

**PROCUREMENT SPECIFICATIONS
DELTA MODEL DSC1000 PORTABLE BARRIER- CRASH CERTIFIED
BARRIER SYSTEM SOFT STOP BARRICADE**

SYNOPSIS

This Procurement Specification defines a CRASH CERTIFIED- PORTABLE BARRIER SYSTEM- DELTA Model DSC1000. The system has been tested in full scale configuration at an independent testing laboratory and has certified to meet the ASTM 2656-07 P40, 5,000 pound (2300 kg) vehicle at 40 mph (60 kph). This barricade is designated at a "Soft Stop" vehicle barricade. Full scale testing demonstrated that a collision does not distort the passenger compartment of the test vehicle. Delta's "Soft Stop" technology decelerates and stops the vehicle over a short distance, technically referred to as "occupant ride down acceleration".

The DSC1000 is configured for expedited deployment and, as needed, retrieval and relocation.

This Barrier System can be sited on existing concrete or asphalt roadways or verges; level compacted soils or a combination of these. No excavation or sub-surface preparation is required. The DSC1000 is a Phalanx Type Barrier Ramp totally self-contained with a clear opening of 144 inches (3.65 M). The Barricade is deployed after being towed to the site and then lowered into position by means of hydraulic jacks. No hand cranking required. Once sited the wheels are stored and then vehicle ramps are folded out, completed the deployment. Estimated deployment time- 15 to 20 minutes. The barrier retrieved time 12-18 minutes.

The standard system has a BATTERY OPERATED Hydraulic Power Unit, maintained and recharged from either a Solar Array, an Internal Battery Charger (operated on a local power source), a Field Interchangeable Rechargeable Battery Pack or from other local low voltage sources. The control point can be at the Barrier, or at an adjacent control site, or by a hand held control module on a 'plug-in' umbilical cable. The Hydraulic Power Unit can be located on the Barricade or positioned remotely.

A **DELTA Hydraulic Power Unit** operated on locally supplied power can be specified in locations where suitable local power is available. Both the Locally Powered and the Battery Powered Hydraulic Pumping Units can be sized to provide pass-through rates suitable for most inspection and identification station requirements.

Available operating modes include, full automatic, remote-hard line, remote-radio, card reader, key switch, local guard push button station, master(s) and slave(s) control panels... etc. - or by combination thereof.

* Optional Feature

** Customer Specified

GENERAL SPECIFICATIONS

1. PATENT LICENSES

The CRASH CERTIFIED Phalanx Barrier System shall be fully licensed for manufacture under U.S. Patents Numbers 6,382,869, dated May 7, 2002 (Above Grade Mass Displacement Trafficway Barrier), 5,560,733 dated Oct. 1, 1996 (Gas Pre-Charged Mass Counterbalancing, Re: 33201 dated April 17, 1990 (Hydraulic Safety Barrier Traffic-way Controller) and other issued and pending.

2. SYSTEM SPECIFICATIONS

- 2.1 Barrier construction: Barrier shall be an above grade, portable assembly containing a PHALANX TYPE Full Width Barrier Ramp hinged at both ends, raised and lowered by means of a Hydraulic Operating System. When the Barrier Ramp is raised to the guard position, it shall present a formidable obstacle to approaching vehicles. Upon vehicle impact, the force shall first be absorbed by the Barrier Ramp and then transmitted to the ground plate and inertia buttress.
- 2.2 Barrier Height: Height of the Barrier shall nominally be 29 inches (0,730 M) as measured from the roadway surface to the top edge of the Barrier Ramp.
- 2.3 Barrier Clear Opening: The standard clear opening shall be 144 inches (3,65 M) as measured inside to inside of the buttresses.
- 2.4 Finish: All external surfaces of the barrier, ramps, support mechanism and transporter shall have a rust inhibiting industrial enamel surface. The Barrier is optionally available with inorganic zinc rich primer and color finish coat.
- 2.5 Barrier Ramp Locking Method: The following locking device shall be furnished
 - 2.5.1 Manual Locking Pin. The Barrier shall be provided with a locking pin with padlock locking points to secure the Barrier in the guard position. (Padlock to be furnished by others.)

3. PERFORMANCE

- 3.1 Configuration Drawing: Delta Drawing 90255 Rev A. 8/29/2008.
- 3.2 Experience: Barrier and auxiliary equipment shall be of a proven design. Manufacturer shall have 20 years documented experience with similar vehicle Barriers.
- 3.2 Qualification Tests: Barrier design shall have been successfully tested in full scale configuration in accordance with ASTM 2656-07 P40, 5,000 pound (2300 kg) vehicle at 40 mph (60 kph).
- 3.3 Note: Successful full scale crash test in accordance with ASTM 2656-07 P40, 5,000 pound (2300 kg) vehicle at 40 mph (60 kph) were conducted May 24, 2007 at KARCO Engineering, Adelanto, California.

