

# THE 412 OPERATOR AND 455 D CONTROL PANEL: INSTALLATION MANUAL

January, 2004  
412 Operator And  
455 D Control Panel  
Installation Manual

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**FRAC**

# IMPORTANT SAFETY INFORMATION

Both the installer and the owner and/or operator of this system need to read and understand this installation manual and the safety instructions supplied with other components of the gate system. This information should be retained by the owner and/or operator of the gate.

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**WARNING!** To reduce the risk of injury or death

1. **READ AND FOLLOW ALL INSTRUCTIONS.**
  2. Never let children operate or play with gate controls. Keep the remote control away from children.
  3. Always keep people and objects away from the gate. **NO ONE SHOULD CROSS THE PATH OF THE MOVING GATE.**
  4. Test the gate operator monthly. The gate **MUST** reverse on contact with a rigid object or stop when an object activates the non-contact sensors. After adjusting the force or the limit of travel, retest the gate operator. Failure to adjust and retest the gate operator properly can increase the risk of injury or death.
  5. Use the emergency release only when the gate is not moving.
  6. **KEEP GATES PROPERLY MAINTAINED.** Read the owner's manual. Have a qualified service person make repairs to gate hardware.
  7. The entrance is for vehicles only. Pedestrians must use separate entrance.
  8. **SAVE THESE INSTRUCTIONS.**
- 

When installing the photo-beams supplied with this unit two things need to be considered.

1. Care should be exercised to reduce the risk of nuisance tripping, such as when a vehicle, trips the sensor while the gate is in motion.
2. One or more photobeams shall be located where the risk of entrapment exists, such as the perimeter reachable by the moving gate leaf.

## GATE DESIGN

1. A gate is a potential traffic hazard, so it is important that you locate the gate far enough away from the road to eliminate the potential of traffic getting backed up. This distance is affected by the

size of the gate, how often it is used, and how fast the gate operates.

2. The operator you choose to install on your gate must be designed for the type and size of your gate and for the frequency with which you use the operator.
3. Your gate must be properly installed and must work freely in both directions before the automatic operator is installed.
4. An automatic operator should be installed on the inside of the property/fence line. Do not install the operator on the public side of the property/fence line.
5. Pedestrians should not use a vehicular gate system. Prevent such inappropriate use by installing separate gates for pedestrians.
6. Exposed, reachable pinch points on a gate are potentially hazardous and must be eliminated or guarded.
7. Outward swinging gates with automatic operators should not open into a public area.
8. The operating controls for an automatic gate must be secured to prevent the unauthorized use of those controls.
9. The controls for an automatic gate should be located far enough from the gate so that a user cannot accidentally touch the gate when operating the controls.
10. An automatic gate operator should not be installed on a gate if people can reach or extend their arms or legs through the gate. Such gates should be guarded or screened to prevent such access.

## INSTALLATION

1. If you have any question about the safety of the gate operating system, do not install this operator. Consult the operator manufacturer.
2. The condition of the gate structure itself directly affects the reliability and safety of the gate operator.
3. 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.
4. The installer must provide a main power switch that meets all applicable safety regulations.
5. Clearly indicate on the gate with the 2 warning signs that are included (visible from either side of the gate).

6. It is extremely unsafe to compensate for a damaged gate by increasing hydraulic pressure.
7. Devices such as reversing edges and photobeams must be installed to provide better protection for personal property and pedestrians. Install reversing devices that are appropriate to the gate design and gate application.
8. Before applying electrical power, be sure that the voltage requirements of the equipment correspond to your supply voltage. Refer to the label on your operator system.

## USE

1. 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.
2. When using any electrical equipment, observe some fundamental rules:
  - Do not touch the equipment with damp or humid hands or feet.

- Do not install or operate the equipment with bare feet.
  - Do not allow small children or incapable persons to use the equipment.
3. If a gate system component malfunctions, turn off the main power before making any attempt to repair it.
  4. Do not attempt to impede the movement of the gate. You may injure yourself as a result.
  5. This equipment may reach high temperatures during operation; therefore, use caution when touching the external housing of the operator.
  6. Learn to use the manual release mechanism according to the procedures found in this installation manual.
  7. Before carrying out any cleaning or maintenance operations, disconnect the equipment from the electrical supply.
  8. To guarantee the efficiency of this equipment, the manufacturer recommends that qualified personnel periodically check and maintain the equipment.

## U.L. CLASS AND FAAC OPERATOR

| Model  |     | Duty Cycle      | Typical Use  |
|--|-----|-----------------|--|
| Class I: Residential Vehicular Gate Operator                 |     |                 |  |
| 402  | 750 | Limited duty    | • Home use   |
| 422  | 760 |                 | • Small apartment building, for example, up to 4 units in a building, with limited public access |
| 412  | 400 |                 |  |
| 620  | 640 |                 |  |
| 885  |     |                 |  |
| Class II: Commercial/General Access Vehicular Gate Operator  |     |                 |  |
| 400  | 640 | Continuous duty | • Apartment buildings  |
| 620  | 885 |                 | • Very public access   |
| Class III: Industrial/Limited Access Vehicular Gate Operator |     |                 |  |
| 400  | 640 | Continuous duty | • No public access   |
| 620  | 885 |                 |  |
| Class IV: Restricted Access Vehicular Gate Operator          |     |                 |  |
| 620  | 640 | Continuous duty | • Prison rated security  |
| 885  |     |                 |  |

# TECHNICAL DATA

## THE 412 COMPACT OPERATOR

| Parameter                                     | Measure   |                           |
|---|---|---------------------------|
| Voltage required <sup>1</sup> , VAC           | 115, +/-10%, 50-60 Hz                           | 230, +6 or -10%, 50-60 Hz |
| Duty type                                     | Residential duty                                |                           |
| Maximum duty cycle <sup>2</sup>               | 18 cycles/hr                                    | 30 cycles/hr              |
| Maximum leaf length, ft (m)                   | 14 (4.3)  |                           |
| Maximum leaf swing, deg                       | 110   |                           |
| Thrust and traction <sup>3</sup> , ft-lb (Nm) | 0-294 (0-400)                                   | 0-235 (0-320)             |
| Stroke, in. (cm)                              | 11 3/8 (29)                                     |                           |
| Rod speed <sup>4</sup> , in./sec (cm/sec)     | 3/4 (1.9)                                       | 5/8 (1.6)                 |
| Thermal cut out, deg F (deg C)                | 284 (140)                                       |                           |
| Operator dimensions,<br>l' w' h, in. (cm)     | 39 5/16 ' 3 3/4 ' 7 9/16<br>(99.8 ' 9.5 ' 19.2) |                           |
| Operator weight, lb (kg)                      | 14.3 (6.5)                                      |                           |
| Current draw, A                               | 5   | 2                         |
| Maximum amperage draw<br>for accessories, mA  | 800 mA  | 800 mA                    |

1) While the 412 Operator is capable of 18 or 30 cycles/hr, as a residential-duty operator it is not designed for such continuous, sustained operation.

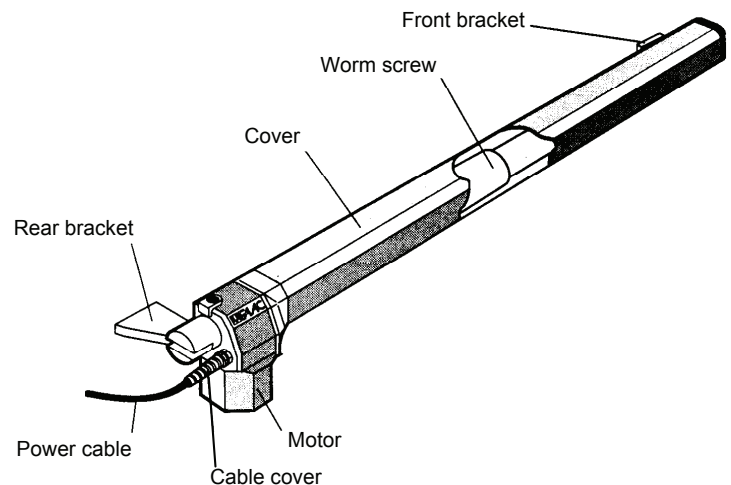
# UNPACKING THE OPERATOR

When you receive your 412 Compact Operator, complete the following steps.

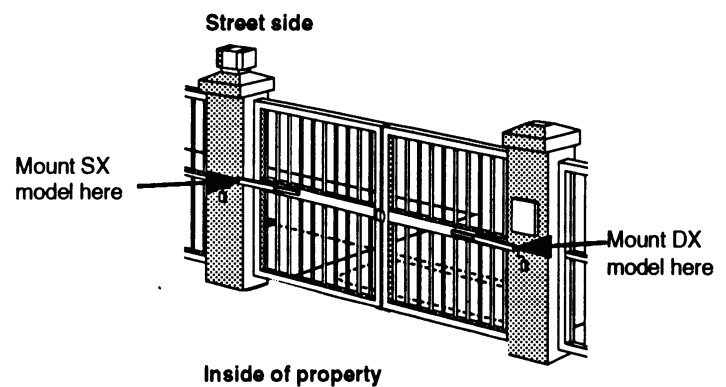
Inspect the shipping box for physical damage such as a torn carton. Then inspect the operator after you remove it from the box. Notify the carrier immediately if you note any damage because the carrier must witness the damage before you can file a claim.

As you unpack the box, insure that all the parts listed below are included (also see Figure 1). Your kit (a pair of operators) has these parts:

- (1) Control panel enclosure with control panel and photobeams inside (only 1 per kit).
- (2) 412 Operator units. One is marked SX and one is marked DX. Be sure to install each on the proper gate leaf (see Figure 2).
- (2) Protective covers for the worm screw housing of the operator
  - (1) Package of mounting hardware:
    - (2) Rear mounting brackets
    - (2) Rear mounting plates that attach to the gate post (or column)
    - (2) Front mounting brackets that attach the operators to the gate leaves
  - (1) Parts package:
    - (2) Capacitors
    - (2) End caps
    - (2) Plastic inserts for the protective cover
    - (2) Manual Release keys
    - (2) Plugs for covering the Manual Release keyhole
    - (6) Snap rings
    - (4) Screws for attaching the cover to the operator
    - (2) Long pins for rear mounting (each requires 1 snap ring)
    - (2) Short pins for front mounting (each requires 2 snap rings)



**Figure 1. Parts of the 412 Compact Operator (SX model is shown)**



**Figure 2. Mount the proper model (SX or DX) on the gate leaf whether the gate swings inward or outward.**

# THE 412 COMPACT OPERATOR

## GENERAL CHARACTERISTICS

The FAAC 412 Compact Operator is an automatic gate operator for a swinging gate leaf. The 412 Compact Operator is useful in apartment and other residential applications and can accommodate a gate leaf up to 14 ft (4.3 m) long.

