# TABLE OF CONTENTS

### IMPORTANT SAFETY INFORMATION
- Important Safety Instructions ............................................. 3
- Important Installation Instructions ...................................... 3
- General Safety Precautions ................................................. 4
- UL325 Gate Operator Classifications .................................... 5
- Installing the Warning Signs .............................................. 5

### 1. DESCRIPTION AND TECHNICAL SPECIFICATIONS .................. 6

### 2. INSTALLATION DIMENSIONS .............................................. 6
- 2.1. Inward Opening ......................................................... 6
- 2.2. General Rules .......................................................... 6
- 2.3. Outward Opening ...................................................... 7

### 3. WIRING ............................................................................. 7

### 4. INSTALLATION ................................................................. 7
- 4.1. Preliminary Checks ....................................................... 7
- 4.2. Installation of the Operators ........................................ 7

### 5. MANUAL OPERATION .......................................................... 8
- 5.1 Restoring normal operating mode ..................................... 8

### 6. MAINTENANCE AND REPAIRS ........................................... 8

### 5. SPARE PARTS ................................................................... 9

### 455D CONTROL BOARD .......................................................... A2
- 1. General Description ....................................................... A2
- 2. Technical Specification .................................................... A2
- 3. Features ......................................................................... A2
- 4. Layout and Components ................................................ A2
- 5. Electric Connections ...................................................... A3
- 6. Connection of Safety Devices ......................................... A4
- 7. Operating Logics ............................................................ A6
- 8. Programming ................................................................. A6
- 9. Start-up ......................................................................... A8
- 10. Learning Operating Times ............................................. A9
- 11. Final Tests .................................................................... A9
- 12. Operating Modes Detailed Description ......................... A10
- 13. Prewired Enclosure ....................................................... A12

Limited Warranty .................................................................. A16
1. Install the gate operator only when the following conditions have been met:
   • The operator is appropriate for the type and usage class of the gate.
   • All openings of a horizontal slide gate have been guarded or screened from the bottom of the gate to a minimum of 4 feet (1.25 m) above the ground to prevent a 2.25 inch (55 mm) diameter sphere from passing through openings anywhere in the gate or through that portion of the adjacent fence that the gate covers when in the open position.
   • All exposed pinch points are eliminated or guarded.
   • Guarding is supplied for exposed rollers.
2. The operator is intended for installation on gates used by vehicles only. Pedestrians must be provided with a separate access opening.
3. To reduce the risk of entrapment when opening and closing, the gate must be installed in a location that allows adequate clearance between the gate and adjacent structures. Swinging gates shall not open outward into public access areas.
4. Before installing the gate operator, ensure that the gate has been properly installed and that it swings freely in both directions. Do not over-tighten the operator clutch or pressure relief valve to compensate for a damaged gate.
5. User controls must be installed at least 6 feet (1.83 m) away from any moving part of the gate and located where the user is prevented from reaching over, under, around or through the gate to operate the controls. Controls located outdoors or those that are easily accessible shall have security features to prevent unauthorized use.
6. The Stop and/or Reset buttons must be located within line-of-sight of the gate. Activation of the reset control shall not cause the operator to start.
7. All warning signs and placards must be installed and easily seen within visible proximity of the gate. A minimum of one warning sign shall be installed on each side of the gate.
8. For gate operators that utilize a non-contact sensor (photo beam or the like):
   • See instructions on the placement of non-contact sensors for each type of application.
   • Exercise care to reduce the risk of nuisance tripping, such as when a vehicle trips the sensor while the gate is still moving.
   • Locate one or more non-contact sensors where the risk of entrapment or obstruction exists, such as at the reachable perimeter of a moving gate or barrier.
   • Use only FAAC “Photobeam” photoelectric eyes to comply with UL325.
9. For gate operators that utilize a contact sensor (edge sensor or similar):

---

**Important Safety Instructions**

**WARNING:** TO REDUCE THE RISK OF SEVERE INJURY OR DEATH:

- READ AND FOLLOW ALL INSTRUCTIONS.
- Never let children operate or play with the gate controls. Keep remote controls away from children.
- Always keep people and objects away from the gate. NO ONE SHOULD CROSS THE PATH OF A MOVING GATE.
- Test the gate operator monthly. The gate MUST reverse on contact with a rigid object or when an object activates a non-contact sensor. If necessary, adjust the force or the limit of travel and then retest the gate operator. Failure to properly adjust and retest the gate operator can increase the risk of injury or death.
- Use the manual release mechanism only when the gate is not moving.
- KEEP GATE PROPERLY MAINTAINED. Have a qualified service person make repairs to gate hardware.
- The entrance is for vehicles only. Pedestrians must use a separate entrance.
- SAVE THESE INSTRUCTIONS.

---

**Important Installation Instructions**

1. Install the gate operator only when the following conditions have been met:
   • The operator is appropriate for the type and usage class of the gate.
   • All openings of a horizontal slide gate have been guarded or screened from the bottom of the gate to a minimum of 4 feet (1.25 m) above the ground to prevent a 2.25 inch (55 mm) diameter sphere from passing through openings anywhere in the gate or through that portion of the adjacent fence that the gate covers when in the open position.
   • All exposed pinch points are eliminated or guarded.
   • Guarding is supplied for exposed rollers.
2. The operator is intended for installation on gates used by vehicles only. Pedestrians must be provided with a separate access opening.
3. To reduce the risk of entrapment when opening and closing, the gate must be installed in a location that allows adequate clearance between the gate and adjacent structures. Swinging gates shall not open outward into public access areas.
4. Before installing the gate operator, ensure that the gate has been properly installed and that it swings freely in both directions. Do not over-tighten the operator clutch or pressure relief valve to compensate for a damaged gate.
5. User controls must be installed at least 6 feet (1.83 m) away from any moving part of the gate and located where the user is prevented from reaching over, under, around or through the gate to operate the controls. Controls located outdoors or those that are easily accessible shall have security features to prevent unauthorized use.
6. The Stop and/or Reset buttons must be located within line-of-sight of the gate. Activation of the reset control shall not cause the operator to start.
7. All warning signs and placards must be installed and easily seen within visible proximity of the gate. A minimum of one warning sign shall be installed on each side of the gate.
8. For gate operators that utilize a non-contact sensor (photo beam or the like):
   • See instructions on the placement of non-contact sensors for each type of application.
   • Exercise care to reduce the risk of nuisance tripping, such as when a vehicle trips the sensor while the gate is still moving.
   • Locate one or more non-contact sensors where the risk of entrapment or obstruction exists, such as at the reachable perimeter of a moving gate or barrier.
   • Use only FAAC “Photobeam” photoelectric eyes to comply with UL325.
9. For gate operators that utilize a contact sensor (edge sensor or similar):
Important Installation Instructions (continued)

- Locate one or more contact sensors where the risk of entrapment or obstruction exists, such as at the leading edge, trailing edge, and post mounted both inside and outside of a vehicular horizontal slide gate.
- Locate one or more contact sensors at the bottom edge of a vehicular vertical lift gate.
- Locate one or more contact sensors at the bottom edge of a vertical barrier (arm).
- Locate one or more contact sensors at the pinch point of a vehicular vertical pivot gate.
- Locate hard-wired contact sensors and wiring so that communication between sensor and gate operator is not subjected to mechanical damage.
- Locate wireless contact sensors, such as those that transmit radio frequency (RF) signals, where the transmission of signals are not obstructed or impeded by building structures, natural landscaping or similar hindrances. Wireless contact sensors shall function under their intended end-use conditions.
- Use only FAAC MSE MO, CN60 or M60 edge sensors.

