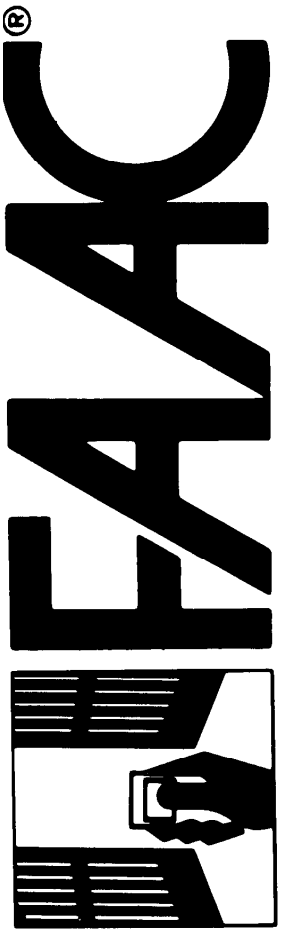
The 412 24v Operator and 424 MPS Control Panel: Installation Manual

Contents



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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.

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.

There are three kinds of safety issues involved with an automatic gate operator: issues arising from the design of the gate, from the installation of the gate and the operator, and from the use of the gate operator. The following information is designed to help you be sure your gate and its operator are well-designed, installed correctly, and used safely.

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 a minimum of 2 warning signs (visible from either side of the gate) that indicate the following:
    - The gate is automatic and could move at any time, posing a serious risk of entrapment.
    - Children should not be allowed to operate the gate or play in the gate area.
    - The gate should be operated only when it is visible to the operator and the when the area is free of people and obstructions.
6. It is extremely unsafe to compensate for a damaged gate by overtightening a clutch or increasing hydraulic pressure.
7. Devices such as reversing edges and photocells 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			
Class II: Commercial/General Access Vehicular Gate Operator			
400	640	Continuous duty	• Apartment buildings
620			• Very public access
Class III: Industrial/Limited Access Vehicular Gate Operator			
400	640	Continuous duty	• No public access
620			
Class IV: Restricted Access Vehicular Gate Operator			
620	640	Continuous duty	• Prison rated security

Technical Data

The 412 Low Voltage Operator

Parameter	Measure
Voltage required, VAC	22 VAC, +6% -10%, 50-60 Hz
Duty type	Residential duty
Maximum duty cycle	50 cycles/ hr
Maximum leaf length, ft (m)	14 (4.3)
Maximum leaf weight, lb (kg)	500 (225)
Maximum leaf swing, deg	110
Thrust and traction force, lb (N)	562.5 (2500)
Stroke, in. (cm)	11 3/8 (29)
Rod speed , in./sec (cm/sec)	5/8 (1.6)
Thermal cut out, deg F (deg C)	284 (140)
Operator dimensions, l × w × h, in. (cm)	39 5/16 × 3 3/4 × 7 9/16 (99.8 × 9.5 × 19.2)
Operator weight, lb (kg)	14.3 (6.5)
Current draw, A	3
Maximum amperage draw for accessories, mA	500

The Control Panel

The 412 low voltage operator must be installed with the 424 MPS control panel.

The 424 MPS control panel allows you to set these parameters:

- The sensitivity of the electronic clutch
- The operating logic (A or EP mode)
- The pause time
- How the gate responds to multiple activation signals
- The number of operators
- The reversing stroke function
- The behavior of triggered reversing devices
- The leaf delay for overlapping leaves

Power source: The 424 MPS requires 22VAC. A 40VA, Class 2 plug in transformer is provided with the system.

Batteries: Two 12 volt, 7.2 Amp/hour, maintenance free batteries are provided with the system. They should be connected in series to the 424 MPS to provide 24vdc to the control panel during normal operation and act as a source of power in the event of a loss of AC power.

Fuses:

Fuse	Protects
F1 = 3.15Amp, 250V	Accessory output
F2 = 10Amp, 250V	Motor
F3 = 3.15Amp, 250V	Logic

Operating logics available: A and EP.

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- 14" x 16" fiberglass enclosure with 424 MPS control panel. Power input terminals, a power disconnect switch, a 110v receptacle, and a test button will be installed on the backplate. Two 12v batteries and a plug in transformer will also be included in the enclosure.

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 cylinder 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 End caps
   - 2 Plastic inserts for the protective cover
   - 2 Manual Release keys
   - 2 Plugs for covering the Manual Release keyhole
   - 8 Snap rings
   - 4 Screws for attaching the cover to the operator
   - 4 Pins for attaching the operator to the mounting brackets (each requires 2 snap rings)

