a guide to security turnstiles

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1. Introduction

A turnstile or entrance control system is designed to deter or completely stop unauthorised entrants, whilst enforcing the use of an access control system to ensure the ‘one token one person’ rule applies. Security levels vary depending on style and type of the products.

2. Scope

This guide provides details of the different style and type of turnstile systems, along with an indication of installation, interconnectivity and interoperability of available systems. Comparisons between styles and types are included to help in the specification of the correct product.

3. Terms and Abbreviations

**Anti-pass back:** Where the turnstile provides a return signal to the Access Control System to signal that user A has entered or exited the building. If user A then passes his proximity card to user B the access control system will know that this entry is potentially fraudulent and prevent access/egress.

**Anti-piggybacking:** Where methods have been put in place to avoid unauthorised people gaining access to a secured area by passing through in collusion with another person who does have authorisation.

**Anti-tailgating:** Where measures have been taken to avoid an unauthorised person following another through a secured entrance way, therefore achieving access without the authorised person’s knowledge or consent.

**Biometric Control:** The use of biological features i.e. Fingerprints, eyes, voice etc to ensure that the user is carrying their access control card and that fraudulent entry is not being gained by a 3rd party.

**Breakaway force:** The level of force, required by the turnstile user, to collapse the turnstile barrier or barriers to allow emergency escape.

**DDA Compliance:** Indicates whether a particular product is capable of allowing use by a disabled person. *Previously this related to The Disability Discrimination Act, 1995. The applicable Act (except in Northern Ireland) is now The Equality Act 2010. For further information refer to BSIA Form 173, An Access Control Guide to Disability Discrimination.*

**DDA Disability Discrimination Act (see DDA Compliance)**

**Egress:** The exit of a user from a building through a turnstile.

**Fail safe:** The turnstile will collapse or release all locking to allow non-secure egress during an emergency situation. Used in the majority of situations as part of a cohesive fire strategy.

**Fail secure:** During an emergency situation the turnstile will ensure that any user is not ‘trapped’ within the unit before locking to ensure that security is maintained in all situations.

**Ingress:** The entry of a user into a building through a turnstile.
**Optical turnstiles:** Turnstiles that monitor the number of transactions, and detect unauthorized entry and signal this through an alarm of some form rather than a physical barrier.

**Return signal:** A signal or pulse from a turnstile to signify that a user has activated/used/or carried out an unauthorised passage through the units.

**Volumetric security:** A security measure (normally used to prevent piggy-backing) where the physical volume of the turnstiles user is measured rather than purely the weight.

**Weight sensing:** A method of preventing piggy-backing by the turnstile weighing the occupant(s) of the turnstile during operation. If the weight exceeds the permissible weight of user, access will be denied.

4. **Types**

![Security Portal](image1)

![Rising Arm Barrier](image2)

![Tripod Barrier](image3)

![Full-height Barrier](image4)

![Optical Barrier](image5)

![DDA Pass Gate](image6)

![Rotating Barrier](image7)

![Sliding Barrier](image8)
5. Security levels
The majority of waist height turnstiles are reliant on the user responsibility to prevent collusion between users enabling unauthorised ingress/egress.

