WINKEL Systems

PTI

Control of Linear Motion

Winkel Systems encompass 4 basic categories: Vertical, Multi Axis Systems, Telescoping and Special Purpose Units. Each unit incorporates features and design criteria per the application requirement. Although each System is generally unique, the design basics are similar. Every Winkel unit is robust and provides heavy duty linear motion for demanding applications. Existing designs can be quickly modified to adapt dimensional requirements of the application.

System Types

1. Vertical Lifts (typically floor or base mounted)

Lift Masts

Pallet Stackers

Fast Pick Stations with Wrappers

2. Linear & Multi-Axis Systems

Overhead Gantry with X, Y & Z Control

1 & 2 Axis + Rotation

3. Telescoping Systems & Forks

Horizontal Units

Vertical Units

4. Special Purpose Units

Coil Turning Units

Tool Changing Units

Robot Guide Tracks

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1. Vertical Lifts

Lift Masts

Winkel Lift Masts are built for loads from 100 lbs to 8 tons. They are built to specification including single, double or four pillar designs. These Lifts are robust and deigned for continuous use with minimal maintenance. Standard versions are equipped duplex chains and security switches. Fail safe brakes, locking devices, service platforms and hoists are all optional accessories. The lifting "platform" whether arms, forks or conveyor tables, can be designed to adapt to or be supplied by the customer. Any color combination is possible for matching adjacent equipment. Each can interface to controllers for matching process flow. Each are pre-tested and arrive fully assembled, (as far as shipping may allow) and include full operations manuals.

Belt lifts are also economical and a variety of reinforced belts are available. Position control is an added feature for Belt driven lifts. For more information please contact PTI.

Single Mast Custom Load Tray

Double Mast Belt Lifter

Lifting & Traveling Unit

Pallet Stackers

4 Pillar Pallet Stacker

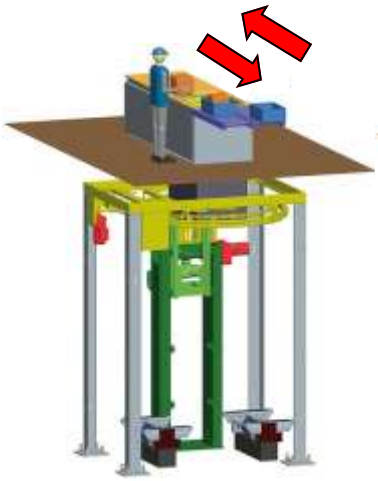
Pallet Stacker

Conveyor Table lifter

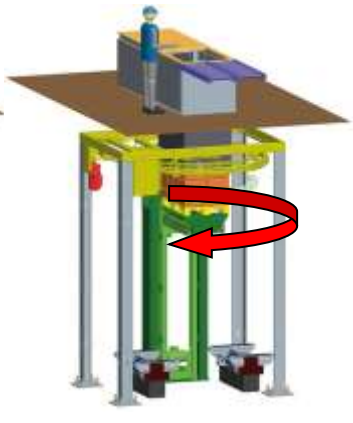
Lifter with Back-Up Drive

Fast Pick Stations

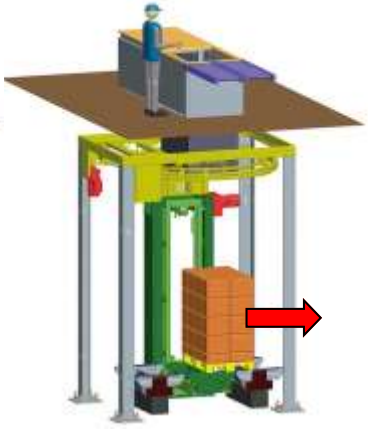
The Fast Pick Station optimizes a Pick / Pack / Wrap operation from a Mezzanine level. Designed for loads to 2860 lbs. Each station can allow up to 800 picks on pallets per hour. A stroke of 20 feet is possible. System is rigid and virtually maintenance free. Multiple in feed positions are possible to optimize packing and work-station station flow.



