

**ARCHITECTURAL SPECIFICATION****FMST-6X – Full Height Manual Turnstile – Four-Arm Model**

*(NOTE TO SPECIFIER: Select product model depending on desired finish)*

**AVAILABLE FINISHES****FMST-6XSS – Stainless Steel****FMST-6XGL – Galvanized Finish****FMST-6XPF – Powder Coat Finish****SECTION 08 71 00 – Door Hardware****SECTION 11 14 00 – Pedestrian Control Equipment****SECTION 28 10 00 – Electronic Access Control and Intrusion Detection****PART I – GENERAL****1.01 SECTION INCLUDES**

- A. This section covers the furnishing and installation of an electrically controlled full height security turnstile.
- B. For further information, call the factory at +1 909.591.8431 and ask for the technical support department; or email [information@alvaradomfg.com](mailto:information@alvaradomfg.com).

**1.02 REFERENCES**

- A. This product is fully certified by a nationally recognized testing laboratory to UL 294, UL 325, and CSA C22.2 NO.247-14.
- B. CE marked in accordance with appropriate European Directives.

**1.03 QUALITY ASSURANCE**

- A. Manufacturer shall be a company specializing in the supply of security turnstiles with a minimum of 10 years' experience.
- B. Installer shall have a minimum of one year experience installing similar equipment, or shall supply a factory representative during installation of the turnstile.

**1.04 SUBMITTALS**

- A. Submit manufacturer's descriptive literature for specified equipment, including options.
- B. Provide dimensional layout, installation instructions, and anchoring instructions.
- C. Provide shop drawings, if required.

**1.05 DELIVERY, STORAGE AND HANDLING**

- A. Deliver materials to job site in manufacturer's packaging undamaged, complete with installation instructions.
- B. Store off ground, under cover, protected from weather, construction activities and debris.
- C. Use forklift and pallet jack equipment as required for moving.

**1.06 PROJECT/SITE CONDITIONS**

Install the FMST-6X on a level concrete pad.

**1.07 WARRANTY**

Alvarado warrants its products against defects in material and workmanship for a period of one (1) year from the date of invoicing. The warranty covers defects in materials and workmanship and does not cover freight, labor or incidental costs. Obtain full warranty terms from Alvarado.

## **PART II – PRODUCTS**

### **2.01 MANUFACTURER**

Alvarado Mfg. Co., Inc. 12660 Colony Street, Chino, CA 91710.

### **2.02 PRODUCT**

FMST-6X Full Height Security Turnstile, no substitutions. Features of the turnstile shall include: roto with four rows of arms; pulse relay; time-out relay; rotation feedback detection; horizontal opening inspection cover; fail-lock entry / fail-safe exit operation; card reader mounting plates; key overrides in both directions; self-adjusting speed control with self-centering; and ability to convert turnstile from fail-safe to fail-lock and vice versa without removing the top channel;. Note: A roto that self-centers through spinning and settling is not acceptable. When lock arms are disengaged, the turnstile shall rotate only once and shall self-center when the roto is spun with up to 250lbs of force.

### **2.03 CONSTRUCTION**

#### **A. Top Channel:**

1. The top channel frame shall be a 7" wide, 4-gauge, steel U-channel powder coated in a zinc-rich powder coat.
2. The top channel cover system shall slide apart horizontally, providing access to the interior of the top channel without having to lift the cover vertically when removing. The top channel cover shall be fabricated from 16-gauge, #304 stainless steel, polished to a satin (#4) finish.

#### **B. Yoke (Curved Section):**

1. The yoke (curved section) shall be an all welded single assembly, not multiple assemblies bolted together. It shall consist of 10 pieces of vertically aligned 1 3/4" OD 16-gauge steel tubing notched and welded to two curved, horizontal tubes. Two 3/16" x 1" steel straps shall be welded to the outside of the ten tubes for support. No external fasteners shall be used in the fabrication of the yoke section.

#### **C. Roto (Rotating Section):**

1. The roto (rotating section) shall be an all welded single assembly, not multiple assemblies bolted together. It shall consist of four vertical groupings of arms, with each arm notched and welded vertically to a vertical 3" x 3/16" wall tube. Each grouping of arms shall be positioned 90 degrees apart from one another and shall consist of 13 arms (52 total arms per roto). Each arm shall be 14-gauge; 1 3/4"OD steel tubing. Arms shall have either welded metal caps (powder coated or stainless steel models) or ribbed, force-fit plastic caps (galvanized models). No external fasteners shall be used in the fabrication of the roto section.

#### **D. Bottom Bearing Assembly:**

1. The bottom bearing assembly shall consist of a sealed inter-ring bearing, a bearing shaft which fits into the underside of the roto, and bottom bearing housing and cover.