<table>
<thead>
<tr>
<th>Turnstile Type</th>
<th>DDA Compliant</th>
<th>Physical Security Level</th>
<th>Typical Appearance</th>
<th>Speed</th>
<th>Ease Of Use</th>
<th>Typical Cost</th>
<th>Emergency Egress</th>
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<tbody>
<tr>
<td>DDA Passgate</td>
<td>Yes</td>
<td></td>
<td>Low-Medium</td>
<td>Fast 60</td>
<td>Easy</td>
<td>£</td>
<td>Unhindered</td>
</tr>
<tr>
<td>Tripod</td>
<td>No</td>
<td></td>
<td>Prominent</td>
<td>Slow 15-25</td>
<td>Medium</td>
<td>£</td>
<td>Hindered</td>
</tr>
<tr>
<td>Optical only</td>
<td>Yes</td>
<td></td>
<td>Low Key</td>
<td>Fast 60</td>
<td>Easy</td>
<td>£</td>
<td>Unhindered</td>
</tr>
<tr>
<td>Rising Arm</td>
<td>Yes</td>
<td></td>
<td>Low-Medium</td>
<td>Fast 60</td>
<td>Easy</td>
<td>£</td>
<td>Unhindered</td>
</tr>
<tr>
<td>Sliding barrier</td>
<td>Yes</td>
<td></td>
<td>Low-Medium</td>
<td>Fast 60</td>
<td>Easy</td>
<td>£</td>
<td>Unhindered</td>
</tr>
<tr>
<td>Sweeping Barrier</td>
<td>Yes</td>
<td></td>
<td>Low-Medium</td>
<td>Fast 60</td>
<td>Easy</td>
<td>£</td>
<td>Unhindered</td>
</tr>
<tr>
<td>Rotating barrier</td>
<td>No</td>
<td></td>
<td>Medium</td>
<td>Slow 15-25</td>
<td>Easy</td>
<td>£</td>
<td>Hinder</td>
</tr>
<tr>
<td>Rotating full height</td>
<td>No</td>
<td></td>
<td>High</td>
<td>Slow 6-10</td>
<td>Awkward</td>
<td>£</td>
<td>Hinder</td>
</tr>
<tr>
<td>Airlock</td>
<td>Yes/No 5</td>
<td></td>
<td>High</td>
<td>Slow 6-10</td>
<td>Awkward</td>
<td>£</td>
<td>Unhindered</td>
</tr>
<tr>
<td>Security Rotating Door</td>
<td>No</td>
<td></td>
<td>High</td>
<td>Medium 20</td>
<td>Easy</td>
<td>£</td>
<td>Hinder</td>
</tr>
</tbody>
</table>

Key:
1 Indicates whether a product of this type is typically DDA compliant. Products vary and compliance can be dependent on other circumstances
2 Level of physical security in comparison with other types
3 Speed measured in persons per minute
4 Level of emergency access for this type of product
5 DDA access possible depending on diameter
6. Typical Locations & Example Use

**Key**

- Glass
- Turnstiles and Barriers

**Office & Commercial**
- External perimeter security
- Reception area
- Visitor segregation
- Internal security

**Financial**
- Banks
- Data Centres
- Protecting areas containing sensitive data

**Airports**
- Passenger separation
- Self check-in
- Self boarding

**Leisure**
- Stadiums
- Museums
- Theme parks
- Libraries
- Attractions
7. Systems Integration

Security turnstiles can be integrated with the following peripherals, with many physically integrated within the body of the units:

- Card readers; proximity and swipe, smart cards etc.
- Key pads
- Biometric systems
- Cameras
- Lift destination control
- Card collection systems
- People counters
- Coin/token collection
- Building Management systems
- Fire/intruder
- Asset protection
- Metal/explosive detection
- TCP/IP Ethernet networks

Care must be taken to ensure the access control reader choice is compatible with the usage and speed of the chosen turnstile. Proximity readers will provide higher flow of traffic, whilst bio-metric readers may be deemed inappropriate for an optical type turnstile.
8. Interconnection

Most turnstile manufacturers are fully compatible with the majority of access control systems in the market today, purely requiring a two door controller to control ingress and egress through the units.

Two separate inputs are required, per barrier, to operate the unit in each direction, in the majority of cases being a normally open, going closed connection.

Other inputs may include visitor access and override + modes and operation controls. The majority of units provide a fire alarm input to allow emergency egress, either allowing break-out or providing unhindered egress if required.

Outputs will give passage confirmation in each direction for accurate occupancy counting and appropriate use of the chosen security method. Alarm state outputs are provided, either remotely or within the unit, to indicate a security breach or misuse.

Newer products are capable of direct connection, control and monitoring over existing Ethernet networks ensuring full compatibility with IP Access Control, CCTV and Building Management Systems with no need for further connection.