General Safety Precautions

Gate Construction
Vehicular gates should be constructed and installed in accordance with ASTM F2200: Standard Specification for Automated Vehicular Gate Construction. For more information, contact ASTM at: www.astm.org

Installation
- If you have any questions or concerns regarding the safety of the gate operating system, do not install the operator and consult the manufacturer.
- The condition of the gate structure itself directly affects the reliability and safety of the gate operator.
- Only qualified personnel should install this equipment. Failure to meet this requirement could cause severe injury and/or death, for which the manufacturer cannot be held responsible.
- The installer must provide a main power switch that meets all applicable safety regulations.
- It is extremely unsafe to compensate for a damaged gate by increasing hydraulic pressure.
- Install devices such as reversing edges and photo beams to provide better protection for personal property and pedestrians. Install reversing devices that are appropriate to the gate design and application.
- Before applying electrical power, ensure that voltage requirements of the equipment correspond to the supply voltage. Refer to the label on your gate operator system.

Usage
- Use this equipment only in the capacity for which it was designed. Any use other than that stated should be considered improper and therefore dangerous.
- The manufacturer cannot be held responsible for damage caused by improper, erroneous or unreasonable use.
- If a gate system component malfunctions, disconnect the main power before attempting to repair it.
- Do not impede the movement of the gate, you may injure yourself or damage the gate system as a result.
- This equipment may reach high thermal temperatures during normal operation, therefore use caution when touching the external housing of the gate operator.
- Use the manual release mechanism according to the procedures presented in this manual.
- Before performing any cleaning or maintenance operations, disconnect power to the equipment.
- All cleaning, maintenance or repair work must be performed by qualified personnel.
UL325 Gate Operator Classifications

**RESIDENTIAL VEHICULAR GATE OPERATOR CLASS I**
A vehicular gate operator system intended for use in a single family dwelling, garage or associated parking area.

**COMMERCIAL / GENERAL ACCESS VEHICULAR GATE OPERATOR CLASS II**
A vehicular gate operator system intended for use in commercial locations or buildings such as multi-family housing units (five or more single family units), hotels, parking garages, retail stores or other buildings that serve the general public.

**INDUSTRIAL / LIMITED ACCESS VEHICULAR GATE OPERATOR CLASS III**
A vehicular gate operator system intended for use in industrial locations or buildings such as factories, loading docks or other locations not intended to service the general public.

**RESTRICTED ACCESS VEHICULAR GATE OPERATOR CLASS IV**
A vehicular gate operator system intended for use in guarded industrial locations or buildings such as airport security areas or other restricted access locations that do not service the general public, and in which unauthorized access is prevented via supervision by security personnel.

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**Installing the Warning Signs**

This FAAC swing gate operator is supplied with two warning signs to alert people that a possible hazard exists and that appropriate actions should be taken to avoid the hazard or to reduce exposure to it. Permanently install one warning sign on each side of the gate so they are fully visible to traffic and pedestrians. Use appropriate hardware such as metal screws (not supplied) to permanently install each warning sign.
The FAAC 412 is a self-contained compact operator that consists of an electric motor that drives a worm screw housed in an aluminum casing. The system locks mechanically; therefore no electric lock is required. Positive stops are required.

The 412 operator is designed and built to automate vehicular swing leaf gates. Do not use for any other purpose.

1. DESCRIPTION AND TECHNICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Tab. 1: Technical specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Input voltage</strong></td>
</tr>
<tr>
<td><strong>Rod extension speed</strong></td>
</tr>
<tr>
<td><strong>Traction and thrust force</strong></td>
</tr>
<tr>
<td><strong>Operating ambient temperature</strong></td>
</tr>
<tr>
<td><strong>Power</strong></td>
</tr>
<tr>
<td><strong>Current</strong></td>
</tr>
<tr>
<td><strong>Motor rotation speed</strong></td>
</tr>
<tr>
<td><strong>Thermal protection</strong></td>
</tr>
<tr>
<td><strong>Weight</strong></td>
</tr>
<tr>
<td><strong>Protection class</strong></td>
</tr>
<tr>
<td><strong>Leaf max width</strong></td>
</tr>
<tr>
<td><strong>Leaf min width</strong></td>
</tr>
<tr>
<td><strong>Leaf max weight</strong></td>
</tr>
<tr>
<td><strong>Use frequency</strong></td>
</tr>
</tbody>
</table>

Always separate the connection cables of the low voltage accessories from the high voltage power cables. Use separate conduits to avoid interference.

The installer is responsible for grounding the gate and operator systems, for providing the main power breaker switch, and for making sure that the entire gate system meets all applicable electrical codes.

Make sure to locate all controls that operate the gate system at least 6 ft away from any moving parts.

2. INSTALLATION DIMENSIONS

2.1. INWARD OPENING

2.2. GENERAL RULES

If the dimensions indicated in table A or B cannot be obtained the following general rules can be used determine different installation dimensions:

- to obtain 90° opening of the leaf: \( a + b = \) rod stroke.
- to obtain over 90° opening of the leaf: \( a + b < \) rod stroke.
- lower \( a \) and \( b \) dimensions will result in higher speeds.
- limit the difference of the \( a \) and \( b \) dimensions to within 1.5 in higher differences will create high speed variations during the opening and closing movement;
- if the column dimensions or the position of the hinge do not make it possible to reach the required A dimension, a niche must be carved in the column as shown in Fig. 2;
4. INSTALLATION

4.1. PRELIMINARY CHECKS

To ensure trouble-free operation, make sure that the gate (whether existing or yet to be installed) has the following specifications:

- max. length of each gate leaf: 14 ft.
- strong and rigid leaf frame
- smooth gate movement, with no stiff points
- hinges in good condition
- gate swings level
- mechanical travel limit stops

If any welding has to be done on the gate, do this before installing the automation system. The good status of the gate structure directly influences the reliability and safety of the automation system.

4.2. INSTALLATION OF THE OPERATORS

1) Mount the rear bracket to the gate post according to the dimensions in par. 2.1 or 2.3. Adjust the length of the bracket if necessary.

2) Mount the operator to the rear bracket using the supplied bolt (fig. 3).

3) Release the operator (see par. 5).

4) Extend the rod to the end of its stroke (fig. 4).

