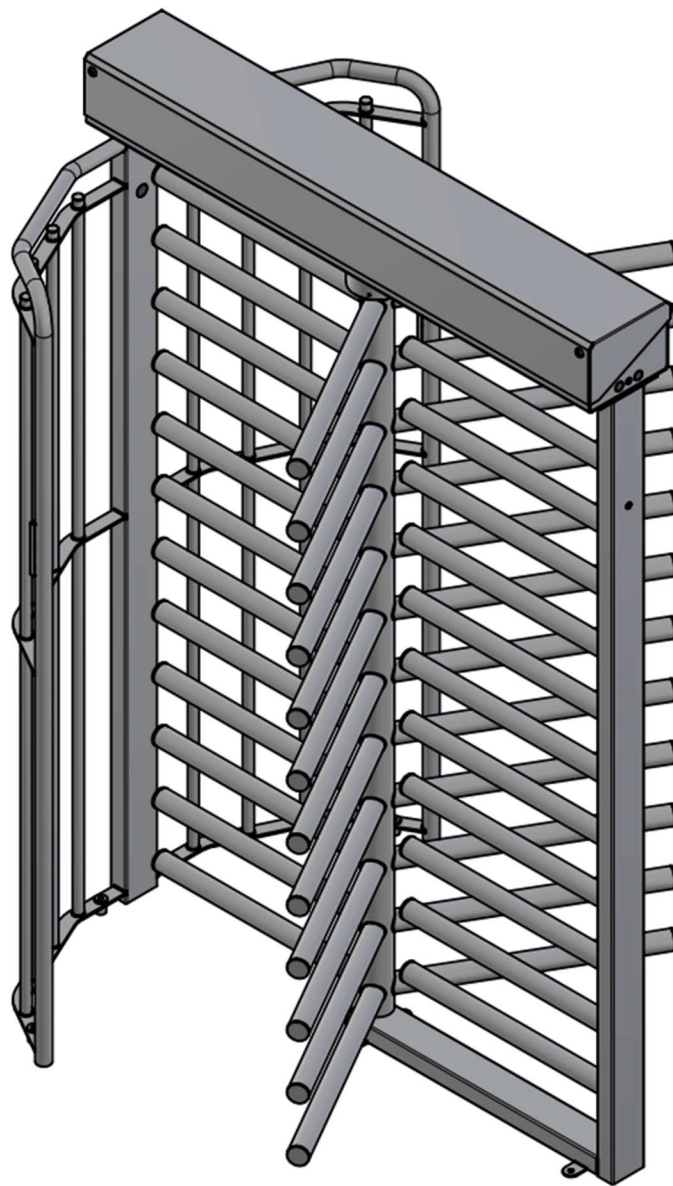




FULL-HEIGHT TITAN TURNSTILE



INSTALLATION AND OPERATION MANUAL

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2. INTRODUCTION

2.1. About This Manual

This manual provides installation, operation, and maintenance instructions for the Full-Height Turnstile. It is designed to assist installers, technicians, and end-users in ensuring proper setup and reliable performance.

Key topics covered include safety precautions, electrical wiring, mechanical assembly, troubleshooting, and compliance with CE standards. Following the instructions in this manual will help ensure safe and efficient operation while maintaining compliance with industry regulations.

For additional support, contact:

www.TURNSTILES.us

303-670-1099

patrick.mcallister@TURNSTILES.us

2.2. Product Overview

The Full-Height Turnstile is a high-security access control solution designed for indoor and outdoor use. It ensures controlled, one-person-at-a-time passage, making it ideal for stadiums, transit stations, industrial sites, and restricted facilities.

Constructed from durable materials such as powder-coated steel, hot-dip galvanized steel, or stainless steel (304/316 grade), the turnstile is built for long-term reliability in high-traffic environments. It is available in single and double configurations with multiple arm options to meet site-specific requirements.

The turnstile integrates with access control systems, including card readers, biometric scanners, and remote activation, ensuring seamless entry management. It supports both fail-safe and fail-secure operation modes, with an optional fire alarm override for emergency egress.

3. SAFETY PRECAUTIONS

3.1. General Warnings

Failure to follow these instructions may result in serious injury, equipment damage, or voided warranty. Only qualified personnel should install, operate, or service this turnstile.

- **Read** this manual completely before **installation** or **operation**.
- Only skilled **persons** may **install, test and service** the turnstile.
- **Two or more people** are required to **erect** and **assemble** the turnstile.
- **ENSURE POWER IS DISCONNECTED** before performing any electrical work.
- **DO NOT** modify or alter the turnstile or its components. Unauthorized modifications may compromise safety and compliance.
- **SECURE** the turnstile properly on a stable, level surface to prevent tipping or malfunction.
- Keep hands, clothing, and objects clear of moving parts during operation.
- Test and verify function after installation and maintenance to ensure safe operation.
- Incorporate the turnstile into a monitored access control system for maximum security.
- Ensure emergency procedures are in place, including fire alarm integration for safe egress when required.

3.2. Safety Icons & Their Meaning

This manual uses the following safety icons to indicate important information regarding installation, operation, and maintenance. Please read all warnings carefully before proceeding.

CAUTION

Highlights a potential risk to equipment, property, or minor injury, requiring careful attention.



WARNING

Indicates a hazardous situation that, if not avoided, could result in serious injury or death.



RISK OF ELECTRIC SHOCK

Warns of a critical risk of shock by electric power source.



FIRE HAZARD

Warns of the risk of a situation that may cause fire.



INFORMATION

Provides important information or tips to ensure proper installation, testing and operation.



SAVE THIS PAGE

4. COMPLIANCE AND STANDARDS

The Full-Height Turnstile is designed to meet industry safety and performance standards for access control and physical security. Compliance with these standards ensures safe operation, durability, and seamless integration with modern security systems.

CE Marking (European Compliance)

This turnstile is CE-certified, ensuring compliance with electrical safety, electromagnetic compatibility (EMC), and mechanical durability according to European Union regulations. Key directives include:

- Electromagnetic Compatibility (EMC) Directive – Ensures the turnstile does not cause or suffer from electromagnetic interference.
- Low Voltage Directive (LVD) – Ensures electrical safety and protection against electric shock hazards.
- Machinery Directive – Covers mechanical safety requirements, including durability and operational reliability.

Americans with Disabilities Act (ADA) Considerations

While full-height turnstiles are not ADA-compliant, they should be installed alongside an ADA-compliant entry solution, such as a swing gate or alternative accessible passage.

All installations must comply with local building codes, electrical regulations, and security system requirements to ensure proper operation and safety.

5. SPECIFICATIONS & TERMINOLOGY

5.1. Turnstile Models & Configurations

The Full-Height Turnstile is available in two distinct models, each designed to meet different security and aesthetic requirements. Both models are offered in single-rotor and double-rotor configurations, with options for 3-arm and 4-arm rotors to accommodate various access control needs.

The TITAN Series features straight arms on the rotor.

Available Configurations:

- Single-Rotor: One passage lane.
- Double-Rotor: Two independent passage lanes.
- Arm Options: 3-arm or 4-arm rotor.

TRIUMPH Series is designed with bent tube arms on the rotor.

Available Configurations:

- Single-Rotor: One passage lane.
- Double-Rotor: Two independent passage lanes.
- Arm Options: 3-arm or 4-arm rotor.

Both models support bi-directional passage, integrate with access control systems, and are constructed from durable materials to withstand indoor and outdoor environments.

The turnstile is available in fail-lock (standard) or fail-safe configurations. In a fail-lock setup, the turnstile remains locked during a power failure, preventing unauthorized passage. In a fail-safe setup, the turnstile unlocks automatically when power is lost, allowing free rotation for emergency exit.

5.2. Materials & Finishes

Full-height turnstiles are constructed from high-quality, durable materials to ensure long-lasting performance in both indoor and outdoor environments. The available material and finish options provide corrosion resistance, weather durability, and aesthetic flexibility to suit various security applications.

Material Options:

- Mild Steel – Cost-effective and durable, suitable for standard security applications.
- 304-Grade Stainless Steel – Corrosion-resistant and ideal for most indoor and outdoor environments.
- 316-Grade Stainless Steel – Superior corrosion resistance, recommended for marine, coastal, and highly corrosive environments.

Finish Options:

- Powder-Coated Mild Steel – Provides a durable, scratch-resistant surface available in various custom colors.
- Hot-Dip Galvanized Mild Steel – Offers enhanced corrosion resistance, making it ideal for outdoor and industrial environments.
- Brushed Stainless Steel (304/316 Grade) – A sleek, professional finish resistant to rust and staining.

Turnstiles are engineered for strength, reliability, and long-term use, ensuring compliance with security and safety requirements in high-traffic environments.

5.3. Dimensions & Weight

Full-height turnstiles are engineered to fit standard security entryways while maintaining a robust and secure access control system. Dimensions vary based on model type, configuration, and arm design.

Single-Rotor Turnstile (TITAN & TRIUMPH Models)

- Overall Height: 91.5 in (2325mm)
- Overall Width (Base): 62.2 in (1580mm)
- Passage Width: 29 in (737mm)
- Required Maintenance Clearance: 95.5 in (2425mm)
- Headroom Clearance: 84 in (2136mm)
- Weight: ~438 lbs. (200kg)

Double-Rotor Turnstile (TITAN & TRIUMPH Models)

- Overall Height: 91.5 in (2325mm)
- Overall Width (Base): 97 in (2465mm)
- Passage Width (each lane): 29 in (737mm)

- Required Maintenance Clearance: 95.5 in (2425mm)
- Headroom Clearance: 84 in (2136mm)
- Weight: ~794 lbs. (360 kg)

Clearance & Installation Considerations

- Minimum Ceiling Clearance: 4 in (100mm) above the turnstile for installation and maintenance.
- Foundation Requirements: Install on a solid, level concrete base for structural stability.
- Recommended Clearance for Service & Maintenance: Ensure at least 95.5 in (2425mm) above the turnstile for maintenance access.

The turnstiles are designed with a consistent 1-inch (25mm) gap between moving and fixed components to eliminate pinch points and reduce the risk of injury during operation.

For custom dimensions or special configurations, consult TURNSTAR technical support.

5.4. Common Terms

- **Foundation:** The prepared concrete base prepared for the turnstile mounting.
- **Fail-Lock (Fail-Secure):** A configuration where the turnstile remains locked during a power failure to prevent unauthorized access.
- **Fail-Open (Fail-Safe):** A configuration where the turnstile unlocks automatically when power is lost, allowing free exit.
- **Rotor:** The rotating assembly with arms that controls user passage.
- **Top Channel:** The upper housing that contains the mechanism and control electronics.
- **Mechanism:** The internal assembly that locks or unlocks the rotor based on access control signals.
- **Bean Washer:** Special curved washers used to suspend the rotor on the mechanism when tightened.
- **Override Key:** A mechanical key used to manually unlock the rotor in case of emergency or power loss.
- **Access Control System:** External hardware (e.g., card readers, biometric devices) used to authorize entry.
- **Comb & Screen Assemblies:** Fixed vertical barriers that guide users and prevent unauthorized passage around the rotor.
- **Double Rotor A / B:** The two meshing rotor assemblies in a double (tandem) turnstile. Rotor A and Rotor B rotate independently to control dual-lane passage.
- **Double Comb A / B:** The two opposing comb assemblies in a double turnstile, positioned at the front and back to restrict passage.

6. LAYOUT DRAWINGS

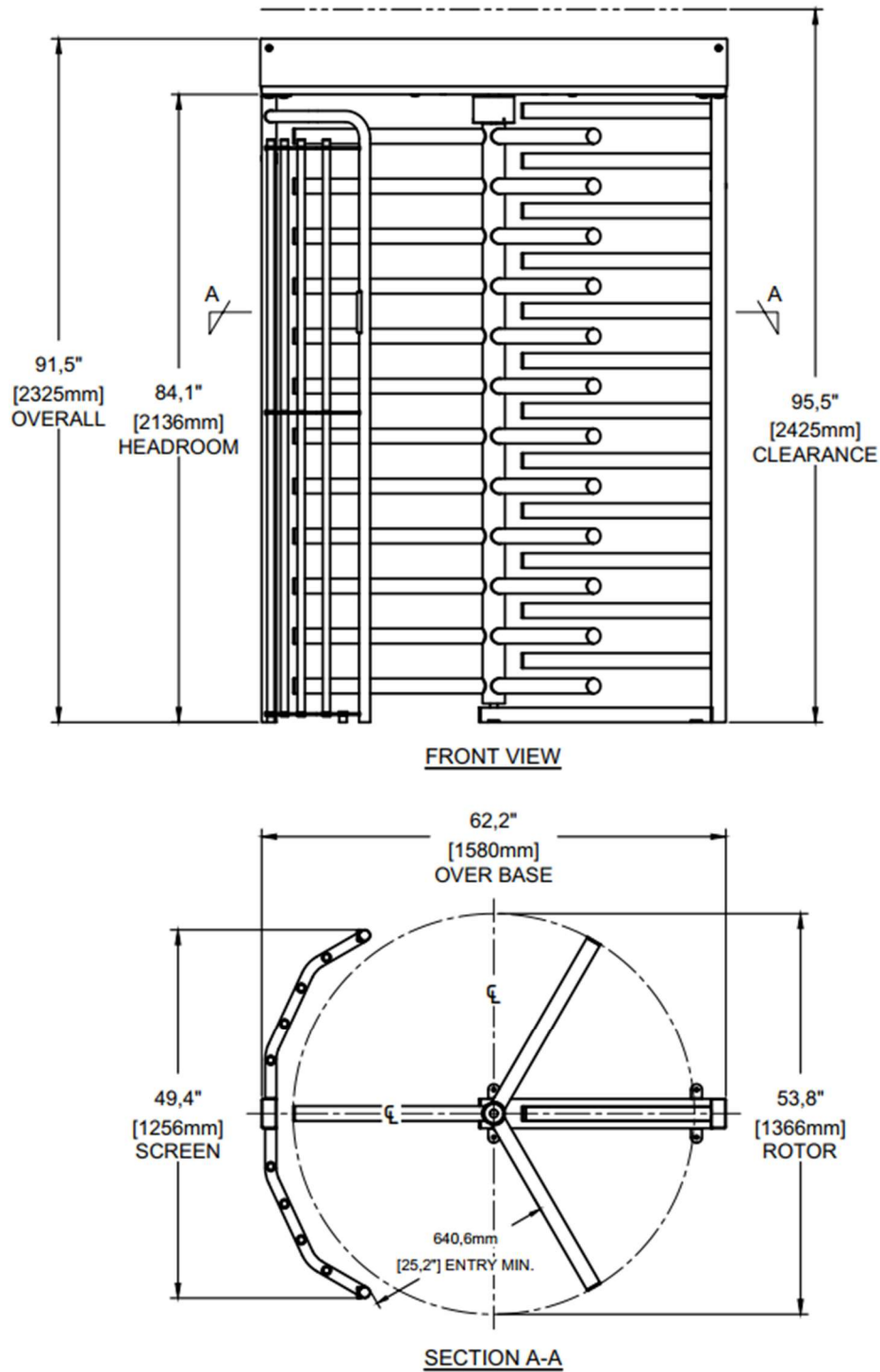
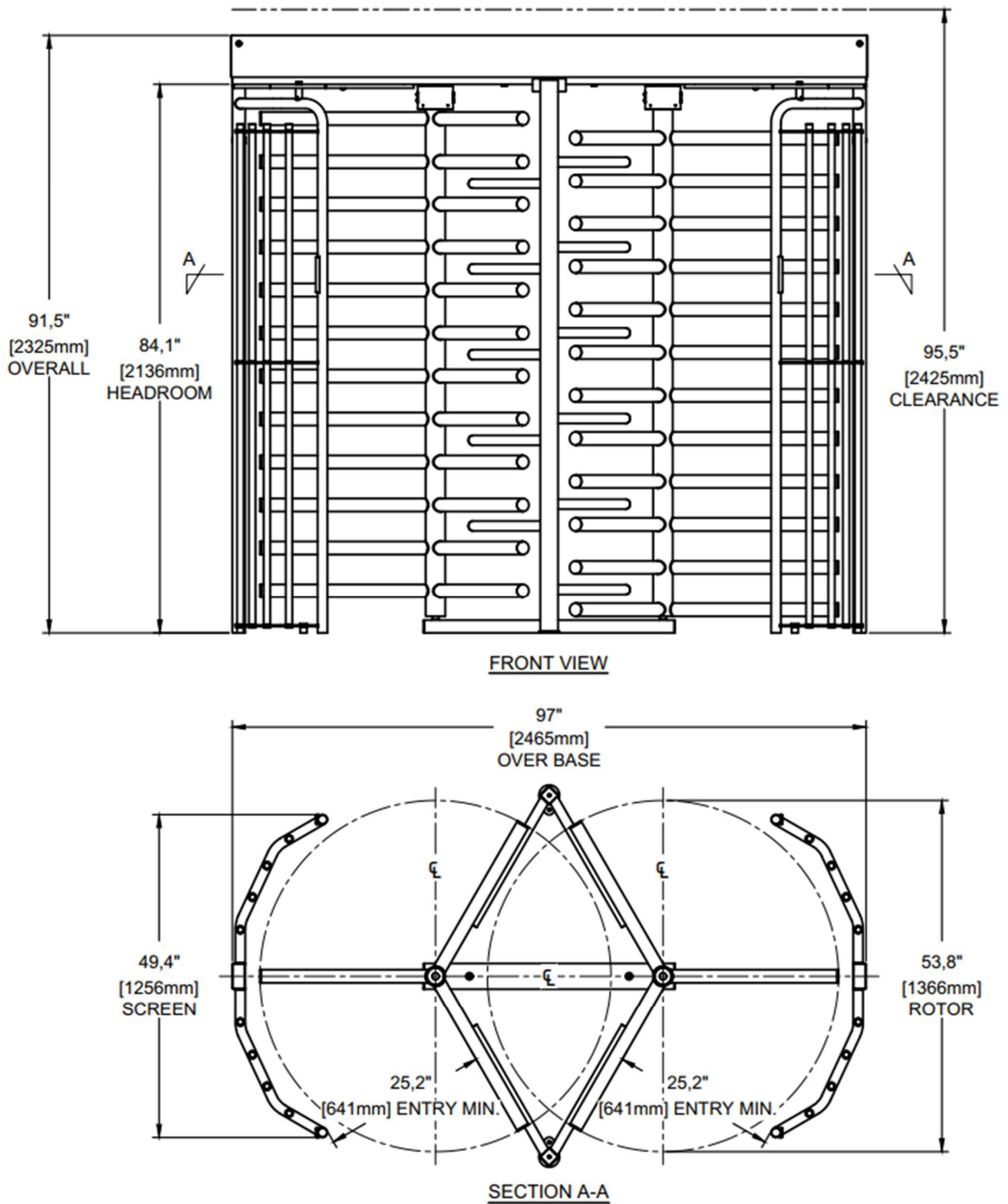


