

PERIMETER SECURITY & HVM

Redeployable Hostile Vehicle Mitigation (HVM) Measures



SYSTRA

Redeployable Hostile Vehicle Mitigation (HVM) Measures

Introduction

The continued threat from terrorism remains real and credible. Enhanced building stand-off protection to deter attack and reduce consequential loss, particularly from vehicle borne improvised explosive devices (VBIEDs) is increasingly specified for many vulnerable site perimeters. SYSTRA's redeployable perimeter and stand-off protection solutions have been designed to deliver unrivalled protection for people and assets against VBIED attack and explosive blasts. The systems can be deployed quickly with minimal disruption, typically on a short or medium term basis, providing an ideal solution for security sensitive locations or events.

Benefits

Unrivalled protection - against vehicular attack, unauthorised vehicle access and explosive blast.

Flexible configurations - schemes can be designed to meet the needs of a wide range of site parameters.

Rapid deployment - units are transported on flatbed trucks for quick and easy unloading.

Security that blends with the environment - specific colour and traffic management options are available.

Impact and blast effect mitigation - the containment of concrete within the SYSTRA units prevents the formation of dangerous secondary projectiles.

Ballistics - tested for BR7 for 7.62mm A.P and 12.7mm (0.5cal) A.P with no spall to BS EN 1063.

Applications

SYSTRA's redeployable HVM systems have been installed at a variety of high-profile locations and temporary venues. Many of these deployments provide operational continuity at each location. Allowing sites to adapt as changes occur to the threat or site operations. The system provides an effective and highly reliable solution to the client's individual changing needs.



System description

The system incorporates a variety of anti-attack vehicle barriers designed to control or prevent access to security sensitive locations.

The barriers are painted as standard using a two-coat paint system in black and yellow as standard. Bespoke colour schemes based on RAL colours with reflective tapes/signage and embellishments are also available on request.

The highly redeployable nature of the system means it can be put into position quickly and then subsequently moved or reconfigured as the need arises, creating a legacy security solution that can be easily adapted to meet changing client requirements.

System performance

SYSTRA anti-attack vehicle barriers have been extensively tested and meet the requirements of the relevant agencies operating within the perimeter security environment.

These tests have included:

- **Vehicle impact** - successfully tested in accordance with PAS68*
- **Blast** - the SYSTRA panel has been successfully tested against a wide range of blast attacks.

Service offering

SYSTRA delivers peace of mind to our customers by offering a complete turnkey project service, including security reviews, security solution design, project management, installation, maintenance and full after-sales service. Our team is available to assist at all stages of a project.

Construction

Our construction material comprises of two steel plates that are connected together to form panels by an array of welded transverse bars. The panels are filled with ready mixed concrete and the resulting composite offers unrivalled protection against explosive blast and impact.

Delivering value to customers

With innovation and continuous improvement at the heart of our business performance, we aim to create value by offering a differentiated product range supported by unrivalled customer service.



*PAS 68 - specification for vehicle security barriers

This Publicly Available Specification (PAS) has been prepared to address the needs of organisations who wish to have assurance that vehicle security barriers will provide the level of impact resistance that they seek. The full PAS classification covers the mass, speed, angle and resulting penetration and dispersion values of an impact test relating to the specified product. See individual product data sheets for detailed PAS classifications of the full range of SYSTRA's Hostile Vehicle Mitigation Measures.

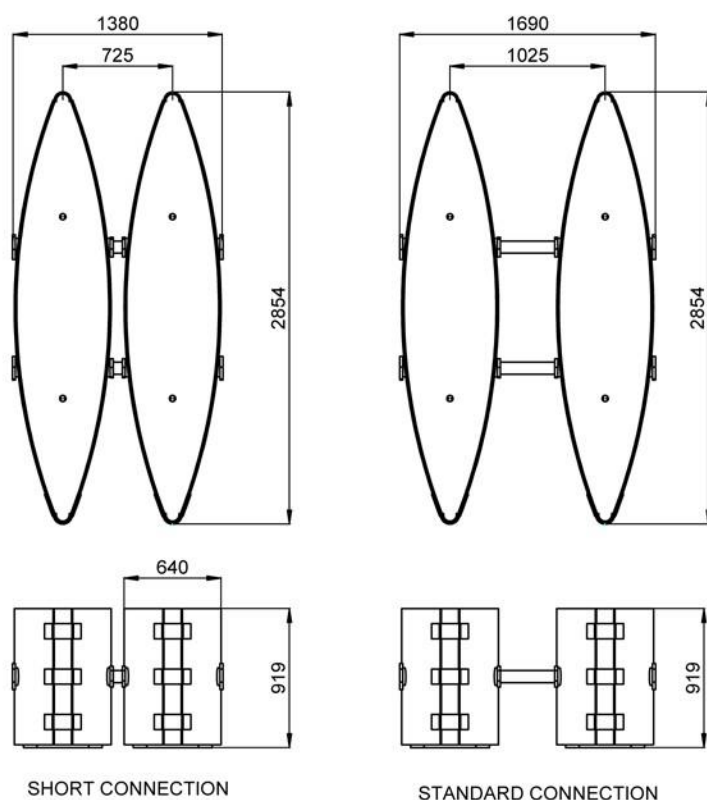
SYSTRA

Barges

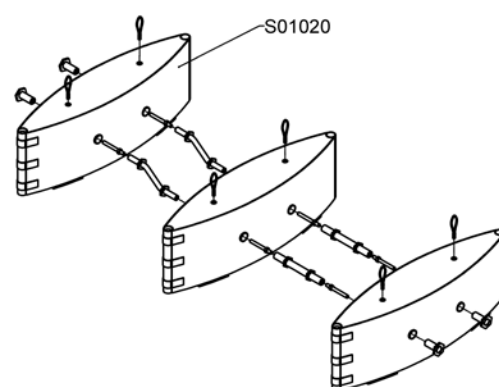
Barge Unit

Barges have been used extensively in all manner of HVM schemes. Whilst they can be used in short runs to provide protection across a small span, they are also used in many other of the SYSTRA HVM products such as the drop arm and swing gates.

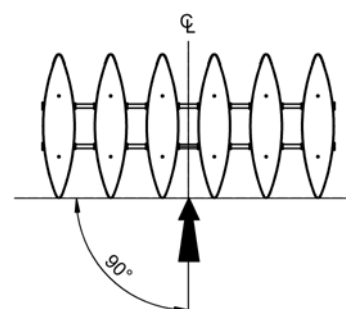
Part No.	Description	Approx. Weight
S01020	Barge	3,072 Kg
Units can be supplied in standard or premium paint finishes.		
Barges can be connected together in a variety of different ways to suit a scheme.		
Typical arrangement also requires 2 no. connection shafts, threaded connections and end caps.		
Barge units can be connected to other products in the SYSTRA HVM range using the appropriate connector.		



