

**MODEL DSC1400
PHALANX® TYPE BARRIER SYSTEM
SURFACE MOUNTED
ELECTRO-HYDRAULIC DRIVE
SELF CONTAINED**

This Procurement Specification defines a Traffic Control Barricade using Delta Scientific Corp. – PHALANX® TYPE

SYNOPSIS

- The DSC1400 has been engineered to withstand a K4 (Dept. of State Standard or ASTM Designation F 2656-07, Rating M30, P1 level impact.
- The DSC1400 is a surface mounted, self-contained system. It is supplied with an Electro-Hydraulic Drive System. The drive system can be specified for operation with either Single or Three-phase power.
- Normal operating speed is 5 seconds for the Electro-Hydraulic power units. Field adjustable speed is standard for the Electro-Hydraulic unit.
- In the Emergency Operating mode the Barrier is brought to a full guard position in 2.0 seconds (nominal). This feature is available only with the Electro-Hydraulic power unit and is an option.
- The DSC1400 can be installed on a flat existing concrete roadway. Normally no excavation is required.
- Time of installation at a prepared site is typically less than 4 hours for a qualified crew.
- A complete range of Prime Movers, Control Options, Interface Packages, Sensors, Signal Lights, Safety Provisions etc. is available.

Specifications subject to revisions without notice.

1.0 SCOPE

This specification defines the procurement of a PHALANX® HYDRAULIC BARRIER SYSTEM Model DSC1400. Each System consists of one Barrier the CONTROLS AND LOGIC CIRCUITS, FEATURES and OPTIONS as defined herein.

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2.0 SYSTEM CONFIGURATION

2.1 BARRIER

2.1.1 Barrier Construction. Each Barrier shall be a surface mount assembly that has a Steel Ground Frame that can be attached directly to an existing roadway, slab and girder floor or other specifically prepared base structures. The Barrier shall have a heavy steel Ramp that can be deployed to the guard position. In that position, it presents a formidable obstacle to approaching vehicles. Upon impact, forces shall be first absorbed by the ramp and then transmitted to the barrier buttresses, the ground plate and the underlying structure/ roadway.

2.1.2 Barrier Height. In the full guard position the height of the Barrier shall be 32 inches [81.28 cm] as measured from the high point of the raised barrier Ramp to the underlying structure / roadway.

2.1.3 Free Traffic Opening. The unobstructed distance between Buttresses shall be 144 inches [366 cm]. Alternate widths are available.

2.1.4 Foot Print shall be 60 inches [152 cm] X the clear opening width + 40 inches. Example: 144 inch [336 cm] clear opening equals a total width of 184 inches (437 cm). The two buttresses, hinges, and thrust transfer blocks shall be welded to the road frame. It shall have a series of drilled 0.75 inch [19 mm] clearance holes to accommodate concrete anchor bolts. Clear opening lengths

Note: Size, number, pattern and diameter of mounting holes can be varied to meet specific underlying structure conditions.

2.1.5 Buttresses. The buttress shall be 32.5 inches [82.6 cm] high by 60 inches [152.4 cm] deep by 24 inches [61 cm] wide for the "power unit buttress" or 16 inches [41 cm] wide for the non power unit buttress.

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- 2.1.6 The power buttresses shall contain the Electro-Hydraulic Power Unit, control and logic circuits, locks and safety devices, and spring assist if applicable.
- 2.1.7 Finish. The roadway plates shall have a non-skid surface. (Special stripping and colors optionally available.)

3.0 PRIME MOVERS

This section defines the specific Operating Speed, Duty Cycle and Power Off and Emergency Fast Operation (EFO) of the Barrier when supplied with an HPU when operating on a Power Source of 115 volts, single phase, 60 hertz, 30 amps or 230 volts, single phase, 60 hertz, 30 amps.

The HPU can be configured to operate from a wide range of voltages, 50 or 60 hertz, single or three phase power sources.

The HPU is located within a buttress of the DSC1400.

