

DYNAMIC STORAGE MACHINES

Increase efficiency, organisation and picking speeds
in your warehouse





Increase productivity
Expand the storage and capacity of your warehouse

AUTOMATED SOLUTIONS FOR EFFICIENT WAREHOUSING

Dynamic Storage Machines are an almost unbeatable choice when it comes to maximum efficiency in order picking and small parts retrieval. Due to their modular design system it can be adapted to your exact requirements and offer a virtually endless range of applications. From the rapid Tornado Lift System or the IPN Industrial Paternoster vertical carousel for utilisation of existing building heights, to the HOCA Horizontal Carousel for maximum picking productivity in rooms with low ceiling heights. Constructor offers you an automated system for your warehouse that can be designed to meet your individual needs requirements.

Benefits of automated storage:

- ✓ Save floor space by up to 75%
- ✓ Significantly reduce picking errors
- ✓ Increased picking efficiency by 65%
- ✓ Customised to individual requirements
- ✓ Good ergonomic working environment - "Goods-To-Person" Principle
- ✓ Tailor your machine to your building
- ✓ Protect goods from dust, dirt, light and unauthorised access

Tornado Vertical Lift Storage Machines



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IPN Paternoster Storage Machines



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HOCA Horizontal Carousel Storage Machines



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TC2000 Warehouse Management System



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Batch Picking improves productivity



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Fast, flexible and safe

The Tornado Lift System is a dynamic storage system which moves vertically and delivers the required goods on a tray directly to the operator, either by pushing a button or scanning a barcode. The Tornado offers maximum storage capacity on minimum floor space and fast access to the goods.

The modular design of the system enables a variety of machine widths and heights, it can be customised to meet nearly every requirement. The simple structure makes this storage system reliable and low-maintenance. An intelligent control system can locate the most active trays as close as possible to the access opening for efficient picking. Picking times can be improved by up to 65 % and picking accuracy increased. The vertical travel speed of the Tornado Lift System is up to 2.2 m/s. With this high picking performance it keeps waiting time to a minimum.



TORNADO LIFT SYSTEM

Thanks to its modular construction and variety of dimensions the Tornado can easily integrate into different working environments. It requires almost 75% less floor space compared to conventional storage solutions and can operate as a stand alone system or as a multi-unit installation. Further space saving can be achieved by installing the Tornado outside your warehouse with the pick opening inside. The Tornado can easily be adapted to your individual warehousing situation.

The Tornado Lift systems operates using the bespoke Constructor TC2000 software. This Windows based platform can be easily linked with your existing WMS or ERP system so that the Machine becomes an extension of your network. (See page 14 for more details.)

Ergonomic and safe

- ✓ Easy product identification using a product code, bar code or from a host system.
- ✓ The required tray is brought directly to the operator – “goods- to-person” principle.
- ✓ The retrieved goods are presented at each operator’s ideal working height, for optimal ergonomics.
- ✓ Safe and secure storage with password protected access.

Versatile and reliable

- ✓ The modular design enables a variety of machine widths and heights.
- ✓ Tornado’s simple structure makes the system reliable and low-maintenance.
- ✓ Tray load capacities of up to 600kg.
- ✓ Maintenance via Remote Control Function.

Increase picking performance

- ✓ The entire tray can be taken out and transported to another work station.
- ✓ The intelligent control system locates the most active trays as close to the access opening as possible
- ✓ Vertical travel speeds up to 2.2 m/s offers rapid picking performance, reducing waiting times to a minimum.

Various ways to position your Tornado Lift System

Through an existing roof or through the ceiling



Integration into multi-storey buildings



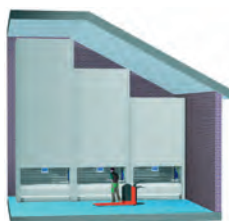
Installation in the basement



Outside the building with connection to the inside



Installation under sloping roof or shed roof constructions



Installation under ventilation plant

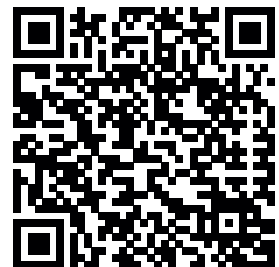


Tailor made for 1001 purposes



Tornado can double capacity

The Tornado's storage capacity can be doubled by integrating two standard Tornados into one unit – Tornado DT. Just like a standard Tornado, a batch picking system can be connected to a Tornado DT - see page 15. This allows you to double your capacity but operate the machine as a single unit. By doing this you can further speed up picking times and minimise errors.



