

# **STG 34 Series Security Turnstiles**

## **Installation and Operating Instructions**

**BURLE**

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## UNPACKING YOUR SECURITY TURNSTILE

\*Unless otherwise specified, your turnstile will have been shipped fully assembled. Please refer to the following steps when unpacking.

1. Check to ensure no damage has occurred in transit. If any damage is found, notify the carrier immediately. **Do not** proceed with unpacking.
2. Do not remove the turnstiles from pallet or wooden framework until instructed to do so.
3. The STG, ASTG and CATG turnstiles are furnished with foam heel protectors. The heel protectors are on the lowest arms of each spindle. These are a permanent part of the turnstile. **Do not remove.**
4. After unpacking and before proceeding with the installation, check the packing and material check list. Verify that all equipment and any accessories ordered have been supplied.

**Note:** Depending on the model type of turnstile, the anchor bolts and certain external accessories that may have been ordered will have been packed into the control head assembly of the turnstile and/or on the shipping pallet.

\*When shipped disassembled additional assembly instructions will accompany this manual.

## INSTALLATION

### DOs AND DON'Ts

**DO**..... Read all instructions thoroughly before proceeding with the installation.

**DO**..... Pay special attention to all referenced drawings when installing turnstile.

**DON'T**... Service the turnstile without turning off the power.

**DON'T**... Discard these instructions after installation.

**DON'T**... Remove or damage the heel protectors on the bottom arms of the spindle section.

### Caution

Improper installation WILL VOID all warranties on this product.

If you should have any questions or need more information, please contact our Technical Applications Department:


PHILIPS CSS, INC.  
Access Control Hardware  
7041 Orchard Street  
Dearborn, MI 48126  
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Technical Assistance 1-800-338-3692

## SITE PREPARATION

1. It is **extremely** important that the turnstile be mounted on a solid and level foundation to avoid shifting and unstable operation.

If the site where the turnstile is to be mounted is without any foundation, it will be necessary to pour a concrete pad.

Refer to 80-150 foundation drawing before pouring concrete. Be sure that pad is level and depth is below frost line, or as required by local conditions to ensure turnstile stability. **Do not pre-set anchors!**

 **Important: Pad sizes vary based on model type. Be sure to pour the concrete pad based on the foundation drawing for the specific model turnstile being installed.**


Allow concrete sufficient time to set-up before attempting to mount turnstile.

2. If the turnstile is to be mounted on an existing concrete surface, check to ensure the concrete is of sufficient depth and area to support the turnstile.

**Note:** The use of shims for leveling the turnstile on unlevel surfaces is acceptable. Shims must provide stable support to the vertical member of the turnstile that is being shimmed.

# INSTALLATION

The turnstile should be mounted as described and illustrated on attached drawing 80-155. Once positioned, check to ensure the unit is **plumb and level**.

 **Important:** Do not allow the spindle section to sway or otherwise move from perpendicular to the controller during installation.

## ELECTRICAL INFORMATION

### Control Panel

#### Function Inputs

**Open** - One terminal for entrance access control device.

**Close** - One terminal for exit access control device.

**Tamper** - One terminal for optional tamper switch located inside turnstile control box, to indicate when service panel is removed. The turnstile will not work when the service panel is removed. The power must be momentarily shut off to reset the controller and operate the turnstile. A jumper wire must be installed if this option is not used.

All function inputs require a dry set of normally open contacts, wired to the desired function and one of the six common terminals.

#### Indication Inputs

**Rotation** - One terminal for rotation indication switch. De-activates the maximum run timer once rotation of the arms moves the self-center plunger far enough to trip the switch.

**Travel Limit (EI2)** - One terminal for a single limit switch. Which is tripped by the self-center plunger and indicates that the turnstile has completed a cycle. The controller will then relock the turnstile and wait for another valid access signal from either direction.

All indication inputs are pre-wired at the factory.

#### Power Inputs

- 24 VAC
- 24 VAC RETURN
- COMMON/GROUND
- 12 VAC
- 12 VAC RETURN

All power inputs are pre-wired at the factory.