I. Elevations and Dimensions



II. Components



III. Test Layout



III: Test layout – PAS68:2010
Temporary Barrier

V1500[M1]/120/90:0.6/0
V7500[N2]/50/90:1.0/0
V7500[N2]/64/90:2/0
V7500[N3]/64/90:5.4/0

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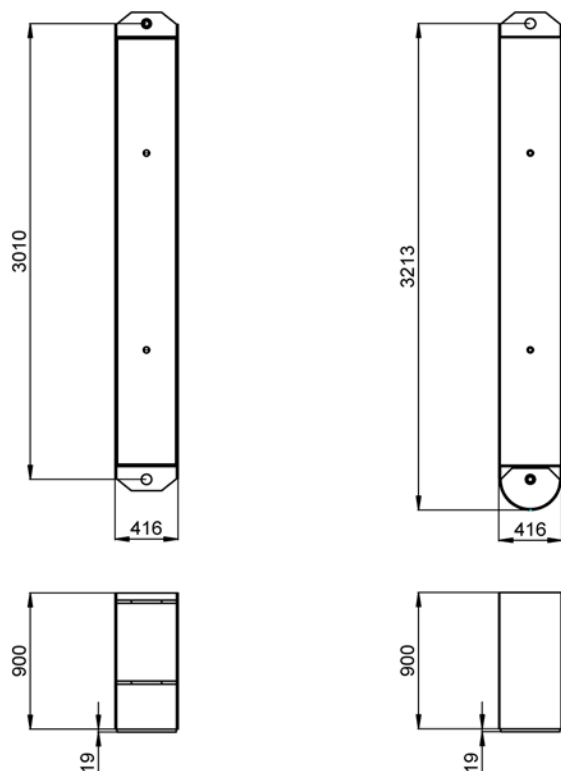
SYSTRA

Barriers

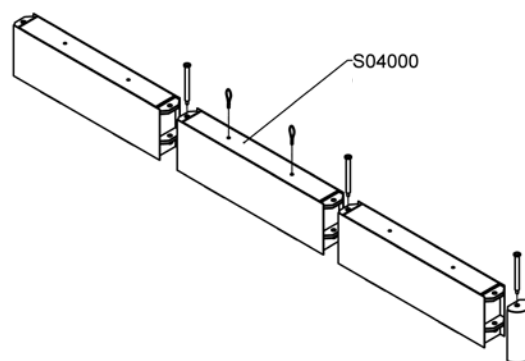
Straight Barrier

Controls traffic effectively across a variety of road layouts. Large numbers of barriers can be linked together to create an extended length of HVM.

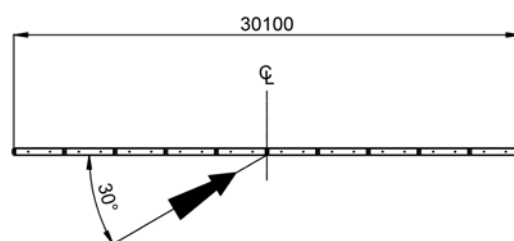
Part No.	Description	Approx. Weight
S04000	Straight Barrier	2858 Kg
Units can be supplied in standard or premium paint finishes.		
Typical arrangement also requires 2 No. connection pins.		
Barrier units can be connected to other SYSTRA HVM solutions using the appropriate connection piece.		



I. Elevations and Dimensions



II. Components



III. Test Layout



III: Test layout – PAS68:2010
Temporary Straight Barrier
V/7500[N2/64/30:0/1.25

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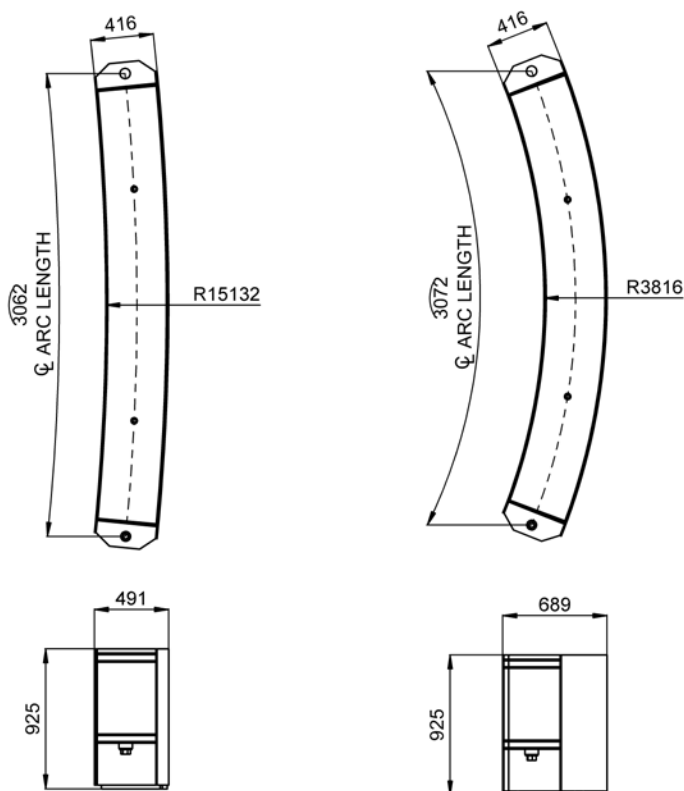
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Barriers

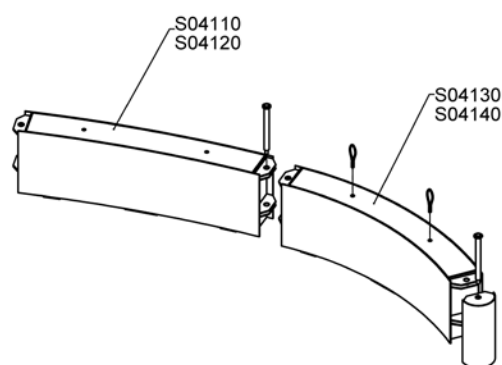
Curved Barriers

Curved barriers are available in a range of angles to suit a wide range of road layouts. They are usually used in conjunction with SYSTRA straight barriers to create full HVM solutions.

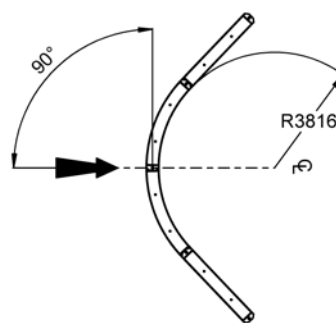
Part No.	Description	Approx. Weight
S04110	Shallow Curved Barrier (Radius 15.13 m) – Right Handed	2,934 Kg
S04120	Shallow Curved Barrier (Radius 15.13 m) – Left Handed	2,934 Kg
S04130	Tight Curved Barrier (Radius 3.81m) – Right Handed	2,928 Kg
S04140	Tight Curved Barrier (Radius 3.81m) – Left Handed	2,928 Kg
Units can be supplied in standard or premium paint finishes.		
Typical arrangement also requires 2 No. connection pins		



