

TURNSTAR



RELIABLE ★ DURABLE ★ GUARANTEED

INSTALLATION MANUAL



OCTAGONAL GLASS TURNSTILE

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1. COPYRIGHT & LIABILITY

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2. INTRODUCTION

- 2.1. This Manual is specifically compiled to train and refer the technical staff of TURNSTAR to assemble, test and fault find the specific product. The manual will discuss in depth features of the product for the reader to gain a full understanding of the operation and maintenance required.
- 2.2. Turnstar strives for repeatable quality instilled in its product range and to achieve this, there is an agreed standard for manufacturing, assembly and testing. For more information on these standards, refer to the TURNSTAR Technical Standards documentation.
- 2.3. There are a few symbols used in this manual that the reader should understand. These will help to point out important notes, warnings and guidelines to the technician and assembler. There are some important terms to take note of which will be used in this manual:



3. OVERVIEW

- 3.1. The Octagonal Glass Turnstile is a medium level access control product.
- 3.2. The Turnstile has a heavy-duty mechanism with controller, which locks and unlocks two solenoids.
- 3.3. The Turnstile is used as bi-directional entry and exit, one person at a time.
- 3.4. There are two variants of the Turnstile. One with a single and one with a double passage.
- 3.5. The Turnstile requires a trigger for either entry and exit direction, typically provided by an access control system.
- 3.6. The glass is manufactured from 10mm thick clear toughened safety glass. The glass shatters on impact, minimizing the probability of a person being cut by large glass shards.
- 3.7. The Turnstile can be manufactured either from brushed stainless steel 304 or powder-coated mild steel.

NOTE WELL: This product is not suitable for outdoor use as it is not weather and rain proof. In case of outdoor installation, ensure that an additional roof is above the unit to shelter from rain. The product is also not wind-proof and cannot be used as a draft blocker.

4. SINGLE TURNSTILE DRAWINGS

- 4.1. The Single Turnstile has one clear open passage of 638mm that allows entry through the turnstile in both directions. The turnstile has a 1398mm width x 1397mm depth x 2296mm height.
- 4.2. The Single Turnstile requires a tolerance of 5mm opening per side on the width and 10-15mm above the top cover for installation clearance.
- 4.3. The Single Turnstile needs a level plinth, not to deviate by more than 3mm across the width and depth of the base. The plinth must be ideally 150mm deep to accept diameter 10 x 100 anchor bolts with a nylon sleeve. A conduit should be prepared with the plinth, for cables to lead through the primary conduit entry points, into the uprights and up to the top cavity for connections to the controller.
- 4.4. The Core Positions of the Single Octagonal Glass Turnstile are located primarily at the base, 1360mm apart, shown on **Figure 2: Single Turnstile Conduits**. There are alternative conduit entry points on the side top bulkhead and down into the top cavity from the cover plate.

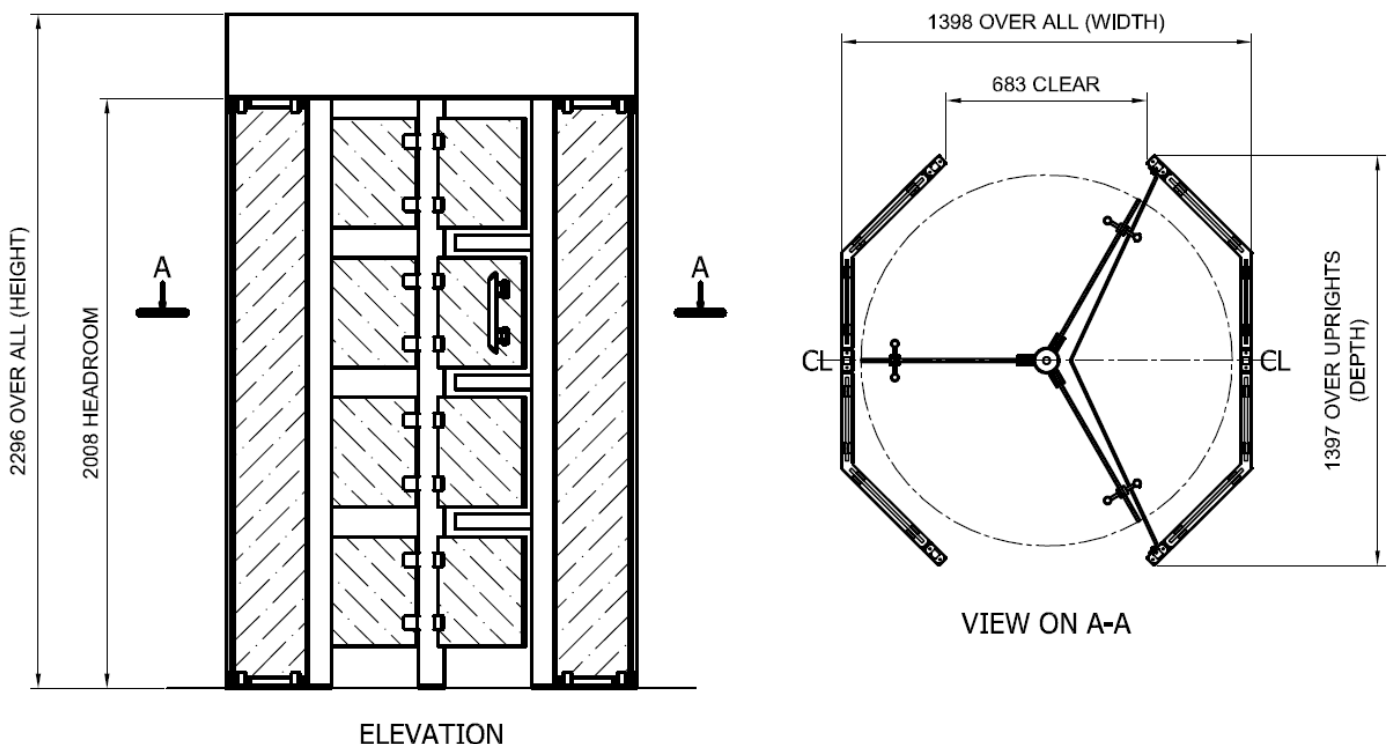


Figure 1: Layout of Octagonal Single Turnstile

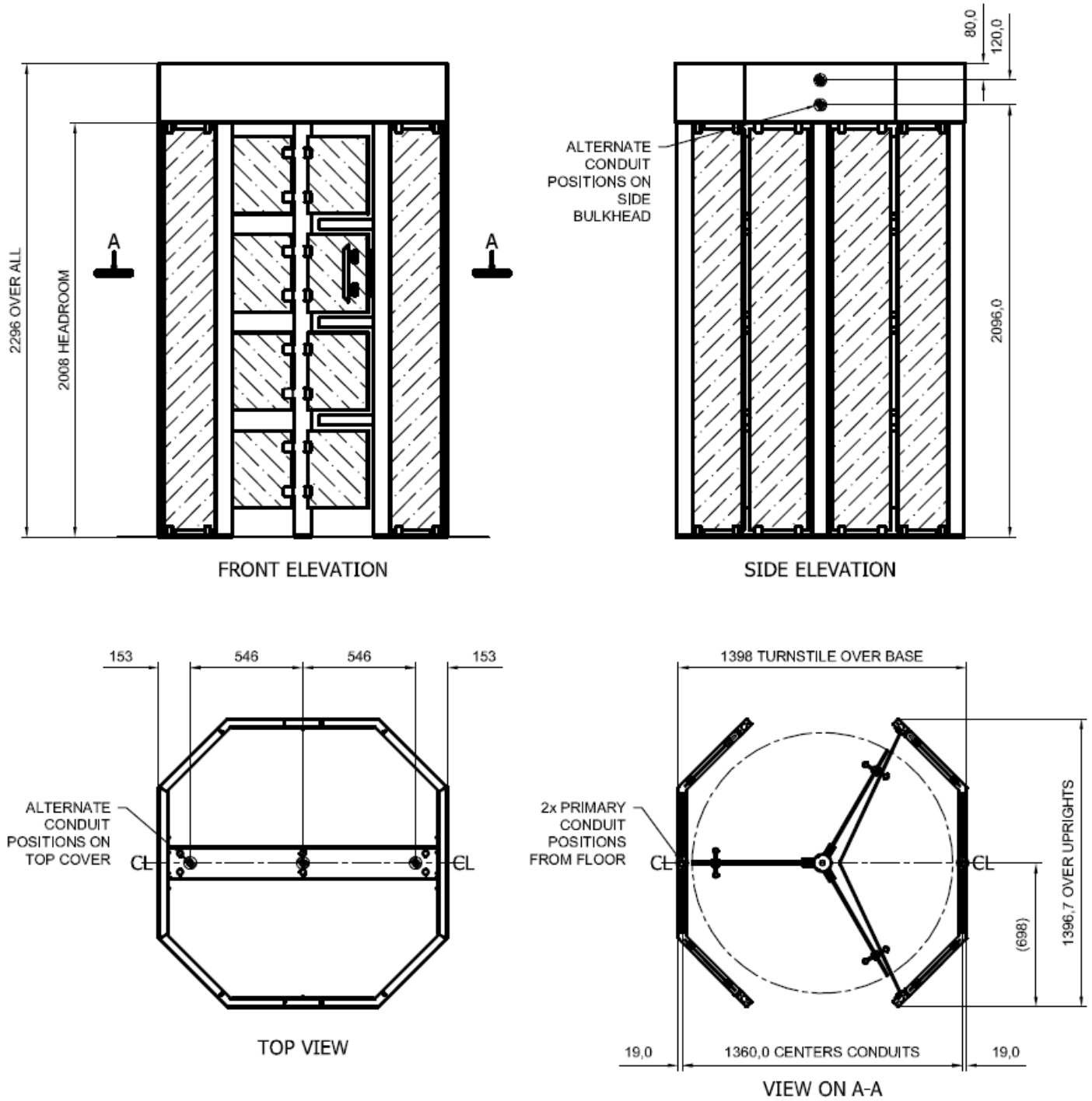


Figure 2: Single Turnstile Conduits

5. SINGLE TURNSTILE INSTALLATION PREPARATION

5.1. Identifying parts.

- 5.1.1. Before commencing with installation, ensure that power and control cables are available, either from the floor or from the top.
- 5.1.2. If the cabling is to be introduced from the floor through the uprights, ensure that the conduits are flush with the floor level, and that the cabling extends +- 3,5 meters above floor level.
- 5.1.3. If the cabling is introduced from the top or the side, ensure that cabling extends +- 2 meters to reach the center of the bulkhead, where the control panel is located.

5.2. Plinth Details.

- 5.2.1. The Single Turnstile Requires a 1498mm x 1450mm x 150mm (minimum) deep plinth. The strength should be approximately 15MPa.