5) Lock the operator (see par. 6).

6) Rotate the operator rod two full turns clockwise (fig. 4).

7) Fit the front bracket onto the rod as shown in fig. 5.

A. Use suitable rigid/flexible conduits for laying power cables.
B. Always keep low voltage accessory cables separate from AC–power cables. To avoid interference, use separate conduits.
5. MANUAL OPERATION

In the event of a power failure or malfunction, the gate can be operated manually by removing the plug and inserting the special release key as shown in fig. 9.

To release the operator, turn the key in the direction of leaf closing (fig. 9). Open or close the leaves manually.

5.1. RETURNING TO NORMAL OPERATION

Turn off power to the system before re-locking the operators to avoid all risk of starting them accidentally.

To re-lock the operator, turn the key in the leaf opening direction (fig. 9). Remove the key and re-insert the plug.

6. MAINTENANCE

Periodically check the gate structure and ensure in particular that the hinges are in perfect working condition.

Check that the electronic force setting on the control board is adjusted correctly and that the manual release mechanism is fully functional.

Safety devices installed on the system must be checked every six months.

REPAIRS

For repairs, refer to FAAC authorized service centers.

8) Close the gate leaf and, keeping the operator perfectly level, locate the leaf attachment position of the front bracket (fig. 6).

9) Spot weld the front bracket to the leaf, protecting the cylinder from any welding splatter.

Note: If the gate frame does not allow a secure mounting position of the bracket, add a support plate.

10) Release the operator and ensure that the gate opens smoothly with no stiff points and that it stops on the mechanical travel stops.

11) Complete the welding of the front bracket to the leaf. Before welding, detach the operator from the bracket to prevent any welding splatter from damaging it.

12) Prepare the aluminum cover by positioning the plastic insert and the end cap as shown in fig. 7. Secure them with the short screws provided.

12) Slide the cover on the operator as shown in fig. 8.

13) For a dual leaf application repeat the above operations to install the second operator.

The plastic insert has a slot that must align with the slot in the cover.
6. SPARE PARTS

<table>
<thead>
<tr>
<th>Part</th>
<th>Part Number</th>
<th>Description</th>
<th>Part</th>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>799360</td>
<td>Motor Housing, SX Top Section</td>
<td>10</td>
<td>2705</td>
<td>Capacitor for 115V (25uf)</td>
</tr>
<tr>
<td>01</td>
<td>799359</td>
<td>Motor Housing, DX Top Section</td>
<td>10</td>
<td>2707</td>
<td>Capacitor for 220V (8uf)</td>
</tr>
<tr>
<td>02</td>
<td>713009</td>
<td>Manual Release Key, 412</td>
<td>11</td>
<td>7272795</td>
<td>Protective Cover</td>
</tr>
<tr>
<td>03</td>
<td>7171345</td>
<td>Flange, Protective Cover,SX</td>
<td>12</td>
<td>722298</td>
<td>Protective Cover Support</td>
</tr>
<tr>
<td>03</td>
<td>7171335</td>
<td>Flange, Protective Cover,DX</td>
<td>13</td>
<td>n/a</td>
<td>Self Tapping Screw (5 x 18mm)</td>
</tr>
<tr>
<td>04</td>
<td>n/a</td>
<td>Self Tapping Screw (3.5 x 13mm)</td>
<td>14</td>
<td>716074</td>
<td>Motor Housing, Bottom Section</td>
</tr>
<tr>
<td>05</td>
<td>n/a</td>
<td>Self-Tapping Screw (5.5 x 15mm)</td>
<td>15</td>
<td>746030</td>
<td>Stator (Motor) for 220V</td>
</tr>
<tr>
<td>06</td>
<td>799358</td>
<td>Cylinder Collar</td>
<td>15</td>
<td>746755</td>
<td>Stator (Motor) for 115V</td>
</tr>
<tr>
<td>07</td>
<td>736060</td>
<td>Cylinder Assembly</td>
<td>16</td>
<td>748028</td>
<td>Rotor (Motor)</td>
</tr>
<tr>
<td>08</td>
<td>727148</td>
<td>End Cap, Protective, SX</td>
<td>17</td>
<td>710919</td>
<td>Strain Relief</td>
</tr>
<tr>
<td>08</td>
<td>727147</td>
<td>End Cap, Protective, DX</td>
<td>18</td>
<td>390009</td>
<td>Skin Pack (1 pack = 2 operators)</td>
</tr>
<tr>
<td>09</td>
<td>n/a</td>
<td>Self-Tapping Screw (3.5 x 9.5mm)</td>
<td>n/a</td>
<td>6020082</td>
<td>Plug for Manual Release</td>
</tr>
</tbody>
</table>
1. General Description

The 455 D control board is used to operate the FAAC High Voltage swing gate operators. It has several operating logics built in, programmable with the help of a display and push-buttons. The board allows connection of various accessories including monitored photocell for compliance with the UL325 standard Ed: 6.

The 455 D control board should be installed in an enclosure that is conveniently located as close as possible to the gate operator. All electrical connections from the control board to the operator must be made in a weatherproof junction box.

2. Technical Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Voltage</td>
<td>115 V~ ± 10% or 230 V~ +6% -10% 50/60 Hz</td>
</tr>
<tr>
<td>Input Power</td>
<td>10 W</td>
</tr>
<tr>
<td>Motor Max. Load</td>
<td>800 W</td>
</tr>
<tr>
<td>Accessories Max. Load</td>
<td>0.5 A</td>
</tr>
<tr>
<td>Electric Lock Max. Load</td>
<td>15 VA</td>
</tr>
<tr>
<td>Ambient Operating Temperature Range</td>
<td>-4°F to +131°F</td>
</tr>
<tr>
<td>Protection Fuses</td>
<td>5A (230V version) 10A (115V Version) 800 mA (accessory)</td>
</tr>
</tbody>
</table>

3. Features

**Function Logics:**

**Opening/Closing Time:**
- Programmable (from 0 to 120 s)

**Pause Time:**
- Programmable (from 0 to 4 min.)

**Closing Leaf Delay:**
- Programmable (from 0 to 4 min.)

**Opening Leaf Delay:**
- 2 s (can be excluded)

**Thrust Force:**
- Adjustable on 50 levels for each motor

**Terminal Board Inputs:**

**Terminal Board Outputs:**
- Flashing Lamp / Motors / 24 VDC Accessories Power Supply / 24 VDC Indicator-Light / Fail Safe / 12 VAC Electric Lock Power Supply

**Programmable Functions:**
- Logic / Pause Time / Thrust Force / Torque at Initial Thrust / Opening and Closing Leaf Delay / Reversing Stroke / Over-Pushing Stroke / Indicator-Light / Pre-Flashing / Electric Lock / Fall Safe / Safety Devices Logic / Assistance Request / Deflection Time of Obstacle or Contact Point

**Learning Function:**
- Simple or complete work time learning, with or without Limit-switches

4. Layout and Components

Connector J2 - Rapid Connection to RP Receivers

The 5 pin J2 connector allows to plug in the FAAC RP radio receivers.

