

## MODEL DSC2000 SYSTEM MODULAR PHALANX® TYPE BARRICADE SYSTEM

This Procurement Specification defines a FULL SCALE CRASH TESTED AND CERTIFIED – PHALANX® TYPE COUNTER TERRORIST BARRIER SYSTEM - Model DSC2000. Each System consists of an array of three Barrier Modules or more.

### SYNOPSIS

- The Model DSC2000 Barrier System has been tested in full scale configuration in accordance with the Department of State *Certification Standard Test Method for Vehicle Crash Testing of Perimeter Barriers and Gates*, SD-STD-02.01, Revision A, March 2003. The rating is **K12.**

### UNITED KINGDOM CRASH TEST

- The DSC501 has been tested to the United Kingdom BSI Standard PAS:68 2007 Crash Test. 7.5 Tonne EU truck at 80 kph. Two Meter penetration and partially functional after the vehicle was removed. The two outer barricades were operational. Second attack readiness demonstrated. Passed Test.
- The DSC2000 System consists of an array of Three Barrier Modules, or more that are positioned across a traffic-way to be protected. Arrays are used to cover wide entrances. Up to twelve modules have been run from a single HPU.
- In the lowered, 'free passage' position, the Barrier Modules are completely flush with the roadway. There are no buttresses, raised plates, counterweights, back braces or bolt heads that might trip pedestrians or impede authorized vehicular traffic.
- The DSC2000 Barrier System requires a foundation depth of only **11.0 inches (279mm).**
- In the Emergency Operating mode the Barrier Modules are brought to a full guard position in less than **0.5 seconds.**
- To simplify installation the Barrier Modules do not have to be disassembled for interconnection, positioning or casting in place.
- Fully assembled Individual Barrier Modules weigh 1,100 lbs. (499 kg). For 'man-handling' the Modules can be disassembled into two elements each weighing approximately 550 lbs. (249 kg).

- Complete Barrier Modules can be stacked four high for shipping and handling. Individual Modules are 60 in. long 30 in. wide and 10 in. deep (1.520mm X 760mm X 254mm).
- A complete range of Prime Movers, Control Options, Interface Packages, Sensors, Signal Lights, Safety Provisions etc. are available.

## **1.0 SCOPE**

This specification defines the procurement of a MODULAR PHALANX® HYDRAULIC BARRICADE SYSTEM Model DSC2000. Each System consists of (one, two, three or four arrays of three Barrier Modules or more) a HYDRAULIC POWER SYSTEM, the CONTROLS AND LOGIC CIRCUITS, FEATURES and OPTIONS as defined herein.

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## **2.0 SYSTEM CONFIGURATION**

### **2.1 BARRICADE (S)**

- 2.1.1 Barricade Construction. Each Barricade Module shall be a shallow frame below grade assembly that can be cast in a foundation of 11 inches [279mm] in depth. The assembly shall have a heavy steel ramp weldment capable of being rotated to an above grade position. The guard position shall present a formidable obstacle to approaching vehicles. Upon impact, forces shall be first absorbed by the Ramp weldment and then transmitted to the foundation of the unit.
- 2.1.2 Barricade Modules Height. In the full guard position the height of the Barricade Modules shall be 36 inches [914mm] as measured from the top of the foundation frame to the top of the barrier Ramp
- 2.1.3 Barricade Array Length. An array of three Barrier Modules shall have a length of 108 inch [2.74mm]. Individual Barrier Modules are 24 inches [609mm) long – the spacing between ramps will be 18 inches [457mm].
- 2.1.4 Frame / Foundation Depth. The frame of the Barrier Module shall be 10 inches [254 mm] deep. The foundation depth is 11.0 inches [279mm].
- 2.1.5 Safety / Visibility Panel. Descending from the front edge of the Barrier Ramp shall be a rigid panel containing a red reflective lens. (A red warning light may be specified) The height of the panel shall be 12.0 inches [304 mm].

2.1.6 The Safety/Visibility Panel shall have yellow/white (alternately yellow/black) diagonal stripes.

2.1.7 Serviceability of Safety / Visibility Panel. The panel and side skirts, mounted on the Ramp Weldment shall be readily removable to facilitate Barrier Maintenance and Service using standard hand tools.

