



Marshall's

Creating Better Spaces

OPERATING AND MAINTENANCE MANUAL

MANUAL TERRA QUANTUM BOLLARDS MKI



Preface

This manual relates to the Terra Bollards, which is supplied by Marshalls LP USA. Any queries regarding the operation or maintenance of this equipment should be referred to:

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Test data:

The Innovative Side Folding HVM Bollard has been successfully impact

- PAS 68 Terra Quantum Bollard 7.5t @ 30mph
- V/7500[N2]/48/90:0.0/0.0

Tested dimensions: lift height 925mm

« PAS 68 V/7500[N2]/48/90:0.0/1.5 »

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MANUAL TERRA QUANTUM BOLLARD



Pictured here as a Dual Terra Quantum Bollard system



The Innovative Side Folding HVM Bollard has been successfully impact tested to PAS 68 with 7.5t @ 30mph.

- PAS 68 Terra Quantum Bollard 7.5t @ 30mph
- V/7500[N2]/48/90:0.0/1.5

Tested dimensions: lift height 925mm

BENEFITS & FEATURES

- The Terra Quantum Bollard Innovative Direction of Travel - Side Folding Bollard uniquely raises and lowers.
- The Retractable Bollard is twinned with a static unit and is manually operated.
- Each bollard has a manual hydraulic power unit including hydraulic reservoir, manual hand pump and manual release valve within the bollard enclosure.
- Bollard lid has a gas strut and handle to assist with lifting and a mechanical lock.
- The bollard has a padlockable locking pin within the bollard enclosure.
- 2no Terra Quantum Bollards back to back form a 4m clear aperture.
- The Terra Quantum Bollard can be retrofitted into an existing line of PAS 68 static bollards to provide an HVM access point.
- Control cabinet or self contained unit depending on configuration.

OPTIONS

- 100/200mm Traffic Light System

FINISH OPTIONS

- Polyester Powder Coated
- Stainless Steel Clad

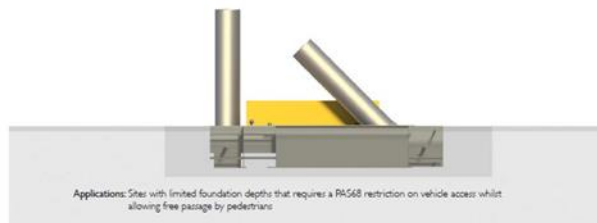
CIVIL REQUIREMENTS

L: 2350 x W: 1000 x D: 450
Control Cabinet Foundation (if required)
L: 800 x W: 800 x D: 300

Note: Power and control wiring ducts may be required

⚠ Depending on configuration

⚠ This is subject to a risk assessment to ensure the automatic equipment complies to BS EN 12453



Applications: Sites with limited foundation depths that requires a PAS68 restriction on vehicle access whilst allowing free passage by pedestrians

Version History

Version	Date	Author	Changes
1.0	January 2015	SN	First Issue
2.0	November 2016	SN	First Issue

Warnings & Cautions

This manual contains various warnings, cautions and notes that are contained within rectangular boxes as shown below:



WARNING

A 'WARNING' BOX CONTAINS INFORMATION WHICH, IF IGNORED, COULD LEAD TO PERSONAL INJURY OR LOSS OF LIFE



CAUTION

A 'CAUTION' BOX CONTAINS INFORMATION WHICH, IF IGNORED, COULD LEAD TO DAMAGE OR FAILURE OF THE EQUIPMENT



NOTE

A 'NOTE' BOX HIGHLIGHTS NON-SAFETY CRITICAL INFORMATION WHICH THE READER SHOULD BE AWARE OF

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1 GENERAL DESCRIPTION

The Marshall's USA manual Terra Quantum Bollard is a rugged underground rising bollard designed to provide a secure access point for vehicles to or from a site. The Terra Quantum Bollard has been successfully impact tested to the latest British PAS68 7.5 tonnes @ 30 MPH (48kph). The type of bollard comes at a standard lift height of 925mm. A typical manual Terra Quantum Bollard installation is shown in the figure below.



Figure 1 – Manual Terra Quantum Bollards (rising)

The manual Terra Quantum Bollard consists of four major components, a rising sleeve, the framework which it sits into, a cabinet which houses the manual hand pump hydraulic system needed to move the rising bollard and a static bollard. This hydraulic system is controlled with a manual hand pump.

The manual Terra Quantum Bollard's mechanical system comprises of a hydraulic ram. The manual hand pump in turn drives the ram. This ram is connected to a box section which forms the main beam of the rising bollard. The hand pump pumps hydraulic oil into the ram. This extends the ram which in turn raises the bollard. The hydraulic pressure in the ram keeps the bollard in the raised position.

1.1 General

Operation of the bollard is controlled by manual hand pump. Further detail on the operation can be found in Section 3.
To lower the manual Terra Quantum Bollard a manual release valve can be operated.

