



Access Control Solutions

## UL 325 & ASTM F2200

What you need to know...

### UL August 2018 Updates



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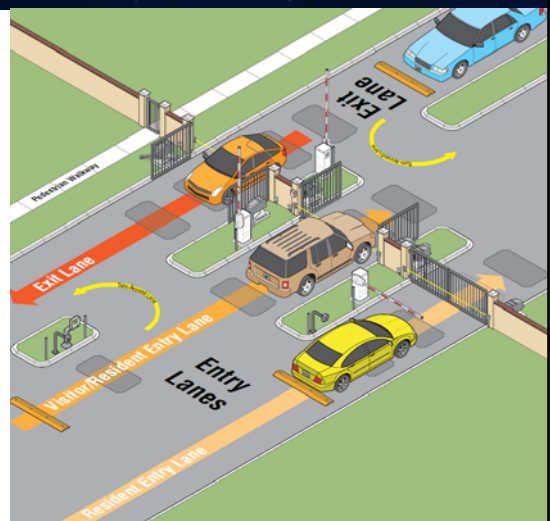


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## UL 325 & ASTM F2200

When installing an Automated Gate system it should comply with the UL 325 and ASTM F2200 Standards:

- ✓ Physical construction, design and installation of the Gate.
- ✓ Entrapment Protection requirements.



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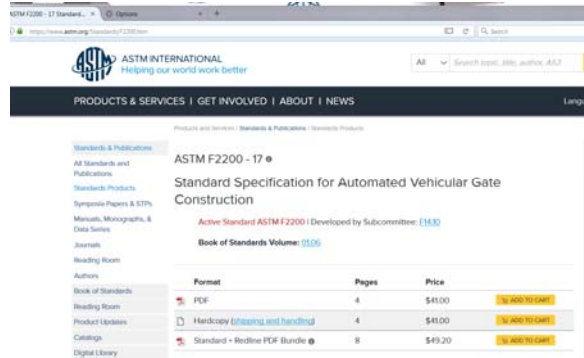


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**UL 325 & ASTM F2200**

## Purchase the ASTM F2200 Standard:

- ✓ This has a General Gates section
- ✓ Plus specific requirements for
  - ✓ Slide
  - ✓ Swing
  - ✓ Overhead Lift
  - ✓ Vertical Pivot



- ✓ <https://www.astm.org/Standards/F2200.htm>



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**UL 325 & ASTM F2200**

## UL325 – August 2018, update to UL 325

- ✓ The UL 325 Standard has been updated. This will go into effect August 1, 2018.
- ✓ Gates must have two independent forms of entrapment protection for each direction of travel. (Inherent + additional device)
- ✓ Exception would be Swing gate with no entrapment in the OPEN direction. This does not require 2<sup>nd</sup> Device in the OPENING direction of travel.

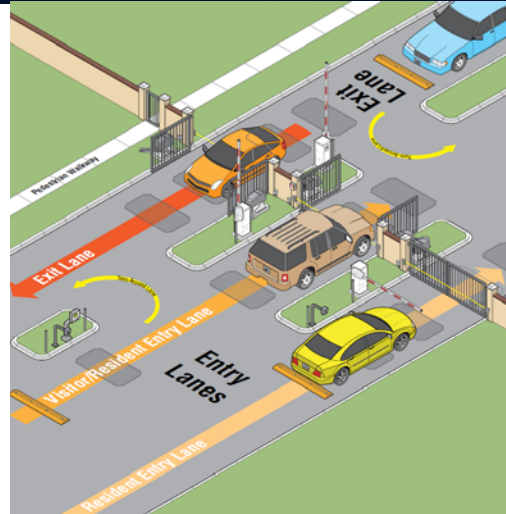


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### UL325 – Type A Device:

- ✓ “Inherent Entrapment Device”, which is the reverse sensitivity or Pulse Counter in the Operator (Type A Device).
- ✓ DoorKing Operators have a Type A device active in both directions of travel. This counts as one of the UL required devices.
- ✓ This must be tested and adjusted every time you visit the jobsite.