9. Installation Requirements

Units will require a structurally sound, level surface to allow their installation and to ensure reliable operation, but specialist fixings can be used to allow installation on raised access floor and soft screed finishes.

All units will require a number of input and outputs which are facilitated by conduits located within the floor, the design of which should always be referred to the manufacturer for details.

In existing locations, where the user does not wish to damage the existing floor, the majority of turnstile types can be installed on raised plinths which allow the units to be easily removed, and does not necessitate the adaptation of floor finishes.

Full height units can be cabled from above which make the installation easier with less disruption being required to the floor.
10. Configuration

As a rough guide when calculating the number of turnstiles required the following formula (based upon 15% of the building population entering/exiting the building in a five minute period) can be used. However, it is highly recommend that all users consult with a reputable turnstile manufacturer for an accurate recommendation.

**Total Installation Capacity (per Minute) = (Building Population x 15%) / 5**

**Standard Width Lanes: 500 – 660mm**
This dimension is critical to ensure that two users cannot enter through the turnstiles ‘side by side’ thereby gaining unauthorised access.

**Wheelchair Accessible Lanes: 900 – 940mm**
Allows passage for wheelchair users and those with other impairments or who are in need of assistance.

**Side Pass Gate:**
Consideration may be given to the provision of alternative, supervised access for visitors, couriers and those with large luggage or parcels.

**Barriers:**
Most turnstile manufacturers will provide a variety of turnstile designs to suit the individual clients’ requirements, and to provide an aesthetically seamless appearance.

**Glass and Post Systems**

**Cantilevered Glass System**

![Glass and Post Systems](image1.jpg)

![Cantilevered Glass System](image2.jpg)
Standard configurations

DDA Lane

Standard Lane

900 - 914

500 - 660

DDA Lane

Standard Lane

900 - 914

500 - 660

1000

1200

1500

1800
11. Environmental Benefits
In conjunction with an access control system and connection to building management system turnstiles can facilitate savings on energy loss by detecting when certain building areas are unoccupied.

Most products use steel, stainless steel and glass along with recyclable plastics so can be recycled at end of life.

12. Insurance requirements
Many installations will benefit from high security turnstile systems in reducing premiums against loss or damages.

13. Service and Maintenance
It is recommended that a minimum of 1-2 preventative maintenance visits per annum are carried out on all turnstiles but in areas of high traffic flow or abuse additional maintenance visits may be appropriate.

14. Standards & legislations
For European Countries all products should comply with the requirements of the appropriate European Directives and be marked with a CE mark.

For America UL 325/3295 apply.

15. Summary
Security management plays an increasingly important role in today’s society, and ensuring you offer your customer the perfect access control solutions to meet their security needs is vital.

With the extensive range of security turnstiles available in the market today, each designed to suit different levels of security, you are sure to find the perfect solution that fits your requirements.

Seeking professional advice from a BSIA registered turnstile manufacturer prior to specifying a turnstile system is highly advised. Not only will they be able to advise you on the best type of product suited to your required level of security, they can also provide recommendations on installation and access control integration.
This document was created by the Access and Asset Protection Section (formerly Access Control Section) of the British Security Industry Association (BSIA).

The British Security Industry Association is the trade association for the private security industry in the UK. Our members provide over 70% of UK security products and services and adhere to strict quality standards.

Access control provides the ability to control, monitor and restrict the movement of people, assets or vehicles in, out and around a building or site. Products range from token based systems and digital keypads, through to biometric identification systems and the associated hardware.

Access control products are subject to fast-moving technological development. A major focus of the BSIA Access Control Committee is to raise awareness amongst end-users and specifiers of the different types of equipment that is available and the most appropriate environments for using them.

BSIA membership will raise your company profile and ensure that your business is at the heart of influencing the future of the security industry. You will become part of a unique group of high quality and professional companies which are well-respected and well-represented to government, end users, specifiers, standards and legislative bodies. For more information contact the BSIA.