#### **E. OV (Barrier)**

1. The OV (barrier section) shall be an all welded single assembly. It shall consist of 13 arms notched and then welded to a 3"OD x 3/16" wall steel vertical tube. The arms shall be constructed from 1 3/4" OD x 14-gauge steel tubing. Each arm shall have a welded end cap. No external fasteners shall be used in the fabrication of the OV section.

#### **F. Yoke Guard Plate**

1. The yoke guard plate is a single piece of 16-gauge steel that bolts to the underside of the top channel assembly and the top of the yoke.

### **2.04 EQUIPMENT**

- #### **A. General:**
- The turnstile shall provide electric lock control in both directions. Upon receipt of an authorization signal from an access control system or a push button device, turnstile will unlock and allow a single user to pass through the turnstile in the direction requested. The turnstile will reset after the user has passed through the turnstile or within 20 seconds if passage does not occur and will be bi-directional in operation.

#### **B. Mechanical Operation:**

1. Roto / Top Channel Connection: The connection between the roto and the top channel shall be accomplished through the use of a multiple grooved splined shaft and coupling.

2. Turnstile Locking / Unlocking: A solenoid/spring assembly shall move the lock arms into the "locked" or "unlocked" position. Each lock arm shall be controlled independently to allow bi-directional control.
3. Top Bearings: The top bearings shall be fully concealed from view by a cover fabricated from #304 stainless steel.
4. Self-Adjusting Speed Control / Self-Centering: The turnstile shall have self-adjusting speed control which automatically increases or decreases resistance depending on the pushing force of the user. The turnstile shall also self-center, automatically returning to the "home" position after rotation. Self-centering shall be controlled. When lock arms are disengaged, the turnstile shall rotate only once when the roto is spun with up to 250lbs of force. A roto that self-centers through spinning and settling is not acceptable.

C. Electrical Operation:

1. The turnstile top channel shall contain a fused junction box into which the installer wires primary power (110VAC or optional 220VAC).
2. The power junction box shall contain an on/off switch. When the switch is in the "on" position, a green LED shall illuminate on the turnstile controller.
3. A UL-rated transformer shall be joined into the junction box and shall step down the primary power to low voltage, 12VDC operation.
4. The turnstile shall be fail-lock in the entry direction, and fail-safe in the exit direction.
5. The turnstile shall have key overrides allowing the operating technician to override the access control system and unlock one or both directions of the turnstile. Key overrides to be installed in the bottom of the top channel, one for each direction of operation.
6. Electrical operation of the turnstile shall be tested and approved by Los Angeles Testing Laboratories.

D. Turnstile Control:

1. The turnstile shall have a microprocessor-based turnstile controller which shall be conformal coated to provide protection against corrosion.
2. All inputs and outputs of the controller shall be opto-isolated to protect against power surges, noise, ground loop, and damage from remote lightning.
3. The turnstile shall accept as an activation signal a momentary dry contact output of any duration longer than 50 milliseconds. This is commonly called a "pulse" or "interface" relay capability.
4. Once the turnstile is activated (unlocked) the user is allowed a maximum of 20 seconds to pass through the turnstile. If the turnstile is not rotated within the 20 second time frame, the turnstile automatically relocks. This is commonly called automatic turnstile relock or "time-out" relay capability.
5. When a rotation of the turnstile occurs, rotation shall be detected by an electrical opto-interrupter. No mechanical microswitches shall be used in the operation of the turnstile.
6. Upon rotation, the turnstile shall provide a momentary dry contact output to signify a rotation has occurred. The dry contact is provided as "feedback" signal that a passage has occurred. One output per rotation direction.
7. The turnstile shall control two solenoids, one per direction of operation.
8. In the event the turnstile needs to be converted from fail-safe to fail-lock, or vice versa, it shall be possible to convert the turnstile from fail-safe to fail-lock and vice versa without removing the top channel.
9. The turnstile shall have two test buttons, one per direction of rotation, that simulate the control system interface signal. The purpose of the test buttons is to provide the installer a simple method of troubleshooting by isolating turnstile functionality from the activation system.
10. It shall be possible to unlock the turnstile in either direction through the application of a continuous dry contact that is independent from the standard "unlock" activation signal.

## 2.05 FACTORY TESTING

- A. Product shall be fully tested at the factory prior to shipment.
- B. Check all mechanical connections.
- C. Inspect product finish. Touch up prior to shipment.

## 2.06 FINISHES

*(NOTE TO SPECIFIER: Select the finish desired)*

- A. Stainless Steel: All exterior components, including top and bottom bearing covers are to be fabricated from #304 Stainless Steel, polished to a satin (#4) finish.
- OR
- B. Hot-Dip Galvanized: All exterior components, except the top channel cover and top and bottom bearing covers (which are to be #304 stainless steel) are to be hot-dip galvanized to ASTM Standard A 123/A 123M-02.
- OR
- C. Powder Coat: All exterior components, including top and bottom bearing covers are to be painted in a powder coat color specified by the project requirements.

