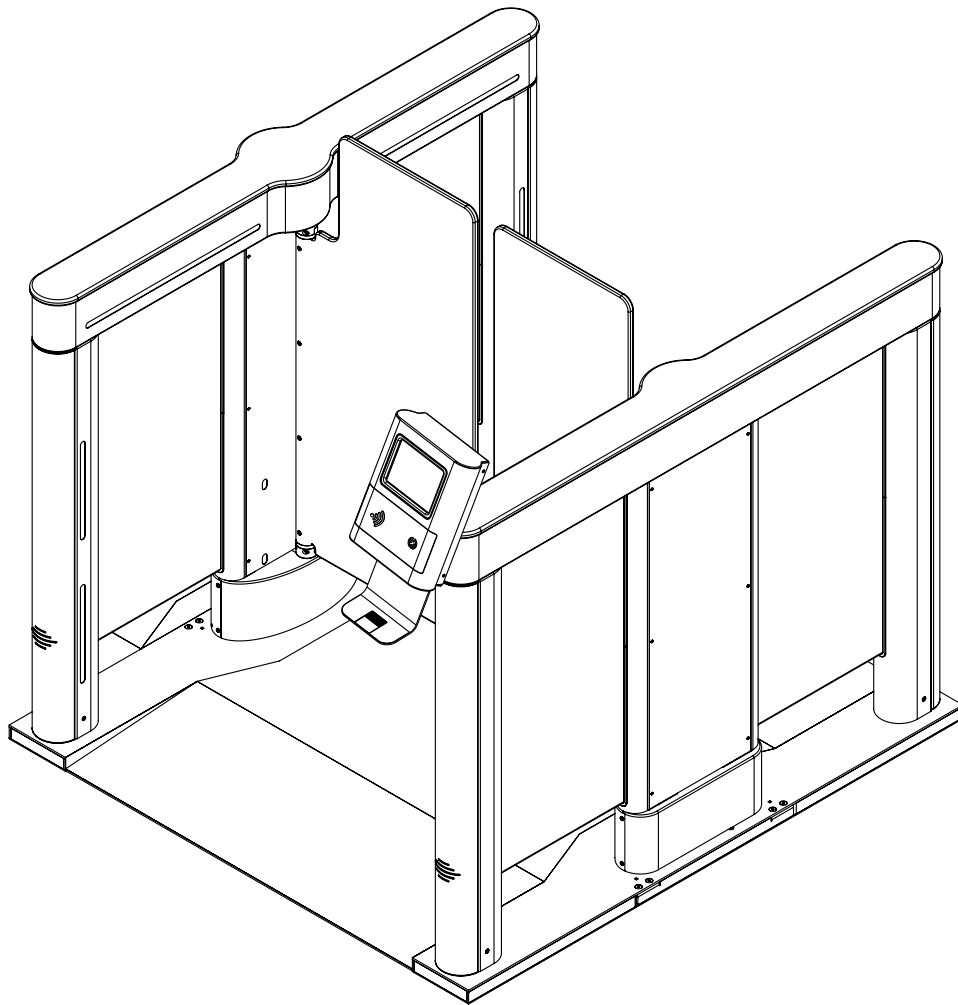


**SUPERVISOR 5000 with
Integrated IntraQ Admission Device**



Installation Instructions

Alvarado Manufacturing Company, Inc.
12660 Colony Street, Chino, CA 91710
Phone: +1 (909) 591-8431
Fax: +1 (909) 628-1403
support@alvaradomfg.com
www.alvaradomfg.com



Contents

Contents	2
ETL Certification	2
Safety Precautions	3
Safety Icons	3
Installation Tools	4
Uncrating	4
Parts List	4
Introduction	6
SU5000 Cabinets	6
Before You Begin	8
Slab Requirements	8
Space Requirements	8
Conduit Requirements	9
Electrical Requirements	9
Environmental Requirements	9
Communication Requirements	10
User Training	10
Pre-Installation Checklist	10
Pre-Installation Instructions	11
Cabinet Panel Removal	11
Baseplate Installation (Optional)	12
Pre-Installation Instructions	13
Anchoring the Turnstile	13
IntraQ Head Installation	15
Wiring Instructions	16
Primary Power	16
Crossover Cable Connection	16
I/O Control Board	17
Configuring Free-Pass Exit	19
Ethernet Communication (Optional)	20
Barrier Installation	20
Post-Installation Functions Check	22
Finish the Installation	26
Cabinet Lid Installation	26
Cabinet Panel Installation	27
Base Cover Installation	27
Post-Installation Checklist	28
Troubleshooting	29
Appendix A - Setting the Home Position	30
Appendix B - 36" Single Lane - Plan, Elevation & Footprint Drawing	31
Appendix C - 28" & 36" Baseplate Dimensions	32
Appendix D - External DC Power Supply Installation (Optional)	33
Appendix E - Multi-Lane Conduit Requirements	39
Appendix F - Crossover Cable Connection Diagrams	40
Revision History	41

ETL Certification



This product is fully certified by a nationally recognized testing laboratory to UL 2593 and CSA C22.2 #247. Unauthorized modification to this product in any way is prohibited.



Safety Precautions



The Supervisor 5000 may present a risk to persons and property if it is not installed and/or operated correctly. This manual must be read in its entirety and all safety and operations information must be followed. Note the following precautions:

- For indoor use only.
- Use only skilled individuals to install and service the turnstile.
- DO NOT operate the turnstile if it has been damaged in any manner. If damaged, have the unit repaired or adjusted by a skilled service person before use.
- DO NOT modify or alter the turnstile.
- Have skilled individuals maintain the turnstile according to a proper maintenance schedule.
- In access control applications, train all personnel that will be using the turnstile in the proper method of operation. In addition, properly train new users as they are added to the system.
- DO NOT use non-Alvarado parts to repair a damaged turnstile.
- Closely follow the handling instructions for moving or lifting the turnstile during installation.
- Power off the turnstile before connecting or disconnecting any communication or power wiring to the turnstile.
- Pour utilisation à l'intérieur seulement.
- Utilisez uniquement des personnes qualifiées pour installer et entretenir le tourniquet.
- NE PAS faire fonctionner le tourniquet s'il a été endommagé de quelque façon. S'il est endommagé, faire réparer ou ajuster l'unité avant l'utilisation par un(e) préposé(e) à l'entretien qualifié(e).
- NE PAS modifier ou altérer le tourniquet.
- Le tourniquet doit être maintenu selon un calendrier d'entretien adéquat par des personnes qualifiées.
- Dans les applications de contrôle d'accès, former tout le personnel qui utilisera le tourniquet selon la bonne méthode de fonctionnement. De plus, bien former les nouveaux utilisateurs à leur intégration au système.
- NE PAS utiliser des pièces ne provenant pas du Alvarado pour réparer un tourniquet endommagé.
- Suivez strictement les instructions de manutention pour déplacer ou soulever le tourniquet lors de l'installation
- Éteignez le tourniquet avant de brancher ou de débrancher le câblage de communication ou le câblage d'électricité.
- This turnstile can be used by children aged **12** years and above, and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge, if they have been given supervision or instruction concerning use of the turnstile in a safe way and understand the hazards involved. Children shall not play with or around the turnstile.
- The turnstile shall be disconnected from its power source during service and when replacing parts. The turnstile shall be disconnected from its power source before connecting or disconnecting any communication or other activation/feedback control wires. If it is not possible that the technician can check from any point to which he has access that the main power is removed, a disconnection with a locking system in the isolated position shall be provided.

Safety Icons

The following symbols are used throughout the manual to highlight important information and potential risks when installing, servicing or using the turnstiles covered in this manual.



This symbol is used in this manual to warn installers and operators of potential harm. Please read these instructions very carefully.



This symbol is used in this manual to designate potential conditions that may pose a risk to pedestrians, personnel, property and equipment. Please read these instructions very carefully.

NOTE

This symbol is used in this manual to designate useful information for the installer and operator. Please read these instructions.



For questions, please contact Alvarado at (909) 591-8431, Monday – Friday 7:00am to 4:00pm PST. Please read this manual completely before installing or operating the purchased product.



Installation Tools

- Tape Measure
- Chalk Line
- Pencil
- Hammer Drill
- 5/8" Concrete Drill Bit
- Shop Vac
- Hammer
- 3/32" hex key
- 1/8" hex key
- 9/16" Wrench
- Torque Wrench (ft.-lbs.)
- Torque Wrench (in.-lbs)
- 9/16" Socket
- Level
- 5/32" Allen Wrench
- #2 Phillips Head Screwdriver
- Precision Flat Head Screwdriver
- 4mm 'Stubby' Allen Wrench (Supplied)
- Clear RTV Silicone

Uncrating

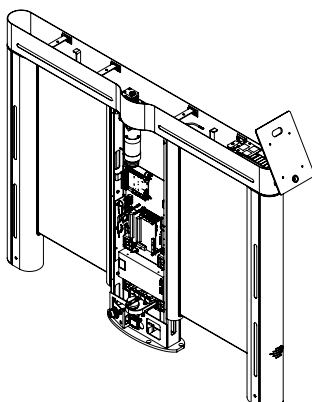
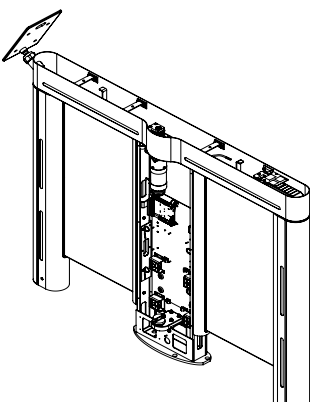
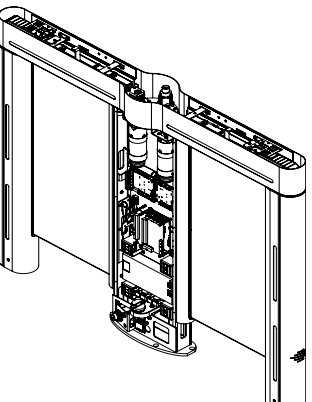
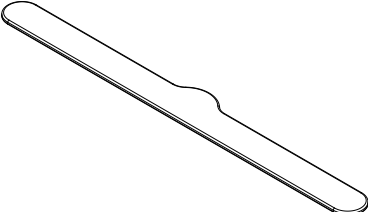
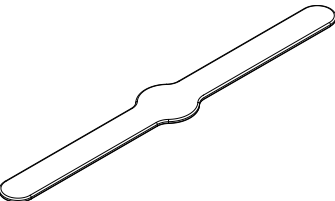
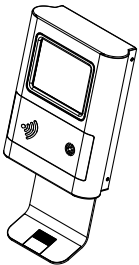
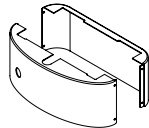
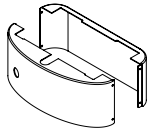
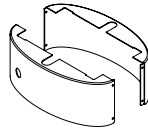


The SU5000 has been packed for shipping to prevent damage to the unit. Two or more installers are required to unload the SU5000 at the installation site. Once the turnstile cabinets have been placed in the installation location, carefully remove the protective packing material from the sides of the cabinets.

Parts List

This product is shipped with all installation hardware and components. If installing a two-lane set, refer to the Two-Lane Set Parts List below. For single-lane set, refer to the Single-Lane Set Parts List. Make sure that none of these parts are missing and/or damaged before beginning installation. If parts are missing and/or damaged, please contact Alvarado.

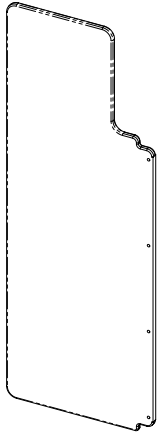
Two-Lane Set Parts List

 <p>Main Cabinet (Qty 1)</p>	 <p>Secondary Cabinet (Qty 1)</p>	 <p>Center Cabinet (Qty 1)</p>
 <p>Main/Secondary Cabinet Lids (Qty 2)</p>	 <p>Center Cabinet Lid (Qty 1)</p>	 <p>IntraQ (Qty 2)</p>
 <p>Main Cabinet Base Cover (Qty 1)</p>	 <p>Secondary Cabinet Base Cover (Qty 1)</p>	 <p>Center Cabinet Base Cover (Qty 1)</p>



Parts List (cont.)

Two-Lane Set Parts List (Cont.)



Barriers
(Qty 4)

(Barrier height and width may vary from the barrier depicted above.)

Hardware:

- Barrier Clamp Bars (Qty 4)
- Barrier Clamp Bar Screws (Qty 16)

Concrete Anchor Package:

- 3/8" x 2" Concrete Anchors (Qty 21)
- 3/8" x 2 1/2" Hex Head Cap Screws (Qty 21)
- 3/8" Flat Washers (Qty 21)

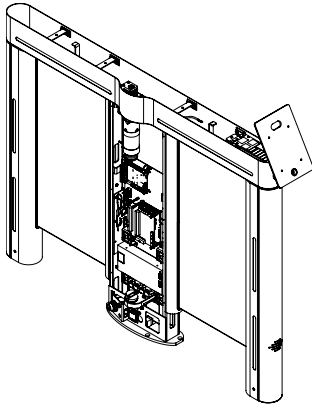
Cabling:

- 8' Crossover Cable (Qty 2)

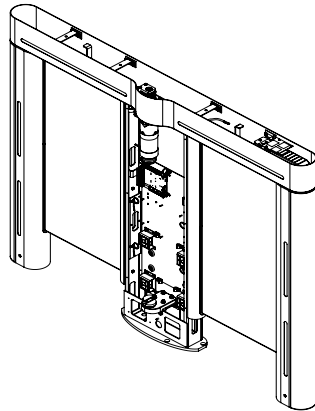
Software:

- File Management USB (Qty 1)

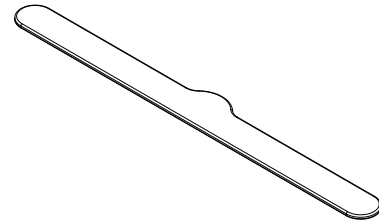
Single-Lane Set Parts List



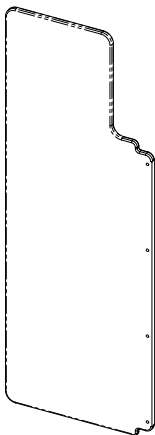
Main Cabinet
(Qty 1)



Secondary Cabinet
(Qty 1)

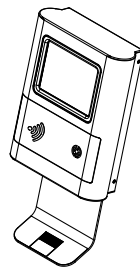


Main/Secondary Cabinet Lids
(Qty 2)

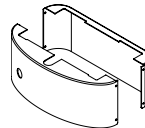


Barriers
(Qty 2)

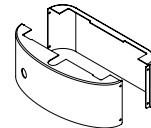
(Barrier height and width may vary from the barrier depicted above.)



IntraQ
(Qty 1)



Main Cabinet Base Cover
(Qty 1)



Secondary Cabinet Base Cover
(Qty 1)

Hardware:

- Barrier Clamp Bars (Qty 2)
- Barrier Clamp Bar Screws (Qty 8)

Concrete Anchor Package:

- 3/8" x 2" Concrete Anchors (Qty 16)
- 3/8" x 2 1/2" Hex Head Cap Screws (Qty 16)
- 3/8" Flat Washers (Qty 16)

Cabling:

- 8' Crossover Cable (Qty 1)

Software:

- File Management USB (Qty 1)



Introduction

This manual covers the physical installation process for IntraQ-SU5000 Optical Turnstiles. A separate *IntraQ-SU5000 User Guide (PUD4454)* provides operating instructions and additional information such as configuring turnstiles for bi-directional passage applications and monitoring outputs. It is highly recommended that both this manual and the *IntraQ-SU5000 User Guide (PUD4454)* be read in their entirety prior to beginning installation.

SU5000 Cabinets

There are three types of SU5000 cabinets used to create passage lanes: a main cabinet, a secondary cabinet, and a center (expansion) cabinet. A single passage lane consists of a main cabinet and a secondary cabinet [Fig. 1]. The center cabinet is used to create additional passage lanes with the addition of a single cabinet [Fig. 2].

Each cabinet has an unsecured and secured side. The secured side is the side that requires access control to enter. The unsecured side is typically the side from which patrons enter the facility.

Main Cabinet

The center portion of the main cabinet contains the main turnstile controller, I/O control board, motor and motor control board, power supply, safety sensor receivers, one moving barrier, and a power switch located at the base on the secured side.

The top channel of the main cabinet contains the operational sensor receivers, a drive system, and cabling for the IntraQ device.

Secondary Cabinet

The center portion of the secondary cabinet contains a motor and motor control board, safety sensor transmitters, and one moving barrier.

The top channel of the secondary cabinet contains the operational sensor transmitters, a drive system, and cabling for the IntraQ device.

Fig. 1 Single-Lane Configuration

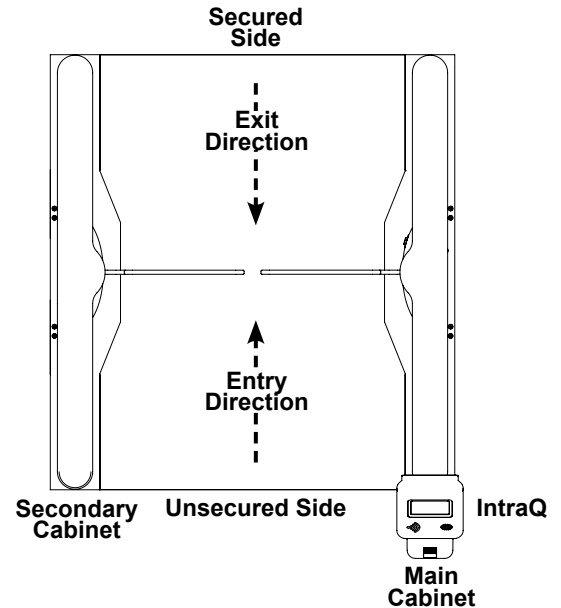


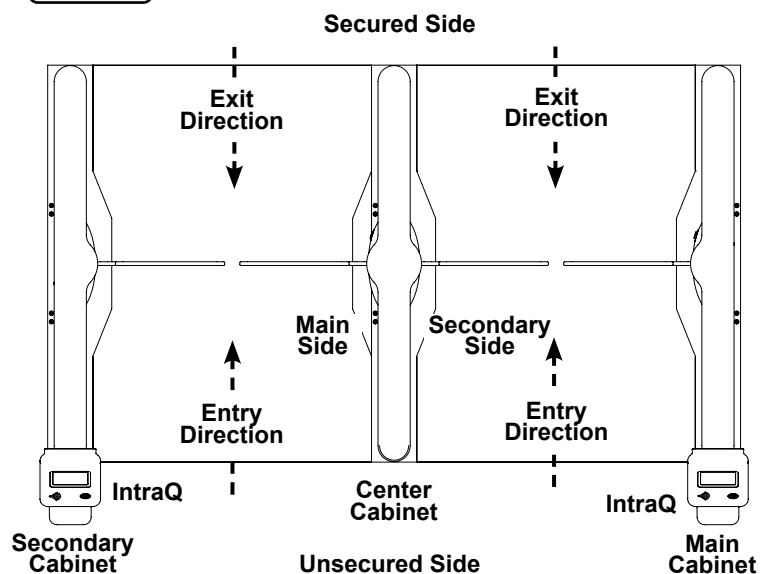
Fig. 2 Multi-Lane Configuration

Center Cabinet (Multi-Lane Configuration)

Center cabinets contain both main and secondary components. Center cabinets are extension cabinets used in multi-lane applications. An unlimited number of center cabinets can be added.

