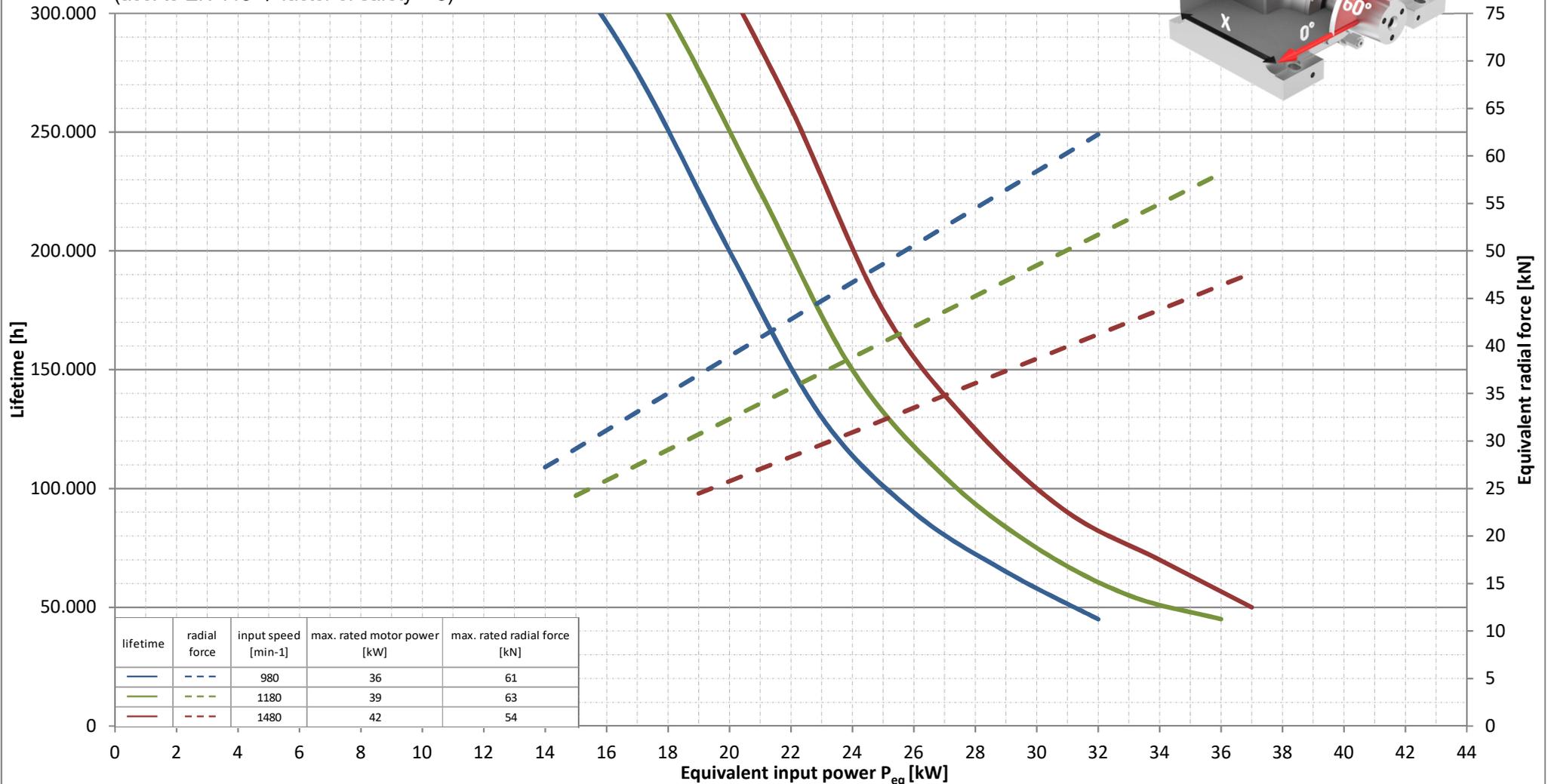
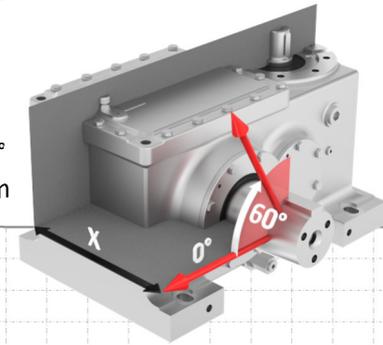


The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art. Worm toothing is calculated according to latest amendment of standard DIN 3996:2012.