The self-contained 412 Compact Operator consists of an electric motor that drives a worm screw housed in an aluminum casing.

The locking the 412 Operator provides in the fully opened and fully closed positions is a service device rather than a security device. Additional, external locks are recommended under the following conditions:

- \* It is a solid-faced gate.
- \* The length of the gate leaf is 6 ft (2 m) or longer.
- \* The installation requires tight security.
- \* The site is subject to vandalism.
- \* The site is subject to strong or very gusty wind.

For gates with two leaves, two operators are installed.

In two-operator gate installations, both operators are wired to one control panel. In such gate installations, one leaf can be wired and programmed to close slightly later than the other leaf to accommodate overlapping gate designs.

The electronic control panel is a microprocessor-based controller that accepts a wide range of product accessories and reversing devices, thus allowing for flexible gate system design.

For its protection, the single-phase, bidirectional motor shuts off automatically if its operating temperature reaches 284 deg F (140 deg C). Also for the protection and proper operation of the 412 Operator, each gate leaf on which it is installed must have a fixed positive stop in both the opened and closed positions.

Built-in security and anti-crushing measures of the 412 Operator include a key-operated Manual Release mechanism and a torque adjustment mechanism that precisely controls the force transmitted to the gate leaf through the 412 Operator.

The Manual Release mechanism is a key-operated device that disengages (or engages) the worm screw drive of the 412 Operator. When the drive is disengaged, you can open and close the gate leaf by hand. Such manual operation of the gate is necessary during installation and useful during power failures.

The torque of the 412 Operator is set during Basic Programming of the 455 D Control Panel. (see page 20 for Basic Programming). FAAC recommends that the gate leaf stop if it encounters a force of more than about 33 lb (15 kg).

Reversing devices (such as inductive loops and photocells) should be installed to provide non-contact reversing operation.

## INSTALLATION INSTRUCTIONS

Installing the 412 Operator involves preparing the gate, installing the operator(s), installing the control panel, setting the torque adjustments on the control panel, and setting other operational controls.

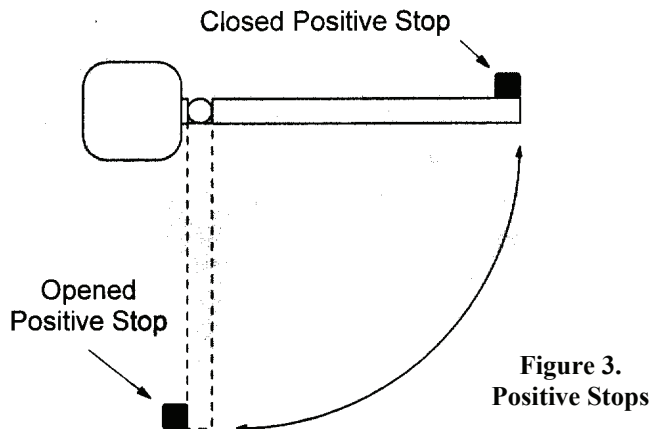
**Note:** The following installation instructions assume you are fully capable of installing an electromechanical operator on a gate. This manual does not instruct you in designing a gate, installing a gate (whether on masonry, wood, or metal posts), or basic electrical wiring. The installation tasks discussed in this manual are tasks particular to the 412 Operator.

### PREPARE THE GATE

Before you install the 412 Operator, you need to prepare the gate itself for the operator. Be sure to do the following three things:

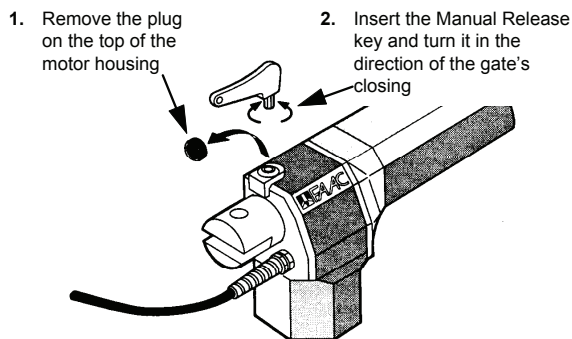
Make sure that the gate structure is solidly built. Add reinforcing crosspieces if necessary to the gate leaves. Make sure that the gate moves smoothly on its hinges without excessive friction by swinging it opened and closed by hand. If necessary, lubricate all the gate's moving parts.

Provide positive stops for the gate leaves in the fully opened and fully closed positions (see Figure 3).



## MANUAL RELEASE MECHANISM

The Manual Release mechanism is a built-in release device of the 412 Operator (see Figure 4). To access the keyhole, remove the plug on the top of the motor housing. Then insert the key and turn it a half turn in the direction of the gate's closing to disengage the operator's motorized operation. You can now move the gate leaf by hand to open or close the gate. Operating the gate leaf by hand is necessary during installation and is useful during power failures.



**Figure 4.** Use the Manual Release key to disengage the 412 Operator from its motor so that you can move the gate leaf by hand in the opening or closing direction

## INSTALLING THE OPERATOR

Once you have prepared the gate, you are ready to proceed with the installation of the operator.

Follow the instructions below to install your operator whether in an inward or outward swinging configuration.

Installing the operator consists of the following steps:

- \* Establishing the orientation of each gate leaf and its operator.
- \* Attaching the rear mounting bracket
- \* Attaching the operator to the rear mounting bracket
- \* Attaching the front mounting bracket to the operator

- \* Attaching the front mounting bracket to the gate leaf
- \* Attaching the operator's protective cover
- \* Installing the 455 D control panel
- \* Adjusting the torque for the operator
- \* Setting the operating controls

## ESTABLISH THE ORIENTATION OF THE OPERATOR AND THE GATE LEAF

Before you begin mounting brackets or attaching parts, you first need to establish the proper orientation of each operator in relation to its gate leaf.

Figure 2 (page 5) shows a biparting gate from the side where the operators are mounted. The operator attached to the hinge on the left of the gate must be an SX model. If the hinge is on the right side, the DX model must be installed.

Installing the operator on the wrong side makes it impossible to install the protective cover of the operator.

## ATTACH THE REAR MOUNTING BRACKET

### Inward swinging gate:

You need to determine whether to attach the rear mounting bracket directly to the post (or wall) or to notch the post and install a recessed liner. Large pillars require a recessed liner to house the rear mounting bracket and part of the operator so that the pillar will not interfere with the swing of the gate when it is fully opened.

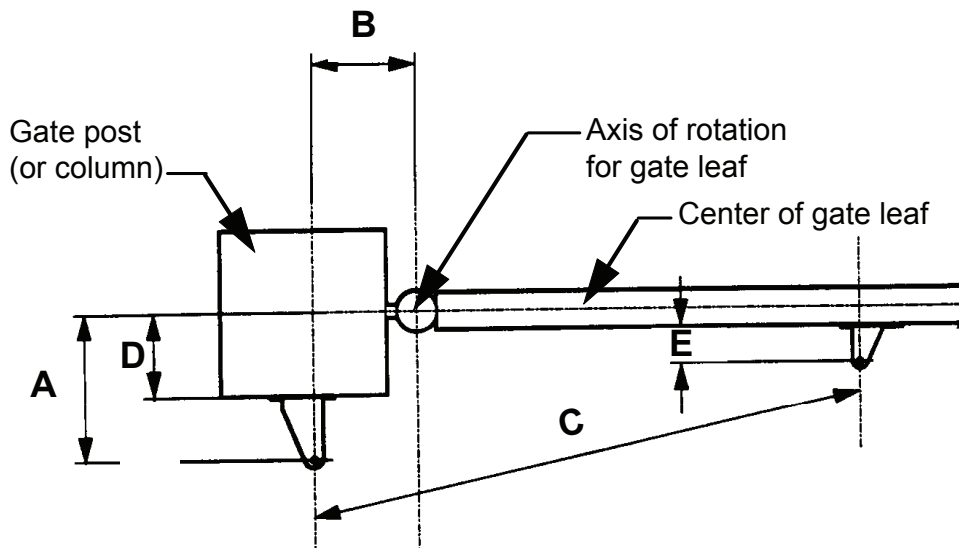
To determine whether you need a recessed liner, measure the distances B and D (shown in Fig. 5) on your gate. If your measure of B or D is greater than the dimensions shown for your operator in Figure 5, notch the post and construct a recessed liner for the post mounting bracket (see Figure 6). The recessed liner should be constructed of 3/16 or 1/4 in. steel with a minimum interior height of 11 13/16 in. (30 cm) so as to allow you to meet the required dimensions shown in Figure 5. Make sure the recessed liner is securely embedded in the post (or wall).

There are two parts to the rear mounting bracket. The horizontal bracket attaches to the operator, and the slotted vertical plate attaches to the gate post (see Figure 8). Weld the two parts together and bolt the assembly to the gate post of column. Note, though, that use of the vertical rear mounting plate is optional.

Once you have positioned the rear mounting bracket, attach the bracket to the post (or wall or recessed liner), making sure the dimensions on your gate system match those shown in Figure 5.