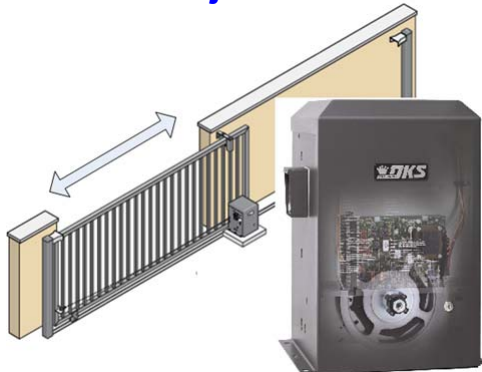


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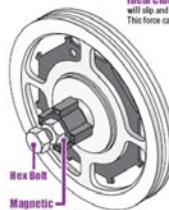
## Inherent Entrapment Device

How to Adjust: 9100 9150



### 3.4 Clutch Adjustment

**Ideal Clutch Adjustment:** The operator will cycle the gate without the clutch slipping. The clutch will slip and the gate will reverse ONLY after striking an obstruction with no more than 75 Lbs of force. This force can be measured with a gate scale, DoorKing P/N 2600-025.



Hex Bolt  
Magnetic Spring Assembly  
Hex nut is connected to black plastic magnet hold

#### To adjust clutch:

- 1 Make sure power to operator is OFF when adjusting clutch.
- 2 Hold large pulley to loosen the hex bolt counter clockwise.
- 3 Magnetic spring assembly can now be loosened (counter clockwise) or tightened (clockwise) to adjust the clutch.
- 4 Tighten the hex bolt to lock assembly after adjustment.

**Note:** After power has been turned back on, the first open command will automatically run the “multiple gate cycle” to locate and remember the open and close gate positions (See section 3.3 on previous page).

### 3.5 Inherent Reverse Sensor Adjustment

- 1 Press the Key Switch button to cycle the gate. **Key Switch**
- 2 While gate is cycling, slowly rotate reverse sensor clockwise until the gate reverses direction. Rotate reverse sensor back counter-clockwise approximately 1/8 turn.
- 3 Cycle the gate a few times to be sure that it cycles completely.



#### Reverse Sensitivity

**Note:** Each operator must be individually adjusted if dual operators have been installed.



**Important Note:** 2 magnetic sensors located on the bottom of the circuit board sense when the magnetic spring assembly is slipping during operation. Keep all high voltage wires away from the 2 sensors to avoid any electrical interference between the sensors and magnets.



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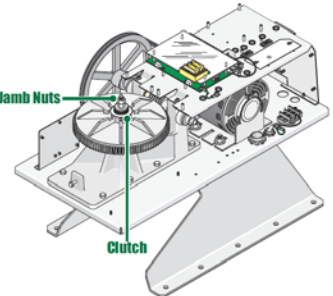
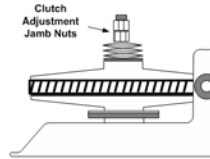
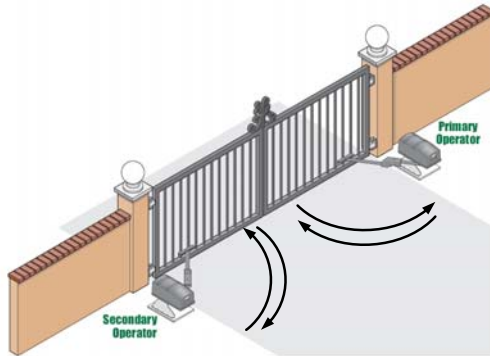
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## Inherent Entrapment Device

### How to Adjust: 6100 6300

### 3.5 Clutch Adjustment

1. Be sure AC power switch is turned OFF whenever adjustments to the clutch are being made. Loosen the upper jamb nut to "un-lock" the lower jamb nut. Loosen the lower jamb nut.
2. Manually move the gate so that it is positioned approximately half way open.
3. Tighten the lower jamb nut finger tight then tighten it ONE turn with a wrench. Re-tighten the upper jamb nut.
4. Turn AC power switch ON and momentarily jump across terminals 11 and 20. When the gate begins to open, determine if the clutch is slipping. If the clutch is slipping, turn AC power OFF and tighten the lower jamb nut one more turn. This process may have to be repeated several times to get the clutch adjusted correctly. Always start the gate from the half open position when adjusting the clutch.



**Clutch Note:** The ideal clutch adjustment will allow the operator to move the gate through its open and close travel cycle without slipping, but will slip upon contact with an obstruction with no more than 40 Lbs of force. This force can be measured with a gate scale, DoorKing P/N 2600-225.