The center portion of the center cabinet contains the main turnstile controller, I/O control board, two motors and two motor control boards, power supply, safety sensors for both the main and secondary side of the center cabinet, two moving barriers, and a power switch located at the base on the secured side of the main side.

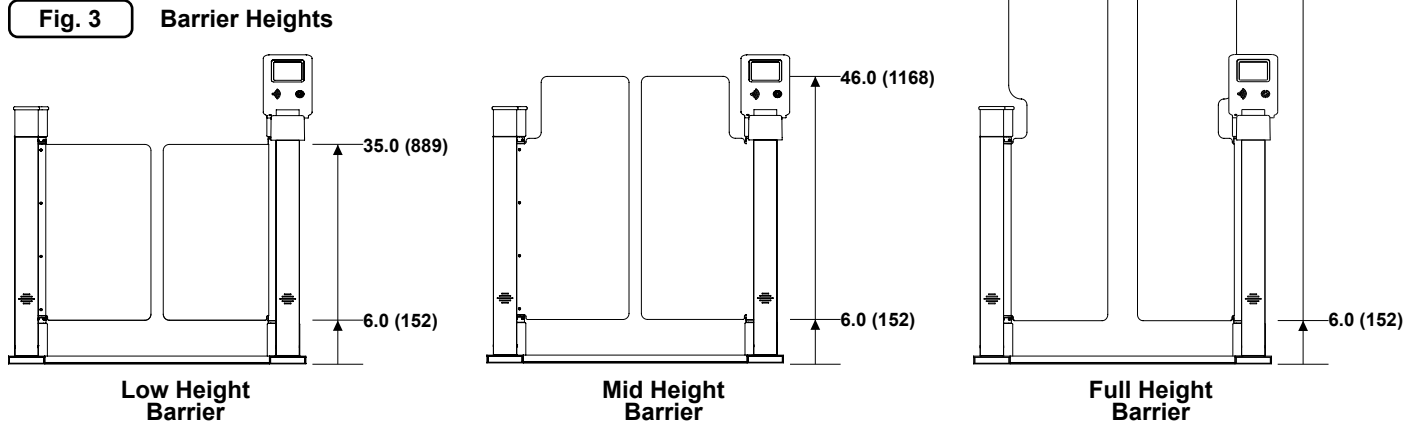
The top channel of the center cabinet contains main and secondary side operational sensors, two drive systems, and two user status displays that communicate lane status to the user. IntraQ devices can be installed on either end of center cabinets.





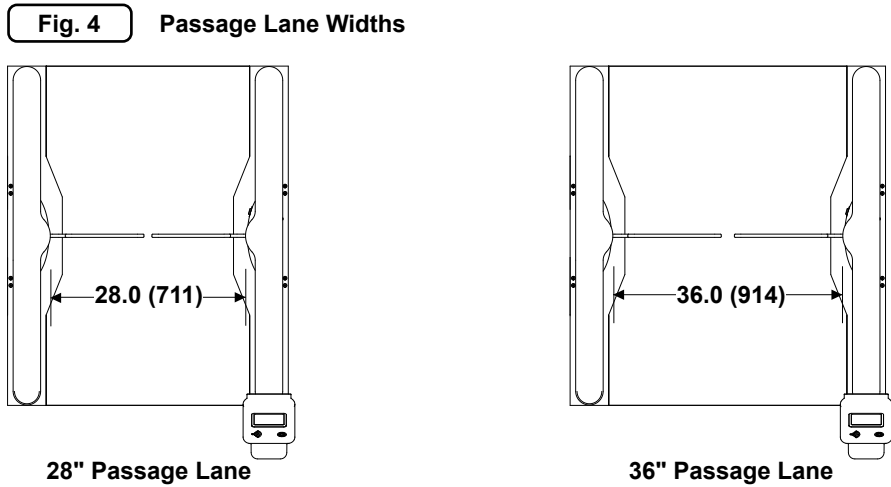
Barrier Height

SU5000 barriers come in low (35"), mid (46") and full (69") heights [Fig. 3].



Passage Lane Width

SU5000 barriers come in widths to create 28" or 36" passage lanes [Fig. 4].



The IntraQ Admission Device

IntraQ admission devices are mounted to the ends of SU5000 cabinets. They are typically installed on at least the unsecured side, but they can be mounted on the secured side as well to process exit scans. IntraQ devices do not ship installed to the turnstile and need to be mounted to the mounting plates after the SU5000 cabinets are installed.

Network Communication

IntraQ devices require an active network connection to a validation service to validate ticket scans and receive software updates. IntraQ devices can connect to the network with an Ethernet or a wireless connection. The connection method used is determined by which hardware is ordered.

SU5000 lanes can accept an optional Ethernet connection to allow software updates to be pushed to the devices.



Before You Begin

Use only skilled technicians for site preparation and installation of the turnstile using Alvarado's instructions.

Slab Requirements

The following slab requirements must be taken into consideration when selecting the installation location:

- A level solid concrete pad with a minimum thickness of 4" (102mm).
- Use full sweep electrical conduit underneath the floor.
- Three separate conduits for primary source power, external data, and the crossover cable must be used.
- Cabinets must be installed plumb with the floor while level and square to each other.

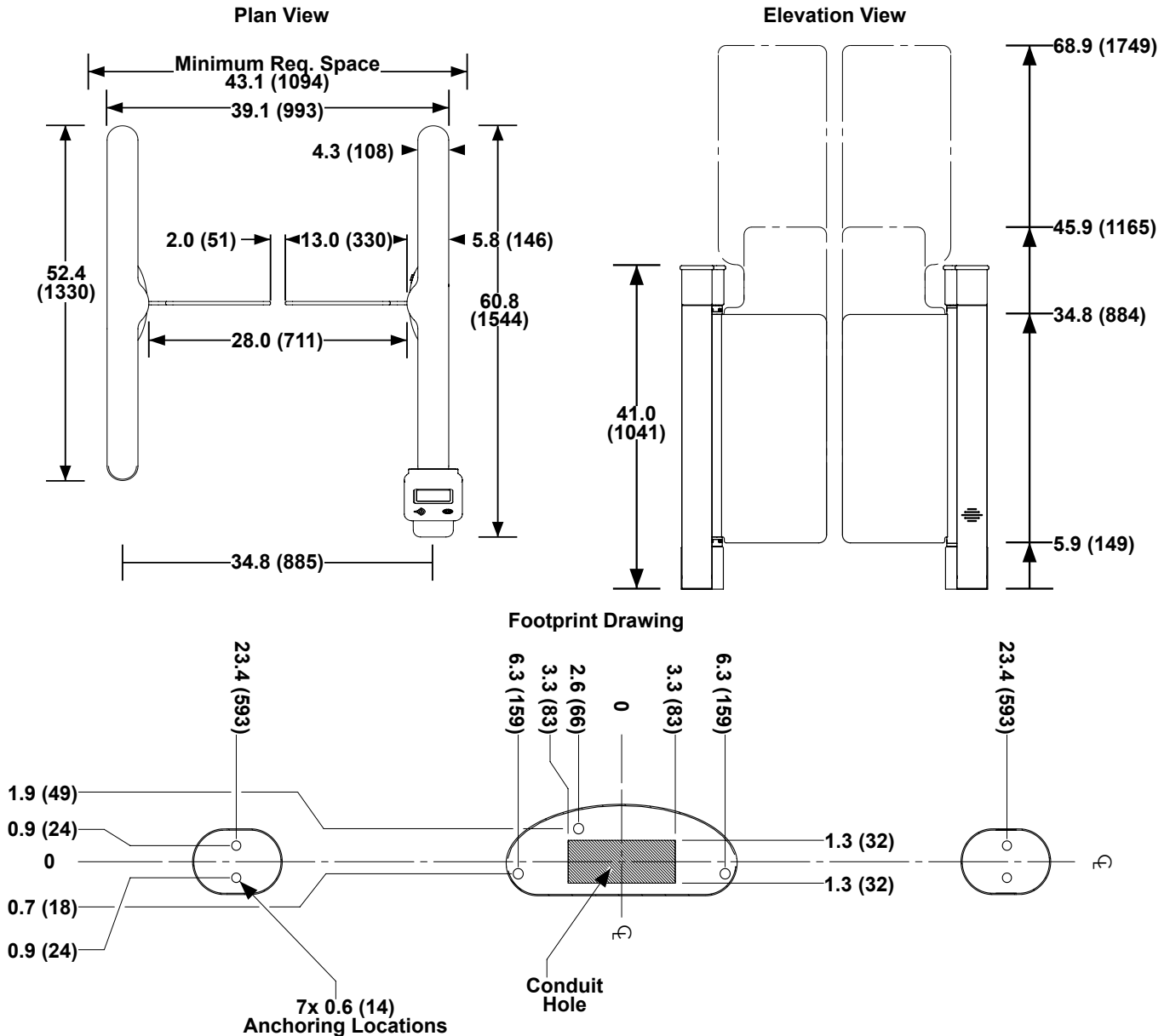
Space Requirements

Refer to the footprint and plan drawings [Fig. 5] to determine the installation location and conduit requirements for a 28" single lane. See "Appendix B - 36" Single Lane - Plan, Elevation & Footprint Drawing" on page 31 for 36" width.

NOTE

For ease of installation and service, allow 6" of space between cabinets and walls or other surfaces.

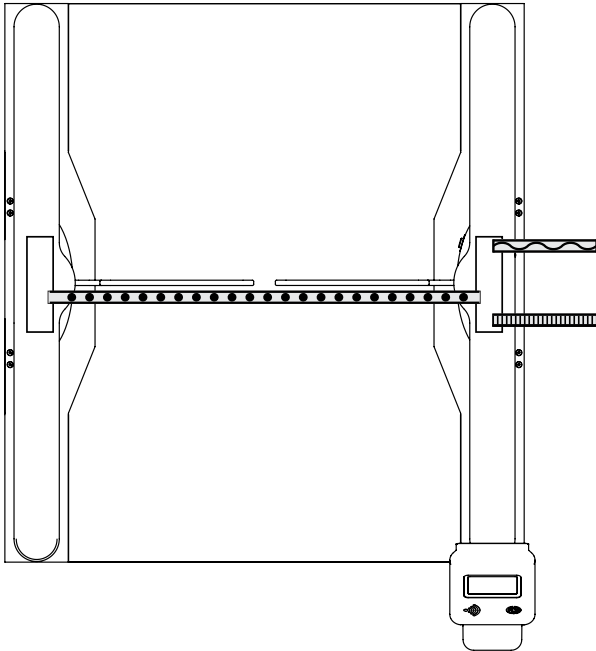
Fig. 5 28" Single Lane - Plan, Elevation & Footprint Drawing





Conduit Requirements

Fig. 6 SU5000 Conduit Lines



NOTE

For multi-lane conduit requirements, refer to "Appendix E - Multi-Lane Conduit Requirements" on page 39.

NOTE

The opening for the conduit in the center of each cabinet is 6.50" x 2.50" (165mm x 64mm). The three required conduits **MUST** fit in this area [Fig. 6].

Symbology	Description	Conduit Size
	Primary Power**	3/4"
	Ethernet/Fire Safety System	3/4"
	Crossover Cable	1"

****If the External DC Power Supply option was ordered, use this conduit to route 24VDC.**

NOTE

Seal the floor area around the conduits running up and into the cabinets. This will prevent condensation and debris build-up coming from whatever may be below the floor.

Electrical Requirements

Power Supply	110-120 VAC, 60 Hz or 220/240 VAC, 50 Hz
Power Consumption (per Lane)	Peak: 100W Operating: 65W Idle: 45W
Operational Voltage	Primary power is stepped down and rectified for low-voltage 24 VDC, 12 VDC, and 5 VDC operation
Fuse	2.5A (slo-blo) located in the main cabinet
Drive Motor	24 VDC (brushless)
Surge Protection	Alvarado suggests the use of surge protection on the high-voltage power line to further protect electronics

Environmental Requirements

- **DO NOT** install the product outdoors. This product is intended for indoor use only.
- **DO NOT** install the SU5000 where infrared lighting (strobe lights, flash photography, etc.) is in the direct path of the optical sensors. Interference may affect the performance of the turnstile.

The following are suggested operating temperature and humidity ranges for the SU5000:

	Operation	Non-Operation/Storage
Temperature Range	10-32°C / 50-90°F	0-40°C / 32-104°F
Humidity Range (Non-Condensing)	15% - 85% RH	--

CAUTION

Operating the SU5000 outside the listed temperature and humidity ranges may negatively affect turnstile performance, and could potentially cause damage to the turnstile and void the warranty.



Communication Requirements

The device must maintain an active network connection to the validation system to properly process scanned media. A networked PC with Alvarado's GateUtility software is also recommended to allow for easy device configuration and file updates.

User Training

All personnel that will be involved with operating the IntraQ-SU5000 should be trained in the proper method of operation. Detailed operation instructions are outside the scope of this manual, but can be found in the included *IntraQ-SU5000 User Guide (PUD4454)*. If further training is desired, contact Alvarado for information regarding on-site training services.

Pre-Installation Checklist

It is the installer's responsibility to ensure the following steps are completed before beginning the installation.

1. All components and hardware to be installed have been unpacked, correctly identified, and moved to the installation location.
2. The turnstile configuration and layout has been confirmed with the site manager.
3. All applicable requirements in the Before Getting Started section have been met.



Pre-Installation Instructions

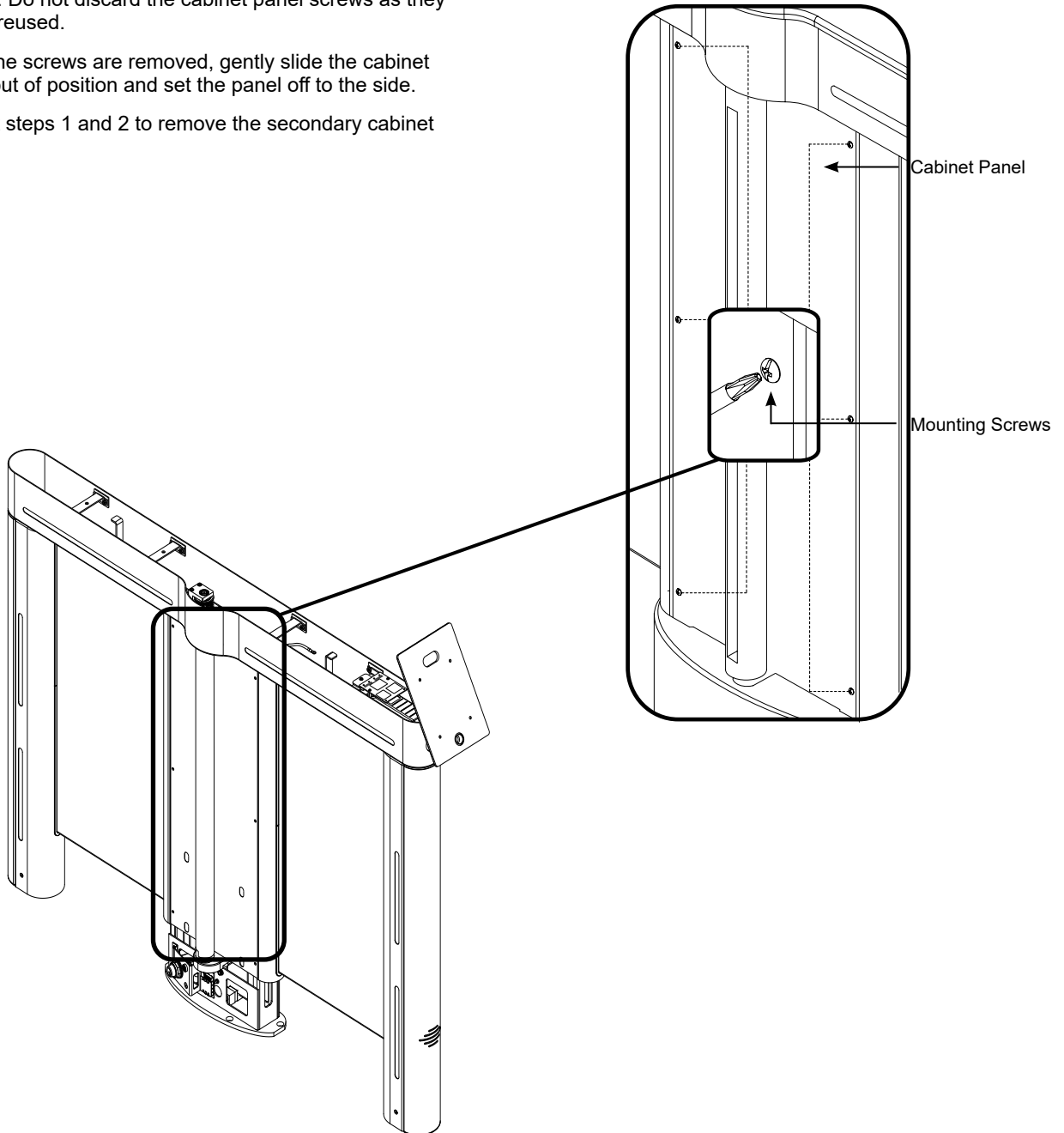
NOTE

It is assumed that the Pre-Installation Checklist steps have been completed prior to beginning the installation.

Cabinet Panel Removal

1. Using a Phillips screwdriver, remove the six (6) mounting screws that secure the cabinet panel to the main cabinet [Fig. 7]. Do not discard the cabinet panel screws as they will be reused.
2. Once the screws are removed, gently slide the cabinet panel out of position and set the panel off to the side.
3. Repeat steps 1 and 2 to remove the secondary cabinet panel.