**Terminal Block J3 - Power Supply**

- PE: Earth Connection / Ground
- N: AC V~ power supply (Neutral)
- L: AC V~ power supply (Line)

⚠️ The installer is responsible for grounding the operator system, for providing the main power breaker switch, and for making sure that the entire gate system meets all applicable electrical codes.
5. Electric Connections

Terminal Block J4 - Motors and Warning Lamp

M1:  COM / OP / CL: Connection to Motor 1
Must be used for single-leaf configuration

M2:  COM / OP / CL: Connection to Motor 2
Cannot be used in single-leaf configurations

LAMP:  Warning lamp output (AC V —)

Terminal Block J1 - Accessories

OPEN A - “Total Opening” Command (N.O.):
Any pulse generator (push-button, detector, etc.) which, by
closing a contact, commands opening and/or closing of
both gate leaves. To install several full opening pulse gen-
erators, connect the N.O. contacts in parallel.

OPEN B - “Partial Opening” Command (N.O.) / Closing:
Any pulse generator (push-button, detector, etc.) which, by
closing a contact, commands opening and/or closing of
the leaf driven by motor M1. In the B and C logics, it always
commands closing of both leaves. To install several partial
opening pulse generators, connect the N.O. contacts in
parallel. See logic chart for exact operation.

STP - STOP Contact (N.C.):
Any device (e.g. a push-button) which, by opening a con-
tact, is able to stop gate movement. To install several STOP
devices, connect the N.C. contacts in series.

NB: If STOP devices are not used, connect a jumper between
the STP terminals and .

CL FSW - Closing Safety Contact (N.C.):
The closing safety input is used to protect the leaf move-
ment area during closing. While closing, an activa-
tion of the the safety device connected to this input will
reverse the movement of the gate leaves. This input is
inactive during the opening cycle. To be compliant with the
UL325 standard at least one monitored safety device must be
connected to this input. See the next paragraph on how to con-
nect a monitored device. If this input is active when the
gate is closed it will prevent the leaf opening movement.

OP FSW - Opening safety devices contact (N.C.):
The opening safety input is used to protect the leaf move-
ment area during opening. While opening, an activa-
tion of the the safety device connected to this input will
reverse the movement of the gate leaves. This input is
inactive during the closing cycle. To be compliant with the
UL325 standard if this input is used to protect an entrap-
ment zone at least one monitored safety device must be
connected to it. See the next paragraph on how to con-
nect a monitored device. If this input is active when the
gate is closed it will prevent the leaf opening movement.

– - Negative for power supply to accessories
± - 24 VDC - Positive for power supply to accessories

Important: Accessories max. load is 500 mA. To calculate
current draw, refer to the instructions for individual
accessories.

–TX FSW - Negative Power to photocell transmitters.
This terminal is used for the photocells monitoring feature.
Compliance with the UL325 standard requires connecting
the transmitter photocell negative power to this input and
activating the FAIL SAFE function (see Advanced Program-
ing). This will allow the 455 D board to check the correct
operation of the safety photecells before each opening
or closing cycle.

Terminal Block J5 - Indicator-Light and Electric Lock

W.L. - Power supply to indicator-light
Connect a 24 VDC - 3 W max. indicator-light, if neces-
sary, between this terminal and the +24V supply. To avoid
compromising correct operation of the system, do not
exceed the indicated power.

LOCK - Power supply to electric lock
If necessary, connect a 12 Vac electric strike lock be-
tween this terminal and the +24V power supply. Or con-
nect a 12 Vac relay and a Maglock following the sche-
matic above.

Terminal Block J6 - Limit-Switches
These inputs are dedicated to the connection of opening
and closing limit switches.
**6. Connection of Safety Devices**

**Entrapment protection**

To comply with the UL325 standard for gate operators every entrapment zone, as defined in ASTM F2200, must be protected by two independent entrapment protection devices. One of the devices is inherent in the FAAC operators or the control board design, the other can be external, like a photocell or an edge sensor.

See this picture for the photocells positioning:

![Figure C](image)

**Opening Safety Devices:**

Are active only during the gate opening movement, and are suitable for protecting the area between the opening leaves and fixed obstacles (walls, etc) against the risk of entrapment.

**Closing Safety Devices:**

Are active only during the gate closing movement, and are suitable for protecting the closing area against the risk of entrapment.

**Monitored Devices:**

Additionally the UL325 standard requires that every external entrapment protection device must be monitored for presence and correct operation. To comply with this requirement the photocells must be wired as shown:

![Connection of One Pair of Monitored Opening Photocells and One Pair of Monitored Closing Photocells](image)

Once the photocells are wired the Fail Safe mode of the 455D control board must be enabled. To enable it enter in advanced programming by pressing and holding “F” and then press “+”, scroll to the “FS” parameter and select “Active”.

For more details please refer to the advanced programming paragraph.

**ADVANCED PROGRAMMING**

<table>
<thead>
<tr>
<th>Display</th>
<th>Function</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>FAIL SAFE:</td>
<td><strong>FS</strong></td>
<td><strong>no</strong></td>
</tr>
</tbody>
</table>

*If this function is activated, it enables a function test of the photocells before any gate movement. If the test fails (photocells not serviceable), the gate does not start the movement.*

4 = Active  no = Disabled

Only one monitored photocell can be connected to the Closing or Opening safety inputs. More than one photocell or other device can be connected to the safety inputs, but they will not be monitored.

Other devices connected to the safety inputs must have normally closed contacts and wired in series with the main monitored sensor.

See the following example of one closing safety monitored photocell and one non monitored one.
Opening/Closing Safety Devices:
They operate during the gate opening and closing movements and are suitable to protect the opening and closing areas against the risk of impact. Typically these photocells work in combination with other monitored photocell protecting closing or opening entrapment zones. In that case they can’t be monitored so they can only protect against potential impact on vehicles.
7. Operating Logics

This is a brief description of the main operating logics of the system. For a complete description please refer to Table 3

- A (automatic): The gate opens on command and automatically closes after a pause phase. A second command while opening is ignored; a second command during the pause phase interrupts the pause time; a second command during closing reopens the gate. A maintained open command will hold the gate open.

- S (security): The security mode is like A logic except that a second command during opening immediately closes the gate. A maintained open command will not hold the gate open.

- E (semi-automatic): This mode requires a command to open and a command to close. A second command during opening stops the gate. A second command during closing reopens the gate.

- EP (semi-automatic, step by step): This mode requires a command to open and a command to close. A second command during opening or closing causes the gate to stop. A third command then reverses the previous motion of the gate.

- B (manned, pulsed): This mode is designed for guard station use and requires a three button switch (pulsed) to open, close, and stop the gate.

- C (manned and constant): This mode requires constant pressure switches. One to open and one to close. No pressure on a switch stops the gate.

