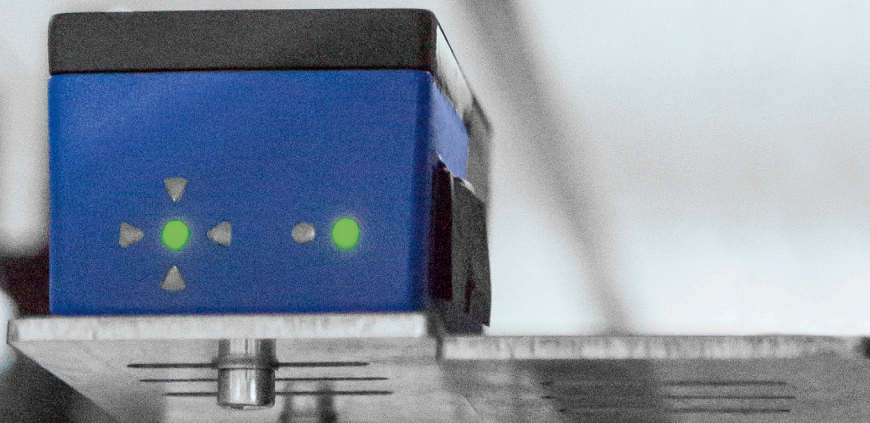




**APS**



A breakthrough in hoistway information

**CEDES**  
More than you expect!

# APS - Absolute Positioning System

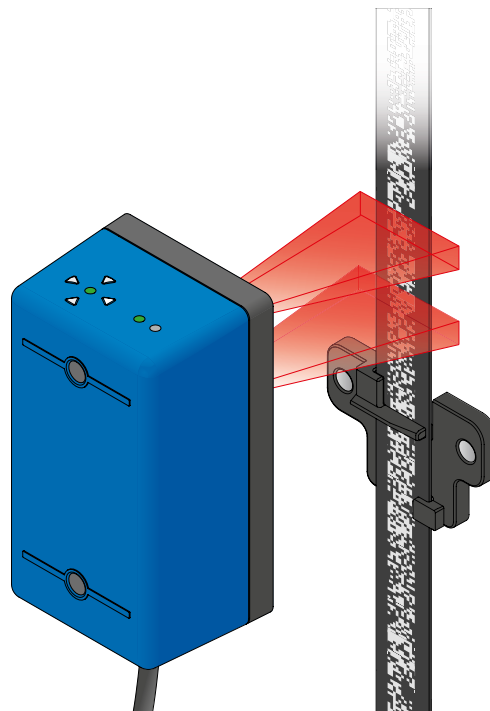
From CEDES comes the APS, the revolutionary Absolute Positioning System. Even in the highest buildings with the fastest elevators, the APS tracks car speed and position with the precision and reliability of a Swiss watch. The system consists of the APS sensor, code tape and mounting clips.

The contactless, SIL 3 rated, twin IR-camera system on the elevator car continuously reads the APS code tape mounted along the elevator shaft. The position and velocity information of the elevator car is then transmitted to the elevator controller through customer specific interfaces such as CAN. Because the APS code tape can be mounted on guide rails, C-profiles, landing door operators or landing door sills, the APS fits into every elevator configuration, including modernization and retrofitting projects.

In conjunction with the elevator controller, the APS sensor can compensate for building compression as well as detect the floor level automatically. These functions clearly differentiate APS from competitive sensors, making it a breakthrough in hoistway information.



CEDES AG is certified according to ISO 9001: 2008.



APS sensor (rear view)



APS sensor (front view)



Code tape



Code tape suspension

# Features

## APS is ...

### safe

- SIL 3 certified by TÜV

### innovative

- Floor level detection using position indicator clips
- Integrated reading of markers for building compression compensation, no additional sensors needed
- Absolute position up to 1,500 m with a resolution of 0.5 mm
- Velocity up to 20 m/s with a resolution of 1 mm/s

