kardexremstar

Buyers Guide

Vertical Carousels | Horizontal Carousels

A Side by Side Comparison

Vertical Carousels | Horizontal Carousels

Making the Leap Into Automated Storage

Although similar in name, Vertical Carousels and Horizontal Carousels are dramatically different automated storage and retrieval technologies when you take a closer look. The most obvious difference is in the way the machines operate. Per their naming – Vertical Carousels rotate vertically and Horizontal Carousels rotate horizontally. However, there is more to talk about when it comes to these two dynamic storage and retrieval systems.

Vertical Carousels are a series of carriers attached in fixed locations to a chain drive. Movement is powered by a motor, which sends the carriers in a vertical loop around a track in both forward and reverse directions – similar to a Ferris wheel. Goods are stored or retrieved through an ergonomically positioned access opening with a work counter.

A Horizontal Carousel consists of an oval track supporting rotating bins with shelves. A motor located inside of the oval track powers the carriers around the track horizontally; stopping at a pre-designated access point for storage or retrieval of goods.

Making the Leap Into Automated Storage

Both automated technologies have been around since the 1950s and are often given the unfair categorization of "ASRS dinosaurs" when nothing could be farther from the truth. In reality, their rich history and experience in material handling makes them steadfast and reliable storage devices.

A variety of design tweaks and improvements over their lifetime have ensured these loyal dynamic storage units continue to deliver modern, world class manufacturing and distribution facilities improved material handling efficiencies such as:

- 60 – 75 % Floor Space Savings
- 2/3 Less Labor
- 99.9 % Pick Accuracy
- Increased Throughput
- Higher Inventory Control

Vertical Carousels


Horizontal Carousels

Vertical Carousels | Horizontal Carousels

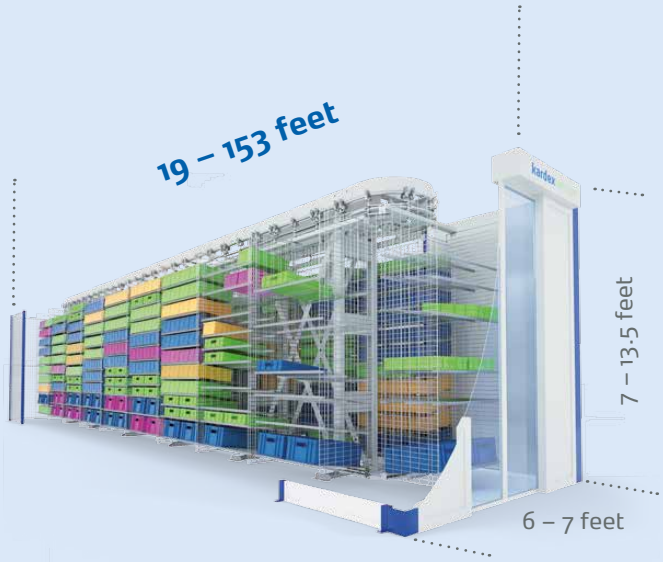
General Dimensions

Both units are generally rectangular in shape with Vertical Carousels ranging 6 to 14 feet wide by 4 to 5 feet deep and Horizontal Carousels ranging 6 to 7 feet wide by 19 to 153 feet long. The difference here is that both carousels are accessed on the width dimension; making Vertical Carousels wide and shallow and Horizontal Carousels narrow and long.

Another big differenator is unit height – Vertical Carousels start at just over 7 feet and can reach up to 32 feet tall whereas Horizontal Carousels start at just over 7 feet, but have a max height of 13.5 feet. While Horizontal Carousels are indeed a good option for areas with ceiling heights under 15 feet, they can be double (or triple) stacked for higher ceilings.

Vertical Carousels

Horizontal Carousel

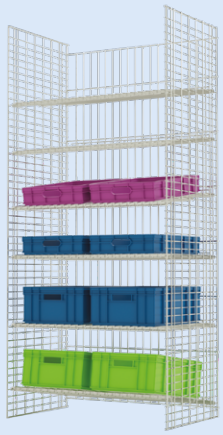


Products Stored

The ultimate footprint of the unit always starts with the size and weight of the product you need to store – and then how much of it you have.

Size

Vertical Carousel Carriers



Horizontal Carousel Carrier

Vertical Carousels store items on carriers ranging from 49 to 144 inches wide by 17 to 24 inches deep. The carrier width is roughly 2 feet shorter than the overall unit width allowing some room on either side of the carrier for the track. The height of the carrier can range from 8 to 19 inches. Carriers can be further subdivided with additional shelves for management of smaller items. Totes, containers, boxes or drawers can be used to organize smaller parts in a high density storage environment.