8. Programming

To program the 455D Control Board, you have to access "PROGRAMMING" mode. Programming is split into two parts: BASIC and ADVANCED.

Basic Programming:

To access BASIC PROGRAMMING, press key F:

- Press and hold F, the unit will display the name of the first function / parameter.
- When you release the key, the unit will display the parameter’s current value.
- Value can be modified with keys + and -.
- Press and hold F again, the unit will display the name of the next function / parameter.
- When you reach the last function, press F to exit the program, the display resumes monitoring input status.
- IMPORTANT: Make sure to exit programming mode otherwise the changes will not be saved.

The following table displays the sequence of functions accessible in BASIC PROGRAMMING:

<table>
<thead>
<tr>
<th>Display</th>
<th>Function</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>OPERATING LOGICS (see tab. 3/a - h):</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td>- Semi-automatic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Automatic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- &quot;Safety&quot; Automatic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- &quot;Stepped&quot; Semi-automatic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- &quot;Stepped&quot; Automatic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>= &quot;Safety Stepped&quot; Automatic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>= 'B' Semi-automatic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>= Dead-man</td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>PAUSE TIME:</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>This has effect only when automatic logic is</td>
<td></td>
</tr>
<tr>
<td></td>
<td>selected. Adjustable from 0 to 59 secs. in</td>
<td></td>
</tr>
<tr>
<td></td>
<td>one-second increments.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Subsequently, display changes to minutes and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>tenths of seconds (separated by a decimal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>point), time is adjusted in 10-second</td>
<td></td>
</tr>
<tr>
<td></td>
<td>increments, up to 4 minutes max. Thus, if the</td>
<td></td>
</tr>
<tr>
<td></td>
<td>unit displays 25.41, Pause Time is 2 mins.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>and 50 secs.</td>
<td></td>
</tr>
<tr>
<td>F1</td>
<td>LEAF 1 FORCE:</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Adjusts thrust of Motor 1.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>= minimum force</td>
<td></td>
</tr>
<tr>
<td></td>
<td>50 = maximum force (hydraulic)</td>
<td></td>
</tr>
<tr>
<td>F2</td>
<td>LEAF 2 FORCE:</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Adjusts thrust of Motor 2.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>= minimum force</td>
<td></td>
</tr>
<tr>
<td></td>
<td>50 = maximum force (hydraulic)</td>
<td></td>
</tr>
<tr>
<td>cd</td>
<td>LEAF 1 CLOSING DELAY:</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Delays closing start of leaf 1 with respect to</td>
<td></td>
</tr>
<tr>
<td></td>
<td>leaf 2. Adjustable from 0 to 4.1 minutes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(see Pause Time).</td>
<td></td>
</tr>
<tr>
<td>tL</td>
<td>TIME LEARNING (see Section F.3.):</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Enables the selection between “simple”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>learning and “complete” (manual choice of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>deceleration and stop points) learning.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Simple Learning: + ≈ 1 s.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Complete Learning: + &gt; 3 s.</td>
<td></td>
</tr>
<tr>
<td>ln</td>
<td>Exit from programming and return to input</td>
<td></td>
</tr>
<tr>
<td></td>
<td>status monitoring.</td>
<td></td>
</tr>
</tbody>
</table>

For hydraulic operators, set force to the maximum level.
Advanced Programming:
To access ADVANCED PROGRAMMING, press and hold key F and then press key +:
• Release key +, the unit displays the name of the first function.
• Release key F, modify the value of the function with keys + and -.
• Press and hold key F, the unit displays the name of the next function, and if you release it, the value that can be modified with keys + and -.
• When you reach the last function, press F to exit the program, the unit resumes monitoring input status.

The following table shows the sequence of functions accessible in ADVANCED PROGRAMMING:

<table>
<thead>
<tr>
<th>Display</th>
<th>Function</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>b0</td>
<td>MAXIMUM TORQUE AT INITIAL THRUST:</td>
<td>no</td>
</tr>
<tr>
<td></td>
<td>The motors operate at maximum torque (ignoring the torque setting) at start of movement. Useful for heavy leaves.</td>
<td>yes</td>
</tr>
<tr>
<td>c5</td>
<td>LAST STROKE AT CLOSING:</td>
<td>no</td>
</tr>
<tr>
<td></td>
<td>The motors are activated at full speed for 1 second to facilitate locking of the electric lock.</td>
<td>yes</td>
</tr>
<tr>
<td>r5</td>
<td>REVERSING STROKE:</td>
<td>no</td>
</tr>
<tr>
<td></td>
<td>Before opening, while the gate is closed, the motors thrust to close for 2 seconds thus facilitating release of the electric lock.</td>
<td>yes</td>
</tr>
<tr>
<td>ad</td>
<td>LEAF 2 OPENING DELAY (2 s):</td>
<td>no</td>
</tr>
<tr>
<td></td>
<td>Enables delayed start (at opening) of leaf 2, avoiding interference between leaves.</td>
<td>yes</td>
</tr>
<tr>
<td>FS</td>
<td>FAIL SAFE:</td>
<td>no</td>
</tr>
<tr>
<td></td>
<td>If this function is activated, it enables a function test of the photocells before any gate movement. If the test fails (photocells not serviceable), the gate does not start the movement.</td>
<td>yes</td>
</tr>
<tr>
<td>PF</td>
<td>PRE-FLASHING (5 s):</td>
<td>no</td>
</tr>
<tr>
<td></td>
<td>Activates the flashing lamp for 5 seconds before start of movement.</td>
<td>yes</td>
</tr>
<tr>
<td>EL</td>
<td>ELECTRIC LOCK ON LEAF 2:</td>
<td>no</td>
</tr>
<tr>
<td></td>
<td>For using the electric lock on leaf 2 instead of on leaf 1.</td>
<td>yes</td>
</tr>
</tbody>
</table>

NOTE: Parameter modifications take effect immediately. Exit out of programming to save changes. If the equipment is powered down before returning to normal status monitoring, any unsaved modifications will be lost.

To restore programming defaults, press and hold the three buttons +, -, F simultaneously for 5 seconds.
9. Start-up

LED Indicators:
The board has a two-digit display. When not in “PROGRAMMING” mode, this display is used to indicate the status of inputs. The figure below shows how the LED segments are mapped to the corresponding inputs.