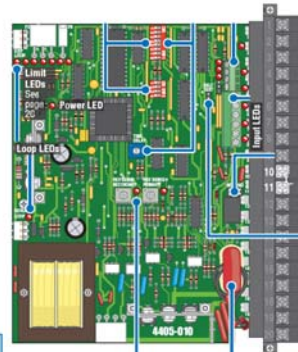
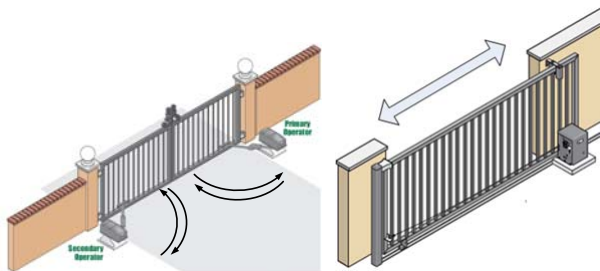


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## Inherent Entrapment Device

### How to Adjust: Gearbox Op's



### Inherent Reverse Sensors

Adjust reversing sensitivity for the open AND close direction of the PRIMARY (single) and SECONDARY (dual) operators. See page 21.



### Primary Current Sensor

Uses a sensing coil with a given number of wire turns through it to monitor the current flow of the primary operator motor.

Factory Set:  
1/2 HP Motor - 2 Turns  
1 HP Motor - 1 Turn

### Secondary Current Sensor

Uses a sensing coil with a given number of wire turns through it to monitor the current flow of the secondary gate operator motor.

Factory Set:  
1/2 HP Motor - 2 Turns  
1 HP Motor - 1 Turn  
See page 22.

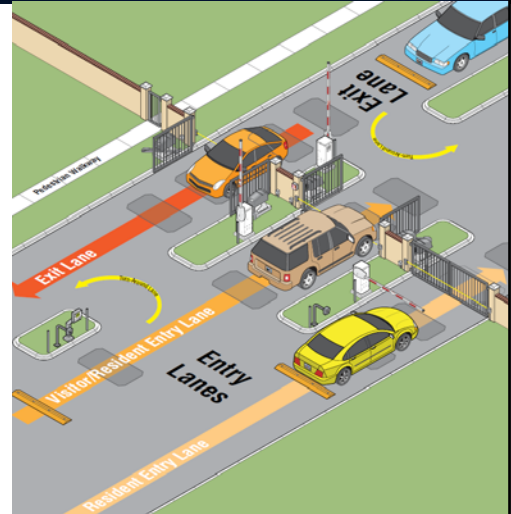


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## UL 325 & ASTM F2200

### UL325 – External Devices:

- ✓ To meet UL 325, you will need to add one or more additional external Entrapment Protection Devices.
- ✓ These typically will be Photo Beams (Type B1) and/or Gate Edges (Type B2)

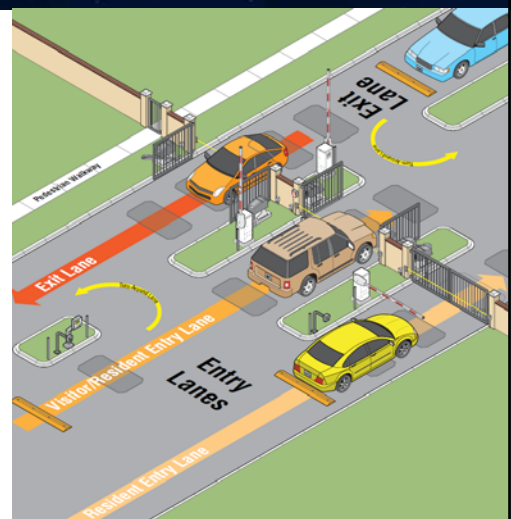


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## UL 325 & ASTM F2200

### UL325 - Paragraph 31.1.1 :

- ✓ Exception for barrier gates not coming within 16" of a fixed or rigid object.





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### UL325 - Paragraph 32.1.8

- ✓ A gate operator installed in accordance with the manufacturers instructions, utilizing external devices B1 or B2, shall monitor for the presence of the device at least once during each OPEN and CLOSE cycle.
- ✓ Upon monitoring, should device not be present or fail Operator shall function as per 32.1.23 (Type D Device), or shall only be able to be moved manually.