2.1.6 Finish. The roadway plates shall have yellow/white (alternately yellow/black) diagonal stripes and have a non-skid surface.

## 2.2 HYDRAULIC POWER UNIT (HPU)

2.2.1 Hydraulic Circuit. Circuit shall incorporate the design concepts as described by US Patent # 4,490,068. Unit shall consist of an electrically driven hydraulic pump, which shall pressurize a high pressure manifold connected to a hydraulic accumulator. Electrically actuated valves shall be installed on the manifold to allow oil to be directed to the hydraulic cylinders to raise and lower the Barricade. The hydraulic circuit shall include all necessary control logic devices, interconnect lines and valves to override and lock out the normal speed control valve(s) for emergency fast operation of the Barricade(s).

2.2.2 Main Power. The electric motor driving the hydraulic pump shall be fed from (specify actual sit voltage, phase and frequency, i.e. 230/3/60). Motor shall be sufficiently sized for the expected number of Barricade operations.

2.2.3 Power Off Operation. The accumulator shall be sized to allow \_\_\_\_\_(specify number of half-cycle operations required) of a single Barricade Array in the event of a power outage. Enhanced power off capability can be selected as an option. The control valves shall also be manually operable in this case.

2.2.4 Manual Operation. A hand pump shall be furnished to allow the Barricades Array to be raised manually in the event of a prolonged power interruption.

2.2.5 Construction. The hydraulic power unit and accessories shall be mounted and wired on an integral steel skid. The HPU shall fit in an envelope 60 inches W x 36 inches D x 60 inches H [1524 mm W x 914 mm D x 1524 mm H]. The HPU shall be mounted indoors or in an optional weather resistant enclosure.

## 2.3 CONTROL AND LOGIC CIRCUITS

The following circuits and control stations shall be furnished:

2.3.1 Control Circuit. A control circuit shall be provided to interface between all Barricade control stations and the hydraulic power unit. This circuit shall contain all relays, timers, logic circuits and other devices necessary for the Barricade operation.

2.3.1.1 Voltage. The control circuit shall operate from a 120 volt, 50/60 Hz, 10 amp supply (optionally 240volt, 50/60 Hz). An internally mounted power supply shall convert this to 24 VDC for logic functions, all external control stations, indicator lights and valve actuation.

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

(The following control station(s) can be specified).

2.3.2 Remote Control Master Panel (No Slave Panel). A remote control master panel shall be supplied to control Barricade functions. This panel shall have a key lockable main switch with "main power on" and "panel on" lights. Buttons to raise and lower each Barricade Array (or set[s]) shall be provided. Barricade Array "up" and "down" indicator lights shall be included for each Barricade Array (or set[s]). The emergency fast operate (EFO) feature shall be operated from a pushbutton larger than the normal controls (optionally a covered toggle switch). The EFO shall also be furnished with EFO active light and reset button.

(Select Control Panel 2.3.3 instead of 2.3.2 if Slave Panel 2.3.4 is desired.)

2.3.3 Remote Control Master Panel. (With Slave Panel[s]) A remote control master panel shall be supplied to control Barricade function. This panel shall have a key lockable main switch with "main power on" and "panel on" lights. Buttons to raise and lower each Barricade Array (or set[s]) shall be provided. Barricade "up" and "down" indicator lights shall be included for each Barricade Array (or set[s]). The emergency fast operate circuit (EFO) feature shall be operated from a pushbutton larger than the normal controls (optionally a covered toggle switch). The EFO shall be furnished with EFO active light and reset button. The remote control master panel shall have a key lockable switch to arm or disarm the remote slave panel(s). An indicator light shall show if the slave panel is armed

2.3.4 Remote Control Slave Panel. A remote control slave panel shall also be supplied to control the Barricade operation. This panel shall have a "panel on" light that is lit when enabled by a switch on the remote control master panel. Buttons to raise or lower each Barricade Array (or set) shall be provided. Barricade "up" and "down" indicator lights shall be included for each Barricade Array (or set). The emergency fast operate (EFO) feature shall be operated from a pushbutton larger than the normal controls (optionally a covered

toggle switch). When the slave panel EFO is pushed, an EFO "active" lamp will light and operation of the Barricade(s) will not be possible until reset at the master panel.