## 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)

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

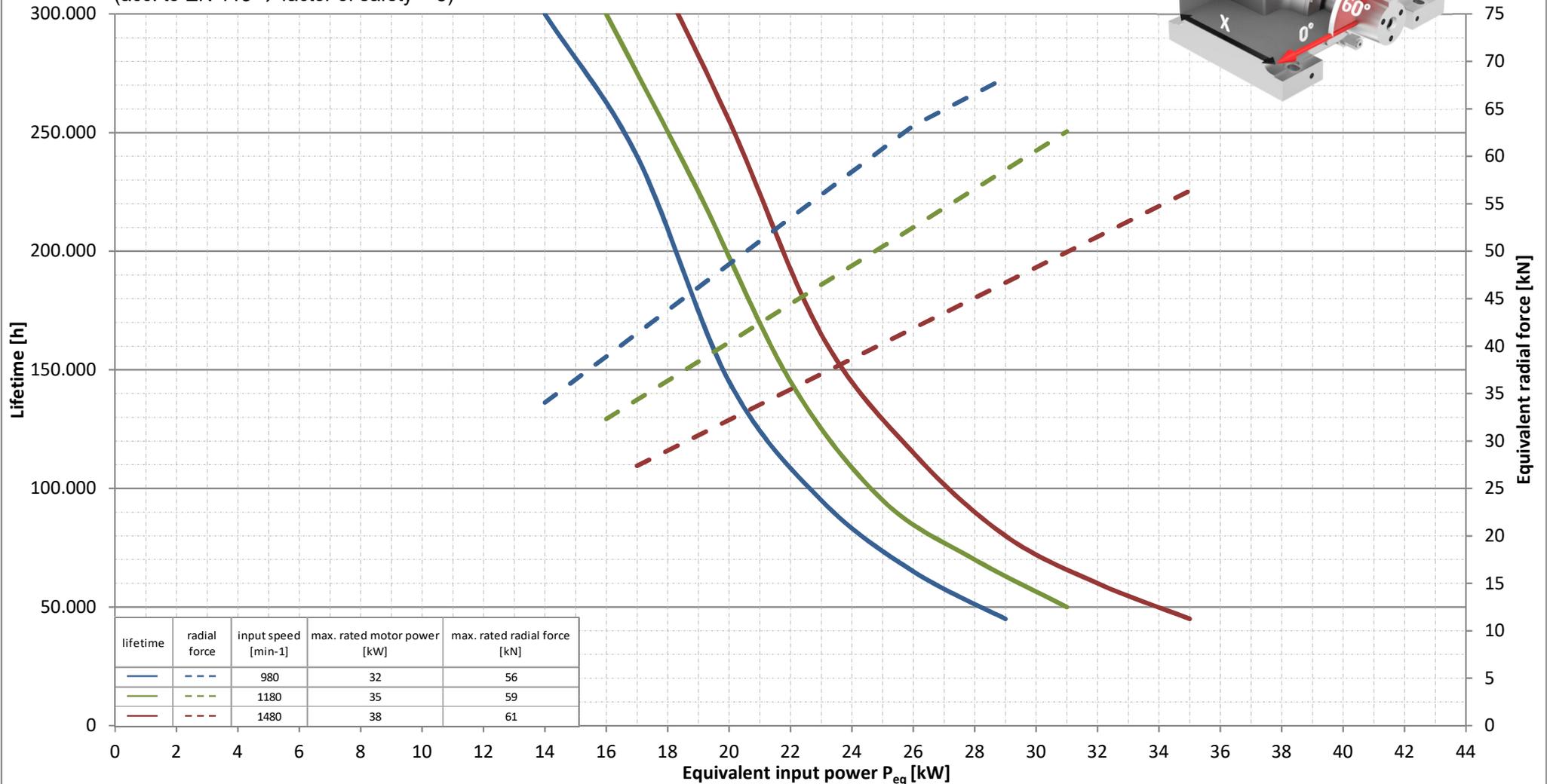
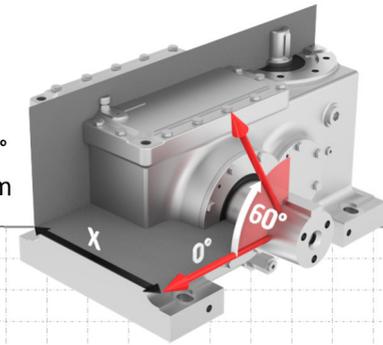


The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art. Worm toothing is calculated according to latest amendment of standard DIN 3996:2012.