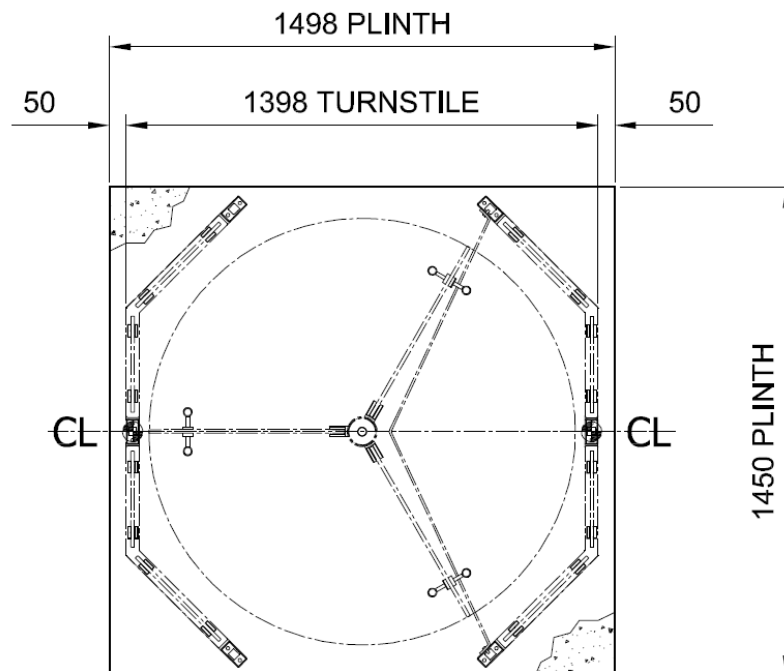


Figure 3: Single Turnstile Plinth

5.3. Marking out the installation on the floor.

- 5.3.1. Ensure the floor is level. Check with a suitable levelling line and spirit level. Levelness should not deviate by more than 3mm across.
- 5.3.2. With a chalk line, mark the center position of where the Turnstile will be installed.
- 5.3.3. Mark the outer edges 699 mm away from the center line on each side. The Turnstile base outer edges are 1398mm apart. This represents the outside of the Turnstile.

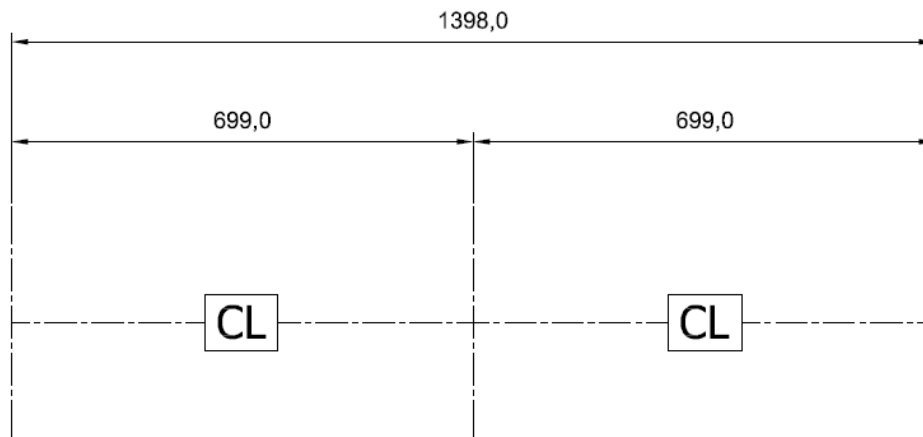


Figure 4: Marking on Floor

- 5.3.4. Mark the conduit points 19mm inside from the outer edges as shown. Prepare conduits if required by core-drilling or chasing conduit and cabling to these points.

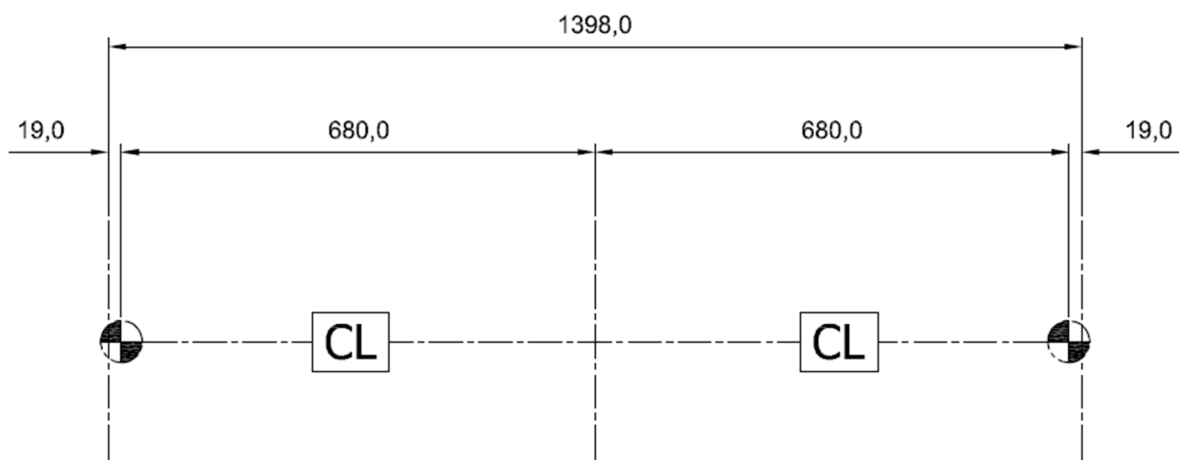


Figure 5: Marking conduit positions

6. **DOUBLE TURNSTILE DRAWINGS**

- 6.1. The Double Turnstile has two clear open passages of 638mm that allows entry through the turnstile in both directions. The turnstile has a 2180mm width x 1397mm depth x 2296mm height.
- 6.2. The Double Turnstile requires a tolerance of 5mm opening per side on the width and 10-15mm above the top cover for installation clearance.
- 6.3. The Double Turnstile needs a level plinth, not to deviate by more than 3mm across the width and depth of the base. The plinth must be ideally 150mm deep to accept diameter 10 x 100 anchor bolts with a nylon sleeve. A conduit should be prepared with the plinth, for cables to lead through the primary conduit entry points, into the uprights and up to the top cavity for connections to the controller.
- 6.4. The Core Positions of the Double Octagonal Glass Turnstile are located primarily at the base, 1360mm apart, shown on **Figure 6: Layout & Conduits of Octagonal Double Turnstile**. There are alternative conduit entry points on the side top bulkhead and down into the top cavity from the cover plate which is shown on **Figure 7: Double Turnstile Alternate Conduits**.