2.3.2.1 Voltage. The remote control panel(s) shall operate on 24 VDC.

2.3.2.2 Construction. The remote control station(s) shall be housed in a standard 19 inch electronics rack type surface mount panel with all devices wired to a terminal strip on the back.

2.3.2.3 (Option) Panel(s) shall be equipped with a timer circuit to notify the operator via an annunciator "squealer" that the Barricade array(s) has been left in the down position for too long a time period. The alarm is reset when the Barricades are returned to the up position.

### **3.0 ACCESSORY EQUIPMENT** (Any or all of the following may be selected):

3.1 Auxiliary Emergency Fast Operate Circuit. A separate hydraulic circuit consisting of a pressure reserve source, operating control logic and interconnect lines and valves shall be supplied. This circuit shall provide an available source of power to operate the Barricade Array(s) at emergency fast speed (as specified in 4.4.2), even after power off or manual operation or high frequency operation has depleted the normal reserve capacity. This system will operate in conjunction with and from normal EFO controls.

3.2 Electro-Mechanical Signal Gate. An electrically operated wood arm signal gate shall be supplied to alert vehicle drivers of the Barricade position. The gate operate shall interface with the Barricade Array(s) at the control circuit. The control circuit shall close the gate at the Barricade array "up" command and remain closed until the Barricade Array is fully lowered. The wood arm shall be \_\_\_ foot (6, 8, 10 or 12 foot can be specified) long and be striped with reflective yellow/black tape. The gate assembly shall be mountable directly to the roadway surface.

3.3 Stop/Go Traffic Lights. Red/Green 8 inch stand alone traffic lights shall be supplied to alert vehicle drivers of the Barricade position. The green light shall indicate that the Barricade is fully down. All other positions shall cause the light to show red. Brackets shall be supplied to allow light(s) to be located on a (3.5 inch OD post) (wall) (3.5 inch OD post - back to back). The light operating voltage shall be 120 Volt (alternately 240 Volt), power consumption 40 watts per incandescent light. (alternatively, LED lights may be specified).

3.4 Sump Pump. A self priming sump pump shall be supplied to drain water collected in the

Barricade foundation. The pump shall have the capacity to remove \_\_\_\_ inches per minute of rainfall a distance of \_\_\_\_\_ feet to customer supplied discharge drain. Pump operating voltage shall be 120/1/50-60 (alternately 240/1/50-60).

- 3.5 Safety Interlock Detector. A vehicle detector safety loop shall be supplied to prevent the Barricade from being accidentally raised under an authorized vehicle. The detector shall utilize digital logic have fully automatic tuning for stable and accurate long term reliability. The output of the detector shall delay any Barricade Array rise signal (except for EFO command) when a vehicle is over the loop.
- 3.6 Enhanced Power Off Capability. The hydraulic accumulator shall be sized to provide \_\_\_\_ half cycle operations of a single Barricade array (or sets of Barricade array(s)).
- 3.7 Weather Resistant HPU Enclosure. A lockable weather resistant enclosure shall be provided for the HPU. The design shall provide for easy access to the HPU for maintenance and emergency operation of the hydraulic system. Enclosure shall be provided with a corrosion resistant coating and shall be 60 inches W x 36 inches D x 60 inches H [1524 mm W x 914 mm D x 1524 mm H].
- 3.8 Heavy Duty Weather Resistant HPU Enclosure. A lockable weather resistant enclosure shall be provided for the HPU fabricated from not less than 0.25 inch [6,35mm] steel plate. The design shall provide for easy access to the HPU for maintenance and emergency operation of the hydraulic system. Enclosure shall be provided with a corrosion resistant coating and shall be 60 inches W x 36 inches D x 60 inches H [1524 mm W x 914 mm D x 1524 mm H].

#### **4.0 PERFORMANCE**

- 4.1 Experience. Barricade Systems and auxiliaries shall be of proven design. Manufacturer shall have had 7,000 Phalanx type Barricade Systems in field operation for a minimum of 11 years with documented field experience for all major components and design features.
- 4.2 Qualification Test. Barricade System design shall have successfully passed an actual full scale crash test conducted by a qualified independent agency.
- 4.2.1 Performance Evaluation. The Barricade System shall have a performance evaluation per D.O.S. Specification SD-SDT-02.01, Revision A (Dated March 2003) of K12.