In Feed for Packing a Variety of Box Sizes



Shrink Wrapping Option after Packing



Wrapped and ready for shipment

2. Linear & Multi-Axis Systems

Overhead Gantry with X, Y & Z Control
1 & 2 Axis Linear plus Rotation

Winkel has designed and manufactured thousands of Linear and Multi-Axis Systems over 3 decades from Automotive Applications to a wide variety of Industrial Material Handling of all sorts. Every System is designed and built to match application requirements. Winkel system experience and proven designs provide for a quick and cost effective design process. Previous systems and be modified to for the application. Depending on position accuracy, a variety of drives are available. Multiple drives (heads) can be incorporated on a single the axis to optimize work station work flow. For instance, additional bridges can be added along the length (or width) depending on the process. Limit or proximity switches are standard for safety control. Design coordination allow adaptation to the users equipment. Any color combination is possible for matching adjacent equipment. Each can interface to controllers for matching process flow. All are pre-tested and arrive fully assembled (as far as shipping may allow) and include full operations manuals. Final assembly and operation set up is available.

CAD or 3D Design templates are available at www.winkel-bearing.com to help the design process get started (Select “Components” then “Inquiry multi axis systems”). And a faxable application criteria sheet is included within this document to further define system criteria.

Belt lifts Are also economical and a variety of reinforced belts are available. Position control is an added feature for Belt driven lifts. For more information please contact PTI.

Single Bridge Gantry with X, Y and Z-Axis Control

Dimensions horizontal axis, Type PLE-100 ZS-H, rack and pinion drive for load capacity up to 100 kg, speed to 5 meter per second and repeatability from 0.5mm.

Type DLE Dynamic Linear (Einheit) Unit with Z-Axis Rotation. Loads to 8800 Lbs, speed to 5 meters / sec., high precision.

Type SLE/DLE Multi-Axis Lifter, Load capacity 500Kg, Max speed 1.5 Meters/sec

Vertical Telescoping , work piece handling, load 200kg.

2 Pillar y and Z-Axis Lifter

Lifting and Turning

P.T. International Corp.

3. Telescoping Systems & Forks

Horizontal Units & Vertical Units

Winkel Telescoping Systems are robust, made for continuous use and require minimal, infrequent maintenance. All lift units are designed with duplex chain or belts with safety devices. Suitable carriages, load frames, or special designed attachments are available on request. Every system can be designed to adapt to the user's requirement. Units available in Stainless and for loads to up to 4.5 tons. Each unit is provided with a complete service manual and delivered as assembled as shipping will allow. Units are designed to interface with system controllers.

Load / Unloading Device with telescopic forks

Vertically Telescoping, Transfer Lift

Horizontal Auto Load Shuttle

Horizontal Load Shuttle

2 Pillar Lifting Unit with Telescoping Forks

Single Mast Lift with Telescoping Forks

Low Profile Work load Shuttle with Telescoping Forks

4. Special Purpose Units

Coil Turning Units
Tool Changing Unit
Robot Guide Tracks

Winkel has designed and manufactured a wide variety of special purpose units, including Coil Turning Units, Tool Change Shuttles, and Guide Tracks for Robots. A few are shown here and each incorporates Winkel Combined Bearings and profile.

Robot Guide Tracks generally include hardened LM guides or hardened flat bar with hardened rack and pinion drives, polyamide pinion for lubrication of the rack, a central lubrication system, and design repeatability less +/- 0.1 mm, easy floor adjustment, and driving speed over 2m/sec, with convers on request.

Each unit can be designed to fit mounting brackets or tool holders, or other industry recognized flanges. Any color combination is possible for matching adjacent equipment. Each can interface to controllers for matching process flow. All are pre-tested and arrive fully assembled (as far as shipping may allow), and include full operations manuals. Final assembly and operation set up is available.

For more information please contact PTI.

Winkel RLE - Robot Tracks Units are economical linear systems designed and built systems for load capacities up to 2tons of Robot weight.

5 & 10 Ton Coil Turning Units

Robot Tracks, Hardened guides, Travel 2 m/s, repeatability +/-0.1mm, Floor leveling/adjustment feature.