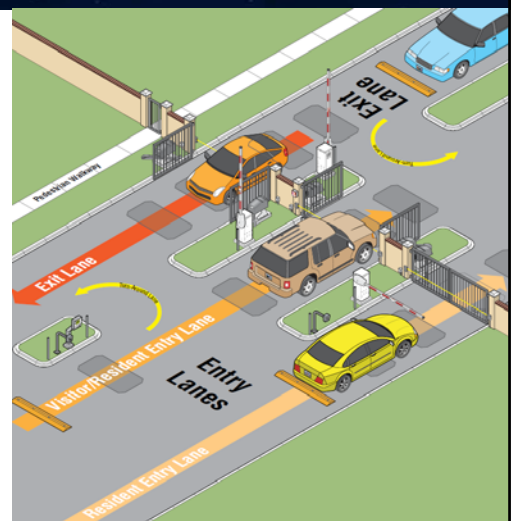


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### Where do I provide Entrapment Protection?

- ✓ OPEN Direction and Closing Direction
- ✓ Cover the entire travel of the gate.
- ✓ Remember ASTM and UL entrapment points
  - ✓ Reach Through on Slide Gates
  - ✓ Hinge position on swing gates

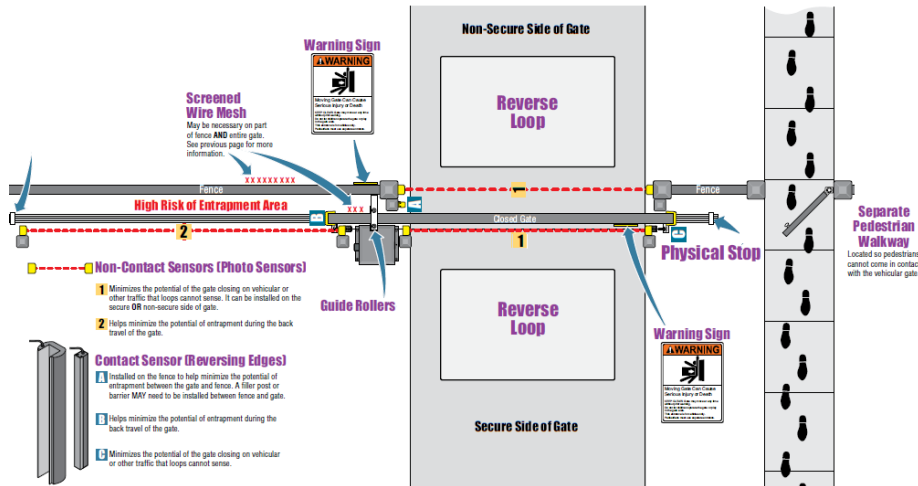




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## How do External Entrapment Protection Devices affect the gate system?

There are two different types of Entrapment Inputs on DK Operators:

- ✓ **Beam Inputs** - Monitored Beam inputs, provide for Reverse or STOP function depending upon the direction of travel
- ✓ **Edge Inputs** - Monitored EDGE inputs provide Reversing action.

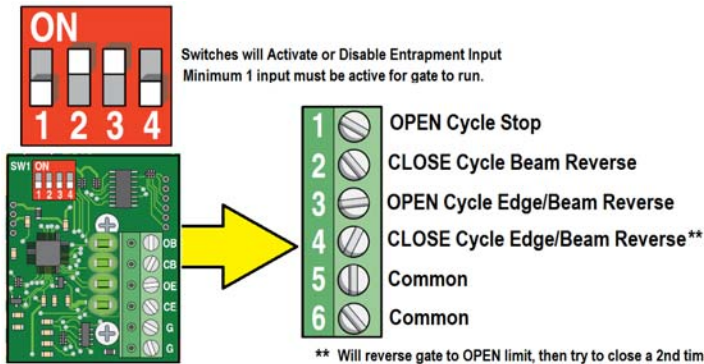


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## Where to connect monitored devices:

Some Operator Models may have only 1 of these inputs.



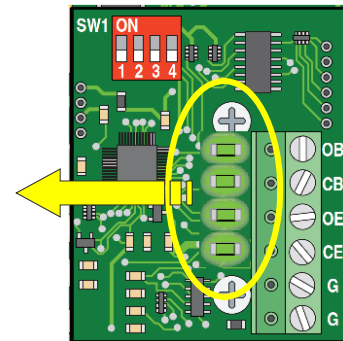
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## Monitored Inputs:

LED will indicate condition of Monitored Device:

- ✓ LED Off
  - ✓ Normal Operation.  
Entrapment Device is connected properly.