The table below shows the status of the LEDs in relation to the status of the inputs.
Note the following:
LED ON = closed contact
LED OFF = open contact

Operation of the Status Signaling LEDs

<table>
<thead>
<tr>
<th>LEDs</th>
<th>ON</th>
<th>OFF</th>
</tr>
</thead>
<tbody>
<tr>
<td>OP_A</td>
<td>Command activated</td>
<td>Command inactive</td>
</tr>
<tr>
<td>OP_B</td>
<td>Command activated</td>
<td>Command inactive</td>
</tr>
<tr>
<td>STOP</td>
<td>Command inactive</td>
<td>Command activated</td>
</tr>
<tr>
<td>FSWCL</td>
<td>Safety devices clear</td>
<td>Safety devices triggered</td>
</tr>
<tr>
<td>FSWOP</td>
<td>Safety devices clear</td>
<td>Safety devices triggered</td>
</tr>
<tr>
<td>FCA1 (if used)</td>
<td>Limit switch free</td>
<td>Limit switch triggered</td>
</tr>
<tr>
<td>FCC1 (if used)</td>
<td>Limit switch free</td>
<td>Limit switch triggered</td>
</tr>
<tr>
<td>FCC2 (if used)</td>
<td>Limit switch free</td>
<td>Limit switch triggered</td>
</tr>
<tr>
<td>FCA2 (if used)</td>
<td>Limit switch free</td>
<td>Limit switch triggered</td>
</tr>
</tbody>
</table>

The status of the LEDs while the gate is closed at rest are shown in bold.

Rotation direction and force check:
1. Program the functions of the 455 D control board according to need, as previously shown.
2. Cut power to the electronic control equipment.
3. Release the operators and manually move the gate to the mid-point of the opening angle.
4. Re-lock the operators.
5. Restore power.
6. Send an opening command on the OPEN A input and verify that the gate leaves start moving towards the open position.

Note: If the first OPEN A pulse starts a closing movement, cut power and reverse the phases of the electric motor (red and black wires) on the 455 D control board.
7. Check force setting of the motors, modify if necessary.

Note: For hydraulic operators, like the 400, force should be programmed to maximum level (50)
8. Stop leaf movement with a STOP command.
9. Release the operators, close the leaves and re-lock the operators.

Opening/closing time is established by a time learning procedure which can be accomplished in “simple” or “complete” modes. The simple mode doesn’t allow a slow down phase in the operator, while the complete mode does.

The slow down can be useful to reduce the mechanical stress on the gate, but it can create problems in high wind conditions.

10. Learning Operating Times

Make sure travel limit mechanical stops are present.

WARNING: During the learning procedure, safety devices are disabled! Avoid crossing the leaf movement area when this operation is carried out.
- SIMPLE LEARNING (Without Slow Down):
  Check that the leaves are closed. Enter “BASIC PROGRAMMING,” select the TIME LEARNING function and then press the + push-button for 1 second. The display begins flashing and the leaves begin to open.
  As soon as the leaves reach the opening contact point, provide an OPEN A pulse (with the key operated push-button or with the radio control) to stop the movement. The leaves stop and the display stops flashing.
  Press push-button F to exit and save the programming. The procedure is complete and the gate is ready to operate.

- COMPLETE LEARNING (With Slow Down):
  Check that the leaves are closed. Enter “BASIC PROGRAMMING,” select the TIME LEARNING function and then press the + push-button for more than 3 seconds. The display begins flashing and leaf 1 begins to open. The following functions can be performed by sending OPEN A pulses (by key push-button or radio control).
  A total of 8 OPEN A commands required:
  1. Slow down at opening of leaf 1
  2. Leaf 1 stops at opening and leaf 2 begins its opening movement
  3. Slow down at opening of leaf 2
  4. Leaf 2 stops at opening and immediately begins its closing movement
  5. Slow down at closing of leaf 2
  6. Leaf 2 stops at closing and leaf 1 begins its closing movement
  7. Slow down at closing of leaf 1
  8. Leaf 1 stops at closing
  When the display stops flashing, press push-button F to exit and save the programming. The procedure is complete and the gate is ready to operate.

Notes:
- If you wish to eliminate deceleration in certain stages, wait for the leaf to reach its stop-limit and supply 2 consecutive Open pulses (by 1 second).
- If only one leaf is present, the entire sequence must nevertheless be completed. When the leaf has finished opening, supply 5 Open pulses until the leaf begins to close, and then resume normal operation.

11. Final Tests

Once programming is complete and the proper operating times are stored in the board’s memory perform a complete test the system. Verify that the operator(s) run properly and, most importantly, check that force is adequately adjusted and that safety devices are operating correctly.
After simple or complete learning the board will add 3 sec. to the programmed time so the operators will run against the stops.

Monitored safety test:

IMPORTANT: To make sure that the safety photocells protecting entrapment zones are monitored properly install a temporary jumper on the N.C. output of the photocell and give an OPEN A command. The gate must not move, otherwise check the wiring of the photcells and make sure that FAIL SAFE is enabled in Advanced Programming.
### 12. Operating Modes Detailed Description

#### 12.1 Operating Modes

- **Closed**: Door is closed (unaffected by other inputs).
- **Open**: Door is open (unaffected by other inputs).
- **Closing**: Door is closing (unaffected by other inputs).
- **Opening**: Door is opening (unaffected by other inputs).
- **Locked**: Door is locked (unaffected by other inputs).

#### 12.2 Effect on other active pulse inputs

- **Re-closes the leaf immediately (3)**: If a new pulse occurs within 2 seconds after reversing, it immediately stops operation.
- **Opens the leaf**: If the leaf is not closed, it opens immediately.
- **Closes the leaf**: If the leaf is not opened, it closes immediately.
- **Opens the leaf for the partial opening time** (4): If the leaf is not closed, it opens for the partial opening time.
- **Re-opens the leaf immediately** (1): If the leaf is closed, it opens immediately.

#### 12.3 Effect on opening (3)

- **If maintained, it prolongs the pause until disabled by the command (timer function)**.

#### 12.4 Other inputs

- **Releasable**: Enables the door to close or open.
- **CLOSING**: Door is closing.
- **OPEN**: Door is open.
- **OPENING**: Door is opening.
- **STOP**: Door is stopped.
- **LOCKED**: Door is locked.

#### 12.5 Effect on safety devices

- **Opening Safety Devices**: No effect (OPEN disabled).
- **Closing Safety Devices**: No effect (OPEN disabled).
- **OP/CL Safety Device**: No effect (OPEN disabled).

