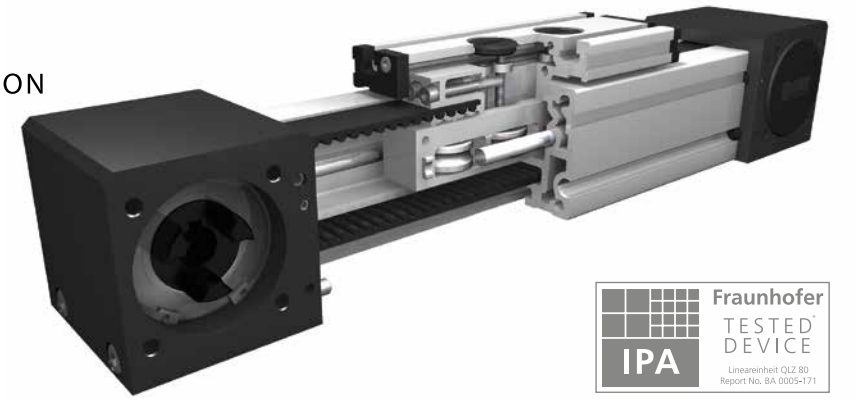
# Linear system **QLZ 60, 80, 100**

TECHNICAL SUMMARY
Reference Only

## BELT DRIVE

- INDEPENDENT INSTALLATION POSITION
- LONG TRAVERSE PATH >6000 MM
- CLEAN ROOM

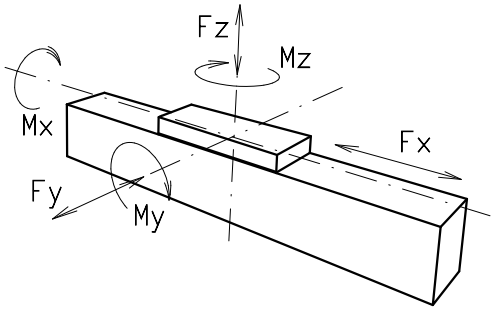


Fraunhofer IPA TESTED DEVICE
Lineareinheit QLZ 80
Report No. BA 0005-171

**Function:**
This unit consists of a square aluminium profile with an integrated roller guide. The carriage is driven by a timing belt. Each standard pulley includes one coupling claw on one side. Belt tension can be readjusted by a simple screw adjustment device in the carriage. This device can also be used for symmetrical adjustment of two or more linear units running parallel. This linear unit is suitable for application in clean rooms of clean-room classification 1.000 (corresponding to US Fed. Standard 209 E). With this series, multi-part assembled units with long strokes can be realized.

**Fitting position:** As required. Max. length 6.000 mm without joints.
**Carriage mounting:** By T-slots.
**Unit mounting:** By T-slots and mounting sets. The linear axis can be combined with any T-slot profile.
**Belt performance:** HTD with steel reinforcement, no backlash when changing direction, repeatability ± 0,1 mm.
**Carriage support:** In the standard version, the carriage runs on 4 rollers which can be adjusted and serviced at a central servicing position. For longer carriages the number of rollers can be increased.