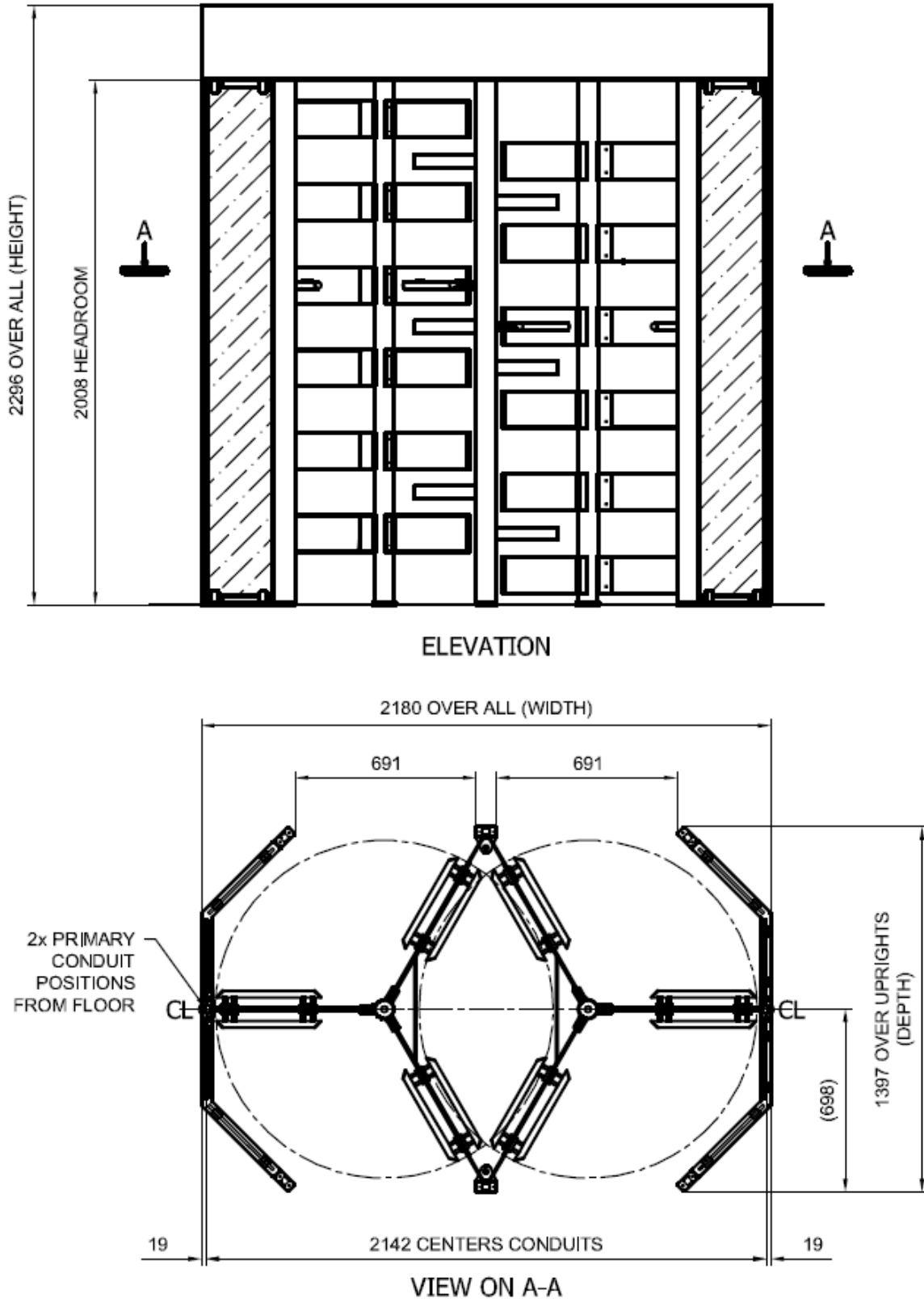


Figure 6: Layout & Conduits of Octagonal Double Turnstile

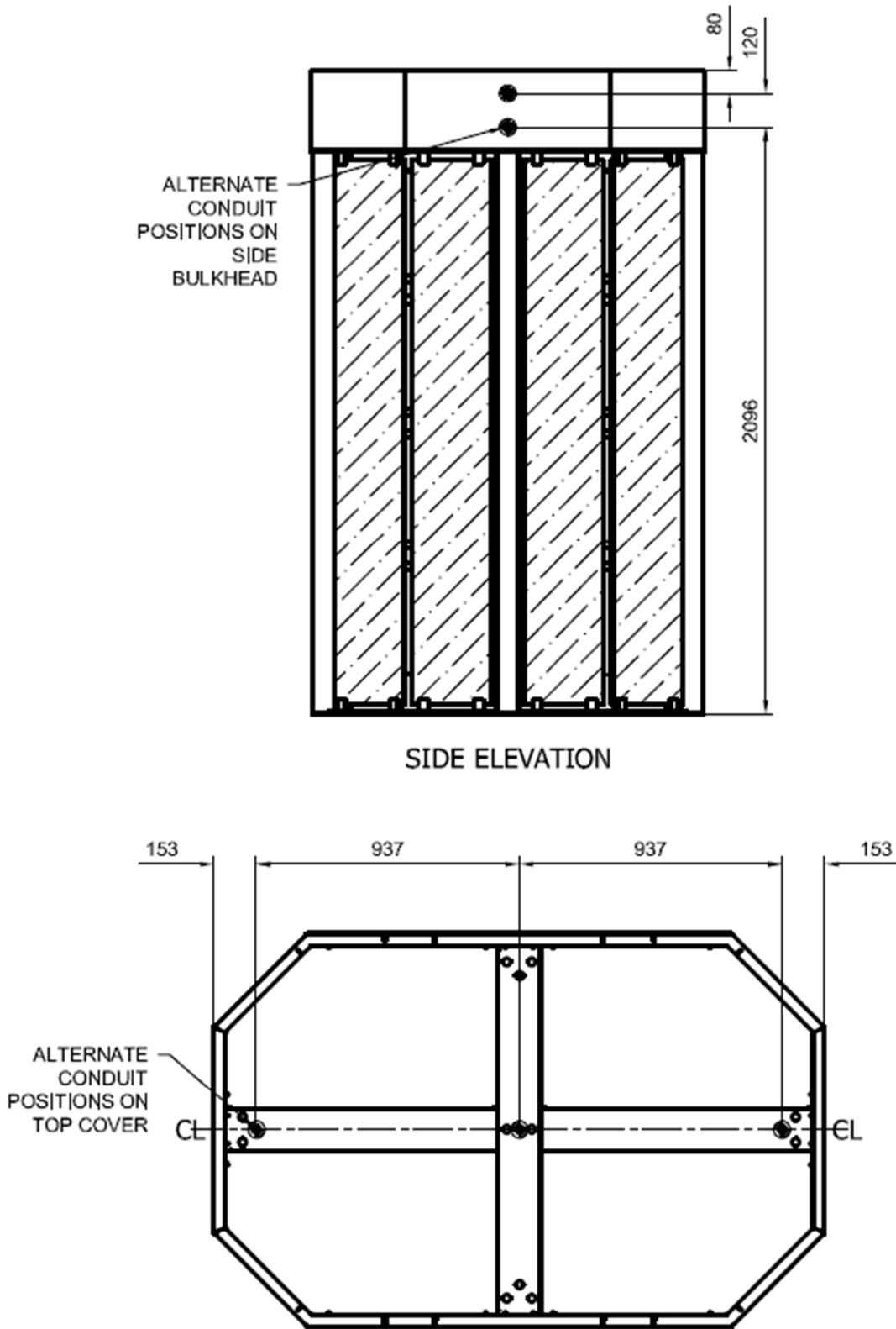


Figure 7: Double Turnstile Alternate Conduits

7. DOUBLE TURNSTILE INSTALLATION PREPARATION

7.1. Identifying parts.

- 7.1.1. Before commencing with installation, ensure that power and control cables are available, either from the floor or from the top.
- 7.1.2. If the cabling is to be introduced from the floor through the uprights, ensure that the conduits are flush with the floor level, and that the cabling extends +- 3,5 meters above floor level.
- 7.1.3. If the cabling is introduced from the top or the side, ensure that cabling extends +- 2 meters to reach the center of the bulkhead, where the control panel is located.

7.2. Plinth Details.

- 7.2.1. The Double Turnstile Requires a 2280mm x 1450mm x 150mm (minimum) deep plinth. The strength should be approximately 15MPa.

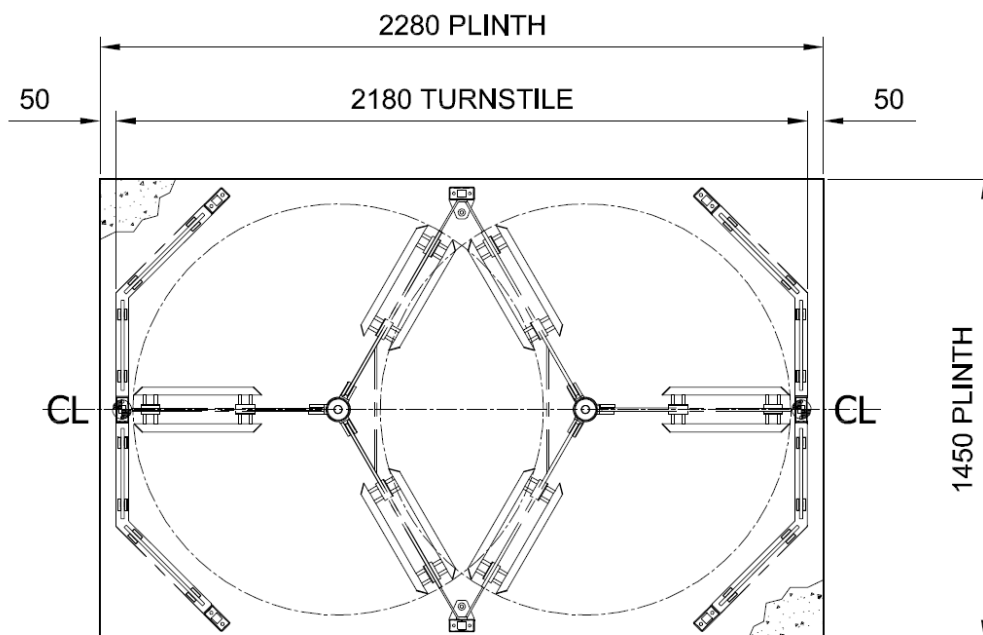


Figure 8: Single Turnstile Plinth

7.3. Marking out the installation on the floor.

7.3.1. Ensure the floor is level. Check with a suitable levelling line and spirit level. Levelness should not deviate by more than 3mm across.

7.3.2. With a chalk line, mark the center position of where the Turnstile will be installed.

7.3.3. Mark the outer edges 1090 mm away from the center line on each side. The Turnstile base outer edges are 2180mm apart. This represents the outside of the Turnstile.

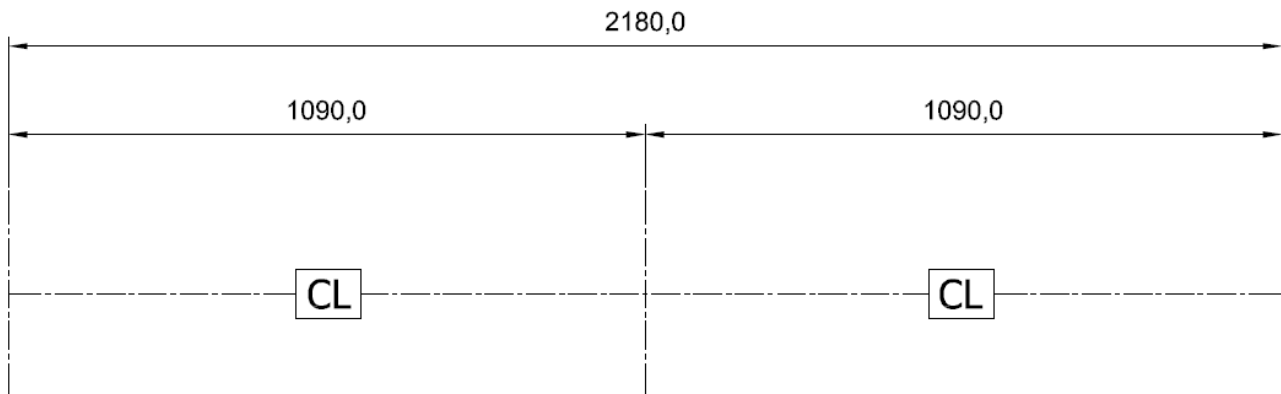


Figure 9: Marking on Floor

7.3.4. Mark the conduit points 19mm inside from the outer edges as shown. Prepare conduits if required by core-drilling or chasing conduit and cabling to these points.

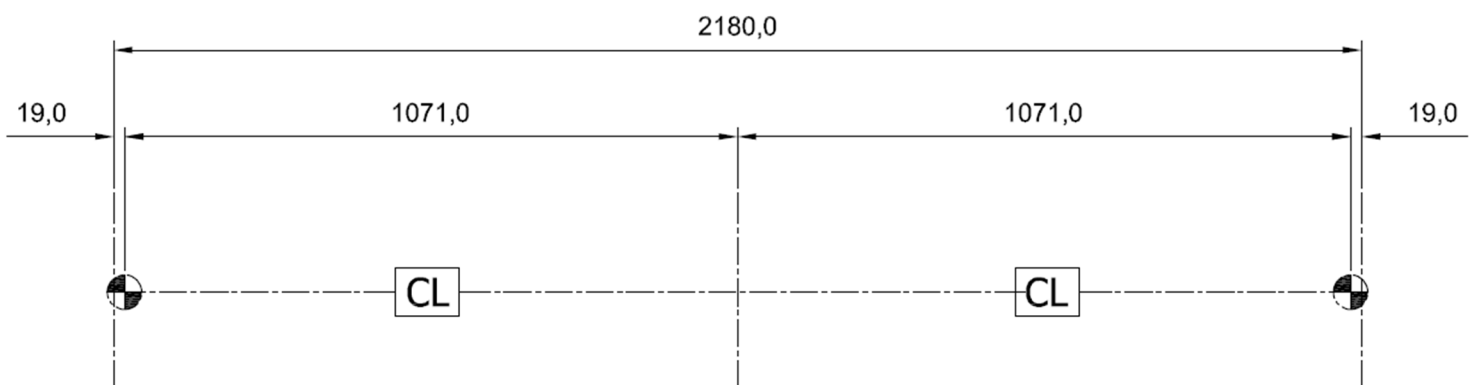


Figure 10: Marking conduit positions

8. INSTALLATION

8.1. Marking Hole Positions to be drilled.

8.1.1. On the single turnstile, there are 8x off diameter 10,5 counter-sunk holes for bolts on the frame, and 3x off diameter 12,5 counter-sunk holes for the center plate of the rotor. Mark these, remove frame and drill holes for suitable anchors into finished floor level.

8.1.2. When drilling the holes, the frame bolting holes can be used as a template for the drill head, to ensure that the holes are drilled in the correct position.

