NOISE AND RIDE COMFORT PERFORMANCE

evolution 200/300

Noise

1 Shaft / Machine

Speed	1 m/s	2 m/s	3 m/s
L_{AFmax} (dB)	65	67	72

Measured in compliance to DIN 8989:2019-08. SSTIII according to VDI 4100:2012-10 achieved up to 2 m/s, SSTII above 2 m/s.

Structure-born noise

$L_{a,max}$ complies with DIN 8989:2019-08 SSTII according to VDI 4100:2012-10.

2 Car

Speed	1 m/s	2 m/s	3 m/s
L_{AFmax} (dB)	58	62	65

Values for standard cabins. Depending on shaft conditions, installation and car cladding, noise in car is 5 to 8 dB lower than in the shaft (ventilator noise excluded).

3 Landing door

L_{AFmax} 59 dB

Measured in compliance to DIN 8989:2019-08. SSTIII according to VDI 4100:2012-10 achieved.

4 Pass-by noise at the landing

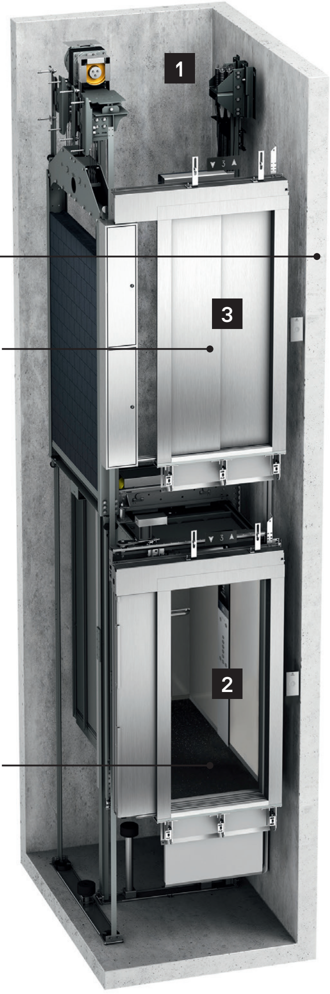
L_{AFmax} 50 dB

Measured in compliance to DIN 8989:2019-08. SSTIII according to VDI 4100:2012-10 achieved.

5 Adjacent rooms[1]

$L_{AFmax, nT} \leq 27$ dB

Possible due to compliance with DIN 8989:2019-08



Ride comfort

With roller guides for speed ≥ 1.6 m/s

6 Lateral car vibration

ISO PP ≤ 10 mg

7 Vertical car vibration

ISO PP ≤ 15 mg

Legend

Noise

L_{AFmax} Is the maximum air born sound pressure level that is measured in an operation cycle. It is A-weighted to recreat a human hearing perception and F-weighted with a sampling time of 125 ms to factor in fast changes in sound pressure.

$L_{a,max}$ Maximal measured acceleration-level during an operation cycle. It is based on a reference acceleration of 10^{-6} m/s^2.

$L_{AFmax, nT}$ Maximum A-weighted standard sound level according to VDI 4100:2012-10.

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.

Notes

All these values can only be achieved following a correct assembly process.

[1] It is the responsibility of the building designer to ensure that the shaft provides enough air-borne and structure-borne noise attenuation to comply with DIN 8989:2019-08.

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 8989:2019-08 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.

Contact us:

TYPICAL SOUND PRESSURE LEVELS

Source	dB
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
evolution landing door closing at 1 m	59
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 8989:2019-08**
  Acoustical design in buildings - Lifts
- **VDI 4100:2012-10**
  Sound insulation between rooms in buildings - Dwellings - Assessment and proposals for enhanced sound insulation between rooms
- **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.