TECH DATA

POWERED SYSTEMS OPERATIONS

Zero Force Sensor® System

Spacesaver's patented Zero Force Sensor system (ZFS) provides a completely "passive" method of protecting people and objects in the open aisles of mobile storage systems that is superior to any safety system on the market today.

BENEFITS

Zero Force Sensor System is a microprocessor controlled, infrared photoelectric system that requires no conscious effort or weight pressure to stop or prevent carriage movement when a person or an object is detected in an open aisle.

1. Detect people, wheelchairs, carts, stools, and books on the aisle floor and prevent carriage movement.
2. Prevent carriage movement if people in the aisle are climbing or hanging on storage housing to retrieve stored materials.*
3. Allow an opening aisle to continue to open to its full width after a user has entered it.
4. Immediately stop carriage movement into a closing aisle should a user enter it as it is closing.
5. Activate a system of face panel mounted indicators and controls to assist users.

DESIGN AND CAPABILITIES

1. A copyrighted computer logic tracking system.
2. An infrared safety shield, with cross-aisle sensors located along the full length of each carriage, that prevents carriage movement whenever the beam is broken or when the sensors are in a tracking mode.
3. A Photo Sweep® system, mounted 3/4" (19 mm) above the floor on the side of each carriage, that scans the length of the carriage and prevents movement when the beam is broken by a person or object.
4. An entry/exit zone assembly, consisting of multiple photoelectric sensors located at the entrance to each aisle, that senses both the presence and direction of movement of one or more persons in an aisle and prevents carriage movement accordingly.

When a user enters a Zero Force Sensor (ZFS equipped system at any aisle, that aisle automatically locks into its full open position. The face panel controls shall display a lighted red LED. When the open aisle becomes cleared of people and objects, the system automatically resets and the LED then becomes green, indicating that the system is ready for use.

Under normal usage, activation and reset of ZFS is fully automatic. The system's fail-safe Photo Sweep design means that carriage movement will be safely prevented if the Photo Sweep system fails. A safety-override key is available to provide access should that ever happen.

If a sensor for a cleared aisle is activated and the aisle locks into its open position, the system can be reset by pressing the Reset button on the control.

ZFS can be combined with other Spacesaver system features including System Auto Move and Park options and Spacesaver's programmable aisle, which allows independent use of more than one aisle at a time.

ZFS systems requiring access from both ends can be equipped with dual controls for operation from either end of the carriages.

DESIGN AND CAPABILITIES (CONTINUED)

Spacesaver powered systems are UL System Listed in the United States and Canada (C-UL US).

APPLICATION

ZFS systems are available on Spacesaver powered systems in standard carriage lengths of 6' to 81' (1.83 m - 25 m). (Contact factory for other lengths.) The systems operate with standard power pantographs for aisles up to 60" (1524 mm) wide and are designed to work with any type of storage housing at all heights.

The design flexibility of ZFS systems means there are no weight limits on carts or trucks in the aisle (other than those imposed by floor load ratings), no limits on aisle length, no special rail spacing considerations and no special flooring requirements.

* For user safety, climbing on storage housings is not recommended. Stools and ladders specifically designed for accessing stored materials should be used to access items.

TECHNICAL SPECIFICATIONS

ZERO FORCE SENSOR SYSTEM:
All aisles shall be protected with a microprocessor controlled infrared photoelectric sensor system consisting of the following components:

1. Cross-aisle sensors shall be located on the face of the carriage profile on 6" (152 mm) centers along the first 30" (762 mm) entry/exit zone of each carriage and the last 30" (762 mm) of each carriage in a dual entry system at every potential moveable aisle. The remaining cross-aisle sensors between the entry/exit zone shall be located at the face on the carriage profile typically on 12" (304 mm) centers.
2. Two direction sensing quadratures shall be located at each potential aisle entrance location, near the end of the carriage profile.
3. An infrared photoelectric safety sweep shall be mounted on the carriage 3/4" (19 mm) above the floor and scan the entire length of the aisle.
4. All components shall be completely solid state for maximum reliability.

The microprocessor shall have a computer logic tracking system which combines with the infrared photoelectric detectors providing the following operation modes:

1. System shall be passively activated so that when a person, wheelchair, cart, etc. is present in the open aisle, the aisle automatically locks in its full open position.
2. When personnel, wheelchairs, carts, etc. have exited the aisle, the system automatically resets and the LED indicators will change to green.
3. Should a person enter an opening aisle, carriage movement for that aisle will continue until the aisle is fully open. The safeties will remain activated until the aisle is clear.
4. Should the aisle be closing when someone enters it, the carriage movement at that aisle stops immediately. All other carriages will come to a controlled, ramped stop. The LED indicator on the carriage adjacent to the closing aisle will flash red one time per second, while the LED indicators on all other carriages, remain off. The aisle must be cleared and the reset button must be depressed on the control head with the flashing LED.
5. Should an aisle lock open with no person or object in the aisle, the system may be reset only by pressing the "RESET" button at the affected aisle.
6. The infrared photoelectric safety detection system shall operate on all the carriages moving in the direction of the closing aisle. When a beam is interrupted during a closing carriage/aisle movement, the system shall come to a full stop. The LED indicator on the carriage adjacent to the closing aisle will flash red one time per second, while the LED indicators on all other carriages remain off. This safety activation shall be based on presence rather than weight. There shall be no mechanical switches, hinges, or base plates present in the aisle. To reset the system, push the reset button at the affected aisle.
   a. If all photobeams are clear and functioning properly, the system shall reset and the LED indicator will turn steady green.
   b. If a photobeam is obstructed, i.e., a box is in its path, the only command the system will accept is to move the carriage away from the obstructed aisle.
7. Should a component of the Photo Sweep system fail, carriage movement will be safely locked out.
8. The mobile system shall be U.L. System Listed and in the United States and Canada (C-UL US).

* Specifications subject to change.

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