



**MODEL RSS-2000 SERIES
ELECTRIC WEDGE VEHICLE BARRIER
CRASH TESTED AND CERTIFIED
MINIMUM DEPTH FOUNDATION CONFIGURATION**

SYNOPSIS

This Specification defines a DOS K-12 rated electric vehicle barrier. The barrier was certified with a foundation depth of 24 inches [610 mm], and is suited for applications where sub-surface conditions are such that more extensive excavations are precluded.

This RSS-2000 has been tested in full-scale configuration and certified to the highest DOS K-12 standards. Testing by an independent testing laboratory confirms that it will STOP AND DESTROY A HEAVILY LOADED TRUCK MOVING AT HIGH SPEEDS. Further, the crash test resulted in a negative penetration.

In the lowered position, the barrier is completely flush with the roadway.

The barrier is operated by an electromechanical actuator, which requires little or no maintenance.

The RSS-2000 can be operated by a range of optional inputs such as; vehicle detectors and identification systems, remote-hard line, remote-radio, card reader, key switch or by local guard remote operator console, etc, or by combinations thereof.

1.0 SCOPE

This specification defines the Model RSS-2000, Electric Vehicle Barrier, consisting of one or more vehicle barriers operating independently or conjunction with other units, the controls, features and options as defined herein.

2.0 SYSTEM CONFIGURATION

2.1 BARRIER

2.1.1 Barrier Construction - Barrier shall be a shallow steel vault below grade assembly set in a foundation requiring minimal concrete foundation of 24 inches [610 mm] in depth. The vault assembly is hot dipped galvanized. The barrier unit that rotates to an above ground position is constructed of reinforced steel post connected by a crash bar. Upon impact, forces shall be transferred through the posts into the foundation. Optional top plate can be installed for additional ballistic protection, creates a plate barrier appearance.

2.1.2 Barrier Height - Barrier shall be 36 inches [.9 M] inches as measured from the top of the vault to the top of the barrier crash bar.

2.1.3 Barrier Length - Barrier length shall be 10 foot [3.05 M]. (Barrier can be optionally specified to 12.5 foot [3.81 M] or 15 foot [4.57 M] widths as needed.)

2.1.4 Barrier Shipping Weight – Barrier shipping weight shall be 6,720 lbs [3,048.15 kg] for 10 foot barrier; 8,260 lbs [3,746.67 kg] for 12.5 foot barrier; and 9,800 lbs [4,445.20 kg] for 15 foot barrier.

- 2.1.5 Foundation Depth - The vault of the barrier shall be 24 inches [610 mm] below grade.
- 2.1.6 Safety/Visibility Panel – Red strobe lights shall be installed on the outer posts to provide caution when barrier is deployed. Reflective red and white striped material shall be placed along the crash bar on both the approach and backsides. (Color patterns of both the reflective material and the strobes can be altered as desired)
- 2.1.7 Serviceability Panels - Removable top plates provide access to the all maintenance and service points with standard hand tools. Plates are secured with recessed tamper proof Torx head screws.
- 2.1.8 Finish - The roadway plates and barrier post assembly shall be painted white and shall have a non-skid surface. (Color of the barrier and Bollard Post Assembly can be altered as desired)

2.2 ELECTROMECHANICAL ACTUATOR

- 2.2.1 Actuator shall be a worm gear and self-lubricating.
- 2.2.2 Main Power - Motors are available to operate on 120v/230v single phase or 120v/240v three phase voltage; and can accommodate 12v and 24 volt, 50 or 60 Hz based on site requirements
- 2.2.3 Loss of Power Operation – An optional Battery Back-up System can provide over 500 continuous cycles in the event of primary power loss. Control of the barrier can be done through normal operating controls.
- 2.2.4 Manual Operation – Barriers can be manually operated with a cordless drill fitted with the proper drive.

2.3 CONTROL AND LOGIC CIRCUITS

The following circuits and control stations shall be furnished:

- 2.3.1 Control Panel - A control panel shall be provided to interface between all remote operator consoles and barrier locations. This panel shall contain all control circuits, relays, timers and other devices necessary for the barrier operation.
 - 2.3.1.1 Voltage - The control circuit shall operate from a 120 volt, 50/60 Hz supply (optionally 240 volt, 50/60 Hz or 24 VDC). An internally mounted transformer shall reduce this to 24 VAC (optionally 24 VDC) for all remote operator consoles.
 - 2.3.1.2 Construction - The control panel shall be mounted in a general-purpose NEMA 4 metal enclosure. All device interconnect lines shall be run to terminal strips.
- 2.3.2 Remote Operator Console – Barrier shall be supplied with a remote operator console capable of controlling one or multiple barriers. The standard console shall have push button controls for “Open”, “Close”, and “Stop” for each barrier. Configurations with more than one barrier shall have an “All Up” control button for emergency situations. Barrier position indicator lights can be provided. Additional remote operator consoles can be placed in separate locations to operate in the same capacity.
 - 2.3.2.1 Voltage - The remote operator console shall operate on 24 VAC (optionally 24 VDC).
 - 2.3.2.2 Construction – The remote control panel shall be a a general-purpose NEMA 12 metal enclosure.