I. Elevations and Dimensions



II. Components



III. Test Layout



III: Test layout – PAS68:2010
Temporary Curved Barrier

V7500[N2]/64/90:9.0/0

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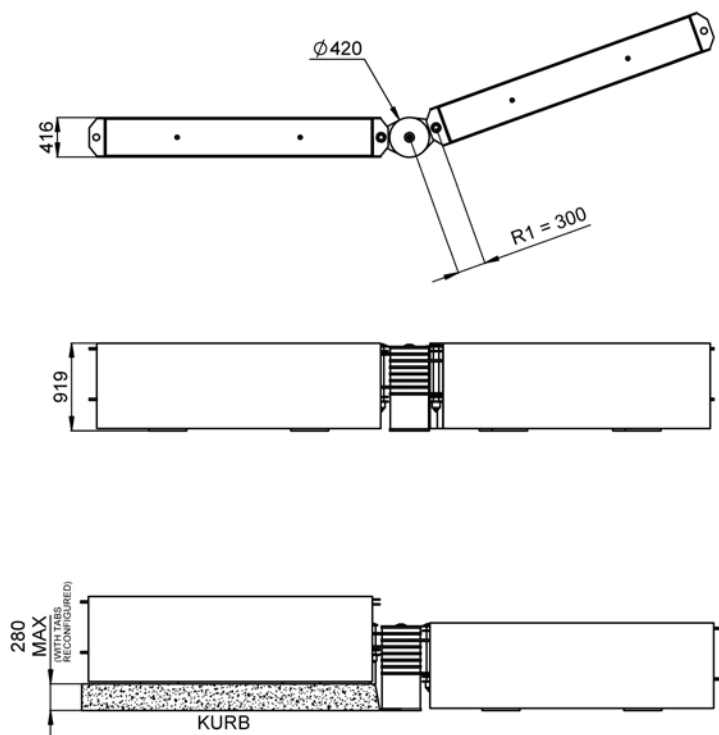
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Barriers

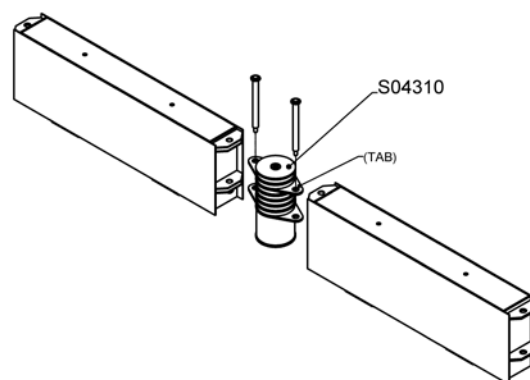
Swivel Post Connector

The swivel post connector allows straight barriers to be orientated at angles to accommodate road layouts. It also allows barriers to be located on sloped or stepped sections of roadway.

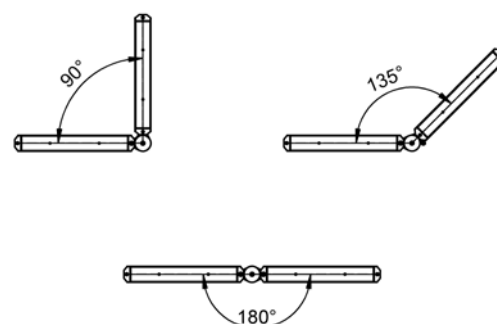
Part No.	Description	Approx. Weight
S04310	Swivel Post Connector	365 Kg
Units can be supplied in standard or premium paint finishes.		
Price of Swivel Post Connector does not include Barriers and other Barrier components.		



I. Elevations and Dimensions



II. Components



III. Swivel Post operation through 90°



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Barriers

Quicklink Lite

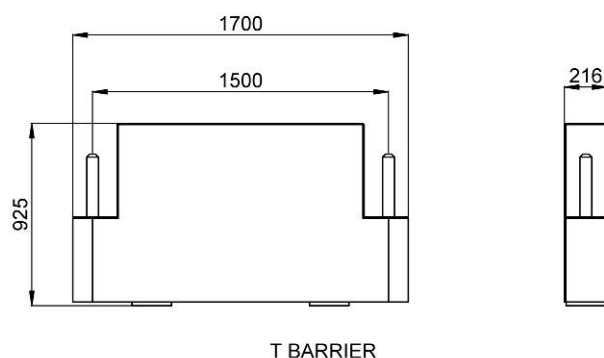
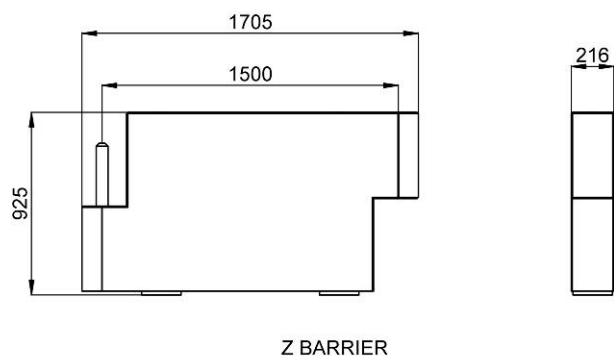
Utilised where a lower rating than our traditional barrier system is required with the added flexibility and speed of deployment of the Quicklink joint. The Quicklink joint allows for rapid movement and deployment of the system.

Part No.	Description	Approx. Weight
S04510	Quicklink Lite Z Barrier	813 kg
S04520	Quicklink Lite T Barrier	825 kg
S04530	Quicklink Lite T Connector	218 kg
S04540	Quicklink Lite Stability Post	227 kg

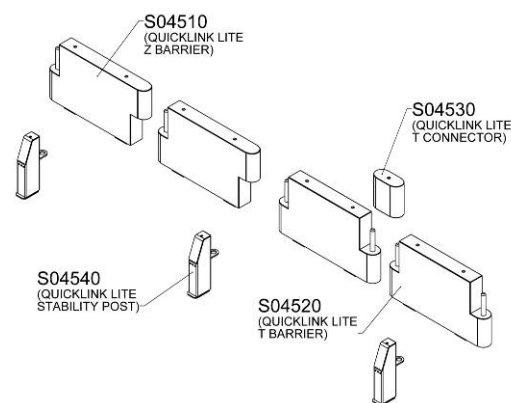
Units can be supplied in standard or premium paint finishes.

Units available in 1.0 m CRS, 1.5 m CRS, 2.0 m CRS and 3M CRS. 1.5 m CRS illustrated.

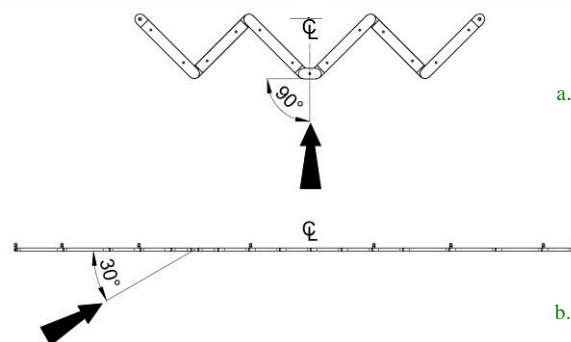
Units can be connected to other products in the SYSTRA HVM range using the appropriate connector.



