NOISE AND RIDE COMFORT PERFORMANCE

EOX

630 kg at 1,00 m/s

Noise

1 Car

L_{Aeq} ≤ 50 dB(A) ± 2 dB(A) average

At 1 m high inside the car.

2 Landing door movement

L_{Aeq} ≤ 52 dB(A) ± 2 dB(A) average

At the landing, 1.0 m in front of the door and 1.5 m high, when the door is moving.

3 Pass-by noise at landing

L_{Aeq} 47 dB(A) +/- 2 dB(A)

At the landing, 1.0 m in front of the door and 1.5 m high, when the elevator is passing.

4 Adjacent rooms

$L_{AF\,max}$ ≤ 24 dB(A)

Fulfils the DIN8989:2019 protection goals according to DIN4109 for volumes up to 125 m^3 and VDI 4100 SST III (scenario B).

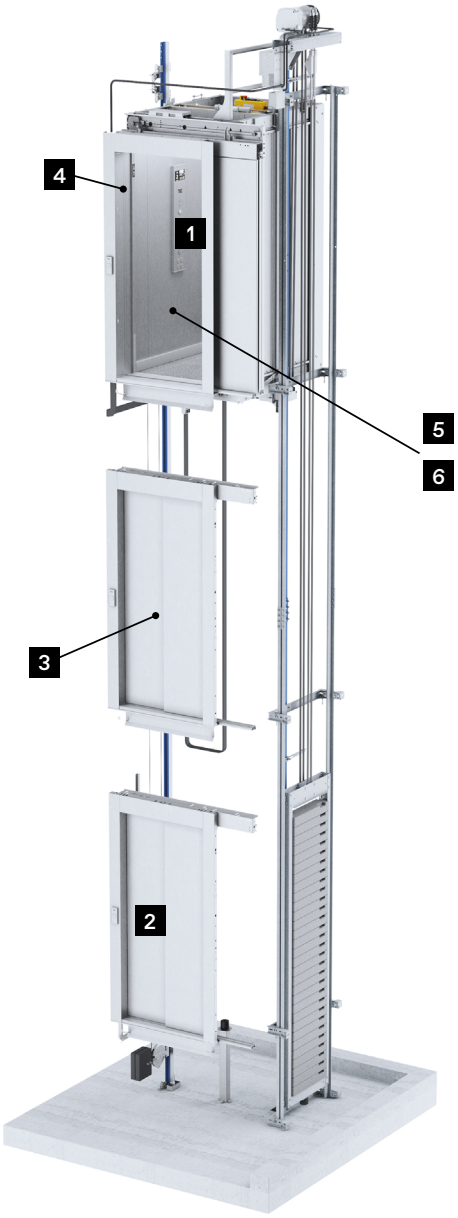
Ride comfort

5 Lateral car vibration

ISO PP ≤ 11 mg
ISO A95 ≤ 3 mg ± 2 mg

6 Vertical car vibration

ISO PP ≤ 17 mg
ISO A95 ≤ 14 mg ± 2 mg



Legend

Noise

L_{Aeq} The A-weighted equivalent continuous sound pressure level in decibels measured over a stated period of time.

$L_{AF\,max}$ The A-weighted and fast time weighted maximum sound pressure level measured in decibels over a stated period of time.

Ride comfort

ISO PP Maximum peak-to-peak vibration levels, according to ISO 18738:2003. The maximum peak-to-peak vibration level is the greatest of all the peak-to-peak values found between defined boundaries.

ISO A95 Typical peak-to-peak vibration levels, according to ISO 18738:2003. The A95 (typical) peak-to-peak vibration level is that value which 95% of the peak-to-peak levels, between defined boundaries, are equal to or below this value.

EOX

1000 kg at 1,75 m/s

Noise

1 Car

L_{Aeq} ≤ 53 dB(A) ± 2 dB(A) average

At 1 m high inside the car.

2 Landing door movement

L_{Aeq} ≤ 52 dB(A) ± 2 dB(A) average

At the landing, 1.0 m in front of the door and 1.5 m high, when the door is moving.

3 Pass-by noise at landing

L_{Aeq} 55 dB(A) +/- 2 dB(A)

At the landing, 1.0 m in front of the door and 1.5 m high, when the elevator is passing.