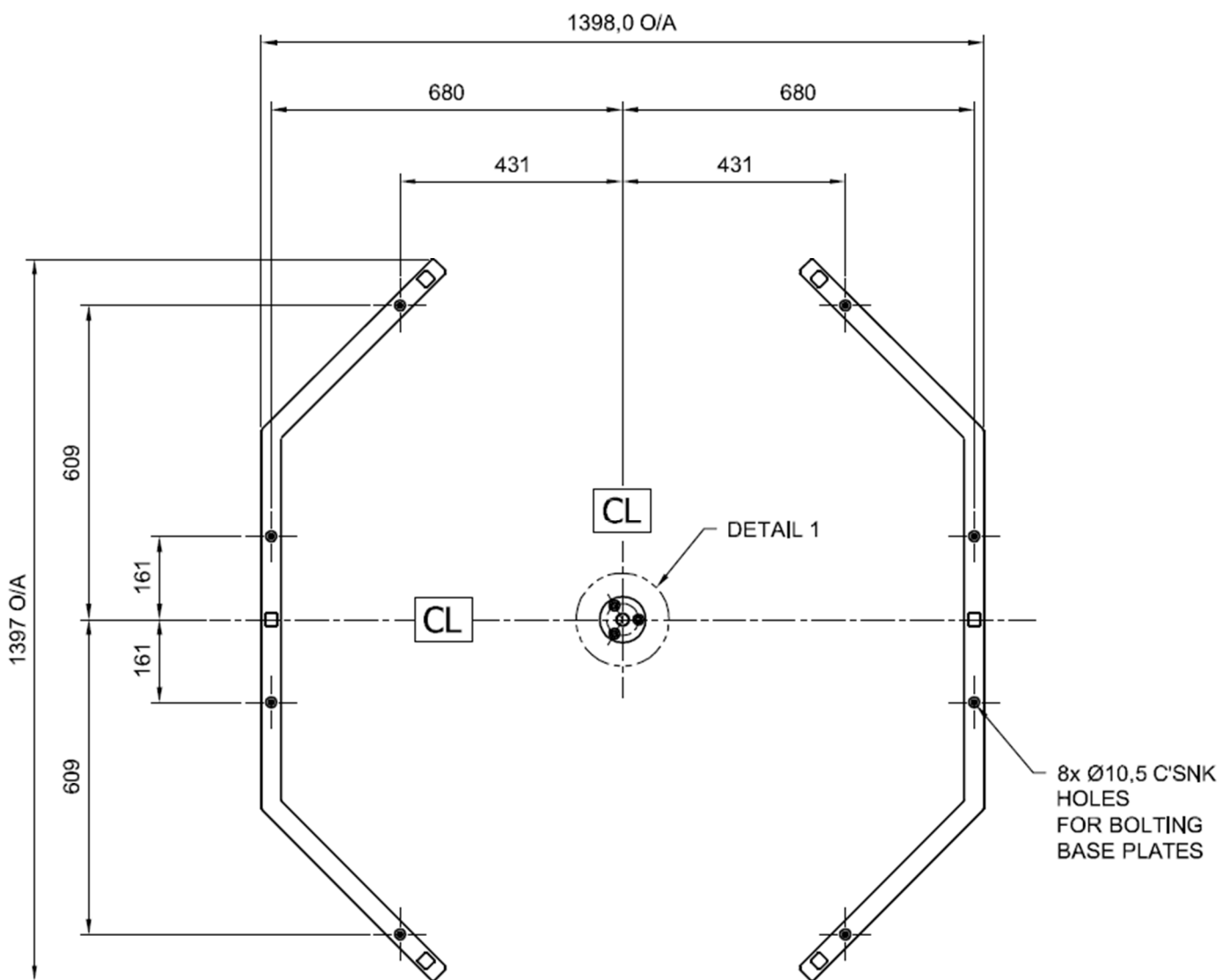


Figure 11: Single Turnstile Footprint

8.1.3. The center plate for the rotor must be placed correctly centered between the frames. Misalignment will cause the rotor to fail to turn.

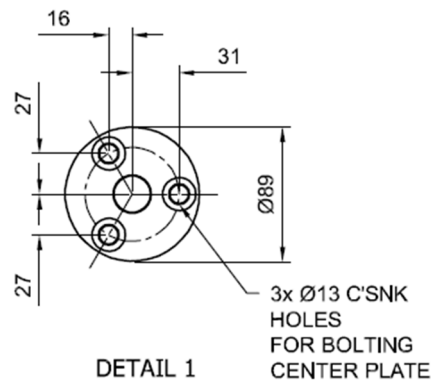


Figure 12: Detail of Center Plate for Rotor

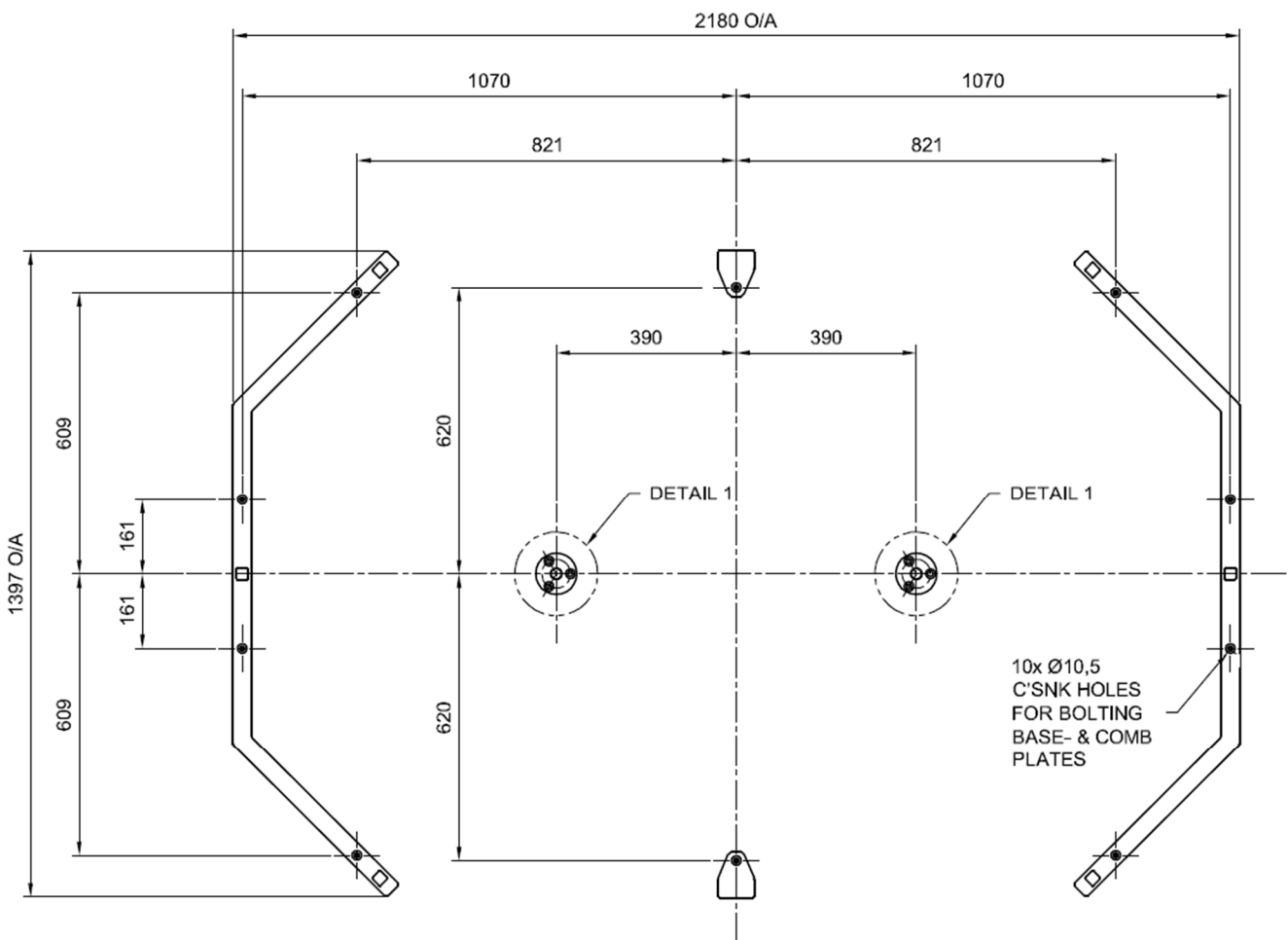


Figure 13: Double Turnstile Footprint

8.2. Accessing the bolting holes.

8.2.1. On the Double turnstile, there are 10x off diameter 10,5 counter-sunk holes for bolts on the frame and the comb plates, and 3x off diameter 12,5 counter-sunk holes for each of the center plates of the 2X rotors. Mark these, remove frame and drill holes for suitable anchors into finished floor level.

8.2.2. Ensure that the frame is correctly in position before bolting down. See (FIGURE) for a reference to check the squareness of the frame.

8.2.3. To access the holes if the side glass is already installed, remove the glass by loosening the screws holding the clamps from inside the Turnstile. The clamps are located at the top and bottom of the glass. Lift off the cover plate hiding the holding down bolts (See **Figure 14: Accessing the holding down bolt holes**. Fit the anchor bolts into the bolting holes and tighten, before replacing the cover plate, glass and clamps.