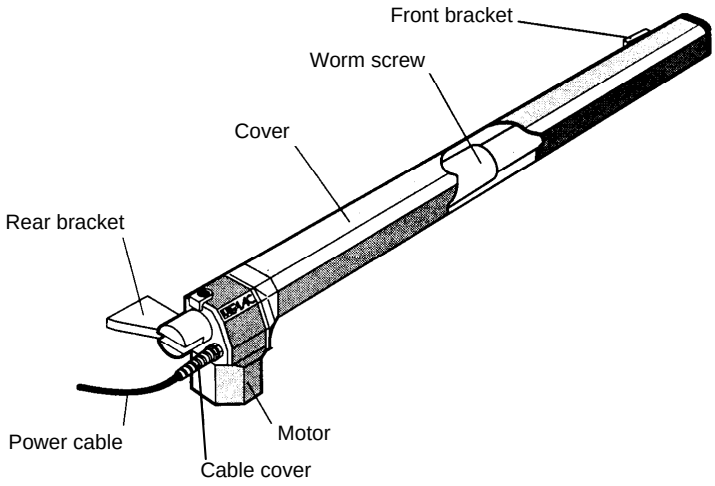


Figure 1. Parts of the 412 Compact Operator (SX model is shown)

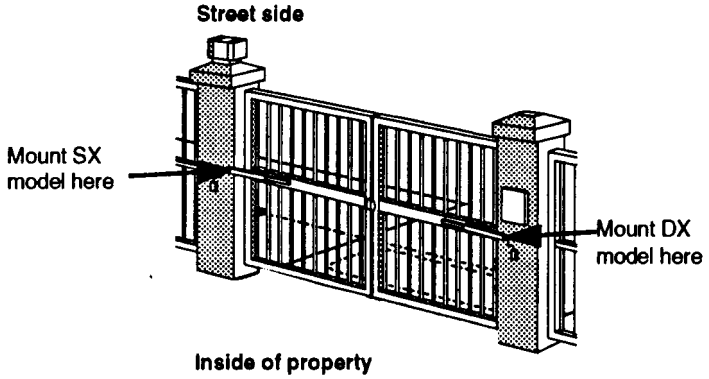


Figure 2. Mount the proper model (SX or DX) on the gate leaf whether the gate swings inward or outward.

The 412 Low Voltage 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 6 ft (1.8 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:

- The gate face is solid.
- 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. Each of them is designed for either the right or left gate leaf: If the hinge is on the left as you face the gate on the side where the operator will be installed, you want a left or SX version; if the hinge is on the right when you face the gate on the side where the operator will be installed, you want a right or DX version. A kit has one right and one left version (see Figure 2).

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 424 MPS 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. The control panel sets the closing leaf delay, the opening/closing time, the pause time, the torque, the operating logic of the gate system, the function of the reversing stroke (required for some electric locks), and the behavior of triggered reversing devices during the closing phase.

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.

The force of the 412 Operator is controlled by a DIP switch located on the 424 MPS control panel. FAAC recommends that the gate leaf stop if it encounters a force of more than 33 lb (15 kg).

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

Operating Logic

Manual Release Mechanism

The Manual Release mechanism is a built-in release device of the 412 Operator (see Figure 3). 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.

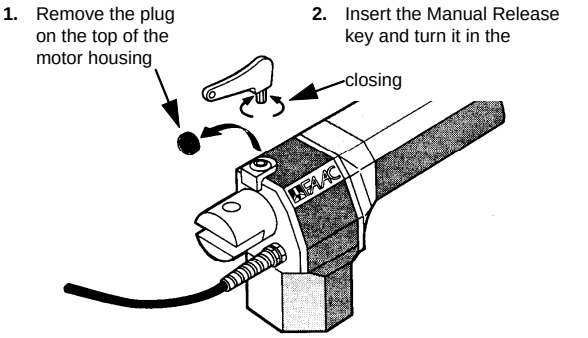


Figure 3. Use the Manual Release key to disengage the 412 Operator from its motor so that you can move the gate leaf by hand in the opening or closing direction

You re-engage the motor of the operator by turning the key one full turn in the direction of the gate's opening. Remove the key and replace the plug.

General Operating Logic

Given the electromechanical nature of the 412 Operator, the behavior of the operator when it encounters an obstacle is always the same *no matter which logical mode of operation has been set on the control panel.*

If an obstruction interrupts the gate's opening, the gate will reverse it's motion and close.

> **WARNING!** The pressure the gate leaf applies to an obstruction is determined by the force adjustment setting.

If an obstacle interrupts the gate's closing, the gate will reverse it's motion and open. This will not inhibit the automatic close if you are using it.

If an obstacle interrupts the gate's travel twice in succession, the gate will stop and wait for another activation input. This will cause the gate to run at slow speed for one cycle to ensure that the obstacle has been removed.

Logical Operating Modes

> **Note**: FAAC strongly recommends the use of reversing devices no matter which logic you choose for your gate operation.

The logics available on the 424 MPS control panel are briefly described below:

- **A (automatic):** The gate opens on command and automatically closes after a pause phase. A second command on opening is ignored; a second command during closing reopens the gate. A maintained signal holds the gate open.
- **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 leaves to stop all motion. A third command then reverses the previous motion of the gate leaves.

Installation Instructions

Installing the 412 Operator involves preparing the gate, installing the operator(s), installing 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:

1. Make sure that the gate structure is solidly built.
2. Make sure that the gate moves smoothly on its hinges without excessive friction by swinging it opened and closed by hand. Lubricate all the gate's moving parts.
3. Provide positive stops for the gate leaves in the opened and closed positions (see Figure 4).