### robust

- High light reserve
- Insensitive to dust and smoke

### flexible

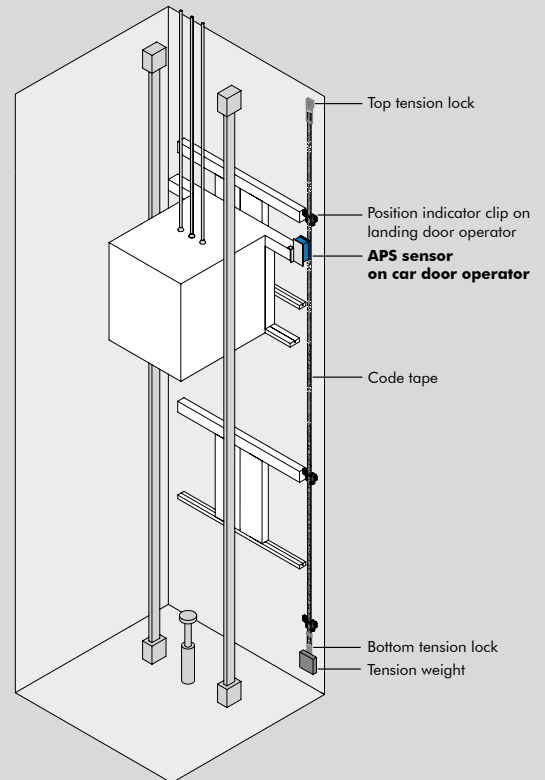
- Suitable for new facilities, modernization and retrofitting
- Can be mounted on the guide rail, C-profiles, landing door operator or landing door sill
- CAN or customer specific interface