#### Outputs

**Alarm Relay** - A S.P.D.T. Relay to give remote alarm capability.

**Exit Relay, Aux.** - A S.P.D.T. Relay for add-on devices such as red and green traffic control lights or remote direction indication.

**Entrance Relay, Aux.** - A S.P.D.T. Relay for add-on devices such as red and green traffic control lights or remote direction indication.

**OD** - Open driver for entrance solenoid 24VDC.

**CD** - Close driver for exit solenoid 24VDC.

The OD and CD outputs are pre-wired at the factory.

#### Timers

**Maximum Run Timer (1 - 64 sec.)** - Set maximum allowed time needed, after a valid access input, for an individual to enter and start rotating the turnstile arms. If the rotation does not begin during this time, the turnstile will automatically re-lock. This prevents an unsecure condition to exist for a long period of time.

**Alarm Timer (1 - 20 sec.)** - Set maximum amount of time needed for an individual to completely walk through and exit the turnstile, allowing the arms to set in the home position. If the arms of the turnstile do not set in the home position within this specified time, the alarm relay will start pulsing. The turnstile will continue to allow normal operation while in this alarm mode. The power to the controller must be interrupted momentarily to reset the alarm condition.

Both timers are pre-set at the factory to meet most applications. However, you may have to re-adjust the timers to meet your particular application.

#### Jumper Wire Selections

**W104 and W105 (fail-safe/fail-lock)** - The combination of these cut or uncut wires determines the fail-safe or fail-lock mode of both the entrance and exit. These wires are configured at the factory to match your specific order. Do **not** cut any other wires.

Cutting both jumper wires will set both entrance and exit in the fail-safe mode.

Cutting jumper wire W104 only will set the entrance as fail-safe and the exit as fail-lock.

Cutting jumper wire w105 only will set the entrance as fail-lock and the exit as fail-safe.

Not cutting jumper wires w104 and w105 will set both sides as fail-lock.

#### Test Buttons

- OPEN, (ENTRANCE), INPUT.
- CLOSE, (EXIT), INPUT.
- E12, (LIMIT SWITCH), INPUT.
- TAMPER INPUT.
- ROTATION INPUT.

These test buttons are parallel to the function and indication inputs for quick and easy electrical troubleshooting of the turnstile electrical system.

## Monitor Lights

- ALL CONTROL INPUTS (RED)
- ALL RELAY OUTPUTS (RED)
- ALL TIMERS (RED)
- WARNING BEEPER TAMPER (RED)
- POWER ON (GREEN)

These lights allow for easy monitoring of the control devices, control board, and turnstile system.

## METHOD OF OPERATION

Receipt of a momentary dry contact closure at either the entrance (open) or exit (close) input of the controller, will activate the appropriate solenoid which in turn will disengage a locking bar from a ratchet and allow the turnstile arms to be manually pushed 120 degrees, in the selected direction of rotation, before automatic re-lock of the turnstile will occur.

A maximum run timer is activated simultaneously with the receipt of the momentary dry contact closure at the entrance or exit inputs. If rotation of the turnstile arms does not begin within the time set on the maximum run timer, the turnstile will automatically re-lock. If at any time during the set time of the maximum timer the turnstile arms do begin to rotate, the maximum run timer will shut off and allow the full 120 degree rotation to occur.

As the arms begin to rotate and the maximum run timer shuts off, the alarm timer becomes activated and begins its set time cycle. If the arms of the turnstile are not rotated to the next home position, full 120 degrees, within the set time of the alarm timer, the controller alarm circuit is activated. Activation of the alarm circuit will not interfere with the normal operation of the turnstile and controller. A relay output (alarm) on the controller will continually pulse for as long as the alarm circuit is activated. A remote signaling device, (supplied by others), can be wired to the alarm relay contacts for alerting security or maintenance of the alarm condition at the turnstile. To reset the alarm circuit the power to the controller must be interrupted momentarily. A switch reset could be wired to a remote location.

When the arms complete approximately 90 degrees of the 120 degree rotation, and before either the maximum run or alarm timer zero out, a limit switch is tripped causing the solenoid to deactivate, the locking bar to re-engage the ratchet and the turnstile to lock in the home position at 120 degrees rotation.