Figure 5. Important mounting dimensions for inward-swinging 412 operators, top view



| Mounting Dimensions  |                             |                     |
|--|-----------------------------|---------------------|
|  | 90-deg Swing                | 110-deg Swing       |
| A  | 5 3/4 in. (14.5 cm)         | 4 7/8 in. (12.5 cm) |
| B  | 5 3/4 in. (14.5 cm)         | 4 7/8 in. (12.5 cm) |
| <b>WARNING!</b> A and B should differ by no more than 2 in. Larger differences may dangerously alter the speed of operation. |                             |                     |
| C  | 36 1/4 in. (89.2 cm)        |                     |
| D  | Maximum 4 1/2 in. (10.8 cm) | 3 3/8 in. (8.45 cm) |
| E  | Less Than A                 | Less Than A         |

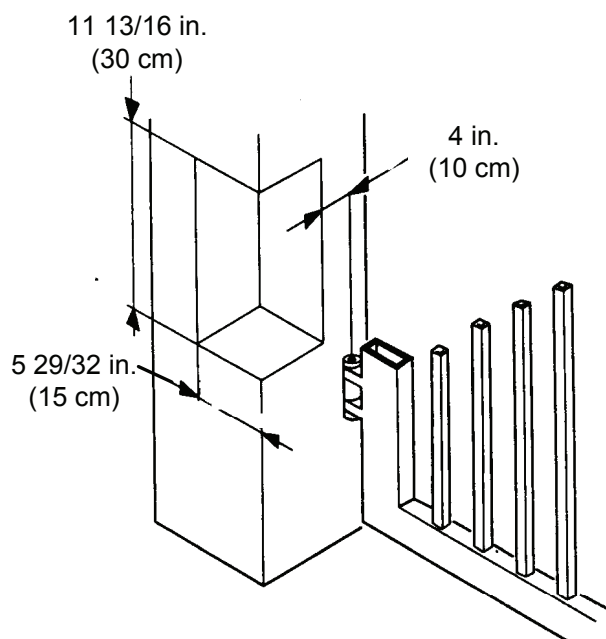


Figure 6. The required dimensions of the recessed liner when notching the gate post

#### Outward swinging gate:

If you are installing the 412 Operator to swing the gate outward, construct a steel elbow of sufficient size to attach to the gate pillar and rear mounting bracket (see Figure 7 for elbow dimensions).

#### ATTACH THE OPERATOR TO THE REAR MOUNTING BRACKET

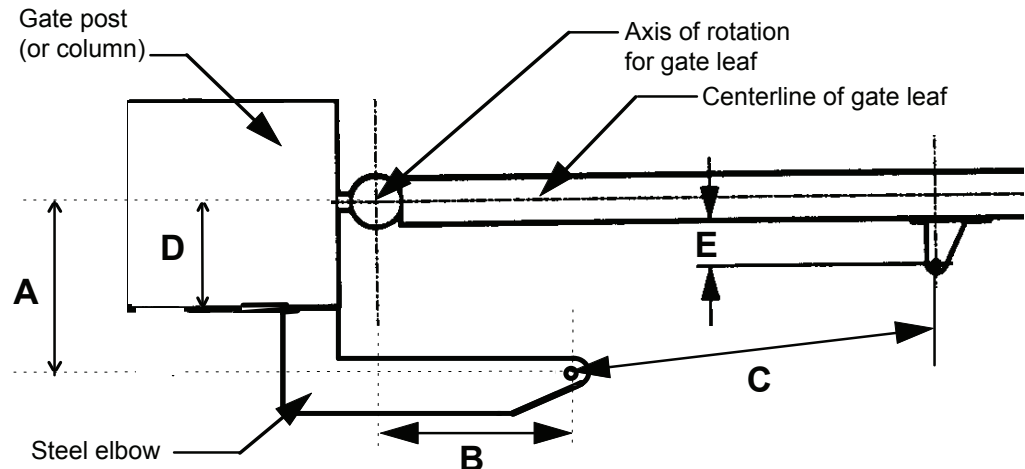
Attach the operator to the rear mounting bracket with the long pin and one snap ring on the bottom (see Figure 8).

#### ATTACH THE OPERATOR TO THE FRONT MOUNTING BRACKET

Attach the operator to the front mounting bracket with the short pin and one snap ring on the bottom and one snap ring on the top (see Figure 9).



**Figure 7. Important mounting dimensions for outward-swinging 412 operators, top view**



| Mounting Dimensions  |                     |                     |
|--|---------------------|---------------------|
|  | 90-deg Swing        | 110-deg Swing       |
| <b>A</b>   | 5 3/4 in. (14.5 cm) | 4 7/8 in. (12.5 cm) |
| <b>B</b>   | 5 3/4 in. (14.5 cm) | 4 7/8 in. (12.5 cm) |
| <b>WARNING!</b> A and B should differ by <i>no more than 2 in.</i> Larger differences may <i>dangerously</i> alter the speed of operation. |                     |                     |
| <b>C</b>   | 24 1/4 in. (62 cm)  |                     |
| <b>D</b>   | N/A                 | N/A                 |
| <b>E</b>   | Less Than A         |                     |

## ATTACH THE FRONT MOUNTING BRACKET TO THE GATE LEAF

Disengage the operator's worm screw drive from its motor with the Manual Release. Insert the key in the top of the motor assembly, and turn the key a half turn in the direction of the gate's closing.

You should be able to lengthen or shorten the cylinder covering the operator's worm screw by pulling or pushing the cylinder. Lengthen or shorten the operator to the required distance for your gate installation:

**Inward swinging:** Lengthen the worm screw completely and push the cylinder in 1/8 to 1/4 inch.

**Outward swinging:** Shorten the worm screw completely and then pull the cylinder out 1/8 to 1/4 inch.

With the gate in the fully closed position, temporarily clamp the front mounting bracket (previously attached to the operator) to the gate leaf and insure that the cylinder of the worm screw is level.

Move the gate leaf by hand to the fully opened position against the gate stop and insure that the cylinder is level.

Next, you must determine that the worm screw has not reached the full extent of its travel. Remove the operator

from the front mounting bracket and push or pull the cylinder in the direction of its opening direction of travel:

**Inward swinging:** You should be able to push the cylinder in about 1/2 of an inch.

**Outward swinging:** You should be able to pull the cylinder out about 1/2 of an inch.

If the worm screw was not at the full extent of its travel when attached to front mounting bracket, then with the operator detached from the front mounting bracket, permanently attach (weld) the front mounting bracket to the gate leaf (see Figure 10).

If the worm screw was at the full extent of its travel, try moving the front mounting bracket toward the hinge and retesting. If again the front mounting fully extends the worm screw, then the rear mounting dimensions are incorrect (see Figure 5 or 7, whichever applies to your installation). Reattach the rear mounting bracket as necessary.

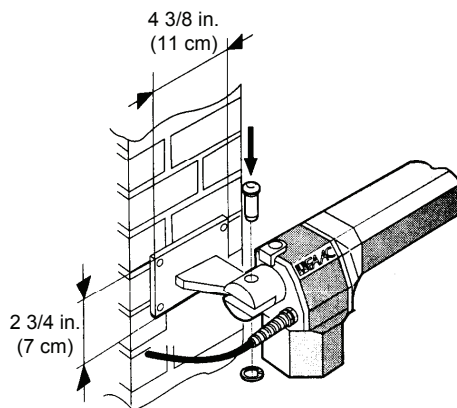
Once the front mounting bracket is welded in place, you can reattach the operator to the bracket.

## ATTACH THE OPERATOR COVER.

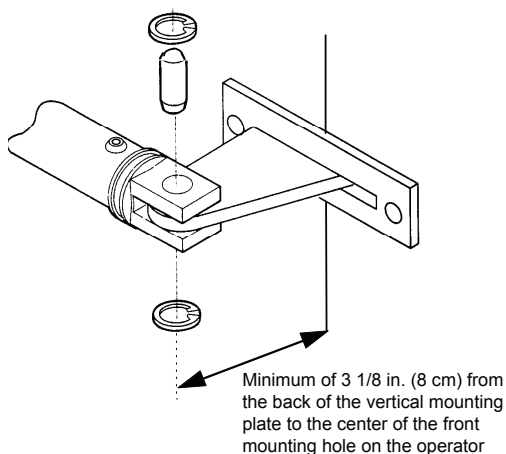
Once the operator is attached to the gate leaf, you next prepare the cover for installation.

**Caution:** If you did not correctly establish the orientation of the gate leaf and properly install the DX model on the right side and SX on the left side, you will be unable to install the cover on either operator.

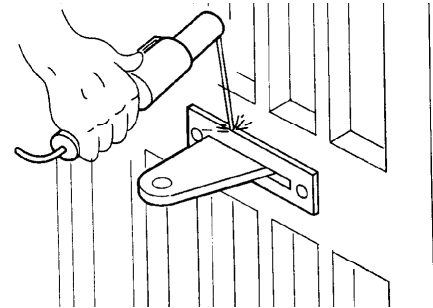
Position the mounting insert inside the aluminum cover and then slide the aluminum cover into position. Secure the cover and insert with the short screws provided (see Figure 11).



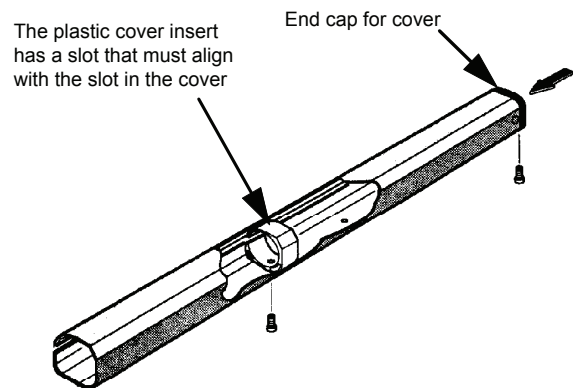
**Figure 8.** Attach the operator to the rear mounting bracket (an SX version is shown)



**Figure 9.** Secure the operator to the front mounting bracket with the short pin and 2 snap rings



**Figure 10.** Weld the front mounting bracket into position after insuring the operator is level in the fully closed and fully opened positions



**Figure 11.** Attach the cover with two screws (SX model shown)

## INSTALLING THE 455 D CONTROL PANEL

Locate the control panel enclosure in the most convenient position possible, considering the movement of the gate. Figure 12 shows a basic layout for a two-leaf gate with the 412 Compact Operator.