Fig. 7 Removing Screws





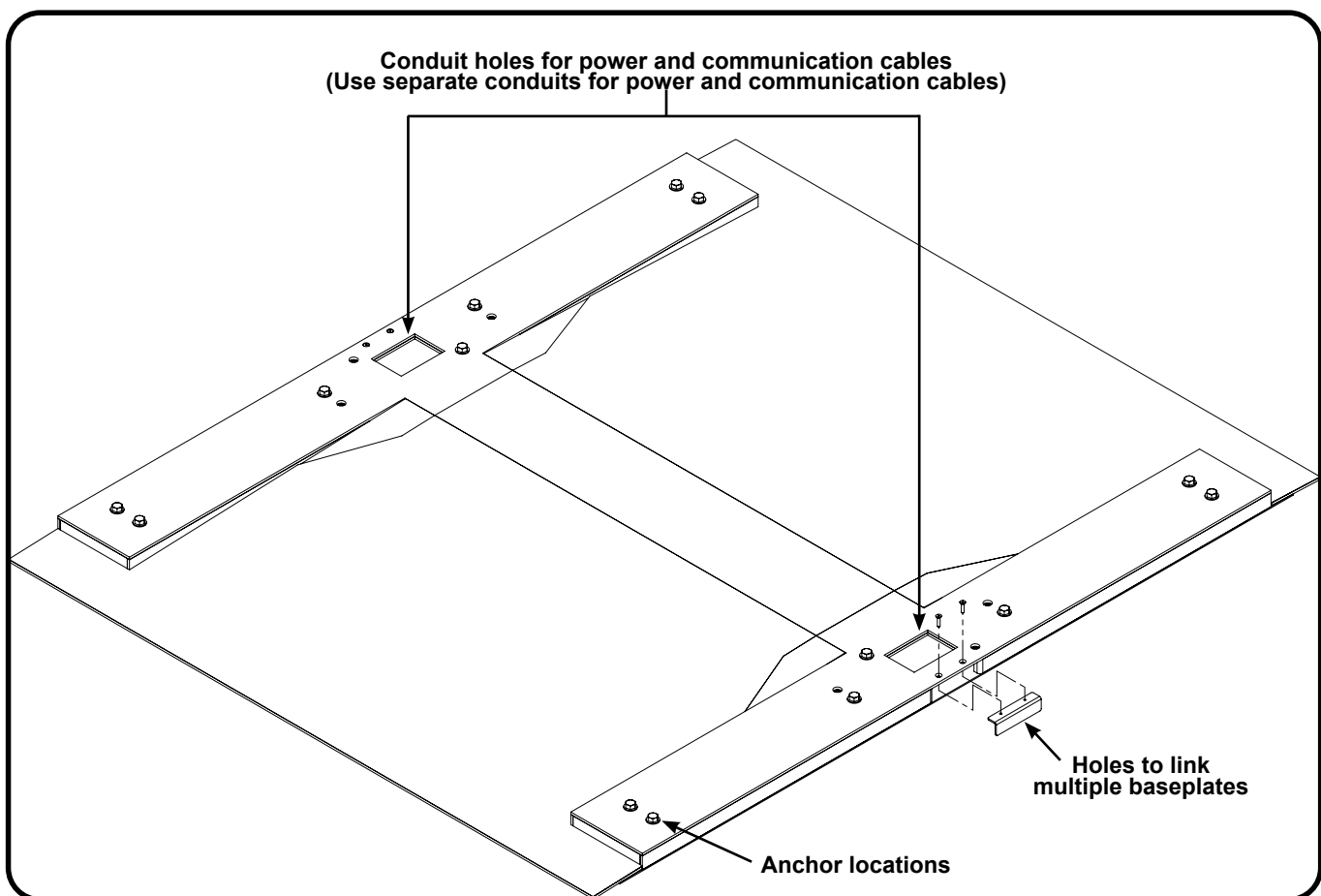
Baseplate Installation (Optional)

NOTE

Refer to "Appendix C - 28" & 36" Baseplate Dimensions" on page 32 for baseplate dimensions.

The baseplate enables installation of the SU5000 turnstile on a solid foundation without the need to drill holes into the concrete. The baseplate also provides concealed conduit channels for wiring primary power, crossover communication, and access control. Baseplates may be bridged together for multi-lane configurations. The following information will guide the installer in baseplate installation:

1. Determine and mark the installation location.
2. Place the baseplate in the marked location.
3. Determine how the primary power and access control wiring will be routed to the main and/or center cabinet. Most commonly, the wiring is run into the baseplate through one of the side plates and routed to the main and/or center cabinet. To remove the side plate, remove the four (4) screws as shown in [Fig. 8].
4. Use the **center** cable channel to route the primary power, crossover cable, and access control wires as shown in [Fig. 8].
5. Mount the SU5000 cabinets to the baseplate at the anchor location using the supplied mounting bolts [Fig. 8].
6. For multi-lane applications, bridge the baseplates using the supplied bridge support(s) and screws [Fig. 8].
7. Reinstall the side plate(s).

Fig. 8**Baseplate**



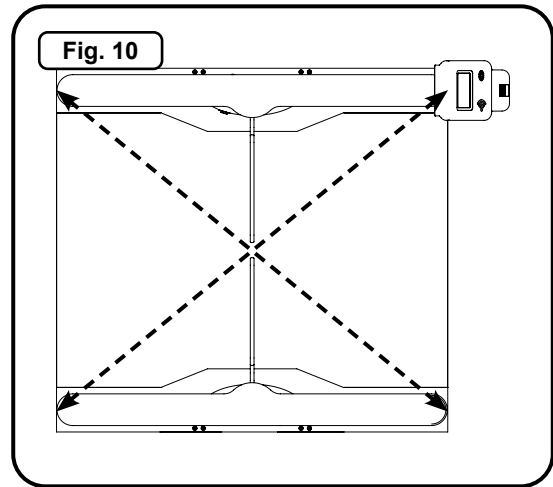
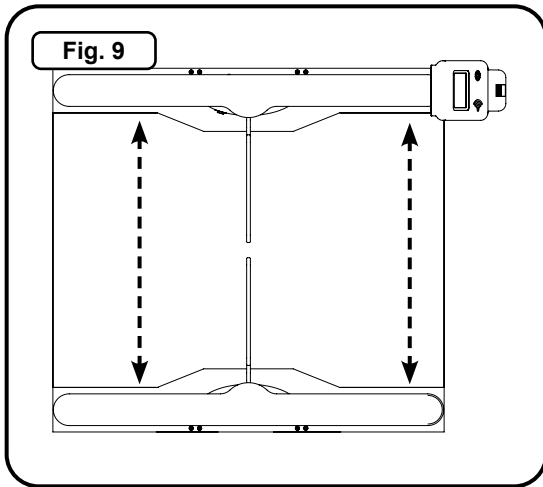
Pre-Installation Instructions

Anchoring the Turnstile

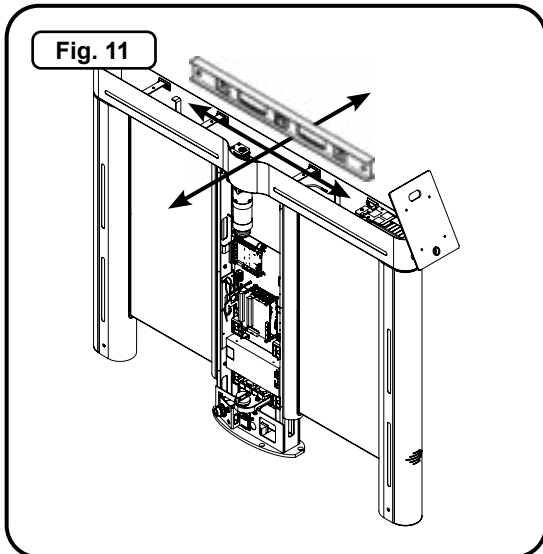
NOTE

The lane 1 main cabinet is always the right-most cabinet when viewed from the unsecured side.

1. Place the main cabinet and the secondary cabinet in the determined location [see "Space Requirements" on page 8].
2. All cabinets must be level and square to each other. This will ensure that the optical sensors are aligned, and that the barriers will line up properly when installed. Use the following procedures to level the cabinets, and square each cabinet with respect to the floor and other cabinets:
3. Measure the distance from the inside wall of one cabinet top channel to the inside wall of the other cabinet top channel, on both the entry and exit side of the lane for a consistent measurement [Fig. 9].
4. Measure the diagonal distance from the end of one cabinet to the end of the opposing cabinet, then measure the opposing diagonal distance [Fig. 10]. If these distances are equal, the cabinets are square.



5. Using a level, verify each cabinet is level [Fig. 11]. If necessary, shim to bring the cabinets level.





Anchoring the Turnstile (cont.)

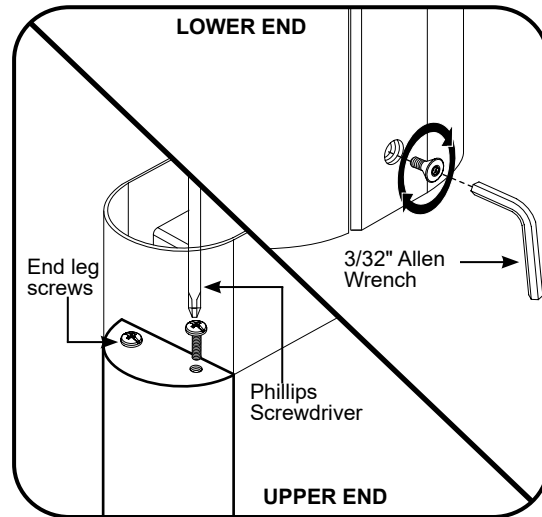
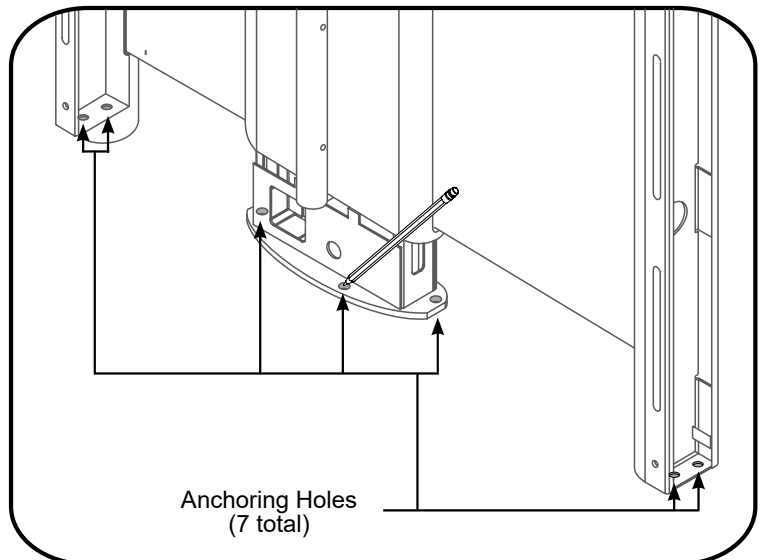
6. Remove cabinet end legs with a Phillips screwdriver and 3/32" hex key [Fig. 12].
7. Remove the card reader mounting bracket and set aside.
8. Use a pencil and mark each mounting hole location [Fig. 13]. There will be a total of seven (7) mounting holes per cabinet. Remove the cabinets when complete.
9. Using a 5/8" concrete drill bit, drill the anchor holes 3" in depth at the center of each marked location.

CAUTION

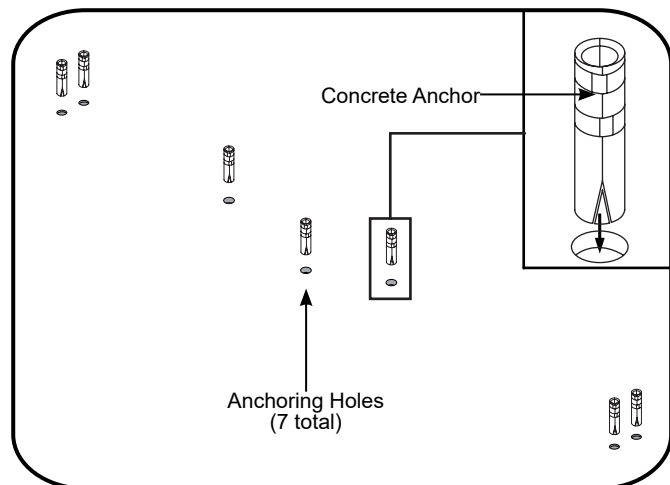
If drilling through terrazzo flooring, add the thickness of the terrazzo tile to the hole depth. Use appropriate length anchor bolts.

NOTE

The anchor holes must be clean before installing the anchor bolts. If the holes are not clear of debris, the anchor bolts may not tighten correctly.

Fig. 12 Removing End Legs**Fig. 13** Marking Anchor Holes

10. Insert the anchors into each drilled hole [Fig. 14]. The threaded end of the anchor must be inserted into the hole first. Use a hammer to tap the anchors into place, if needed. Ensure that the anchors are flush with the concrete floor.
11. If not already done, pull all wires (AC power, access control and crossover cable) through conduit and conduit access in center frame of cabinet prior to anchoring cabinets.
12. Using clear RTV silicone, seal the gaps between the conduit and conduit holes.
13. Maneuver each cabinet over the anchor locations. Insert seven (7) 3/8" x 2-1/2" anchor bolts and flat washers.
14. Using a socket wrench and 9/16" socket, provisionally snug the anchors. Do not fully tighten them yet.
15. Refer to "Barrier Installation" on page 20 and perform the barrier leveling procedure.
16. Once cabinets are level and square to one another, torque anchors to 80 ft-lbs.

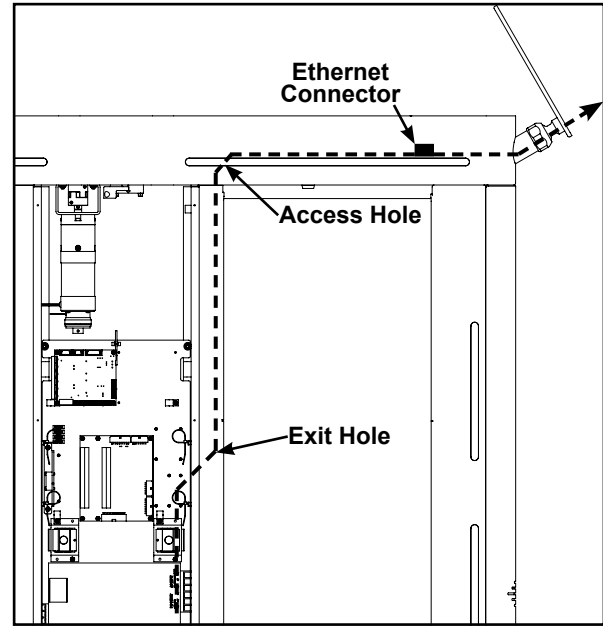
Fig. 14 Inserting Anchors



IntraQ Head Installation

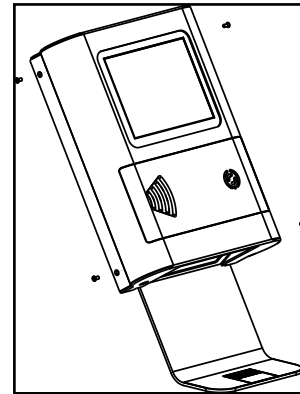
1. Route an Ethernet cable from the base of the cabinet to the Ethernet connector in the top channel [Fig. 15].

Fig. 15 Cable Routing



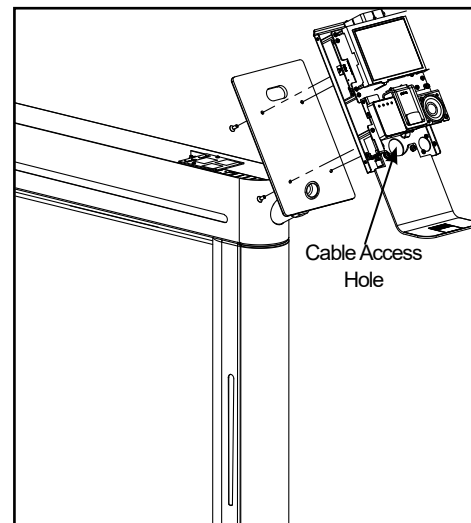
2. Use a Phillips-head screwdriver to remove the four screws securing the case to the IntraQ. Set the screws and the case to the side.

Fig. 16 IntraQ Case Screws



3. Line the mounting holes in the back of the IntraQ with the screw holes on the SU5000 mounting plate. Feed the Ethernet, power, and communication cables through the access hole in the IntraQ backplate. Use a 1/8" hex key to tighten the screws and secure the IntraQ to the SU5000 mounting plate.
4. Connect the Ethernet, power, and communication cables.
5. Use a Phillips-head screwdriver to secure the case to the IntraQ.

Fig. 17 IntraQ Case Screws





Wiring Instructions

NOTE

FOR EXTERNAL DC POWER SUPPLY INSTALLATION INSTRUCTIONS, REFER TO "Appendix D - External DC Power Supply Installation (Optional)" on page 33.

Primary Power

NOTE

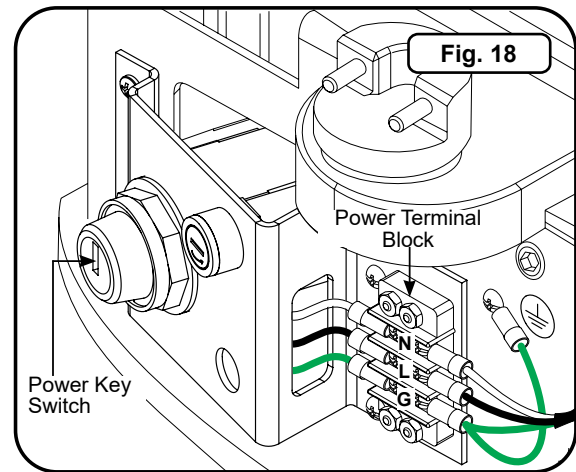
110VAC and 220VAC primary power must be hard wired in place. It is strongly recommended that a licensed electrician perform this procedure in accordance with applicable local codes.