Should a valid access signal be received from both the entrance (open) and exit (close) inputs simultaneously, the controller will release the exit side first and store the input signal received from the entrance side. Upon completion of the exit rotation the controller will automatically release the entrance rotation for one cycle. Only one signal will be stored by the controller.

The controller is equipped with a tamper circuit. When the tamper switch option is selected the switch will be

activated by removal of the turnstile mechanism access panel. Activation of the tamper circuit will disable the controller and the alarm relay will pulse. The access panel must be installed then disconnect power momentarily from the turnstile to reset the tamper circuit. To service and troubleshoot the turnstile you must bypass the tamper switch by installing a jumper wire from the tamper input to one of the common inputs on the control board. Be sure to remove the jumper after servicing if you have the tamper switch option.

A circuit for the optional red and/or green indicating lights is provided. In the standard method of operation the red light is turned on when the turnstile is locked. If a authorized access input signal is received, the red light for that side will go out and the green light will turn on. Upon completion of 120 degree rotation the turnstile will relock, the green light will go out and the red light will turn on again.

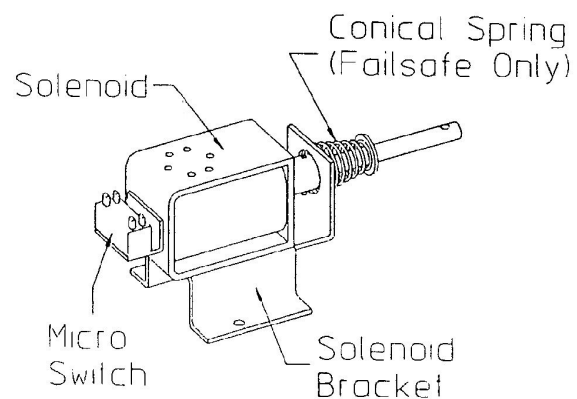
## MAINTENANCE

### Mechanical

Required maintenance procedures are as follows:

1. Check for loosened screws, nuts, bolts, etc.

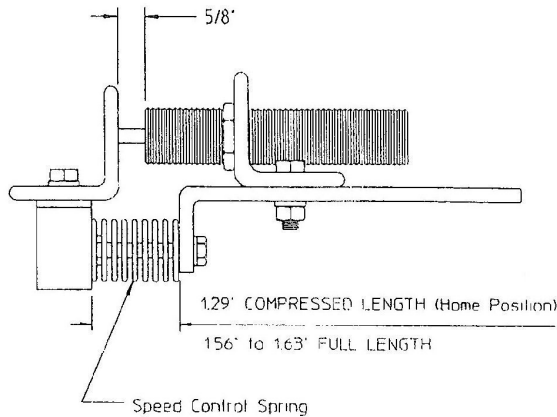
**Note:** Pay special attention to the solenoid mounting bracket (85-219). Normal vibration from the energizing and de-energizing of the solenoid may loosen the screw securing these brackets which may result in **faulty** operation. Make sure these parts are securely tightened and the solenoid is properly aligned. A quality grade thread lock is required on all screws associated with the solenoid as shown in **Figure 1**.



**Figure 1: Solenoid Assembly**

2. If the turnstile fails to self-center and no binding of the plunger is visible, the speed control cylinder may need adjustment as shown in **Figure 2**.

The entire cylinder can be adjusted in and out of the speed control bracket. If adjustment is required through the speed control bracket, it is imperative that a 1/8 in stroke **remain available** on the cylinder plunger when it is at maximum stroke as shown in **Figure 2**.



**Figure 2: Speed Control Adjustments**

3. Check all bushings, bearings, and pivot points for proper lubrication. Although pivot points have been pre-lubricated at the factory and all bushings are permanently lubricated, a few drops of good quality lubricating oil (3 in 1 oil) should be applied during the regular scheduled maintenance.

**Note:** Although a grease fitting is provided on the flange bearings, the bearings are sealed against dust and water and will seldom if ever require grease. Once a year greasing should more than satisfy most installations.