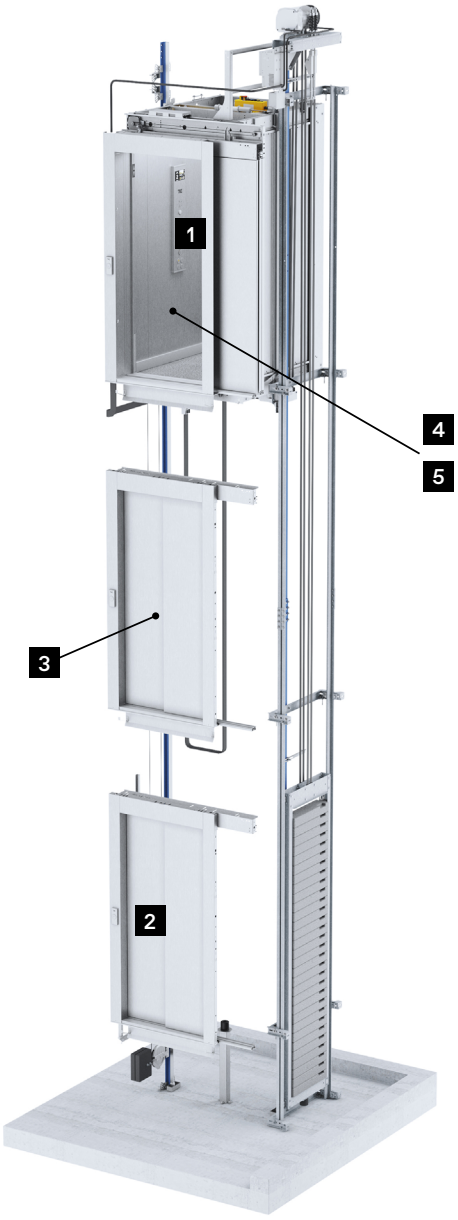
Ride comfort

4 Lateral car vibration

ISO A95 ≤ 13 mg ± 2 mg

5 Vertical car vibration

ISO A95 ≤ 20 mg ± 2 mg



Legend

Noise

L_{Aeq} The A-weighted equivalent continuous sound pressure level in decibels measured over a stated period of time.

$L_{AF\,max}$ The A-weighted and fast time weighted maximum sound pressure level measured in decibels over a stated period of time.

Ride comfort

ISO A95 Typical peak-to-peak vibration levels, according to ISO 18738:2003. The A95 (typical) peak-to-peak vibration level is that value which 95% of the peak-to-peak levels, between defined boundaries, are equal to or below this value.

EOX

1600 kg at 1,75 m/s

Noise

1 Car

L_{Aeq} ≤ 51 dB(A) ± 2 dB(A) average

At 1 m high inside the car.

2 Landing door movement

L_{Aeq} ≤ 52 dB(A) ± 2 dB(A) average

At the landing, 1.0 m in front of the door and 1.5 m high, when the door is moving.

3 Pass-by noise at landing

L_{Aeq} 51 dB(A) +/- 2 dB(A)

At the landing, 1.0 m in front of the door and 1.5 m high, when the elevator is passing.

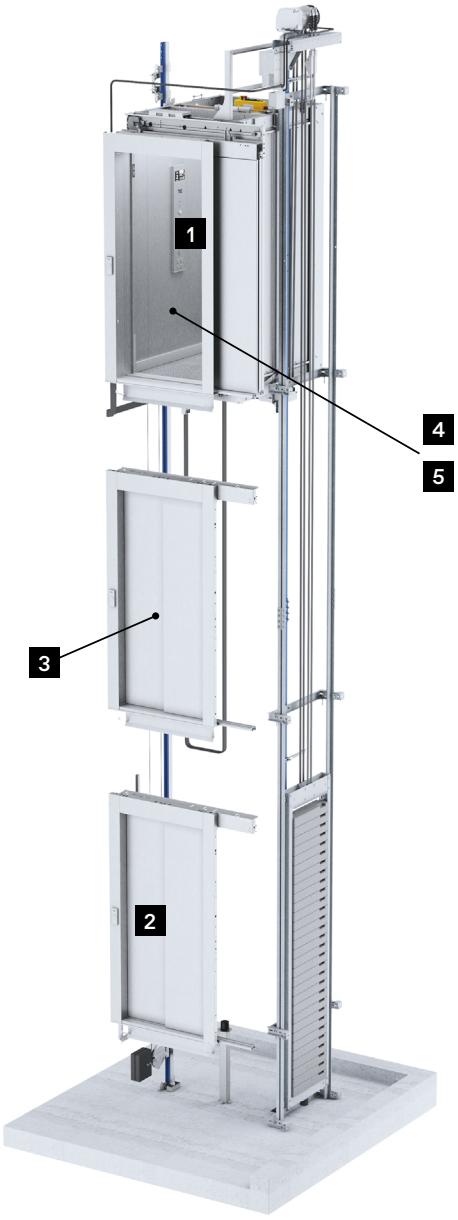
Ride comfort

4 Lateral car vibration

ISO A95 ≤ 10 mg ± 2 mg

5 Vertical car vibration

ISO A95 ≤ 15 mg ± 2 mg



Legend

Noise

L_{Aeq} The A-weighted equivalent continuous sound pressure level in decibels measured over a stated period of time.