#### 12.6 Table of Effects

**Tab. 3/a**

<table>
<thead>
<tr>
<th>Logic &quot;E&quot;</th>
<th>GATE STATUS</th>
<th>OPEN-A</th>
<th>OPEN-B</th>
<th>STOP</th>
<th>OPENING SAFETY DEVICES</th>
<th>CLOSING SAFETY DEVICES</th>
<th>OP/CL SAFETY DEVICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLOSED</td>
<td>Opens the leaf</td>
<td>Opens single leaf</td>
<td></td>
<td>No effect (OPEN disabled)</td>
<td>No effect</td>
<td>No effect (OPEN disabled)</td>
<td></td>
</tr>
<tr>
<td>OPEN</td>
<td>Re-closes the leaf immediately (3)</td>
<td></td>
<td>No effect (if on opening, OPEN A disabled)</td>
<td>No effect</td>
<td>No effect (OPEN disabled)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CLOSING</td>
<td>Re-opens the leaf immediately</td>
<td>Stops operation</td>
<td>No effect (saves OPEN)</td>
<td>No effect (saves OPEN)</td>
<td>No effect</td>
<td>No effect</td>
<td></td>
</tr>
<tr>
<td>OPENING</td>
<td>Stops operation (3)</td>
<td></td>
<td>Reverses to close</td>
<td>No effect</td>
<td>No effect</td>
<td>No effect</td>
<td></td>
</tr>
<tr>
<td>LOCKED</td>
<td>Closes the leaf</td>
<td>(with Closing Safety devices engaged, opens at the 2nd pulse) (3)</td>
<td>No effect</td>
<td>No effect (OPEN disabled)</td>
<td>No effect (OPEN disabled)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Tab. 3/b**

<table>
<thead>
<tr>
<th>Logic &quot;A&quot;</th>
<th>GATE STATUS</th>
<th>OPEN-A</th>
<th>OPEN-B</th>
<th>STOP</th>
<th>OPENING SAFETY DEVICES</th>
<th>CLOSING SAFETY DEVICES</th>
<th>OP/CL SAFETY DEVICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLOSED</td>
<td>Opens the leaf and closes it after pause time (1)</td>
<td>Opens single leaf and closes after pause time (1)</td>
<td></td>
<td>No effect (OPEN disabled)</td>
<td>No effect</td>
<td>No effect (OPEN disabled)</td>
<td></td>
</tr>
<tr>
<td>OPEN on PAUSE</td>
<td>Reloads pause time (1) (3)</td>
<td></td>
<td>No effect (if on opening, OPEN A disabled)</td>
<td>No effect</td>
<td>Reloaded pause time (1) (3)</td>
<td>Reloaded pause time (1) (3)</td>
<td></td>
</tr>
<tr>
<td>CLOSING</td>
<td>Re-opens the leaf immediately (1)</td>
<td></td>
<td>No effect (saves OPEN)</td>
<td>No effect (saves OPEN)</td>
<td>No effect</td>
<td>No effect</td>
<td></td>
</tr>
<tr>
<td>OPENING</td>
<td>No effect (1) (3)</td>
<td></td>
<td>Reverses to close</td>
<td>No effect</td>
<td>No effect</td>
<td>No effect</td>
<td></td>
</tr>
<tr>
<td>LOCKED</td>
<td>Closes the leaf (3)</td>
<td></td>
<td>No effect (OPEN disabled)</td>
<td>No effect (OPEN disabled)</td>
<td>No effect (OPEN disabled)</td>
<td>No effect (OPEN disabled)</td>
<td></td>
</tr>
</tbody>
</table>

**Tab. 3/c**

<table>
<thead>
<tr>
<th>Logic &quot;S&quot;</th>
<th>GATE STATUS</th>
<th>OPEN-A</th>
<th>OPEN-B</th>
<th>STOP</th>
<th>OPENING SAFETY DEVICES</th>
<th>CLOSING SAFETY DEVICES</th>
<th>OP/CL SAFETY DEVICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLOSED</td>
<td>Opens the leaf and closes it after pause time</td>
<td>Opens single leaf and closes after pause time</td>
<td></td>
<td>No effect (OPEN disabled)</td>
<td>No effect</td>
<td>No effect (OPEN disabled)</td>
<td></td>
</tr>
<tr>
<td>OPEN on PAUSE</td>
<td>Re-closes the leaf immediately (3)</td>
<td></td>
<td>No effect (if on opening, OPEN A disabled)</td>
<td>No effect</td>
<td>On release, closes after 5&quot; (OPEN disabled) (3)</td>
<td>On release, closes after 5&quot; (OPEN disabled) (3)</td>
<td></td>
</tr>
<tr>
<td>CLOSING</td>
<td>Re-opens the leaf immediately</td>
<td></td>
<td>No effect (saves OPEN)</td>
<td>No effect (saves OPEN)</td>
<td>No effect</td>
<td>No effect</td>
<td></td>
</tr>
<tr>
<td>OPENING</td>
<td>Re-closes the leaf immediately (3)</td>
<td></td>
<td>Reverses to close</td>
<td>No effect</td>
<td>No effect (saves OPEN)</td>
<td>No effect</td>
<td></td>
</tr>
<tr>
<td>LOCKED</td>
<td>Closes the leaf (3)</td>
<td></td>
<td>No effect (OPEN disabled)</td>
<td>No effect (OPEN disabled)</td>
<td>No effect (OPEN disabled)</td>
<td>No effect (OPEN disabled)</td>
<td></td>
</tr>
</tbody>
</table>

**Tab. 3/d**

<table>
<thead>
<tr>
<th>Logic &quot;EP&quot;</th>
<th>GATE STATUS</th>
<th>OPEN-A</th>
<th>OPEN-B</th>
<th>STOP</th>
<th>OPENING SAFETY DEVICES</th>
<th>CLOSING SAFETY DEVICES</th>
<th>OP/CL SAFETY DEVICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLOSED</td>
<td>Opens the leaf</td>
<td>Open leaf for the partial opening time</td>
<td></td>
<td>No effect</td>
<td>No effect</td>
<td>No effect (OPEN disabled)</td>
<td></td>
</tr>
<tr>
<td>OPEN</td>
<td>Re-closes the leaf immediately (3)</td>
<td></td>
<td>No effect (if on opening, OPEN A disabled)</td>
<td>No effect (OPEN disabled)</td>
<td>No effect (OPEN disabled)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CLOSING</td>
<td>Steps operation</td>
<td></td>
<td>No effect (saves OPEN)</td>
<td>See paragraph 5.2.</td>
<td>No effect</td>
<td>No effect</td>
<td></td>
</tr>
<tr>
<td>OPENING</td>
<td>Steps operation (3)</td>
<td></td>
<td>No effect</td>
<td>See paragraph 5.2.</td>
<td>No effect</td>
<td>No effect</td>
<td></td>
</tr>
<tr>
<td>LOCKED</td>
<td>Revert movement in reverse direction (3) (always closes after a stop)</td>
<td></td>
<td>No effect (OPEN disabled)</td>
<td>No effect (OPEN disabled)</td>
<td>No effect (OPEN disabled)</td>
<td>No effect (OPEN disabled)</td>
<td></td>
</tr>
</tbody>
</table>
### Tab. 3/e

<table>
<thead>
<tr>
<th>Logic “AP”</th>
<th>PULSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>GATE STATUS</td>
<td>OPEN-A</td>
</tr>
<tr>
<td>CLOSED</td>
<td>Open the leaf and closes it after pause time</td>
</tr>
<tr>
<td>OPEN on PAUSE</td>
<td>Stops operation (3)</td>
</tr>
<tr>
<td>CLOSING</td>
<td>Re-opens the leaf immediately</td>
</tr>
<tr>
<td>OPENING</td>
<td>Stops operation (3)</td>
</tr>
<tr>
<td>LOCKED</td>
<td>Closes the leaf with Closingsafety devices engaged, opens at the 2nd pulse (3)</td>
</tr>
</tbody>
</table>