4. Should any loose screws be discovered during maintenance, it is recommended that a drop of thread lock be applied before re-tightening.

## ELECTRICAL SYSTEMS TROUBLESHOOTING

A complete electrical system consist of the access control device, controller, limit, rotation and tamper switches, solenoids and power supply. You can monitor the sequence of operations from the access control device to the solenoid through the lights on the control inputs, timers and output drivers.

### Failure to operate

**Power** - The green light in the middle of the controller should be on if there is power to the board. If the green light is not on, check fuse X102 on the controller. If necessary, replace fuse with a 2 amp @ 250 VAC 5mm x 20mm fuse. If fuse is good and the light is not on,

check power at terminals L1 and L2 on the power strip by the transformer for 115 VAC. If there is power at L1 and L2, check for 12 VAC and 24 VAC at the power terminals on the controller with a volt/ohm meter. No power to either or both power terminals means either the wire connections are bad or the transformer must be replaced.

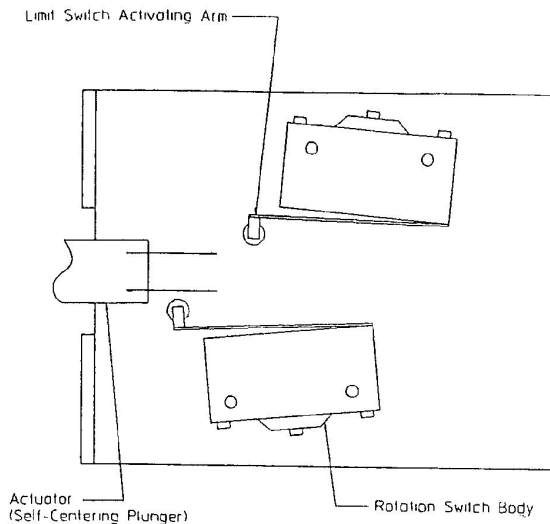
**Tamper Light Flashing** - If the tamper light in the upper left corner of the controller is flashing, then make sure a jumper wire is installed from the tamper input to one of the common inputs. If you have the tamper switch option then make sure the two wires from the switch are connected to those inputs. If you have the jumper connected and the tamper light is still flashing then replace the control board. If you have the tamper switch option then remove power from the control board and hold down the white tamper test button and reconnect power. If the tamper light is still flashing then replace the control board. If the light is not flashing then either the tamper switch is bad or there is a bad wire connection from the switch to the controller. Replace tamper switch or repair wire.

**Access Control Device** - Test buttons and lights are located on the control board by the input terminals for the access control devices. If the light for the access control device is on, disconnect one of the two wires from that device and press the test button on the controller for that device. If the turnstile works correctly then either you have a short between the two wires from the device or the device is staying energized. Check the access control system and wiring. If the light is not on and the turnstile works correctly when you push the test button then the access control device is not working or there is a bad wire connection. Check the access control device and wiring. If the turnstile doesn't work and you do not get the correct sequence of lights on the control board, the control board must be replaced.

Check the limit and rotation switches for proper activation by the self-centering plunger. The plunger should lightly touch both switches during one-third cycle of the turnstile (120 degree spindle rotation). It should not cause the switch activating arm to strike the switch body. In addition, an audible "click" should be heard when the plunger engages a switch arm.

**Limit Switch** - If this switch malfunctions it may be possible for two people to go through the turnstile in the same direction with only one valid access input before the maximum run timer relocks the turnstile. Replace the switch.

**Rotation Indication Switch** - If this switch malfunction you will get a false alarm indication on every cycle indicating the turnstile has not set in the home position. Replace this switch. The power to the controller must be interrupted momentarily to reset alarm condition after switch is replaced.



**Figure 3: Limit and Rotation Switch Adjustment**

When checking to ensure that there is proper tripping action, rotate turnstile very slowly and listen closely for the "click" of the switch. The click indicates a tripping action has occurred, and the very slow rotation will allow you to see a "too heavy" trip and make an adjustment before possible damage to the switch occurs.

**Timers** - If the timer lights do not turn on when the turnstile is activated or they do not keep consistent time on every cycle, replace the control board.