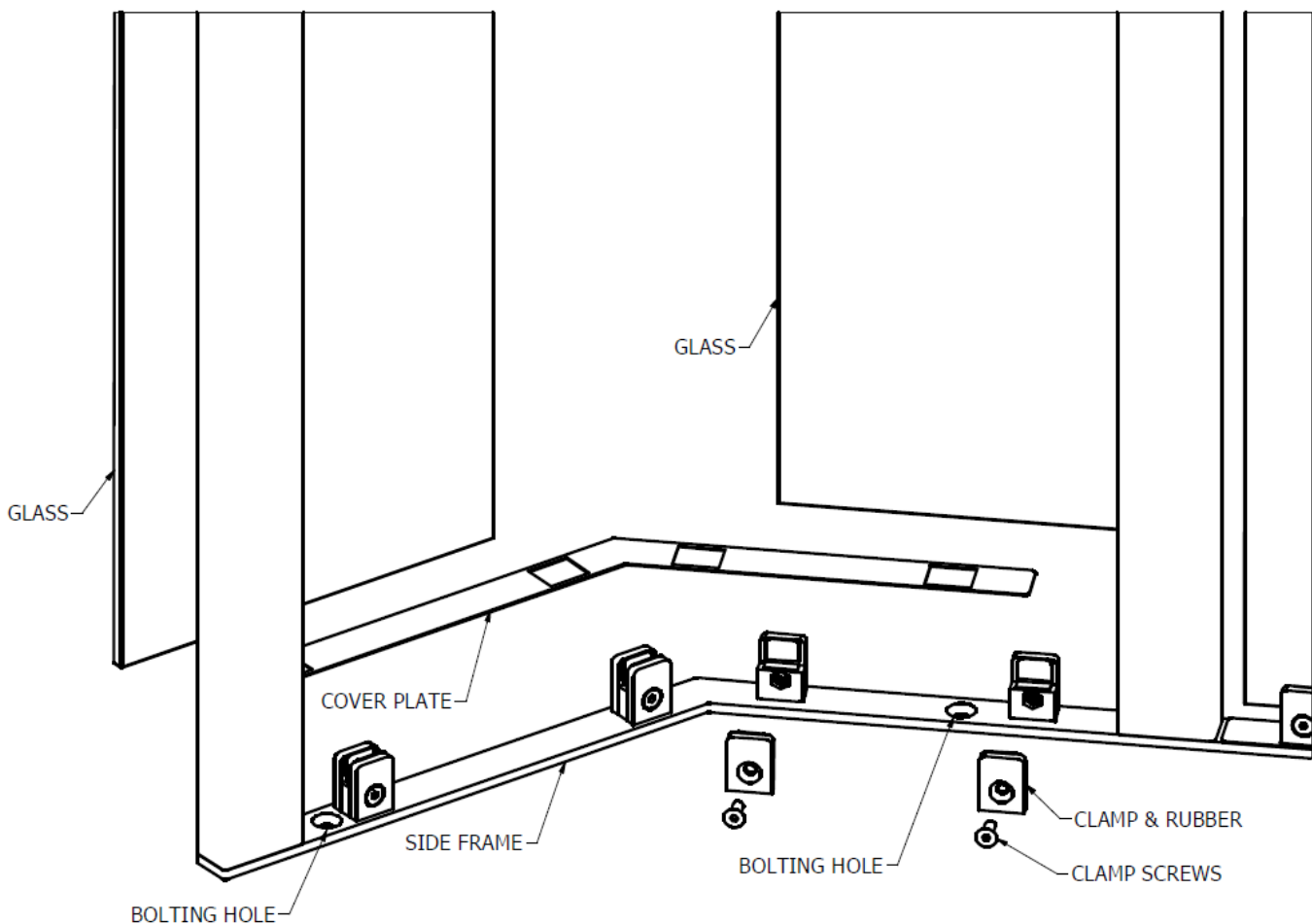


Figure 14: Accessing the holding down bolt holes

8.3. Leading Cables to Controller

8.3.1. Before bolting down the frame, lead the power & control cable through the base frame, through the upright, into the approximate center of the bulkhead where the mechanism is located.

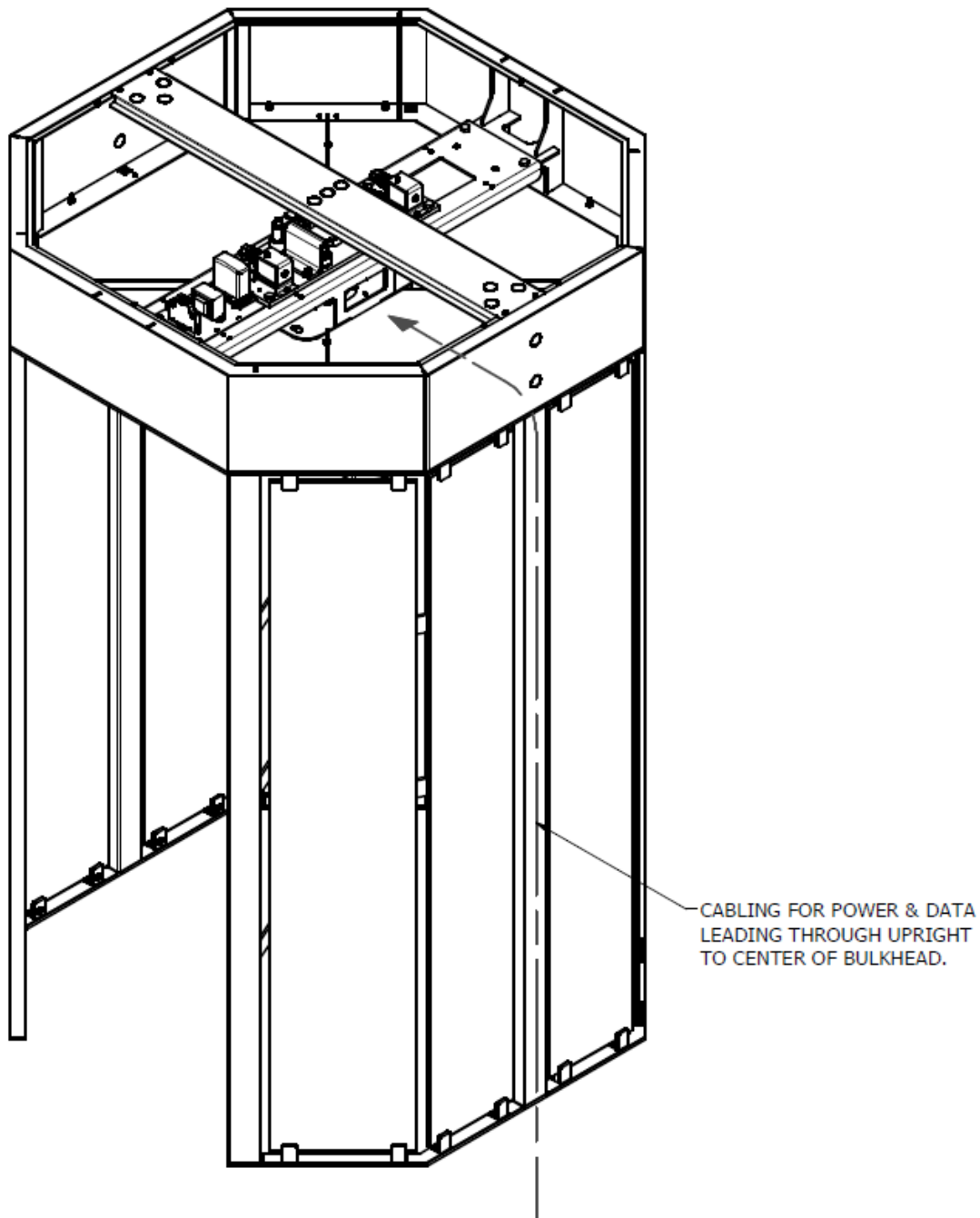


Figure 15: Cabling through into Bulkhead

8.3.2. If the cabling is pulled through the side bulkhead or top cover, ensure the cables are long enough to route to the control panel.

8.3.3. The double Turnstile has two mechanisms and two controllers and requires a power supply and data cable for each of the controllers. In total, 2x power cables and 2x data cables.

8.4. Bolting the Frame to the Floor.

8.4.1. The anchors used for bolting the frame and center bearing plate to the floor are recommended to be:

8.4.1.1. Screw: SXR-7x87MM-PZ4 - SXR 7 x 78mm PZ4 FISCHER SCREW

8.4.1.2. Sleeve: SXR-10x80Z-PL - SXR 10 x 80mm FISCHER PLUG

8.4.1.3. Dia. 8 Countersunk Washer – Available from Turnstar

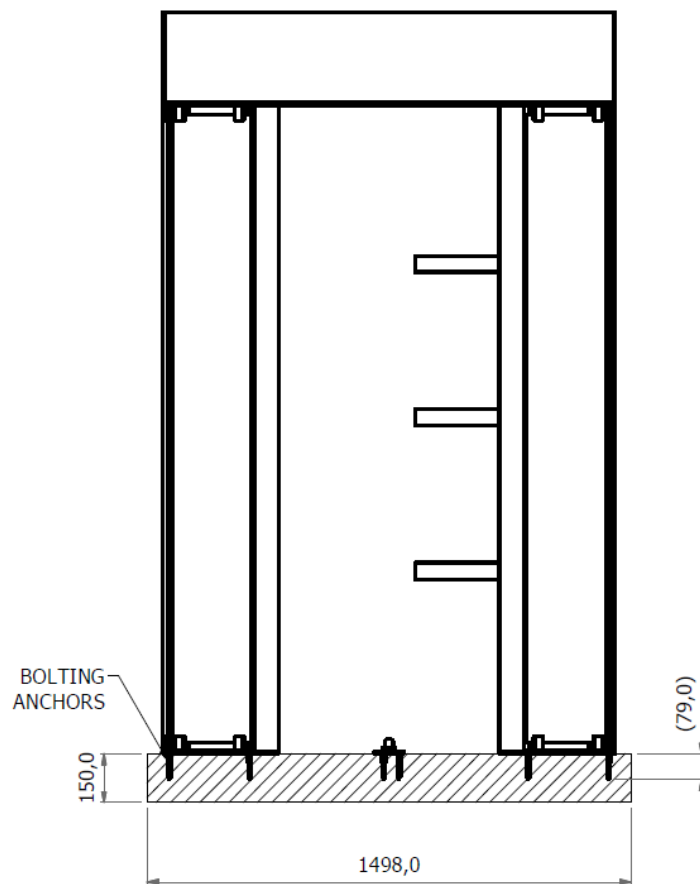
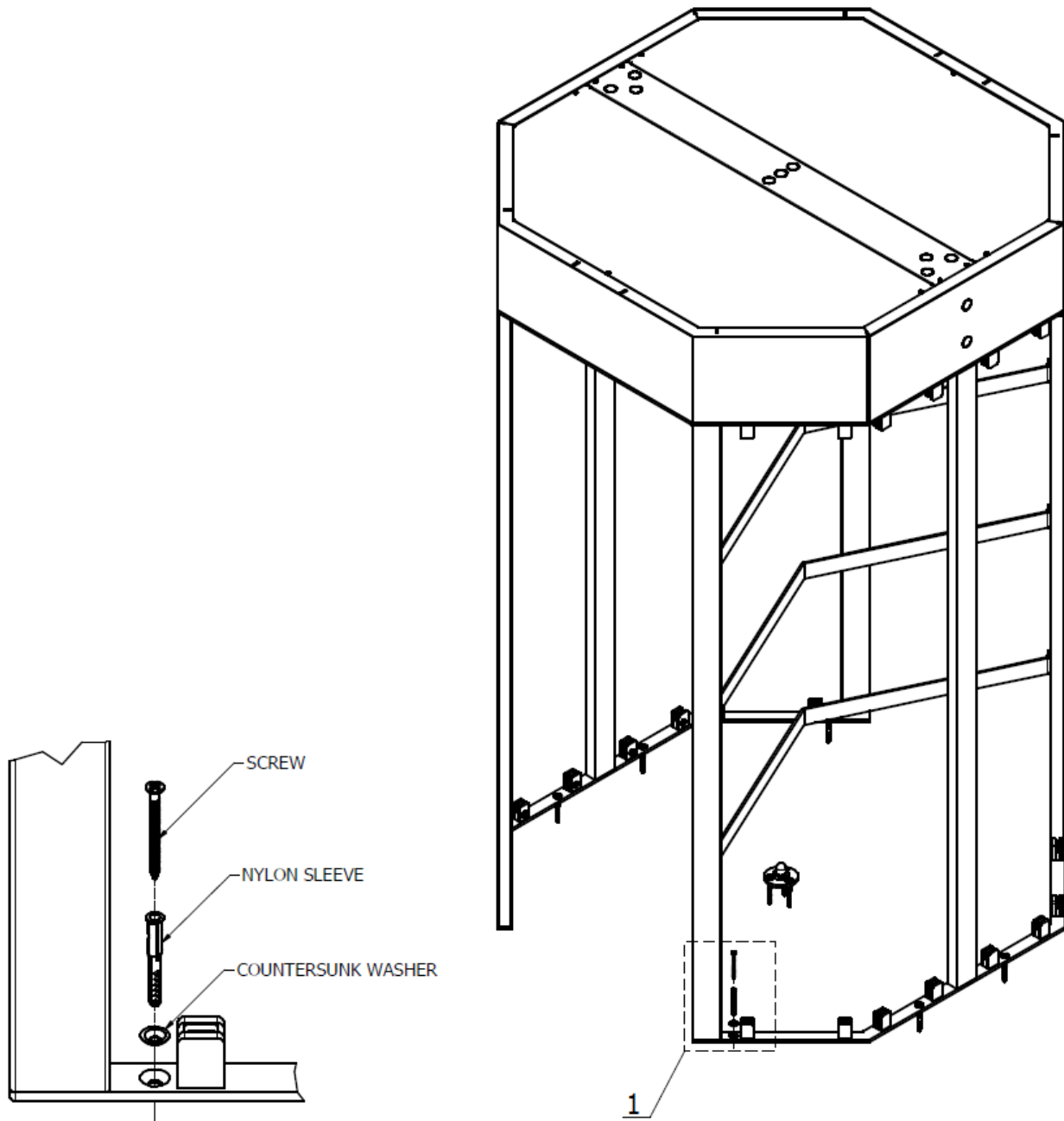