The primary wiring lines for 110VAC and 220VAC consist of the following:

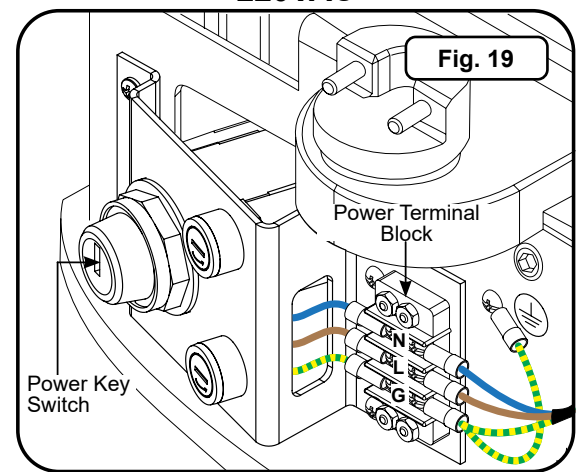
Terminal	110V	220V
Neutral	White	Blue
Line	Black	Brown
Ground	Green	Green/Yellow

1. Locate the pre-installed power terminal block and attached wiring (located next to the power key switch) [Fig. 18].
2. Attach each power wire to the power terminal block with the corresponding color exiting on the other side [Fig. 18 & Fig. 19].
3. Using a Phillips head screwdriver, tighten each terminal block connection.

110VAC



220VAC



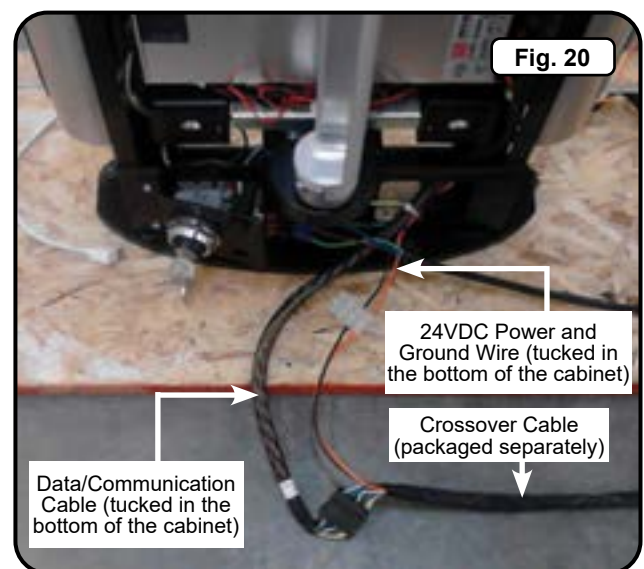
Crossover Cable Connection

1. The included crossover cable interconnects communication signals and low-voltage 24VDC between the main and secondary cabinets. The default length of the crossover cable included with the SU5000 is 8'. Lanes wider than 36" must use a 13ft crossover cable. Optional crossover cable lengths of 13', 20' and 40' are available.
2. Locate the low-voltage terminal block tucked in the bottom of the base in the main cabinet [Fig. 20].
3. Insert the 24VDC positive wire (orange) and the negative wire (black) into the terminal block, matching the colors with the other side and tighten [Fig. 20].
4. Connect the data connector from the crossover cable to the data connector in the main cabinet [Fig. 20].

NOTE

The crossover must connect from MAIN to SECONDARY. Center cabinets have two crossover cable connectors tucked in the base: one labeled MAIN and one labeled SECONDARY. Crossover cables are used to interconnect main and secondary connectors. Refer to "Appendix F - Crossover Cable Connection Diagrams" on page 40 for crossover cable connection diagrams.

5. Repeat Steps 1 – 3 for the secondary cabinet.



CAUTION

DO NOT MODIFY CROSSOVER CABLE.



I/O Control Board

Signal Inputs and Outputs To / From Access Control System

The I/O board is wired at the factory prior to shipment. When uncrated, the cables from the I/O board are routed up to the IntraQ mounting plate on master cabinets.

Inputs

Signal inputs from outside systems are wired into the SU5000's I/O control board. There are two types of input signals, momentary dry contacts (MDC) and sustained dry contacts (SDC). All input signals must be normally open (N.O.), voltage-free, dry contacts, with the exception of the fire alarm input, which can be configured (via jumper on the I/O control board) to accept either a normally open or normally closed (N.C.) sustained contact. MDC's must be at least 100ms in duration to register. While the SU5000 can accept signals up to 2 seconds in duration, the suggested MDC input duration is 1 second or less to support rapid throughput in high volume applications.

Outputs

Signal outputs are available from the SU5000's I/O control board. Outputs are normally open, voltage-free, momentary dry contacts. The output signal length is 500ms in duration.

Inability to Provide Specified Inputs

If the access system cannot provide the specified MDCs, isolation relays should be used.

Fig. 21 Main Cabinet

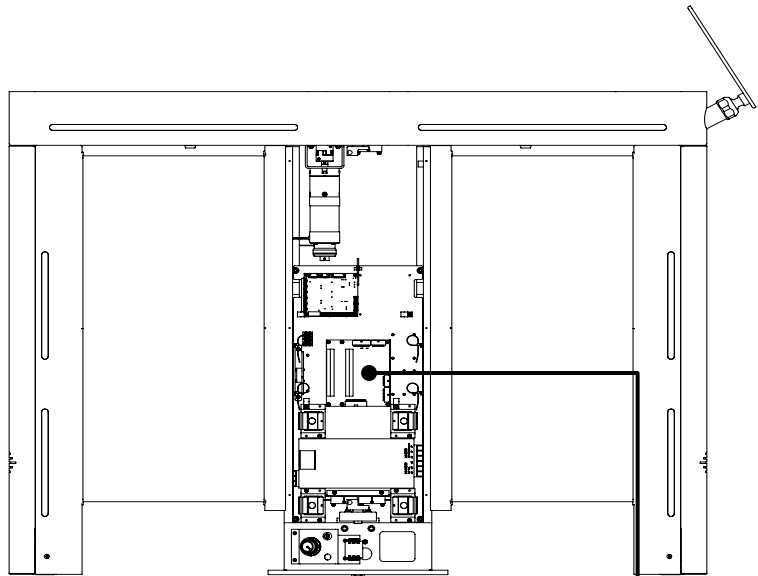
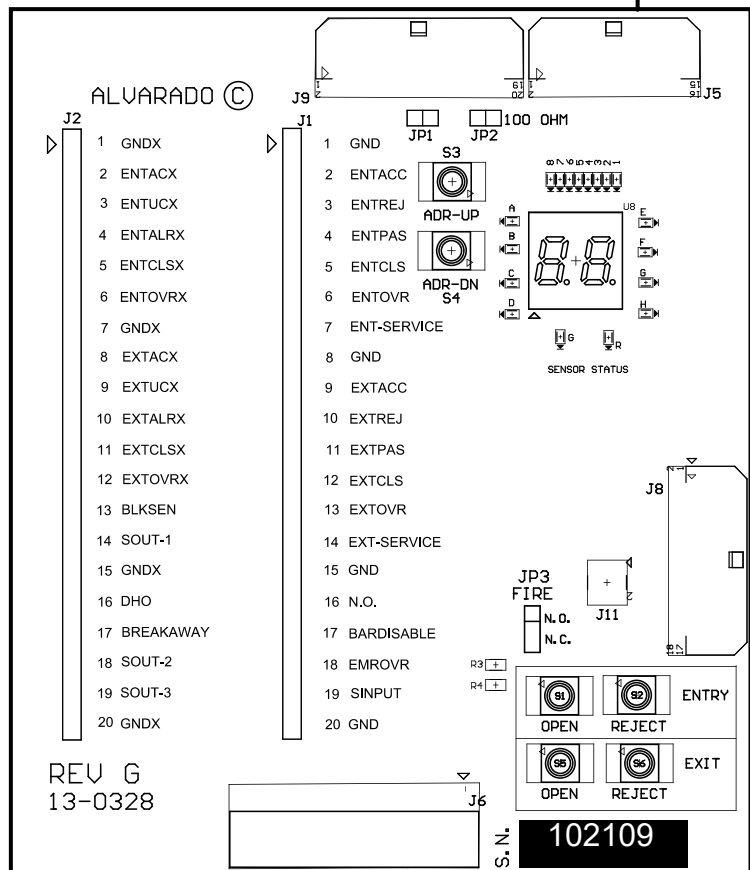


Fig. 22 I/O Control Board



NOTE NEVER connect signal lines containing voltage directly to the I/O control board.

LEGEND	
ITEM	NAME
J1	Input Terminals
J2	Output Terminals
JP3	Fire Alarm System Jumper (N.O. - N.C.)

**I/O Control Board (13-0328 Rev. G) Terminal Descriptions**

J1 Input Contacts				
Pin #	Pin Name	Function Description	Contact Type	Function & Behavior Description
1	GND	Ground	N/A	Common input signal ground.
4	ENTPAS	Free Passage Entry	SDC	Sets the turnstile to Free Passage mode in the entry direction.
8	GND	Ground	N/A	Common input signal ground.
11	EXTPAS	Free Passage Exit	SDC	Sets the turnstile to Free Passage mode in the exit direction.
15	GND	Ground	N/A	Common input signal ground.
18	EMROVR	Emergency Override	SDC (N.O. or N.C.)	Opens the barriers toward the unsecured side; barriers remain open and turnstile is inactive until SDC is removed, or contact is reestablished if N.C. jumper is enabled. (Typically used for fire alarm or life safety systems.)
20	GND	Ground	N/A	Common output signal ground.



Configuring Free-Pass Exit

The SU5000 can be configured to allow patrons to freely exit through the turnstile without having to scan a ticket or other scan media first. Follow the instructions below to configure the SU5000 to allow free-pass exits.

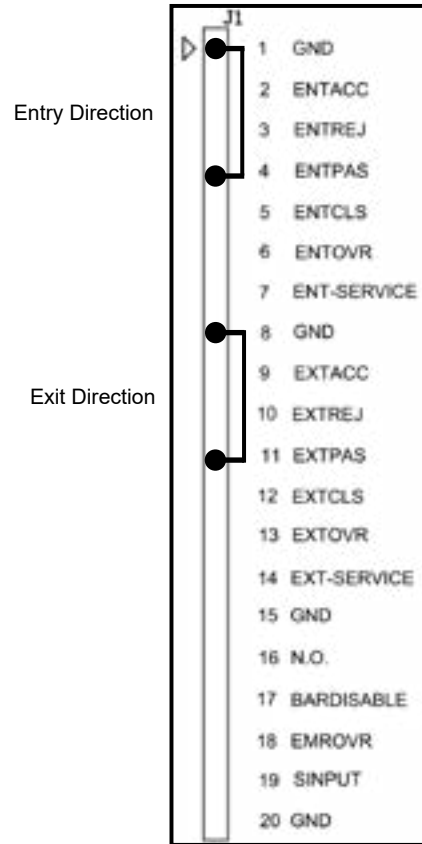
Entry Direction

1. Locate the ENTPAS and any GND terminal.
2. Using a wire jumper, connect the ENTPAS and GND terminals [Fig. 23].

Exit Direction

1. Locate the EXTPAS and any GND terminal.
2. Use a wire jumper to connect the EXTPAS and GND terminals [Fig. 23].

Fig. 23





Ethernet Communication (Optional)

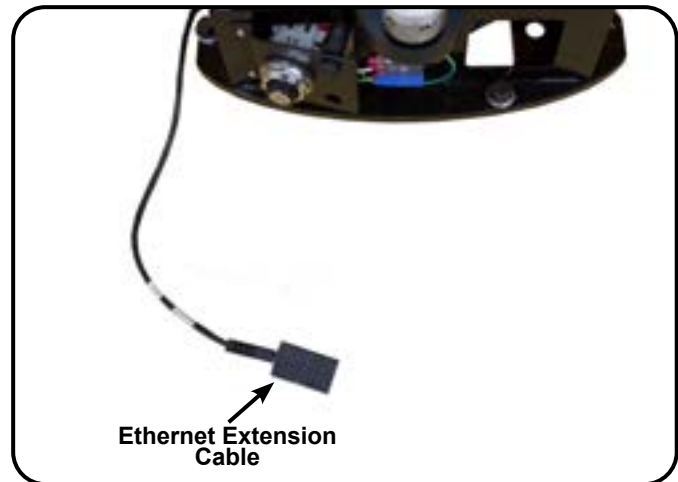
NOTE

It is assumed that Ethernet cabling has been run to the turnstile via conduit and pulled through the conduit opening in Step 6 of the Anchoring the Turnstile section.

1. Locate the Ethernet extension cable tucked in the base of the main/center cabinet [Fig. 24].
2. Connect the Ethernet cable to the Ethernet extension cable.
3. Tuck the Ethernet extension cable back into the base of the cabinet.

Fig. 24

I/O Control Board



Barrier Installation

NOTE

The barriers are shipped unattached inside a crate. The clamp bars and hardware are packaged in the box labeled "HARDWARE ENCLOSED."



This installation requires two people: One person will need to hold the barrier while the other person inserts and tightens the mounting screws.

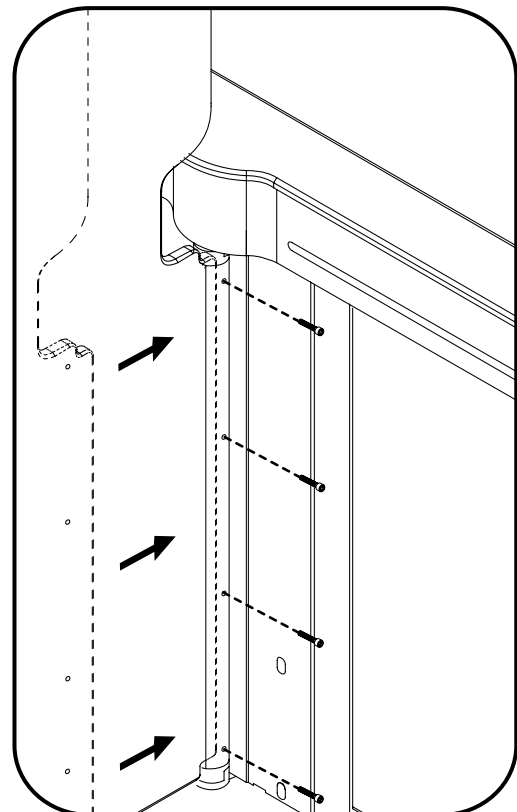
1. Insert the barrier edge into the mounting groove on the spindle, aligning the barrier and spindle mounting holes [Fig. 25].

NOTE

- Exercise care not to scratch the barriers during handling. Do not lay or lean the barriers on an abrasive surface. If the barriers are going to be cleaned, use only a soft cloth and a cleaner suitable for acrylic surfaces.
- Barriers must be attached prior to testing. Abnormal behavior may result if tested without the barriers attached.

Fig. 25

Inserting Barrier Edge





Barrier Installation (cont.)

- Position the clamp bar on the barrier. Insert and tighten the mounting screws and clamp bar to 44 in-lbs. Test to make sure the barrier does not wiggle [Fig. 26].

Fig. 26 Tightening Mounting Screws

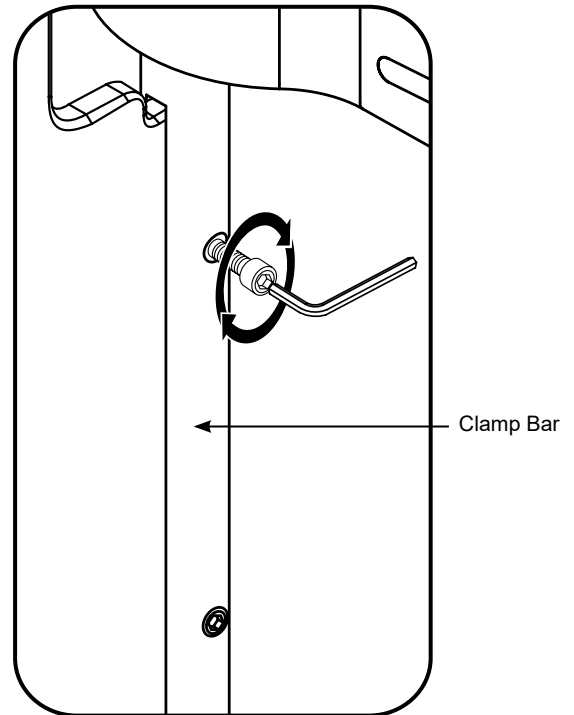
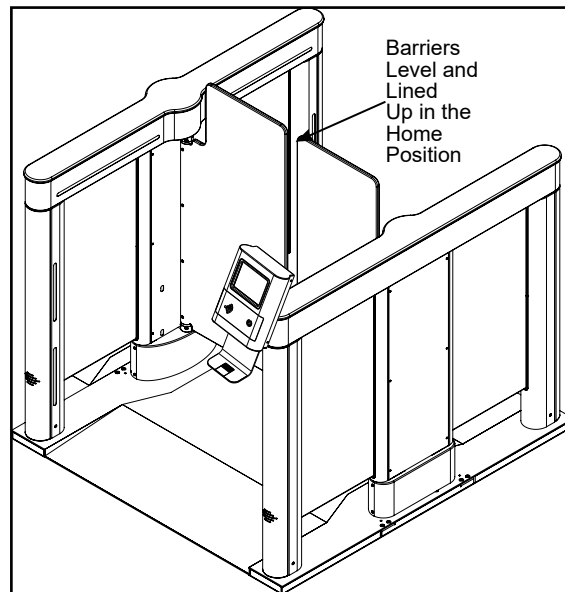


Fig. 27 Checking that Barriers Are Level

- Once the barriers have been installed, check that they are level and lined up properly in the Home position. If the barriers do not line up in the Home position, the cabinets may not be level. Insert shims as needed to level barriers. Refer to "Anchoring the Turnstile" on page 13 for instructions on leveling and squaring the cabinets.



The barriers above are shown in the Home Position.



Post-Installation Functions Check

Alvarado turnstiles are thoroughly inspected and tested for proper performance prior to being shipped. Perform the following function checks to verify the turnstiles have been installed properly and are fully operational. If any problems are encountered during the functions check, refer to "Troubleshooting" on page 29.

Powering On

NOTE

The keys to power the turnstile ON/OFF are packaged in the hardware box that was shipped with the turnstile.

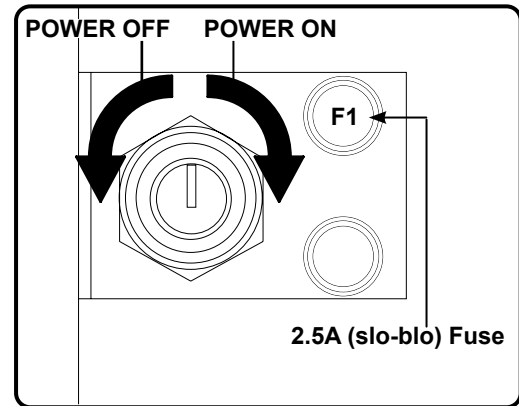
There is a power key switch on the inside of the base cover of all main and center cabinets.