**Output Drivers and Aux. Relays** - If the lights on the exit or entrance Aux. Relays do not turn off, in a fail-safe mode, or on, in fail-lock mode, after a valid input signal, the control board must be replaced.

**Solenoids** - If either the entrance or exit solenoid does not energize after the appropriate control output, the solenoid is bad or there is a bad wire connection. Check wire connections or replace solenoid. If neither solenoid energizes after a control input, check the in line on the red wire. If fuse is blown, replace fuse with a 1.6 amp @ 250 VAC 5mm x 20mm fuse. Make sure a jumper wire is installed between the two stop terminals on the control board.

## MULTI-CONTROLLER SYSTEM CHECK

### Before Applying Power

Check that all wire connections to the Multi-Controller are secure.

Verify that all wires connected by a twist-on wire connector are secure.

Check that the grounding screw is tightened.

Rotate the R121 MAX. RUN and the R123 ALARM TIMERS clockwise until they stop. All other timers should be turned down in the counter-clockwise direction.

Verify the following actions and results.

**ACTION:**

Turn power on.

**RESULT:**

D102 TAMPER LED, D110 M-SAFETY LED and D115 POWER ON (green) LED should all be on. In addition, D130/D131 ENTRANCE/EXIT Relay LED should be off if fail-secure or on if fail-safe. If equipped, all the external red "no-go" lights should be on.

**ACTION:**

Send a "dry momentary contact closure" via the external access device.

**RESULT:**

D106 OPEN or D107 CLOSE LED should light momentarily, the locking bar should disengage ratchet. The corresponding D130 ENTRANCE or D131 EXIT Relay LED should turn on (fail-secure) or off (fail-safe), and the D121 MAX. RUN TIMER LED should light and stay on. If equipped, the green "go" light should turn on and the red "no-go" light should turn off for that direction.

**ACTION:**

Rotate the spindle until the rotation switch is "tripped".

**RESULT:**

The D101 ROTATION LED should light and stay on, the D121 MAX. RUN TIMER LED should turn off, the D123 ALARM TIMER LED should turn on, and the D130 ENTRANCE or D131 EXIT Relay LED and indicator lights should be unchanged.

**ACTION:**

Rotate the spindle until the limit switch is "tripped".

**RESULT:**

The D101 ROTATION LED should remain on, the D123 ALARM LED should remain on, the D112 EI2 LED should light and stay on, and the D130 ENTRANCE or D131 EXIT Relay LED should be unchanged. If equipped, all indicator lights should remain unchanged.

**ACTION:**

Rotate the spindle until the limit switch is deactivated.

**RESULT:**

The locking bar should engage the ratchet, the D130 ENTRANCE OR D131 EXIT LED should turn off (fail-secure) or on (fail-safe), the D101 ROTATION LED should remain on, the D123 ALARM TIMER LED should remain on, the D112 EI2 LED should turn off, the D121 MAX. RUN TIMER LED should be off. If equipped, the green "go" light should be off and the red "no-go" light should be on for that direction.

**ACTION:**  
 Rotate the spindle until rotation switch is deactivated.

**RESULT:**  
 The D101 ROTATION LED and D123 ALARM TIMER LED should turn off.

85-214 Pivot Arm Spring  
 85-215 Linkage Pin  
 85-225 Solenoid  
 85-270 Flange Bearing  
 85-285 Self-Centering Mechanism  
 Spring

## Test The Timers

Remove power from the turnstile.

Rotate the R121 MAX. RUN and the R123 ALARM TIMERS counter clockwise until they are in the 9:00 AM and 3:00 PM position respectively.

Turn power on.

**ACTION:**  
 Send a "dry momentary contact closure" via the external access device. Do not rotate the arms.

**RESULT:**  
 In approximately 10 seconds, the D121 MAX. RUN TIMER LED should shut off and the turnstile should time out and relock.

**ACTION:**  
 Send a "dry momentary contact closure" via the external access device and rotate the spindle until only the rotation switch is "tripped" and hold it there.