Figure 1: Single Turnstile

**Figure 2: Double (Tandem) Turnstile**

7. TOOLS AND EQUIPMENT

Proper installation and maintenance of the full-height turnstile require specific tools to ensure accurate assembly, secure fastening, and reliable operation. Below is a list of recommended tools for installation, servicing, and routine maintenance.

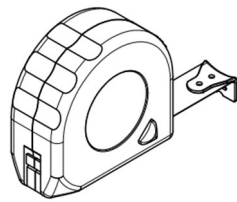
7.1. Installation Tools

These tools are required for assembling and securing the turnstile during installation:

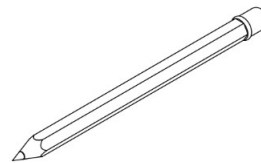
- **Step ladder** – Required for installing overhead components.
- **Measuring tape 16ft (5m)** - Ensures accurate positioning and alignment.
- **Marker pen/chalk & chalk line** - For marking hole positions and alignment lines.
- **Hammer drill** - Required for drilling anchor holes in the foundation.
- **5/8" (16mm) masonry drill bit** - Used for concrete anchor installation.
- **Hammer** - For setting anchors into place.
- **Spirit level** - Ensures the turnstile is installed perfectly level.
- 3/4" (19mm) hexagon flat spanner - Used for holding M12 bolts.
- **3/4" (19mm) hexagon socket** - Used for tightening M12 bolts.
- **Socket ratchet handle for 3/4" (19mm) socket** - Provides leverage for securing M12 bolts.
- **15/16" (24mm) flat spanner** - Used for tightening rotor disk to mechanism.
- 1/8" approx. (3mm) Allen key - For securing top sleeve.
- **5/16" approx. (8mm) Allen key** - Used for fasteners on pawls and top plate.



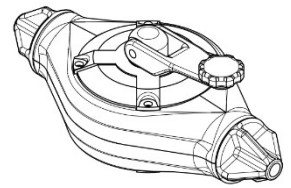
Step Ladder



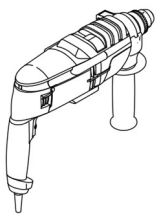
Measuring tape 16ft (5m)



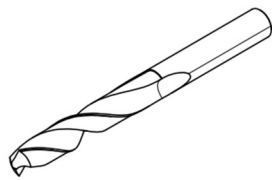
Marker pen/chalk



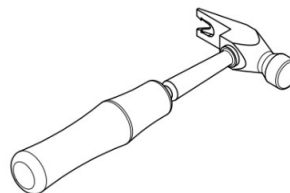
Chalk line



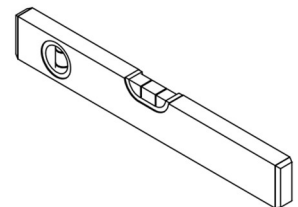
Hammer drill



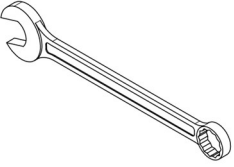
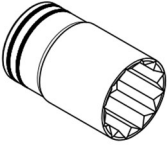
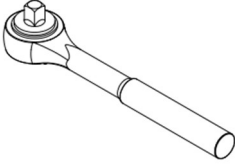
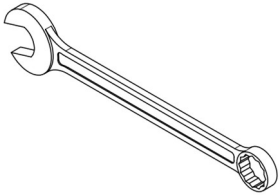


5/8" (16mm) masonry drill bit



Hammer




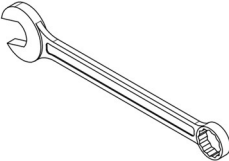

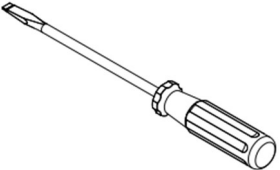
Spirit Level

			
3/4" (19mm) hexagon flat spanner	3/4" (19mm) hexagon socket	Socket ratchet handle for 3/4" (19mm) socket	15/16" (24mm) flat spanner
			
1/8" approx. (3mm) Allen key	1/8" approx. (3mm) Allen key		

7.2. Maintenance Tools

These tools are needed for servicing the solenoid:

- **9/32" spanner (7mm)** - Used for #8 (M4) hex nuts
- **3/8" spanner (10mm)** - Used for 1/4" (M6) hex bolts
- **3/16" approx. (5mm) Allen key** - Used for 1/4" (M6) socket head screws
- **Flathead screwdriver No.10** - Used for M5 slotted screws
- **Lubricants & cleaning materials** - As specified in the maintenance section

			
9/32" spanner (7mm)	3/8" spanner (10mm)	3/16" approx. (5mm)	Flathead screwdriver

Using the correct tools ensures safe and efficient installation, prevents damage to components, and maintains long-term reliability of the TURNSTAR full-height turnstile.

8. ASSEMBLY PARTS

The turnstile includes a number of components that are provided packed individually, or pre-assembled into sub-components for ease of achieving final assembly.

8.1. Structural Components

- **Rotor Assembly** – The rotating structure that controls one-person-at-a-time entry.
- **Screen Assembly** – Fixed vertical bars that prevent bypassing and guide users through the passageway and serves as the foundation structure that secures the turnstile to the floor.
- **Comb Assembly** – Prevents bypassing, and on the single turnstile, serves as the second foundation structure that secures the turnstile to the floor.
- **Top Channel** – The main housing for the mechanism and electronics.
- **Cover** – Keeps the mechanism and electronics enclosed in the top channel.

8.2. Mechanical & Safety Components

- **Mechanism** – Unlocks the rotation to allow passage or restrict access based on input signals.
- **Bean Washers** – Holds the rotor suspended on the mechanism.
- **Rubber Buffers** – Dampens the force against the mechanism locking pawls.
- **Override Keys** – Used to manually unlock the turnstile mechanism, allowing free rotation during maintenance or in case of emergency.

8.3. Electrical Components

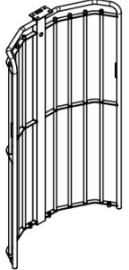
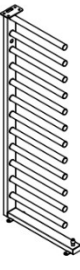
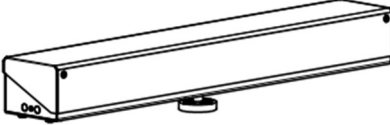
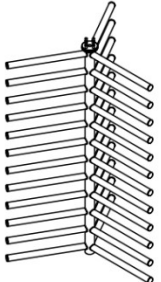
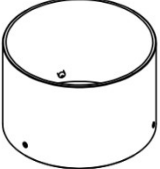

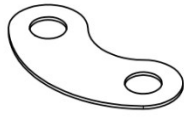
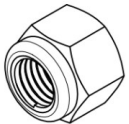


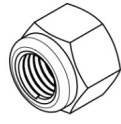
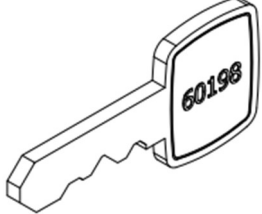
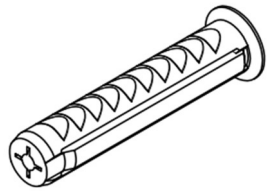
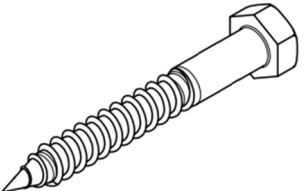
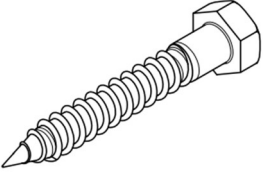
- **Control Panel Assembly** – Houses the turnstile logic, power supply, and circuit breaker, along with electrical connections for access control integration.
- **Solenoids** – Mounted to the mechanism to control the locking and unlocking functions.
- **Limit Switches** – Mounted to the top of the mechanism, to detect the direction and status of the rotor rotation.

8.4. Illustrated Parts List

The product is sent with all available parts either separately or partially assembled. All components must be confirmed before starting assembly. The mechanism and control panel are usually assembled inside the closed channel. If all components are not provided for a single turnstile, contact Turnstar before continuing the installation.

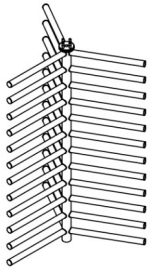
Single Turnstile Components

- The single turnstile consists of a screen, a comb, a rotor and a channel assembly.
- Other parts are bolts for assembling the frame, a top disk sleeve to conceal the rotor connection to the mechanism, the parts to connect the rotor, and keys for opening the channel cover, and to use for over-riding the mechanism.

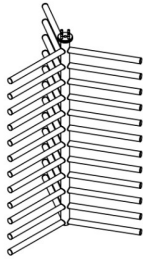
			
Screen (x1)	Comb (x1)	Channel with Mechanism (x1)	
			
Rotor (x1)	Top Disk Sleeve (x1) and 0.25" x 0.4" (M6x10) Allen Head Screws (x3)	Round Rubber Buffer (x4)	Bean Washer (x2)
			
5/8"-11 (M16) Nylon Hexagon Hexnut (x4)	1/2"-13 x 1-3/8" carriage bolt (M12 x 35), low head (x8)	0.5" (M12) Washer (x8)	1/2"-13 (M12) Nylon Hexagon Hexnut (x8)
			
Turnstile Channel & Override Keys (x4)	3/8" x 3-1/8" (10 x 80mm) nylon sleeve anchor (x8)	3/8" x 4" (M10 x 100) coach screw or lag bolt (x4)	3/8" x 5" (M10 x 75) coach screw or lag bolt (x4)

Double (Tandem) Turnstile Components

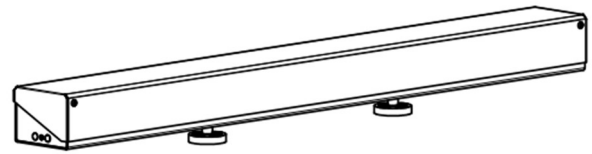
- The double turnstile consists of two screens, two double combs, a rotor A with a meshing rotor B and a channel with dual mechanism assembly.
- Other parts are bolts for assembling the frame, two split top disk sleeves to conceal the rotors connection to the mechanisms, the parts to connect the rotors, and keys for opening the channel cover, and to use for over-riding the mechanisms.



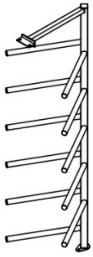
Double Rotor A (x1)



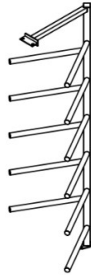
Double Rotor B (x1)



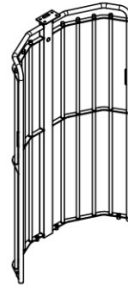
Double Channel with 2x Mechanism



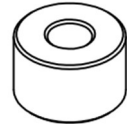
Double Comb A (x1)



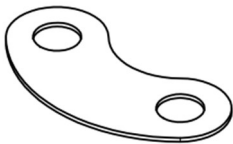
Double Comb B (x1)



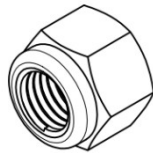
Screen (x2)



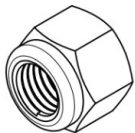
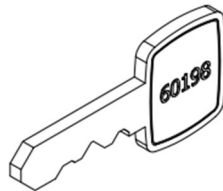
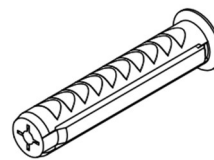
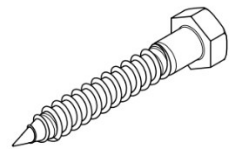
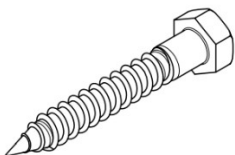
Round Rubber Buffer (x8)



Bean Washer (x4)