I. Elevations and Dimensions



II. Components



III. Test Layouts



III: Test layout – PAS68:2010

Herringbone Layout (a): Temporary Barrier V/3500[N1]/48/90:2.9/0

Straight Layout (b): Temporary Barrier V/3500[N1]/48/30:0.3/0

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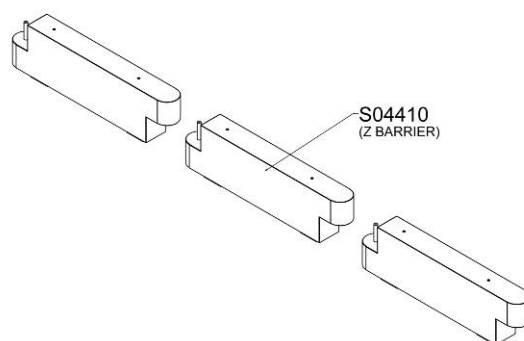
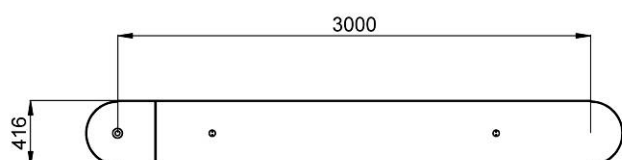
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Barriers

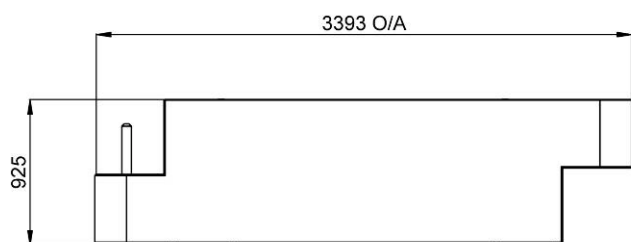
Quicklink Heavy

The latest iteration of our Barrier system providing similar performance to our traditional pinned barriers but with the added flexibility and speed of deployment of the Quicklink joint.

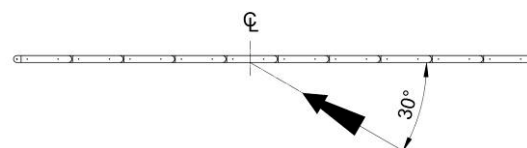
Part No.	Description	Approx. Weight
S04410	Quicklink Heavy 'Z' Barrier	2879 kg
Units can be supplied in standard or premium paint finishes.		
Other lengths of unit available: 1.0 m CRS, 1.5 m CRS, 2.0 m CRS and 3.0 m CRS. 3.0 m CRS illustrated.		
Units can be connected to other products in the SYSTRA HVM range using the appropriate connector.		
End units, linking units and 'T' units also available. Please enquire for more details.		



II. Components



I. Elevations and Dimensions



III. Test Layout



III: Test layout – PAS68:2010
Temporary Quicklink Barrier
V/7500[N2]/64/30:0.5/0

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Gates

Vertical Opening Gate

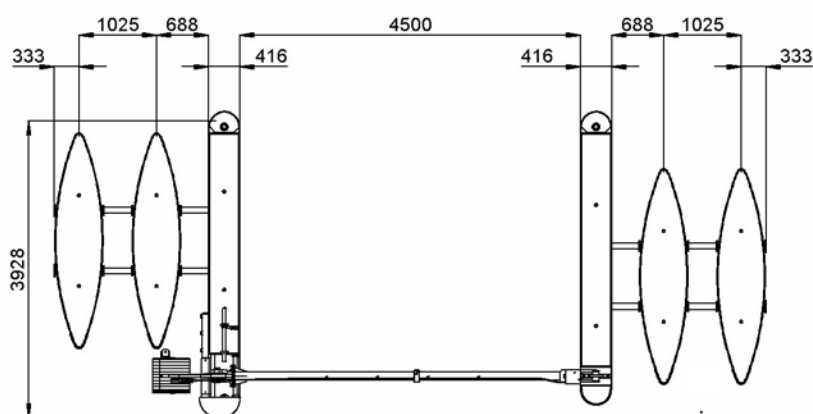
Provides a high level of protection whilst facilitating quick and easy authorised vehicle access. These incorporate heavy steel sections and locking points attached to SYSTRA barges. Gate openings are available up to 6.5m.

Part No.	Description	Approx. Weight
S02100	Hinge Barrier	3,100 Kg
S02300	Latch Barrier	3,500 Kg
S01304	Gate Boom (4.5m Illustrated)	1,450 kg

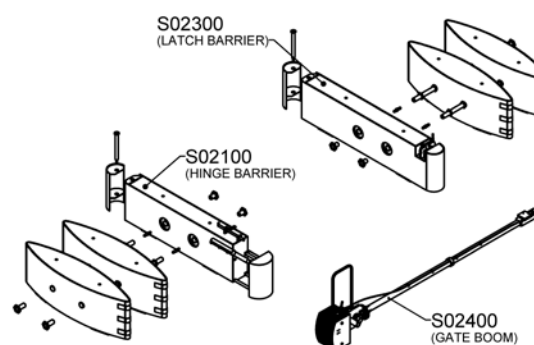
Units can be supplied in standard or premium paint finishes.

Typical arrangement also requires 4 No. Barges and accessories

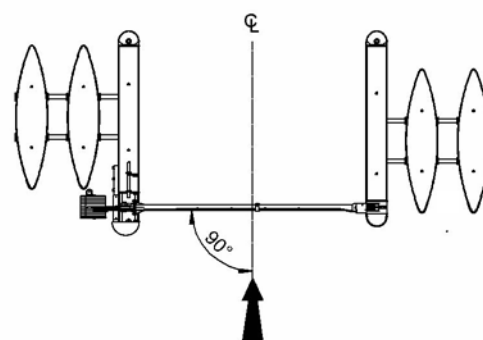
Price of Gate Assembly does not include Barges and Barge Connections



I. Elevations and Dimensions



II. Components



III. Test Layout



III: Test layout – PAS68:2010
Rising Gate

V/7500[N2/48/90:4.7/0

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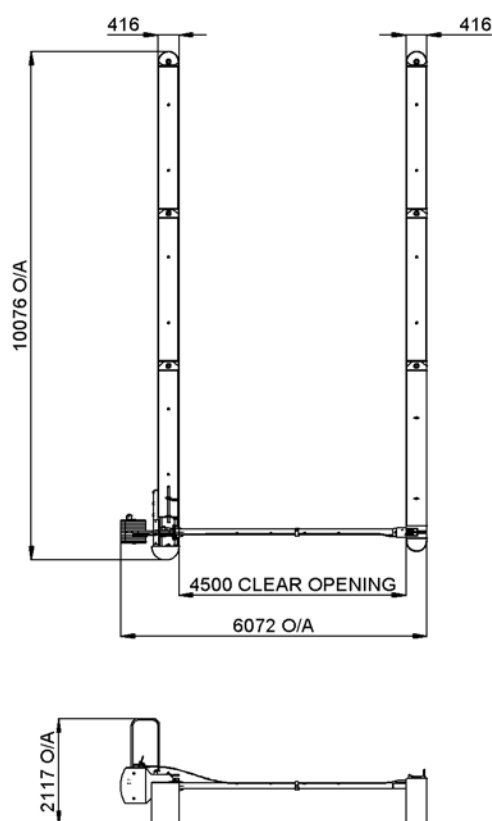
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Gates

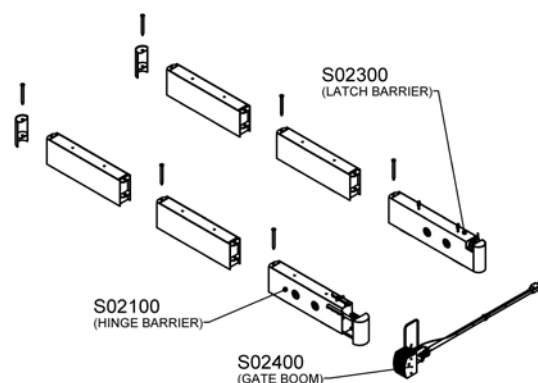
Inline Vertical Opening Gate

Inline configuration for maximum performance combined with minimal footprint. The SYSTRA inline drop arm gate is ideal for locations where the width of the location dictates that the standard gate is unsuitable-on single sections of roads for example. 4.5m clear opening supplied. Other sizes are available on request.