**RESULT:**  
 In approximately 20 seconds, the D132 ALARM LED and K132 OUTPUT RELAY will pulse on and off indefinitely until power is removed from turnstile.

## Wrap-up

Remove power from the turnstile for approximately 20 seconds to reset the Multi-Controller board.

If removed, install protective polycarbonate panel with the brass thumb screws.

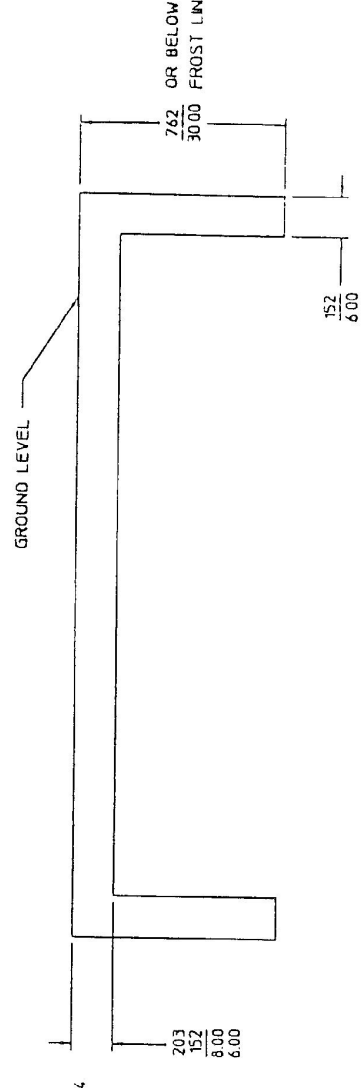
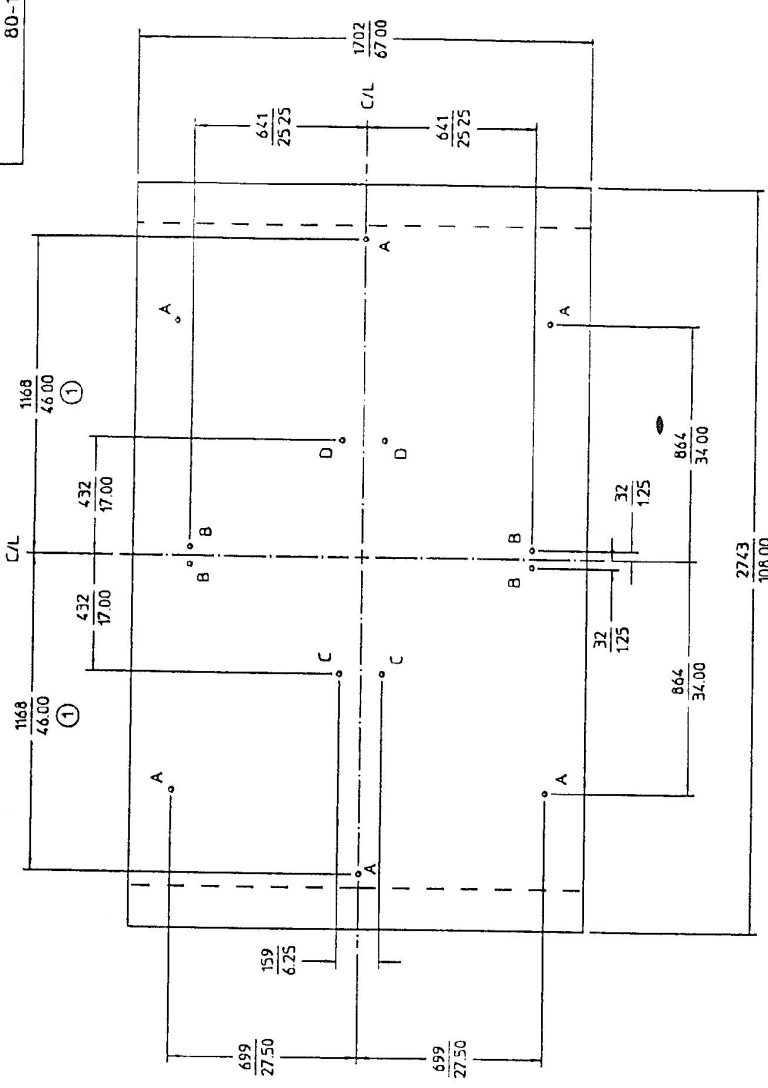
Remove any equipment on top of access panel.