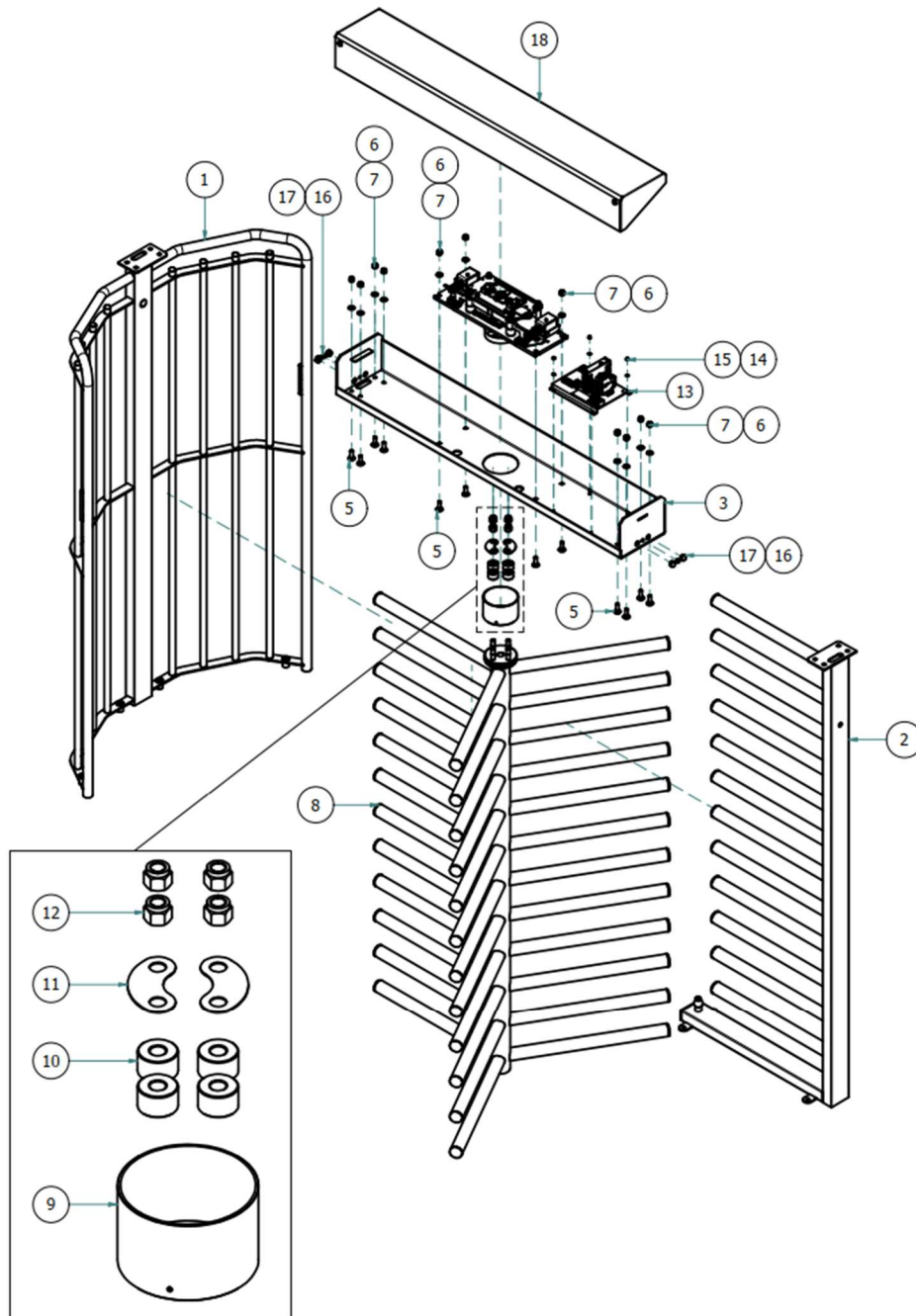
5/8"-11 (M16) Nylon Hexagon
Hexnut (x8)1/2"-13 x 1-3/8" carriage
bolt (M12 x 35) (x8)

0.5" (M12) Washer (x8)

1/2"-13 (M12) Nylon Hexagon
Hexnut (x8)Turnstile Channel & Override
Keys (x6)3/8" x 3-1/8" (10 x 80mm)
nylon sleeve anchor (x8)3/8" x 3" (M10 x 75) coach
screw or lag bolt (x4)3/8" x 5" (M10 x 75) coach
screw or lag bolt (x4)

Exploded Views

- Single Turnstile Exploded View

**Figure 3: Single Turnstile Exploded View**

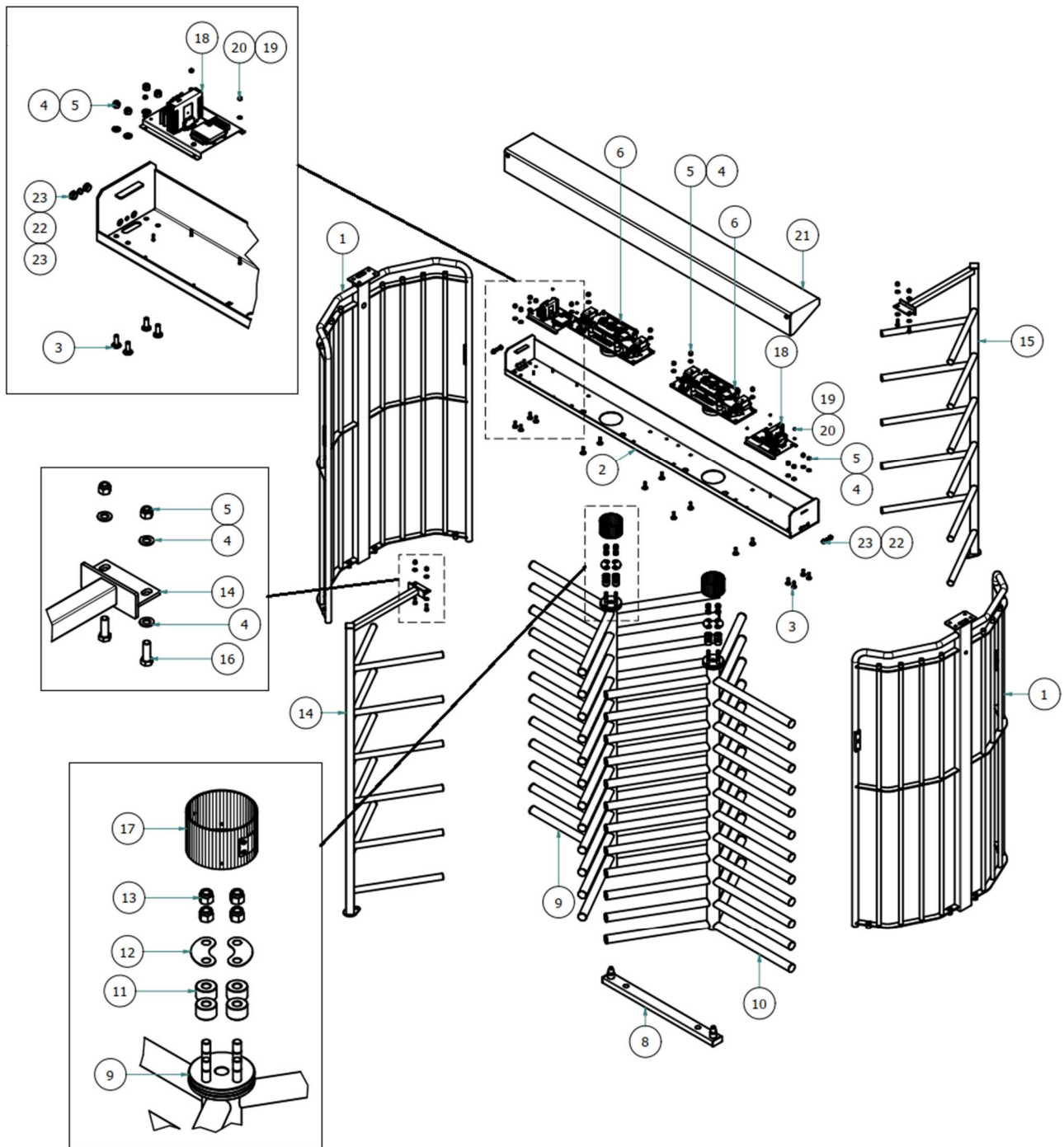


Figure 4: Double Turnstile Exploded View

Single Titan 3-Arm FHE Turnstile - Parts List

No	Qty	Part No.	Description
1	1	1800-SA-02	3-ARM FHE SCREEN ASSEMBLY
2	1	1800-SA-03	TITAN FHE SINGLE COMB ASSEMBLY
3	1	1800-WM-02	FHE SINGLE TOP CHANNEL WELDMENT
4	1	2205-AS-01	3-ARM FHE MECHANISM - FAIL-SECURE
5	12	M12x35-SCHBS-ZP	M12 x 35 SQUARE CUP HEAD BOLT SMALL HEAD, ZINC PLATED
6	12	M12x24-PFW-ZP	M12x24 PLAIN FLAT WASHER, ZP
7	12	M12-NHN-ZP	M12 NYLOCK HEX NUT, ZP

Single Titan 3-Arm FHE Turnstile - Parts List

No	Qty	Part No.	Description
8	1	1800-SA-04	TITAN 3 FHE SINGLE ROTOR ASSEMBLY
9	1	1800-SA-13	TOP DISK SLEEVE ASSEMBLY
10	4	FHT-PT-02	RUBBER DISK BUFFER, 40 OD x 16 ID x 25mm
11	2	FHT-LC-33	BEAN WASHER
12	4	M16-NHN-ZP	M16 NYLOCK HEX NUT, ZP
13	1	1800-SA-14	FHE 1800 CONTROL PANEL ASSEMBLY
14	4	M6x12-PFW-ZP	M6x12 PLAIN FLAT WASHER, ZP
15	4	M6-NHN-ZP	M6 NYLOCK HEX NUT, ZP
16	2	13-PP-BL	DIA 13 INTERNAL PANEL PLUG, BLACK HDPE
17	4	20_22-DPP-BL	DIA 20-22 DOME PANEL PLUG, BLACK HDPE
18	1	1800-SA-05	FHE SINGLE COVER ASSEMBLY

Double Titan 3-Arm FHE Turnstile - Parts List

No	Qty	Part No.	Description
1	2	1800-SA-02	3-ARM FHE SCREEN ASSEMBLY
2	1	1800-WM-09	FHE DOUBLE TOP CHANNEL WELDMENT
3	8	M12x35-SCHBS-ZP	M12 x 35 SQUARE CUP HEAD BOLT SMALL HEAD, ISO 8678, ZINC PLATED
4	24	M12x24-PFW-ZP	M12x24 PLAIN FLAT WASHER, ZP
5	20	M12-NHN-ZP	M12 NYLOCK HEX NUT, ZP
6	2	2205-AS-01	3-ARM TURION MECHANISM -FAIL-SECURE
7	8	M12x35-SCHB-ZP	M12 x 40 SQUARE CUP HEAD BOLT, ZINC-PLATED
8	1	1800-SA-15	DOUBLE BASE ASSEMBLY
9	1	1800-SA-06	TITAN 3 DOUBLE A ROTOR ASSEMBLY
10	1	1800-SA-07	TITAN 3 DOUBLE B ROTOR ASSEMBLY
11	8	FHT-PT-02	RUBBER DISK BUFFER, 40 OD x 16 ID x 25mm
12	4	FHT-LC-33	BEAN WASHER
13	8	M16-NHN-ZP	M16 NYLOCK HEX NUT, ZP
14	1	1800-SA-08	TITAN 3 EXTENDED DOUBLE COMB A ASSEMBLY
15	1	1800-SA-09	TITAN 3 EXTENDED DOUBLE COMB B ASSEMBLY
16	4	M12x35-HSS-ZP	M12x35 HEX SET SCREW, 4.8, ZP
17	2	527-SA-03	SPLIT SLEEVE COVER ASSEMBLY
18	2	1800-SA-14	FHE 1800 CONTROL PANEL ASSEMBLY
19	8	M6x12-PFW-ZP	M6x12 PLAIN FLAT WASHER, ZP
20	8	M6-NHN-ZP	M6 NYLOCK HEX NUT, ZP
21	1	1800-SA-10	DOUBLE COVER ASSEMBLY
22	2	13-PP-BL	DIA 13 INTERNAL PANEL PLUG, BLACK HDPE
23	4	20_22-DPP-BL	DIA 20-22 DOME PANEL PLUG, BLACK HDPE

9. INSTALLATION INSTRUCTIONS

The turnstile includes a number of components that are provided packed individually, or pre-assembled into sub-components for ease of achieving final assembly.

9.1. Site Preparation

Proper site preparation is essential to ensure the correct installation, stability, and long-term performance of the full-height turnstile. The following guidelines must be followed before installation begins.

Determine where the turnstile will be installed. Consider the footprint size and the clearance height required to the installation location, the bolting anchors, and any conduit requirements.

If a new foundation is being prepared, install a 1" (25mm) PVC conduit at one of the two (or both if needed) designated conduit center positions. Power and data cables should be routed through this conduit before placing the turnstile. Ensure the conduit is flush with the finished floor level to avoid interfering with the turnstile's base. Cables should extend approximately 140 inches (3.5 meters) above floor level to allow easy routing through the turnstile frame and into the top channel during installation.

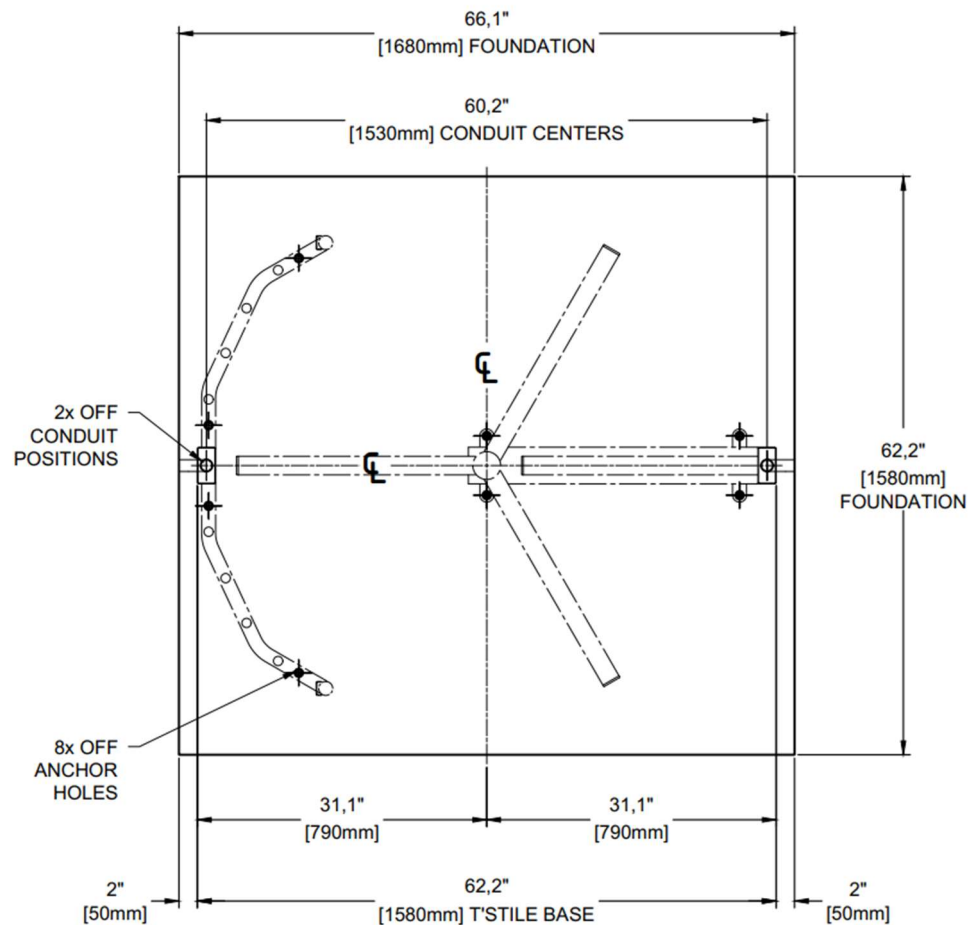


Figure 5: Single Turnstile Foundation

9.2. Foundation Requirements

- The turnstile must be installed on a solid, level concrete base to ensure structural integrity.
- Recommended concrete base specifications:
- Single-Rotor Turnstile: Minimum 66" x 62" (1680mm x 1580mm), 5" (125mm) thick, reinforced.
- Double-Rotor Turnstile: Minimum 101" x 62" (2565mm x 1580mm), 5" (125mm) thick, reinforced.
- Concrete strength should be at least 2900 psi (20MPa).