3.1 HYDRAULIC POWER UNIT – (HPU)

- 3.1.1 Hydraulic Circuit. Circuit shall incorporate the design concepts as described by U. S. Patent # 4,490,068. Unit shall consist of an electrically driven hydraulic pump that shall pressurize a manifold connected to a hydraulic type accumulator. Electrically actuated valves shall be installed on the manifold to allow oil to be driven to the up and/or down side of a double acting hydraulic cylinder to raise and lower the Bollard.
- 3.1.2 Main Power. The electric motor driving the hydraulic pump shall be fed from a locally available power source of (Specify voltage, frequency, phase and amperage such as:) 115 volts / single phase/ 60 hertz /30 amps).
- 3.1.3 Power Off Operation. An internal accumulator shall be sized to allow one and one half full cycle operations of the Barricade in the event of a power outage. The bi-directional control valve shall be manually operable in the event of a power outage.
- 3.1.4 Manual Operation. A hand pump shall be furnished to allow the Barricade to be raised manually in the event of a prolonged power interruption. Barrier can be lowered manually at any time irrespective of the power status.

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- 3.1.5 Construction. The hydraulic power unit and accessories shall be mounted in the left hand buttress. (Defined as the buttress on the left side of a barrier as seen by a vehicle approaching from the attack side. Note – the handing can be reversed at the time of ordering.) Alternatively the HPU shall be mounted indoors or in a stand-alone weather resistant enclosure.
- 3.1.6 Emergency Fast Operate. (EFO) The Barrier shall be brought to a full guard position in 2.0 seconds (nominal). EFO speed based on normal pressure and accumulator charge at time of actuation. Standby pressure reserve for EFO is available optionally.
- 3.1.7 Normal Speed of Operation. Barrier shall be capable of being raised or lowered in 5 to 15 seconds (customer adjustable) when operated at a repetition rate not greater than 4 cycles per minutes.
- 3.1.8 Barrier direction shall be instantly reversible at any point in its cycle from the control stations.
- 3.2.5 Barrier direction shall be reversible at any point in its cycle from the control station(s).
- 3.2.6 Number of cycles per 24 hour period _____. Peak number of cycles per hour _____.

4.0 CONTROL AND LOGIC CIRCUITS

Note. The DSC1400 Barrier can be supplied with Standard Push Button Controller Stations, Touch Screen Control Panels, and Touch Screen Control Panels with Video Monitoring as required.

- 4.1.1 Control Circuit. A control circuit shall be provided to interface between the DSC1400 control station and the hydraulic power unit (HPU). This circuit shall contain all relays, timers and other devices necessary for the Barricade operation.
 - 4.1.1.1 Voltage. The control circuit voltage, 24 VDC shall be provide from an internally mounted power supply/transformer.
 - 4.1.1.2 Construction. The control circuit shall be mounted in a general purpose enclosure. All device interconnect lines shall be run to terminal strips.

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4.2 Push Button Controls. The following circuits and control stations shall be furnished:

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

4.2.1 Remote Control Panel. A remote control panel shall be supplied to control the Barrier operation. This panel shall have a key lockable main switch with "main power on" and "panel on" lights. Buttons to raise or lower the Barrier shall be provided. Barrier up and down indicator lights shall be included for each Barrier.

4.2.1.1 Voltage. The remote control panel shall operate on 24 VDC.

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

4.2.1.3 Panel shall be equipped with a timer circuit to notify the operator via an annunciator "squealer" that the Barricade has been left in the down position for too long a time period.

(Select Control Panel 4.2.2 instead of 4.2.1 if Slave Panel 4.2.3 is desired.)

4.2.2 Remote Control Master Panel. A remote control master panel shall be supplied to control Barrier function. This panel shall have a key lockable main switch with "main power on" and "panel on" lights. Buttons to raise and lower the Barrier shall be provided. Barrier "up" and "down" indicator lights shall be included for each Barrier.

4.2.2.1 Voltage. The remote control panel shall operate on 24 VDC.

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

4.2.2.3 Panel shall be equipped with a timer circuit to notify the operator via an annunciator "squealer" that the Barricade has been left in the down position for too long a time period.

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4.2.3 (Option) Remote Control Slave Panel. A remote control slave panel shall also be supplied to control the Barrier 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 Barrier shall be provided. Barrier "up" and "down" indicator lights shall be included for each Barrier.

4.2.3.1 Voltage. The remote control panel shall operate on 24 VDC.

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

4.2.3.3 Panel shall be equipped with a timer circuit to notify the operator via an annunciator "squealer" that the Barrier has been left in the down position for too long a time period. The time interval shall be customer selectable.

4.3 TOUCH SCREEN CONTROLS

Note. Touch Screen Controls including Touch Screen with Video Monitoring are available in a wide range of options and combinations. For detailed information contact Delta Scientific Engineering.