## 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)

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

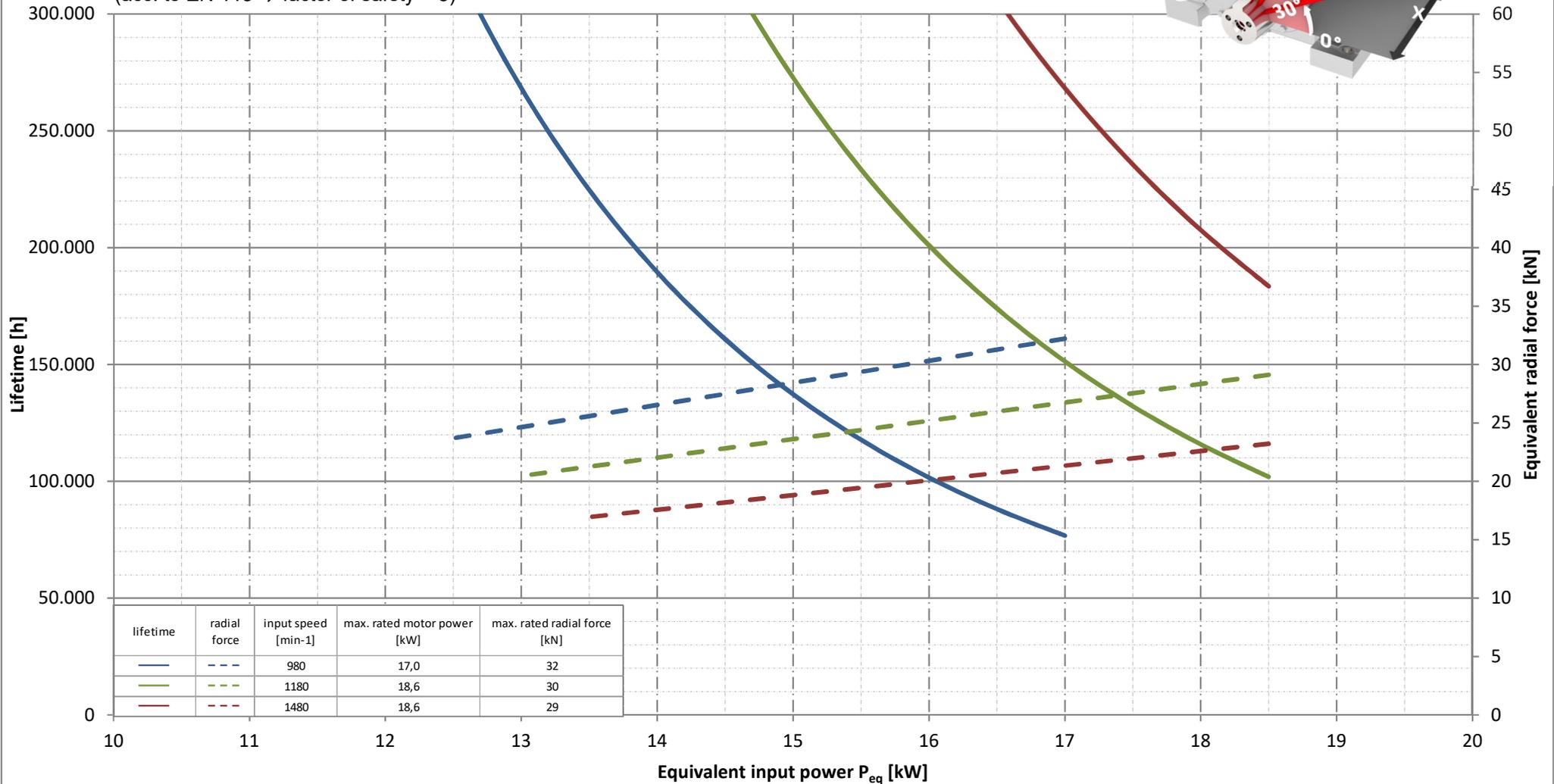
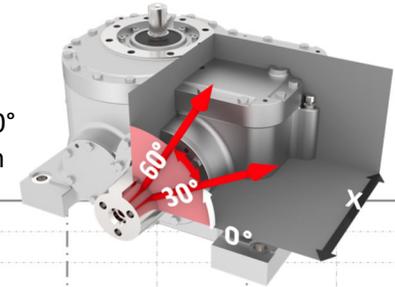


The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art. Worm toothing is calculated according to latest amendment of standard DIN 3996:2012.