INFORMATION

- The foundation must be fully cured before installation (recommended curing time: at least 48 hours in dry conditions).
- The surface must be free of debris, cracks, or uneven areas that could affect stability.
- All holes drilled into the concrete must be positioned at a minimum of 3 inches (80mm) from any edge to prevent cracking or structural failure.

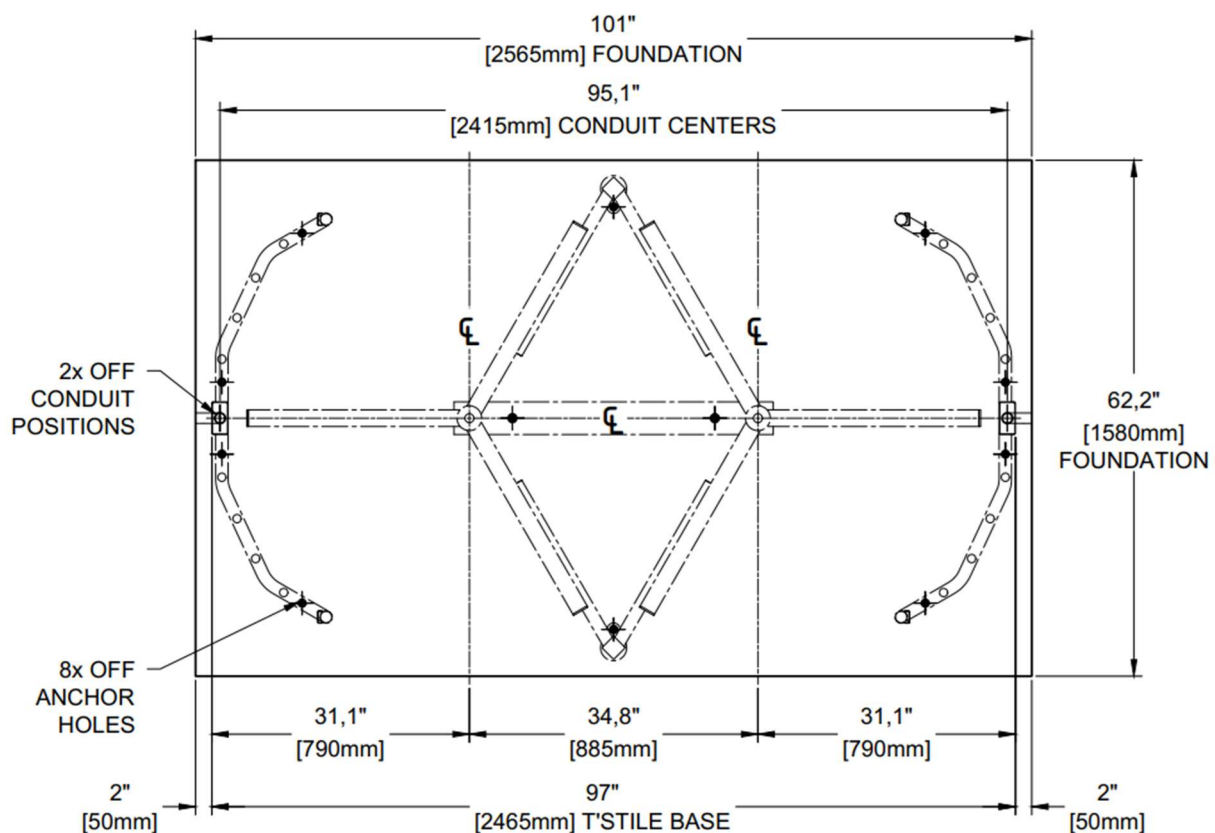


Figure 6: Double Turnstile Foundation

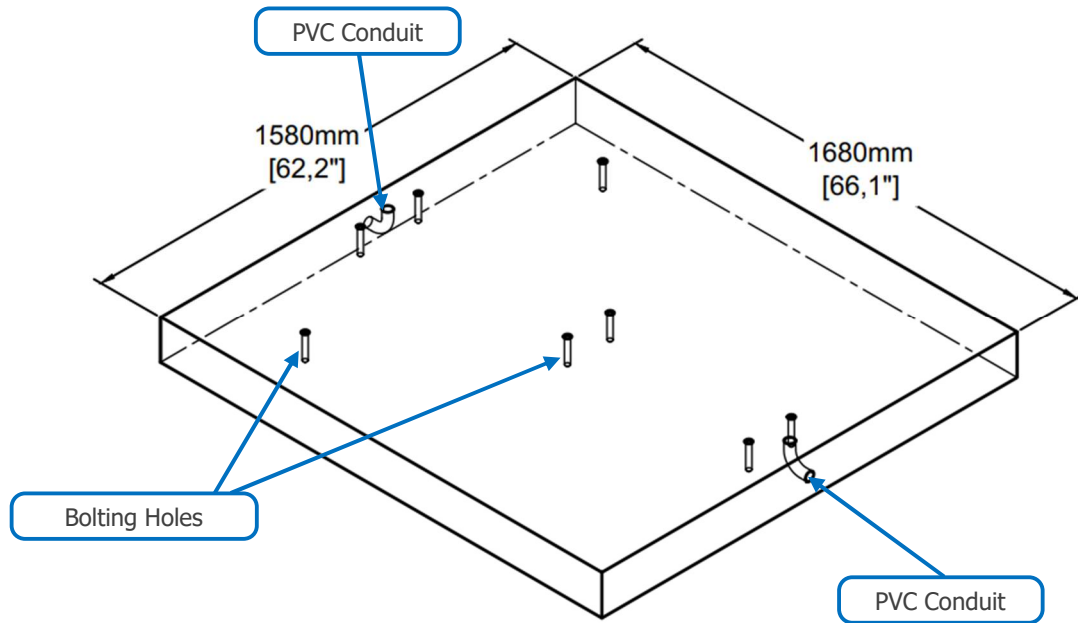


Figure 7: Single Turnstile Foundation Isometric

If a new foundation is being prepared, install a 1" (25mm) PVC conduit at one of the two (or both if needed) designated conduit center positions. Power and data cables should be routed through this conduit before.

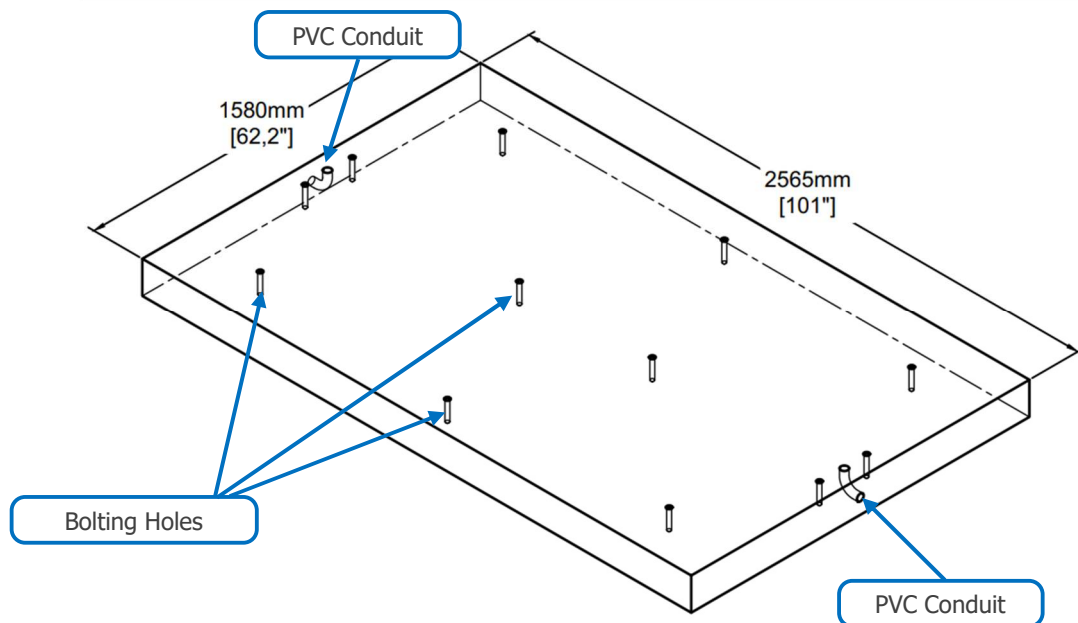


Figure 8: Double Turnstile Foundation Isometric

9.3. **Power & Data Provisioning**

Ensure electrical conduit and data cables are routed to the installation location before mounting the turnstile.

- Standard power requirements:
 - Input Voltage: 110-240V AC (depending on site requirements).
- Control Panel Power:

- Low Voltage Output: 24V DC for control electronics & solenoids
- Power Consumption:
 - ~0,5A Standby
 - ~2A Fully Energised
- Power and data entry options:
 - Through the floor (recommended for secure cabling).
 - For high-level conduit entry, a hole can be drilled into the turnstile top channel to accommodate a 1" (25mm) sealing grommet for cable entry. After drilling, it is essential to treat the exposed metal to prevent corrosion, this may include applying a suitable anti-rust primer or zinc-rich cold galvanizing compound.

Always ensure cabling is positioned to avoid interference with moving parts. In the channel, run cabling along the sides of the channel folds or place cable trunking when necessary.

9.4. Site Selection Criteria

- The turnstile must be installed on a level, reinforced concrete surface that meets the foundation specifications.
- The area should provide unobstructed pedestrian flow, with clearly marked entry and exit points.
- Ensure sufficient clearance for maintenance access and safe operation.

9.5. Clearance & Spacing Requirements

- Maintain a minimum overhead clearance of 95.5" (2425mm) to allow for servicing.
- Ensure at least 1" 25mm spacing from adjacent walls, fences, or barriers.
- The passageway should remain clear of objects, including signage, trash bins, or barriers that could interfere with entry and exit.
- If installed near a security booth or reception area, ensure that staff have a clear line of sight to monitor usage.

9.6. Clearance & Spacing Requirements

- If integrating with perimeter fencing, the fence should be firmly anchored and aligned with the turnstile's screen assembly to prevent bypassing.
- The turnstile comb assembly should be properly aligned with adjacent fencing to prevent gaps that could allow unauthorized access.
- The fencing or walls must be self-supported and should not be welded directly to the turnstile frame, as this may compromise structural integrity.

9.7. Environmental Factors

- For outdoor installations, ensure the turnstile is positioned to minimize exposure to direct rainfall, flooding, or excessive dust accumulation.
- Stainless steel 316-grade material is recommended for coastal or high-corrosion environments.
- Avoid installing the turnstile in areas with high wind loads without additional anchoring considerations.

9.8. **ADA Compliance Considerations**

- Full-height turnstiles are not ADA-compliant, and an alternative accessible entrance (such as a motorized gate or swing gate) must be provided nearby.
- Ensure that signage is present to direct users to the accessible entry point.

CAUTION

The Turnstile frames, rotors and channel are heavy, which can lead to injury if improperly handled.



9.9. **Removing the Cover**

The channel must be opened to access the holes to mount the channel to the screen and comb, or in the case of a double, to the two screens.

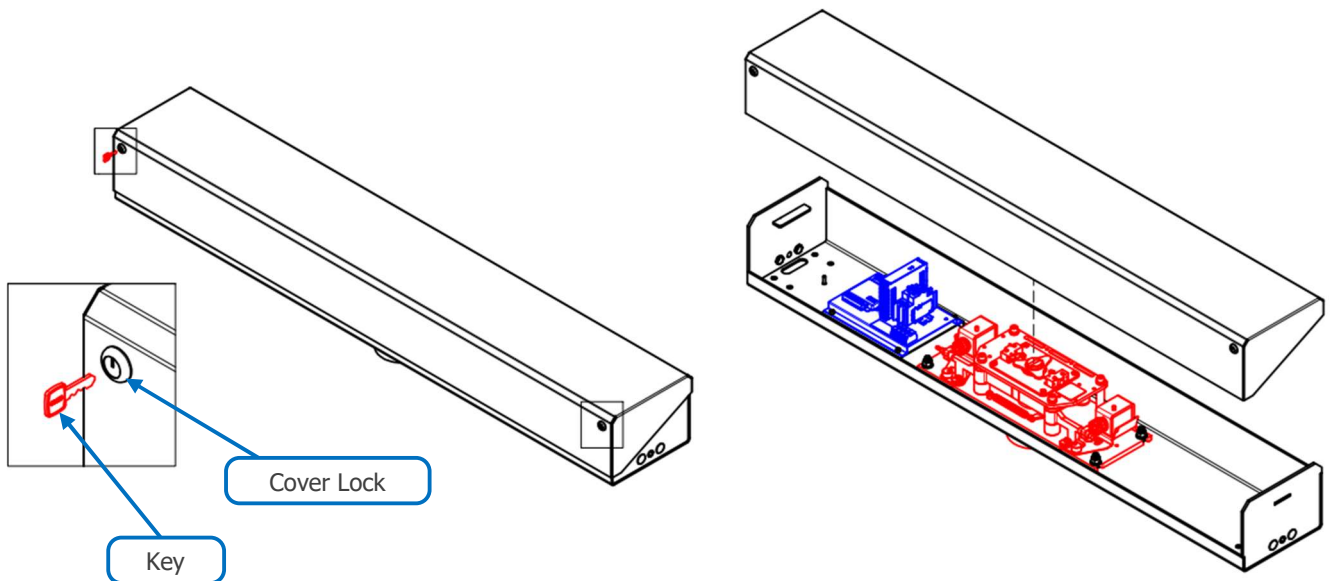


Figure 9: Removing the Cover

Step 1: Unlocking:

- Using the key, unlock the channel at the two ends.

Step 2: Removing Cover:

- Once the cover is unlocked, lift it off the channel and place it in a secure place for refitting later.

9.10. **Single Frame Assembly**

The single turnstile can be pre-assembled adjacent to the installation site. Once the screen, comb, and top channel have been securely assembled, two people can carefully lift and position the frame onto the prepared foundation.

Step 1: Position the Screen and Comb:

- Place the screen and comb assemblies facing each other, ensuring correct alignment.
- Pull any cabling from floor level through one of the uprights into the top channel, before finally moving the screens into place.

WARNING

Crushing Hazard: Ensure multiple people lift and guide the top channel during installation. Do not work beneath suspended parts.



Step 2: Install the Top Channel:

- Lower the top channel onto the two mounting plates located on top of the screen and comb.

Step 3: Insert Fasteners:

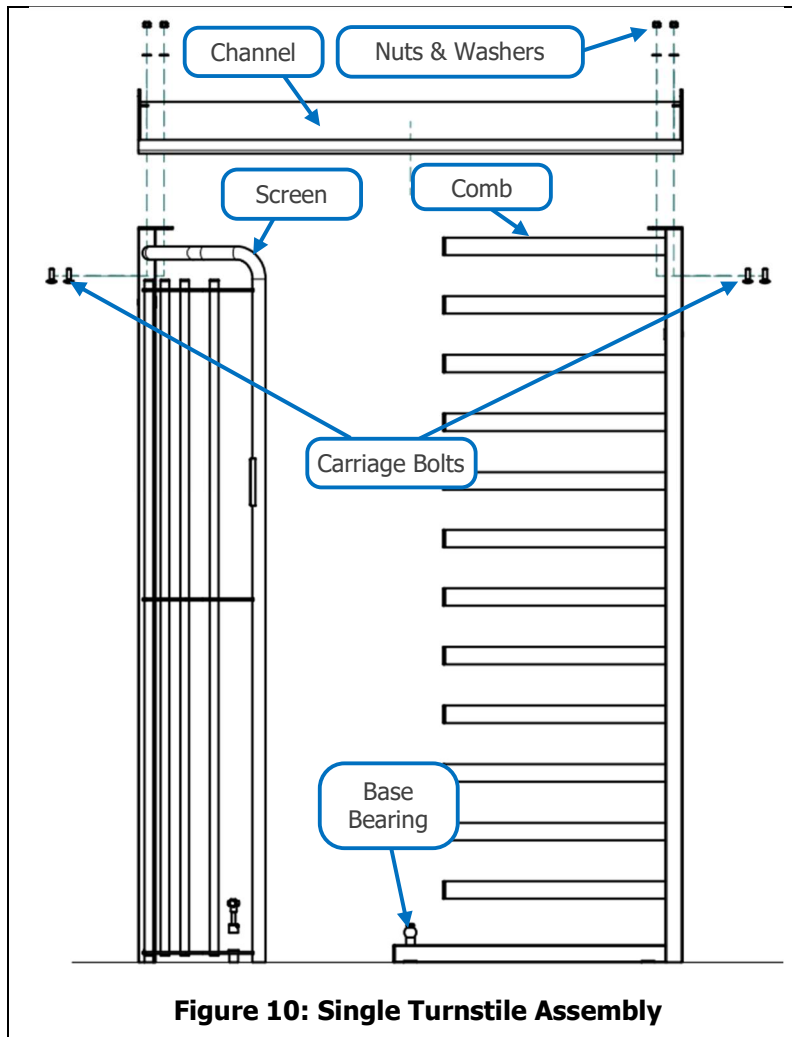
- Insert Square Cup Bolts from the bottom, ensuring the threads protrude into the top channel.

