We Optimize Your Supply Chain

DEMATIC

RapidStore™ UL1800

RapidStore UL1800

REACHING NEW HEIGHTS IN SUPPLY CHAIN MANAGEMENT SOLUTIONS

APPLICATIONS

The RapidStoreTM UL1800, with a corresponding rack structure, is a compact, space efficient unit load storage and staging device. It is an automated solution that provides high-density product storage in a controlled and secure environment. The RapidStore UL1800 is a single mast, computer controlled storage and retrieval machine (SRM). The SRM rides on a floor rail and is stabilized overhead with a steel guide tube. The load platform moves vertically with a steel rope hoist system. The load handling device can pick or deposit loads to locations on either side of the SRM, including rack and operator workstations.

Inventory stored in the RapidStore UL1800 can be accessed on a random basis and be delivered to the point of use: order fulfillment, kitting, production, palletizing, shipping. In a production environment, the RapidStore UL1800 can be the buffer staging device for work in process material that needs to be moved from work cell to work cell or as a finished goods storage system. In a distribution environment, RapidStore can serve as a reserve storage solution, an automatic replenishment system for case pick modules, or as an order consolidation buffer. Distribution centers may also use it as the pick engine for “goods to person” order fulfillment or as the sequencing engine for mixed case palletizing.

KEY ATTRIBUTES

- Automated operation: ambient, cooler, freezer
- Small footprint, compact
- High density; reduces space requirements
- Security & control over inventory
- Inventory & order accuracy
- Minimizes potential damage to products
- Precise sequencing of loads to next process
- Reduction in labor
- Expandable, scalable

EQUIPMENT OPERATION

The RapidStore UL1800 SRM stores and retrieves product from rack locations on either side of the storage aisle. Product can be stored 1, 2, or 3 positions deep into the rack on either side of the aisle. The SRM uses a telescopic shuttle device to move loads to and from the SRM. The telescopic shuttle is mounted to a lift carriage that is hoisted vertically on a mast structure that provides rigid lift carriage guidance. The hoisting system utilizes a wire lift rope routed from the lift carriage over a sheave at the mast top and spools onto a grooved rope drum that is powered by a gear motor. The mast structure is mounted on the SRM base, which contains drive and idler wheel assemblies that support and guide the SRM on a floor mounted crane rail. An electric gear motor powers the drive wheel assembly.

MAXIMUM PERFORMANCE

The RapidStore UL1800 provides high throughput with loads up to 4,000 pounds and machine heights up to 110 feet. AC variable speed motor controllers provide smooth machine accelerations in all axis up to 900 fpm horizontally and 220 fpm vertically.

CONTROLS AND DIAGNOSTICS

The RapidStore UL1800 is controlled by a PLC using ladder logic. Ladder logic has open program access, which is not restricted as it can be in other proprietary control systems. The RapidStore UL1800 uses high-speed laser pulse distance meters to accurately control machine performance and positioning. Unique position addresses are maintained for each storage location. That allows for maximum variation in the physical rack positions that can result if building settlement issues occur. The RapidStore UL1800 has extensive HMI interfaces that can be accessed on the SRM and/or at the end of the SRM aisle. These interfaces are easy to use and highly flexible. The HMI provides software tools to:

- Monitor communications
- Exercise the machine
- Modify the SRM performance parameters
- Create or modify rack address locations
- Perform hundreds of diagnostic and maintenance checks
- Structural Integrity

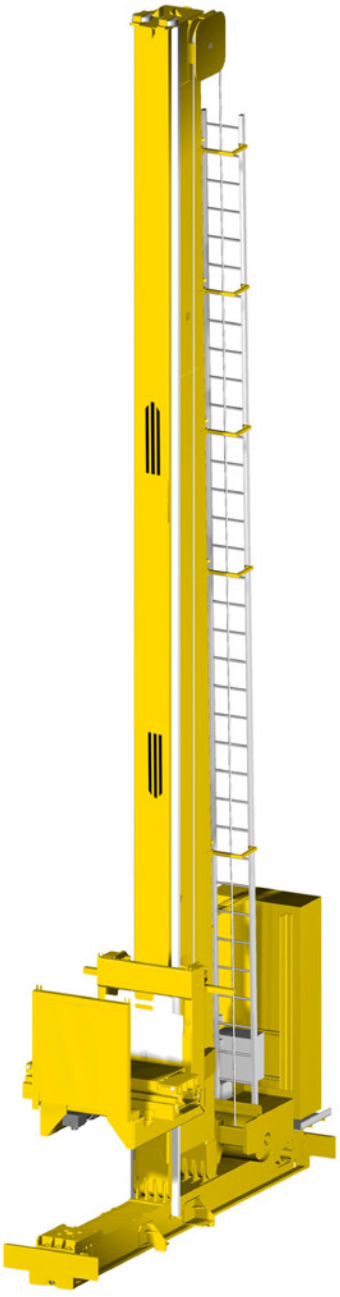
The engineering of the RapidStore UL1800 SRM includes a focus on structural integrity. The structure has been computer modeled using Finite Element Analysis (FEA) techniques. Results of the FEA analysis have been verified by strain gauge testing under dynamic, static, and high speed stop situations. The RapidStore UL1800 has been historically proven in operational environments at its maximum design parameters. The key structural element is the patented pinned mast-to-base connection that provides a predicable load path for mast/base stresses not found in traditional bolted connections.