2 TECHNICAL DESCRIPTION

2.1 Technical Standards

The security equipment supplied by Marshall's is designed to high standards in order to achieve maximum reliability in service. Various standards are used during design, manufacture and installation, in addition to specific customer requirements.

Design	
BS 499-2C: 1999	Welding terms and symbols.
BS EN 12424	Resistance to wind load, Requirements
BS EN 12444	Resistance to wind load, Testing
BS 6571-1 to 4: 1989	Specifications for car parking control equipment.
BS EN 13241-1:2003	Industrial, Commercial & Garage Doors and Gates. Product Standard
Steelwork	
BS EN ISO 4063:2010 BE EN 22553:1995	Specification for the use of structural steel in building. Metric Units
BS EN 1090-2: 2008 +A1 2011	Structural use of steelwork in building. Specification for materials, fabrication and erection. Rolled and welded sections.
BS EN 10029: 1991 BS 7668: 2004 BS EN 10013-1 to 3: 1993 BS EN 10210-1: 1997	Specification for weldable structural steels.
BS 6323-3: 1982 BS EN 10297-1: 2003	Specification for seamless and welded steel tubes for automobile, mechanical and general engineering purposes. Specific requirements for hot finished seamless steel tubes.
Hydraulic	
BS EN ISO 4063:2010 BE EN 22553:1995	Specification for the use of structural steel in building. Metric Units
Finish	
BS 4479-1 TO 9: 1990	General recommendations for design of articles that are to be coated.
BS 4652: 1995	Specification for zinc-rich priming paint (organic media).
BS 5252: 1976	Framework for color co-ordination for building purposes.
BS EN ISO 12944-1 to 8: 1998 BS EN ISO 14713: 1999	Protective coating of iron and steel structures against corrosion.
Foundations	
BS EN ISO 4063:2010 BE EN 22553:1995	Specification for the use of structural steel in building. Metric Units

BS EN 206-1: 2000	Specification, performance, production and conformity.
BS EN 1992-1-1: 2004 Euro code 2	Design of concrete structures. General rules, and rules for buildings.
Safety	
BS EN 12433-(1/2):2000	Terminology - Part 1 Types of Doors. Part 2 Parts of Doors
BS EN 12635:2002+A1:2008	Installation and Use
BS EN 12604:2000	Mechanical Aspects - Requirements

[Table 1 – Technical Standards](#)

2.2 Manual Hydraulic System

The hydraulic system in a manual Terra Quantum Bollard comprises of a hydraulic manual hand pump, a dual acting hydraulic cylinder and hydraulic hose. The cylinder is connected to the manual hand pump unit using the hose which is either referred to as the “flow” line or the “return” line depending on whether the cylinder is extending or retracting. Control valves are installed between the handpump and the cylinder and carry out a number of different functions. Typical valves used in a Marshalls USA hydraulic system are as follows:

- Non-return check valves
- Pressure relief valves
- Flow restrictor valves
- Manual release valves

Hydraulic oil is taken into the hydraulic pump inlet from the reservoir via a suction strainer and pumped directly to the cylinder through two non-return check valves. A pressure relief valve is connected between the hydraulic pump and the first non-return check valve which will alleviate any excess pressure generated in the system. A pressure monitoring point is provided to allow the pump output pressure and pressure relief valve to be checked.



WARNING

THE PRESSURE RELIEF VALVE IS SET TO THE CORRECT PRESSURE IN THE FACTORY. DO NOT ATTEMPT TO CHANGE THE SETTINGS OF THIS VALVE WITHOUT THE CORRECT TESTING EQUIPMENT. FAILURE TO OBSERVE THIS MAY LEAD TO FAILURE OF THE EQUIPMENT IN A DANGEROUS MODE.

The second non-return check valve is in parallel with a flow restrictor valve. This non return check valve will allow oil to flow when the cylinder is required to extend, however when the cylinder is required to retract the oil will be directed through the flow restrictor valve. This valve restricts the flow in the return line when the bollard is lowering bringing the bollard to a smooth, gradual stop. Any tendency for the bollard to “jutter” when lowering is reduced as the flow restrictor creates a constant pressure.

To lower the manual Terra Quantum Bollard a manual release valve can be operated.

2.3 Manual Movement



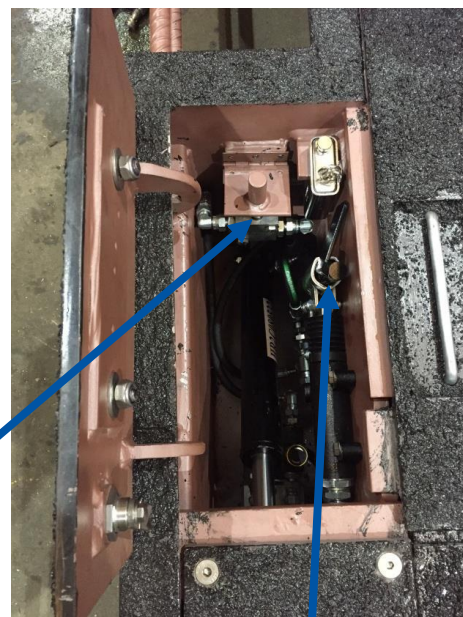
WARNING

WHEN MOVING THE TERRA BOLLARD MANUALLY USING THE PROCEDURES BELOW, ENSURE THAT THE AREA SURROUNDING THE BOLLARD IS CLEAR AS NO SAFETY DEVICES WILL BE IN OPERATION