## 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)

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

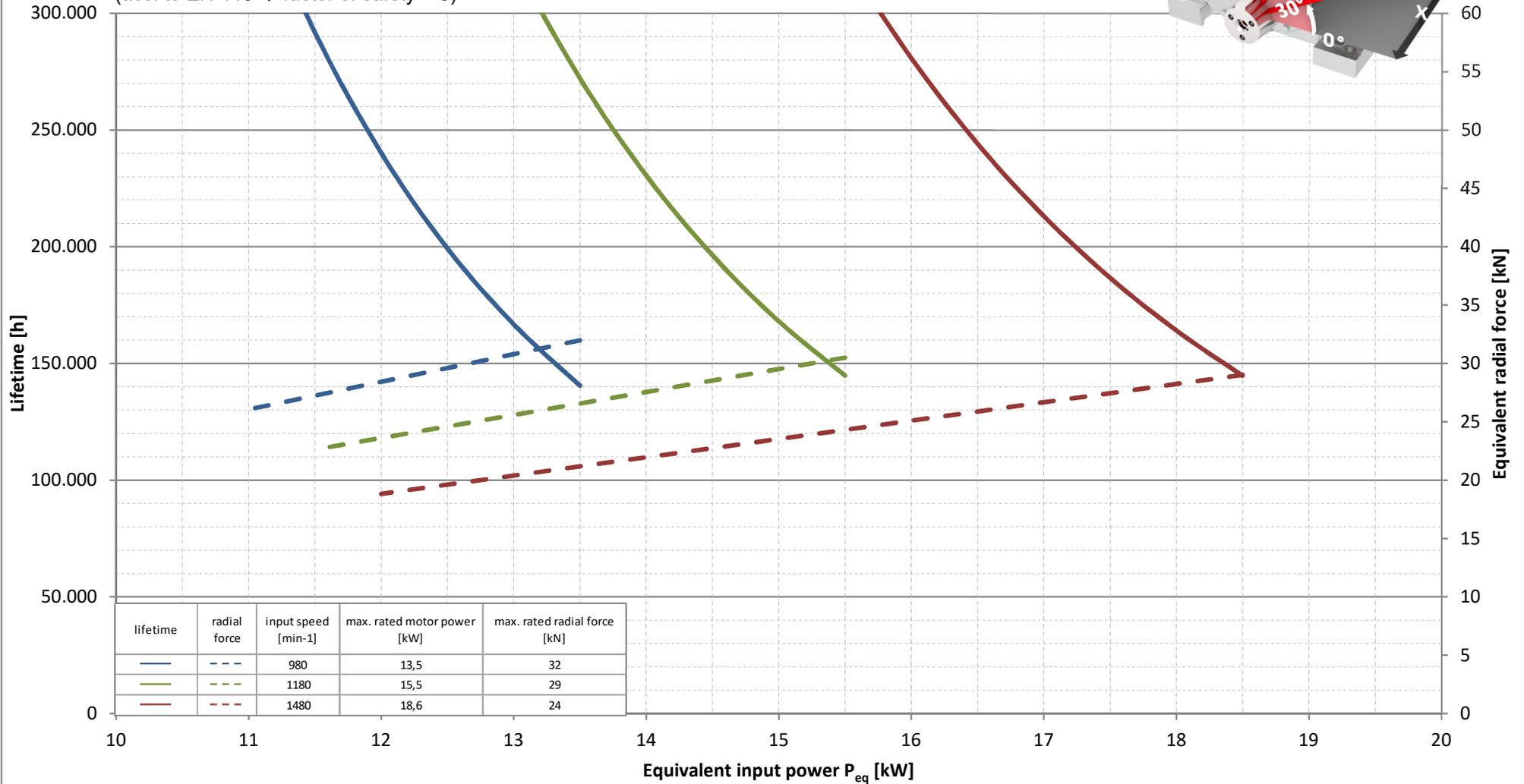
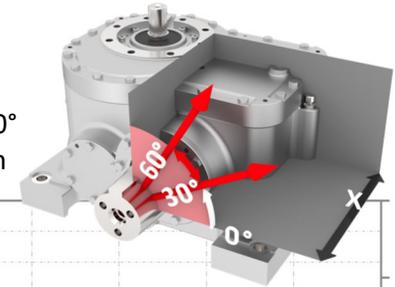


The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art.