Scan this QR-Code for our Tornado customer references

Benefits of Tornado at a glance



- ✓ Up to 75 % saving in floor space, but still provide the same storage capacity
- ✓ Up to 65 % reduction in picking times
- ✓ Ergonomic operation through “Goods-to-person” principle
- ✓ Protect stored goods from dust, dirt and unauthorised access, reducing shrinkage
- ✓ Window-based machine control allows easy integration into existing IT environment
- ✓ Easy, paperless order processing
- ✓ Reduce picking errors
- ✓ Very flexible design, adapts to most warehouses’ space availability
- ✓ Constructor can access your Machine remotely to provide support and guidance
- ✓ Additional openings enable the use of a Tornado on different floor levels
- ✓ Tornado DT – the capacity of two machines with one pick opening
- ✓ Safe storage of goods through permanent internal monitoring to detect overhanging goods

Technical Data

Total height:	4 to 15 m
Tray width:	1250 to 4250 mm
Tray depth:	520, 620, 720, 820 and 1220 mm
Tray load capacity:	up to 600 kg
Height of stored goods:	up to 850 mm
Vertical travel speed:	up to 2.2 m/s
Storage and retrieval speed:	up to 1.2 m/s
Total load capacity:	60 t
Motor output:	5.5 kW

Accessories

- ✓ Light position indicator
- ✓ Light pointer
- ✓ Confirmation strip
- ✓ Bar-code reader and label printer
- ✓ Batch picking
- ✓ Tray inserts
- ✓ Bespoke fitments



Flexible, efficient and ergonomic

The Paternoster System works through vertical rotation. The requested goods are transported to the operator by the shortest possible route and presented in an ergonomic position.

With the particularly compact design, the Constructor IPN Industrial Paternoster makes optimal use of available warehouse dimensions, from the floor up to the ceiling. The IPN Paternoster is the ideal storage system for heavy and small part storage. Paternoster systems can be manually operated, but also features host-controlled order picking and highly-efficient batch picking. In comparison to static storage systems the Paternoster needs almost 75% less floor space.



INDUSTRIAL PATERNOSTER (IPN)

The Constructor Paternoster is a secure and safe solution that offers automated storage for heavier or mixed size items. Offering good accessibility and clear overview of the goods stored while providing an excellent solution for reducing picking times.

The Constructor Paternoster solution saves floor space and offers efficient height optimised storage on a minimal footprint. Retrieval points can be located on different floor levels.

Paternosters are suitable for storing a variety of different sized goods and heavier items. It offers rapid and optimized processing, reduces picking errors, always bringing items to the operator by the shortest route.

A large reduction in picking times is achieved with batch

picking offering a quicker goods selection process. Stock item handling is safe and ergonomic, as the shelf is brought to an optimal working level, helping to reduce worker fatigue.

The Paternoster keeps the products away from dust and light, maintaining the original condition of the items.

With the ability to seamlessly link this machine to your ERP or WMS using Constructor's TC2000 software, managing your picking has never been easier. (See page 14 for further details.)



Benefits of IPN Paternoster at a glance



- ✓ Up to 75 % savings in floor space compared to traditional storage
- ✓ Full utilisation of existing building heights – from the floor to the ceiling
- ✓ Rapid provision of the requested goods thanks to the “Goods-To-Person” principle
- ✓ Reduces picking errors by two thirds
- ✓ Prevents unauthorised use – reduces losses
- ✓ Optimum protection of stored goods against dust, dirt or other environmental influences
- ✓ Safe and ergonomic work environment
- ✓ A safety light curtain protects the user during operating times and electronic photocells inside the machine protect the stored goods from damage
- ✓ The operator is equipped with touch screen controls
- ✓ Low maintenance requirements
- ✓ Easy integration into WMS and ERP systems
- ✓ Well-lit access opening that can be closed and secured with an electronic door
- ✓ Option to have multiple pick openings in different positions or even different floors