Install access panel and tighten mounting screws.

## RECOMMENDED SPARE PARTS

21-113	Limit/Rotation Switch
53-523	Bridge Rectifier
53-791	Transformer
85-156	Speed Control Cylinder
85-213	Solenoid Plunger Spring (Fail-Safe)

- HOLES (FOR 3/8" WEDGE-TYPE ANCHOR BOLTS)
- A - CAGE (6)
  - B - BARRIER (4)
  - C - SPINDLE BEARING ASSEMBLY "A" (2)
  - D - SPINDLE BEARING ASSEMBLY "B" (2)



RECOMMENDED INSTALLATION FOR BURLIE SECURITY TURNSTILE MODEL STG 34

1. Allow 97" between supports.
2. Pour concrete foundation using dimensions shown above.
3. DO NOT PRE-SET ANCHORS IN CONCRETE BEFORE TURNSTILE ARRIVES.  
After arrival, slide the assembled turnstile off the shipping pallet and onto the concrete foundation. (Note: refer to installation instructions for how to remove turnstile from pallet.) Center the turnstile on foundation square and level each section. Drill the required anchor bolt holes. Wedge-Type anchors are provided.
4. To prevent swaying and otherwise unstable operating conditions, attach each side of the turnstile, near the top, to the fence, wall, etc. HARDWARE IS NOT PROVIDED BY THE MANUFACTURER