1. Turn on AC power using the power key switch [Fig. 28]. The power-up cycle will take less than one minute to complete.
2. After the power-up sequence has completed, the SU5000 barriers will move to the Home position and the SU5000 will enter into Controlled Passage mode, for both the entry and exit directions.

NOTE

Barriers are pre-aligned at the factory. However, they may need slight adjustment after installation. Refer to "Appendix A - Setting the Home Position" on page 30 for instructions.

Fig. 28 Power Key Switch



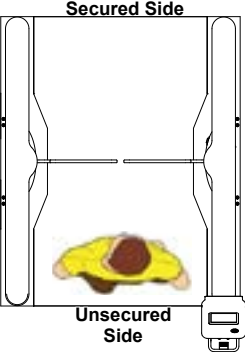
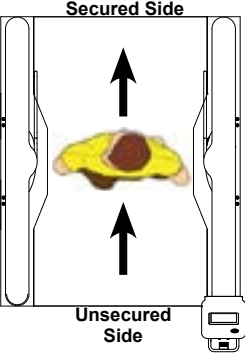
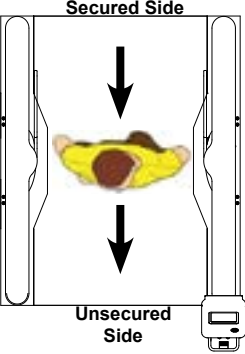


Testing Turnstile Functionality

Perform the following turnstile functionality tests to validate basic turnstile operation. Tests are provided for Controlled Passage, Free Passage, and No Passage modes.

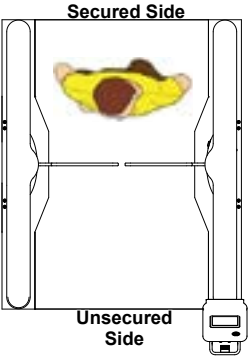
The following is assumed (Controlled Passage mode tests only):

- The access control system is operational and all access control wiring to the turnstile is connected.
- Valid tickets are on hand for activating the turnstile. Alternatively, the IntraQ's test activation function can be used. Refer to the IntraQ User Guide (PUD4454).

TEST	PROCEDURE	TURNSTILE RESPONSE
<p style="text-align: center;">Unauthorized Entry</p>  <p style="text-align: center;">(Unauthorized Entry shown)</p>	<p>Enter the turnstile without authorization.</p>	<ul style="list-style-type: none"> • Unauthorized Entry / Exit alarm sounds. • Dynamic side panels flash red. • Barriers remain closed.
<p style="text-align: center;">Authorized Entry/Exit</p>  <p style="text-align: center;">(Authorized Entry shown)</p>	<p>Scan a valid test ticket with the IntraQ. Walk through the turnstile. Verify the barriers close upon passage completion.</p>	<ul style="list-style-type: none"> • Authorized Entry chime sounds. • Dynamic side panels are solid green. • A "Good Ticket" bitmap displays on the IntraQ screen. • Barriers move to the open position, and close upon passage completion or the timeout period is reached.
<p style="text-align: center;">(Optional) Free Passage Exit</p>  <p style="text-align: center;">(Free Passage Exit Shown)</p>	<p>Enter the turnstile and complete a passage.</p>	<ul style="list-style-type: none"> • Dynamic side panels are solid green. • Barriers open away from the user entering the turnstile. • Barriers close after passage completion.



Testing Turnstile Functionality (cont.)

TEST	PROCEDURE	TURNSTILE RESPONSE
<p data-bbox="191 205 386 231">Unauthorized Exit</p>  <p data-bbox="167 625 394 651">(No-Passage Exit shown)</p>	<p data-bbox="472 205 894 231">Enter the turnstile without authorization.</p>	<ul data-bbox="1027 205 1500 325" style="list-style-type: none"><li data-bbox="1027 205 1500 231">• Unauthorized Entry / Exit alarm sounds.<li data-bbox="1027 247 1500 273">• Dynamic side panels flash red.<li data-bbox="1027 300 1500 325">• Barriers remain closed.



Testing IntraQ Network Communication

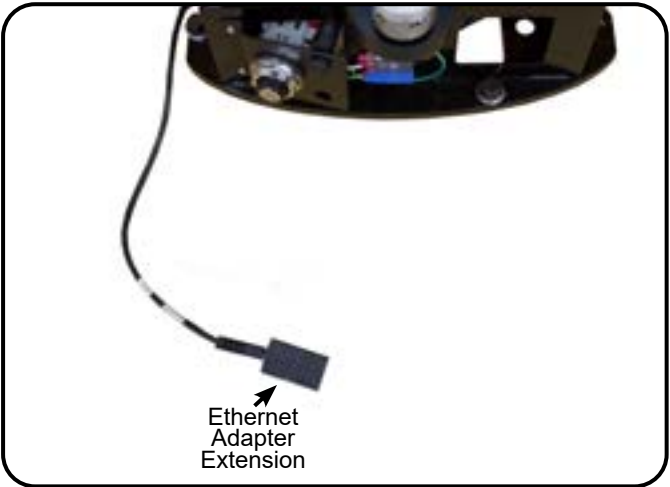
NOTE

The following procedure is applicable to non-networked (standalone) turnstiles. For instructions on testing Ethernet communication over a facility network, please refer to the *SU5000 User Guide (PUD3668)*.

Required Items:

- CAT5/6 Ethernet Cable
- Laptop Computer Running Windows (the laptop should be on the same network subnet as the device.)

Fig. 29 Ethernet Adapter



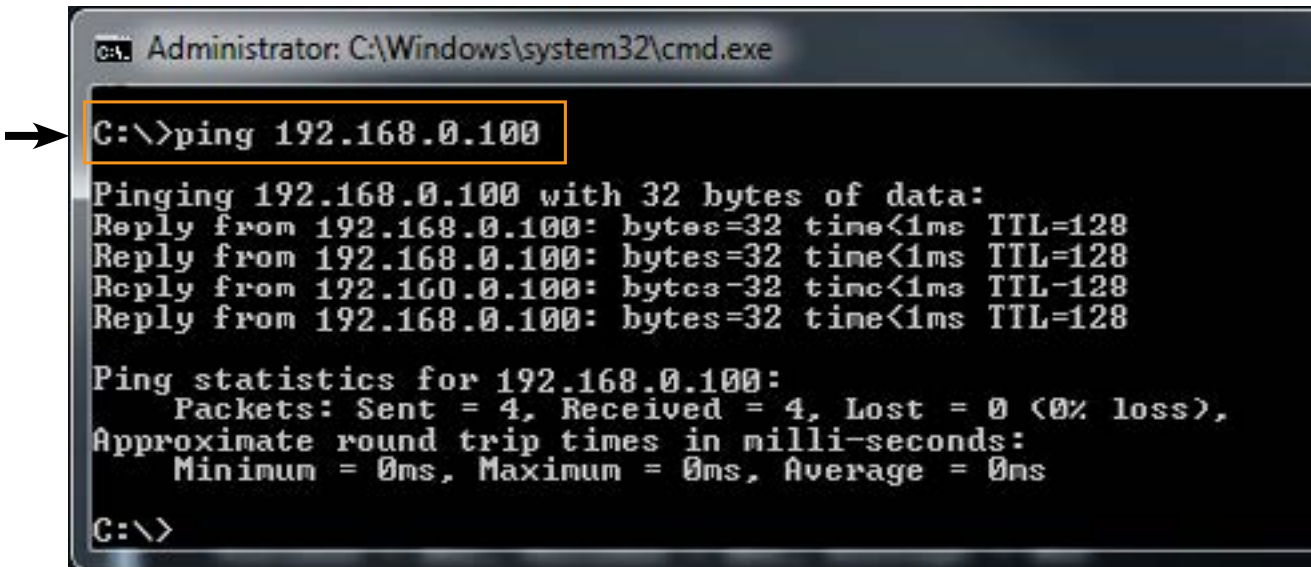
1. Locate the *Ethernet Adapter Extension* tucked in the base of the main/center cabinet [Fig. 29].
2. Connect the Ethernet cable to the Ethernet adapter extension.
3. Connect the other end of the Ethernet cable to the laptop computer.
4. Launch **Command Prompt** on the computer by typing **CMD** in the 'Search programs and files' field.
5. Enter the following command: **ping XXX.XXX.XXX.XXX**, where XXX.XXX.XXX.XXX is the IP address of the IntraQ [Fig. 30].

NOTE

192.168.0.100 is the default IP address configured by Alvarado. If the IntraQ has been assigned a different network IP address, ping that IP address instead. Contact your system administrator for network information.

6. A successful ping will result in the message shown in [Fig. 30]:

Fig. 30 Ping Results





Finish the Installation

Cabinet Lid Installation

NOTE

Due to limited access, use the 4mm Allen 'stubby' wrench provided. (The wrench is taped to the underside of all end cabinet lids.)

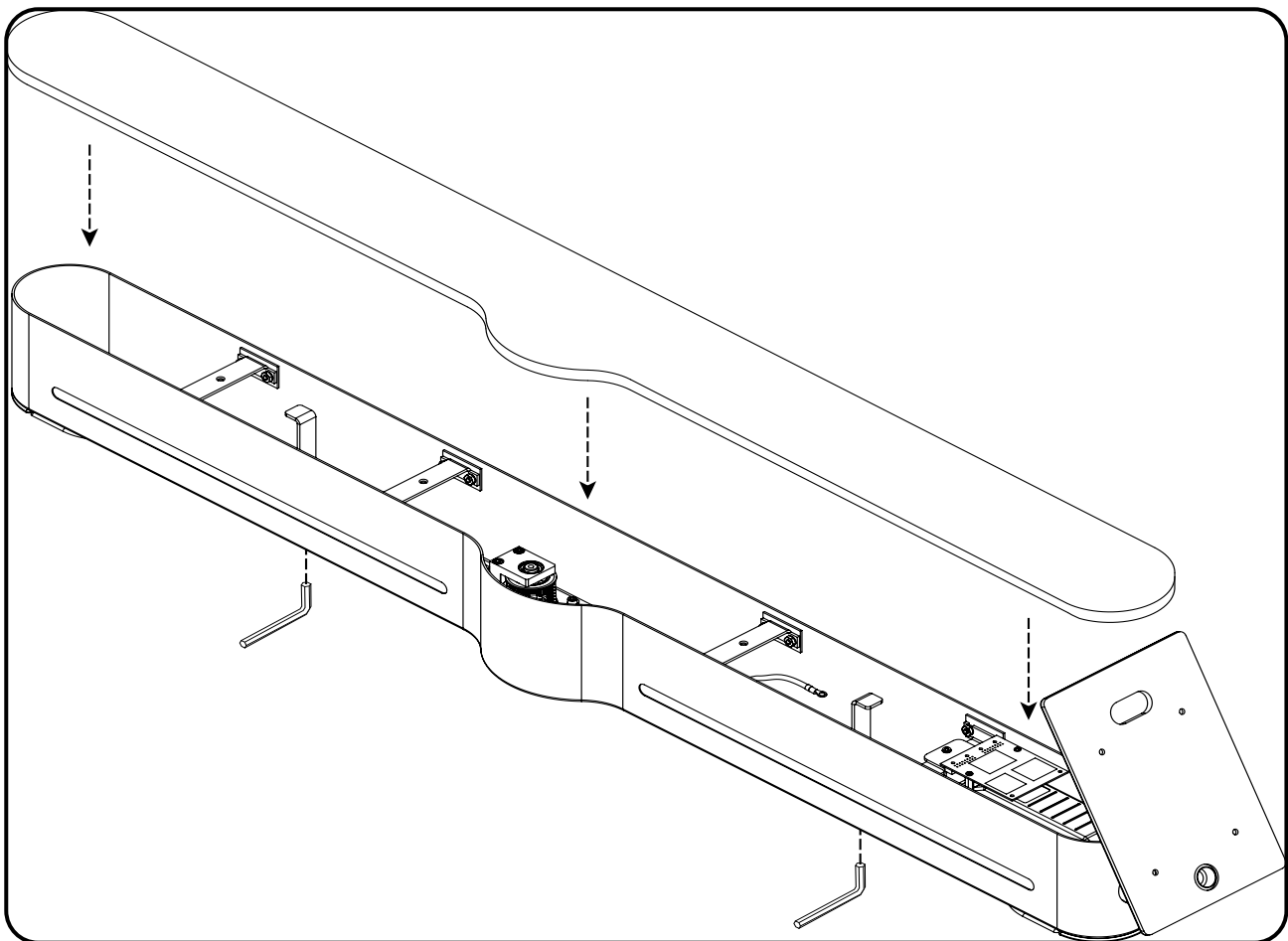
1. Lower the lid onto the cabinet housing [Fig. 31].

WARNING

Do not force the lid into place. Doing so may damage the lid.

2. Insert the 4mm 'stubby' Allen wrench into the cam latch assembly (located under the cabinet housing) and turn 180° counter-clockwise until there is no movement in the lid [Fig. 31].
3. Repeat steps 1 and 2 to install the remaining cabinet lid(s).

Fig. 31 Cabinet Lid Installation

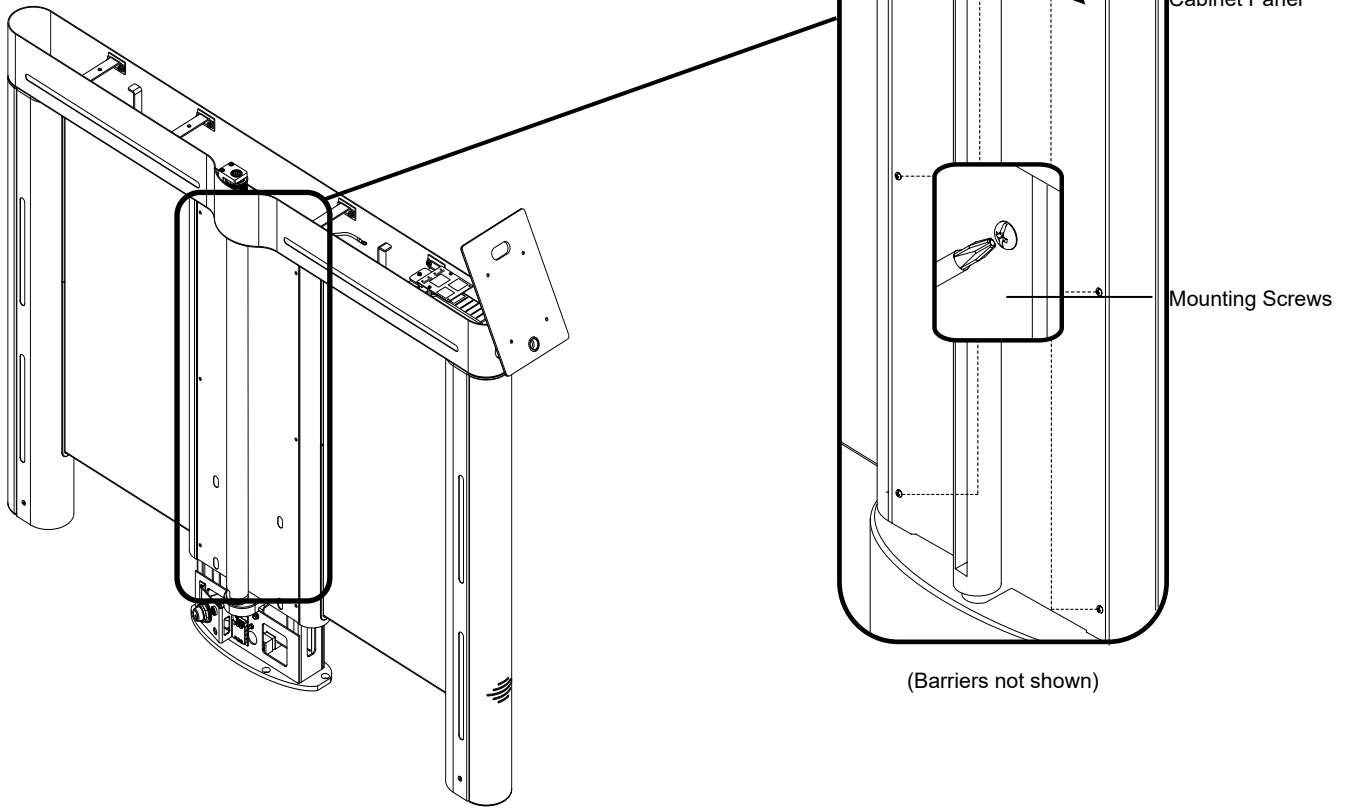




Cabinet Panel Installation

1. Orient the cabinet panel so the sensor windows are at the bottom and gently slide the cabinet panel into position.
2. Using a Phillips screwdriver, insert and tighten the six (6) mounting screws that secure the cabinet panel to the cabinet [Fig. 32].
3. Repeat steps 1 and 2 to install the remaining cabinet panel(s).

Fig. 32 Cabinet Panel Installation



Base Cover Installation

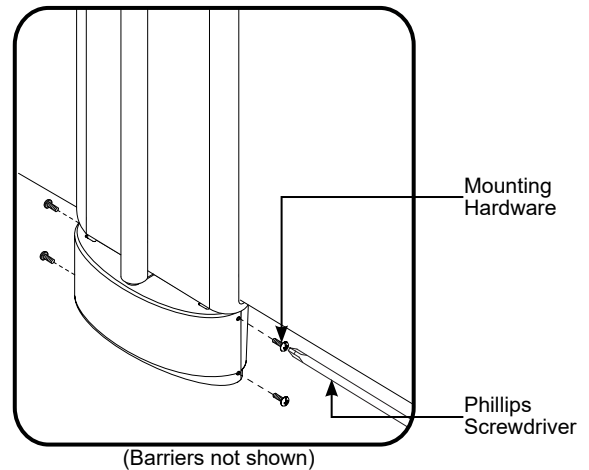
1. Place the base covers in position. The opening for the power key switch must be facing towards the interior of the lane.

NOTE

Main and center cabinet base covers can be identified by the power key switch hole.

2. Align the four (4) mounting holes (located on each side of the base cover) [Fig. 33].
3. Using a Phillips screwdriver, insert and tighten the mounting hardware [Fig. 33].
4. Repeat Steps 1 - 3 to install the remaining base covers.

