General installation information

When installing telescopic slides, the following installation information should be observed, which should ideally already be taken into account when designing the extensions. This will ensure smooth-running, quiet, and low-wear motion of the slides over a long period of time and guarantees their function in the long run.

- Telescopic slides are generally installed in pairs so that the mounting surfaces of the housing and extension side are level, parallel and at a right angle as well as correctly aligned with one another in regard to their position. Furthermore, attention should be given to sufficient stability of the mounting structure so as to keep geometric errors, caused by elastic deformation, as minimal as possible.
- Mounting holes should be applied in such a way that the slides cannot twist or warp during installation. In addition, the slides need to be positioned in the direction of extension in such a way that the extensions reach the end position at the same time when they are retracted or extended. This results in an even load on the rubber stops and locking devices.
- The width of the respective slide installation spaces should be designed with a tolerance of +0.2 / +0.5 mm. This ensures that the slides are subjected to a slight tensile stress in the direction of the middle of the extension. This promotes optimum performance and a long service life.
- Before installation, the inner slides should be moved to the extended and retracted end position once to allow the ball cages to assume their intended position. Installation should also take place at room temperature.
- After installation, the telescopic slides and extensions are to be checked for ease of movement. In case of discrepancies, such as sticking or warping, the cause has to be determined and eliminated through appropriate actions.

Mounting holes, mounting screws

When installing telescopic slides, always use all holes provided for mounting. This will ensure that the forces resulting from the maximum load capacity F_S (nominal load) can be transferred safely from the telescopic slides to the surrounding structure. Failure to use mounting screws reduces the specified load capacity accordingly.

The outer and inner slides have further recesses and auxiliary holes in addition to the holes intended for mounting. The catalog drawings and the CAD data available for download do not show these holes to avoid confusion and design faults. These holes are needed, for example, for the mounting of type-dependent equipment features, such as the self-retracting mechanisms.

Some slide versions have mounting options for screws of various sizes. In this case, all positions of a size or type should be used. Auxiliary holes, which ensure that all mounting holes can be reached, are included in the CAD data but are not shown in the catalog drawings.

The type and specification of the suitable screws are indicated on the respective catalog pages. It is generally recommended to use screws of property class 8.8 in compliance with the specified tightening torque.

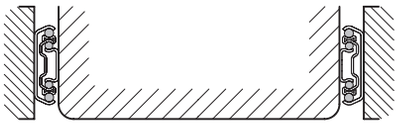
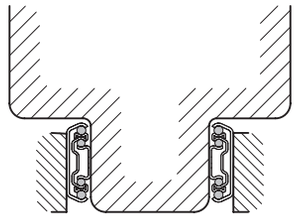
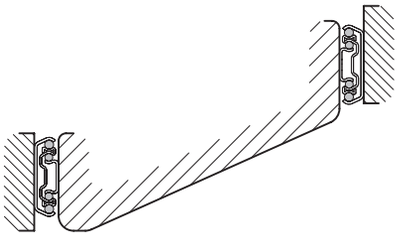
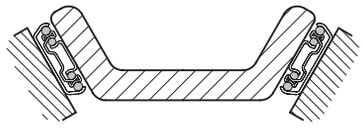
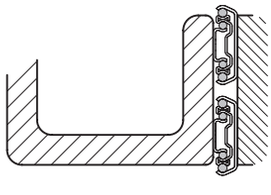
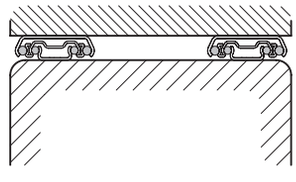
Installation position

Telescopic slides are preferably side-mounted and installed in pairs in a horizontal position. This ensures that the highest possible stability and torsional stiffness is achieved in the smallest installation space and allows for absorption of the maximum load (nominal load). The performance features are optimum in this installation position and wear is reduced to a minimum.

The top and / or bottom mount of the slide is also possible with certain restrictions. The maximum load in this case is only about 20 % to 25 % of the specified nominal load. This more unfavorable slide cross-section results in considerably higher bending in the extended state. As a result, the ball cages may touch the heads of the mounting screws. In case of doubt, the function under load is to be checked in a test setup.

Installing slides in a perpendicular position to the direction of extension is not recommended as increased cage slip occurs in this case. This means that the upper and lower end position of the slide may only be reached with an increased amount of force after a few cycles since the force of gravity causes the ball cage to become dislocated from its correct position.

The following examples show possible **installation positions** of telescopic slides that are considered favorable or acceptable and some that are regarded as unfavorable and should therefore be avoided.