## 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)

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

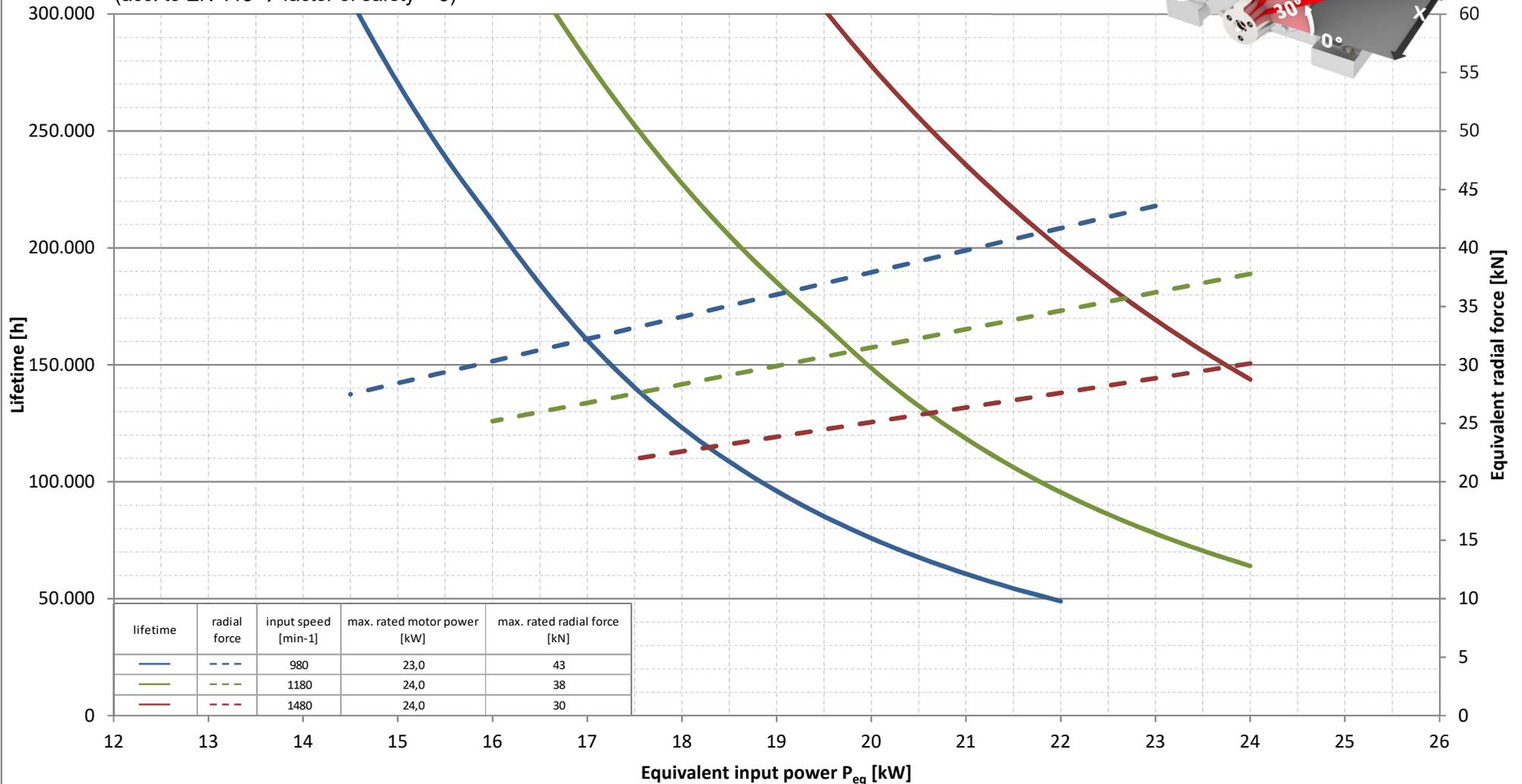
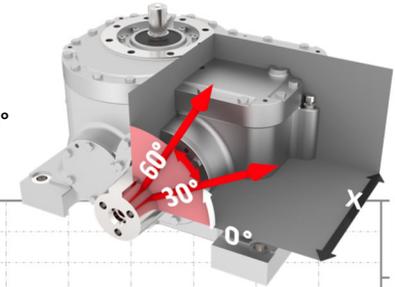


The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art.