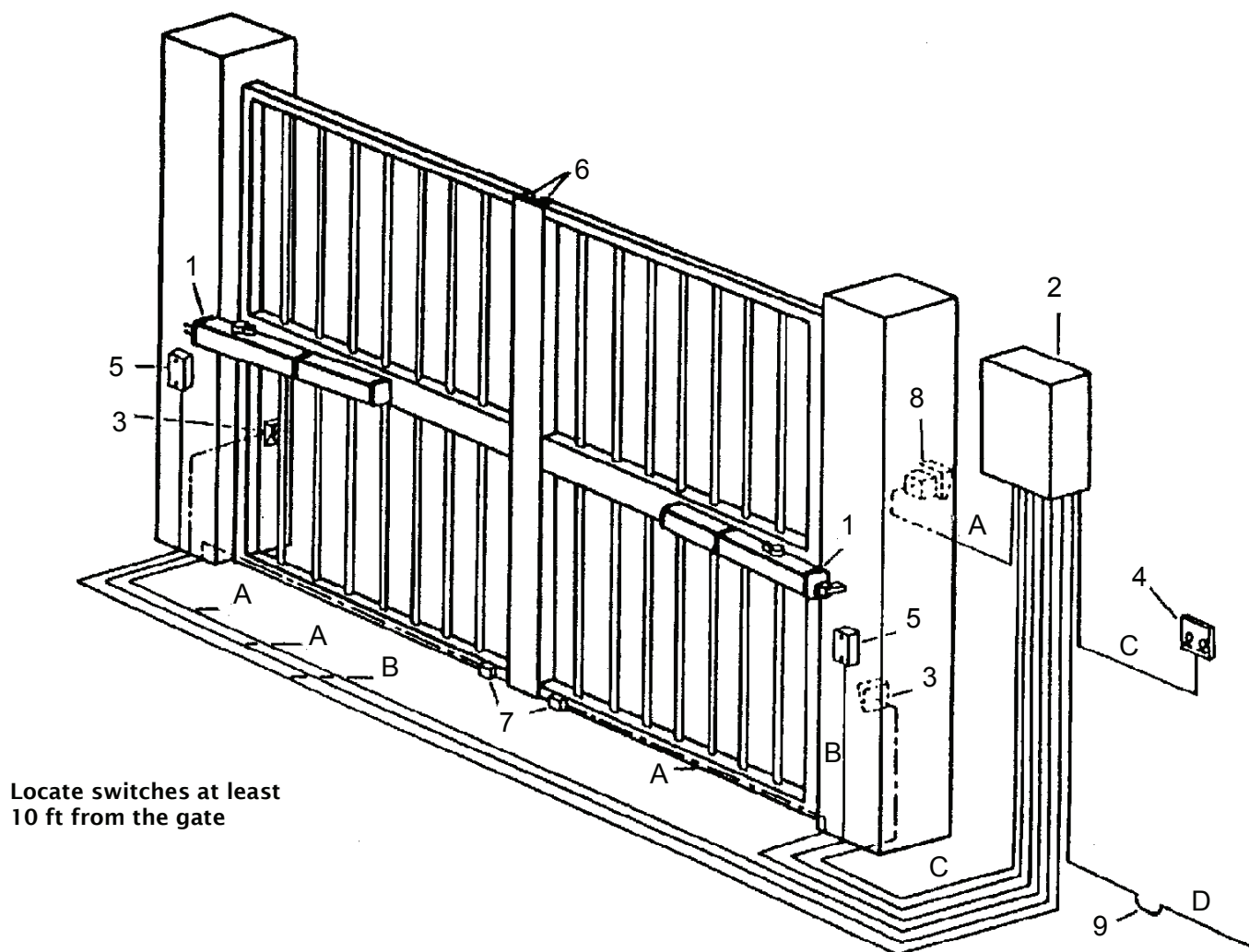
Installing the control panel consists of the following general steps:

- Connecting the main power to the control panel
- Connecting the activating device
- Connecting the operator to the control panel
- Checking the direction of the motor's rotation
- Connecting other devices to the control panel
- Set operating modes

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.

For the complete 455 D Control Panel Installation Instructions, see pages 14–25 of this manual.

Figure 12. The layout of a sample gate system



- 1 Operator
- 2 Control Panel
- 3 Photocell
- 4 Switch
- 5 Junction box (see text)
- 6 Reversing edges
- 7 Gate stops
- 8 Switch
- 9 Wiring to main circuit breaker

Wire Gauges for Given Voltage

220 VAC

- A 2 × 18 AWG
- B 4 × 14 AWG
- C 5 × 18 AWG
- D 4 × 14 AWG up to 414 ft

115 VAC

- A 2 × 18 AWG
- B 4 × 14 AWG
- C 5 × 18 AWG
- D 3 × 14 AWG up to 130 ft  
3 × 10 AWG up to 340 ft

This exploded view diagram illustrates the assembly of a car stereo unit. The components are numbered as follows:

- 1**: Main stereo unit housing.
- 2**: Volume knob.
- 3**: Antenna sleeve.
- 4**: Antenna mounting bracket.
- 5**: Antenna mounting screw.
- 6**: Antenna mounting plate.
- 7**: Antenna cable.
- 8**: Antenna cable connector.
- 9**: Antenna cable connector cap.
- 10**: Antenna cable connector cap with a pull tab.
- 11**: Antenna cable connector cap with a pull tab.
- 12**: Antenna cable connector cap with a pull tab.
- 13**: Antenna cable connector cap with a pull tab.
- 14**: Antenna cable connector cap with a pull tab.
- 15**: Antenna cable connector cap with a pull tab.
- 16**: Antenna cable connector cap with a pull tab.
- 17**: Antenna cable connector cap with a pull tab.
- 18**: Antenna cable connector cap with a pull tab.

# Parts List

## 412 Compact Operator

| POS | PART NO. | DESCRIPTION                                     | QTY |
|-----|----------|---|-----|
| 1   | 799360   | Motor Housing, SX top section                   | 1   |
| 1   | 799359   | Motor Housing DX top section                    | 1   |
| 2   | 713009   | Manual Release Key, 412                         | 1   |
| 3   | 7171345  | Flange, Protective Cover, 412 SX                | 1   |
| 3   | 7171335  | Flange, Protective Cover, 412 DX                | 1   |
| 4   | N/A      | Nickel Plated Self Tapping Screw (3.5 x 13 mm)  | 1   |
| 5   | N/A      | Self Tapping Screw (5.5 x 15 mm)                | 2   |
| 6   | 799358   | Cylinder Collar                                 | 1   |
| 7   | 736060*  | Cylinder Assembly New (Slide On)*               | 1   |
| 8   | 727148   | End Cap, Protective Cover SX                    | 1   |
| 8   | 727147   | End Cap, Protective Cover DX                    | 1   |
| 9   | N/A      | Nickel Plated Self Tapping Screw (3.5 x 9.5 mm) | 3   |
| 10  | 2705     | Capacitor For 115 v (25µf)                      | 1   |
| 10  | 2707     | Capacitor For 220 v (8µf)                       | 1   |
| 11  | 727216   | Protective Cover, 412                           | 1   |
| 12  | 722298   | Protective Cover Support, 412                   | 1   |
| 13  | N/A      | Self Tapping Screw (5 x 18 mm)                  | 4   |
| 14  | 716074   | Motor Housing, Bottom Section                   | 1   |
| 15  | 746030   | Stator (motor) for 220 v                        | 1   |
| 15  | 746755   | Stator (motor) for 115 v                        | 1   |
| 16  | 746028   | Rotor (motor)                                   | 1   |
| 17  | 710919   | Strain Relief, 412                              | 1   |
| 18  | 390009   | Skin Pack, 412 (1 pack = 2 operators)           | 1   |

\*Models Manufactured before 2000 used a screw in type cylinder assembly. The part number for this type cylinder is 736039. The manufacture date is the NR number on the sticker located on the top motor housing.

# THE 455 D CONTROL PANEL

## GENERAL DESCRIPTION

The FAAC 455 D control panel is used to operate the following models.

### Swing gate operators:

|     |     |
|-----|-----|
| 400 | 412 |
| 402 | 750 |
| 422 | 760 |

### Barrier gate operators:

610/615

The 455 D programming controls the following:

**Operating logic:** A, S, E, EP, B, and C logics available.

**Reversing device behavior:** Choose whether a triggered reversing device during closing immediately reverses gate movement or stops the gate and reverses gate movement when no longer triggered.

**Torque or Pressure:** Force adjustment for the 412 operator. Adjustable from 0 to 50.

**Caution:** For all hydraulic operators, the torque **must** be programmed to the maximum (50) setting.

**Pause time between opening and closing:** adjustable from 0 to 240 seconds.

**Opening/Closing time:** adjustable from 0 to 120 seconds.

**Leaf delay on closing:** adjustable from 0 to 4.1 minutes.

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

The 455 D control panel requires a single-phase power supply voltage (115 VAC  $\pm 10\%$  or 230 VAC  $\pm 10\%$ , 50-60 Hz). The power supply should be protected by a 15 amp dedicated circuit breaker (not provided).

**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. The installer should refer to the installation manual for a given operator for more information.**

**NOTE:** An installation is U.L. compliant only when you install the FAAC operators according to the UL325 standards.

## INSTALLING THE 455 D CONTROL PANEL

Locate the control panel in the most convenient position possible, considering the movement of the gate.

Installing the control panel consists of the following general steps:

- \* Connecting the main power to the control panel
- \* Connecting the activating device
- \* Connecting the operator to the control panel
- \* Checking the direction of the motor's rotation
- \* Connecting other devices to the control panel
- \* Set operating modes

## CONNECT THE MAIN POWER SUPPLY

**WARNING!** Turn the main power off before you make any electrical connections or before programming.

Wire the main power supply to control panel terminals in block J3 (see Figures 13 and 14). The installer is responsible for insuring that a separate, grounded circuit protected by a circuit breaker is between the control panel and the main power supply. All wiring should conform to applicable electrical codes, and all wiring and fittings should be weatherproof and/or suitable for burial.

Connect the ground to the grounding terminal in block J3 and connect the power wires to the terminals labeled N (neutral) and L (line).

**NOTE:** For a 230V system, a neutral is not needed. Connect one 115V line to the L (Line) and a second 115V line to the N (Neutral).

# CONNECT THE OPERATOR(S) TO THE CONTROL PANEL

**WARNING!** Turn the main power off before you make any electrical connections or before programming.

**CAUTION:** The operators are grounded only by the grounded circuit the installer provides.

## USING A JUNCTION BOX

If an operator is more than 2 ft away from the control panel, you must use a junction box for connection. Use a U. L. Listed cord grip where the operator cord enters the junction box.

**Note:** If you have a one-leaf gate design, the operator **must** be connected to Motor 1 (terminals 1,2, & 3)

To wire up motor 1, connect the white wire to terminal 1(on the J4 terminal strip), the black wire to 2, and the red wire to 3. Wire each leg of the capacitor (supplied) to terminals 2 & 3.