EASE OF MAINTENANCE

The RapidStore UL1800 is designed with all serviceable components mounted on the base of the SRM. This provides easy access to components by maintenance personnel eliminating routine “high work” for inspections and service.

DESIGNED FOR RETROFIT APPLICATIONS

The RapidStore UL1800 SRM has been designed to fit into existing rack systems supplied by most OEMs. The pinned mast-to-base connection allows easy access into existing aisles. The ability to specify unique load addresses allows the vehicle to adapt to existing rack structures. The RapidStore UL1800 has replaced machines in existing ASRS aisles to enhance throughput and lower maintenance.



SAFETY FEATURES

The RapidStore UL1800 is equipped with a full complement of safety provisions that include detection of oversized loads, slack cables, load alignment, load present/absent, shuttle extension, torque limits and more. Since the lift carriage is ride-able for machine, rack, or building maintenance, a redundant over speed braking device is utilized along with lift carriage controls and guarding to provide maximum safety.

MANUFACTURING & TESTING

The RapidStore UL1800 is fabricated and tested in the Dematic ISO9001 certified Salt Lake City, Utah facility. This facility is dedicated to the production and testing of storage and retrieval machines (SRMs) and is the ideal support facility to serve the North American market. Dematic quality systems ensures that the SRMs are tested and delivered to the customer site performing to specification. Each RapidStore UL1800 SRM is rigorously tested on the floor rail system at the Dematic manufacturing facility before it is shipped to site. This extensive factory testing assures fast system start up at the user site.

Specifications

Load profile **Maximum Weight – 1800 kg (4000 pounds)**
Width – 121.9 cm (48”)
Length – 121.9 cm (48”)
Height – variable lastic tote box, cardboard carton, trays, bundles, shrink wraps
System Height **Minimum – 9.1 m (30’)**
Maximum – 33.5 m (110’)
Controls **Allen-Bradley PLC**
Drives & Motors **AC variable frequency drives & motors**
Performance **Horizontal Speed – 274 m per min (900 fpm)**
Vertical Speed – 67 m per min (220 fpm)
Shuttle Speed – 50.2 m per minute (165 fpm)
Positioning System **DME laser positioning horizontal & vertical**
Communications **Infrared or RF**
Safety Devices **Hydraulic shock absorbers at each end of aisle**
E-stop switches on front and rear
Mechanical limit stops for all directions of travel
Vertical over-travel sensor
Load present detection
Bin location full detection
Slack hoisting rope sensing

Features	Benefits
Modular Assemblies	Minimizes down time & facilitates easy component replacement
Components at floor level	Easy access for equipment maintenance
Ball & socket drive & idler wheel modules	Allows excellent wheel alignment, enhances wheel & track life
Shuttle attachment configuration to lift carriage	Eliminates maintenance issues material fatigue
High efficiency gear reducers	Lower power consumption for equipment
Spring applied, electrically released brakes	Enhances safety, low maintenance design
Robust bearing design standards	Long life with minimal maintenance
Mast ladder	Enhances maintenance access
Synthetic lubricants	Improves bearing life, extends lubrication intervals
Lube free wire lift rope	Requires no periodic lubrication
Nylatron wire rope sheave	Improves rope & sheave life
Conservative sizing of lift carriage	Eliminates track wear and reduces bearing failures & telescopic shuttle rollers
Urethane treaded upper guide rollers	Quiet long life operation
AC variable speed controllers	Smooth speed control, maximizes throughput, minimizes maintenance
Connectorized sensors	Facilitates quick component replacement
DeviceNet sensor network	Enhances component interface & diagnostics
Laser positioning, horizontal & vertical	Accurate, state-of-the-art position feedback
Shuttle encoder positioning	High shuttle accuracy
Pendant maintenance controls easy to use	Provides enhanced visibility
Maintenance ride-able lift carriage	Easy access to upper machine components & rack
Allen-Bradley PLC	Controller Industry accepted control standard
Windows based operator interface	User friendly access at end of aisle, away from moving equipment
Easily modified performance parameters	Configurable acceleration & speed; smooth handling of unstable items
Unique rack map for each storage location	Configurable to facilitate rack settling or alignment issues
Comprehensive diagnostics	Enhances equipment maintenance & support
Grouted thermite welded floor rail	Lowers machine vibration & enhances component life
End of Aisle (EOA) hydraulic buffers	Provides safety back-up
Safety rated open power rail	Enhances reliability & reduced maintenance
Infrared communications	Enhances reliability & reduced maintenance
Safety features	Safe machine operation
SRM testing at factory	Ensures proper set-up, & fast check out at user site

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