Fig. 33 Base Cover Installation





Post-Installation Checklist

1. Power On
 - SU5000 boots up successfully as confirmed by two audible chimes.
 - IntraQ boots up successfully and displays the "Please Scan" screen.
2. Lane Functionality
 - Side panel lighting displays properly for valid and invalid tickets.
 - Auditory alarms are playing back correctly.
 - Barriers move smoothly between the open and closed positions.
3. IntraQ Functionality
 - The IntraQ is successfully reading credentials.
 - Valid tickets are activating the turnstile.
4. Barrier Alignment
 - Barriers are properly aligned in both the open and closed positions.
 - Barriers aligned in the Home position.
5. Attachment
 - Barriers, cabinet lids, end covers, and base covers are securely fastened to the turnstile.
6. Wipe Down Turnstile
 - Acrylic - Wipe down acrylic barriers using a soft cloth and cleaner suitable for acrylic surfaces. We recommend Brillianize and Novus #1 acrylic cleaners.
 - Stainless Steel – Wipe down stainless steel with a damp cloth or use Alvarado's recommended commercial products (see *SU5000 User Guide - PUD3668*).
 - Powder Coated - Wipe down powder coated surfaces with a damp cloth.
7. Manuals Handoff
 - Provide both the *IntraQ-SU5000 Installation Instructions* and the *IntraQ-SU5000 User Guide (PUD4454)* to the project or site manager.



Troubleshooting

This basic troubleshooting section is provided to aid installers with the most commonly encountered installation problems. If you require further troubleshooting assistance, contact Alvarado Technical Support for the Optical Troubleshooting Document.

Symptom	Possible Cause	Solution
Unit will not turn on	No power	Make sure that there is power to the turnstile power terminal block. Check if LEDs are lit on the I/O control board and the seven-segment display is showing a number.
	Blown fuse	Check fuse. If necessary replace with a 2.5A (slo-blo) fuse.
Constant auditory alarming	Communication/ low-voltage cable	Check the I/O control board to see if the red STATUS LED is lit or flickering. If it is, the most likely problem is a loose or improper communication connection. Disconnect the black 16-pin connectors from the I/O control board and motor control boards, apply contact cleaner / lubricant to connector pins and reseal. Retry operation. If condition persists, perform the same process on the 16-pin connectors going into and out of the light boards and sensor boards. Retry operation. Alvarado Technical Support has a process document and can provide additional instructions.
Barriers operate erratically.	Digital position encoder is not in place	Verify the digital position encoder is secured to the pulley shaft with all the locks tabs in place. [Fig. 34]. NOTE: After re-seating the digital position encoder, the barrier Home Position must be reset PRIOR to power cycling the turnstile. Refer to Appendix A for instructions to set the Home Position.
Barriers do not move.	Blown 24VDC fuse on the motor controller board.	Locate the motor controller board fuses [Fig. 35]. Using a multimeter, check the 24VDC 6.3A fuse for continuity. If the fuse is blown, contact Alvarado for replacement instructions.
Blocked Sensor auditory alarms sounds after 15 seconds (default).	Wire or cable blocking sensors	Check for a stray wire or cable in front of the transmit and receive operational sensors (horizontal arrays). Tuck any stray wire or cable out of sensor viewing area. If this does not resolve the problem, contact Alvarado technical support for instructions on using the ADR-UP and ADR-DN buttons on the I/O control board to perform diagnostics on sensors.
Barriers either stay open or start to close then open back up	Safety sensor blocked	Check for a stray wire or cable in front of the individual transmit and receive safety sensors. Tuck any stray wire or cable out of sensor viewing area. If this does not resolve the problem, contact Alvarado technical support for instructions on using the ADR-UP and ADR-DN buttons on the I/O control board to perform diagnostics on sensors.
Barriers do not align in closed position	Home position needs to be reset	Follow the Setting the Home Position instructions in Appendix A on Page 32.
System does not boot.	Motor controller board fuse is blown.	Locate the motor controller board fuses [Fig. 35]. Using a multimeter, check the 5VDC 3A and 12VDC 2A fuses for continuity. If a fuse is blown, contact Alvarado for a replacement. NOTES: If a user status display or open / closed status light is out, this may indicate the 5VDC 3A fuse is blown. If the motor controller board LEDs are out, this indicates the 12VDC 2A fuse is blown.

Fig. 34 Digital Position Encoder

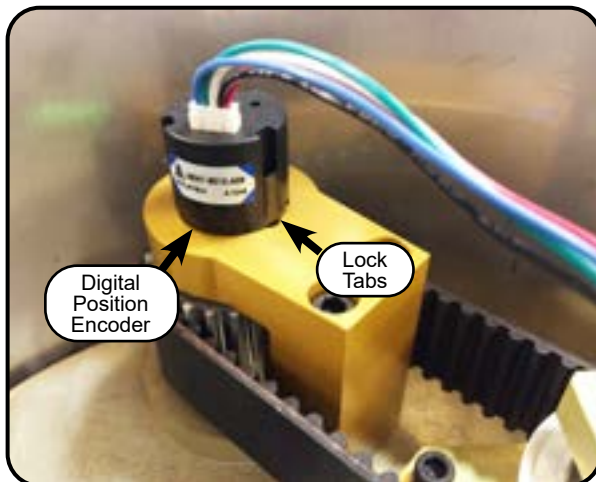
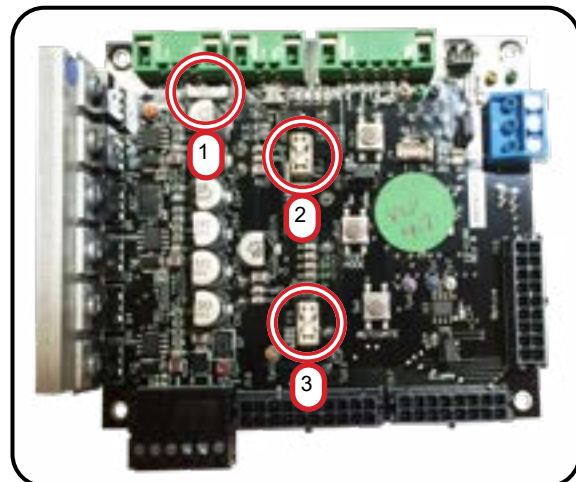


Fig. 35 Motor Controller Board Fuses



FUSES

- 1) 24VDC 6.3A 2) 12VDC 2A 3) 5VDC 3A



Appendix A - Setting the Home Position

1. Locate the motor controller board in the center or main cabinet [Fig. 36 & Fig. 37] respectively. The (D2) LED will be blinking indicating normal operation mode.
2. Press the 'Test Mode' button for two seconds. The (D2) LED will be lit solid. You are now in test mode [Fig. 37].
3. Move the barrier a couple of inches in both directions and then place it in the home position [Fig. 38].
4. Press the 'Home' button to set.
5. Press the 'Test Mode' button for two seconds to exit test mode. The (D2) LED will return to blinking status indicating normal operation mode.
6. Locate the secondary motor controller board in the secondary or center cabinet.
7. Repeat Steps 1 through 5 for the secondary barrier.

NOTE

On center cabinets, the secondary motor controller board controls the secondary barrier on the other side of the cabinet (the adjacent lane).

Fig. 36 Center Cabinet - Motor Controller Boards

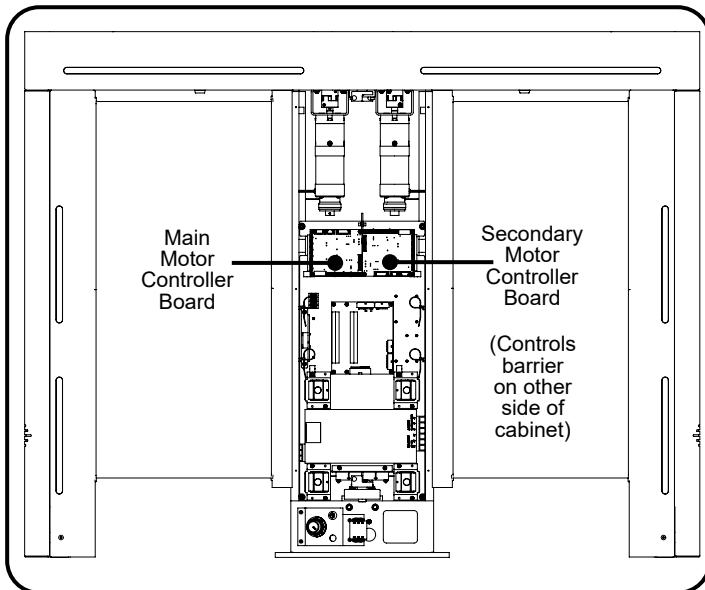


Fig. 37 Main Cabinet - Motor Controller Board

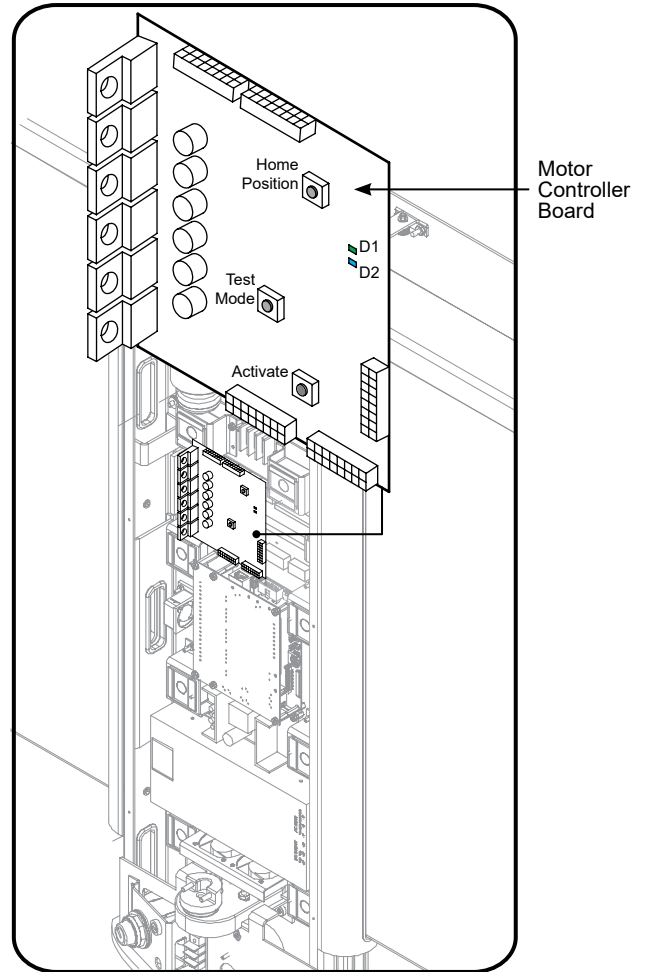
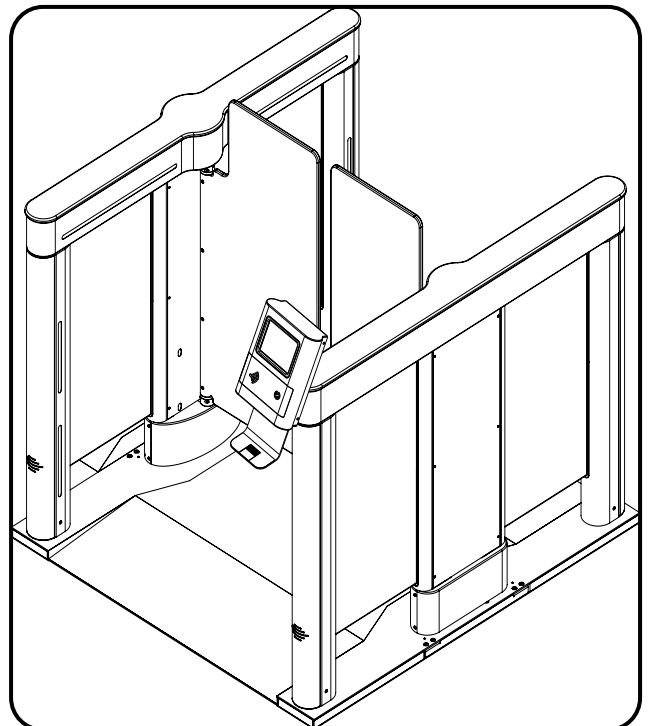
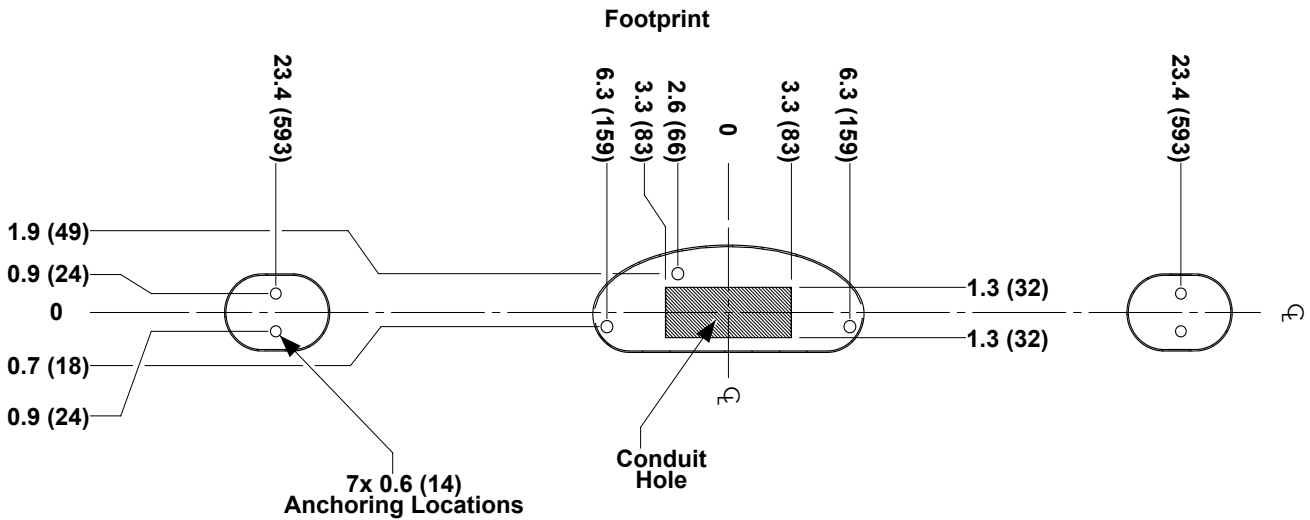
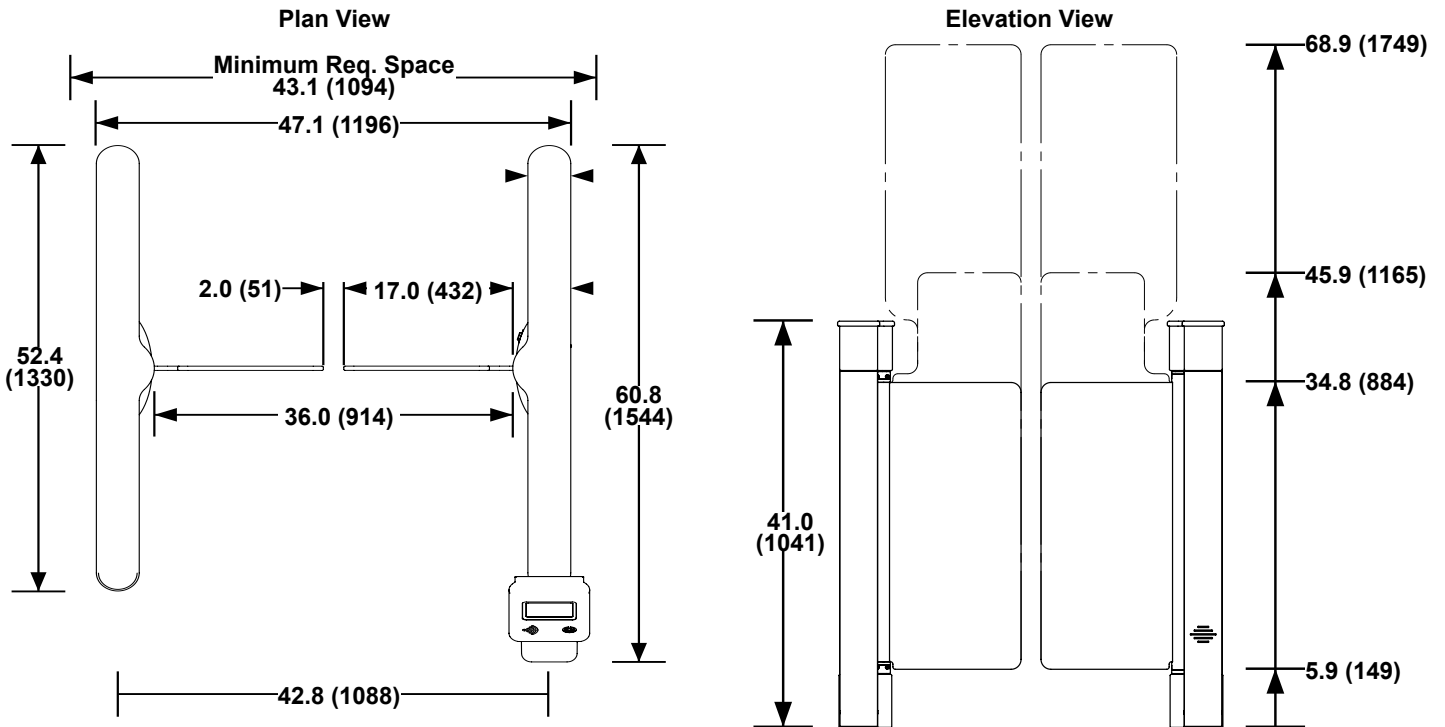