Winkel Custom Turning unit for Welding Operation

Tool changing system with tilting unit, telescopic forks and eccentric lift, load capacity 1 ton

Robot Tracks, Rack & Pinion driven, Heavy Duty

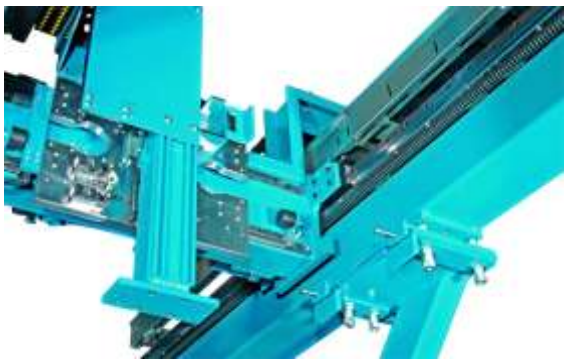
Winkel Custom Turning unit

Systems - Key Features & Timeline

Linear Systems requiring repetitive linear movements, positioning, lifting, or rotational sequencing are all possible with Winkel kinetic designs. Winkel Systems utilize Combined Bearings, Profiles, Gears, Racks, Variable Frequency Drives and/or Gear Motors, and Interface Logic as required by our customers. System possibilities are endless. Reviewing Winkel systems on-line or documented in the catalog of applications may provide some helpful design concepts. PTI needs just basic parameters to get started such as loads, positioning frequency, kinetic requirements, and general dimensional guidelines. Your preliminary concepts are welcomed to further illustrate your need. Existing Winkel designs can often be utilized to provide the basic frame-work for a new system, saving significant engineering time. Full system set-up support is also available. Winkel designs are engineered for endurance. Full documentation is provided along with the operating manual. Several end-use customers operating with installed Winkel systems are shown on the back.

Key Features

- Customized Solutions for Single and Multi-Axis needs.
- Kinetic Systems are extremely durable, incorporate Steel Profiles and Combined Roller Bearings for Heavy Radial and Axial loads. Vulkollan wheels are available for quiet, high-speed operation. Ideal for process integration and repetitive movements.
- Rack & Pinion Actuation with SEW Gear Motors & Interface Ready.
- Thousands of Winkel Systems in use world wide.
- Virtually maintenance free and extremely durable.
- Full System Design by Winkel.



X-, Y- & Z-Axis Control

Timeline Example

Budget Quote:

- Gather basic parameters & sketches from customer ***1-2 Weeks***

Order Processing (Once Order is Approved):

- Preliminary Drawings ***4-6 Weeks***
- Final Design ***2 Weeks***
- Drawings & Design Approved by Customer
- Production ***6-8 Weeks***
- Full Assembly & Test (Customer Visit Welcome) ***2 Weeks***
- Disassembly & Pack for Sea Freight ***1 Week***
- Sea Freight from Germany ***4-5 Weeks***
- Optional: On-Site Installation

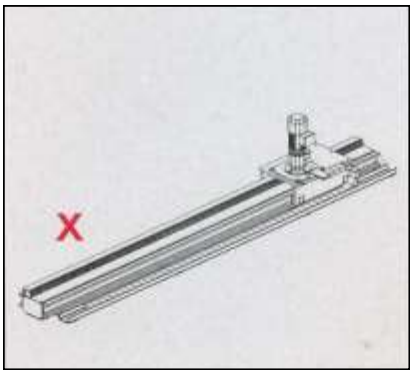
**Exact timeline depends on scope of project*

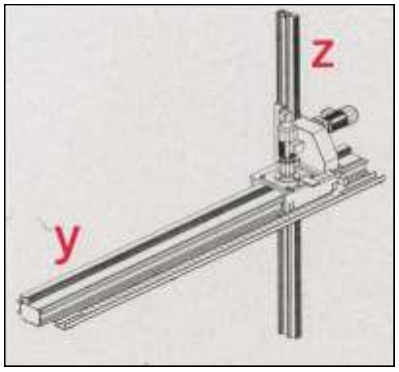
Dual Bridge with X- & Z- Axis Control

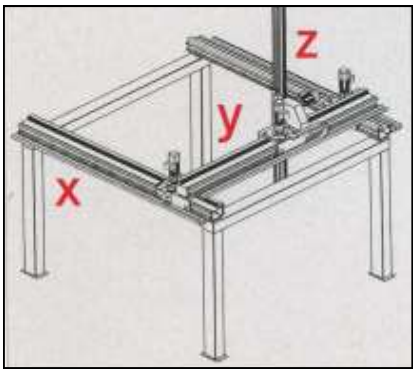
P.T. International Corp.