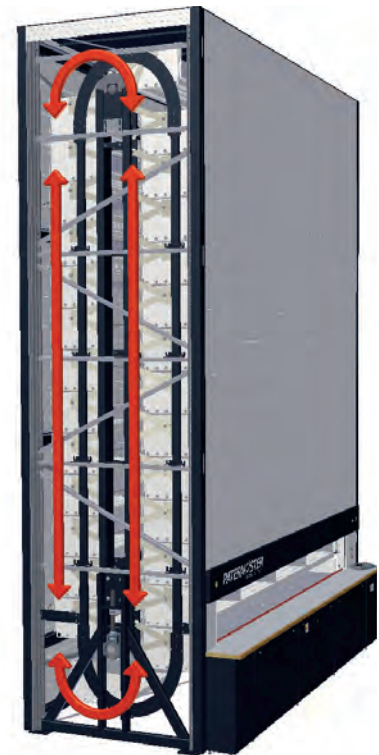
Always tailored to your business



Technical Information

Total height:	up to 15 m
Carrier widths:	2,850 and 4,100 mm
Carrier depths:	420, 520 and 620 mm
Clear carrier height:	201 – 493 mm
Carrier load capacity:	up to 600 kg
Total capacity:	up to 16 t
Machine width:	3,703 and 4,953 mm
Machine depth:	1,836, 2,036 and 2,236 mm
Motor output:	1.5 / 2.2 / 4.0 kW
Control System	PaC 100
Connection with ERP, WMS, robot, RJ45-connection	

Constructor Paternoster brings goods to the operator using the shortest route.



HORIZONTAL CAROUSEL (HOCA) ACCOMMODATE HIGH STOCK LEVELS



The Constructor Horizontal Carousel is an excellent solution for large warehouses or low roofed buildings. The horizontal storage system can support the whole warehouse operation by offering an efficient picking solution. The HOCA transports goods from their locations, bringing them to the chosen picking point.

The idea of the Constructor HOCA is to combine horizontally moving shelves into the smallest area, whilst utilising the available space. The horizontal storage system can accommodate large quantities of bulky goods, reducing picking times significantly.

A HOCA brings goods to the operator rapidly and ergonomically. By combining several machines with one user, productivity can be significantly improved. Modern technology allows picking from several different locations and compared to traditional methods, reduces picking errors by two thirds.

This machine can be easily connected to the production, logistics and sales databases and just like the other Constructor storage machines, the control system will always choose the quickest route for the transportation of goods to the picker.

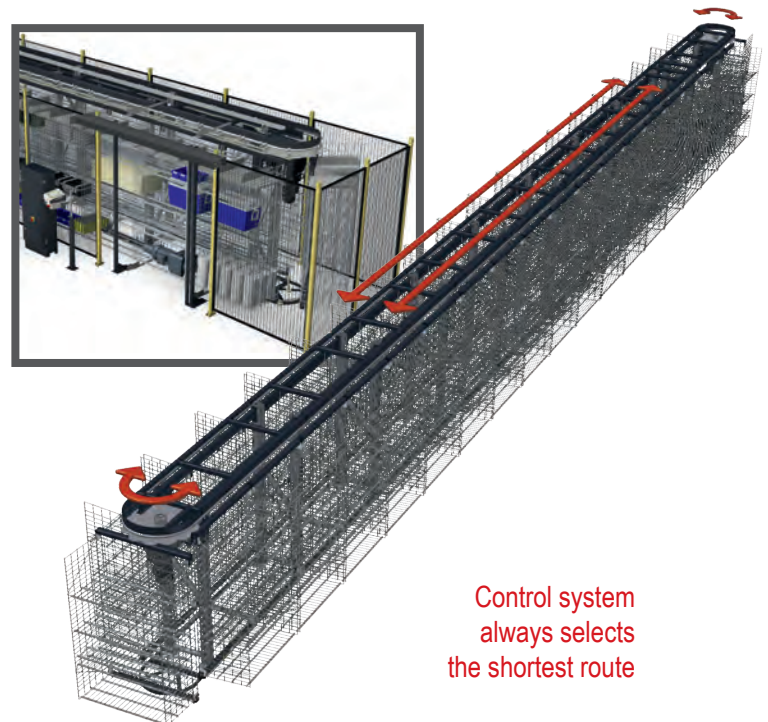
Benefits of Horizontal Carousels at a glance