**Note:** If you want to delay the closing of one gate leaf in a two-leaf gate design, be sure to connect its operator to Motor 1.

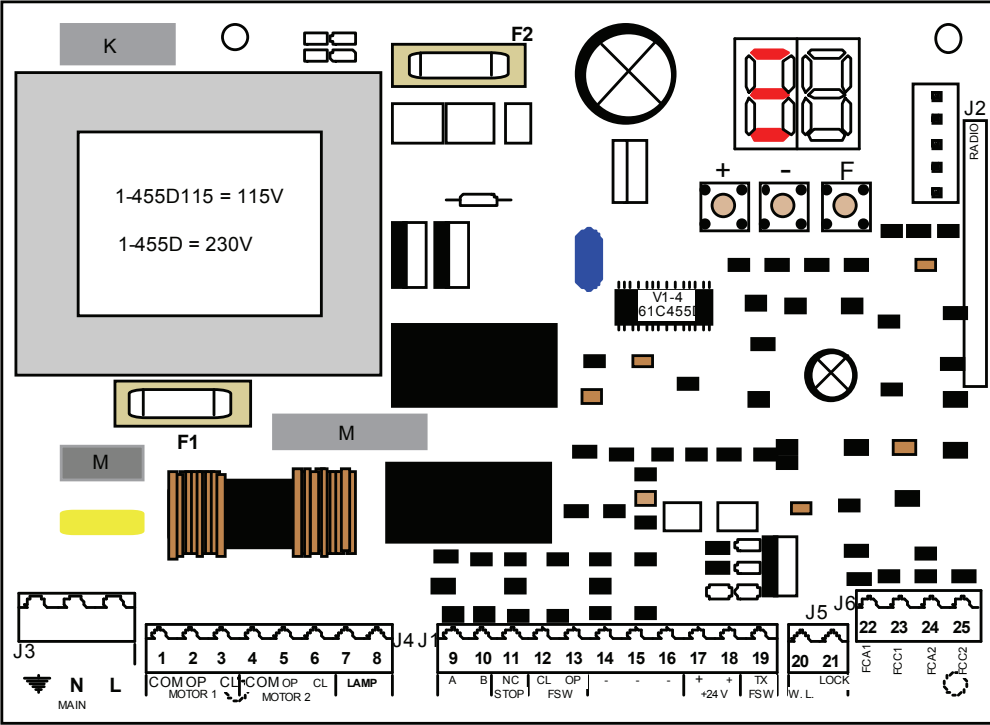
In order to wire motor 2 in a bi-parting system, connect the white wire to terminal 4 (on the J4 terminal strip), the black wire to 5, the red wire to 6. Wire each leg of the capacitor (supplied) to terminals 5 & 6.

## CHECK THE MOTOR'S DIRECTION OF ROTATION

After you have connected the main power supply, and the operator(s) to the control panel, you need to check the direction of rotation for each operator motor in your gate design.

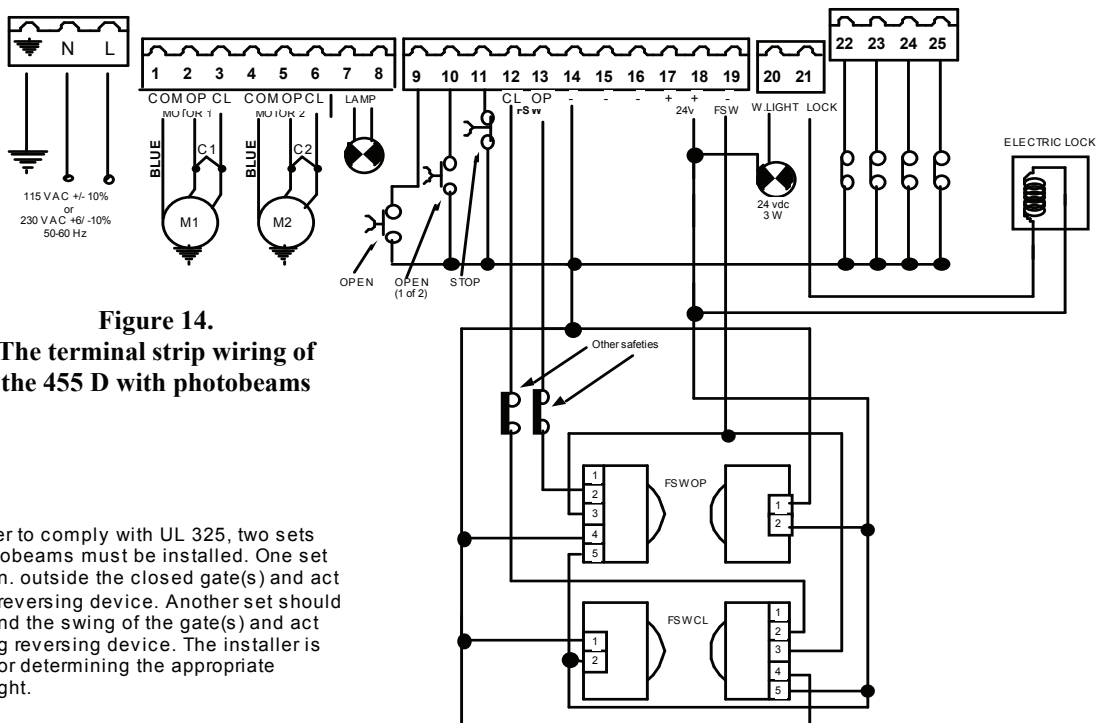
**Note:** To check a motor's direction of rotation, you must have three closed circuits on terminal block J1. Install one circuit between terminals 11 and 16, another circuit between terminals 12 and 19, and another circuit between terminals 13 and 19.

Figure 13. The 455 D Control Panel



|   |         |         |
|---|---------|---------|
| J3 terminal block for main power supply           |         |         |
| J4 terminal block for connecting the operator (s) |         |         |
| J1 terminal block for low-voltage accessories     |         |         |
| J2 quick connector port                           |         |         |
| F Function Push Button                            |         |         |
| — Programming Push Button                         |         |         |
| + Programming Push Button                         |         |         |
| FUSES   | 220 VAC | 115 VAC |
| F1 Main Power                                     | 5 A     | 10 A    |
| F2 Accessories                                    | 800 mA  | 800 mA  |





**Figure 14.**  
**The terminal strip wiring of**  
**the 455 D with photobeams**

**NOTE:** In order to comply with UL 325, two sets of FAAC photobeams must be installed. One set should be 6 in. outside the closed gate(s) and act as a closing reversing device. Another set should be 6 in. beyond the swing of the gate(s) and act as an opening reversing device. The installer is responsible for determining the appropriate mounting height.

You cannot check the motor's direction of rotation without these circuits (jumpers) or the accessories. When properly prepared for testing, the LEDS FSWOP, STOP, and FSWCL should be illuminated (see figure 16 on page 17).

**WARNING!** Running the operator—even for testing purposes—without a connected reversing device is potentially dangerous. Do not place yourself within the path of the moving gate during your test.

Disengage the operator(s) with the Manual Release key (see operator installation manual), and open the gate by hand about halfway. Next, engage the operator(s) with the Manual Release key so that you can check the rotation of the motor (s).

To activate the operator(s) momentarily short across terminals 9 and 14.

Turn on the main power and send an activating signal to the operator. The gate leaf (or leaves) should open. If a gate leaf closes, then you need to turn off the main power and reverse the connection of the red and black wires on terminal block J4 for the operator controlling that leaf. Then you need to recheck the rotation direction again.

After having completed your test of the motor's direction of rotation, replace any test circuits you installed (between terminals 11 and 16, between 12 and 19, and between 13 and 19) with the proper reversing and stop devices. The instructions for installing such accessories follow.

## CONNECT OTHER DEVICES

**WARNING!** Turn the main power off before you make any electrical connections.

**POWER SUPPLY FOR ACCESSORIES:** You can access a 24 VDC output for supplying power to accessories through terminals 17 or 18, (+) and 14 or 15 or 16, (-) on terminal block J1. In most cases, this source can be used to power 24 VDC accessories.

**NOTE:** The 455 D control panel allows a maximum accessory load of 800 mA.

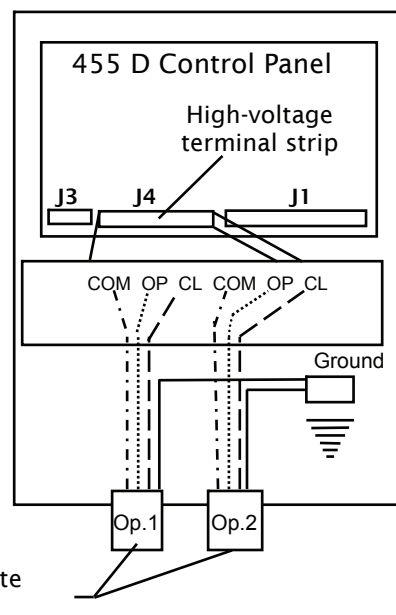
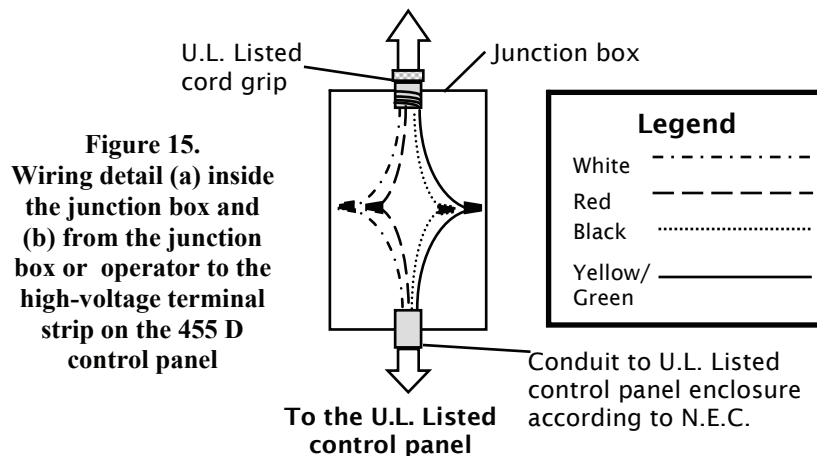
**REVERSING DEVICES:** Reversing devices include photocells, inductive loops, and so forth. All of the reversing devices should have contacts of the normally closed (N.C.) type. Where you connect a device depends on whether you want the device to operate during opening or during closing.

