Automated storage and retrieval systems, sometimes known as AS/RS or AS/RS, are made of a variation of computer-controlled systems that automatically place and retrieve loads from set storage locations in a facility with precision, accuracy and speed.

**Industry Size**

- **9.18 Billion**
- by 2023
- **7.37% CAGR** growth between 2017 and 2023

(Source: MarketsandMarkets)

**Types of ASRS**

<table>
<thead>
<tr>
<th>Unit Load</th>
<th>Mini Load</th>
<th>Vertical Lift Modules</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machines that store large loads (usually 1,000+ pounds), typically on pallets with storage rack structure, reaching 100 feet or more tall.</td>
<td>Operating the same way as a unit-load AS/RS, a mini-load AS/RS handle lighter loads, usually weighing less than 1,000 pounds.</td>
<td>VLMs consist of a column of trays in the front and back of the module with an automatic inserter/extractor in the center that stores and retrieves the required trays.</td>
</tr>
</tbody>
</table>

**Shuttles**
Shuttles are used for the automated handling of totes, trays, cartons or all three in the same system – for either warehousing or manufacturing.

**Horizontal Carousels**
Ideal for storing small parts and pieces, horizontal carousels are comprised of a series of bins that rotate horizontally around a track.

**Vertical Carousels**
Rotating vertically, like a Ferris wheel, vertical carousels house a series of shelves or carriers to provide high-density storage.

**VLMs**
VLMs consist of a column of trays in the front and back of the module with an automatic inserter/extractor in the center that stores and retrieves the required trays.

**Shuttles**
Shuttles are used for the automated handling of totes, trays, cartons or all three in the same system – for either warehousing or manufacturing.

**Cube Based Storage**
Ultra-high density goods-to-person picking system which utilizes robots to store and retrieve inventory bins from a cubical storage grid.

**Benefits**

- Improves throughput
- Increases accuracy levels to 99.99%
- Increases ergonomics and worker safety
- Saves up to 85% of otherwise wasted floor space
- Increases labor productivity up to 85%
- Provides real-time inventory control
- Enhances product security
- Provides highest possible storage density

**Interesting Fact**
Every U.S. patent ever issued is stored in vertical carousels at the Patent and Trademark Office.

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