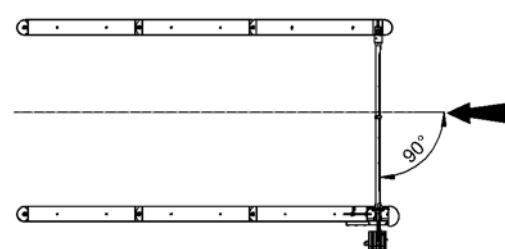
Part No.	Description	Approx. Weight
S02100	Hinge Barrier	3,100 Kg
S02300	Latch Barrier	3,500 Kg
S01304	Gate Boom (4.5m Illustrated)	1,450 kg
Units can be supplied in standard or premium paint finishes.		
Typical arrangement also requires 4 No. Straight Barriers		
Price of Gate Assembly does not include Barriers or accessories.		



I. Elevations and Dimensions



II. Components



III. Test Layout



III: Test layout – PAS68:2010

Rising Gate

V/7500[N2/48/90:4.7/0

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Gates

Swing Gate

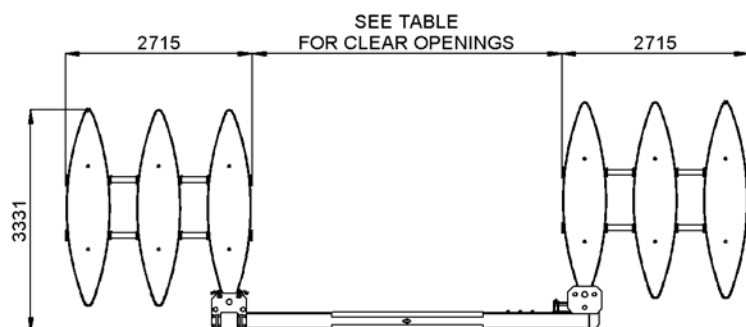
Provides a high level of protection whilst facilitating quick and easy authorised vehicle access. These incorporate heavy steel sections and locking points attached to SYSTRA barges. Gate openings are available from 3.0 metres to 6.30 metres to suit a wide variety of access layouts.

Part No.	Description	Approx. Weight
S03202	Gate Boom (4.5m Illustrated)	Varies on Clear Opening
S03300	Gate Latch	160 Kg
S03400	Gate Hinge	230 Kg

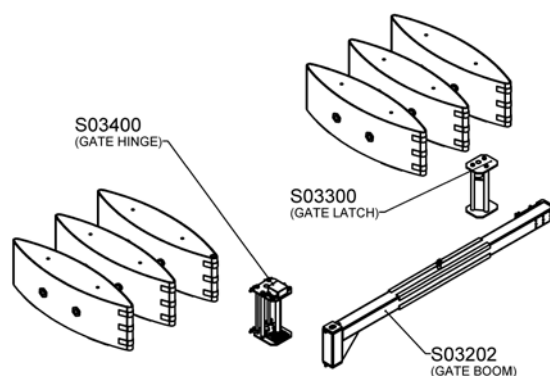
Units can be supplied in standard or premium paint finishes.

Typical arrangement also requires 6 No. Barges (2 gate enabled, 4 standard) and accessories

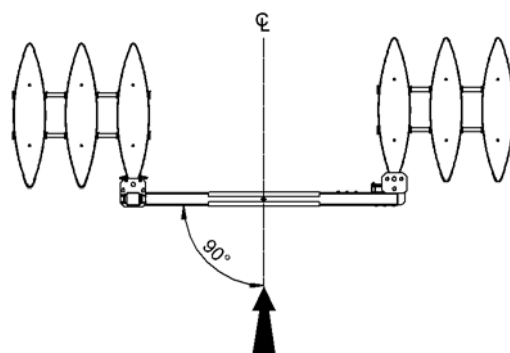
Standard Gate openings supplied - 3.0m, 3.75m, 4.0m, 4.5m, 5.0m and 6.3m. Other sizes are available on request.



I. Elevations and Dimensions



II. Components



III. Test Layout



III: Test layout – PAS68:2010
Swing Gate

V/7500[N2]/64/90:4.9/0 (4.5m opening)
V/7500[N2]/64/90:3.7/0 (6.3m opening)

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Gates

16m Clear Opening Double Swing Gate

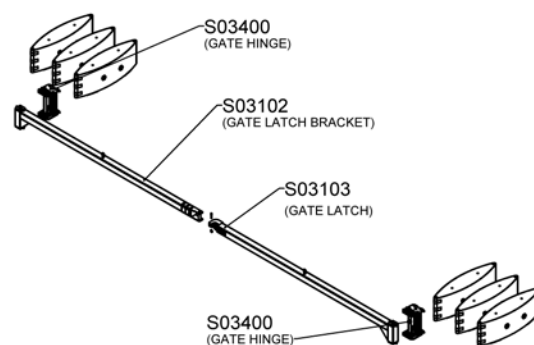
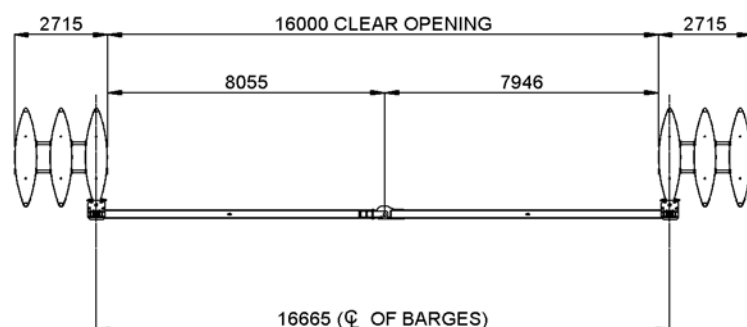
Provides a high level of protection whilst facilitating quick and easy authorised vehicle access. These incorporate heavy steel sections and locking points attached to SYSTRA barges. The Double Swing Gate is ideal for providing protection across dual carriageways and wider roadways.

Part No.	Description	Approx. Weight
S03102	Gate Latch Bracket	530 Kg
S03103	Gate Latch	555 Kg
S03400	Gate Hinge	230 Kg (per item)

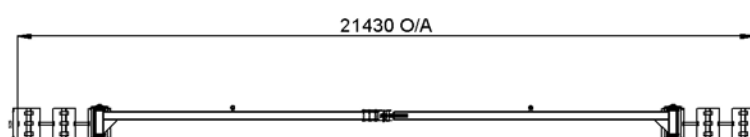
Units can be supplied in standard or premium paint finishes.