$L_{AF\,max}$ The A-weighted and fast time weighted maximum sound pressure level measured in decibels over a stated period of time.

Ride comfort

ISO A95 Typical peak-to-peak vibration levels, according to ISO 18738:2003. The A95 (typical) peak-to-peak vibration level is that value which 95% of the peak-to-peak levels, between defined boundaries, are equal to or below this value.

EOX

1600 kg at 3,00 m/s

Noise

1 Car

L_{Aeq} ≤ 53 dB(A) ± 2 dB(A) average

At 1 m high inside the car.

2 Landing door movement

L_{Aeq} ≤ 52 dB(A) ± 2 dB(A) average

At the landing, 1.0 m in front of the door and 1.5 m high, when the door is moving.

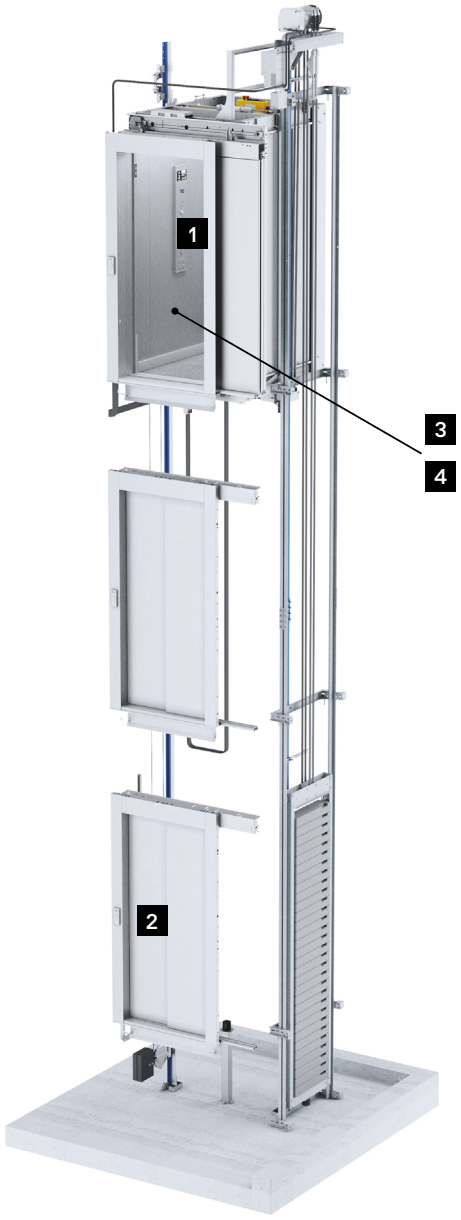
Ride comfort

3 Lateral car vibration

ISO A95 ≤ 4 mg ± 2 mg

4 Vertical car vibration

ISO A95 ≤ 12 mg ± 2 mg



Legend

Noise

L_{Aeq} The A-weighted equivalent continuous sound pressure level in decibels measured over a stated period of time.

$L_{AF\,max}$ The A-weighted and fast time weighted maximum sound pressure level measured in decibels over a stated period of time.

Ride comfort

ISO A95 Typical peak-to-peak vibration levels, according to ISO 18738:2003. The A95 (typical) peak-to-peak vibration level is that value which 95% of the peak-to-peak levels, between defined boundaries, are equal to or below this value.

Note: Measurements based on an EOX configuration with decorative cladding and roller guides (car and counterweight). Travel height: 108 m.

EOX

1800 kg at 1,75 m/s

Noise

1 Car

L_{Aeq} ≤ 52 dB(A) ± 2 dB(A) average

At 1 m high inside the car.

2 Landing door movement

L_{Aeq} ≤ 52 dB(A) ± 2 dB(A) average

At the landing, 1.0 m in front of the door and 1.5 m high, when the door is moving.