Figure 16: Bolting Anchors in Frame



DETAIL: 1

Figure 17: Bolting frame to Floor with Anchors

8.4.2. The screw and sleeve should be fitted through the countersunk washer, into the countersunk hole of the base, into the finished floor level.

8.5. Placing the Rotor on the center Bearing plate.

- 8.5.1. The rotor can only be placed onto the bearing pin at the base with the mechanism removed from the top.
- 8.5.2. Loosen the center top cover and the mechanism from the channel. Lift the mechanism off the channel.
- 8.5.3. Make sure the bearing and circlip is fitted into the base of the rotor. Place the rotor onto the bearing pin on the center plate.
- 8.5.4. Make sure the rotor is aligned correctly with the top disk in the correct orientation. See **Figure 18: Rotor Alignment**.
- 8.5.5. Note: It is essential that the center base plate and the mechanism shaft is correctly aligned at this point. Misalignment will cause the rotation to be hindered.

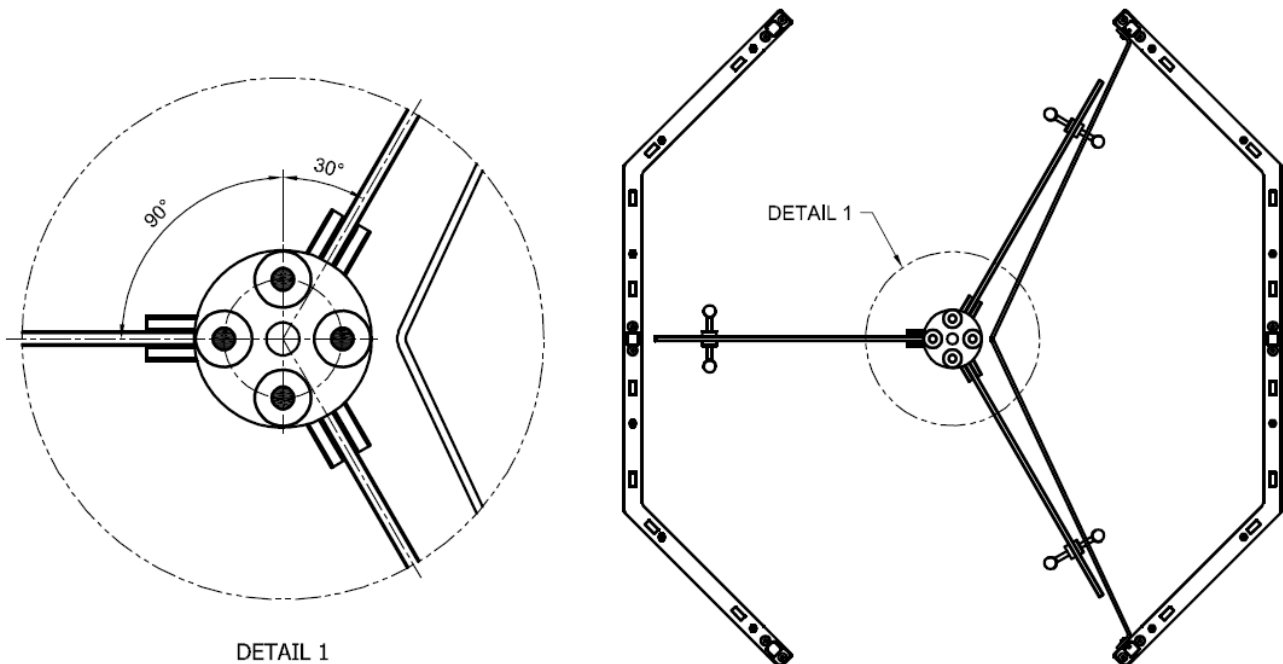


Figure 18: Rotor Alignment

- 8.5.6. Fit the rubber buffers into the mechanism disk and lower the mechanism onto the rotor, making sure that the disk with the studs on the rotor, and the disk with the rubber buffers on the mechanism fit correctly.
- 8.5.7. Place the beam washers above the rubber buffers onto the studs and place the nylock hexnuts above the beam washers onto the studs. See **Figure 20: Placement of Parts for Rotor Assembly**.

8.5.8. Using a suitable spanner, tighten the nylock hexnuts onto the bean washers. The rubber buffers should have a slight compression. The rotor will lift slightly off the bearing pin.