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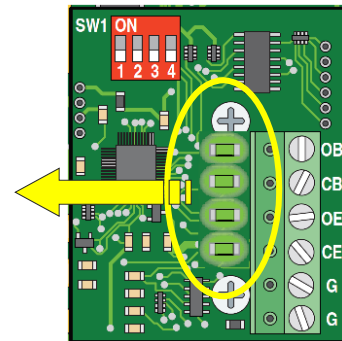
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## Monitored Inputs:

LED will indicate condition of Monitored Device:

### ✓ LED ON

- ✓ Normal Operation. Entrapment Device is providing an Output to the Gate Operator. Device is sensing an obstruction.



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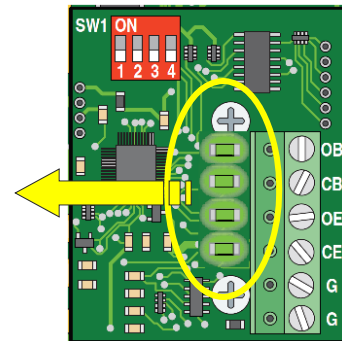
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## Monitored Inputs:

LED will indicate condition of Monitored Device:

### ✓ LED Flashing

- ✓ Fault in System. Device is not wired correctly, or Not correct type of Device. Device not present.





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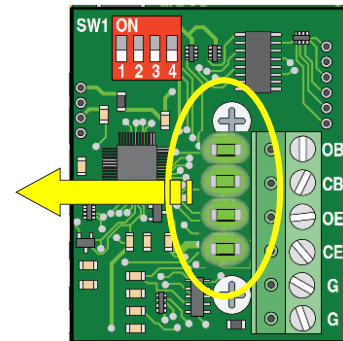
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### Monitored Inputs:

LED will indicate condition of Monitored Device:

✓ **ALL LED's Flashing**

- ✓ All Switches are turned OFF for Entrapment Inputs.
- ✓ Must have at least 1 Switch ON with Entrapment Device Connected.

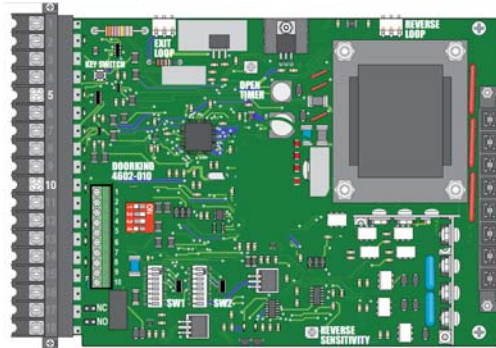


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### Some Entrapment Protection Examples:

4602-018 Board, 9100 & 9150 Slide Gates:



- |    |                                 |
|----|---------------------------------|
| 1  | OPEN Cycle Stop                 |
| 2  | Common                          |
| 3  | CLOSE Cycle Beam Reverse        |
| 4  | Common                          |
| 5  | 24VAC Beam Power                |
| 6  | Power Common                    |
| 7  | OPEN Cycle Edge/Beam Reverse    |
| 8  | Common                          |
| 9  | CLOSE Cycle Edge/Beam Reverse** |
| 10 | Common                          |
- 
- |    |   |   |   |
|----|---|---|---|
| ON |   |   |   |
| 1  | 2 | 3 | 4 |
- Must have a minimum of 1 switch turned ON for gate to run



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## How does this affect DoorKing control boards?

### UL 2016:

- ✓ In Jan 2016, all boards were updated to Rev AA, which run under the UL 2016 updated requirements. Current revisions may be Rev AC, AF, etc.
- ✓ Control Boards for pre-2016 have been re-numbered. Example, 4602-012, 4502-012, these are “Pre-2016 Control Boards.”



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## What About upcoming UL325 August 2018 change?

- ✓ Gates must have two independent forms of entrapment protection for each direction of travel.
- ✓ Exception would be Swing gate with no entrapment in the OPEN direction. This would not require 2<sup>nd</sup> Entrapment Device in this direction.



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## Changing Part Numbers for August 2018 UL 325

- ✓ All Operators and Control Boards will have new part numbers to help identify the different functions:
  - 6300-080 will be **6300-380**. Control board 4502-010 will be **4502-018**
  - 9150-080 will be **9150-380**. Control board 4602-010 will be **4602-018**
  - **4100-018 & 4405-018** board will automatically determine if they are installed in a Slide or Swing Gate Operator and set the UL requirements accordingly.