Fig. 38 Barrier Home Position





Appendix B - 36" Single Lane - Plan, Elevation & Footprint Drawing





Appendix C - 28" & 36" Baseplate Dimensions

Fig. 39 28" Baseplate Dimensions

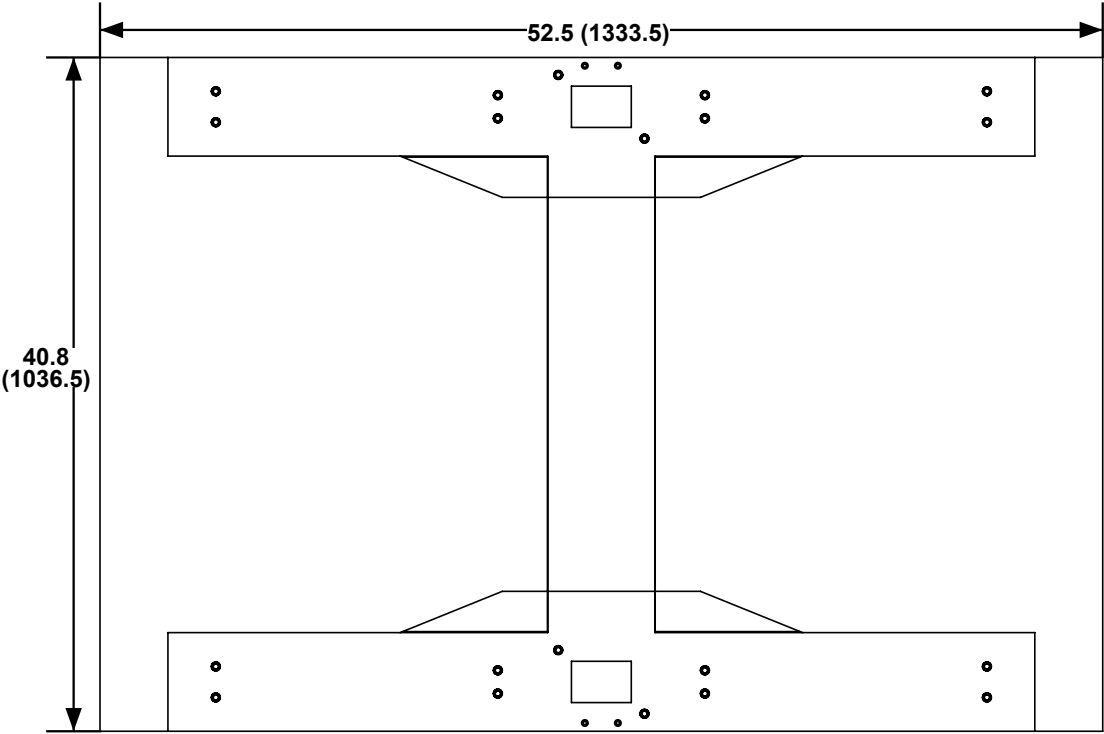
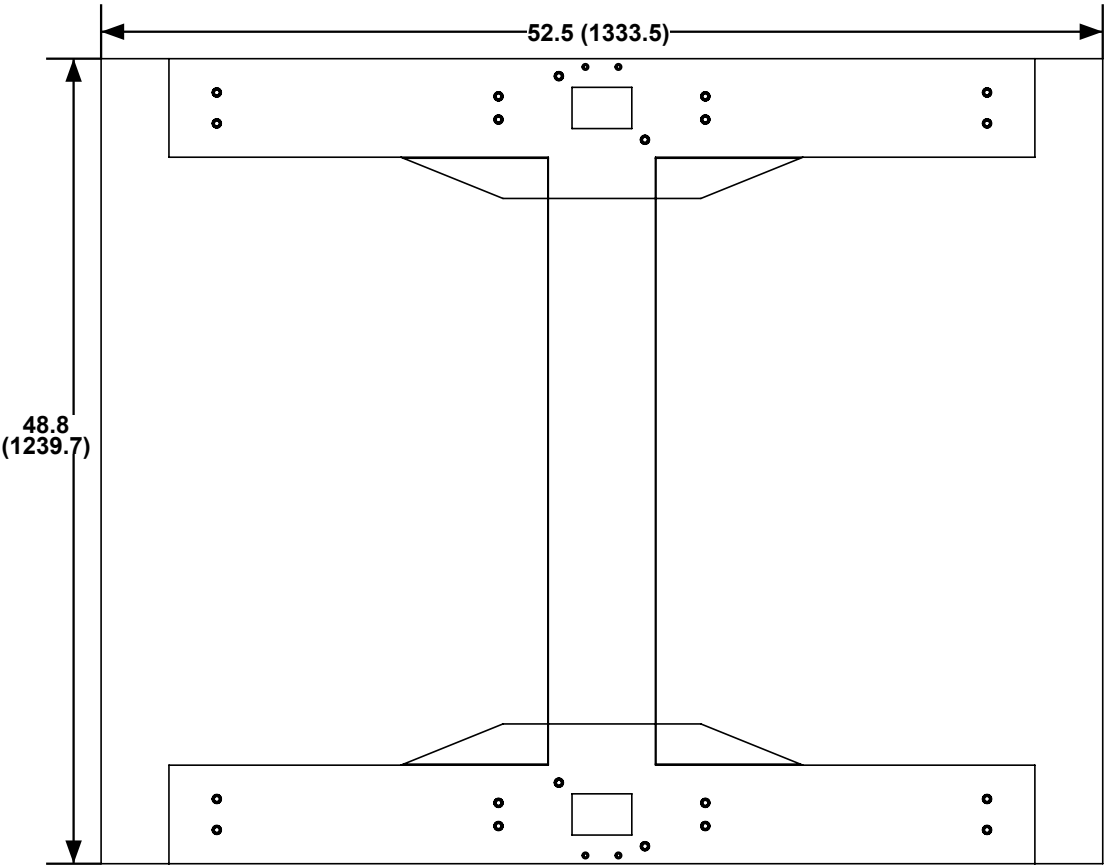


Fig. 40 36" Baseplate Dimensions





Appendix D - External DC Power Supply Installation (Optional)

THESE INSTRUCTIONS ARE APPLICABLE FOR EXTERNAL DC POWER SUPPLY INSTALLATIONS ONLY.

Before You Begin

- One power supply is required per lane. Each power supply enclosure can house up to three power supplies. The power supplies are pre-installed at Alvarado prior to shipping. Make sure to locate all required components, and verify the correct number of power supplies are present prior to beginning installation.
- It is assumed that conduit has been run to the main/center cabinet for each lane for low-voltage 24VDC power wiring. Refer to Conduit Requirements section on Page 9 for more information.
- Due to the various mounting methods and surfaces available for mounting the enclosure, mounting hardware and detailed mounting instructions are not provided.
- See "Connect Low-Voltage 24VDC from Enclosure to Turnstile(s)" on page 35 for wire gauge recommendations for 30, 50, and 100 ft. runs. If your installation requires runs beyond 100 ft, ensure wire gauge is appropriate and in compliance with local electrical codes.
- The location of the power supply enclosure must adhere to the Environmental Requirements section found on Page 9. Controlled environments such as an electronics closet are ideal.
- See "Power Supply Enclosure Dimensions" on page 38 for measurements.
- It is strongly recommended that a licensed electrician perform this procedure in accordance with applicable local electrical codes.
- Throughout this document, the power supply enclosure is shown with three power supplies installed. The instructions are the same for single and dual power supply installations.

Locate and Mount the Enclosure(s)



WARNING

ENSURE PRIMARY POWER IS SHUT OFF AT THE BREAKER.

1. Determine the installation location for the power supply enclosure(s). If mounting the enclosures to a wall or other surface, use the five (5) provided mounting holes and appropriate hardware [Fig. 41].
2. Using a 5/64" Allen wrench, remove the four (4) cover screws and remove the cover [Fig. 42].

Fig. 41 Mounting Holes (Side View)

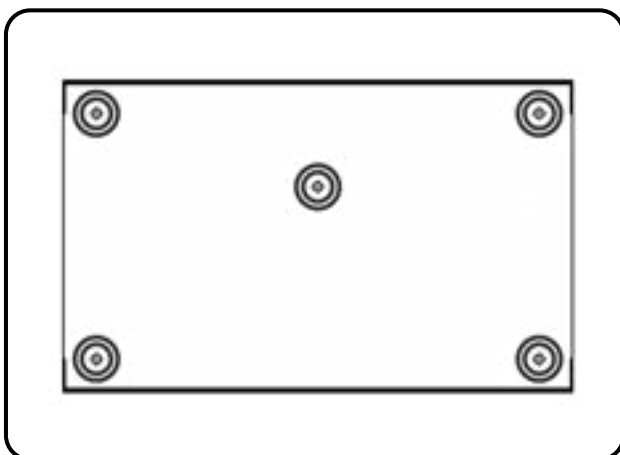
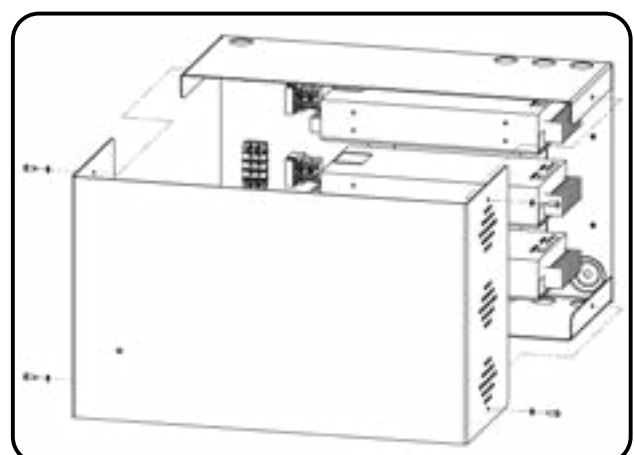


Fig. 42 Removing Cover Screws





Connect Primary Power to Enclosure(s)

NOTE

Primary power wiring and connectors are not supplied by Alvarado.

The primary wiring lines for 110VAC and 220VAC consist of the following:

Terminal	110V	220V
L ine	Black	Brown
N eutral	White	Blue
G round	Green	Green/Yellow

3. Route primary power conduit to one of the supplied conduit holes on the enclosure [Fig. 43].
4. Locate the pre-installed primary power terminal block [Fig. 43]. There is one primary power terminal block per enclosure.
5. Attach each primary power wire to the primary power terminal block according to the table above [Fig. 44].
6. Using a Phillips-head screwdriver, tighten each terminal block connection.
7. Attach the supplied protective cover on the terminal block.
8. Repeat Steps 3 for 7 for additional power supply enclosures.

Fig. 43 Primary Power Terminal Block

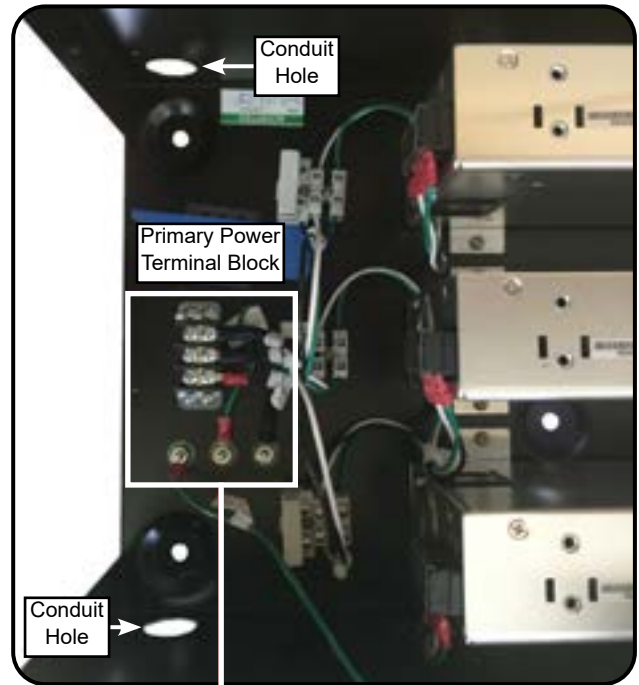
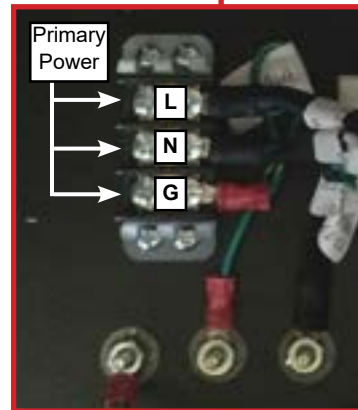


Fig. 44





Connect Low-Voltage 24VDC from Enclosure to Turnstile(s)

Twelve (12) ring connectors are supplied by Alvarado for connecting low-voltage 24VDC power to the turnstiles. If you do not require all twelve connectors, only use what is needed.

Due to the differences of each installation scenario, 24VDC wire is not supplied by Alvarado. See the recommendations below for selecting the best wire for your installation.

NOTE

DISTANCE	GAUGE
30 ft (9.14m)	16 AWG
50 ft (15.24m)	14 AWG
100 ft (30.48m)	12 AWG

9. Route 24VDC power conduit(s) to supplied conduit holes on the enclosure. See [Fig. 48] on page 37 for location of 24VDC conduit holes.
10. For each power supply to be connected, locate the output

TIP

If connecting to multiple turnstiles, it is recommended to label each power supply "Lane 1", "Lane 2", "Lane 3", etc.

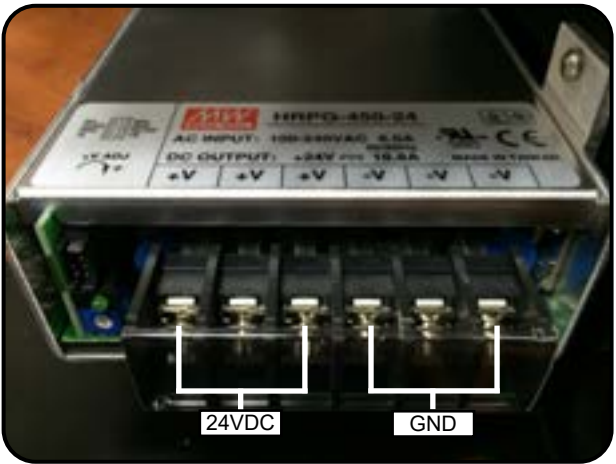
terminal block [Figure D4]. Each terminal block has three (3) 24VDC (+V) and three (3) ground (-V) terminals. You will only require one (+V) and one (-V) per lane.

NOTE

The 24VDC (+V) and GND (-V) terminals are common.

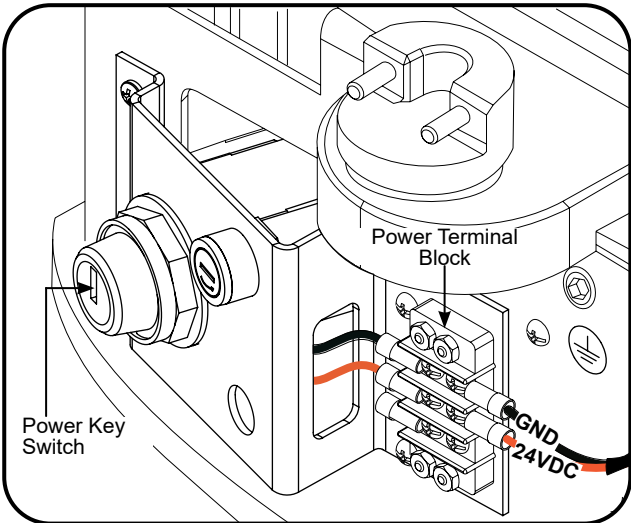
11. Using the supplied connectors, connect the 24VDC (+V) and ground (-V) wires to the output terminal block [Figure D4].

Fig. 45 Power Supply Output Terminal Block



12. At the turnstile, using the supplied connectors, connect the 24VDC and GND wires to the power terminal block as shown in [Figure D5].
13. Repeat Steps 9 - 12 for additional power supplies and turnstiles.

Fig. 46 Turnstile Power Terminal Block



Return to Crossover Cable Connection section located on page 16 to continue the installation.

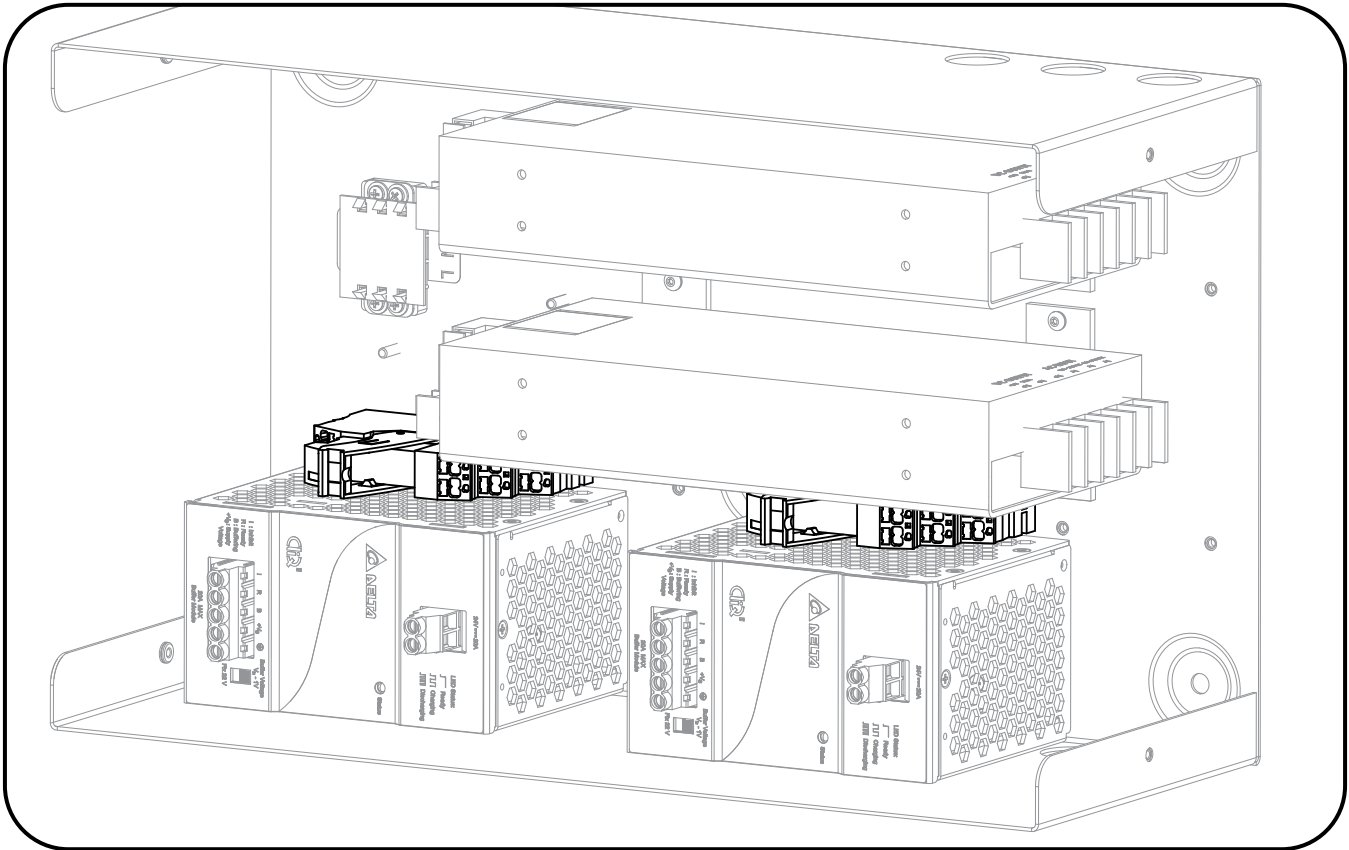


Option: Power Buffer - Connect from Enclosure to Turnstile

The Remote Power Supply option can also include a Power Buffer, which ensures the barriers open towards the exit direction upon power loss.