Horizontal Carousels store items in carriers that hang from an overhead track. Carriers can be 24.5, 32.5 or 37 inches wide by 18, 22 or 24 inches deep. The carrier height ranges from 6 to 12 feet and determines the height of the overall unit. Carriers can be divided using intermediate shelving to create custom storage locations ideal for totes, containers or boxes holding smaller items.

Weight

Product weight can also be a variable in your automated storage technology selection. Vertical Carousels can handle weights up to 1,430 pounds per carrier; while Horizontal Carousels can handle up to 2,000 pounds per carrier. In some cases a few pounds can make all the difference.

Which One Is Right for You?

Now that you know the basics – which one should you use?
Here are some things to consider ...

#1 | Physical Space

#2 | Picking Speed

#3 | Product Mix

#4 | Cost

Consideration

#1 | Physical Space

The physical space of your warehouse is a main consideration when it comes to deciding between a Vertical and Horizontal Carousel – specifically ceiling height. A lower ceiling height might mandate a Horizontal Carousel over a Vertical Carousel. Although if space is really tight and you are looking for maximum cubic capacity, a Vertical Carousel might be the better option. Even at a lower ceiling height, Vertical Carousels provide a bit more capacity when compared to Horizontal Carousels.

Another option is to build a tall attached exterior enclosure to house the Vertical Carousels and punch an access opening through an existing exterior wall – this is more common than you'd think – especially for low ceiling facilities that are out of space.

It's all about the balance of the physical space you have and the space (storage density) you require.

Consideration

#2 | Picking Speed

Another consideration is the system throughput requirement – which is dependent on your specific application.

How fast you need to get product out of the system might determine the best technology for you. Throughput rates are highly dependent on the system configuration (layout and process), inventory locations (slotting), order profile (single line vs. multi), picking strategy (single order or batch picking), etc. Carousels are generally arranged into workstations, or pods. An operator(s) works within the pod picking stored product from each machine to fill orders – usually following light or voice directed picking commands.

One of the main advantages to automated storage and retrieval systems is the goods-to-person delivery. All stored goods are delivered directly to the operator, significantly reducing walk and search time and therefore increasing order picking throughput rates. A word of caution when designing a workstation, always consider the operator walk time to the units. Vertical Carousels are generally laid out in a straight line – 2 or 3 – in a row next to one another. Arranging three Vertical Carousels next to each other can quickly create a 36 foot (plus) work area. When there are four or more Vertical Carousels you usually see them arranged two by two; face to face.

This allows the operator to work in the middle of the workstation and access all four units easily; with a 24-foot walking area, instead of 48 feet. In high throughput application, every step counts. For high throughput, Horizontal Carousels are also arranged in workstations or pods; but the difference here is the access point is variable and can be adjusted to create the most efficient layout. When using two Horizontal Carousels side by side, the operator can access each carousel at an angle, creating a small workstation of only 5 or 6 feet.

When multiple Horizontal Carousels are positioned in a workstation the center carousels can be pushed back and accessed from the front, while the side ones can be directed to stop on a side or angle – creating a very tight workstation for the operator.

Pod of 4 Vertical Carousels

Pod of 4 Horizontal Carousels

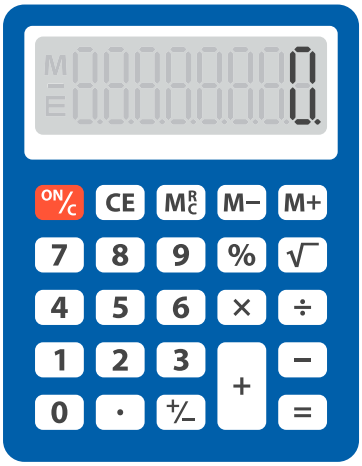
Consideration

#3 | Product Mix

The stability of your product mix is also a decision criteria to consider. Vertical Carousels provide highly dense storage for static product sizes. While intermediate shelves can be changed from storing 2-inch tall product today to 4-inch products tomorrow; there are carrier size limitations. Horizontal Carousels are easier to adjust to a changing product mix. Carrier shelving can be added or removed and pick lights can be adjusted as needed.

#4 | Cost

It all comes down to how much does it cost and what's in your budget. Overall, the Horizontal Carousel is the least expensive option per cubic foot stored. While price is always a main consideration, it's never all about price in the end – it's about finding the best system to meet your needs now and into the future.



Your decision should be based on the space you have, the requirements of your application and the cost. Ask a material handling specialist to analyze your application, provide you a comparison cost for both solutions and help you weigh the pros and cons.

Connect with a Specialist

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