Typical arrangement also requires 6 No. Barges (2 gate enabled and 4 standard) and accessories

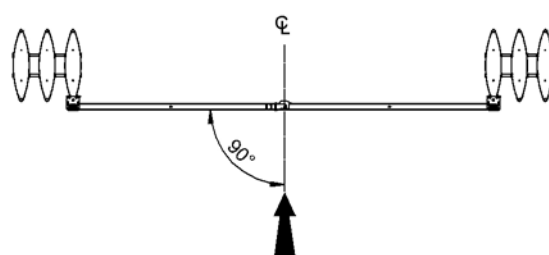
Other sizes of clear opening are available on request



II. Components



I. Elevations and Dimensions



III. Test Layout



III: Test layout – PAS68:2010
Double Swing Gate

V/7500 [N2]/64/90:10.6/0

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Pedestrian Access

Pedestrian portal

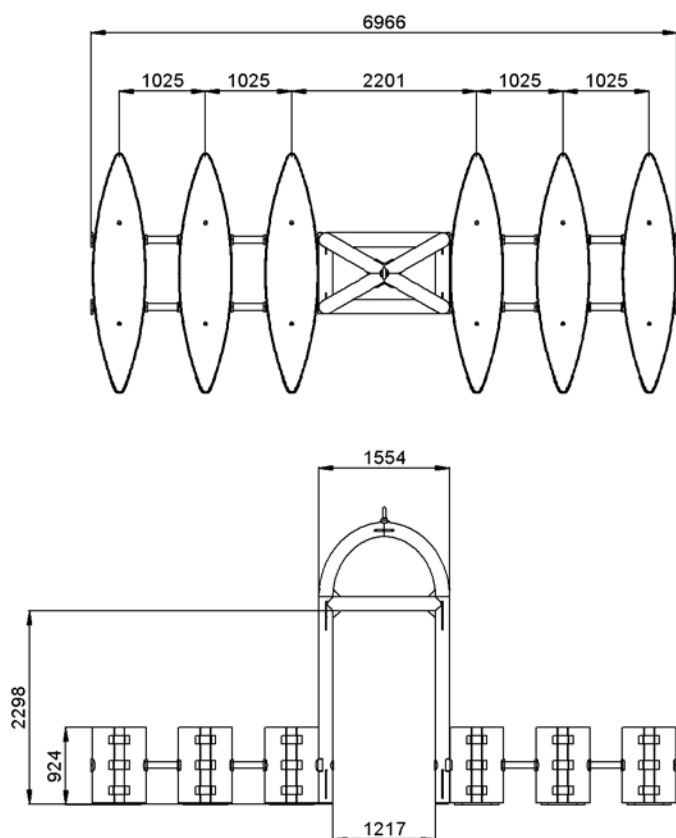
To enable pedestrian movement through a line of SYSTRA HVM measures where a more visual point of access is required in the aiding of crowd control.

Part No.	Description	Approx. Weight
S01210	Single Portal Frame	970 Kg
S01210 TC	Portal Threaded Connector (4 no. per portal frame)	6 Kg (per item)
S01210 PEC	Portal End Cap (4 no. per portal frame)	4 Kg (per item)

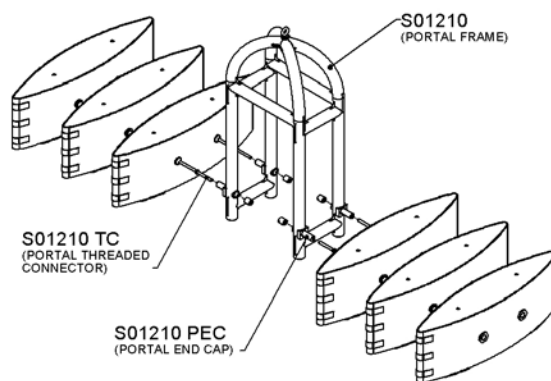
Units can be supplied in standard or premium paint finishes.

Typical arrangement also requires 6 No. Barges and accessories

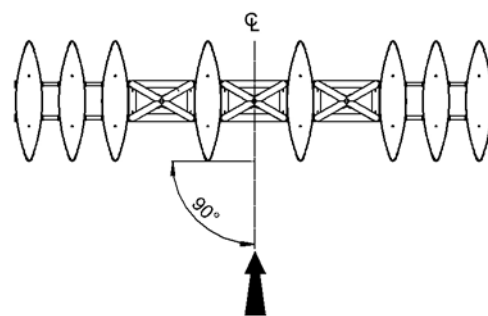
A wide variety of multiple portal frames and barge configurations can be applied to suit specific applications.



I. Elevations and Dimensions



II. Components



III. Test Layout



III: Test layout – PAS68:2010
Pedestrian Portal

V/7500[N2]/64/90:0.22/0
V/7500[N2]/64/90:0.16/0

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Pedestrian Access

Pedestrian Ground Plate

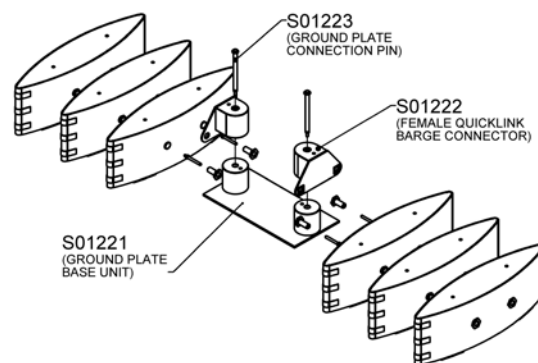
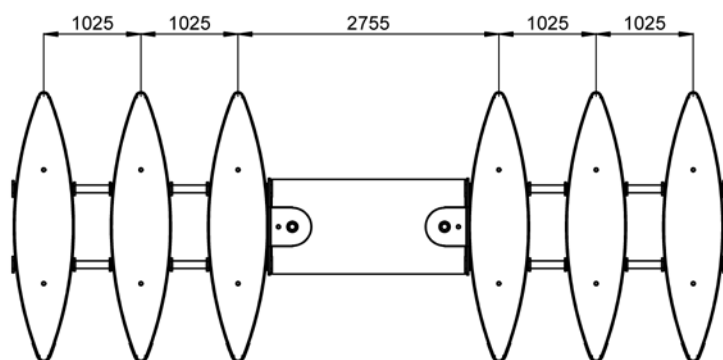
To enable pedestrian movement through a line of SYSTRA HVM measures where a more visual point of access is required in the aiding of crowd control.

Part No.	Description	Approx. Weight
S01221	Ground Plate Base Unit	550 Kg
S01222	Female Quicklink Barge Connector	117 Kg
S01223	Ground Plate Connection pin	17 Kg

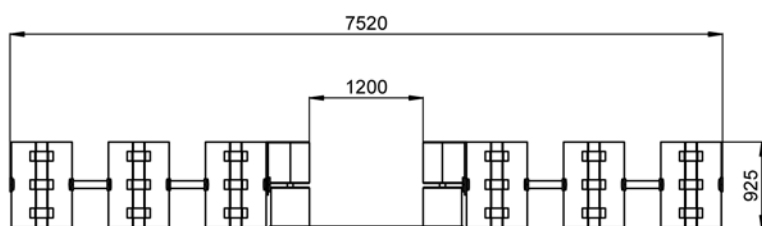
Units can be supplied in standard or premium paint finishes.