* Optional Feature

** Customer Specified

3.4 Soft Stop technology provides relative occupant safety compared to hard stop designs as it provides ride down deceleration.

4. PRIME MOVER - HYDRAULIC POWER UNIT- BATTERY POWERED

4.1 The Barrier System shall be raised, lowered, deployed and retrieved by means of a Battery Powered precision Hydraulic Power Unit (Reference Delta Document H4050 HPU/DC) The Hydraulic Power Unit shall be powered by a high energy, deep discharge battery. When fully charged it can typically operate the Barrier Ramp 125 cycles without recharging provisions.

4.2 The standard rising speed of the Barrier Ramp to a full guard position shall be adjustable within the range of 5-12 seconds. Lowering speed shall be within range of 3-15 seconds. Barrier direction shall be instantly reversible from the control station(s) or manual push button control, at any point in a cycle.

5. RECHARGING SYSTEMS. The Hydraulic Power Unit circuit shall be designed and configured to accept a wide range of external inputs for recharging the battery or for direct powering of the Hydraulic Power Unit.

5.1 Built in Battery Charger – Local Power Source. The Hydraulic Power Unit shall have a built-in Battery Charger, operating on local power, sized to operate the barrier 400 complete up/down cycles in a 24 hour period. (Based on a maximum throughput of 60 in any two-hour period).

5.2 Solar Re-Charging System**. The system shall be supplied with a Solar Array sized to provide sufficient power to meet the Frequency of Operation (Continuous) rate as specified herein.

5.2.1 The Solar Panel Array is provided with a mounting post and frame for local placement or mounting. An interconnecting electric cable 10 feet long shall be provided.

5.2.2 The Solar Array Re-Charging System will maintain the Internal Battery at working levels.

5.2.3 The Solar Array is sized so that for each standard solar day (defined as 5 hours continuous sunlight) the Barricade system can be operated 30 full cycles without depleting the overall battery charge level. (Also available – Solar Array with capacity to operate 60 full cycles without depleting the overall battery charge level. *)

5.3 Field Interchangeable Battery Pack. The system shall be supplied with--** Portable Rechargeable Battery Packs suitable for rapid field replacement or interchange. The Battery Pack shall be provided with a cable and connector. A mating connector will be mounted on the HPU for quick attachment.

5.3.1 When fully charged a Rechargeable Battery Pack will operate the Barrier 50 full cycles without external re-charging.

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- 5.3.2. Each Rechargeable Battery Pack shall have a built-in battery charging circuit that will operate from 115 VAC 50/60 Hz or from standard 12V DC automotive power outlets.
- 5.3.3 The Battery Pack will be in a self-contained plastic insulated case and have suitable carrying handles and electric power cord for convenient recharging.
- 5.4 Other Charging Means: The Hydraulic Power Unit control panel shall have input electrical connectors to accept the following inputs. One or more external source may be used simultaneously.
- 5.4.1 Direct Powering of the Hydraulic Power Unit:
- a) Jumper input from standard automobile battery 12VDC. (10-ft jumper cables with battery clips and plug in connectors – furnished).
 - b) Input from Field Interchangeable Battery Pack (cable integral with Battery Pack).
- 5.4.2 Battery charging:
- a) 110-120VAC 50/60Hz.
 - b) Solar panel output [cable furnished with Solar Panel(s)].
 - c) 12VDC power output from standard automotive dash plug.
6. **MANUAL OPERATION.** A separate hydraulic pump, manually operated shall be incorporated in the Hydraulic Power Unit to be available for deployment, retrieval and operation of the Barrier in the event of an insufficient power situation.
7. **HYDRAULIC POWER UNIT – Local Power Source. ****
- 7.1 Hydraulic Circuit: Unit shall consist of an electrically driven hydraulic pump which shall be connected to electrically actuated valves installed on a manifold to allow oil to be driven to a hydraulic cylinder(s) to raise or lower the Barrier during normal operation as well as deploying and retrieval. The hydraulic circuit shall include all necessary control logic, interconnect lines and valves.
- 7.2 Main Power: The electric motor driving the hydraulic pump shall be fed from (site voltage, phase and frequency, i.e. 230/3/60). ** Motor shall be sufficiently sized for the expected number of Barrier operations.
- 7.3 Frequency of Operation: Barrier shall be capable of __**__ complete up/down cycles per hour.