Step 4: Preliminary Tightening:

- Loosely tighten the bolts using washers and lock nuts from inside the channel.

Step 5: Frame Alignment Check:

- Before fully tightening, confirm that the frame is square and level using a spirit level.
- Make any necessary adjustments to ensure proper alignment, such as spacers installed on the side of the screen or comb to level the frame.

**Step 6: Final Tightening:**

- Once the frame is confirmed square and level, fully tighten all lock nuts to secure the structure.

Step 7: Cable Routing:

- Check that cabling is in place, routing to the control panel and not obstructed.

CAUTION

The Turnstile frames, rotors and channel are heavy, which can lead to injury if improperly handled. Ensure two or more people are available to place the frames and channel as described.



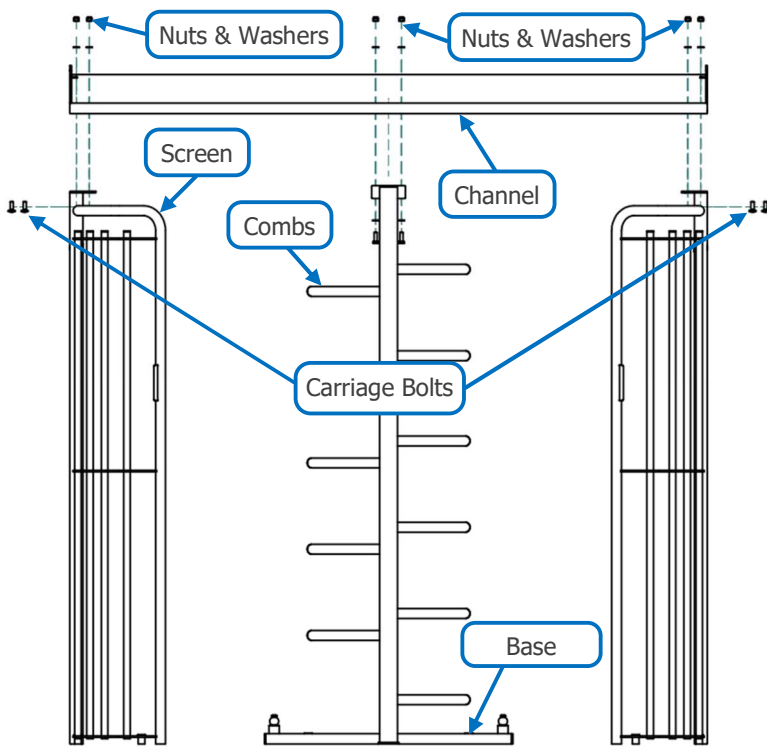


Figure 11: Double Turnstile Assembly

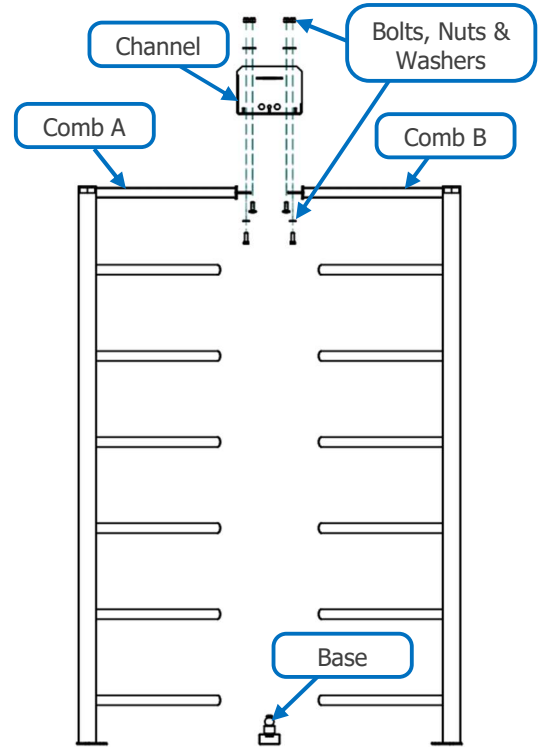


Figure 12: Double Side View

Step 1: Position the Screens

- Place the screens facing each other, ensuring correct alignment.

Step 2: Install the Top Channel:

- Lower the top channel onto the two mounting plates located on top of the screens.

Step 3: Insert Fasteners:

- Insert Square Cup Bolts from the bottom, ensuring the threads protrude into the top channel.

Step 4: Installing the Combs:

- Place the two combs, with arms matching either side, to fit on the underside of the channel.
- Loosely tighten the bolts using washers and lock nuts from inside the channel.

Step 5: Frame Alignment Check:

- Before fully tightening, confirm that the frame is square and level using a spirit level.
- Make any necessary adjustments to ensure proper alignment, such as spacers installed on the side of the screen or comb to level the frame.

Step 6: Final Tightening:

- Once the frame is confirmed square and level, fully tighten all lock nuts to secure the structure.

Step 7: Cable Routing:

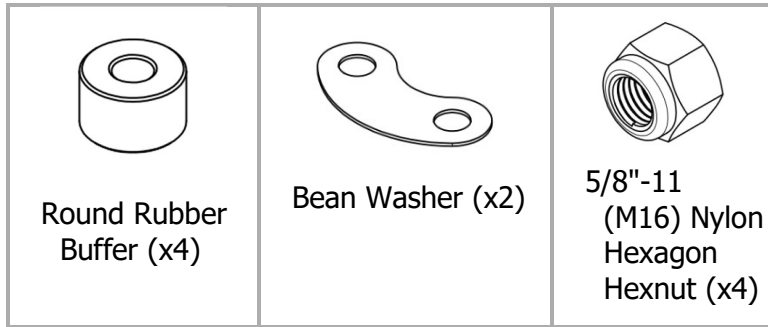
- Check that cabling is in place, routing to the control panel and not obstructed.

INFORMATION

The double turnstile should be assembled in the correct position on the prepared foundation. Route any cable provisioned from the floor level through either of the uprights or both.



9.11. Rotor Assembly



Step 1: Remove the Mechanism from the Channel:

- Inside the top channel, loosen and remove the mechanism from the center mounting area.
- Set the mechanism aside carefully—it will be refitted once the rotor is in place.

Step 2: Place the Rotor:

- Lower the rotor onto the base bearing ball, ensuring it is seated centrally. This may be done at a slight angle to seat onto the ball.
- Orient the rotor so that one set of arms faces the passage entry direction, checking that one top disk stud is also aligned with the set of arms.
- This initial alignment is critical for proper orientation and lock engagement.

Step 3: Place the Sleeve

- Ensure that the sleeve is inserted over the rotor head before placing the mechanism back. The sleeve will cover the disk assembly between the rotor and mechanism.

Step 4: Reinstall the Mechanism:

- Before replacing the mechanism, ensure the 4x rubber buffers are pushed into the holes in the disk below the mechanism. Also ensure to have 2x bean washers and 4x M16 nylock hexnuts available for tightening.
- With the rotor being held by a second person in place, lower the mechanism back into position above the rotor.
- The mechanism disk must align with the 4 studs on the rotor's top disk.

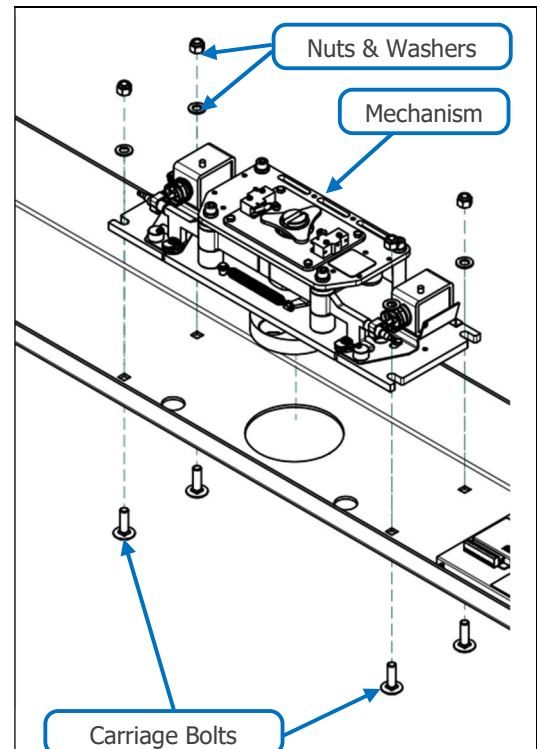


Figure 13: Mechanism

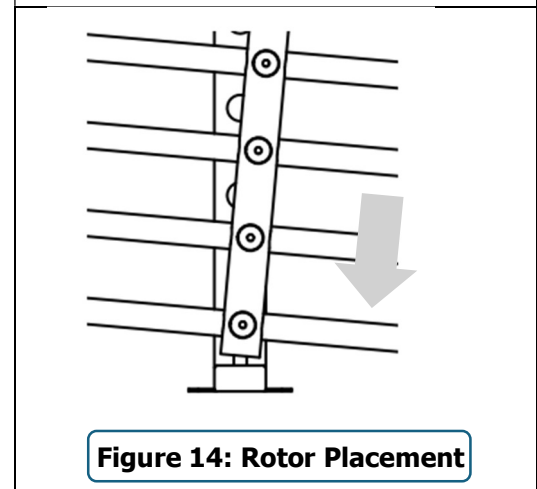


Figure 14: Rotor Placement

INFORMATION

Important for 3-Arm Rotors: The top disk always has 4 studs at 90°, even though the arms are spaced at 120°. This can cause misalignment with the mechanism disk. If it doesn't seat correctly, rotate the rotor 120° and try again until the studs align, and one arm faces the passage direction.

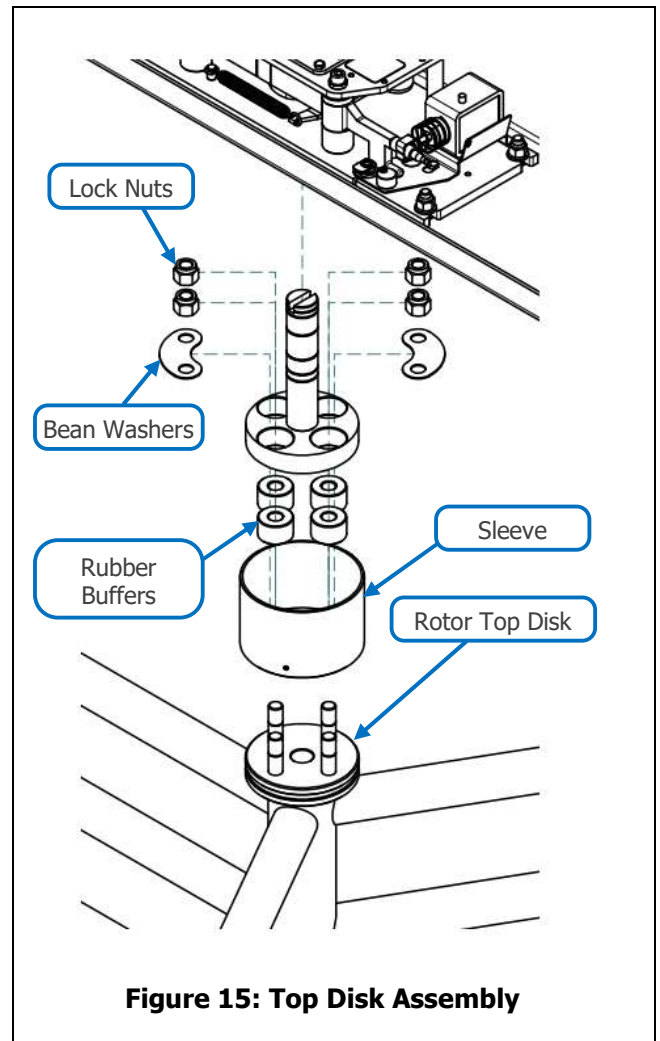
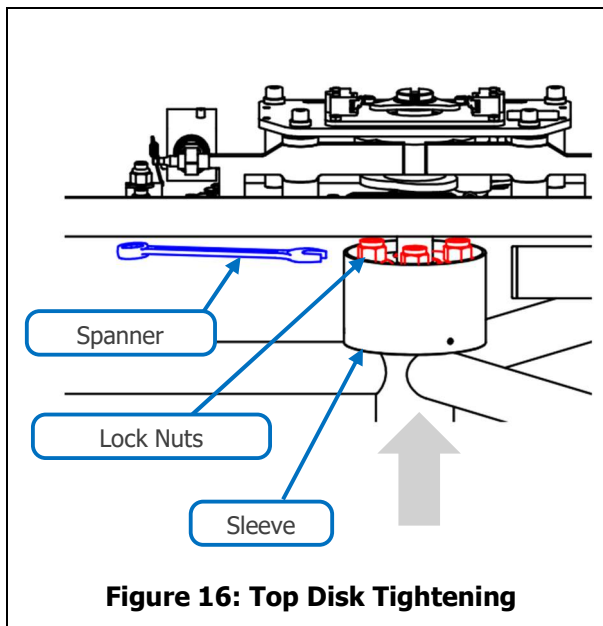


Step 5: Fit and Secure Top Disk Components:

- Once the mechanism is correctly seated on the top disk studs, Place the rubber buffers, bean washers, M16 washers, and M16 lock nuts in the specified order. The bean washers are crucial. They support the rotor and suspend it under tension when the nuts are tightened.
- Gradually tighten the lock nuts evenly until the rotor is fully lifted and suspended by the bean washers and the rubber buffers are compressed between the bean washers and the rotor top disk.

Step 5: Final Alignment and Test:

- If the unit is supplied in fail-lock configuration, use the override key to unlock the mechanism during testing.
- Confirm that the rotor rotates freely and centers properly.
- Check that all fasteners are fully tightened.



9.12. Electrical Conduit & Cable Routing



FIRE HAZARD

WARNING: Route cables with appropriate insulation and avoid tight bends or compression. Ensure all conduit seals are intact.



RISK OF ELECTRIC SHOCK

Warning: Power cables carry high voltage and should always be handled by qualified personnel.



Cable routing should be completed while positioning the turnstile, allowing for any necessary adjustments before the base is permanently secured to the foundation.

There are two options for routing, through-floor entry, or surface/high-level entry.

Through-Floor Entry (Preferred):

- Conduits enter directly beneath the center of the turnstile base, providing a concealed and tamper-resistant installation.
- Recommended for new installations or high-security environments.
- Ensure conduit stubs are accurately aligned with the access area in the screen upright before pouring the foundation.

Surface/High-Level Entry

- For retrofit installations or where underfloor conduit is not practical, surface-mounted conduit can be routed to the top channel or side entry point.
- Use grommets or IP-rated glands to protect cables where they enter the channel.
- Secure conduit to adjacent fencing or support structure to prevent strain on connections.