NO.	DESCRIPTION	DATE	BY
1	ISSUED FOR PRINT	10/20/75	

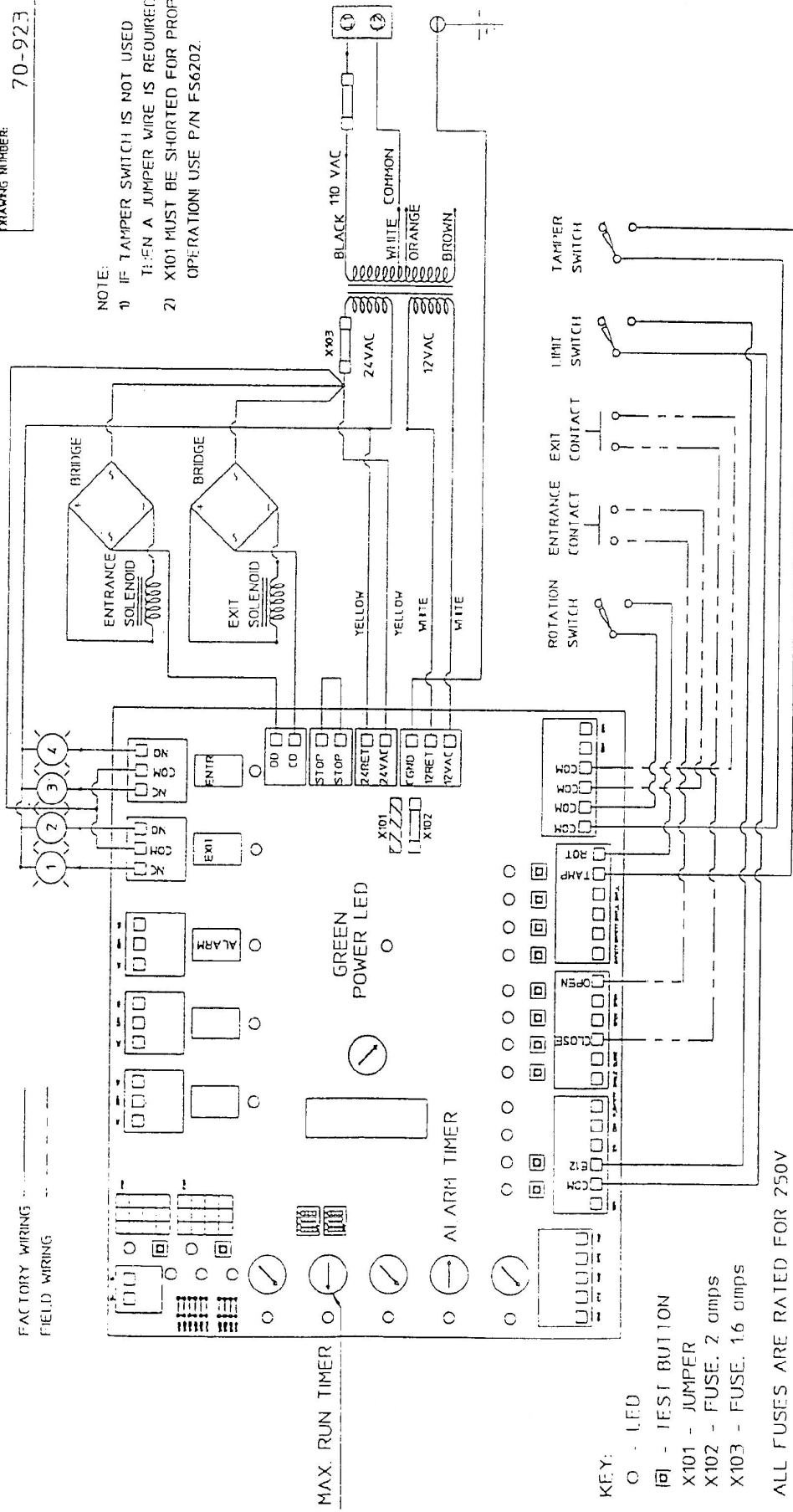
UNITS: MILLIMETERS  
INCHES

DESIGNED BY: [Signature]  
CHECKED BY: [Signature]  
SCALE: 1" = 12"

PROJECT: BURLIE ACCESS CONTROL HARDWARE SYSTEM  
7011 DELWOOD, DUNDAS, ONTARIO, CANADA  
FOUNDATION - STG 34

80-150 1 OF 1

NOTE:  
 1) IF TAMPER SWITCH IS NOT USED  
 THEN A JUMPER WIRE IS REQUIRED  
 2) X101 MUST BE SHORTED FOR PROPER  
 OPERATION! USE P/N FS6202.



FACTORY WIRING  
 FIELD WIRING

MAX. RUN TIMER  
 ALARM  
 GREEN POWER LED  
 ALARM TIMER

KEY:  
 ○ - LED  
 ◻ - TEST BUTTON  
 X101 - JUMPER  
 X102 - FUSE. 2 amps  
 X103 - FUSE. 1.6 amps

ALL FUSES ARE RATED FOR 250V

EXIT	ENTR	1	2	3	4
F SAFE	F SECURE	GREEN	RED	RED	GREEN
F SAFE	F SAFE	RED	GREEN	GREEN	RED
F SAFE	F SAFE	GREEN	RED	GREEN	RED
F SECURE	F SECURE	RED	GREEN	RED	GREEN

REVISIONS

REV	DATE	BY	DESCRIPTION
1	06/27/94	JAK	REPOSITIONED SECONDARY FUSE AND SHORTED X101
2	07/27/94	JAK	CHANGED FACTORY PRE-SET LOCATION OF THERMS
3	10/28/95	EDD	ADDED KEY AND SOME LABELS

ALL DIMENSIONS ARE IN INCHES UNLESS SPECIFIED	
TOLERANCE UNLESS SPECIFIED	
0.0	± 0.060
0.00	± 0.030
0.000	± 0.015
0.0000	± 0.005
ANGULAR	± 0.5°

DRAWN BY/DATE: JAK 06/26/94  
 CHECKED BY/DATE: JAK 06/27/94

**BURLE**  
 ACCESS CONTROL HARDWARE DIVISION  
 7041 ORCHARD DEARBORN, MI 48128

DRAWING TITLE:  
 MULTI-CONTROLLER CONNECTIONS - ST 37234 - 110VAC

SIZE: MODEL: B ST 37234  
 DRAWING NUMBER: 70-923  
 SCALE: 1:2  
 SHEET: 1 OF 1

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