* Optional Feature

** Customer Specified

8. CONTROLS - The Barricade shall be controlled by means of (CONTROL AND LOGIC CIRCUITS ** KEYED PUSH BUTTON SWITCH PANEL **)

8.1 Control and Logic Circuits **. The following control circuits and stations shall be furnished:

8.1.1 Control Circuit: A control circuit shall be provided to interface between all Barrier control stations and the hydraulic power unit. This circuit shall contain all Programmable Logic Controllers, relays, timers and other devices when applicable.

8.1.2 Voltage: The control circuit shall operate from a (120 volt, 50/60 Hz supply 240 volt, 50/60 Hz or 24 VDC **). An internally mounted transformer shall reduce this 24VAC (24 VDC) for all external control stations.

8.1.3 Power Consumption: The control circuit power consumption shall not exceed 250 watts basic load, plus 200 watts for each Barrier in the system.

8.1.4 Construction: The control circuit shall be mounted in a general-purpose enclosure. All device interconnect lines shall be run to terminal strips.

8.2 Standard Remote Control Station: A standard remote control station shall be supplied to control the Barrier operation. This panel shall have a key lockable main switch. Buttons to raise or lower the barrier shall be provided.

8.2.1 Construction: The control station shall be mounted in a weather resistant, minimum rating NEMA 4 (IEC IP65), electrical enclosure. All connection points shall be clearly identified and coded to the applicable Delta drawing.

8.2.2 Voltage: The remote control panel shall operate on 24 VDC.

8.2.3 Panel shall be equipped with a timer circuit to notify the operator via an annunciator "squealer" that the Barrier has been left in the up position for too long time period. The time interval shall be pre set at the factory.

8.2.4 Position Indicating Lights. The Barrier shall be supplied with a limit switch to actuate when the Barrier is securely down. The limit switch shall operate panel lights to indicate the Barrier secure and not secure condition.

9. KEYED PUSH BUTTON SWITCH STATION **

9.1 The Barricade Ramp shall be remotely controlled from a Keyed Push Button Station. The Station shall include 'Barrier Raise' and 'Barrier Lower' push buttons and a locking key switch.

* Optional Feature

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9.2 The station shall be suitable for stand-alone or console mounting and will be oil, dust and drip tight (NEMA 3 equivalent).

10. **TRANSPORTER. The Barrier system shall be mounted on a single axle transporter with** torsion suspension configured for towing behind pick-up truck or equivalent. Within facility towing a golf cart may be used.

11. The Barrier shall be furnished with all necessary running lights, safety chains, electric brakes and other running gear acceptable to most domestic State highway departments. (Special equipment category.)

10.1 The Gross Vehicle weight including Barrier shall be approximately 5,635 pounds.

10.2 Tongue weight: approximately 148 pounds (nominal).

11. **QUALITY ASSURANCE PROVISIONS**

11.1 Testing. Upon completion, the Barrier system will be fully tested in the manufacturer's shop. The following checks shall be made:

11.1.1 Identification: A nameplate with manufacturer's name, model number, serial number and year built shall be located at the hinged end structure.

11.1.2 Workmanship: The Barrier shall have a neat and workmanlike appearance.

11.1.3 Dimensions: Principle dimensions shall be checked against drawings and ordering information.

11.1.4 Finish: Coatings shall be checked against ordering information and shall be workmanlike in appearance.

* Optional Feature

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12. PREPARATION FOR SHIPMENT.

- 12.1 The Barrier system shall be crated or mounted on skids as necessary to prevent damage from handling. The shipping container(s) shall be of sufficient structural integrity to enable the assembly to be lifted and transported by overhead crane or forklift without failure.

13. DISCLAIMER

Please note - careful consideration must be devoted to the selection, placement and design of a Vehicle Barrier. Just as in the case of any traffic system, perimeter security device or security gate that blocks a roadway or drive, care must be taken to ensure that approaching vehicles as well as pedestrians are fully aware of the Barriers and their operation. Proper illumination, clearly worded warning signs, auxiliary devices such as semaphore gates, stop-go signal lights, audible warning devices, speed bumps, flashing lights, beacons, etc. should be considered. Delta has information available on many such auxiliary safety equipment not specifically listed herein. It is strongly recommended that an architect and or a traffic and or safety engineer be consulted prior to installation of a Barricade system. Delta will offer all possible assistance in designing the operating equipment, controls and the overall system but we are not qualified nor do we purport to offer either traffic or safety engineering information. This device is not suited for pedestrian control.

14. PROCUREMENT SOURCE

The Model DSC1000 Portable Crash Certified Barrier System shall be purchased from:

DELTA SCIENTIFIC CORPORATION

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* Optional Feature

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