Cable Routing Guidelines

- **Avoid Interference:** Ensure cables do not pass through or near moving parts, including the rotor, pawls, or solenoid linkages. Use cable ties and guides to secure excess cable length away from rotating assemblies.
- **Power Cable:** Route a single-phase 110–240V AC mains cable to the control panel compartment. Confirm entry point is sealed and strain-relieved.
- **Low Voltage & Signal Cables:** Route 24V DC lines, solenoid wires, and access control inputs/outputs separately from mains wiring. Use shielded cable for access control data lines if required by system design. Keep signal cables away from high-current lines to avoid electromagnetic interference (EMI).

Cable Access to Control Board

- Once routed inside the top channel, cables must be neatly terminated to the internal terminal blocks as per the wiring diagram.
- Leave sufficient cable slack to allow for maintenance access and cover removal.

CAUTION

Do not run conduit or cable directly through rotor support areas, mounting bolt locations or near the mechanism and any moving parts to avoid cable damage.



9.13. Site Mounting Procedure

After the turnstile tests have been completed, the frame can be fixed to the concrete, and any adjacent walls for stability if required.

Step 1: Positioning the Turnstile:

- Move the turnstile in position on the prepared foundation, ensuring all base dimensions are checked and the overall base dimension is adhered to.
- Mark the mounting hole positions using the turnstile frame as a template.

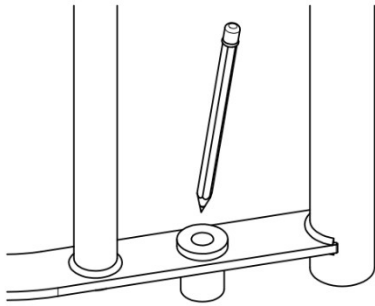


Figure 17: Marking Screen

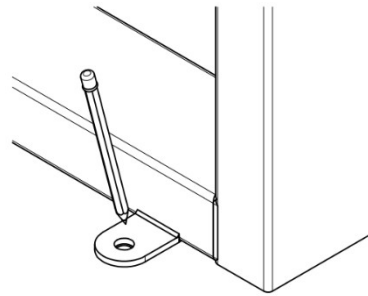
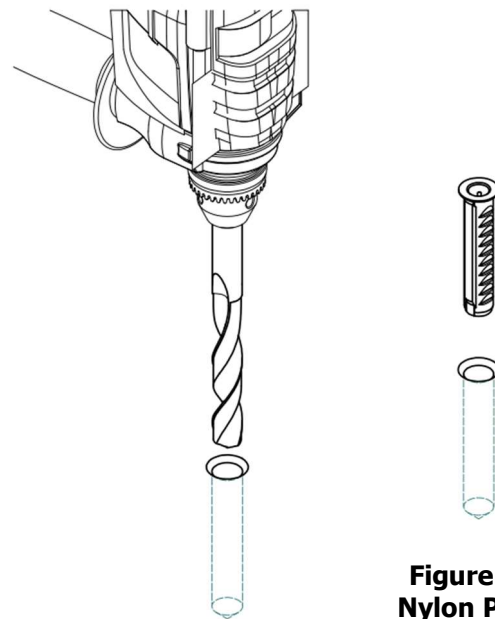


Figure 18: Marking Comb

- There are 4 holes per screen and 4 holes per single comb. For the double turnstile there is 1 hole on each comb for the double, and 2 holes on the center base.
- Ensure that the turnstile frame is aligned properly with entry and exit flow.
- Check that power and data conduit locations are correctly positioned before proceeding.

Step 2: Drilling & Anchor Installation:

- Using a 5/8" (16mm) masonry drill bit, drill anchor holes at the marked positions.
- Drill to a depth of at least 3,5" (90mm) to accommodate coach bolts with nylon plugs. Do not drill any closer than 3" (80mm) to the edge of the concrete.
- Clean out the drilled holes to remove dust and debris.
- Insert nylon plugs into the holes and gently tap them in place with a hammer.



**Figure 19:
Nylon Plug in
Hole**

Step 3: Securing the Turnstile.

- Move the turnstile back onto the prepared foundation, aligning the base with the drilled anchor points.
- Using the anchors, bolt down the screen first, ensuring that it's level across the legs. The anchor sleeves are all the same length, but the screws for the screen will be longer by 1" (25mm).
- Bolt down the comb using sleeves and anchors. For a single turnstile, there are 4 anchors on the comb. For a double turnstile, there are two combs with 1 anchor each to the floor and one center base with 2 anchors.

Figure 20: Drill Hole

- If securing to a wall or post, ensure that there is a 1" – 1.5" gap (25mm – 30mm) between the turnstile upright and the structure. This is to allow the cover to be removed, as it extends over the side of the channel and uprights.
- Insert coach bolts through the base plates and tighten them securely using a 3/4" (19mm) spanner and ratchet.
- Verify that the turnstile is level and plumb using a spirit level.
- If necessary, use shims or washers to adjust for minor surface irregularities.

INFORMATION

Ensuring the turnstile is installed level is critical, as any misalignment of the rotor may lead to improper operation or mechanical interference.

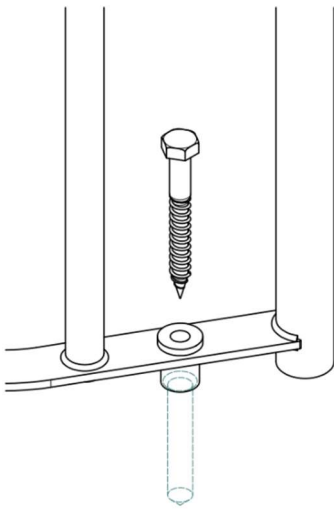


Figure 21: Screw through Screen

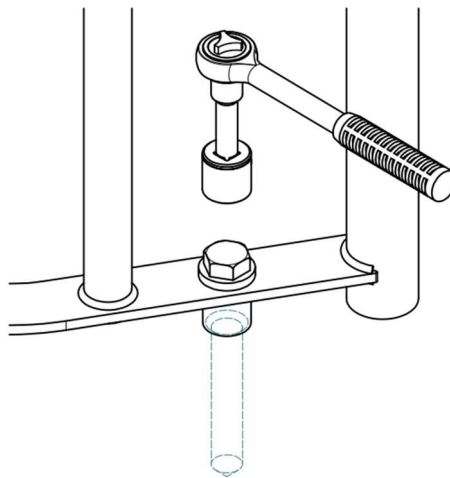


Figure 22: Tightening Screw

Step 4: Final Stability Check

- Ensure that all bolts are fully tightened, and that the turnstile is securely fixed to the foundation.
- Apply torque settings as specified to avoid over-tightening.
- Double-check that the rotor assembly moves freely without obstruction.

10. CONFIGURATION & TESTING

This section is the general guidance for safely routing and terminating electrical cabling. Covers AC input, internal power supply, cable entry options, strain relief, and protection. Emphasizes installer qualifications and disconnection before service.

10.1. Testing Manually

The turnstile can be supplied in either a fail-lock (fail-secure) or fail-open (fail-safe) configuration:

- In a fail-lock setup, the turnstile remains locked during a power failure.
- In a fail-open setup, the turnstile automatically unlocks when power is lost.

TURNSTAR turnstiles are typically shipped in the fail-lock (fail-secure) configuration

- **Fail-Lock (Fail-Secure) Configuration:**

- Use the override keys to unlock the mechanism from underneath the top channel. Manually rotate the rotor. When the rotor reaches mid-rotation, release the arms and the rotor will automatically return to the 0° centered position.
- Test each side individually, use the override keys to lock each side of the mechanism:
- One direction should rotate freely,
- The other side should lock.

- **Fail-Open (Fail-Safe) Configuration:**

- The rotor will already be in the unlocked state. Manually rotate the rotor to check that it centers correctly.
- Then use the override keys to lock each side of the mechanism, confirming that:
- One direction allows free passage,
- The other remains locked.

INFORMATION

Always verify the manual operation behavior before applying power.



10.2. Connecting Power



RISK OF ELECTRIC SHOCK

Danger: Before connecting power, make sure the circuit breaker on the panel is off and that the mains power source is not live.



FIRE HAZARD

For continued protection, replace only with the same type and rating of circuit breaker.

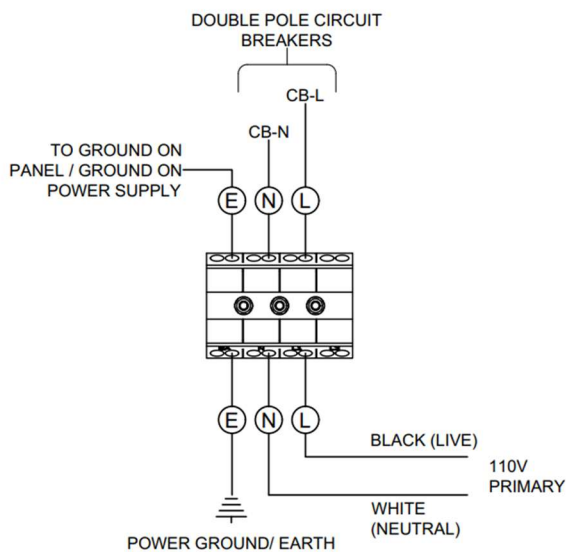


Figure 24: 110V AC Power Connection

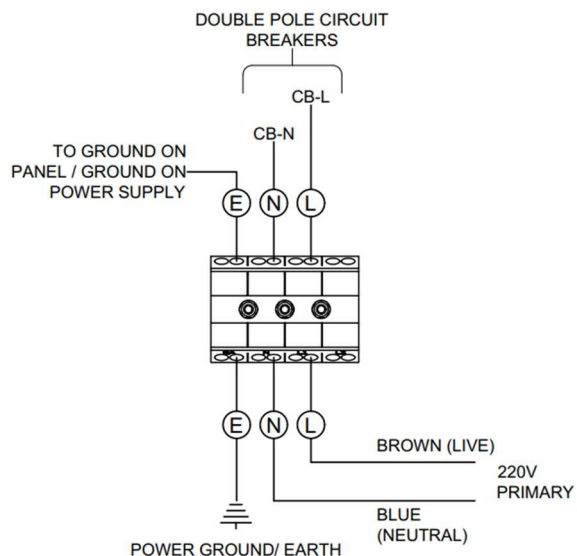


Figure 23: 220V AC Power Connection

Recommended Power Cable for Control Panel Connection:

- Cable Type: 3-core (live, neutral, earth)
- Conductor Size: 14 AWG (2.5 mm²)
- Voltage Rating: 300/500V or higher
- Insulation Type: PVC or LSZH (low smoke zero halogen) depending on site regulations

• Color Code (US) 110V AC:

- Black – Live
- White – Neutral
- Green or Bare – Earth (Ground)

• Color Code (SA/Europe) 220V AC:

- Brown – Live
- Blue – Neutral
- Green/Yellow – Earth

- After assembly, route the pre-pulled cables into the control panel for termination.
- Before connecting power, verify that the turnstile is configured for a 110V power supply, a label indicating the voltage setting can be found next to the mains connector block inside the panel.
- Once confirmed, connect the incoming power cable to the black terminal block marked for AC input on the control panel.

10.3. Connecting Triggers

DISCLAIMER

Emergency egress requirements vary by jurisdiction and are governed by local building codes, fire safety regulations, and authority having jurisdiction. It is the responsibility of the installer or system integrator to ensure that the installed turnstile system, including its configuration and fire alarm integration, complies with all applicable local codes and emergency egress requirements. The Manufacturer assumes no liability for non-compliant installations.



The TL350TUR controller supports fire alarm override through the existing trigger inputs (Entry and Exit). Integration depends on whether the fire system sends a momentary pulse or sustained signal:

- A short pulse (200–800ms) to either Entry or Exit Trigger input will cause the turnstile to momentarily unlock, allowing a brief window for passage, adjustable with the time-out DIP switches.
- For continuous unlocking during a fire alarm condition, ensure DIP Switches 5 and 6 are set to ON (Trigger Latch Enabled). Then apply a constant closed contact (e.g., relay held closed) to the trigger input.
 - The turnstile will remain unlocked as long as the contact is closed, allowing free rotation during the emergency.

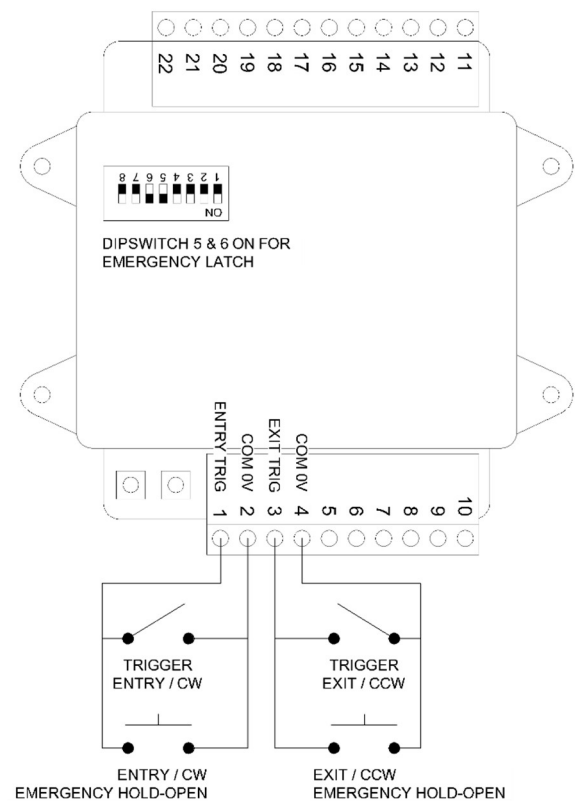


Figure 25: Trigger Connection

Triggers

Terminal		Function	Type
Open Entry / CW	1	Entry Trigger (dry contact)	Pulse 200 – 500ms (Dry Contact)
	2	0V / Common	
Open Exit / CCW	3	Exit Trigger (dry contact)	Pulse 200 – 500ms (Dry Contact)
	4	0V / Common	
Emergency Fire Open Entry / CW	1	Exit Trigger (dry contact)	Latch (Dipswitch 5 ON)
	2	0V / Common	
Emergency Fire Open Exit / CCW	3	Exit Trigger (dry contact)	Latch (Dipswitch 6 ON)
	4	0V / Common	

10.4. Grounding & Protection

- Ensure the turnstile frame and control housing is connected to earth using the provided grounding terminals.

- All cables should be routed through grommets or IP-rated glands, and strain relieved before termination.

10.5. Cable Specifications

Signal Cable Specification, Triggers & Inputs

- Cable Type: Twisted-pair or multi-core signal cable
- Conductor Size: min. 16 AWG (1,3 mm²) recommended, min. 20 AWG (0.5 mm²)
- Voltage Rating: Minimum 300V
- Typical Current: Low current, signal-level only (dry contact)
- Optional Shielding: Use shielded cable (FTP/STP) if running long distances or near high-interference equipment (e.g., motors or AC mains)
- Insulation: As required by site

Use Case Examples:

- Push buttons
- Card readers
- Fire alarm contacts (Latch)

CAUTION

Avoid using very thin wire (e.g., <0.2 mm²) as it may be too fragile for repeated maintenance or termination.



Route the cables from the card readers or other triggering devices, previously pulled during assembly, to the control panel.

Once inside the panel, connect the trigger cables to the designated input terminals on the controller, following the wiring diagram for entry and exit signal inputs.

10.6. Testing the Turnstile

Step 1: Check power.

- Make sure live power is on from the source and switch on the circuit breaker on the panel. The controller will be activated. The lights on the controller will be on, indicating that it is ready.

Step 2: Trigger the entry.