**Forces and torques**




| Size | 60 | | 80 | | 100 | |
|---|---|---|---|---|---|---|
| **Forces/Torques** | static | dynamic | static | dynamic | static | dynamic |
| $F_x$ (N) | 894 | 800 | 1900 | 1800 | 4000 | 3800 |
| $F_y$ (N) | 600 | 500 | 1600 | 1240 | 1900 | 1500 |
| $F_z$ (N) | 900 | 650 | 1500 | 1200 | 2100 | 1700 |
| $M_x$ (Nm) | 15 | 10 | 50 | 40 | 85 | 60 |
| $M_y$ (Nm) | 60 | 50 | 100 | 80 | 140 | 110 |
| $M_z$ (Nm) | 40 | 30 | 75 | 60 | 110 | 90 |
| **All forces and torques related to the following:** | | | | | | |
| existing values / table values | $\frac{Fy}{Fy_{dyn}} + \frac{Fz}{Fz_{dyn}} + \frac{Mx}{Mx_{dyn}} + \frac{My}{My_{dyn}} + \frac{Mz}{Mz_{dyn}} \leq 1$ | | | | | |
| **No-load torque** | | | | | | |
| Nm | 0,6 | | 0,8 | | 1,2 | |
| **Speed** | | | | | | |
| (m/s) max | 4 | | 6 | | 7 | |
| **Tensile force** | | | | | | |
| permanent (N) | 900 | | 1900 | | 4000 | |
| 0,2 s (N) | 1000 | | 2090 | | 4300 | |
| **Geometrical moments of inertia of aluminium profile** | | | | | | |
| $I_x$ mm⁴ | 4,3x10⁵ | | 16,5x10⁵ | | 34,93x10⁵ | |
| $I_y$ mm⁴ | 4,8x10⁵ | | 18,7x10⁵ | | 45,61x10⁵ | |
| Elastic modulus N/mm² | 70000 | | 70000 | | 70000 | |

Driving torque:

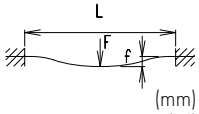
$$M_a = \frac{F * P * S_i}{2000 * \pi} + M_n$$

$$P_a = \frac{M_a * n}{9550}$$

F = force (N)
P = pulley action perimeter (mm)
Si = safety factor 1,2 … 2
$M_n$ = no-load torque (Nm)
n = rpm pulley ($min^{-1}$)
$M_a$ = driving torque (Nm)
$P_a$ = motor power (KW)

Deflection:

$$f = \frac{F * L^3}{E * I * 192}$$




f = deflection (mm)
F = load (N)
L = free length (mm)
E = elastic modulus 70000 (N/mm²)
I = second moment of area (mm⁴)

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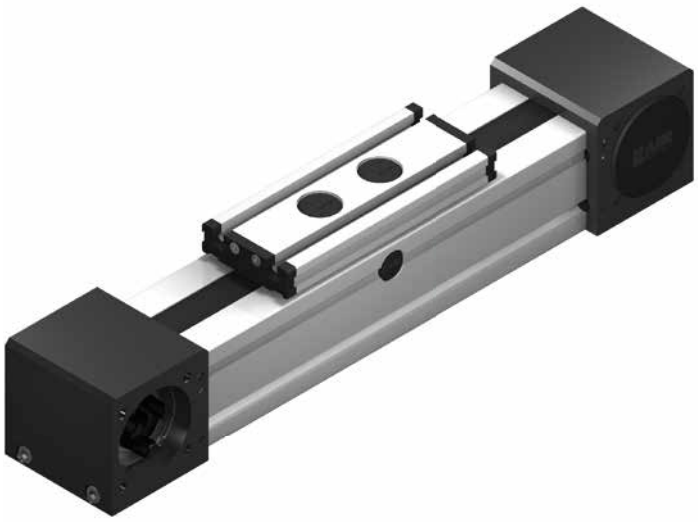
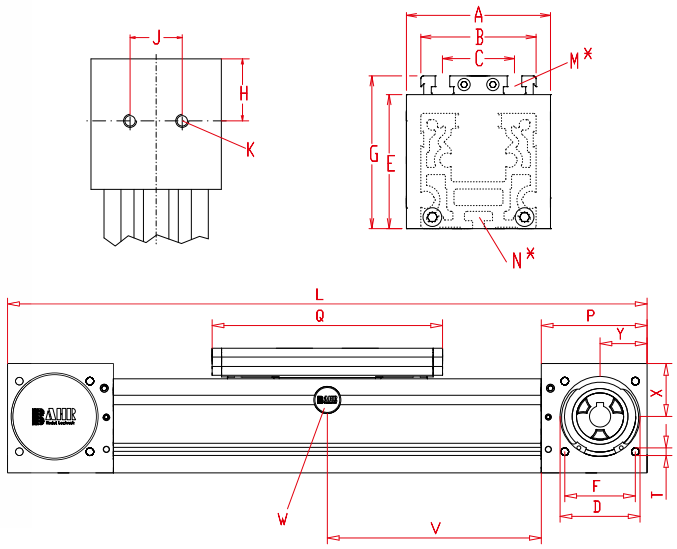
Dimensions (mm)