## 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)

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

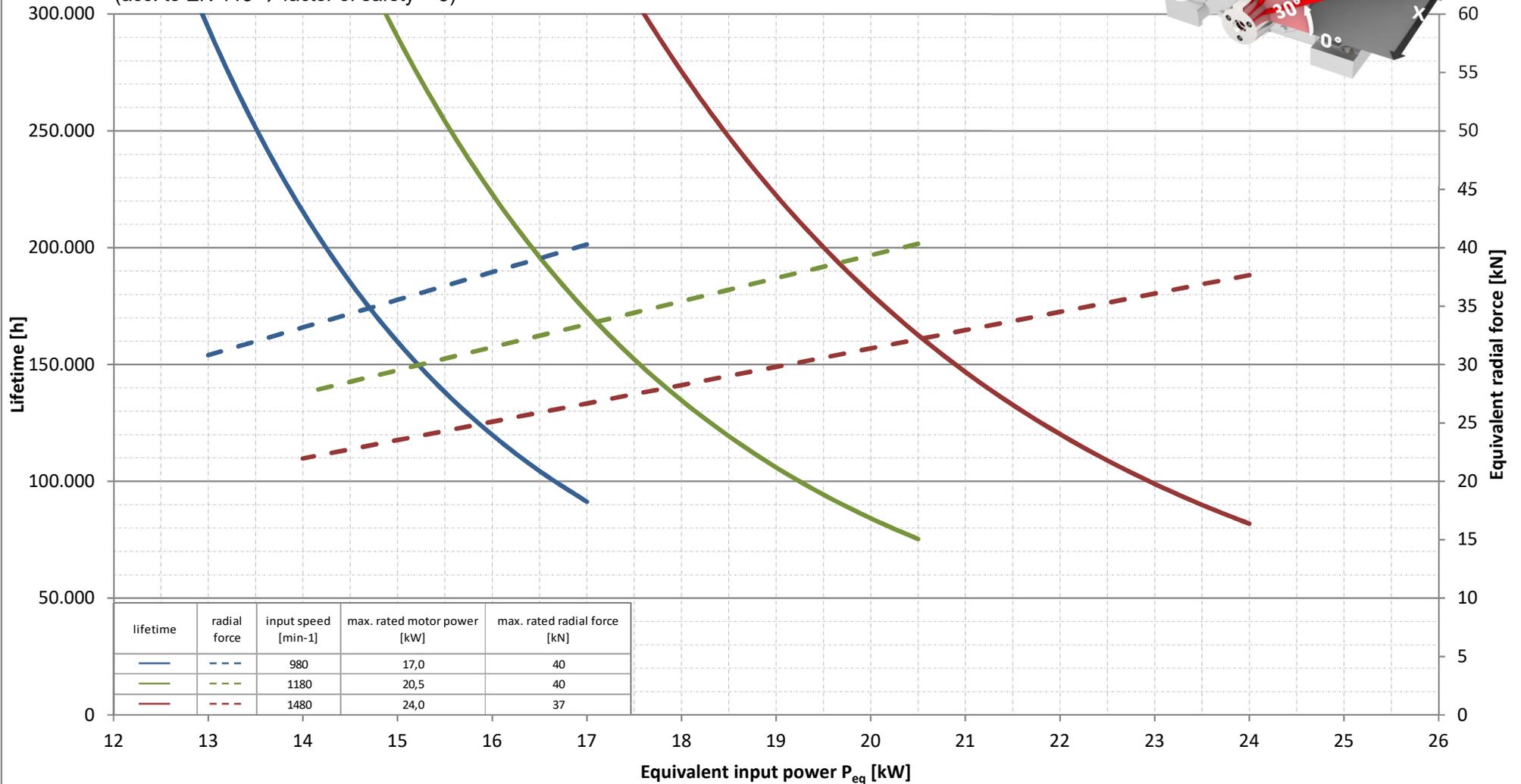
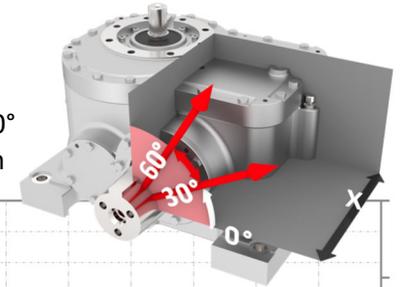


The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art.