Favorable	**Side mount, on both sides**	 
Acceptable	**Side mount, vertical offset, on both sides**	
	Side mount, inclined offset, on both sides	
Unfavorable	**Side mount, on one side**	
	Top and / or bottom mount, on both sides	

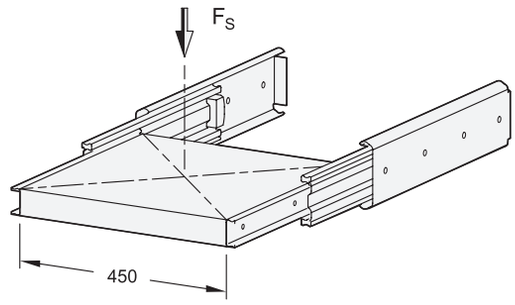
Load capacity

The maximum load capacity of telescopic slides depends on the slide cross-section and the nominal length l_1 as well as the resulting stroke l_2. Furthermore, the extension width, the slide materials used and the components of the equipment options, such as the dampened self-retracting mechanism, have a corresponding influence.

The information on the maximum load capacity of the telescopic slides was determined in endurance tests under the following conditions:

- Slide arrangement in pairs, side mount
- Observance of all mounting information
- Warp-resistant test setup
- Equal distribution of the maximum load F_S over the entire extension area
- Standard slide spacing of 450 mm
- 10,000 or 100,000 test cycles (one extension and one retraction = one cycle)
- Gradual increase of the load

Wear, performance, and maximum bending were assessed after each test section.

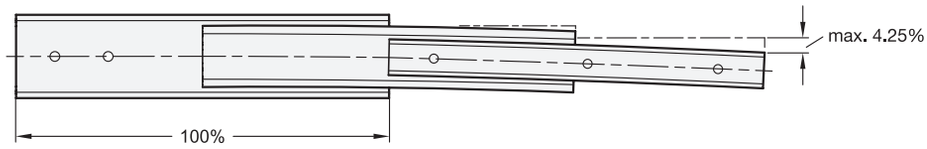


Bending

When extended, telescopic slides demonstrate elastic bending under load, which is most noticeable at the far end of the inner slide. The general rule is that the extent of deformation may not be higher than 4.25 % of the travel path. All slides are within this value at maximum load.

Example:

A telescopic slide with a nominal length of l_1 = 500 mm is extended to the end position and loaded with the maximum load over the entire extension area. The bending at the front-most point of the slide may now be a maximum of 21.25 mm.



Tolerances

All components of the telescopic slides are subject to manufacturing tolerances that ensure consistent quality and a long service life.

Since the stroke results from the interaction of all individual parts of the telescopic slides, the sum of all individual tolerances also has to be taken into account for the length tolerance of the stroke. In addition, the slight deformation of any existing rubber stops should be mentioned. This results in relatively large total tolerances, which are listed on the respective catalog pages and can therefore be taken into account in the design of the extensions.

Travel speed

The permissible extension and retraction speeds of the telescopic slides are specified with a maximum of 0.3 m/s. Shortly before the end of the stroke, the speed should be reduced to less than 0.15 m/s so that the stops, rubber stops, dampened self-retracting mechanisms etc. are not subjected to excessive, abrupt loads.

Slide materials, finishes and corrosion protection

The telescopic slides supplied by JW Winco are made of high-quality steel or stainless steel bands.

The stainless steel telescopic slides are generally delivered with a mill finish.

The steel telescopic slides are partly made of a pre-zinc plated steel band and are subsequently galvanically batch zinc plated and blue passivated with 5 to 7 µm. Corrosion resistance in the salt spray test for at least 72 hours against white rust is ensured in this way.

To achieve higher corrosion resistance, further finish refinements can be provided on request. Two processes are available:

- Galvanically batch zinc plated 5 to 7 µm, black passivated, corrosion resistance in salt spray test for at least 120 hours against white rust
- Galvanically batch zinc plated 5 to 7 µm, passivated, electrolytically coated with T2 top coat / sealer 8 to 12 µm, corrosion resistance in the salt spray test for at least 96 hours against white rust / 500 hours against red rust

All materials and finish refinements used are RoHS compliant.

Lubrication and maintenance

Telescopic slides are permanently lubricated with high-quality, mineral oil-based and lead-free ball bearing greases.

For stainless steel telescopic slides, special FDA compliant greases are used that are neutral in taste and odor. The greases comply with lubricant class H1, which allows them to be used in areas where it is technically infeasible to prevent occasional contact with food. In general, direct contact can be prevented by taking appropriate actions, such as optimum placement of the slides or the use of covers.

Re-lubrication is not necessary under normal conditions of use since the ball cages and balls “push out” small amounts of obtained dirt from the slides when the slides move. In applications with heavier contamination, the slides should be cleaned from time to time with a clean cloth and then re-lubricated. Possible lubricants for the steel versions are, for example, Shell Alvania EP 1 or Klüberplex BE 31-222.

Cage slip

With rapid changes of direction and high acceleration forces, cage slip can occur in the worst case, especially with long ball cages. In this case, the cage does not move synchronously at half the speed of the middle and inner slides but it gradually loses its correct position due to sliding. In such cases, an “idle stroke” may need to be moved to the extended and retracted end position of the slide at moderate speed and under low load in order to reposition the cage.

Operating temperature

The operating temperature of telescopic slides is within the range of -4 °F to +212 °F (-20 °C to +100 °C) and is determined primarily by the plastic and elastomer parts used in the slides. Depending on the place of use and the application, the user may have to check the function of the extensions if the temperature is at the limit.