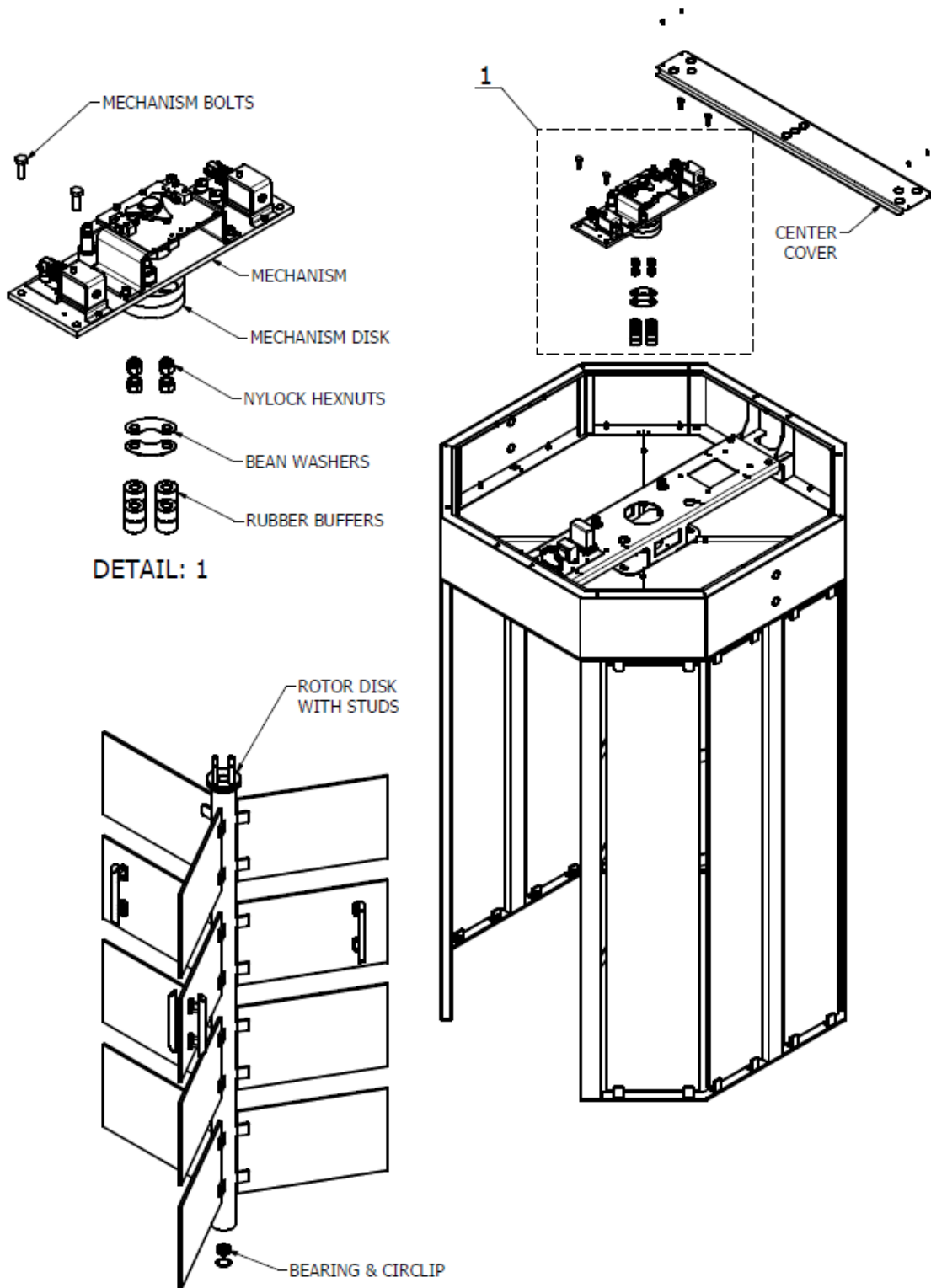


Figure 19: Rotor Assembly to Turnstile

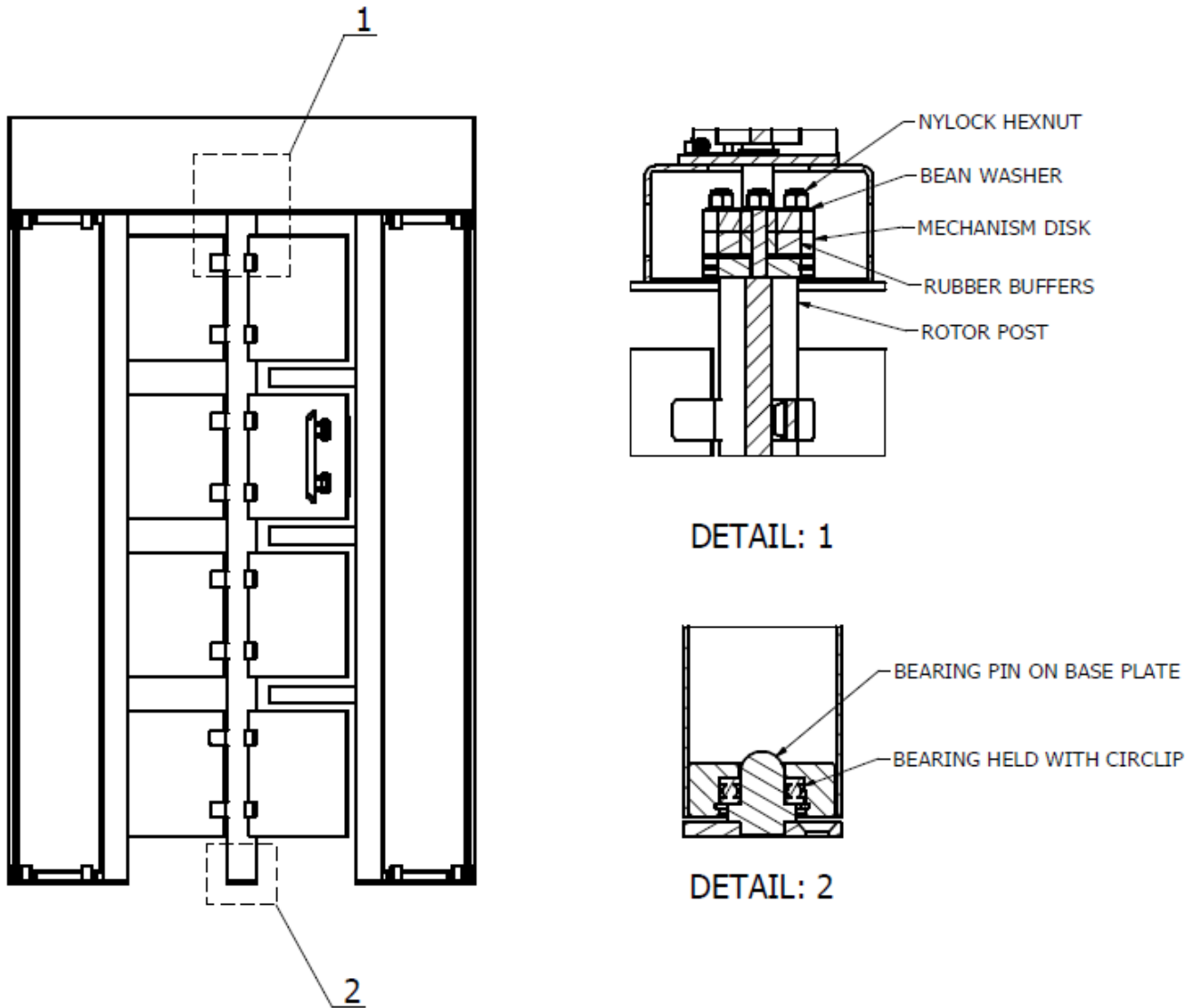


Figure 20: Placement of Parts for Rotor Assembly

8.6. Testing the rotor using the mechanical override.

8.6.1. The mechanical override locks are located below the ceiling. There are two locks that can be unlocked for each direction, to allow free rotation.

8.6.2. Using the key provided, unlock both locks and turn the rotor. The rotation should be smooth without any shudder.

9. CONTROLS AND CONNECTIONS

9.1. Overview of the Control Panel

9.1.1. The control panel consists of a power terminal block where mains power is connected to, a 6A isolator, an 18v AC transformer, a printed circuit board and a Turnstile plug-in Logic controller. These are mounted to a chassis plate which is bolted in the channel of the Turnstile.

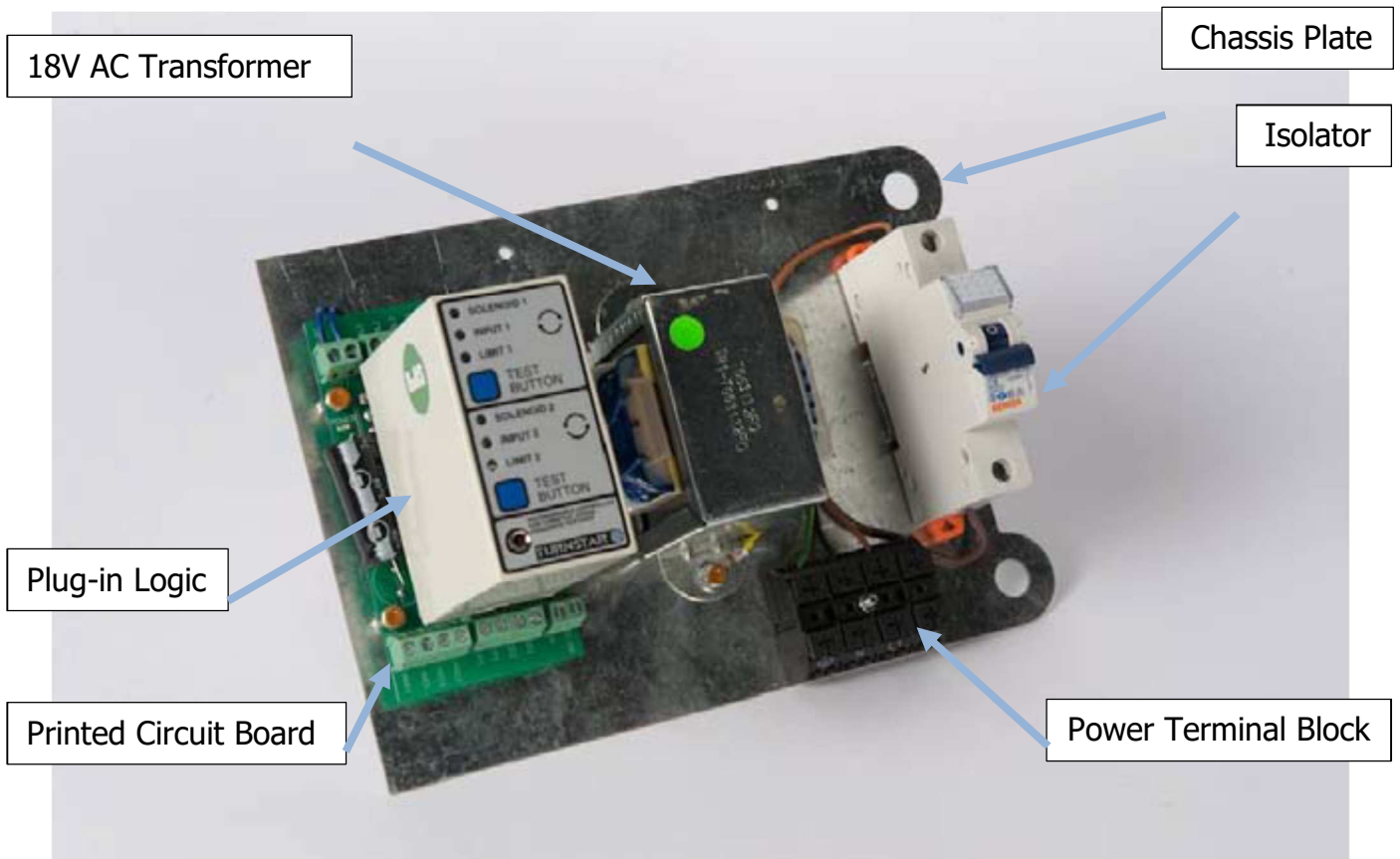


Figure 21: Control Panel Components

9.1.2. The logic controller is factory set and tested, and the dipswitches need only be changed when required.

9.2. Dipswitch Settings on the Turnstile logic

9.2.1. The Turnstile logic has a number of dipswitches located at the back. Below is a table of the dipswitches and functions.

Turnstile Logic Dipswitch Settings			
<i>Dipswitch</i>	<i>Function</i>	<i>On</i>	<i>Off</i>
1	Input 1 (Direction 1)	Extended Trigger Free Rotate	Extended Trigger Ignored
2	Input 2 (Direction 2)	Extended Trigger Free Rotate	Extended Trigger Ignored
3	Solenoid 1 (Direction 1)	Energised	De-energised
4	Solenoid 2 (Direction 2)	Energised	De-energised
5	Sound (Buzzer)	Activates when triggered	Silent

9.2.2. Dipswitch 1 – Input 1 (Direction 1) – When on, will allow an extended trigger to unlock the solenoid so the rotor can free rotate in the clockwise direction. This is used for emergency free open.

9.2.3. Dipswitch 2 – Input 2 (Direction 2) – When on, will allow an extended trigger to unlock the solenoid so the rotor can free rotate in the anti-clockwise direction. This is used for emergency free open.

9.2.4. Dipswitch 3 – Solenoid 1 (Direction 1) – When on, the solenoid will be always energised. This is for the fail-safe setting when power is cut, the turnstile will be free rotating in the clockwise direction. When off, the turnstile will lock when power is cut. This depends on which way the solenoid is mounted.

9.2.5. Dipswitch 4 – Solenoid 2 (Direction 2) – When on, the solenoid will be always energised. This is for the fail-safe setting when power is cut, the turnstile will be free rotating in the anti-clockwise direction. When off, the turnstile will lock when power is cut. This depends on which way the solenoid is mounted.

9.2.6. Dipswitch 5 – Sound (Buzzer) – When on, the buzzer inside the logic will activate when a trigger is received.

NOTE WELL: Changing dipswitches 3 and 4 requires the solenoid direction to be reversed. Only use these when a change from fail-safe to fail-secure or vice versa is done.