Typical arrangement also requires 6 No. Barges and accessories

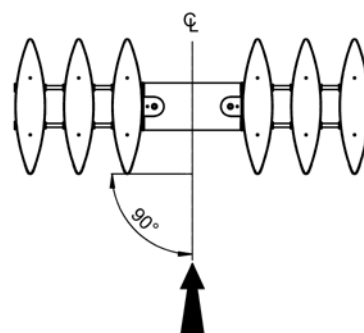
A wide variety of multiple ground plates and barge configurations can be applied to suit specific applications.



II. Components



I. Elevations and Dimensions



III. Test Layout



III: Test layout – PAS68:2010
Pedestrian Access Connector/7500[52]/64/90:0.9/0

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Bollards

Surface Mounted Bollards

This system can be re-used for ultra-shallow below ground installation (please see the SYSTRA Permeable HVM component catalogue for details including the PAS 68 rating.)

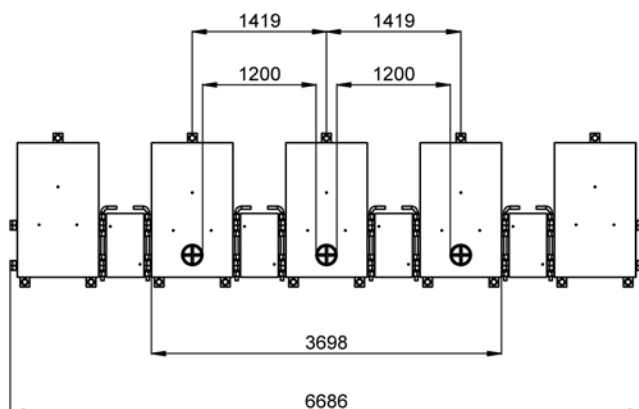
Part No.	Description	Approx. Weight
S06002	Base Plate	736 Kg
S06002	Bollard C.H.S	144 Kg
S06003	Unit Connector	171 Kg

Exact configuration may vary subject to project requirements.

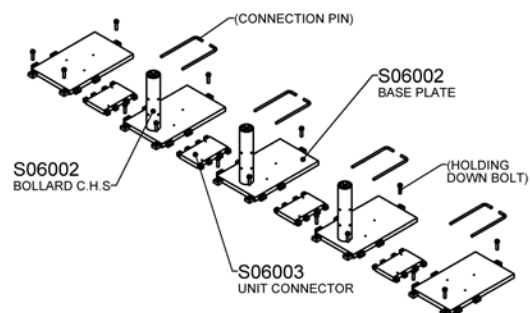
All plated can be shaped to accommodate curvature in plan (details on application.)

Bollards can be provided in various coatings and bollard top geometries (details on application.)

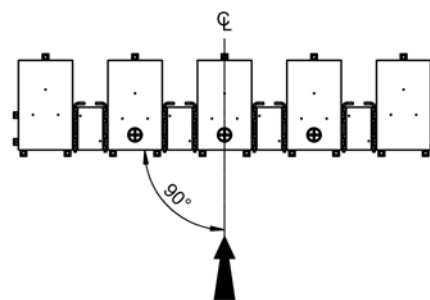
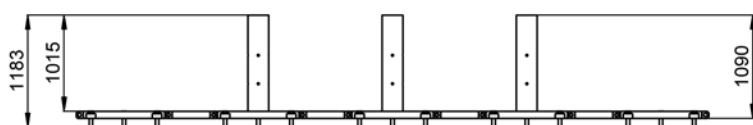
Stainless steel sleeves can be provided (details on application.)



I. Elevations and Dimensions



II. Components



III. Test Layout



III: Test layout – PAS68:2010
Surface Mounted Bollard
V/7500[N2]/48/90:1.7/0

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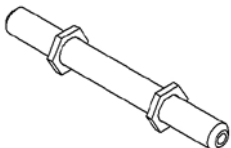
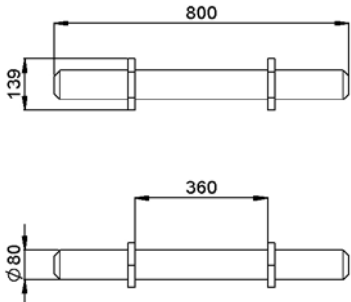
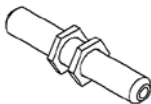
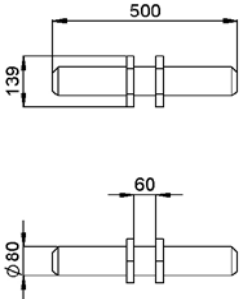
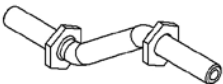
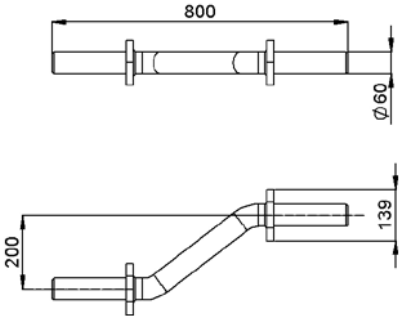
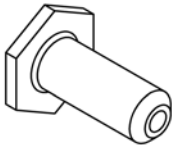
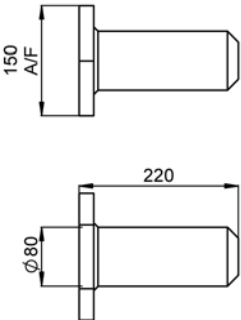
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HVM Additional Items

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Details	Isometric View	Used in Conjunction With	Elevations and Dimensions
Barge Connection Shaft (Standard) Part Number: S01100 Weight: 32 Kg <i>Used for connecting Barge groups together and hinge and latch units to barges. 2 no. used per barge.</i>		S01020 Barge S02300 Latch Barrier S02100 Hinge Barrier	
Barge Connection Shaft (Short) Part Number: S01101 Weight: 20 Kg <i>Used for connecting Barge groups together where space is at a premium. 2 no. used per barge</i>		S01020 Barge S02300 Latch Barrier S02100 Hinge Barrier	
Barge Cranked Connection Shaft Part Number: S01102 Weight: 20 Kg <i>Used for connecting barge groups together over undulating ground. 2 no. used per barge</i>		S01020 Barge	
End Cap Part Number: S01120 Weight: 10 Kg <i>Used to connect barges and barriers to the threaded bar connection. Available in short sizes. 2 no. used per barge.</i>		S01020 Barge S04010 Straight Barrier Short: S01121 S02100 Hinge Barrier S02300 Latch Barrier	

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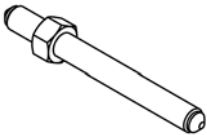
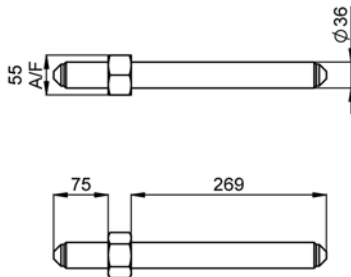

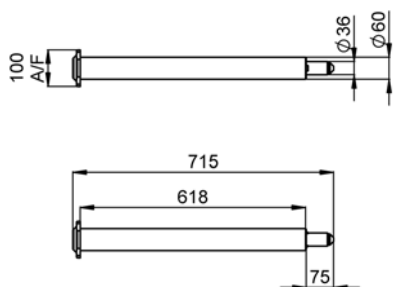
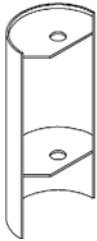
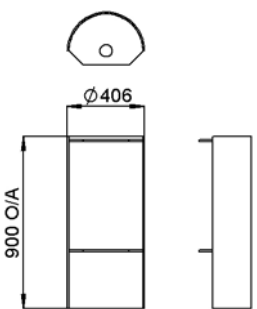