- ✓ High density storage of many different types of goods
- ✓ High cycle speeds offer increased picking efficiency
- ✓ Optimal storage density is ideal for environments with low ceilings, e.g. under a mezzanine
- ✓ Several horizontal carousels deliver the requested goods with pinpoint accuracy and can be operated by one single person
- ✓ Efficient batch picking, short picking times
- ✓ A safe way to store and handle material, user-friendly
- ✓ Easy integration into ERP and WMS systems
- ✓ Option of several pick openings
- ✓ Many options for bay shelf configuration
- ✓ Horizontal Carousel can be installed as a multi-storey system



Technical Information

Bay widths:	830 and 1010 mm
Bay depths:	508 and 608 mm
Minimum shelf height:	60 mm
Bay load capacity:	600 kg maximum per bay
Shelf load capacity:	100 kg maximum per shelf
Bay height:	1700 to 3900 mm
Cycle speed:	20 m/min
Total capacity.:	40 t maximum
Total width required:	2030 and 2230 mm
Total length: 50 m maximum – Overall heights: 2150 to 4350 mm – Motor output: 1.5 / 2.2 kW	



Control system always selects the shortest route

TC2000 - THE PERFECT WAREHOUSE MANAGEMENT SYSTEM FOR CONSTRUCTOR STORAGE MACHINES

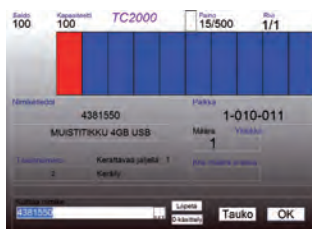


Accurate stock management is critical in today's warehouse environment. The software used to control a storage machine has to be easy to implement into an existing IT environment and create a seamless operation. The TC2000 software successfully achieves this on a daily basis.

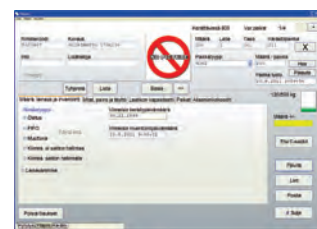
The TC2000 warehouse management system is designed for all the Constructor automatic storage machines with flexible controls for all types of demands. The software enables paperless picking and offers an easily accessible history of activity, as well as giving a clear indication of where goods are located within the machine, indicating which orders need to be picked and updating stock levels once the item has been taken.

TC2000 is windows based and offers a simple, user-friendly and flexible operating program. The user can choose the most suitable language from the system and easily connected to the customer's ERP or existing WMS. The TC2000 can be easily mapped to existing fields, creating a seamless transition from one system to the other.

TC2000 display shows the exact picking position. This reduces picking errors and increases picking rates drastically. ▶



Detailed and clear overview of goods stored. ▶



Benefits of TC2000

- ✓ Windows based system that easily integrates with most existing ERP or WMS tools
- ✓ Suitable to use with all Constructor Machines
- ✓ Batch picking can be easily controlled
- ✓ The modular structure allows additional features to be easily implemented
- ✓ Multi-lingual operating system
- ✓ Visual and clear graphics
- ✓ Support for label printing and bar-code reader
- ✓ Common database for several storage systems
- ✓ Varied back-up functions
- ✓ Online diagnostics capabilities so you don't have to wait for an engineer, with a 95% online fix rate

OPTIMISING EFFICIENCY WITH BATCH PICKING



A Constructor machine has the ability to allow batch picking, enabling the operator to combine numerous orders whilst guiding them through the process of allocating the correct item to the relevant order. The system brings the tray to the operator and provides information on the product and its location.

The control system also displays the quantity to be picked and the related order. Dozens of orders can be picked in the same batch.

The shelves move and the operator stays in one position. This allows optimal picking during one picking batch. While the picker places

products into picking compartments the system selects the next product so that it is ready for picking. This reduces waiting times and increases efficiency.

Constructor machines can be combined with pack to light systems for fast batch processing.



Benefits of Batch Picking

- ✓ One user operates several machines
- ✓ Multiple orders are collated at the same time
- ✓ Individual products are picked for several orders
- ✓ Paperless picking
- ✓ Costs can be reduced by up to 50%
- ✓ Picking speed can be increased up to 70 % compared to standard single picking
- ✓ Ergonomic and efficient working environment

Pallet Racking - P90



Shelving - HI280



Rack Inspection



Mobile Pallet Racking - MOVO



Cantilever



Pallet Shuttle Storage System



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