9.3. Connections

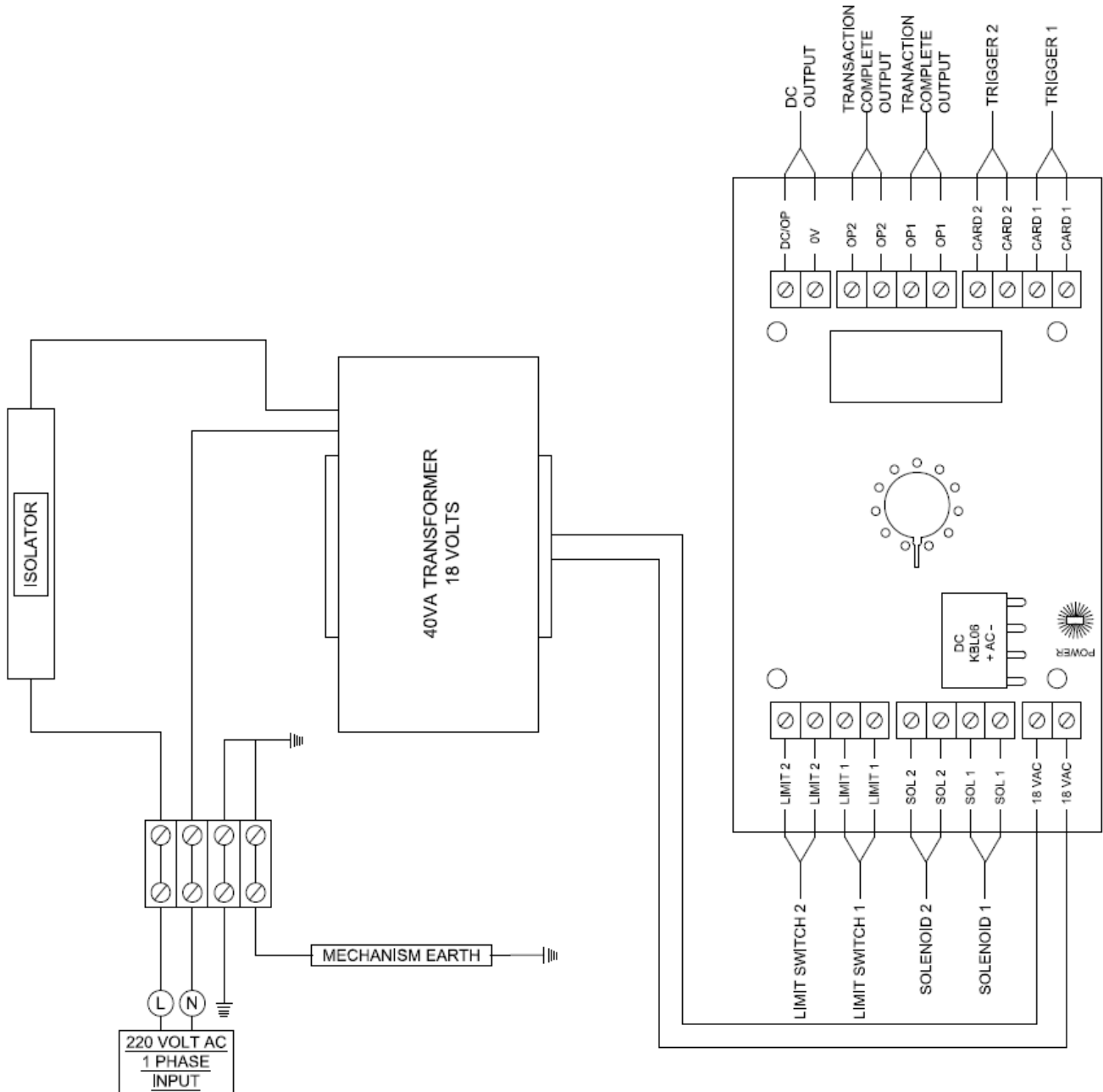


Figure 22: Controller Wiring

9.3.1. Connect live 220V AC 50Hz power to the terminal block. Power requirement is typically 6 amps.

9.3.2. Trigger 1 and Trigger 2 are normally open dry contacts and should be connected to the access control system relay terminals. Alternatively, these can be connected to the normally open connections on a push-button.

9.3.3. Trigger 1 is for clockwise rotation and Trigger 2 is for anti-clockwise rotation. The common is the first of the two terminals.

10. TESTING AND COMMISSIONING

10.1. Manual testing the Operation.

10.1.1. A pushbutton can be connected between CARD 1 and CARD 1 terminals to test direction 1. The same can be done for testing direction 2 by connecting to CARD 2 and CARD 2.

10.1.2. Push the pushbutton, and the mechanism will unlock. Proceed through the direction triggered by pushing the rotor holding the handle. When exiting the turnstile, the mechanism will lock and the rotor will center.

10.2. Connecting a Card- or Biometric Reader System.

10.2.1. The biometric system needs to provide a normally open relay contact.

10.2.2. For direction 1 access, connect the CARD 1 and CARD 1 terminals to RELAY 1 (on the access control system). The triggers are dry contacts.

10.2.3. For direction 2 access, connect the CARD 2 and CARD 2 terminals to RELAY 2 (on the access control system). The triggers are dry contacts.

10.2.4. For reference, RELAY 1 would be for the access control reader on the one side of the turnstile, and RELAY 2 would be for the access control reader on the opposite side of the turnstile.

10.2.5. The readers can be mounted to the uprights on the side of the turnstile. A hole can be drilled for cabling access and cables can be pulled through into the top bulkhead to the control panel.

10.2.6. For larger readers, Turnstar can provide a reader bracket that can be mounted to the upright of the turnstile.

10.3. Mechanical Override

- 10.3.1. The mechanical override can allow the rotor to turn freely in either clockwise, anti-clockwise, or both directions.
- 10.3.2. The mechanical override locks are located below the ceiling. There are two locks that can be unlocked for each direction, to allow free rotation.

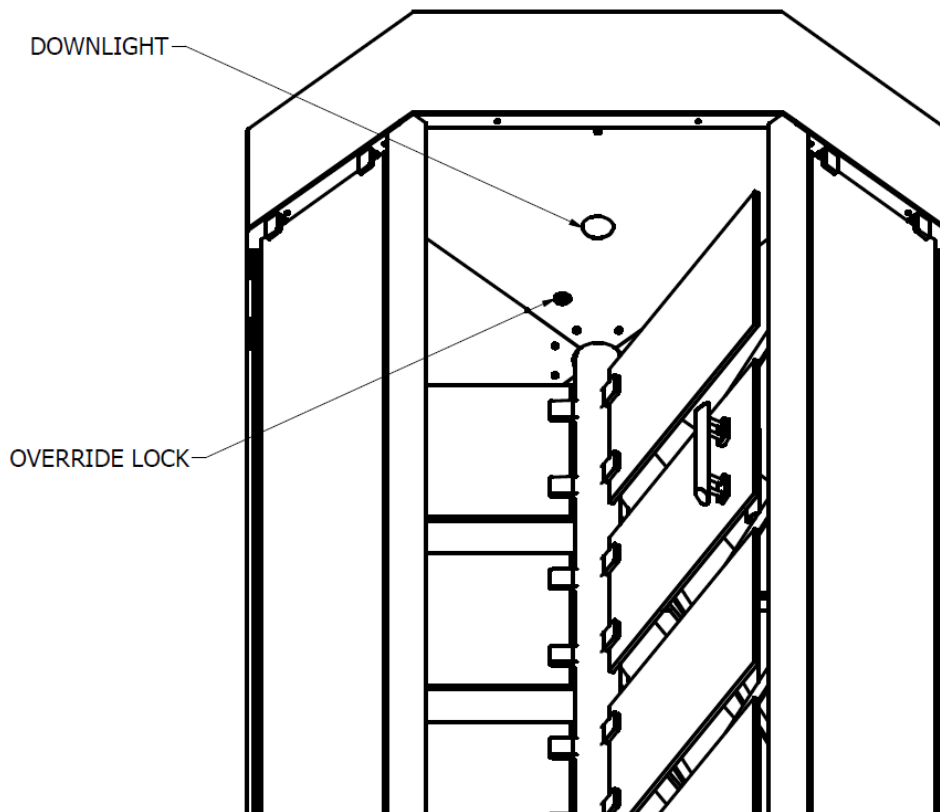


Figure 23: Location of the override lock

11. OPERATION

11.1. Standard trigger and pedestrian entry / exit

11.1.1. When a trigger is received, the mechanism will unlock a direction for the rotor to turn 120 degrees before locking in place. This allows one pedestrian passage through the Turnstile. This operation is the same for both directions.

11.1.2. In the below figure there are three steps to illustrate the operation.

- A pedestrian triggers a card reader and the rotor unlocks.
- The pedestrian moves through the Turnstile passage.
- The pedestrian has completed passage through the turnstile and the rotor locks, having rotated 120 degrees.

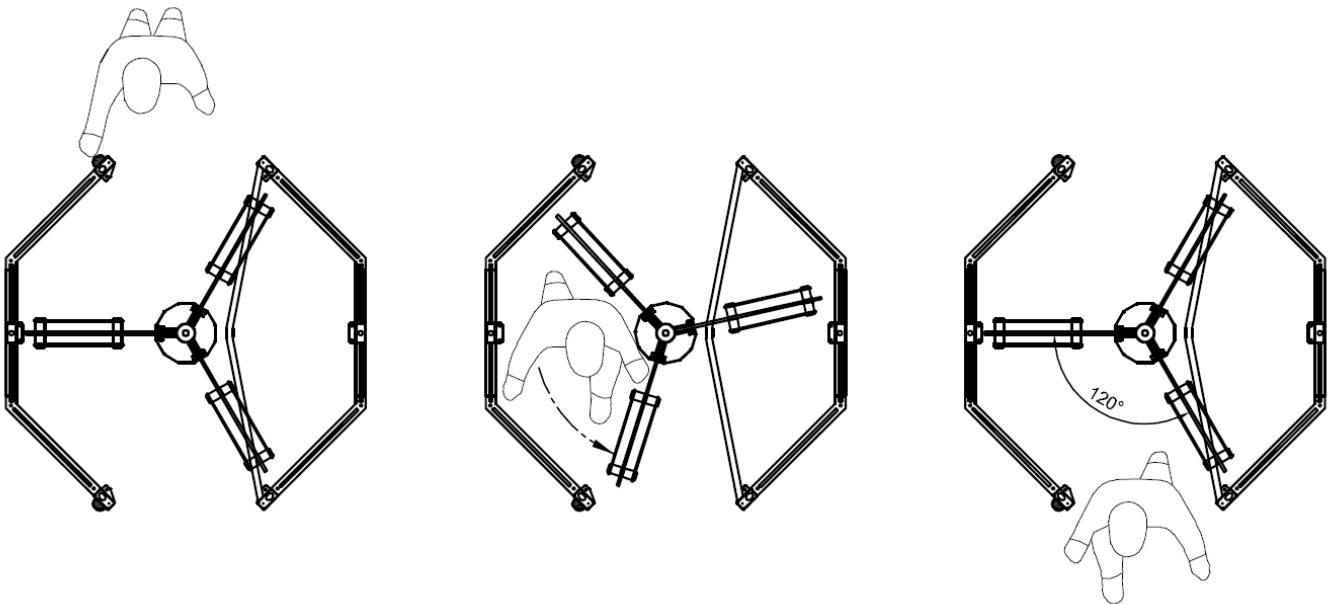


Figure 24: Operation 1

12. **FAULT FINDING**

12.1. Fault finding scenarios and faulty parts

Troubleshooting Table	
<i>Fault Scenario</i>	<i>Faulty Part(s)</i>
Rotor keeps rotating while mechanism is in the locked position.	Keyway
Rotor turns more than once on one transaction.	Micro switches
Rotor doesn't reset after one entry into resting position.	Spring on Index Arm has broken.
Spine only rotates 45 degrees.	Mechanism pawl arms may need adjusting.
	Rubber Bushes
	Locks
	Pawl Locking Position
	Anti-locking Trap Disk
	Logic
	Pc Board
Turnstile Offline (No power being supplied to Pc Board)	No 220V power supplied to Turnstile or circuit breaker, or transformer.