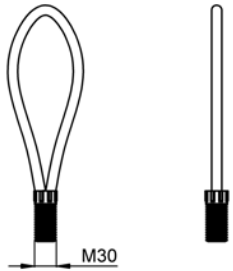
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Threaded Connection Bar Part Number: S01300 Weight: 3 Kg <i>Used for connecting connection shafts together. Available in different lengths dependent on the parts it is connecting.</i>		S01100 Barge connector. S01101 Short connector. S01102 Cranked connector. S01120 End Cap	
Vertical Connection Pin Part Number: S04210 Weight: 15 Kg <i>Used for connecting Barrier units together. Screwed into a captive nut in located in a plate.</i>		S04010 Straight Barrier S04310 Swivel Post	
Bullnose Cover Part Number: S04320 Weight: 50 Kg <i>Used for 'capping' end connections of latch, hinge and straight barrier units.</i>		S02100 Hinge Barrier S02300 Latch Barrier S04010 Straight Barrier S04100 Curved Barriers	
Wire Lifting Loop Part Number: PC2 52880L Weight: 1 Kg <i>M30 wire lifting loops are the recommended way of lifting barges and barrier units into position.</i>		S01020 Barge S02100 Hinge Barrier S02300 Latch Barrier S04010 Straight Barrier S04100 Curved Barriers	

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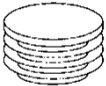
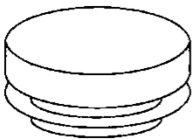
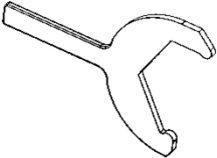
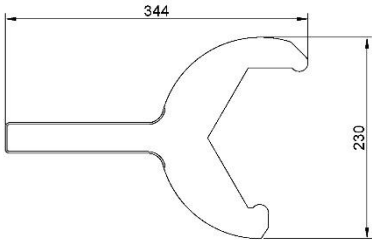
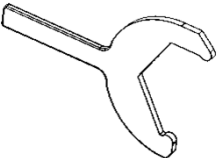
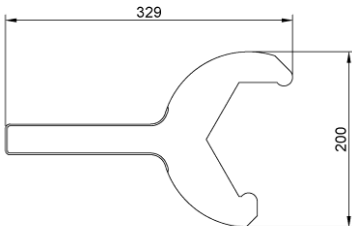
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Details	Isometric View	Used in Conjunction With	Elevations and Dimensions
Lifting Point Blanking Plugs Part Number: COT3136 Weight: Negligible <i>Used for Blanking of Lifting Points on Barriers and Barges</i>		S01020 Barge S02100 Hinge Barrier S02300 Latch Barrier S04010 Straight Barrier S04100 Curved Barriers	32mm Dia. Black Plastic
Barge Blanking Plugs Part Number: COT3999 Weight: Negligible <i>Used for Blanking Ends of Gate Enabled Barges</i>		S01020 Barge	110mm Dia. Black Plastic
150 A/F Small Spanner Part Number: S07104 Weight: 1.8 Kg <i>Used for initial tightening or final removal.</i>		S01120 End Cap.	
120 A/F Small Spanner Part Number: S07101 Weight: 1.61 Kg <i>Used for initial tightening or removal.</i>		S01100 Barge connector. S01101 Short connector. S01102 Cranked connector.	

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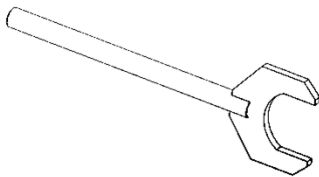
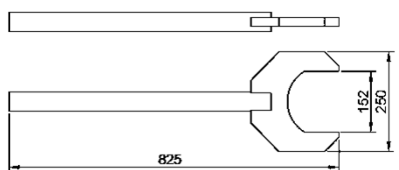
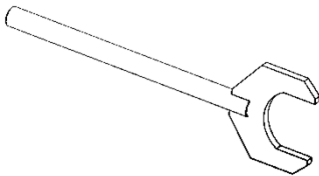
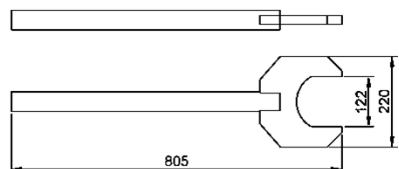
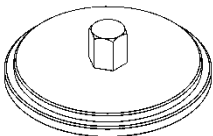
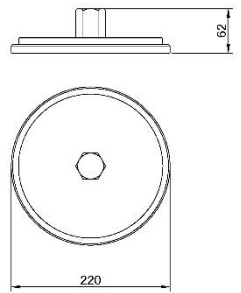
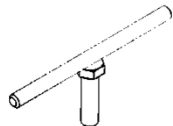
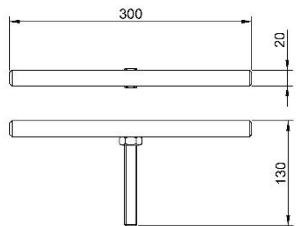
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Details	Isometric View	Used in Conjunction With	Elevations and Dimensions
150 A/F Large Spanner Part Number: S07103 Weight: 6.5 Kg <i>Used for connecting Barge End Caps</i>		S01120 End Cap.	
120 A/F Large Spanner Part Number: S07100 Weight: 6 Kg <i>Used for connecting Barge Horizontal connectors</i>		S01100 Barge connector. S01101 Short connector. S01102 Cranked connector.	
End Cap Socket Part Number: S07102 Weight: 4.39 Kg <i>Used for Barge End Caps.</i>		S01120 End Cap.	
Hinge Pin T-Bar Part Number: S07300 Weight: 0.79 Kg <i>Used as Lifting/Insertion aid for Swing Gate Hinge Pin.</i>		Swing Gate Hinge Pin	

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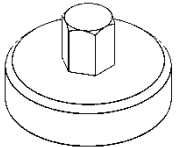
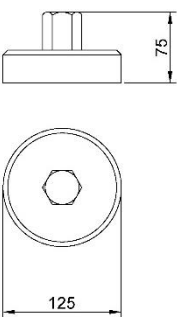
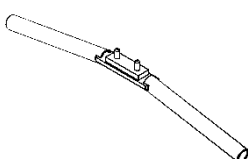
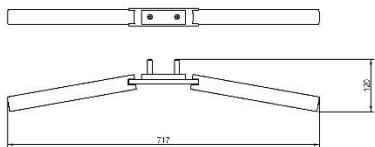
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Details	Isometric View	Used in Conjunction With	Elevations and Dimensions
Vertical Pin Socket Part Number: S07400 Weight: 2.37 Kg <i>Used for tightening barrier vertical connection pin.</i>		S04210 Vertical Pin.	
Portal Spanner Part Number: S07120 Weight: 2.23 Kg <i>Used for connecting Pedestrian Portal End Caps onto Threaded Bars</i>		Pedestrian Portal End Cap	

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