#### **4.3 STOPPING CAPACITY.**

4.3.1 Normal Operation. Barricade Array(s) shall provide excellent security and positive control of normal traffic in both directions by providing an almost insurmountable obstacle to non-armored or non-tracked vehicles. The Barricade System shall be designed to stop a vehicle attacking from either direction.

4.3.2 High Energy Attack. A Barricade Array 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 Barricade System shall be designed to destroy the front suspension system, steering linkage, engine crankcase and portions of the drive train. Significant damage to the Barricade System is probable at these levels.

4.3.2.1 The Barricade System shall be capable of stopping and destroying a vehicle (s0 weighing:

20,000 pounds at 52.5 mph [88.9 KN at 84.5 kph]  
32,000 pounds at 41.3 mph [142 KN at 66.4 kph]

#### 4.4 SPEED OF OPERATION.

4.4.1 Normal Operation. Each individual Module (or array) shall be capable of being raised or lowered in 3 to 15 seconds (customer adjustable) when operated at a repetition rate not greater than specified in paragraph 4.5. Barricade Ramp direction shall be instantly reversible at any point in its cycle from the control stations.

4.4.2 Emergency Fast Operation. Barricade Array(s) shall rise to the guard position from fully down in 0.5 seconds maximum when the emergency fast operate button is pushed provided the system has not previously been exhausted by power off or manual operation or high speed cycle rates exceeding that specified in paragraph 4.5. Barricade Array(s) shall remain in the up and locked position (normal up/down buttons inoperable) until the EFO condition is reset. (See 3.1 for auxiliary emergency fast operate system option).

4.5 FREQUENCY OF OPERATION. Barricade Array(s) shall be capable of \_\_\_\_ (specify up to 120 cycles per hour) complete up/down cycles per hour.

#### 5.0 ENVIRONMENTAL DATA (Please supply the following):

Barricade shall operate satisfactorily under the following environmental conditions:

5.1 Extremes in temperature

Yearly maximum drybulb temp \_\_\_\_\_ f/c

Yearly minimum drybulb temp \_\_\_\_\_ f/c

## 5.2 Rainfall

Yearly average \_\_\_\_\_ inches

Maximum expected hourly rate \_\_\_\_\_ inches / hour

## 5.3 Snowfall

Maximum expected hourly rate \_\_\_\_\_ inches/hour

Roadway will be (mechanically/manually/chemically) cleared \_\_\_\_\_.

## 6.0 QUALITY ASSURANCE PROVISIONS

6.1 Testing. Upon completion, the Barricade System will be fully tested in the manufacturer's shop. In addition to complete cycle testing to verify function and operating speeds, the following checks shall be made:

6.1.1 Identification. A nameplate with manufacturer's name, model number, serial number and year built shall be located within the maintenance access area.

6.1.2 Workmanship. The Barricade System and subsystems shall have a neat and workmanlike appearance.

6.1.3 Dimensions. Principal dimensions shall be checked against drawings and ordering information.

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

## 7.0 PREPARATION FOR SHIPMENT

7.1 The Barricade 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.

## 8.0 MANUFACTURER'S DATA

8.1 Drawings and installation data. The Barricade System drawings and installation, maintenance and operating manuals shall be sent to purchaser within 4 weeks of order. \_\_\_\_ additional copies shall be supplied (1 copy supplied at no cost).



## 9.0 DISCLAIMER

Please note - careful consideration must be devoted to the selection, placement and design of a Barricade installation. Just as in the case of any Barricade system, perimeter security device or security gate that blocks a roadway or drive, care must be taken to ensure that approaching vehicle as well as pedestrians are fully aware of the Barricades 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.

## 10.0 PROCUREMENT SOURCE

The **Model DSC2000** Modular Phalanx ® Type Barricade System shall be purchased from:

### **DELTA SCIENTIFIC CORPORATION**

24901 West Avenue Stanford  
Valencia, California, 91355, USA  
Phone (661) 257-1800  
FAX (661) 257-1081  
Email [admin@deltascientific.com](mailto:admin@deltascientific.com)