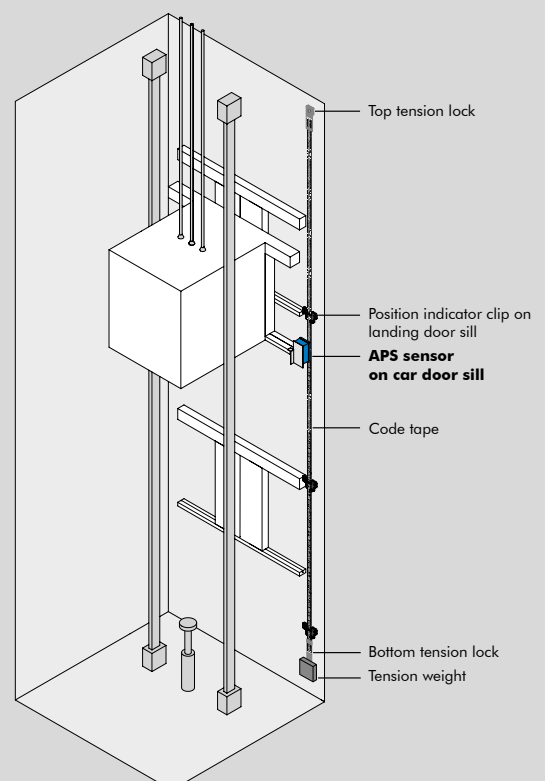
Position indicator clip

# Mounting options

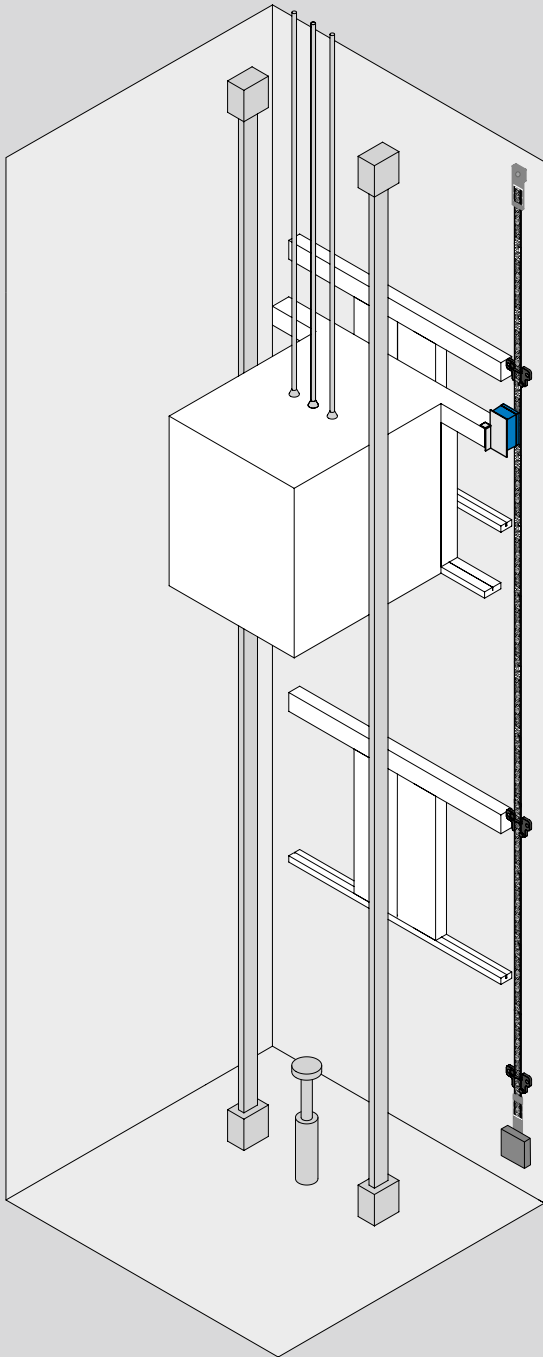
## APS sensor on car door operator



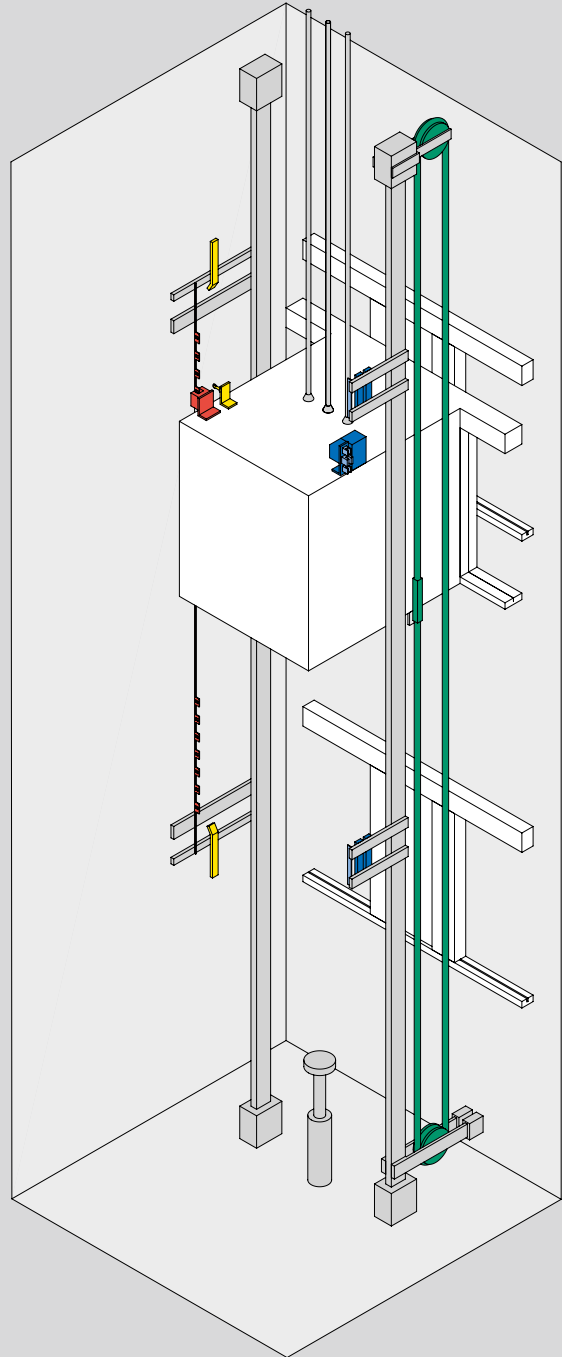
## APS sensor on car door sill



## APS-equipped elevator vs. conventional elevator



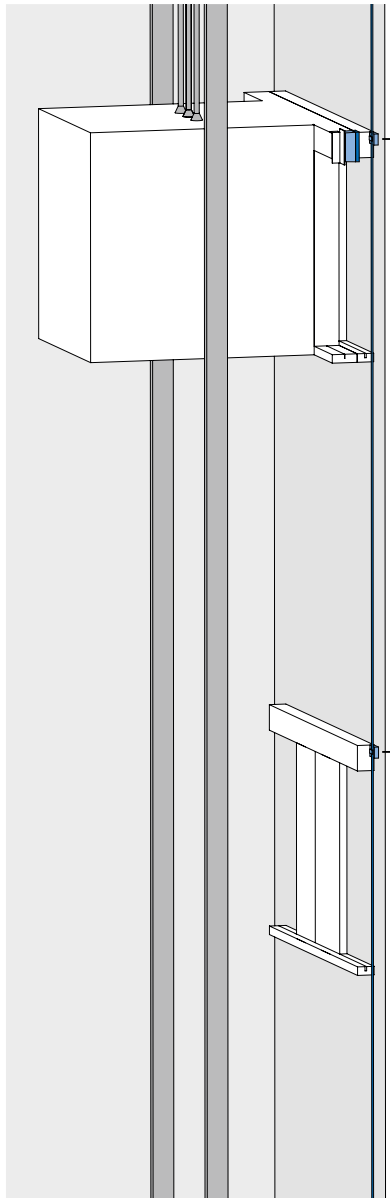
**APS-equipped elevator**



**Conventional elevator**

The APS is a SIL 3 certified system that provides safe and ultra-reliable positioning and speed information. In conjunction with the elevator control, this enables to carry out a wide variety of safety functions within the hoistway. As a result, APS eliminates the need for many individual systems and components currently required by a conventional elevator. These include the final limit switch, final limit inspection switch, over-speed governor, emergency terminal speed limiting, early door opening, releveling with open doors and detection of unintended car movement. All of these have, up until now, required separate systems and components. Installing the APS therefore means a major reduction in costs and much more efficient installation.

## Additional hoistway information using special mounting clips



### Position indicator clip

The APS system is available with two mounting clips. The guide clip guides the code tape and allows it to move in the vertical direction. A special mounting clip containing a position indicator as shown on the left can be used to identify positions of interest in the shaft (e.g. the floor positions). When the APS sensor cameras detect a clip with the position indicator, the position of this clip is sent to the elevator controller by setting a respective bit in the protocol.

### Floor level identification

Using position indicator clips enables floor level identification without the need for additional sensors. The clips must be mounted with the same offset to the landing door sill on all floors (for example, factory setting on the door sill or on the door operator). The elevator can automatically detect the exact position of all floor levels during its initialization run and transmit this information to the elevator controller. This means no manual floor level adjustment is needed.