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## New Control Boards for 2018 UL 325

- ✓ All Control Boards that are xxxx-018 models will function in both the UL 2018 and UL 2016 model gate operators.
  - Xxxx-018 Control board, when plugged into the operator, will determine which version Gate Operator it is installed into, and will function under the correct UL Requirements.
  - Old xxxx-010 boards will not fit into, nor will they work with the UL 2018 machines.
- ✓ **4100-018 & 4405-018** board will automatically determine if they are installed in a Slide or Swing Gate Operator and set the UL requirements accordingly.

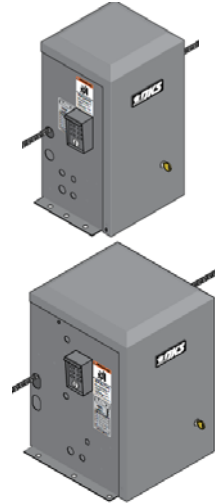


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### 9100 & 9150 Operators:

- ✓ **4602-010 Control Board is changing to 4602-018**
- ✓ **9100-080 changing to 9100-380**
- ✓ **9150-080 1hp changing to 9150-380**
- ✓ **9150-084 1/2 hp changing to 9150-384**
- ✓ **4602-018, works in UL 2016 & UL 2018 Operators**
  - ✓ In 9100 & 9150 UL 2016 will require 1 or more External Entrapment devices
  - ✓ **9100 & 9150 UL 2018 requires 1 or more External Entrapment Devices in each direction of travel.**

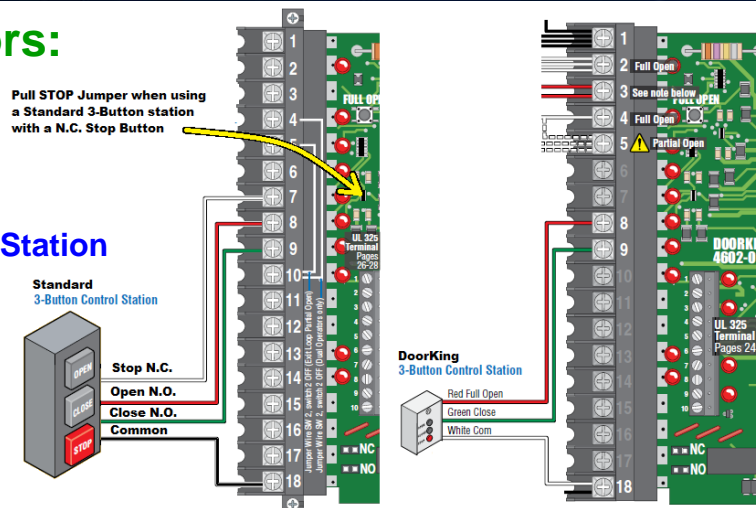


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### 9100 & 9150 Operators:

- ✓ **4602-018: Option for 3-Button Station with a N.C Stop Button**
- ✓ **DoorKing 3-wire 3-Button Station can still be used**
- ✓ **Or, use a 4-wire 3-Button Station with a N.C. Stop Button**





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## 9050 Operators:

- ✓ **4702-010 Control Board is changing to 4702-018**
- ✓ **9050-080 changing to 9050-380**
- ✓ **4702-018, works in UL 2016 & UL 2018 Operators**
  - ✓ In 9050 UL 2016 will require 1 or more External Entrapment devices
  - ✓ **9050 UL 2018 requires 1 or more External Entrapment Devices in each direction of travel.**

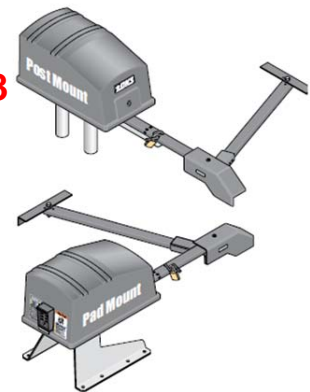


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## 6050 & 6100 Operators:

- ✓ **4502-010 Control Board is changing to 4502-018**
- ✓ **6050-080 changing to 6050-380**
- ✓ **6050-081 changing to 6050-381**
- ✓ **6100-080 changing to 6100-380**
- ✓ **6100-081 changing to 6100-381**
- ✓ **4502-018, works in UL 2016 & UL 2018 Operators**
  - ✓ UL 2016 will require 1 or more External Entrapment devices
  - ✓ **UL 2018 requires 1 or more in each direction of travel. Exception if Swing Gate does not have entrapment point in Open direction, does not need External device in Open.**