**NOTE:** UL **does not** recognize the FAAC system with loop detectors or safety edges. FAAC photobeams must be used to comply with UL 325.

To wire photobeams, refer to page 19 (see FSWOP for opening photobeams, and FSWCL for closing photobeams). Photobeams must be connected as shown. See also page 19 for the wiring of inductive loops. If using more than one reversing device, they must be wired in series.

(a) To the U. L. Listed gate operator

(b) U.L. Listed Control Panel Enclosure



**ACTIVATING DEVICES AND RADIO RECEIVER:** The activating devices and radio receiver for your gate must have normally open (N.O.) contacts. Connect such devices to terminals 9 and 14.

**NOTE:** The FAAC radio receiver plugs into the 5 prongs labeled J2 (Quick connect port).

Page 19 shows how to connect a three or four wire receiver.

**DECODER CARD:** If you are installing the Digicard magnetic card reader, or the Digikey keyboard, use the quick-fit connector J2 for the DS decoder card.

**NOTE:** If your using both a receiver and decoder, hard wire the decoder and plug in the receiver.

**OPEN/HOLD OPEN DEVICE:** To open and hold open the gate, simply maintain a contact across terminals 9 and 14. ("A" Mode only)

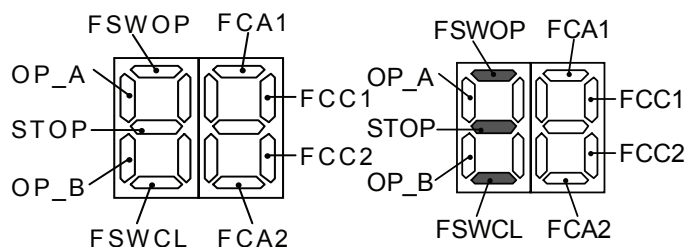
**STOP BUTTON:** The stop button you install must have normally closed (N.C.) contacts. Multiple stop buttons must be wired in series. Connect your stop device between terminals 11 and 16.

**NOTE:** The 455 D will not operate the motors without a closed circuit between 11 & 14.

**The LED Indicators:** The nine light emitting diodes (LEDs) on the control panel can be used to check for the proper function of the devices attached to the panel. The LED lights are on whenever the contacts are closed across each of the respective terminals.

OP\_A and OP\_B (Partial Opening) should illuminate only when an activating signal is sent for 2 and 1 gate leaves, respectively. STOP should be illuminated except when the stop button is pressed. FSWOP and FSWCL should be illuminated except when the reversing devices, for

| LED                  | On   | Off                           |
|----------------------|--|-------------------------------|
| OP_A                 | Command Given                                    | No Command                    |
| OP_B                 | Command Given                                    | No Command                    |
| Stop                 | No Command                                       | Command Given                 |
| FSW<br>Open          | Opening reversing<br>devices clear               | Reversing device<br>triggered |
| FSW<br>Close         | Closing reversing<br>devices clear               | Reversing device<br>triggered |
| FCA1<br>FCC1         | Flashes when gate coder is in use.<br>Operator 1 |                               |
| FCA<br>2<br>FCC<br>2 | Flashes when gate coder is in use.<br>Operator 2 |                               |



This display shows the meaning of each LED.

This display shows the normal status of the control panel.

**Figure 16. The 455 D display.**

opening and closing, respectively, are triggered. Use the LEDs and the next table to determine if the accessory devices you have installed are operating properly.

**Electric Locks:** An electric lock can be wired to the 455 D in terminals 18 and 21 (12Vac pulsed provided). If a reversing stroke is needed to allow the electric lock to release, this must be done in advanced programming.

See page 19 for the connections for a magnetic locking device.

**WARNING LIGHT:** Connect a warning light to terminals 18 and 20 in the group labeled *W.LIGHT* in terminal block J1 and J5. The terminals provide an output voltage of 24 VDC, maximum power 3 Watts. This output voltage will power most 24 VDC warning lights.

**NOTE:** The behavior of the warning light varies according to the logic you have set.

**LOGICS A, S, E, EP, AND B:** The warning light is on steadily during opening and the pause phase. During closing, the light flashes.

**LOGIC C:** The warning light is on steadily during opening and flashes during closing.

## SET OTHER OPERATING CONTROLS

**WARNING!** Turn the main power off before you make any electrical connections.

You need to program the control panel for your gate's operation. The 455 D Control Panel has on board programming that controls a wide range of functions.

### OPERATING LOGICS

**NOTE:** The 455 D Control Panel provides inputs for opening reversing devices and closing reversing devices. FAAC strongly recommends the use of reversing devices, such as photocells or other non-contact sensors.

- **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.

The three programming push buttons allow the programming of the torque (or pressure), the pause time between opening and closing, and the leaf delay on closing.

**WARNING!** Turn the main power off before you make any electrical connections.

For all FAAC hydraulic operators using the 455 D control panel, the force **must** be set at its maximum setting of 50 in order to supply the correct voltage to the operator.

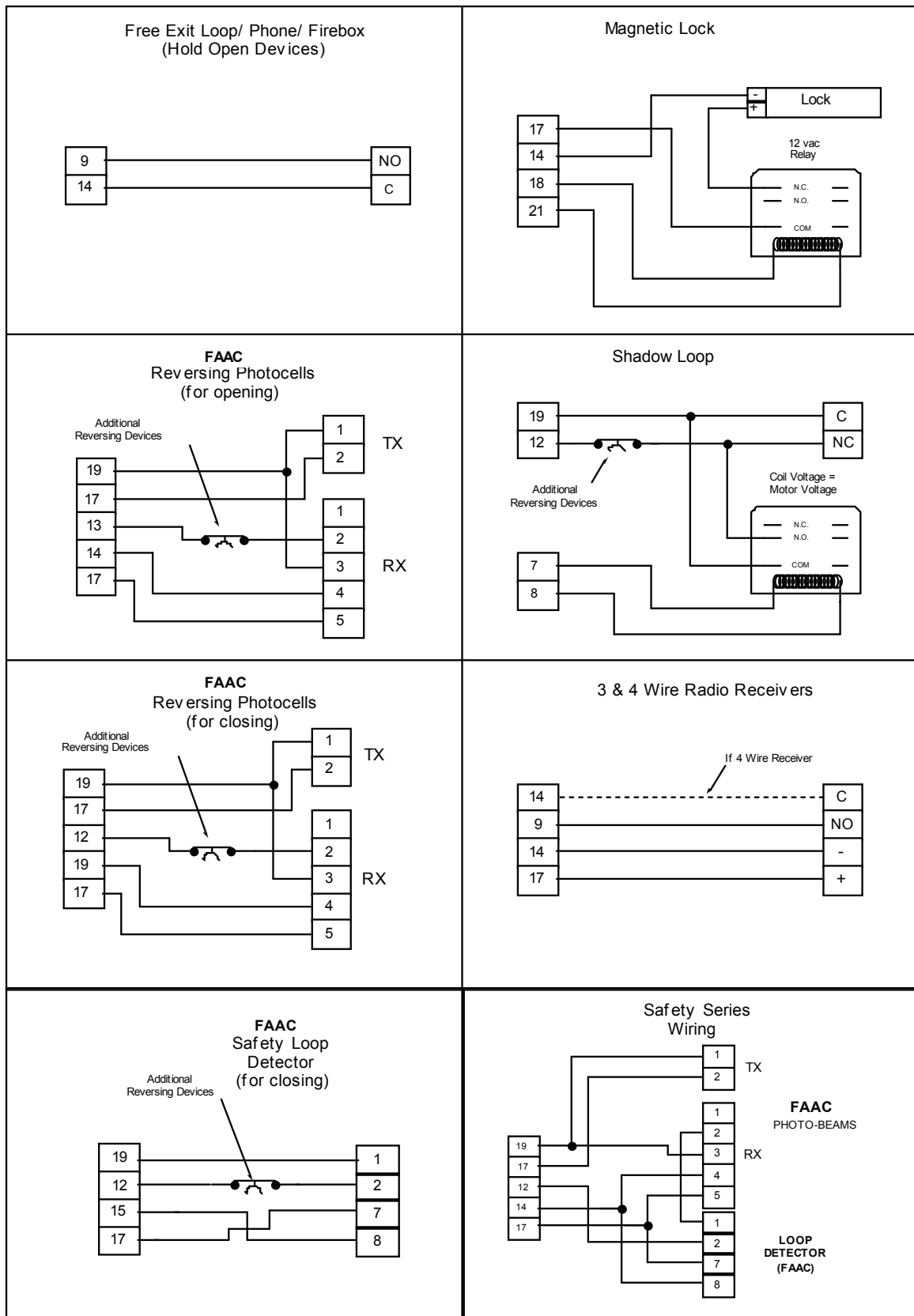
**PAUSE TIME:** The pause time between opening and closing can be adjusted from 0 seconds to 4 minutes. Time is adjusted in one-second increments from 0—59 seconds. When 60 seconds is reached, time is adjusted in 10 second increments up to 4 minutes. i.e. if display shows 2.5, it means 2 minutes and 50 seconds.

**LEAF DELAY:** You may choose to delay one leaf on closing for overlapping gate leaves. Be sure the operator on the leaf for delayed closing is connected to Motor 1. On opening, the leaf connected to Motor 2 is delayed 2.5 sec.

**NOTE:** If an opening leaf delay is desired, it must be enabled in the Advance Programming. However, if enabled, you cannot *adjust* this opening delay of the operator connected to Motor 2.

The closing leaf-delay time is adjustable from 0 to 4 minutes.

**NOTE:** If the opening/closing time is set at less than the leaf delay time, the delayed leaf closes at the end of the closing time.



NO = Normally Open, NC = Normally Closed, C = Common, TX = Transmitter, RX = Receiver

Figure 17. Common Accessories wired to 455 D Control Panel

## PROGRAMMING

To program the automated system, the "Programming Mode" must be accessed.

Programming is split into two parts: BASIC and ADVANCED.

### BASIC PROGRAMMING

To access BASIC PROGRAMMING, press the "F" key.

- If you press it (and hold it down), the display shows the name of the first function.
- If you release the key, the display shows the value of the function that can be modified with keys + and —.
- If you press and hold down the "F" key again (and hold it down), the display shows the name of the next function, etc.
- When you reach the last function, press "F" to exit the program, and the display resumes showing the status of the inputs.