Design Criteria for Multi-Axis Systems

The schematics below represent various axis for movement. When describing the system needs, some basic concepts will identify parameters. For the drive mechanism, the X-axis is typically the long run length. The Y-axis is the width and Z-axis is the vertical stroke. Other helpful criteria is the length (in or mm) of movement or stroke for each axis, speed (in/sec or mm/sec) of the stroke desired, and acceleration (in/sec² or mm/sec²) if any. Also identify the frequency of stroke in times per hour or per day.







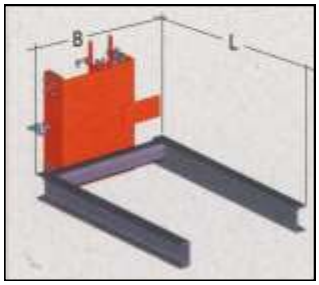
Type of Application: _____

Stroke:	**X** _____ **in or mm**	**Y** _____**in or mm**	**Z** _____ **in or mm**
Speed:	**X** _____ **in/sec or mm/sec**	**Y** _____**in/sec or mm/sec**	**Z** _____ **in/sec or mm/sec**
Acceleration:	**X** _____ **in/sec² or mm/sec²**	**Y** _____**in/sec² or mm/sec²**	**Z** _____ **in/sec² or mm/sec²**
Position Accuracy:	**X +/-** _____ **in or mm**	**Y +/-**_____**in or mm**	**Z +/-** _____ **in or mm**

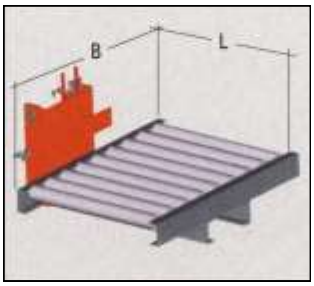
Motor: ☐ **AC Motor Frequency Controlled** ☐ **Servo** **Load** _____ **Lbs or N** **Cycle Rate** _____**cycles/hour**

Other: (Ambient Conditions, etc., that may impact function) _____

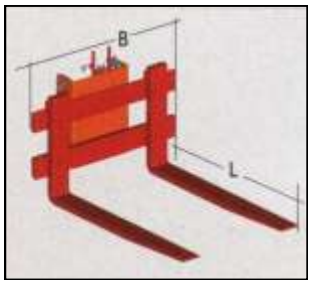
Criteria for Lift Systems



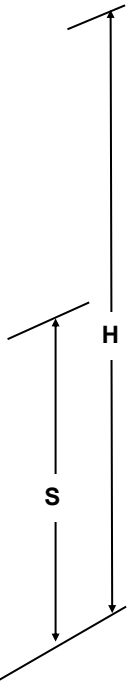
1. Load Frame



2. Conveyor



3. Frame with Forks



Type 1, 2 or 3 or other (Describe) _____

B = _____ **in or mm** **L =** _____ **in or mm**

Load: _____ **Load Center:** _____ **Stroke: S =** _____**in or mm**

Max Height of Load Frame: H = _____ **in or mm**

Motor - AC Frequency Controlled or Servo _____ **Top mount or Floor level** _____

Lifting Speed: _____ **ft/sec or m/sec** **Cycle Rate:** _____**Cycles Per Hour**

Fail Safe Brake: (y/n) _____ **Lifting Sensors or Proximity Switches:** _____

Mechanical Locking System: _____ **Standby By Drive** _____

Lift Mechanism Type: ☐ **Chain** ☐ **Belt** ☐ **Rack & Pinion** ☐ **Hydraulic** ☐ **Other**

Describe Operating Conditions (Surrounding Environment, Temps, Moistures, Contaminants, etc.,

Drawing/Sketch available?) _____

_____

Please include a drawing/sketch if possible. Additional System concepts are available at www.winkel.de.
Contact PTI for additional information. Phone: 704-588-1091 | Fax 704-588-5738 | www.ptintl.com

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