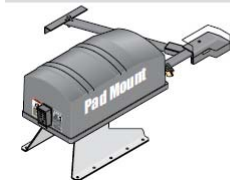
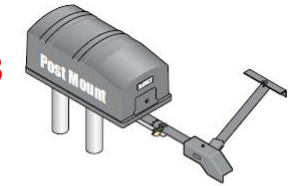


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### 6300 Operators:

- ✓ **4502-010 Control Board is changing to 4502-018**
- ✓ 6300-080 ½ hp changing to 6300-380
- ✓ 6300-081 ½ hp changing to 6300-381
- ✓ 6300-084 1hp changing to 6300-384
- ✓ 6300-085 1hp changing to 6300-385
- ✓ **4502-018, works in UL 2016 & UL 2018 Operators**
  - ✓ UL 2016 will require 1 or more External Entrapment devices
  - ✓ UL 2018 requires 1 or more in each direction of travel. Exception if Swing Gate does not have entrapment point in Open direction, does not need External device in Open.

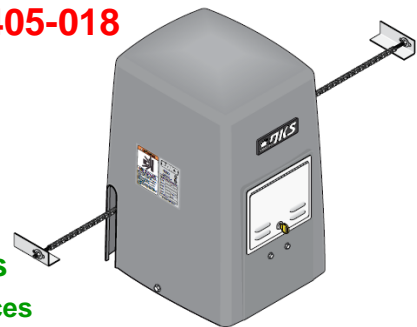


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### 9000 & 6500 Operators:

- ✓ **4405-010 Control Board is changing to 4405-018**
- ✓ 9000-080 ½ hp changing to 9000-380
- ✓ 9000-081 ½ hp changing to 9000-381
- ✓ 9000-085 1 hp changing to 9000-385
- ✓ 9000-086 1 hp changing to 9000-386
- ✓ **4405-018, works in UL 2016 & UL 2018 Operators**
  - ✓ UL 2016 requires 1 or more External Entrapment devices
  - ✓ UL 2018 requires 1 or more in each direction of travel. Also, 4405 Board will determine if this is a Slide or Swing Operator and allow Swing Gate Exception for External Entrapment Protection in Open Cycle.



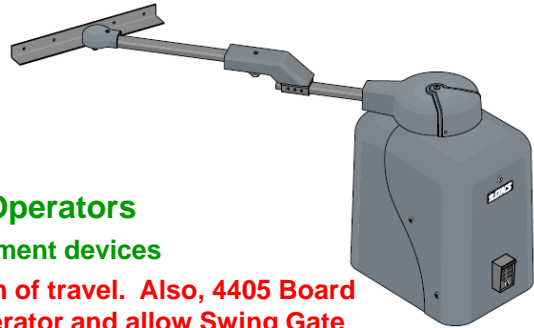


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## 9000 & 6500 Operators:

- ✓ **4405-010 Control Board is changing to 4405-018**
- ✓ **6500-080 ½ hp changing to 6500-380**
- ✓ **6500-081 ½ hp changing to 6500-381**
- ✓ **6500-085 1 hp changing to 6500-385**
- ✓ **6500-086 1 hp changing to 6500-386**
- ✓ **4405-018, works in UL 2016 & UL 2018 Operators**
  - ✓ **UL 2016 requires 1 or more External Entrapment devices**
  - ✓ **UL 2018 requires 1 or more in each direction of travel. Also, 4405 Board will determine if this is a Slide or Swing Operator and allow Swing Gate Exception for Entrapment Protection in Open Cycle**

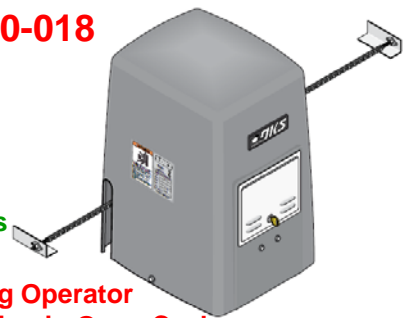


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## 9024 & 6524 Operators:

- ✓ **4100-010 Control Board is changing to 4100-018**
- ✓ **9024-080 changing to 9024-380**
- ✓ **9024-081 Solar Only changing to 9024-381**
- ✓ **4100-018, works in UL 2016 & UL 2018 Operators**
  - ✓ **UL 2016 requires 1 or more External Entrapment devices**
  - ✓ **UL 2018 requires 1 or more in each direction of travel. Also, 4100 Board will determine if this is a Slide or Swing Operator and allow Swing Gate Exception for Entrapment Protection in Open Cycle**