The table on the right shows the sequence of functions accessible in BASIC PROGRAMMING.

### ADVANCED PROGRAMMING

To access ADVANCED PROGRAMMING, press the "F" key and, as you hold it down, press the "+" key:

- If you release the "+", the display indicates the name of the first function.
- If you release the "F" key, too, the display shows the value of the function that can be modified with keys "+" and "—".
- If you press the "F" key (and hold it down), the display shows 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 the "F" key to exit the program, and the display resumes showing the status of the inputs.

The table on page 21 shows the sequence of functions accessible in ADVANCED PROGRAMMING.

### PROGRAM BUTTONS

**+**  
**LEFT**

**-**  
**MIDDLE**



**F**  
**RIGHT**

## BASIC PROGRAMMING



| Display | Function   | Default |
|---------|--|---------|
| LO      | <b>OPERATING LOGICS</b><br>A = Automatic (Timer to Close)<br>E = Semi Automatic<br>S = Security<br>EP = (Semi-Automatic) Step by Step<br>B = Manned, Pulsed<br>C = Manned, constant  | E       |
| PA      | <b>PAUSE TIME</b><br>This is the time between open and closing and is adjustable from 0 to 4 min. This is only true in "A" Mode. (see pause time description)  | 0       |
| F1      | <b>FORCE/TORQUE MOTOR 1</b><br>This adjusts the force / torque that motor 1 is applying to the gate leaf. Setting is 0 to 50.*   | 25      |
| F2      | <b>FORCE/TORQUE MOTOR 2</b><br>This adjusts the force / torque that motor 2 is applying to the gate leaf. Setting is 0 to 50.*   | 25      |
| cd      | <b>CLOSING LEAF DELAY</b><br>Delays the closing of operator wired into motor one outputs. Adjustable from 0 to 4 minutes (Same as pause time)  | 0       |
| EL      | <b>MOTOR RUN TIME</b><br>This enables where you choose from "simple" learning or "complete" learning of the motor run time. See page 10 & 11 for complete details.<br><br>Simple Learning  ≈ 1 s.<br><br>Complete Learning  > 3 s. |         |
| In      | <b>EXIT PROGRAMMING</b><br>Exit from programming and return to display of inputs status.   |         |

\* With Hydraulic operators the Force/Torque must be set to the maximum setting of 50.

| <b>ADVANCED PROGRAMMING</b><br> +  |   |         |
|--|---|---------|
| Display  | Function  | Default |
| bo   | <b>MAXIMUM TORQUE AT INITIAL THRUST:</b> The motors operate at maximum torque (ignoring the torque setting) at start of movement. Useful for heavy leaves.<br>Y = Enable<br>No = Disabled | no      |
| cs   | <b>LAST STROKE AT CLOSING:</b> The motors are activated at full speed for 1s to facilitate locking of the electric lock.<br>Y = Enable<br>No = Disabled                                   | no      |
| rs   | <b>REVERSING STROKE:</b> Before opening, while the gate is closed, the motors thrust to close for 2 s thus facilitating release of the electric lock.<br>Y = Enable<br>No = Disabled      | no      |
| od   | <b>LEAF 2 OPENING DELAY (2s):</b> Enables delayed start of leaf 2, avoiding interference between leaves.<br>Y = Enable<br>No = Disabled   | no      |
| fs   | <b>FAIL SAFE:</b> If this function is activated, it enables a function test of the photocells before any gate movement.<br>Y = Enable<br>No = Disabled                                    | no      |
| pf   | <b>PRE FLASHING (5s):</b> 5s before start of movement.<br>Y = Enable<br>No = Disabled   | no      |
| el   | <b>ELECTRIC LOCK ON LEAF 2:</b> For using the electric lock on leaf 2 instead of on leaf 1.<br>Y = Enable<br>No = Disabled  | no      |

|    |  |    |
|----|--|----|
| ph | <b>INDICATOR-LIGHT:</b><br>If 0 is selected, the output functions as a standard indicator-light (lit at opening and pause, flashing at closing, and off when gate closed). Time can be adjusted from 0 to 59s in 1s increments, and from 1.0 to 4.1 min. in 10s steps.<br>0 = Standard Indicator-Light<br>From 1 to 4.1 = Timed Output | 0  |
| rd | <b>CLOSING PHOTOCELLS REVERSE AT RELEASE:</b> Enable this function if you want the closing photocells to stop the gate and reverse it after the beam is cleared. Default setting is immediate reverse.<br>Y = Enable<br>No = Disabled  | no |
| sp | <b>A.D.M.A.P. FUNCTION:</b><br>If this function is enabled, the safety devices to comply with French standard NFP 25/362.<br>Y = Enable<br>No = Disabled   | no |
| rs | <b>ASSISTANCE REQUEST (COMBINED WITH NEXT FUNCTION):</b> If activated, at the end of countdown (settable with the next function, i.e. "Cycle programming") it effects 8s of pre-flashing at every Open pulse (job request). Can be useful for setting scheduled maintenance jobs.<br>Y = Enable<br>No = Disabled                       | no |
| nc | <b>CYCLE PROGRAMMING:</b><br>For setting count down of system operation cycles. Settable (in thousands) from 0 to 99 thousand cycles. The displayed value is updated as cycles proceed. This function can be used to check use of the board or to exploit the "Assistance Request" function.   | 0  |
| ec | <b>EXTRA WORK TIME:</b><br>When operating, if reversing occurs, and if the leaf does not reach its end contact point, you can activate this function to increase work time.<br>Y = ACTIVE<br>No = DISABLED   | no |
| in | <b>EXIT PROGRAMMING:</b><br>Exit from programming.   |    |



## LEARNING OF OPERATING TIMES

**WARNING:** During the learning procedure, the safety devices are disabled! Therefore, any and all traffic must be avoided in the path of the gate leaf(s).

**NOTE:** Programming must start with the gate(s) in the closed position.

Opening/closing time is established by the learning procedure which varies slightly according to whether you are or are not using Gatecoders.

## LEARNING OF NORMAL TIMES

Normal learning (i.e. without Gatecoders) can be done in two different ways:

### SIMPLE LEARNING (WITHOUT SLOW DOWN)

Close the gates, enter "BASIC PROGRAMMING", select the TIME LEARNING function and press the + push-button for 1 second the display begins flashing and the leaves begin the opening movement.

Wait for the leaves to reach the opening positive stop and then supply an OPEN A command after the desired motor run time has been reached (by push-button or radio control) to stop the movement: the leaves stop and the display stops flashing. One more command given will close the gate.

The procedure has ended and the gate is ready to operate.

### COMPLETE LEARNING (WITH SLOW DOWN)

#### NOTES:

- If you do not wish to slow the gate operator (s) down, wait for the gate to reach its positive stop and supply two (2) consecutive open commands (within 1 second).
- If only one gate operator (1) is used, you must go through the entire programming procedure, as if you were programming for two gate operators (2). When the operator has finished opening, supply 5 open commands until the gate operator begins to close, and then resume normal operations.

Close the gates, enter "BASIC PROGRAMMING", select the TIME LEARNING function and press the + push-button for more than 3 seconds: the display begins flashing and leaf 1 begins opening. The following functions can be commanded by the OPEN A (by push-button wired to terminals 9 and 14, or radio control):

- When gate operator (1) reaches the position that you want it to slow down, an open command must be given to start the slow down phase.
- When gate operator (1) reaches the positive stop and the desired motor run time has been reached, an open command must be given to shut the motor off. At this point gate operator (2) will automatically start to open.
- When gate operator (2) reaches the position that you want it to slow down, an open command must be given to start the slow down phase.
- When gate operator (2) reaches the positive stop and the desired motor run time has been reached, an open command must be given to shut the motor off. At this point gate operator (2) will automatically start to close.
- When gate operator (2) reaches the position that you want it to slow down, an open command must be given to start the slow down phase.
- When gate operator (2) reaches the positive stop and the desired motor run time has been reached, an open command must be given to shut the motor off. At this point gate operator (1) will automatically start to close.
- When gate operator (1) reaches the position that you want it to slow down, an open command must be given to start the slow down phase.
- When gate operator (1) reaches the positive stop and the desired motor run time has been reached, an open command must be given to shut the motor off.

The display stops flashing and the gate is ready for normal operation.

## LEARNING TIMES WITH GATECODER

Learning with the Gatecoder can be done in two different ways:

### SIMPLE LEARNING

Close the gates, enter "Basic Programming", select the TIME LEARNING function and press the + push-button for 1 second: the display begins flashing and the leaves begin the opening movement.

The movement stops automatically when the opening positive stop is reached and the display stops flashing.



The procedure has ended and the gate is ready to operate, using default slow down automatically set by the control panel.

## COMPLETE LEARNING

### NOTES:

- If only one gate operator (1) is used, you must go through the entire programming procedure, as if you were programming a gate operator (2). When the gate operator (1) has finished opening, supply 5 open commands until the gate operator begins to close, and then resume normal operations.

Close the gates, enter "BASIC PROGRAMMING", select the TIME LEARNING function and press the + push-button for more than 3 seconds: the display begins flashing and leaf 1 begins opening movement. The following functions can be commanded by the OPEN A command (by radio control or key push-button):

- When gate operator (1) reaches the position that you want it to slow down, an open command must be given to start the slow down phase. When the gate operator reaches its positive stop, the operator will automatically shut off.
- An open command must be given to start opening gate operator (2).
- When gate operator (2) reaches the position that you want it to slow down, an open command must be given to start the slow down phase. When the gate operator reaches its positive stop, the operator will automatically shut off.
- An open command must be given to start closing gate operator (2).

- When gate operator (2) reaches the position that you want it to slow down, an open command must be given to start the slow down phase. When the gate operator reaches its positive stop, the operator will automatically shut off.
- An open command must be given to start closing gate operator (1).
- When gate operator (1) reaches the position that you want it to slow down, an open command must be given to start the slow down phase. When the gate operator reaches its positive stop, the operator will automatically shut off.

The display stops flashing and the gate is ready for normal operation.

### NOTES:

- The open command to slow down the gate should be given before the gate reaches the positive stop to prevent the gate from hitting the stop at full speed. The positive stop could be mistaken for an obstacle and then upon hitting it, the gate(s) would automatically reverse on contact.