## 2.07 OPTIONS

*(NOTE TO SPECIFIER: The following options are available - delete or use the following as desired)*

- A. User Notification Activation Lights (JS-2 Lights): An LED array in a weatherized housing is located on the turnstile yoke slightly above and behind the card reader plated receiver area. The JS-2 option allows the user to select one of two signal arrays: red/ green or red / green / yellow. The user selection is made via a jumper on the turnstile control board. The light arrays function in one of the following manners:
1. Two-Light Operation  
Red Light – Indicates the turnstile is locked and ready for card presentation.  
Green Light – Indicates the access control system has provided the turnstile controller with an activation indicating an “authorized” card has been presented. When the green light illuminates, the turnstile will unlock.
  2. Three-Light Operation  
Red Light – Indicates the access control system has provided the turnstile controller with an activation indicating that an “unauthorized” card has been presented. The turnstile remains locked.  
Green Light – Indicates the access control system has provided the turnstile controller with an activation indicating an “authorized” card has been presented. When the green light illuminates, the turnstile will unlock.  
Yellow Light – Indicates the turnstile is locked and ready for card presentation.
- B. Open/Closed Status Lights: Install large highly visible red/green lights on the exterior of the top channel in the controlled directions. Turnstile shall also provide an interface that will allow a third party device or system to notify the turnstile when the turnstile is either "open" (available or use) or "closed" (will not accept an activation signal). Interface method shall be a sustained dry contact output. Operation of the lights shall be as follows:
1. An illuminated green light indicates the turnstile is open for controlled operation or for free passage.
  2. An illuminated red light indicates that no passage will be allowed through the turnstile.
- C. Padded Heel/Arm Guards: Snug-fitting padded arm guards for arms at pushing level or for lower arms at heel level.
- D. Full Guard Plate: The standard guard plate is replaced with a guard plate that covers a larger area at the top of the turnstile.
- E. Out of Service Lock Bracket: Enables the turnstile to be secured with a padlock.
- F. Top Channel Stabilizer: Increases the rigidity between the OV and top channel assemblies.
- G. Computerized Counting: Each turnstile rotation outputs a count to GateWatch, Alvarado's Windows-based facility counting software program.
- H. Battery Backup: Trickle charge battery system installed in top channel to provide power to the turnstile in the event of primary power loss.
- I. Card Reader Attachment Plates: 6" x 6" card reader attachment plates allow the attachment of the majority of card readers used.
- J. Fail-Safe / Fail-Safe Operation: Both sides of the turnstile will unlock upon loss of power and provide free passage on both directions.

- K. Fail-Lock / Fail-Lock Operation: Both sides of the turnstile remain locked upon loss of power. Key overrides (which are standard) can still be used to unlock the turnstile.
- L. 220VAC: A 220VAC, 50 – 60 Hz transformer is substituted for standard 110VAC transformer.
- M. RKO-3 (Remote Turnstile Mode Key Switch): A loose three-position switch is provided that allows the turnstile to be placed in one of three operational modes: controlled passage mode, free passage mode, no passage mode. A key switch is required for each direction of operation.
- N. Push Button Assembly: Unlocks the turnstile for one passage with a stainless steel push button assembly.
- O. Reader Plate Receiver Cover: A small aluminum plate is used to cover an unused reader plate receiver.
- P. Lock Arm Monitor: Provides an output when either lock arm is engaged. Monitors required for each direction of operation.
- Q. Top Channel Cover Monitor: Provides an output when the top channel cover is removed.
- R. Dust Protection: Additional measures are added to the top channel for extremely dusty installation environments. Contact Alvarado for more information.

### **PART III – EXECUTION**

#### **3.01 SITE EXAMINATION**

- A. Inspection: Installer must examine the installation location and advise the Contractor of any site conditions inconsistent with proper installation of the product. These conditions include but are not limited to the following:
  - 1. Turnstile must be installed on a level concrete pad.
  - 2. Installation shall not begin until unacceptable conditions are rectified.
- B. Installation: Install turnstiles in accordance with manufacturer's instructions.
- C. Adjustment: Installer shall adjust turnstiles for proper performance after installation.
- D. Instruction: A factory trained installer shall demonstrate to the owner's maintenance crew the proper operation and the necessary service requirements of the equipment, including exterior maintenance.
- E. Cleaning: Clean turnstile and area carefully after installation to remove excess caulk, dirt and labels.

**Note: this specification includes recommended options. Alvarado Mfg. Co., Inc. reserves the right to change this specification at any time without notice.**