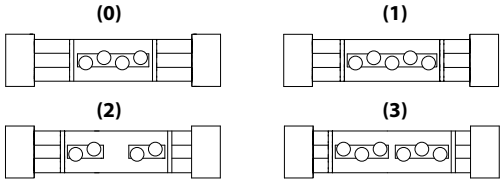

V = Q + 100 mm  W = servicing position

Increasing the carriage length will increase the basic length by the same amount.

| Size ❒ | Basic length L | A | B | C | D -0,05 | E | F | G | H | J | K | N for | M for | P | Q | T | X | Y | Basic weight | Weight per 100 mm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **QLZ** 60 | 280 | 80 | 60 | 36 | 47 | 63 | 42 | 79 | 29,5 | 30 | M 8 | M 5 | M 6 | 59 | 152 | M 6 | 27 | 26 | 3,2 Kg | 0,39 kg |
| **QLZ** 80 | 390 | 100 | 80 | 50 | 68 | 93 | 60 | 106 | 47,5 | 40 | M 10 | M 6 | M 8 | 90 | 196 | M 8 | 45 | 40 | 9,6 Kg | 0,86 Kg |
| **QLZ** 100 | 490 | 130 | 100 | 66 | 90 | 110 | 80 | 129 | 55 | 50 | M 12 | M 10 | M 10 | 110 | 260 | M 10 | 49 | 50 | 15,8 kg | 1,23 Kg |

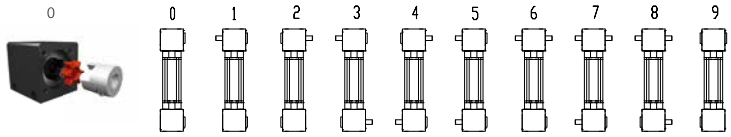
**0** **Choice of guide body profile:**
**(0)** Standard **(2)** corrosion-protected guide rods and screws
**(4)** expanded corrosion-protected version (depending on the availability of components)

**0** **Choice of carriages:**




| Size | Version 1 | | Version 2 | | Version 3 | |
|---|---|---|---|---|---|---|
| | Q | L | Q | L | Q | L |
| **60** | 192 | 320 | >232 | >360 | >232 | >360 |
| **80** | 246 | 440 | >296 | >490 | >296 | >490 |
| **100** | 320 | 550 | >388 | >610 | >388 | >610 |

**0** **Drive version:**




| Size | Shaft ø h6 x length | Key |
|---|---|---|
| 60 | 14 x 35 | 5x5x28 |
| 80 | 18 x 45 | 6x6x40 |
| 100 | 22 x 45 | 6x6x40 |

9 is as 0, but with coupling claws on both sides. The standard version is supplied without shaft. A shaft can be retrofitted by inserting it into the pulley bore and securing it with 2 locking rings or tension sets (size 100 ).

**Belt table / Coupling claw:**

| Code No. | | Size | Belt | Pulley | | Coupling |
|---|---|---|---|---|---|---|
| | | | | mm/rev. | Number of teeth | |
| **0** | **3** | 60 | 5M25 | 130 | 26 | 14 |
| **0** | **4** | 80 | 8M30 | 176 | 22 | 19 |
| **0** | **7** | 100 | 8M50 | 224 | 28 | 24 |

| QLZ | 80 | 1 | 0 | 0 | 0 | 0 | 4 | 1 | 1500 |
|---|---|---|---|---|---|---|---|---|---|
| | Pos. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |

Basic length + stroke = total length

Sample ordering code:
QLZ80, standard body profile, standard carriage, coupling claw on one side, 1110 mm stroke