## 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)

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

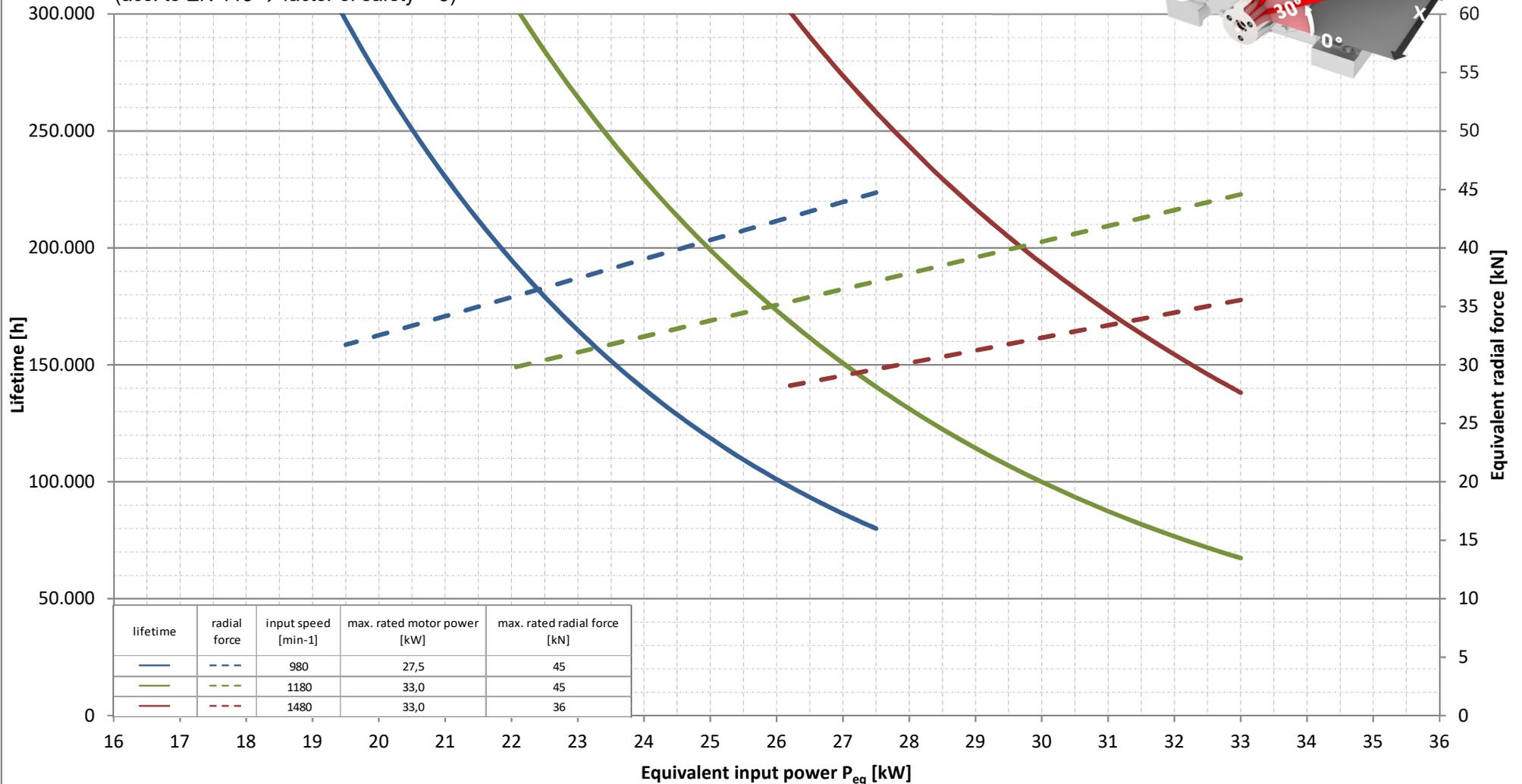
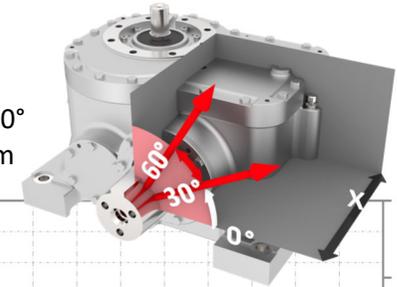


The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art.