### Building compression compensation

Buildings compress slowly over time. This can lead to the car and landing door sills not being correctly aligned, thus creating a severe tripping hazard. The position indicator clips are mounted on the building structure itself. As a result, the position indicator changes its position relative to the code tape if the building compresses. Since the APS is able to recognize the position indicator clip, a slightly different position is communicated to the elevator controller. The controller can then adjust the floor level position accordingly, making sure the elevator cabin always stops perfectly level with the landings.

## Technical data

### Optical

|   |               |
|---|---------------|
| Position resolution                           | 0.5 mm        |
| Velocity resolution                           | 1 mm/s        |
| Range of velocity measurement                 | ±0 ... 20 m/s |
| Distance between APS sensor and APS code tape | 105 mm        |
| Readout tolerance: Distance                   | ±10 mm        |
| Left-right                                    | ±10 mm        |

### Mechanical

|                     |                        |
|---------------------|------------------------|
| Housing (h × w × d) | 103.6 × 56.6 × 45.6 mm |
| Enclosure rating    | IP65                   |
| Temperature range   | -20 °C ... +60 °C      |

### Electrical

|                              |                        |
|------------------------------|------------------------|
| Supply voltage $U_{Sp}$      | 24 VDC ± 20 %          |
| Max. current consumption     | 100 mA                 |
| Max. power-up inrush current | 200 mA                 |
| Compression compensation     | 13 ... $U_{Sp}$        |
| input voltage (optional)     | for switching "active" |
| Scanning rate                | 200 Hz                 |

### Code tape

|             |                      |
|-------------|----------------------|
| Max. length | 1,500 m              |
| Width       | 19 mm                |
| Thickness   | 0.6 mm               |
| Material    | Stainless steel / PC |

### General

|                 |   |
|-----------------|---|
| EMC emission    | EN 12015:2004   |
| EMC immunity    | EN 12016:2004   |
| Vibration       | IEC 60068-2-6:2007  |
| Shock           | IEC 60068-2-27:2008   |
| RoHS            | 2011/65/EU  |
| Certificates    | CE, TÜV   |
| Safety category | EN 61508:2010, SIL 3<br>EN 81-1/2 +A3:2009<br>A17.1/CSA B44:2010, A17.5 |

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