

Buyer's Guide

# Vertical Buffer vs. Vertical Lift Modules





# Which one is best for you?

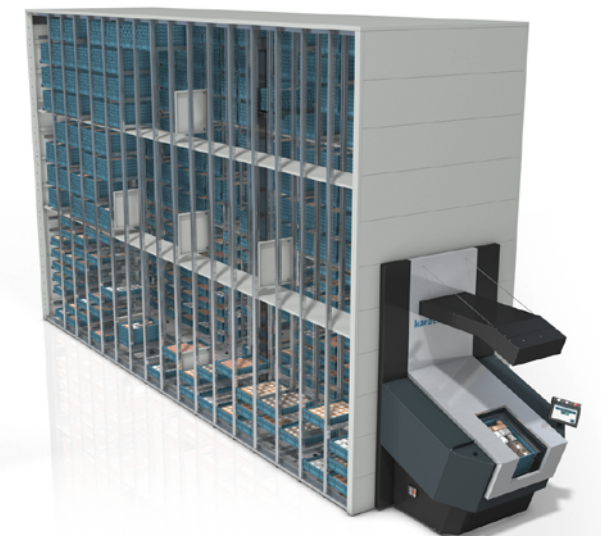
## A side by side comparison

Both Vertical Lift Modules (VLMs) and Vertical Buffer Modules (VBMs) are designed to provide improved efficiencies in your operations including floor space reduction, increased productivity, inventory control, accuracy and ergonomics. Not to mention, they usually cost justify in roughly 18 months because of these efficiency gains.

A notable difference between these two technologies is how they handle items. The VLM is a tray-based delivery system and the VBM is a tote-based delivery system.



Vertical Lift  
Modules

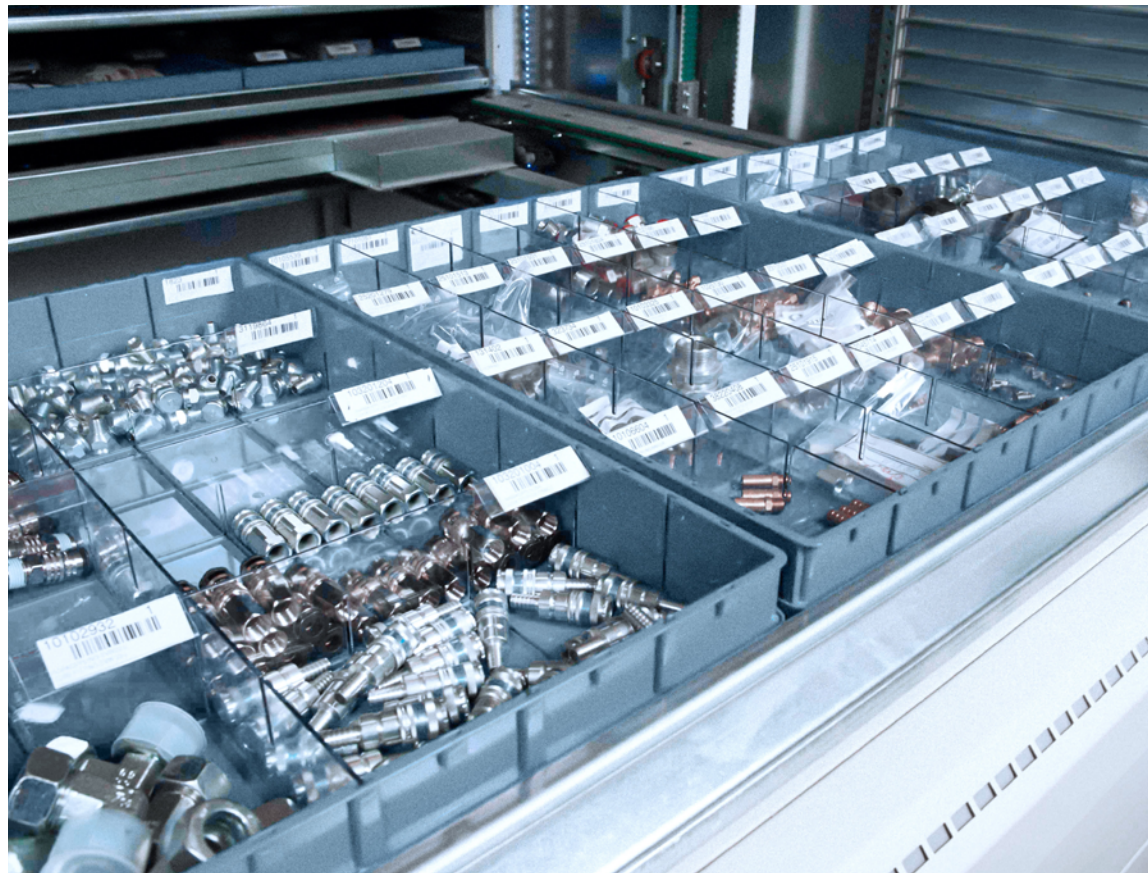


Vertical Buffer  
Modules



# How do they store items?

## Vertical Lift Modules



A VLM consists of two columns of trays with an automated inserter/extractor positioned in the center. The inserter/extractor travels up and down between the stored trays, automatically locating and retrieving them as needed – similar to an elevator with doors which open on both the front and the rear.

## Vertical Buffer Modules



A VBM contains an aisle in the middle of a multi-segment shelving system, where a moveable mast with a telescopic gripper operates. The unit controller sets the gripper in motion picking up a discrete bin/tote and transporting it to a picking station.