2.3.1 Raise Manually

If the manual Terra Quantum Bollard is in the lowered position when manual movement is required, carry out the following steps to raise it.:

1. Open the road lids to allow Bollard to be raised
2. Remove security padlock and locking pin
3. Insert the hand pump handle into the hand pump unit (This is shown in the figure 2) and operate pump from side to side until the rising sleeve reaches the fully raised position. This may be determined by the increase in the pressure needed to operate the hand pump.
4. Insert locking pin and security padlock underneath the bollard
5. Lower the road lids



Release Valve

Figure 2 – Hand Pump Unit

Hand Pump

2.3.2 Lower Manually

If the manual Terra Quantum Bollard is in the raised position when the manual movement is required, carry out the following steps to lower it:

1. Open the main lid
2. Remove the locking pin and security padlock from underneath the bollard
3. Insert the hand pump handle into the Release Valve (This is shown in the figure 2) to lower the bollard.
4. Press Release Valve to allow hydraulic oil to flow through the switch
5. Manual push the Quantum Bollard to allow it to lower

3 PREVENTATIVE MAINTENANCE

The security equipment described in this manual is designed to a high standard in order to cope easily with long periods of arduous duty. It is, however, necessary to maintain the working efficiency at a level that reduces wear and tear and so avoids premature breakdown.

A scheme of planned, preventative maintenance will provide an optimum return of safety, reliability and security, at a minimum cost. It is important that experienced maintenance engineers should carry out the works. Marshalls USA will be pleased to quote for a maintenance scheme that may incorporate a guaranteed breakdown response time.



NOTE

A MAINTENANCE LOGBOOK SHOULD BE KEPT FOR THE INSTALLATION, AND A RECORD KEPT OF FAULTS, DAMAGE, BREAKDOWNS AND SPARES USED. THIS RECORD WILL HELP TO IDENTIFY ANY CONTINUING PROBLEMS SUCH AS WORN OR MISALIGNED COMPONENTS. ANY PROBLEMS NOTED DURING ROUTINE CHECKS SHOULD BE REFERRED TO "5.REMEDIAL MAINTENANCE" FOR RECTIFICATION

3.1 General Checks

1. Visual inspection of operation. Check that the bollard moves smoothly without undue noise.
2. Check the security of all bolt fixings that hold the bollard to the foundations.
3. Check for damage to bollard cabinet and rising sleeve. Check paintwork for damage.
4. Clean any accumulated debris from cabinet. Wash down cabinet with water and detergent cleaner. Apply a silicone based polish to the paintwork.

3.2 Mechanical Checks

1. Check all locking nuts are secure and free from damage.

3.3 Hydraulic Checks

1. Check the level of hydraulic oil in the reservoir. Top up where necessary.
2. Inspect all hydraulic hoses and fittings for leaks, wear, chafing and security.
3. Check hydraulic rams and ram anchor points for signs of wear or damage.
4. Check manual release levers are in working order.

3.4 Documentation

1. Ensure the correct documentation for the manual Terra Quantum Bollard is available.
2. Update the Maintenance Log Book where necessary. Record any faults, usage of spares or adjustments which have been carried out.
3. Report any defects, damage or unsafe practices to Marshalls USA.
4. Complete "Bollard Safety Check List"

4 REMEDIAL MAINTENANCE

4.1 General Fault Finding and Rectification

Fault	Likely Cause	Remedy
Bollard remains in Raised Position	Faulty solenoid operated valves	Replace solenoid operated valves
	Damaged hydraulic cylinder	Replace Hydraulic Cylinder
Bollard remains in Lowered Position	Faulty solenoid operated valves	Replace solenoid operated valves
	Damaged hydraulic cylinder	Replace Hydraulic Cylinder
	Hydraulic oil leak / low oil level in reservoir	Check all hoses and fixings
	Pressure relief valve is incorrectly adjusted	Adjust to correct position

Table 2 -General Maintenance

5 DRAWING LIST

The following is a list of drawings which may be found at the end of this document. These drawings and the information contained within them remains the property of Marshall's USA and are supplied to the customer for the customer's own use. The content of these drawings is confidential to Marshall's USA and the customer and may not be disclosed to third parties without prior written permission from the Managing Director of Marshall's USA.

The documents to refer to for the equipment installed by Marshall's USA is as follows:

Ref.	Description	Drawing Reference
1	Installation drawing	6840-01

Table 3 - Drawing List