## 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)

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

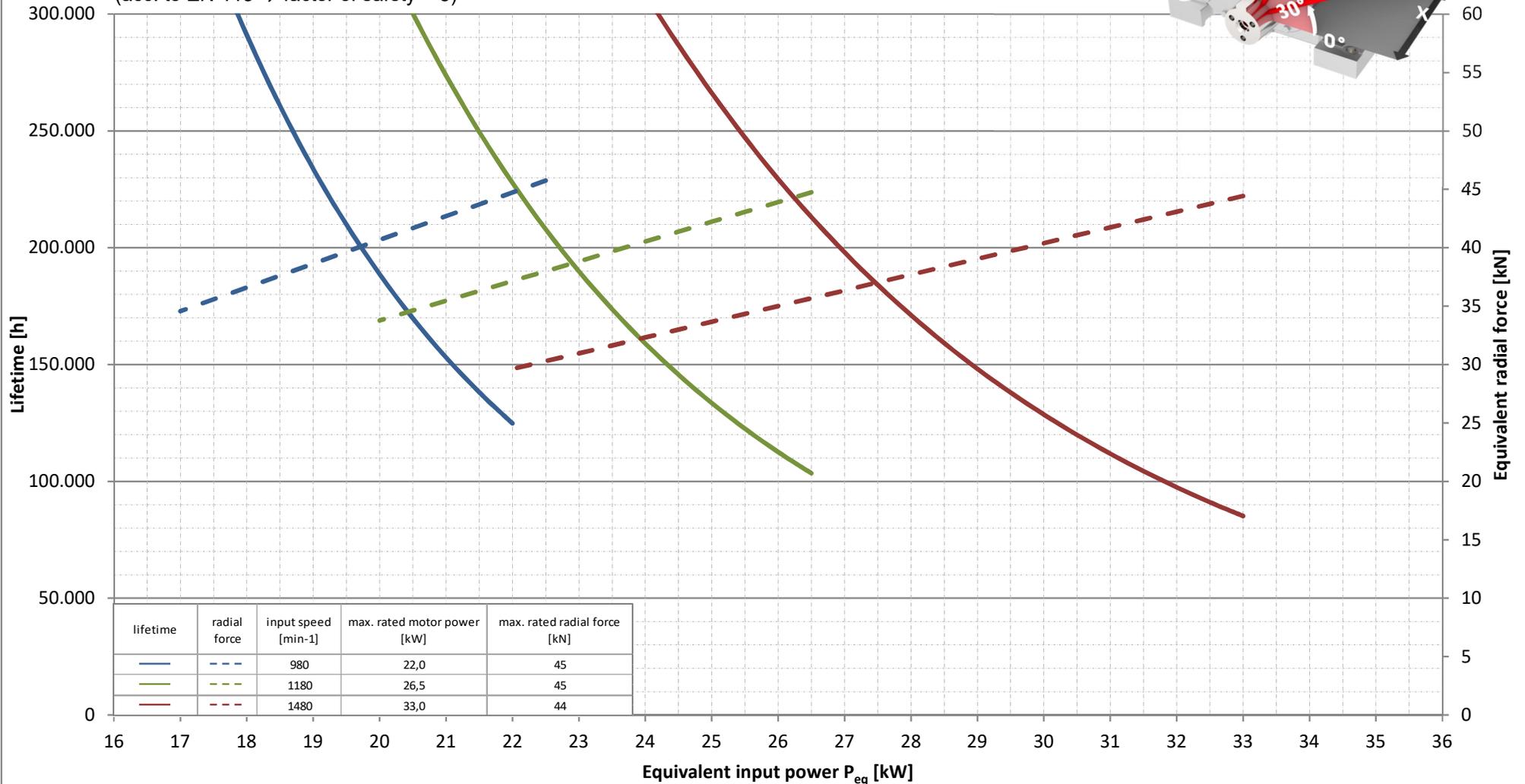
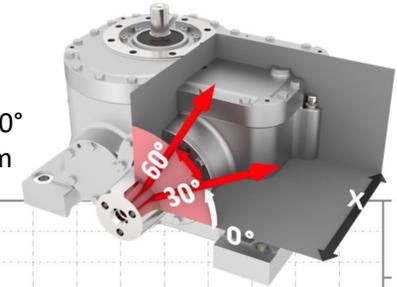


The calculations of machine elements are based on the standards and guidelines, which reflect the current state of the art.

## 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.