- Trigger the entry by the connected device, push button or card reader.
- The rotor will unlock toward the exit. Test this by pushing the rotor and walking through the passage. The turnstile will relock on exit.
- If the rotor unlocks toward the entry, wait for the time-out when the mechanisms locks again, and swap the two directional trigger inputs on the controller and try again.

Step 3: Trigger the exit.

- The rotor will unlock toward the entry. Test this by pushing the rotor and walking through the passage. The turnstile will relock on entry.
- The single turnstile can be pre-assembled adjacent to the installation site. Once the screen, comb, and top channel have been securely assembled, two people can carefully lift and position the frame onto the prepared foundation.

Step 4: Check the emergency fire latch trigger

- Close the emergency contact (latch trigger on either input, typically exit or CCW)

- The rotor will unlock toward the direction, and will remain unlocked, until the contact is opened (released) again.
- If the rotor is unlocking toward the wrong direction, verify that the correct input is being latched.
- If the rotor doesn't open indefinitely, verify that the input is a latching and that the controller dip switches are set for emergency open on latching.

Testing Verification Checklist

Action	Text	Pass	Fail
Power Off Tests			
Rotor Motion	Rotor rotates freely when unpowered and unlocked		
Rotor Manual Exit Lock	Rotor locks on exit attempt		
Rotor Manual Entry Lock	Rotor locks on entry attempt		
Rotor centering	Rotor centers to 0 degree		
Power On Tests			
Exit Trigger	Rotor unlocks and allows one person exit		
Entry Trigger	Rotor unlocks and allows one person entry		
Emergency Exit	Rotor stays unlocked for duration of trigger latch		

11. ELECTRICAL SYSTEMS

This section is the general guidance for safely routing and terminating electrical cabling. Covers AC input, internal power supply, cable entry options, strain relief, and protection. Emphasizes installer qualifications and disconnection before service.



RISK OF ELECTRIC SHOCK

Disconnect power before servicing.
Only qualified personnel may access the control panel.



FIRE HAZARD

For continued protection, replace only with the same type and rating of circuit breaker.



11.1. Control Panel Overview

- The full-height turnstile is fitted with a pre-wired internal control panel.
- The control panel houses the TL350TUR Logic Controller, which serves as the central control unit for the turnstile system.
- The system is designed for an input of 110–240V AC, 50/60Hz (Automatic via Power Supply), suitable for both U.S. and international power standards.
- The control panel includes a DIN-rail mounted circuit breaker for overload protection. No external fusing is required.
- Input Voltage: 110–240V AC, 50/60 Hz (Factory Set).
- The turnstile includes an internal 24V DC power supply to power the controller and solenoids.
- A DIN-mounted circuit breaker protects the system against overload or short circuit.

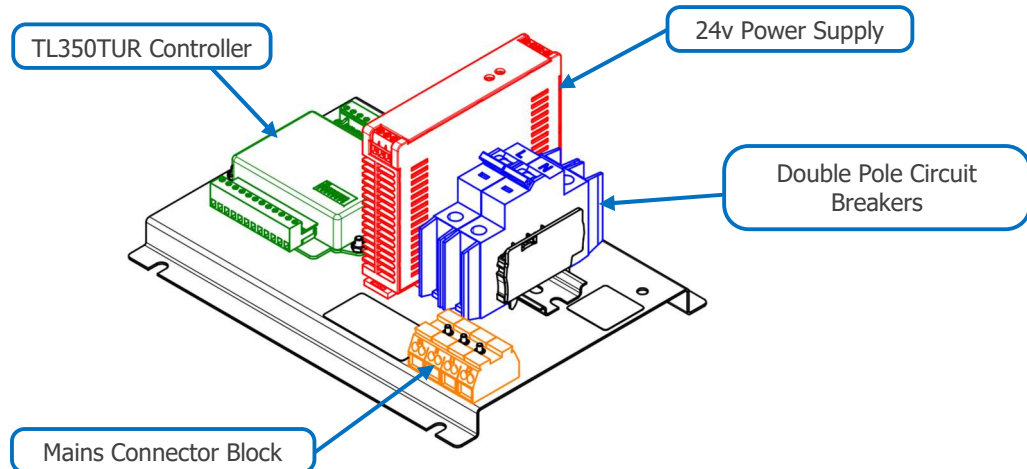


Figure 26: Control Panel Overview

11.2. Controller Overview

LEGEND		
Item	Description	Type
A	Entry Trigger	Input
B	Exit Trigger	Input
C	Entry Test Button	Input
D	Exit Test Button	Input
E	Entry LED (24v 0,5a)	Output
F	Exit LED (24v 0,5a)	Output
G	Entry Limit Switch	Input
H	Exit Limit Switch	Input
I	End of Transaction - Entry	Output
J	End of Transaction - Exit	Output
K	Entry Solenoid	Output
L	Exit Solenoid	Output

DIPSWITCH SETTINGS			
SW	Function	On	Off
1	Entry Solenoid	Fail Open	Fail Lock
2	Exit Solenoid	Fail Open	Fail Lock
3	Entry Trigger Input	N/C	N/O
4	Exit Trigger Input	N/C	N/O
5	Entry Trigger Latch	Enable	Off
6	Exit Trigger Latch	Enable	Off
7	Trigger Memory	On	Off
8	Timeout	10s	20s

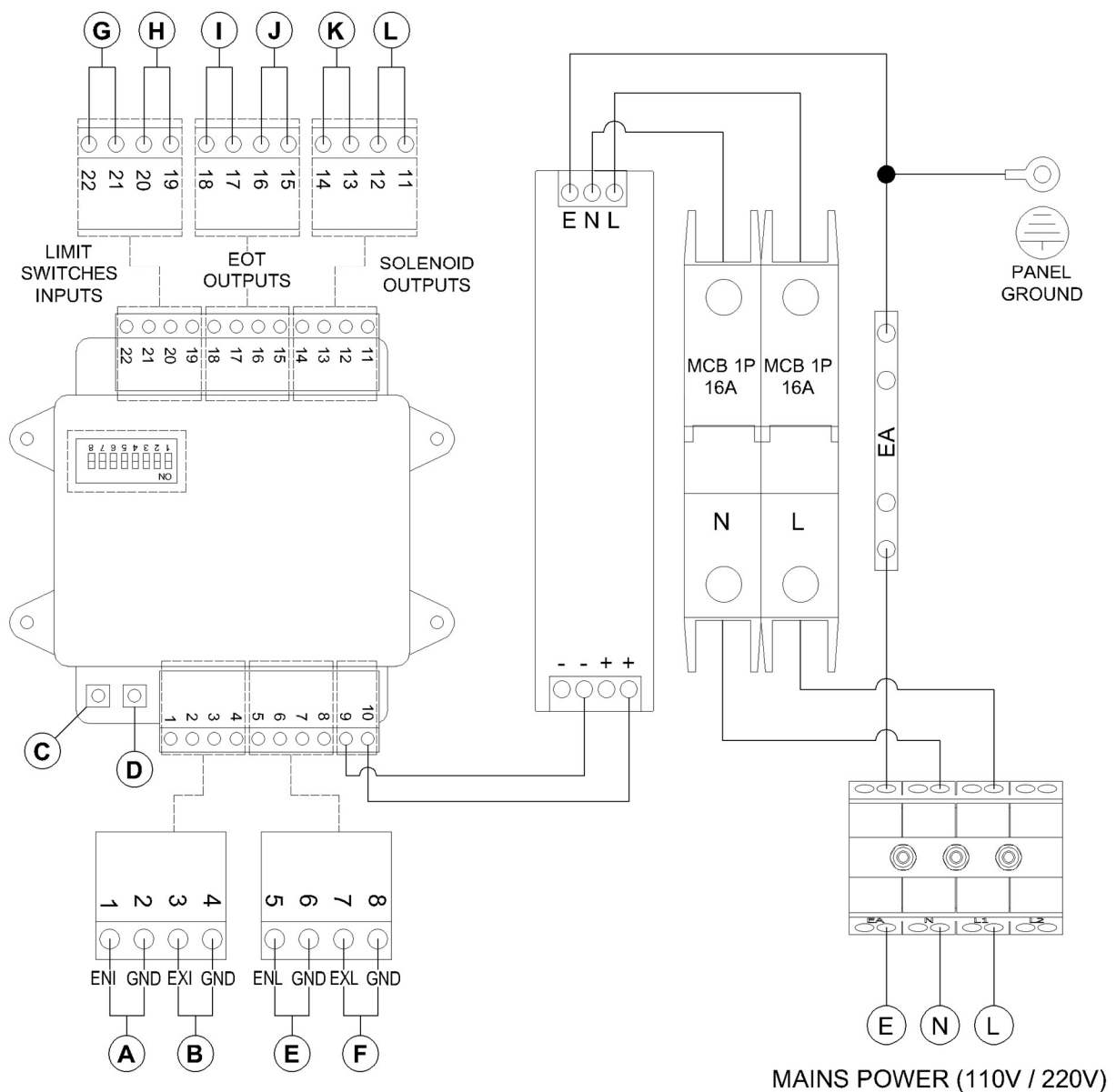


Figure 27: Control Panel Diagram

TL350 Logic Controller Terminals

Terminal	Function	Notes
1	Entry Trigger (dry contact)	Activate entry side (CW Open)
2	0V / Common	For Entry Trigger
3	Exit Trigger (dry contact)	Activate exit side (CCW Open)
4	0V / Common	For Exit Trigger
5	Entry LED (+)	Indicator light
6	Entry LED (-)	Indicator light
7	Exit LED (+)	Indicator light
8	Exit LED (-)	Indicator light
9	0V / COM	System ground
10	+24V	Power Input
11-12	Exit Solenoid (+ / -)	Controls exit locking
13-14	Entry Solenoid (+ / -)	Controls entry locking
15	Exit End of Travel (COM)	Used with mechanical switches
16	Exit End of Travel (N/O)	Normally open contact
17	Entry End of Travel (COM)	Used with mechanical switches
18	Entry End of Travel (N/O)	Normally open contact
19	0V / COM	For Limit switches
20	Exit Limit Switch	Dry contact input
21	0V / COM	For Limit switches
22	Entry Limit Switch	Dry contact input

TL350 Logic Controller Dipswitch Settings

SW	Function	ON	OFF
1	Entry Solenoid Mode	Fail-Safe	Fail-Lock (Secure)
2	Exit Solenoid Mode	Fail-Safe	Fail-Lock (Secure)
3	Entry Trigger I/P	N/C (Normally Closed)	N/O (Normally Open)
4	Exit Trigger I/P	N/C	N/O
5	Entry Trigger Latch	ENABLE (pulse + hold)	OFF (momentary only)
6	Exit Trigger Latch	ENABLE (pulse + hold)	OFF (momentary only)
7	Trigger Memory	ON (remembers trigger)	OFF (clears on timeout)
8	Timeout Duration	10 seconds (default)	20 seconds

11.3. Wiring & Parts Overview

In basic configuration, the control panel consists of the mains connector, the mains circuit breaker, the power supply, and the TL350TUR controller.

The controller **plate** used is 1,2mm mild steel, coated zinc.

The **conductor wire** used is 16 AWG (1.5 mm²) and 14 AWG (2.5 mm²) Alpha hook-up wire:

- 14 AWG Brown wire – 110v Live AC

- 14 AWG Blue wire – 110v Neutral AC
- 14 AWG Green/ Green-Yellow – Ground/ Earth
- 16 AWG Blue – 24v+ DC
- 16 AWG White – 0v DC

The **circuit breaker** is: FAZ-B16/2-RT-L Eaton Double Pole Circuit Breaker 240 VAC MCB 1P 16A

The **power supply** is: DRL-24V75W1AZ Delta Power Supply 85-264 Vac Input / 24Vdc 3.125A Output

The **earthing studs** are typically: Weld Stud - (Capacitor Discharge) M6 x 20 Copper Coated Mild Steel

Wire ends are typically:

- 14-16 AWG SPLICE ferrules
- 14-16 AWG Spade lugs
- 14-16 AWG Pin lugs

Wiring Color Codes (US):

- **AC (110v) Wiring**
 - 14 AWG (2.1mm) Black – Live AC (110–120V)
 - 14 AWG (2.1mm) White – Neutral
 - 14 AWG (2.1mm) Green – Earth (Ground)
- **DC (Low Voltage) Wiring**
 - 16 AWG (1.3mm) Red – 24V DC Positive (+)
 - 16 AWG (1.3mm) Blue – 0V DC Negative (–)
 - 16 AWG (1.3mm) Green – Panel Earth (Ground)

11.4. Mechanism Electrical Overview:

The mechanism's electrical components are two solenoids, and two limit switches.

The solenoids are: Binder 24v Solenoids

The limit switches are: Moujen MJ2-1704

Wire labels are marked as:

- **Sol A 24v+** = Solenoid A Positive
- **Sol A 0v** = Solenoid A Negative
- **Sol B 24v+** = Solenoid B Positive
- **Sol B 0v** = Solenoid B Negative
- **Limit A** = Limit Switch A
- **Limit A Com** = Limit Switch A common
- **Limit B** = Limit Switch B
- **Limit B Com** = Limit Switch B common

12. MECHANISM

12.1. Fail-lock and Fail-open configurations

The fail-lock and fail-open configurations can be set for each direction or both, by modifying the solenoid assembly for the specific direction.

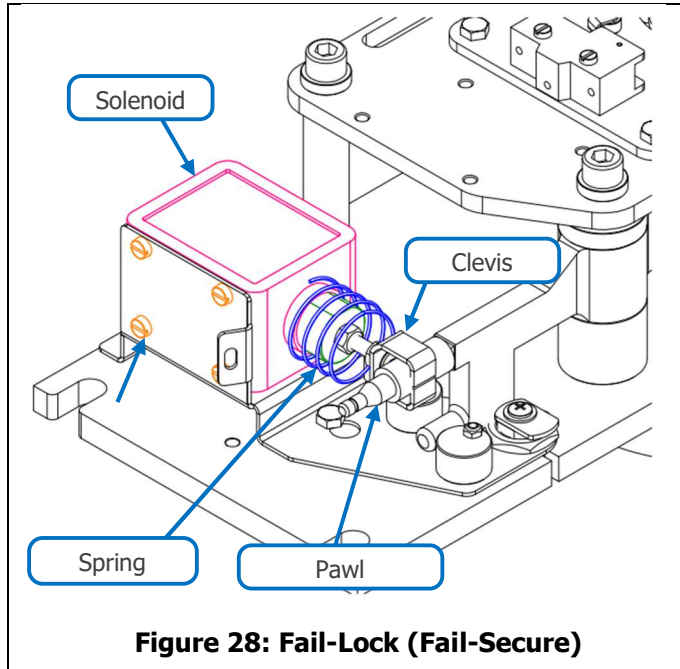


Figure 28: Fail-Lock (Fail-Secure)

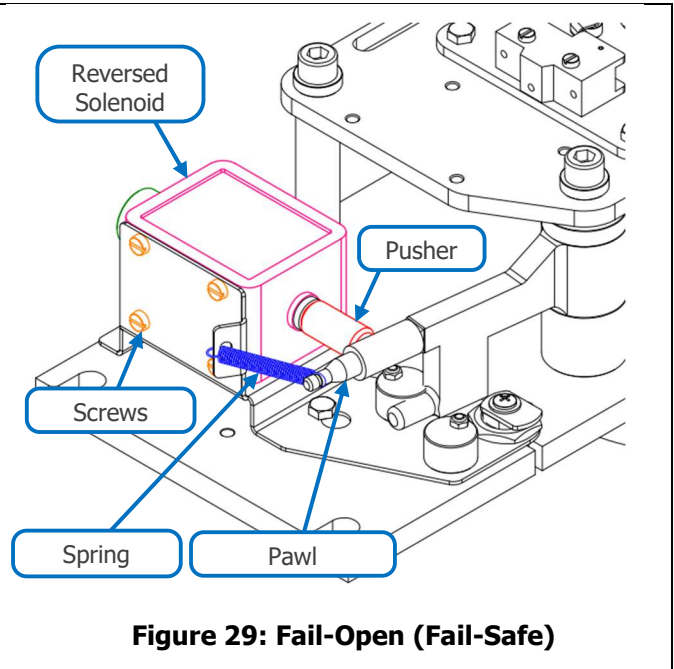


Figure 29: Fail-Open (Fail-Safe)

The operation below can be done in reverse for changing from fail-open to fail-lock.

