NOISE AND RIDE COMFORT PERFORMANCE

momentum 200/300

Noise

1 Machine room

dB(A)=70 - 82* dB(A) at 3.0 - 7.0 m/s
At 1 m from the machine, inside the machine room

* Depending on number of machines operating at the same time

2 Car*

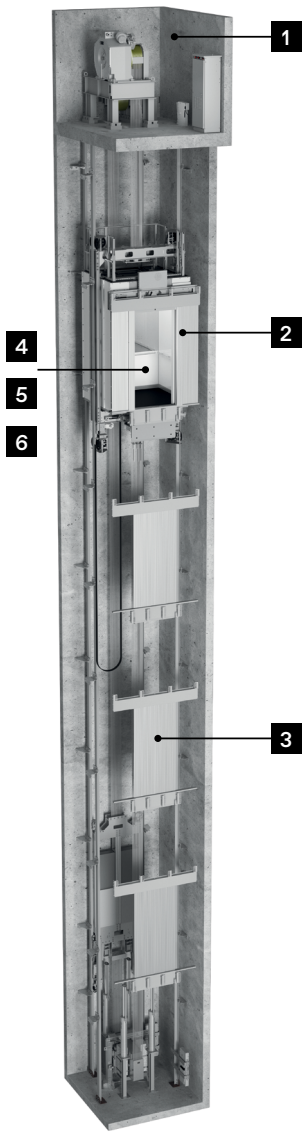
	3 - 4m/s		5 - 7m/s	
	multiple shafts	single shaft	multiple shafts	single shaft
L_{Aeq}	52 dB(A)	55 dB(A)	55 dB(A)	60 dB(A)
$L_{Apk\ max}$	54 dB(A)	57 dB(A)	59 dB(A)	62 dB(A)
Background noise max. 37 dB(A)				

* Fan switched off. Lower values on request, including additional measures

3 Landing door

L_{Aeq} ≤ 53* dB(A) ± 2 dB(A) average, at 3.0 - 7.0 m/s

* According to door type improved values can be achieved



Ride comfort

With roller guides for speed 3.0 - 7.0 m/s

4 Vertical and horizontal car vibration

ISO A95 ≤ 12 mg

5 Acceleration and deceleration rates

v ≤ 4m/s	v > 4m/s
0.8 - 1.0 mg	0.8 - 1.2 mg

6 Jerk

0.7 - 1.4 m/s³

Legend

Noise

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

$L_{Apk\ max}$ The maximum A-weighted sound pressure value measured over a certain period of time.
The sound pressure level is A-weighted and designated with dB(A) to adjust to the mid-range frequencies of human hearing. Also be aware that sound levels are logarithmic values (dB) and cannot be added directly. A doubling of sound level results in a measured increase of 3 dB.

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.

Notes

- All these values can only be achieved following correct assembly process and requirements to building interface:
  Inside shaft
  - Smooth shaft walls by builder
  - Fascia plates connecting door header and door sill above (>4m/s)
  - Air pressure compensation openings for single and multiple shafts (depending on layout and shaft dimensions of respective job)

  Machine Room
  - Machine frame isolation (standard)
- Enhanced noise levels can be achieved through different noise reduction packages, on request:
  - Single layer car (standard)
  - Double layer car
  - Hidden car ventilation
  - Roof "measures"

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.

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.

When a normal elevator starts going up, you feel a jerk until it gets up to speed. This is because the acceleration changes almost instantly from zero to some positive value. The controller and inverter in high-speed elevators are able to arrange acceleration such that the jerk is minimised to provide a smoother high-speed ride.

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
momentum landing door closing at 1 m	≤ 55
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
- **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.