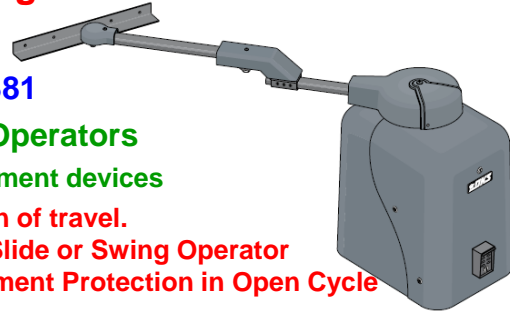


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### 9024 & 6524 Operators:

- ✓ **4100-010 Control Board is changing to 4100-018**
- ✓ **6524-080 changing to 6524-380**
- ✓ **6524-081 Solar Only changing to 6524-381**
- ✓ **4100-018, works in UL 2016 & UL 2018 Operators**
  - ✓ **UL 2016 requires 1 or more External Entrapment devices**
  - ✓ **UL 2018 requires 1 or more in each direction of travel.**  
Also, 4100 Board will determine if this is a Slide or Swing Operator and allow Swing Gate Exception for Entrapment Protection in Open Cycle

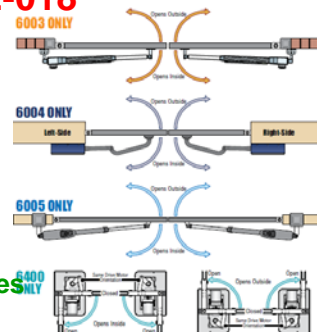


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### Low Voltage Operators:

- ✓ **4302-010 Control Board is changing to 4302-018**
- ✓ **6003-080 changing to 6003-380**
- ✓ **6004-080 changing to 6004-380**
- ✓ **6005-080 changing to 6005-380**
- ✓ **6400-080 changing to 6400-380**
- ✓ **4302-018, works in UL 2016 & UL 2018 Operators**
  - ✓ **UL 2016 will require 1 or more External Entrapment devices**
  - ✓ **UL 2018 requires 1 or more in each direction of travel.**  
Exception if Swing Gate does not have entrapment point in Open direction, does not need External device in Open.



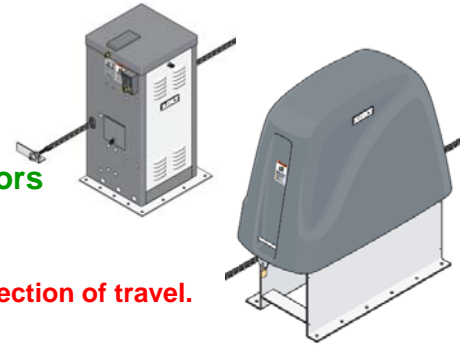


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### Maximum Security Operators:

- ✓ **4404-010 Control Board is changing to 4404-018**
- ✓ All 9200 Series changing to 92\_\_-38\_\_
- ✓ All 9500 Series changing to 95\_\_-38\_\_
- ✓ Example 9210-380 and 9500-380
- ✓ **4404-018, works in UL 2016 & UL 2018 Operators**
  - ✓ 9200 & 9500 UL 2016 Operators will require 1 or more External Entrapment devices
  - ✓ 9200 & 9500 UL 2018 requires 1 or more in each direction of travel.

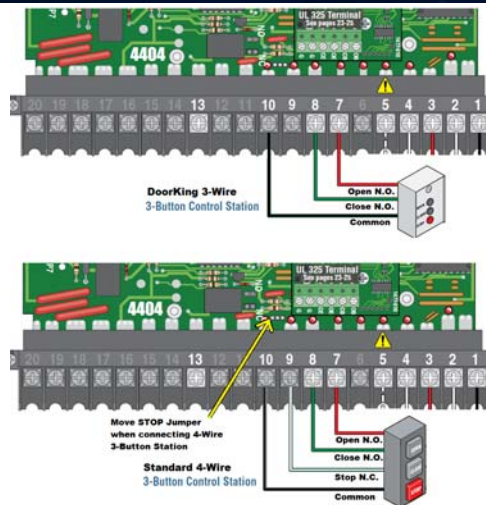


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### Maximum Security Operators:

- ✓ **4404-018: Option for 3-Button Station with a N.C Stop Button**
- ✓ DoorKing 3-wire 3-Button Station can still be used
- ✓ Or, use a 4-wire 3-Button Station with a N.C. Stop Button





Access Control Solutions

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What you need to know...

## UL August 2018 Updates



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