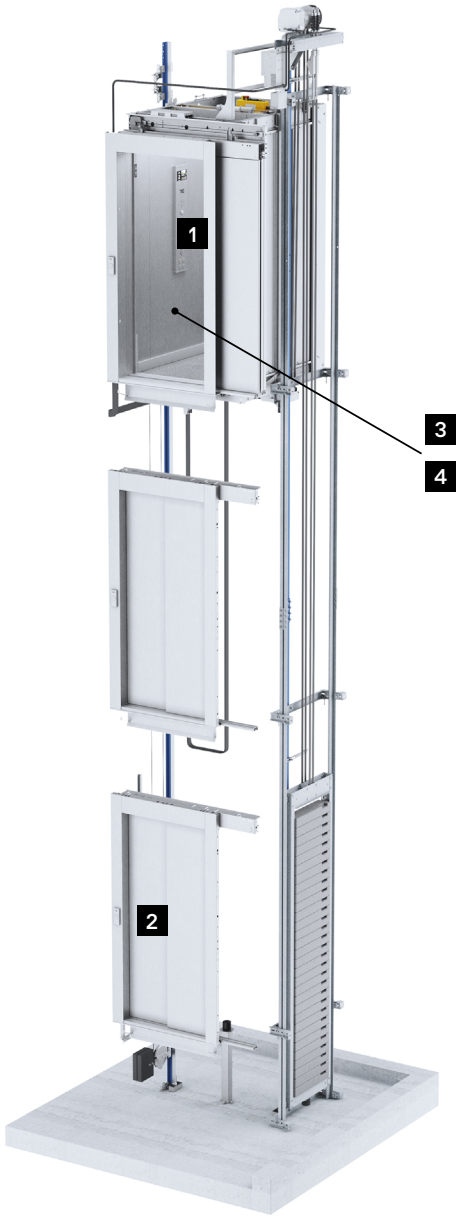
Ride comfort

3 Lateral car vibration

ISO A95 ≤ 6 mg ± 2 mg

4 Vertical car vibration

ISO A95 ≤ 10 mg ± 2 mg



Legend

Noise

L_{Aeq} The A-weighted equivalent continuous sound pressure level in decibels measured over a stated period of time.

$L_{AF\,max}$ The A-weighted and fast time weighted maximum sound pressure level measured in decibels over a stated period of time.

Ride comfort

ISO A95 Typical peak-to-peak vibration levels, according to ISO 18738:2003. The A95 (typical) peak-to-peak vibration level is that value which 95% of the peak-to-peak levels, between defined boundaries, are equal to or below this value.

Note: Measurements based on an EOX configuration with decorative cladding and roller guides (car and counterweight). Travel height: 31 m.

Noise and ride comfort information

Nowadays the elevator is a necessary facility providing access and vertical mobility for visitors and residents in buildings with numerous floors. When used in residential buildings, the noise and vibration of elevator operations can potentially intrude on residences adjacent to the equipment.

Noise

During normal elevator operations several types of noise are produced (drive and brake operation, door operation, relay switching, cooling fan, etc.). Beyond the real sound pressure values, noise disturbances are based on user perceptions, type of noise and ambient noise. The impact is often compounded by the modern trend towards the use of lightweight construction materials. The most significant effect may result in lower sound quality, disturbed sleeping conditions and less enjoyment of residences.

The acoustic quality of an elevator is evaluated through several sound measurements close to the main noise-making components (machine, controller and landing door).

Additionally, noise measurement in adjacent rooms provides information about the sound comfort quality of the elevator system in the building. The role of architects and contractors in defining the building wall mass specification and construction procedures is key to ensuring that the sound pressure level in adjacent rooms fulfills the regulation requirements. The DIN 8989:2019 standard provides wall design descriptions according to the room configuration to support prescriptions in this regard.

Ride comfort

Ride comfort quality in an elevator is mainly evaluated through car vibrations, as well as jerk and acceleration. Vertical car vibration is caused by vibrations from the drive and frequency inverter that are transferred into the car through the traction system. Horizontal car vibration is caused by the car passing through guiderail joints that are not smooth or by guiderail installations that are not straight.

Careful, professional installation, as well as high-quality performance from key components (like the machine, inverter, car and guide rails) are essential for a comfortable riding experience.

TYPICAL SOUND PRESSURE LEVELS	
Source	dB(A)
Jet plane taking off at 100 m	120+
Truck passing at 10 m	80-100
Person shouting at 1 m	80
Vacuum cleaner	80
Average volume of TV or radio	70-90
Normal voice at a distance of 1 m	55-60
EOX landing door closing at 1 m	≤ 52
Background noise in a quiet occupied living room	35-40
Inside an unoccupied house	25-35
Threshold of human hearing	0

Applicable standards for noise and ride comfort quality:

- **DIN 8989:2019**
  Acoustical design in buildings - Lifts.

DIN 4109, VOLUME UP TO 125 M³			
VDI 4100, SST 3 (<24 dB)			
Situation	A	B	C
Octave 63 Hz	84	69	79
Octave 125 Hz	80	65	75
Octave 250 Hz	79	64	74
Octave 500 Hz	79	64	74

- **ISO 18738:2012**
  Measurement of ride quality. Part 1: Lifts.
- **ISO 2631-1:2008**
  Mechanical vibration and shock. Evaluation of human exposure to whole-body vibration. Part 1: General requirements.
- **ISO 8041:2005 C1:2007**
  Human response to vibration - measuring instrumentation.

Based on TK Elevator engineering and elevator manufacturing expertise, we enhance our commitment to passengers and building residents' comfort by continuously optimising our elevators, installation methods and service to the highest comfort standards.

Contact us:

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