## AUTOMATED SYSTEM TEST

When you have finished programming, check if the system is operating correctly.

Most important of all, check that the force is adequately adjusted and that the safety devices are operating correctly.

If pressure adjustments on hydraulic operators are not set before programming. It may need to be reprogrammed for desired results.

**A (Automatic) Logic (455 D)**

| Gate Status | Open A   | Open B  | Stop                             | Opening Reversing Device(s)                                  | Closing Reversing Device(s)                                   | Warning Light |
|-------------|--|---|----------------------------------|--|---|---------------|
| Closed      | Opens both leaves and closes them after pause time | Opens single leaf connected to Motor 1 and closes it after pause time | No effect                        | No effect  | No effect   | Off           |
| Opening     | No effect  | No effect   | Stops                            | Stops; gate closes when reversing device no longer triggered | No effect   | On            |
| Opened      | Interrupts the pause time                          | Interrupts the pause time   | Stops                            | No effect  | Gate remains open until reversing devices no longer triggered | On            |
| Closing     | Opens both leaves                                  | Opens leaf  | Stops                            | No effect  | Depends on DIP switch 4                                       | Flashes       |
| Stopped     | Closes the leaves                                  | Closes the leaf   | No effect (opening is inhibited) | No effect  | No effect (opening is inhibited)                              | On            |

**S (Security) Logic (455 D)**

| Gate Status | Open A   | Open B  | Stop                             | Opening Reversing Device(s)                                  | Closing Reversing Device(s)                                   | Warning Light |
|-------------|--|---|----------------------------------|--|---|---------------|
| Closed      | Opens both leaves and closes them after pause time | Opens single leaf connected to Motor 1 and closes it after pause time | No effect                        | No effect  | No effect   | Off           |
| Opening     | Closes both leaves                                 | Closes leaf   | Stops                            | Stops; gate closes when reversing device no longer triggered | No effect   | On            |
| Opened      | Closes both leaves                                 | Closes leaf   | Stops                            | No effect  | Gate remains open until reversing devices no longer triggered | On            |
| Closing     | Opens both leave                                   | Opens leaf  | Stops                            | No effect  | Depends on DIP switch 4                                       | Flashes       |
| Stopped     | Closes the leaves                                  | Closes the leaf   | No effect (opening is inhibited) | No effect  | No effect (opening is inhibited)                              | On            |

**B (Manned, Pulsed) Logic (455 D)**

| Gate Status | Open A                 | Open B                  | Stop      | Opening Reversing Device(s) | Closing Reversing Device(s) | Warning Light |
|-------------|------------------------|-------------------------|-----------|-----------------------------|-----------------------------|---------------|
| Closed      | Opens 1 or both leaves | No effect               | No effect | No effect                   | No effect                   | Off           |
| Opening     | No effect              | No effect               | Stops     | No effect                   | Stops                       | On            |
| Opened      | No effect              | Closes 1 or both leaves | No effect | No effect                   | No effect                   | On            |
| Closing     | No effect              | No effect               | Stops     | Stops                       | No effect                   | Flashes       |
| Stopped     | Opens 1 or both leaves | Closes 1 or both leaves | No effect | No effect                   | No effect                   | On            |

### E (Semi-automatic) Logic (455 D)

| Gate Status    | Open A             | Open B                                 | Stop                             | Opening Reversing Device(s)                                  | Closing Reversing Device(s)      | Warning Light |
|----------------|--------------------|--|----------------------------------|--|----------------------------------|---------------|
| <b>Closed</b>  | Opens both leaves  | Opens single leaf connected to Motor 1 | No effect                        | No effect  | No effect                        | Off           |
| <b>Opening</b> | Stops              | Stops                                  | Stops                            | Stops; gate closes when reversing device no longer triggered | No effect                        | On            |
| <b>Opened</b>  | Closes both leaves | Closes leaf                            | Stops                            | No effect  | No effect (opening is inhibited) | On            |
| <b>Closing</b> | Closes both leaves | Closes leaf                            | Stops                            | No effect (opening is inhibited)                             | Depends on DIP switch 4          | Flashes       |
| <b>Stopped</b> | Closes the leaves  | Closes the leaf                        | No effect (opening is inhibited) | No effect  | No effect (opening is inhibited) | On            |

### EP (Semi-automatic, Step by Step) Logic (455 D)

| Gate Status    | Open A                        | Open B                                 | Stop                             | Opening Reversing Device(s)                                  | Closing Reversing Device(s)      | Warning Light |
|----------------|-------------------------------|--|----------------------------------|--|----------------------------------|---------------|
| <b>Closed</b>  | Opens both leaves             | Opens single leaf connected to Motor 1 | No effect (opening is inhibited) | No effect (opening is inhibited)                             | No effect (opening is inhibited) | Off           |
| <b>Opening</b> | Stops                         | Stops                                  | Stops                            | Stops; gate closes when reversing device no longer triggered | No effect                        | On            |
| <b>Opened</b>  | Closes both leaves            | Closes leaf                            | Stops                            | No effect  | No effect (opening is inhibited) | On            |
| <b>Closing</b> | Stops                         | Stops                                  | Stops                            | No effect (opening is inhibited)                             | Depends on DIP switch 4          | Flashes       |
| <b>Stopped</b> | Gate leaves reverse direction | Gate leaf reverses direction           | No effect (opening is inhibited) | No effect (opening is inhibited)                             | No effect (opening is inhibited) | On            |

### C (Manned and Constant) Logic (455 D)

| Gate Status    | Open A                 | Open B                  | Stop      | Opening Reversing Device(s) | Closing Reversing Devices(s) | Warning Light |
|----------------|------------------------|-------------------------|-----------|-----------------------------|------------------------------|---------------|
| <b>Closed</b>  | Opens 1 or both leaves | No effect               | No effect | No effect                   | No effect                    | Off           |
| <b>Opening</b> | No effect              | No effect               | Stops     | No effect                   | Stops                        | On            |
| <b>Opened</b>  | No effect              | Closes 1 or both leaves | No effect | No effect                   | No effect                    | On            |
| <b>Closing</b> | No effect              | No effect               | Stops     | Stops                       | No effect                    | Flashes       |
| <b>Stopped</b> | Opens 1 or both leaves | Closes 1 or both leaves | No effect | No effect                   | No effect                    | On            |

# MAINTENANCE

## THE 412 OPERATOR

The FAAC 412 Operator requires no maintenance. Periodically inspect the operator, however, to ensure continued proper operation.

## THE 455 D CONTROL PANEL

Keep the Control Panel free from spider webs, insects, etc. Otherwise the Control Panel requires no maintenance.

# SAFETY IN GATE DESIGN

- A gate is a potential traffic hazard, so it is important that you locate the gate far enough away from the road to eliminate the potential of traffic getting backed up. This distance is affected by the size of the gate, how often it is used, and how fast the gate operates.
- The operator you choose to install on your gate must be designed for the type and size of your gate and for the frequency with which you use the operator.
- Your gate must be properly installed and must work freely in both directions *before* the automatic operator is installed.
- An automatic operator should be installed on the inside of the property/fence line. Do not install the operator on the public side of the property/fence line.
- Outward swinging gates with automatic operators should not open into a public area.
- Pedestrians should not use a vehicular gate system. Prevent such inappropriate use by installing separate gates for pedestrians.
- The operating controls for an automatic gate must be secured to prevent the unauthorized use of those controls.
- The controls for an automatic gate should be located far enough from the gate so that a user cannot accidentally touch the gate when operating the controls.
- Exposed, reachable pinch points on a gate are potentially hazardous and must be eliminated or guarded.
- It is extremely unsafe to compensate for a damaged gate by over tightening a clutch or increasing hydraulic pressure.
- An automatic gate operator should not be installed on a gate if people can reach or extend their arms or legs through the gate. Such gates should be guarded or screened to

# TROUBLESHOOTING

**WARNING!** Before you do any work on the control panel,  
be sure to turn off the main power.

**NOTE:** Any control panel specific information in the following applies to the 455 D control panel only.

## **PROBLEM: THE GATE DOES NOT RESPOND TO AN ACTIVATING SIGNAL.**

### **SOLUTION:**

You should have at least one operator wired to terminals 1,2 and 3.

Be sure that you have the motor start capacitors wired in terminals 2 and 3, 5 and 6 with the directional leads.

Be sure that the torque/force setting is at the maximum setting of 50 in programming for hydraulic operations.

Verify that the LEDs FSWOP, FSWCL, and the STOP are illuminated. If they are not illuminated, be sure that you have closed circuits in the stop and reversing inputs.

Verify that your activating device works properly. OP\_A should illuminate when you signal the gate to open. If OP\_A does not illuminate when you signal the gate, then the problem may be in your activating device. Short across terminals 9 and 14. If the short causes the gate to open, then the problem is in the activating device. Repair or replace the device.

## **PROBLEM: THE GATE DOESN'T OPEN (OR CLOSE) THOUGH THE MOTORS ARE RUNNING.**

### **SOLUTION:**

Make sure that the motor is running in the right direction, and make sure the Manual Release mechanism has fully engaged the system.

## **PROBLEM: THE GATE OPENS BUT DOES NOT CLOSE.**

### **SOLUTION:**

Make sure you have selected the desired operating mode.

Verify that the reversing devices are working properly. FSWOP and FSWCL should be illuminated except when a reversing device is triggered. If either does not illuminate, then one of your reversing devices is preventing the gate from responding to your signal.

Check your reversing devices.

If no reversing devices are installed, make sure a circuit is installed between appropriate terminals.

## **PROBLEM: THE GATE DOES NOT FULLY OPEN (OR CLOSE).**

### **SOLUTION:**

Check the operator's open/close time selection. You should set a time that is just longer than the rated speed of your model of operator. For example, because the 412 CBAC has a rated opening time of 13 sec, you should set the time at 20 or 25 seconds.

Check to see that there are no obstructions in the path of the gate or that the hinges are not binding.

## **PROBLEM: THE OPERATOR DOESN'T WORK SMOOTHLY AND THE GATE JERKS AS IT OPENS AND CLOSSES.**

### **SOLUTION:**

Make sure the Manual Release Mechanism has fully engaged the worm screw operation of the operator.

Make sure that a flexible gate leaf is not the problem. If the gate leaf flexes, then stiffen the gate or use a slower operator.

# 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

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**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.**