4.3.1 General. The controls shall consist of an eight-inch flat screen control panel with color graphic display. The panel will show control "buttons" and graphic representation of the barricade status and cycling graphic displays of the vehicle barricade(s) that changes position (up or down) with the operation of the vehicle barricade. The display will also indicate red when the barricade is in the secure up position (gate closed) and green when in the down and open position (gate open). The flat screen shall be capable of controlling up to four barricades, emergency fast mode and reset, data logging of touch screen events and arming and disarming with a keypad password. Master and multiple Slave Panel combination shall be available.

4.3.2 Plug and Play. The touch screen control panel shall be capable of "Plug and Play" by linking the panel to the Programmable Logic Controller in the motor drive unit (HPU) (EMD) via a category five data cable with Ethernet connectors.

4.3.3 Screen Button Safety. To reduce the possibility of accidental actuation of the controls, the screen buttons shall be programmed to require a holding contact by the operator in order to actuate the barricade.

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- 4.3.4 Emergency Fast Operation (EFO). The touch screen control panel shall have a secondary confirming window that asks the operator to confirm the EFO operation. A second holding contact shall provides an exit function if the screen button was accidentally pushed or the threat ceases. (Emergency Fast Operation is only available with the (HPU) operating prime mover).
- 4.3.5 Data Logging. The touch screen control panel shall have the capability to data log the date, time and events that occur with the control panels. Access to the data will be password protected and downloadable with a USB thumb drive. The touch screen control panel shall be capable of upgrades and changes with a password protected and unloadable from a USB thumb drive.
- 4.3.6 Site Specific Displays. The touch screen control panel shall be capable of site specific labeling of the barricades displayed. Such as "Exit Barrier" or VIP Drive Barrier". (This shall be available on a customized contract basis.)
- 5.0 Accessory Equipment (Any or all of the following may be selected):
 - 5.1 Electro-Mechanical Signal Gate. A 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 circuit. The control circuit shall close the gate at the Barrier "up" command and remain closed until the Barrier 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.
 - 5.2 Stop/Go Traffic Lights. Red/Green 8 inch traffic lights shall be supplied to alert vehicle drivers of the Barrier position. The green light shall indicate that the Barrier 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 volts (alternately 240 volts), power consumption 40 watts per light.
 - 5.3 Safety Interlock Detector. A Barrier detector safety loop shall be supplied to prevent the Barrier 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 Barrier rise signal when a vehicle is over the loop.
 - 5.4 IR beam safety interlock. Infrared sensor mounted in the buttress suppress the normal up command if a vehicle or pedestrian is blocking the beam. (Emergency fast mode will not be limited).

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6.0 PERFORMANCE

6.1 EXPERIENCE. Barrier and auxiliary equipment shall be of proven design. Manufacturer shall have over 10,000 Barrier type vehicle barriers in field operation for a minimum of 20 years with documented field experience for all major components and design features.

6.4 The DSC1400 has been certified by mathematical analysis to be capable of stopping and destroying a Diesel truck weighing 15,000 pounds gross vehicle weight) traveling 30 mph. (ASTM Designation F 2656-07, Rating M30, P1). K4 equivalent.

7.0 ENVIRONMENTAL DATA (Please supply the following):
Barrier shall operate satisfactorily under the following environmental conditions:

7.1 Extremes in temperature

Yearly maximum drybulb temp _____ °F/C.

Yearly minimum drybulb temp _____ °F/C.

7.3 Snowfall

Maximum expected hourly rate _____ inches/hour.

Roadway will be (mechanically/manually/chemically) cleared _____.

8.0 QUALITY ASSURANCE PROVISIONS

8.1 Testing. Upon completion, the Barrier 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:

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

8.3 Workmanship. The Barrier and subsystems shall have a neat and workmanlike appearance.

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

8.5 Finish. Coatings shall be checked against ordering information and shall be workman like in appearance.

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9.0 PREPARATION FOR SHIPMENT

9.1 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.

10.0 MANUFACTURER'S DATA

10.1 Drawings and installation data. The Barrier 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).

11.0 DISCLAIMER

Please note - careful consideration must be devoted to the selection, placement and design of a Barrier 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 vehicles as well as pedestrians are fully aware of the Barrier 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 Barrier 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.

12.0 PROCUREMENT SOURCE

12.1 The Model DSC1400 Phalanx ® Type Barrier System shall be purchased from:

DELTA SCIENTIFIC CORPORATION
40355 Delta Lane
Palmdale, California, 93551, USA
Phone (661) 575 1100
Email info@deltascientific.com

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