# How do they measure up?

## Footprints

A standard VLM unit is roughly 1.5 to 4.4 m wide by 2.3 to 3 m deep. Standard trays storing the inventory range from 1.3 to just over 4 m wide by 0.6 to 0.9 m deep, with a maximum product height of just over 0.72 m. (Ergonomics: You don't want the trays to be too deep or the operators won't be able to reach the items with minimal effort.) VLMs can save up to 85% of previously wasted floor space, which opens possibilities for other revenue generating activities to be added.

In comparison, the picking station, also known as the turntable, on the front of a VBM is 1.8 m wide whereas the unit reaches a width of 2.4 m as standard. These units only handle two tote/bin sizes, 600 × 400 mm or 640 × 440 mm. The VBM can span up to 10.5 m long.



The VLM will maximize density in the smallest footprint.

## Height

VLMs are built to take advantage of the vertical height in a facility. They start at 2.6 m tall but can reach up to 30 m. However, the average height of a VLM is between 10 to 14 m tall. The machine height should be determined by your available ceiling height and storage and throughput requirements.

On the other hand, VBMs have a maximum ceiling height of 12 m, allowing most organizations to take advantage of their full ceiling height. The typical VBM is longer than it is tall, giving it a more rectangular shape.



When the ceiling height exceeds 12 m, or you want to expand the building exterior, VLMs reach up to 30 m tall.

## Load capacities

VLMs can be outfitted with trays that handle up to 1,000 kg each. For applications with heavier loads, lift-assist equipment can be added to a VLM.

The VBM can handle 35 kg per tote. Therefore, if you're looking to store heavy loads, the VLM is going to be the better choice for you.



VLMs are ideal for maintenance and repair operations (MRO) because these items tend to be heavier.



Vertical Lift Module Kardex Shuttle



# Product mix

One of the main differences between these technologies is how they store items in trays versus totes. Therefore, the size and weight of the items you plan to store will often determine the machine which is best for you.

VLMs use a height sensor located at the back of the access opening which measures how tall the items placed in each storage tray are every time the tray is put away. Integrated software crunches those numbers, then directs the VLM to store the trays dynamically – as close as 25 mm apart – to maximize storage density. The machine prioritizes compressed storage to give you the highest storage density possible.

Unlike a tray in a VLM which maximizes the cube, the tote-based VBM does not maximize space density in the same way. The VBM handles two standard two sizes, 600 × 400 mm and 640 × 440 mm, and they can't be used interchangeably within the same unit. The VLM can manage variable product sizes (height, length, width) within a tray versus the VBM which can only handle items sized to fit within the standard tote sizes.



Each tote in a VBM manages an individual SKU.



VLMs deliver a number of SKUs on a tray while VBMs deliver one tote a time.



VBMs offer discrete item handling for increased inventory control and security of high value or sensitive items.

# How fast are they?

Compared to traditional methods, both machines yield high throughput. Operating on the goods-to-person principle, items directly move to the operator. The operator picks an item at an ergonomically positioned access point, either from the VLM's access opening or the VBM's turntable. While the operator picks an item, the next pick is being cued. This eliminates operator dwell time, increasing throughput.

While a VLM tray can mean higher density, your search time can be greater than the tote-based VBM. Searching an 2.4 m wide by 0.9 m deep tray delivered in a VLM to pick an item will take longer than a single SKU from a single tote delivered in a VBM.

Although a VLM can reach straight up to your ceiling, it sacrifices delivery speed when it does. The taller the VLM, the more time it takes to retrieve a tray for picking. The height of the unit should certainly be a consideration when determining the picking speed your operations require.

Reducing the distance between workstations can increase throughput by decreasing operator walking time. When you place VBMs next to each other in a pod or workstation, the center point between each pick station is 2.4 m. Therefore, if you set up a pod of three of these machines, your pick area is 4.9 m. Whereas three VLMs next to one another creates a 9.1 m pick area. The access points are a shorter distance in a pod of VBMs, reducing walk time between pick locations.

**To reach top throughput speeds, outfit ASRS with light-directed picking technologies, and work in a pod utilizing a batch picking strategy.**



# Product handling and transportation

Product handling for both the VLM and VBM can be managed in a variety of ways. Both machines can be operated by a person in a straightforward, semi-automated way where the operator interacts with the storage unit. An operator takes product out of the unit via the access opening or turntable and distributes the items into order totes or onto a conveyor manually.

Both machines can be used for automated product handling by integrating robots. With this automated integration, a robotic arm picks items out of the tray or tote and distributes the items accordingly.

For more advanced automated product handling, the VBM can be equipped with automatic conveyor connections as standard. This means totes can flow in and out of the unit automatically with no human intervention. VBMs are ideal in both order consolidation and order fulfillment operations. Totes can enter the unit automatically, stay in the VBM as buffer storage until the order is complete and leave automatically on the conveyor to the consolidation area. Totes can also flow out of the VBM from pick station to pick station, completely unmanned, increasing throughput.



Vertical Lift Modules Kardex Shuttle



Vertical Buffer Modules Kardex Compact Buffer with automated conveyor connection



# Which one do you need?

Hopefully now you have a better understanding of the primary differences between these two technologies. When making your final decision, keep this in mind:



## Vertical Lift Modules

are ideal for:

- ✓ Heavy items (up to 1,000 kg)
- ✓ Variable product sizes (small, medium, large)
- ✓ Maximum density in the smallest footprint (up to 30 m tall)



## Vertical Buffer Modules

are ideal for:

- ✓ Item weights up to 35 kg
- ✓ Small items fitting in a 640 × 440 mm tote
- ✓ High density (up to 12 m tall)



Contact a specialist