2.3.2.3 Remote operator consoles can be custom designed for specific applications.

3.0 Accessory Equipment (Any or all of the following may be selected):

3.1 High Duty Cycle Actuator and Motor – Shall allow programmable operating speeds. Allows for high volume usage and has an operating speed of less than 2 seconds.

3.2 Electro-Mechanical Traffic Arm Gate - An electrically operated wood arm signal gate shall be supplied to alert vehicle drivers of the barrier position. The gate operate shall interface with the barrier at the control panel. The control panel shall close the gate at the barrier "up" command and remain closed until the barrier is fully lowered. The wood arm shall correspond to the lane width and striped with reflective striped.

3.3 Stop/Go Traffic Lights - Red/Flashing Yellow (or Green) 8 inch stand-alone traffic lights shall be supplied to alert vehicle drivers of the barrier position. The flashing Yellow (or Green) light shall indicate that the barrier is fully down. All other positions shall cause the light to show red. The light operating voltage shall be 120 Volt (alternately 240 Volt), power consumption 40 watts per light.

3.4 Sump Pump - A self-priming sump pump shall be supplied to drain water collected in the barrier foundation. Standard pump shall be capable of pumping 2800 gph, pump operating voltage shall be 120v/single phase/50-60 Hz (alternately 240v/ single phase/50-60 Hz).

3.5 Safety Detector Loop - A vehicle detector safety loop shall be supplied to prevent the barrier from being accidentally raised under an authorized vehicle.

3.6 Power Off Capability – Battery Back-up System can allow over 200 continuous cycles before recharging is required.

4.0 PERFORMANCE

4.1 Experience – Barrier shall be a certified and tested design. Manufacturer shall have installed and operated the barriers in documented field experience for all major components.

4.2 Qualification Test – The RSS-2000 successfully passed a full-scale crash test conducted by a qualified independent agency (Pennsylvania Transportation Institute State University in May 2004).

4.2.1 Performance Evaluation – The Department of State certified the qualification test.

4.2.2 Maintenance - The barrier and accessories shall provide for easy maintenance, such that any local maintenance technician can perform routine and annual maintenance tasks without the use and assistance of heavy equipment.

4.3 STOPPING CAPACITY

4.3.1 Normal Operation – Barrier shall provide positive control of normal traffic and security in both directions by providing an almost insurmountable obstacle to non-armored or non-tracked vehicles. Barrier shall be designed to stop vehicles approaching from both directions and continue to operate when the vehicle is within the weight and velocity characteristics as defined in paragraph 4.3.1.1, minor repairs excepted.

- 4.3.1.1 Barrier vault and foundation shall be fully function after successfully stopping vehicle, in the priority direction, weighing: 15,000 pounds at 50 mph [66,7 kN @ 81 kph]
- 4.3.2 High Energy Attack - Barrier shall be designed to stop and immobilize non-armored or non-tracked vehicles with weight and velocity characteristics as defined in paragraph.
- 4.3.2.1. The barrier system shall be designed to destroy the front suspension system, steering linkage, engine crank case and portions of the drive train.

4.4 SPEED OF OPERATION

- 4.4.1 Normal Operation – Standard raising and lowering of the barrier is 3 seconds. Since the barriers are individually operated additional barriers placed together will also operate at 3 seconds, at continuous cycles. Barrier deployment shall be instantly reversible at any point in its cycle from the remote operator console.
 - 4.4.2 Emergency Fast Operation – With the use of the servo-motor the barrier can be deployed in 2 seconds. The servo actuator will raise the barrier rapidly then slow to a stop, still in the 2 seconds, thus preventing wear on the operating systems.
- 4.5 Frequency of Operation** - Barrier shall be capable of continuous complete cycles. Use of battery back up power also provides for continuous complete cycles.

5.0 ENVIRONMENTAL DATA

- 5.1 Temperature Extremes** - Standard temperature range shall be -20 to 200 degrees Fahrenheit. Additional heating system shall allow for lower temperature range to -40 degrees.
- 5.2 Rainfall** – Barriers shall have a standard pump to remove rainwater and all components in the barrier shall be capable of submersion.
- 5.3 Snow/Ice Conditions** - Barrier shall be able to operate, raising or lowering, with snow and ice present. Barrier design shall allow the barrier to lift or lower through snow build up. Optional Heat Grid System in barrier vault shall melt snow and ice, allowing the sump pump to remove the water.

6.0 QUALITY ASSURANCE PROVISIONS

- 6.1 Testing** – Units are completely assembled and ready for install upon leaving the facility. Every barrier is fully tested (cycles 200 times) before leaving the manufacturing facility. In addition to complete cycle testing to verify function and operating speeds, the following checks shall be made:
- 6.2 Identification** - A nameplate with manufacturer's name, model number, serial number and year built shall be located within the maintenance access area.
- 6.3 Workmanship** - The barrier and subsystems shall have a neat and workmanlike appearance.
- 6.4 Dimensions** - Principal dimensions shall be checked against drawings and ordering information.