### Tab. 3/f

<table>
<thead>
<tr>
<th>Logic “SP”</th>
<th>PULSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>GATE STATUS</td>
<td>OPEN-A</td>
</tr>
<tr>
<td>CLOSED</td>
<td>Open the leaf and closes it after pause time</td>
</tr>
<tr>
<td>OPEN on PAUSE</td>
<td>Stops operation (3)</td>
</tr>
<tr>
<td>CLOSING</td>
<td>Re-opens the leaf immediately</td>
</tr>
<tr>
<td>OPENING</td>
<td>Stops operation (3)</td>
</tr>
<tr>
<td>LOCKED</td>
<td>Closes the leaf (3)</td>
</tr>
</tbody>
</table>

### Tab. 3/g

<table>
<thead>
<tr>
<th>Logic “B”</th>
<th>PULSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>GATE STATUS</td>
<td>OPEN-A (opening)</td>
</tr>
<tr>
<td>CLOSED</td>
<td>Opens the leaf</td>
</tr>
<tr>
<td>OPEN</td>
<td>No effect</td>
</tr>
<tr>
<td>CLOSING</td>
<td>Reverses to open</td>
</tr>
<tr>
<td>OPENING</td>
<td>No effect</td>
</tr>
<tr>
<td>LOCKED</td>
<td>Opens the leaf</td>
</tr>
</tbody>
</table>

### Tab. 3/h

<table>
<thead>
<tr>
<th>Logic “C”</th>
<th>PULSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>GATE STATUS</td>
<td>CONTROLS ALWAYS HELD DOWN</td>
</tr>
<tr>
<td>CLOSED</td>
<td>Open the leaf</td>
</tr>
<tr>
<td>OPEN</td>
<td>No effect (OPEN A/B disabled)</td>
</tr>
<tr>
<td>CLOSING</td>
<td>Stops operation</td>
</tr>
<tr>
<td>OPENING</td>
<td>/</td>
</tr>
</tbody>
</table>
The 455D board can be easily installed in a prewired enclosure supplied by FAAC that integrates a number of functions: Power ON-OFF switch and accessory power outlet, loop detector sockets prewired to the board, large terminal strips to easily connect activations, accessories and safeties.
AC Power Wiring Guidelines

1. Check local wiring codes in all cases and follow all local building codes. Wiring and hookup should be performed by qualified electricians/installers only.

2. AC power should be supplied from a circuit breaker panel and must have its own dedicated circuit breaker. This supply must include a green ground conductor.

3. Properly ground the gate operator to minimize or prevent damage from power surges and/or lightning. Use a grounding rod if necessary. A surge suppressor is recommended for additional protection.

Monitored safety connections

The prewired enclosure comes with dedicated terminal blocks for the connection of safety photocells that can be monitored by the control board for presence and correct operation.

Connect the transmitter photocells as shown on the drawing, to the dedicated TX photo outputs. Connect the receiver photocells 24V power to the dedicated outputs on the terminal block as shown. Connect the N.C. outputs of the photocells to the dedicated terminal blocks.

IMPORTANT: To enable monitoring of the photocells make sure that FAIL-SAFE mode is turned on in the advanced programming menu:

<table>
<thead>
<tr>
<th>Display</th>
<th>Function</th>
<th>Default</th>
</tr>
</thead>
</table>
| FS      | FAIL SAFE: If this function is activated, it enables a function test of the photocells before any gate movement. If the test fails (photocells not serviceable), the gate does not start the movement.  
$4 = $ Active  
$\neg 4 = $ Disabled | $\neg 4 = $ Disabled |
**Maglock connection**

The prewired enclosure comes with dedicated terminal blocks for the connection of a relay to drive a Maglock.

The Maglock kit can be ordered separately as an accessory. Refer to this schematic for the connections.

If using non-FAAC relay make sure the minimum switch voltage is less than 12Vac.
Shadow Loop kit option

The prewired enclosure comes with dedicated terminal blocks for the connection of a relay and a loop detector socket to implement the shadow loop functionality. The Shadow loop kit can be ordered separately as an accessory.

Refer to this schematic for the connections.
LIMITED WARRANTY

To the original purchaser only:

FAAC International, Inc., warrants, for twenty-four (24) months from the date of invoice, the gate operator systems and other related systems and equipment manufactured by FAAC S.p.A. and distributed by FAAC International, Inc., to be free from defects in material and workmanship under normal use and service for which it was intended provided it has been properly installed and operated.

FAAC International, Inc.’s obligations under this warranty shall be limited to the repair or exchange of any part of parts manufactured by FAAC S.p.A. and distributed by FAAC International, Inc. Defective products must be returned to FAAC International, Inc., freight prepaid by purchaser, within the warranty period. Items returned will be repaired or replaced, at FAAC International, Inc.’s option, upon an examination of the product by FAAC International, Inc., which discloses, to the satisfaction of FAAC International, Inc., that the item is defective. FAAC International, Inc. will return the warranted item freight prepaid. The products manufactured by FAAC S.p.A. and distributed by FAAC International, Inc., are not warranted to meet the specific requirements, if any, of safety codes of any particular state, municipality, or other jurisdiction, and neither FAAC S.p.A. or FAAC International, Inc., assume any risk or liability whatsoever resulting from the use thereof, whether used singly or in combination with other machines or apparatus.

Any products and parts not manufactured by FAAC S.p.A. and distributed by FAAC International, Inc., will carry only the warranty, if any, of the manufacturer. This warranty shall not apply to any products or parts thereof which have been repaired or altered, without FAAC International, Inc.’s written consent, outside of FAAC International, Inc.’s workshop, or altered in any way so as, in the judgment of FAAC International, Inc., to affect adversely the stability or reliability of the product(s) or has been subject to misuse, negligence, or accident, or has not been operated in accordance with FAAC International, Inc.’s or FAAC S.p.A.’s instructions or has been operated under conditions more severe than, or otherwise exceeding, those set forth in the specifications for such product(s). Neither FAAC S.p.A. nor FAAC International, Inc., shall be liable for any loss or damage whatsoever resulting, directly or indirectly, from the use or loss of use of the product(s). Without limiting the foregoing, this exclusion from liability embraces a purchaser’s expenses for downtime or for making up downtime, damages for which the purchaser may be liable to other persons, damages to property, and injury to or death of any persons.

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Consumers must inquire from their selling dealer as to the nature and extent of that dealer’s warranty, if any. This warranty is expressly in lieu of all other warranties expressed or implied including the warranties of merchantability and fitness for use. This warranty shall not apply to products or any part thereof which have been subject to accident, negligence, alteration, abuse, or misuse or if damage was due to improper installation or use of improper power source, or if damage was caused by fire, flood, lightning, electrical power surge, explosion, wind storm, hail, aircraft or vehicles, vandalism, riot or civil commotion, or acts of God.