CAUTION

Turn off power to the controller and mechanism by switching off the circuit breaker before carrying out the following operation.



RISK OF ELECTRIC SHOCK

Verify that the power is off by testing on the power supply LIVE input.



To change the locking configuration from fail-lock too fail-open:

- **Step 1:** Remove the solenoid (**item 1**) by unscrewing the 4 base screws (**item 2**) holding it to the mounting plate.
- **Step 2:** Disconnect the clevis from the pawl end.
- **Step 3:** Unscrew the clevis and remove along with the existing spring, nuts and spring (**items 3-4**). Store these in a bag for future use if needed.
- **Step 4:** Remove the plunger (item 5), locknut (item 6), and silicone washer (item 7) .

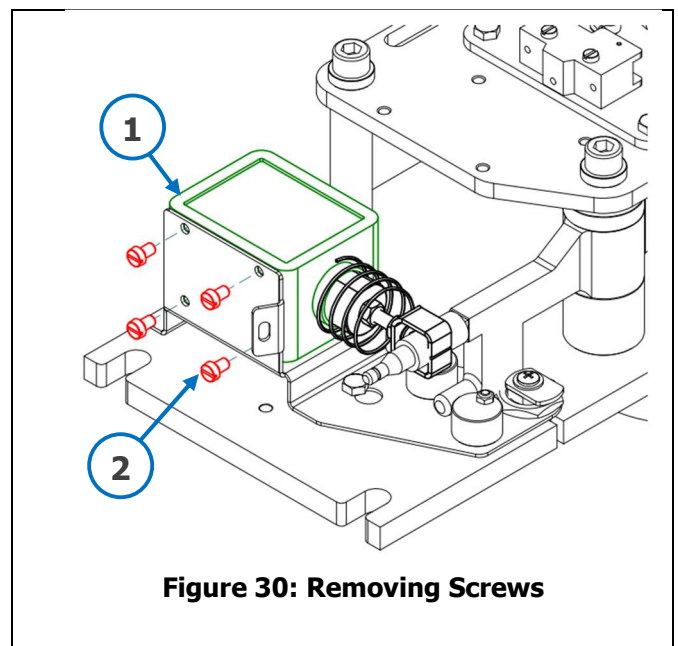
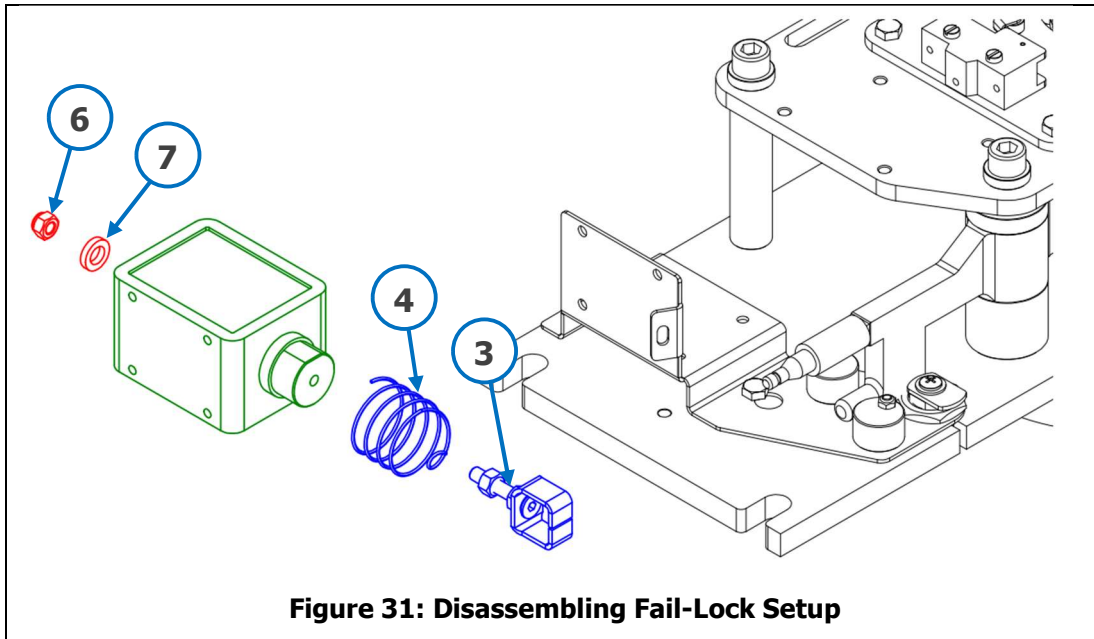
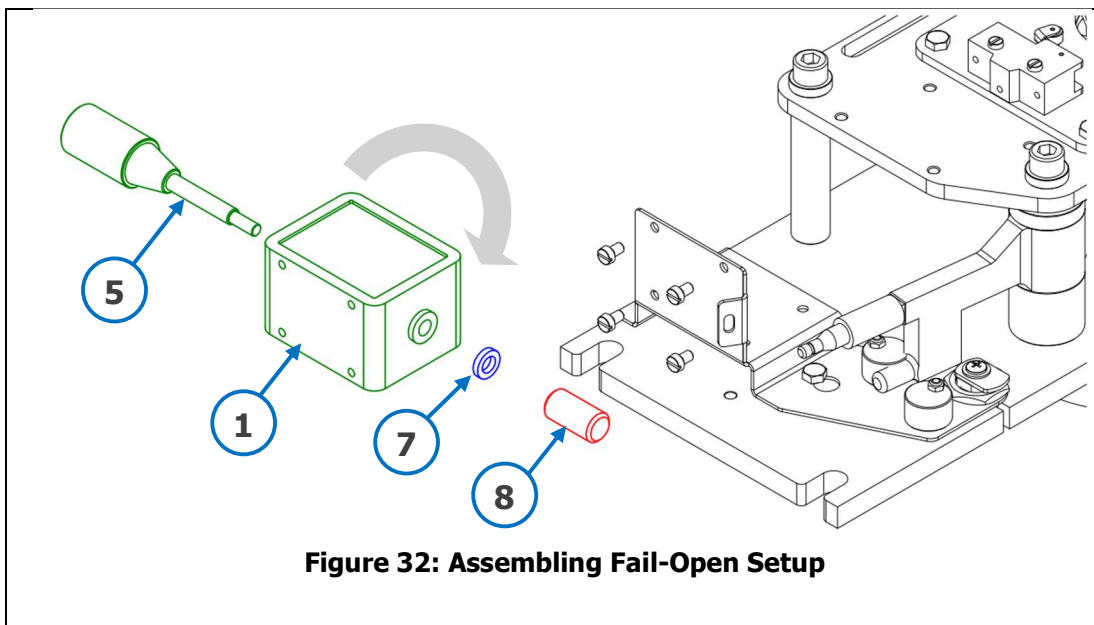


Figure 30: Removing Screws

- **Step 5:** Add the pusher (**item 8**) to the opposite side of the solenoid plunger and tighten using a spanner.

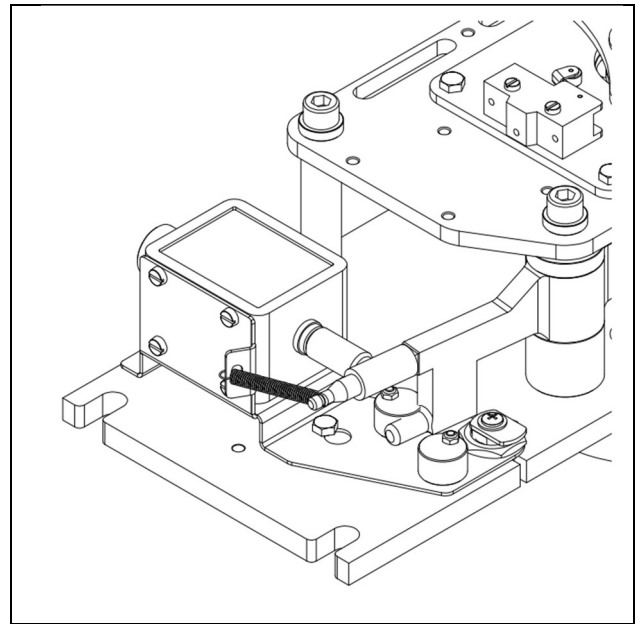
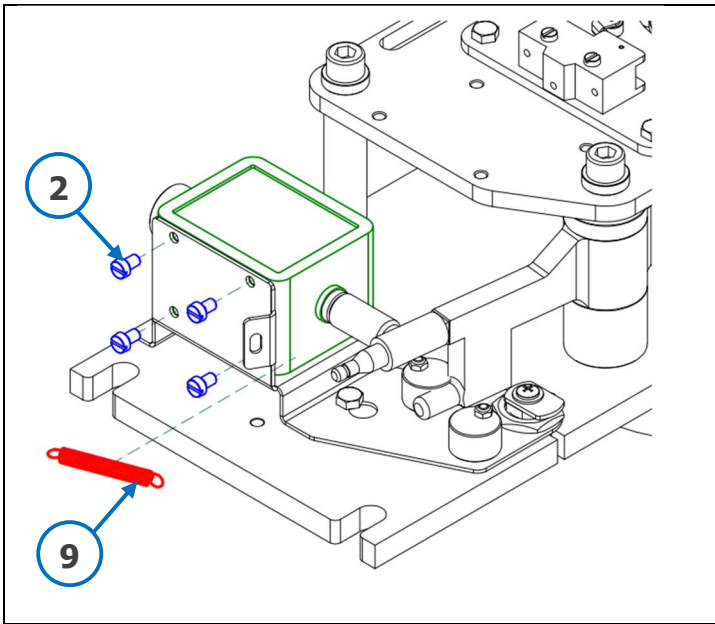


- **Step 6:** Turn the solenoid around, with the pusher facing the pawl and screw the solenoid into the plate, using the existing screws.



- **Step 7:** Hook the spring (**item 9**) onto the plate in the indicated hole, and the other end of the spring on the end of the pawl. The pawl will now be pulled back, unlocking from the disk.
- **Step 8:** By hand, test the motion of the pawl by pushing the front to the lock on the disk and releasing it. The spring will pull the pawl back to unlock.
- **Step 9:** On the controller, set the dipswitch for the direction to fail-safe (fail-open). Take care that the correct direction is being set.
- **Step 10:** Switch power back on at the circuit breaker, and the solenoid will push the pawl, locking at the disk.

- If the pawl does not lock, check the dipswitch settings again to make sure the correct direction is set.



TL350 Logic Controller Dipswitch Settings

SW	Function	ON	OFF
1	Entry Solenoid Mode	Fail-Safe	Fail-Lock (Secure)
2	Exit Solenoid Mode	Fail-Safe	Fail-Lock (Secure)

13. MAINTENANCE & TROUBLESHOOTING

13.1. Maintenance

Maintenance Procedure Checklist

No	Description	Checked
1	Cleaning of all external powder coated surfaces.	
2	Checking fixing and functionality of all turnstile keyed locks in top cover and for mechanism (key 60198).	
3	Cleaning of turnstile mechanism and top channel.	
4	Checking of turnstile mechanism pawl settings and application of grease to pawls and locking disk.	
5	Checking of turnstile solenoid operation & positioning and cleaning with rubbing alcohol.	
6	Limit switch functionality & adjustment, if necessary (2x limit switches).	
7	Checking of turnstile battery backup system.	
8	General functionality: Enter turnstile and become trapped. Trigger for access to be granted and finish the entry (do this for both clockwise and anticlockwise directions).	
9	General functionality: Enter turnstile and become trapped. Allow for time-out and return to the outside position (do this for both clockwise and anticlockwise directions).	

Turnstile Serial Number:	
Date of maintenance:	
Maintenance carried out by:	

13.2. Cleaning

- Depending on the finish of the turnstile, different cleaning instructions will apply.
- Dusting – Dust turnstile with a feather duster or soft cloth.
- Wash – Cleaning of turnstile to be done with a soft cloth (non-abrasive) dipped into a mixture of warm water and mild dishwashing liquid (alkaline-based cleaner with a pH of 12 or lower). Then rinse the turnstile with clean water. Do not spray with high pressure water near the top channel as water can damage the internal electronics.

Cleaning Frequency

Material Type	Action
Powder-coated mild steel	Dust once a month.
	Wash stubborn dirt in the affected area.
Hot-dipped Galvanized mild steel	Dust once a month.
	Wash stubborn dirt in the affected area.
304/316 grade stainless steel	Wash the entire turnstile twice a month with warm soapy water and a soft cloth
Powder-coated 304/316 grade stainless steel	Dust once a month.
	Wash stubborn dirt in the affected area.

13.3. Spare Parts

Spare Parts List

Part	Qty
Transformer	1
Battery Backup UPS power supply (If fitted)	1
Battery (If fitted)	2
Controller Board	1
Limit Switch	2
Solenoid	2
Camlock with Key	2
Camlock Cam	2
Indexing Roller	1
6mm Key	1
Clevis (For fail-lock)	2
Coil Spring (For fail-lock)	2
Pusher (For fail-open)	2
Spring (For fail-open)	2

13.4. Troubleshooting

Troubleshooting		
Symptom	Possible Cause	Recommended Solution
Turnstile rotates freely without power	Mechanical override is engaged	Ensure the mechanical override lock is secured using the provided key
Turnstile fails to unlock during power failure (Fail-Safe mode)	Mechanism is not configured for fail-safe	Verify mechanism setup and adjust to fail-safe configuration
	Logic settings are incorrect	Set the logic board to fail-safe mode using dipswitch configuration
Turnstile unlocks on power failure (Fail-Secure mode)	Mechanism is not configured for fail-secure	Verify mechanism setup and adjust to fail-secure configuration
	Logic settings are incorrect	Set the logic board to fail-secure mode using dipswitch configuration
Turnstile does not unlock when triggered	Solenoid is dirty	Clean solenoid using alcohol. Do not use Q20 or oil-based lubricants
Rotor does not return to home position (self-center)	Indexing spring is broken	Replace the indexing spring inside the mechanism
3-arm turnstile traps user during rotation	Incorrect rotor assembly	Review rotor assembly steps and correct alignment
4-arm turnstile traps user during rotation	Microswitches wired incorrectly	Inspect and correct microswitch wiring to match logic board input
Backup batteries are not charging	Incorrect battery output voltage	Adjust UPS power supply output to 27.6V DC
Turnstile fails to rotate upon valid trigger	No signal received by control panel	Use onboard test buttons or toggle on the logic board to verify function
	Fault in access control trigger	Verify continuity of access control trigger line
	Possible fault on logic PCB	Test both trigger inputs (Card 1 and Card 2). If neither works, replace the logic PCB
Turnstile allows more than one person per activation	Trigger signal is too long, or fire alarm mode is active	Check dipswitch settings for fire alarm mode. Limit trigger pulse to less than 0.75 seconds
	Faulty microswitch	Inspect and replace any damaged or unresponsive microswitches
Rotor arms are colliding or scraping against comb	Rotor height is incorrect, or circlip has failed	Inspect top mechanism. Check circlip and realign rotor height if needed

14. REVISION HISTORY

Revision Table			
Revision	Date	Author	Description
1	10-02-2025	E. Swart	First Issue.
1.1	25-02-2025	E. Swart	Added Fail Safe/ Lock Conversions
1.2	15-03-2025	E. Swart	Fixed Spelling Errors
1.3	16-04-2025	E. Swart	UL & US market alignment redo, imperial sizes added, standards added