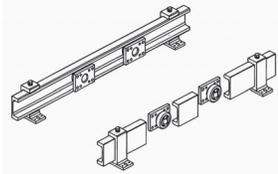


Winkel Combined Bearings and NbV Profiles control linear motion. They are heavy duty units and can be used for precision control as well. Combined bearings fit precisely into channels with minimal components. They guide linear movement



and handle both radial and/or thrust loads. Typically four combined bearings are normally required for a typical single stage linear system. Multiple bearings and profiles may be used for telescoping systems or multi-axis designs.

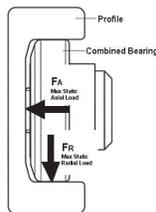
Winkel bearing types cover a wide range of loads and application conditions. Combined bearings are available for varying loads, temperatures, precision, speed, noise and corrosion resistance requirements. Profiles can be fabricated weldments added and/or machined for specialized control and mounting, including curved sections.



The profile size is the most important design consideration in the selection process. Once the system loads are known, the profile size can be determined and then the bearing selected to fit. The profile is designed to fit into equipment framework by welding with brackets drilled and tapped for fasteners or with clamping flanges. PTI stocks 14 standard profile sizes typically in 6 meter lengths in Charlotte NC, and 12 meters lengths in Germany. Profiles can be cut-to-length and shipped quickly from Charlotte. Lengths longer than 12 meters can also be provided on request.



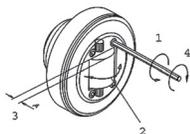
Combined Bearings have higher load ratings than profiles, which provides a design safety factor protecting the bearing. A single combined bearing can handle both radial and thrust loads. Bearings are stocked with and without flanges. Flanges allow simple mounting, a consideration for assembly and maintenance. Bearings can also be welded directly into the equipment frame. Several flange types allow various mounting clearance holes for thru bolts and/or threaded holes for reverse mounting.



The gap between the axial bearing and the inside face of the profile should be controlled as the profiles are installed. The gap can be fine tuned by placing shims behind the flange to reduce or minimize the gap. A gap of 0.5mm to 1mm is recommended. Full contact may preload the bearing resulting in reduced life. Shims are a simple option to adjust this gap at assembly. Proper bearing spacing will ensure a smooth operating system.



Other bearing versions offer internal adjustment means that provide both radial and axial adjustment.



Wipers can be fastened to flanges to limit debris from entering the profile and protect the bearing and profile. Heavy duty units for harsh or corrosive environments allow load control as well as protection of the rolling elements. These units allow re-lubrication and can be provided with special ATC coatings or provided in stainless steel for both bearings and profiles for the ultimate protection



Vulkollan or Polyamide coated steel rollers and bearings allow quiet high speed solutions to 10meters/sec. All are offered as bearing only or with flanges for easy installation and removal.

An new flange mounted version with adjustable radial and axial bearings provides smooth control and snug fits for gap control.



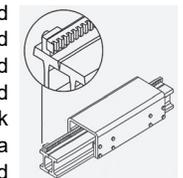
Vukollan Drive Bearings can mount to frames and adapt to drives, run silent and are lubed for life. Jumbo Combined bearings and fabricated Profiles take load capabilities to new levels. The large units with OD's to 280mm have static ratings of 625kN (140,000 Lbs) and are very capable in tough environments. Fabricated Profiles can be provided to suit the desired length.



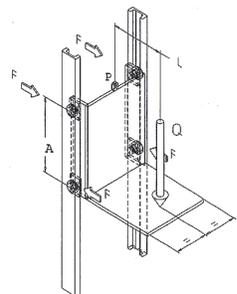
Precision control is accomplished by machining the Profile Load surfaces and using a slightly larger bearing outer race (PR Combined Bearings) to fit the profile precisely (reduced clearance between the bearing and profile) than standard units. PR Profiles and custom length profiles can be offered machined up to 50 feet long in one set up.



Combined Bearings and Profiles can be integrated with existing systems and control can be assisted with our gear and rack products. PTI stocks a wide variety of inch and metric PT products to support and control the system.



PTI can assist with recommendations or suggestions, and review product choices to optimize your system. The Winkel Combined Bearing and Profile system utilizes fewer components and is easier to install than the typical cam follower arrangements. This simple to install system yields a low cost solution to heavy duty linear motion.



Models available: www.winkel.de