The Power Buffer for the Remote Power Supply requires one additional connection to be made from the enclosure relay(s) to each respective turnstile I/O Board; wire not supplied. The Power Buffer option limits the total number of power supplies in each enclosure to two (2).

Fig. 47 Power Buffer Relay Location



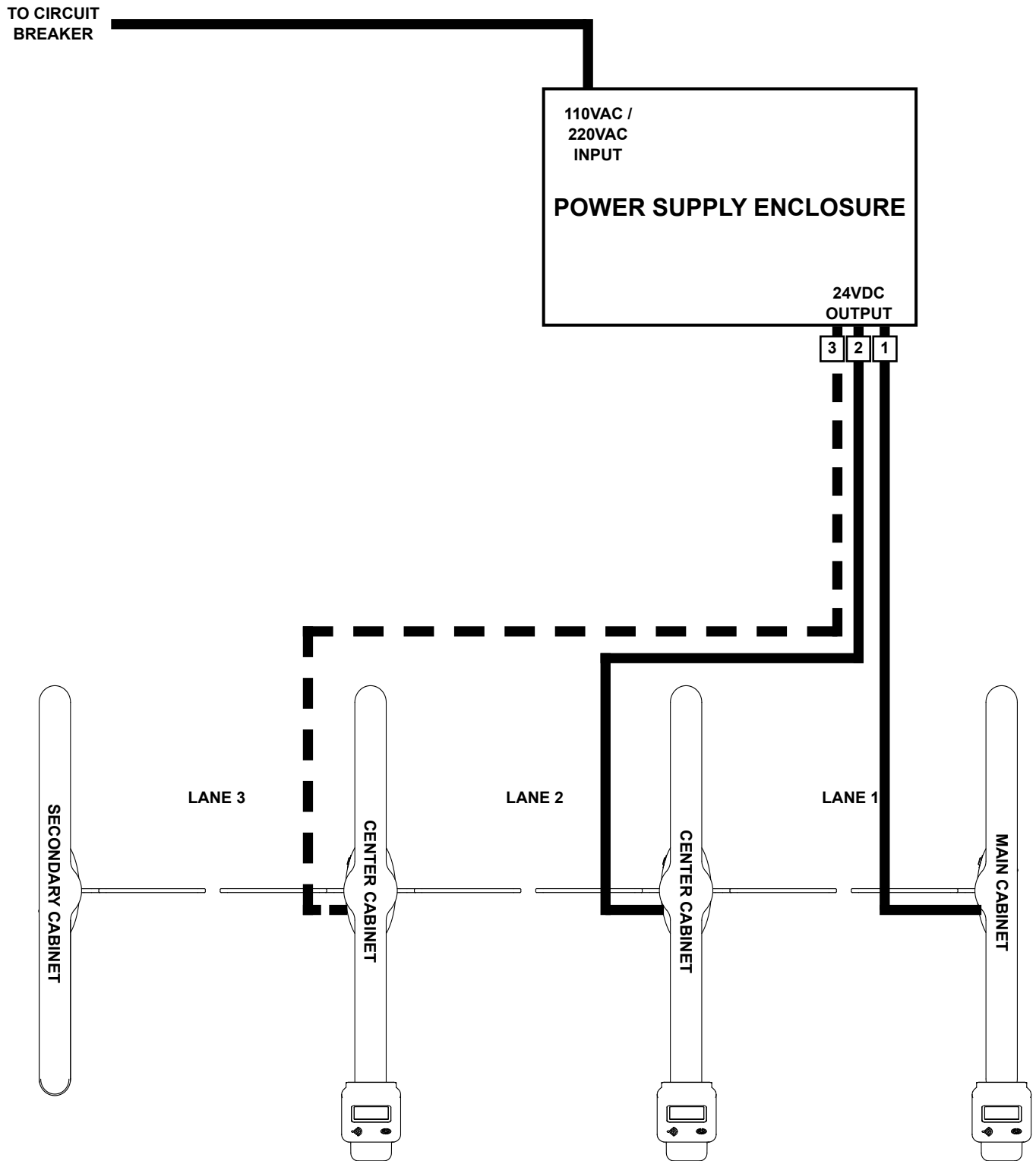
To wire the Power Buffer relays to the IO Boards:

1. Connect wire from the output terminals 11 & 12 from each relay.
2. Pull wire from the enclosure relays to the Main & Center cabinets of each lane.
3. Terminate the wires onto Pins 7 & 8 (ENT-Service & GND) on the J1 Block of each I/O Board.



External DC Power Supply Connection Diagram

Fig. 48 Connection Diagram



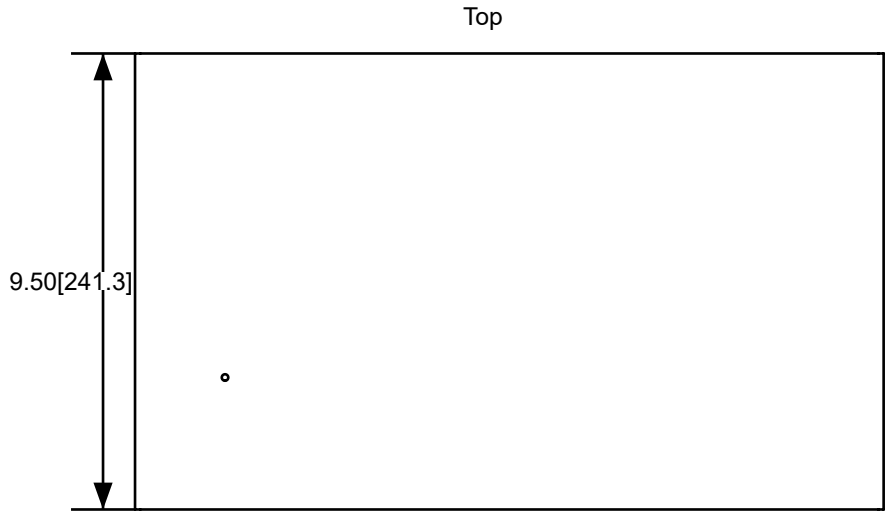
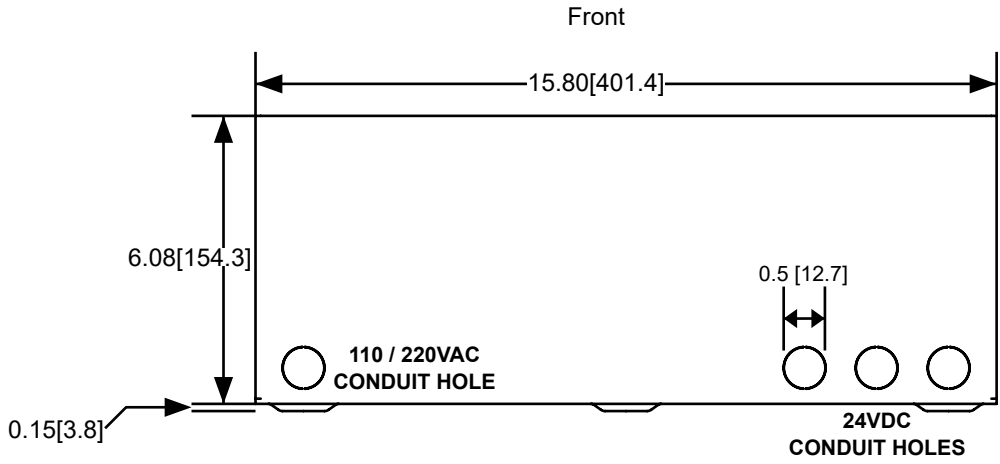
NOTE

When the power buffer option is not included, up to 3 lanes are supported per each remote enclosure. If power buffer option is included, only 2 lanes are supported per remote enclosure.



Power Supply Enclosure Dimensions

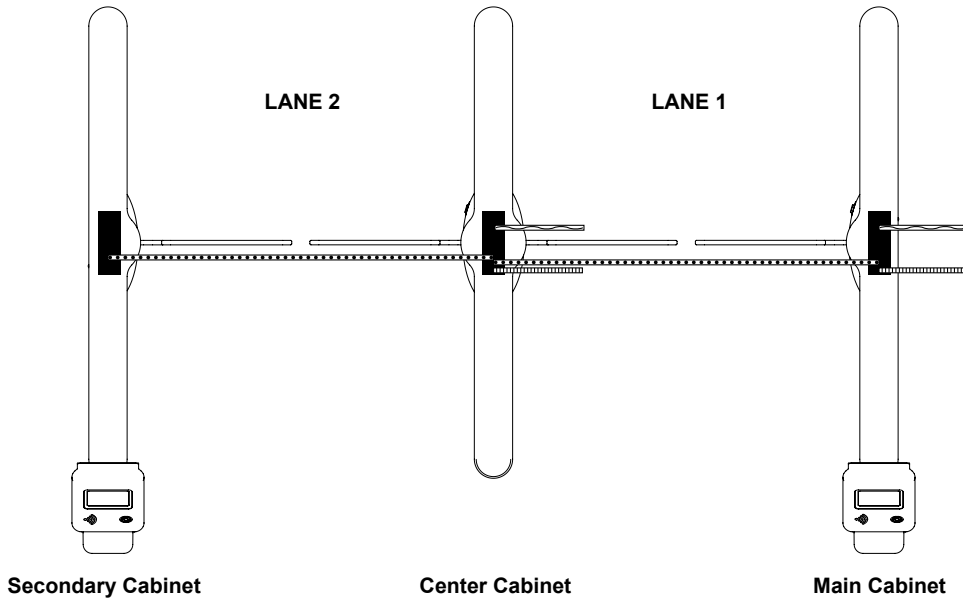
Fig. 49 Dimensions



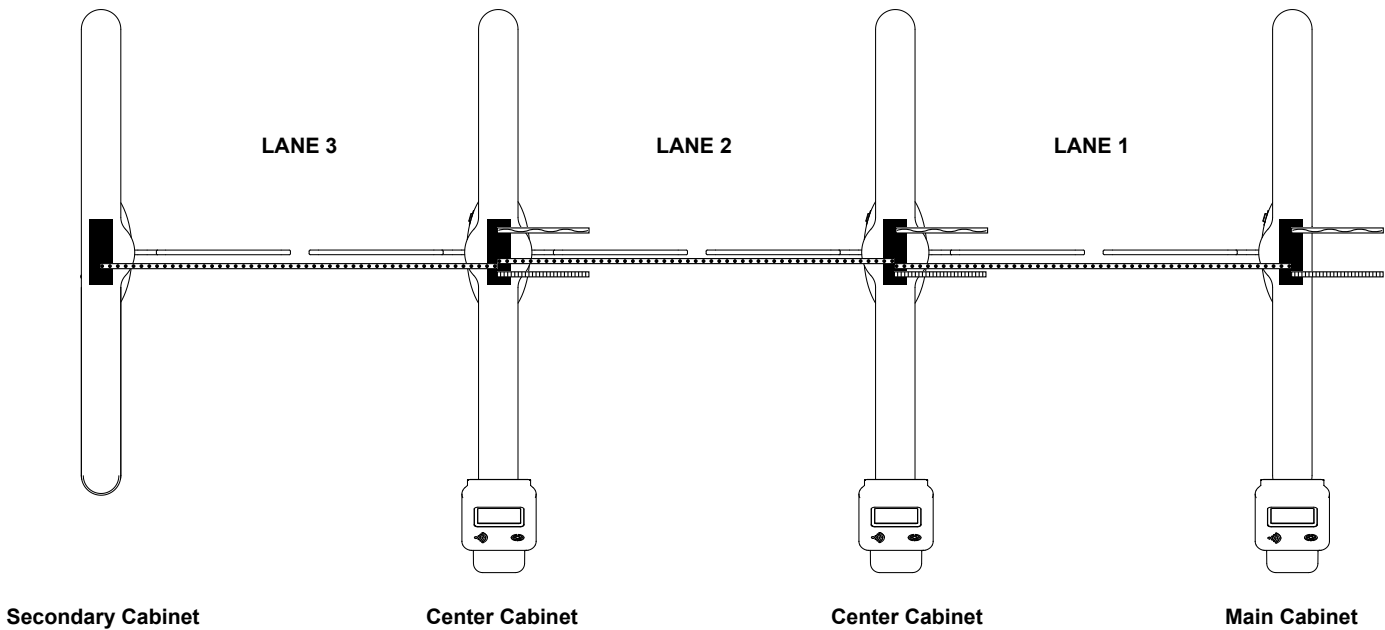


Appendix E - Multi-Lane Conduit Requirements

Two-Lane Configuration



Three-Lane Configuration



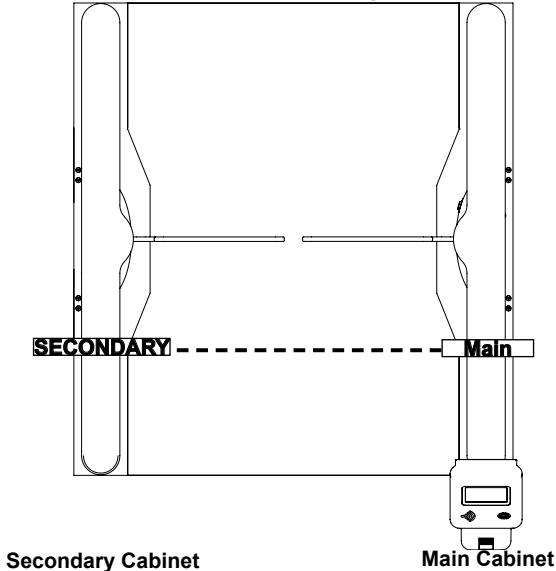
Symbology	Description	Conduit Size
	Primary Power**	3/4" (1/2")**
	Fire Control/ Emergency Override/ Ethernet	3/4"
	Crossover Cable	1"

****If the External DC Power Supply option was ordered, use 1/2" conduit to route 24VDC.**

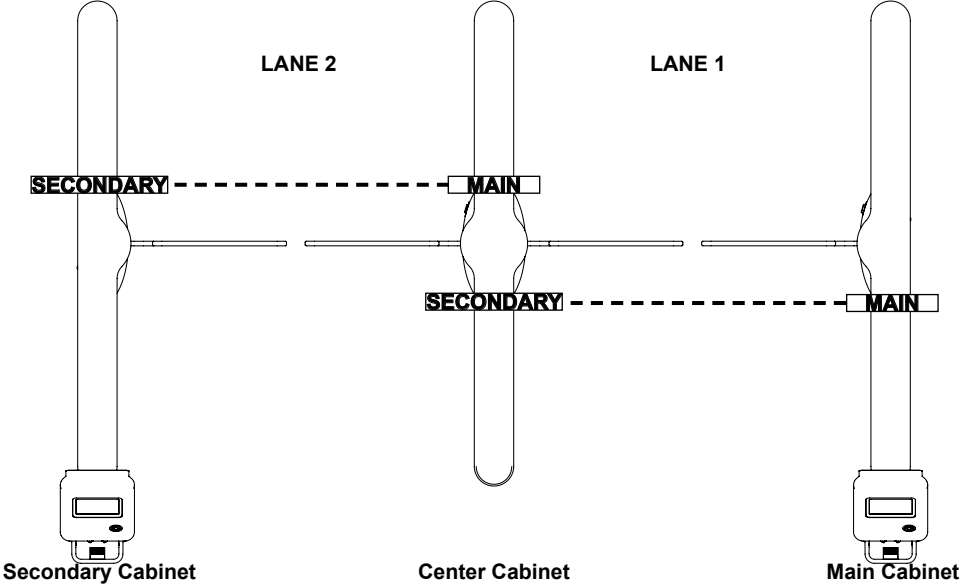


Appendix F - Crossover Cable Connection Diagrams

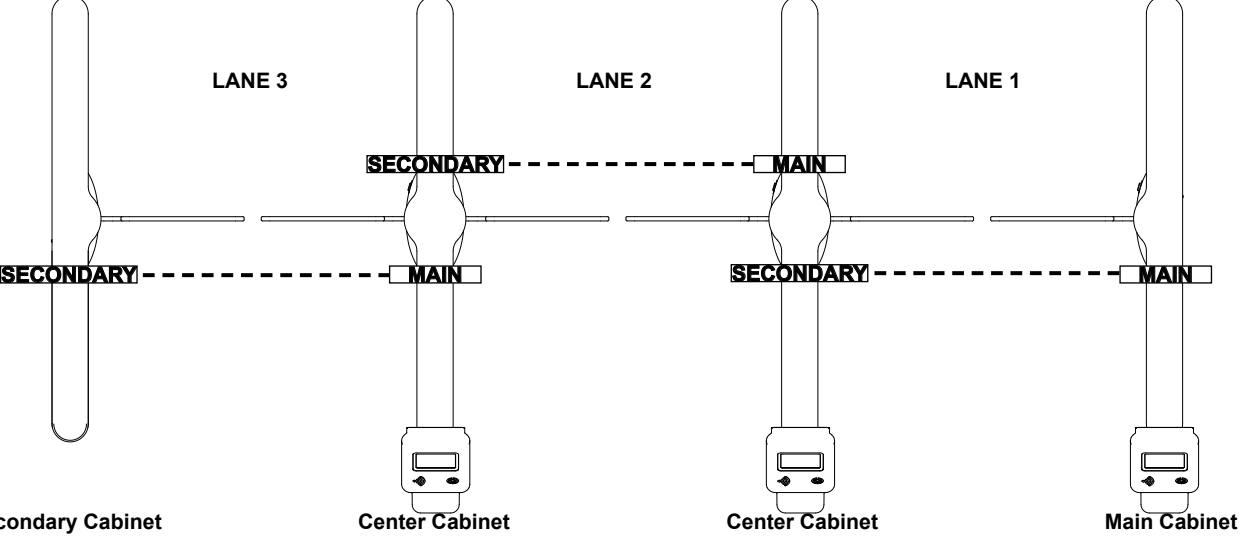
One-Lane Configuration



Two-Lane Configuration



Three-Lane Configuration





Revision History

Revision	Date	Author	Description
1.0	9/2/2020	D Bohannon	Original document
1.1	8/4/2021	D Bohannon	Updated conduit measurements.



Alvarado Manufacturing Company, Inc.

12660 Colony Street, Chino, CA 91710

Telephone: (909) 591-8431

Fax: (909) 628-1403

support@alvaradomfg.com

www.alvaradomfg.com