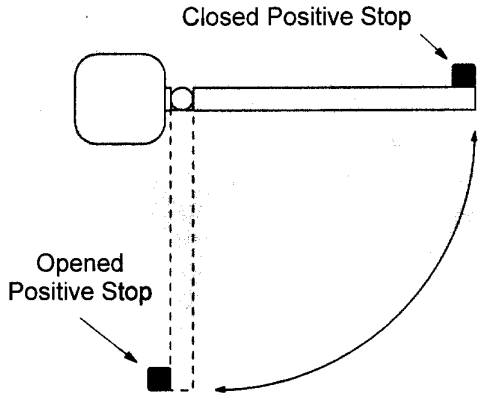


Figure 4. Provide positive stops for the gate leaf

Install the Operator

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

Installing the operator consists of the following steps:

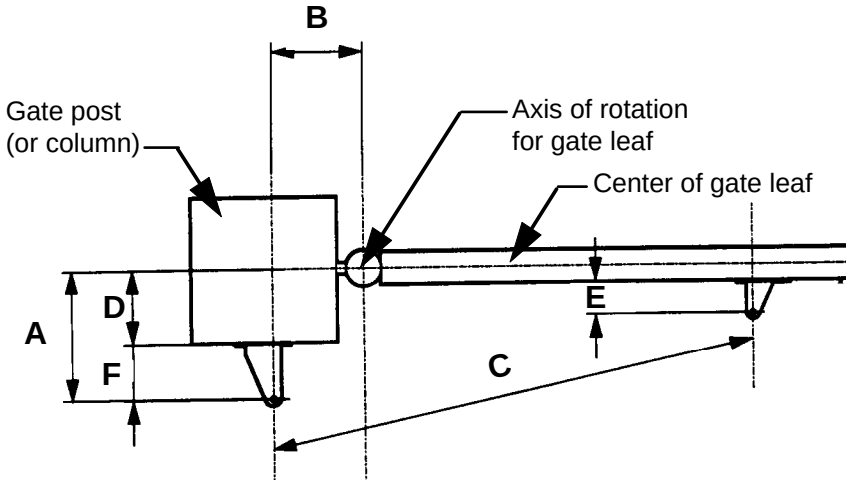
- Attach the rear mounting bracket
- Attach the operator to the rear mounting bracket
- Attach the operator to the front mounting bracket
- Attach the front mounting bracket to the gate leaf
- Attach the Operator cover
- Install the 424 MPS control panel
- Set Operating controls

Attach the Rear Mounting Bracket

Attach the rear mounting bracket according to the dimensions in Figure 5 (inward swing) or Figure 6 (outward swing).

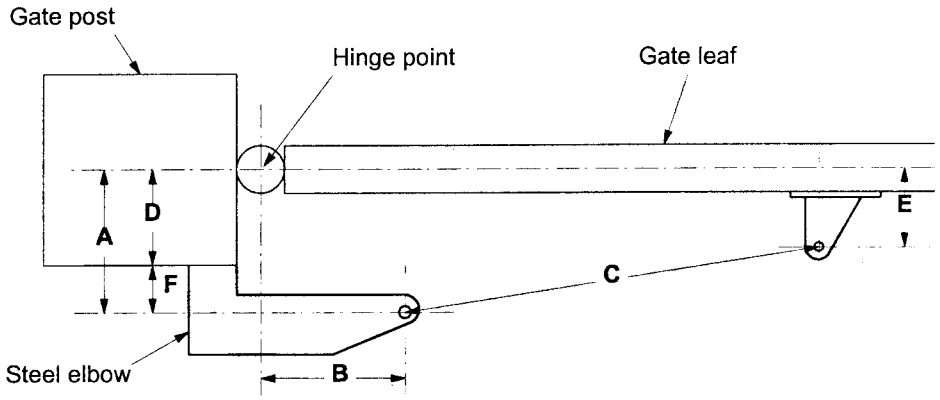
> **WARNING!** You must achieve the A and B dimensions as specified in Figures 5 & 6. Modification of the rear bracket may be necessary to achieve these dimensions (i.e., cutting or extending the bracket provided)

If you have a steel gate post, weld the rear bracket directly to it. If the gate post is made of any other material, attach the optional mounting plate, with lag bolts or anchors, and weld the bracket to it.



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)
WARNING!	**A** and **B** should differ by *no more than* 2 in. Larger differences may *dangerously* alter the speed of operation.	
C	35 1/8 in. (89.2 cm)	
D	4 in. (10 cm)	3 1/8 in. (8 cm)
E	3 1/8 in. (8 cm)	3 1/8 in. (8 cm)
F	***Absolute minimum of 1 3/4 in. (4.5 cm)***	

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)
	WARNING! **A** and **B** should differ by *no more than* 2 in. Larger differences may *dangerously* alter the speed of operation.	
C	24 1/4 in. (62 cm)	
D	4 in. (10 cm)	3 1/8 in. (8 cm)
E	**Absolute minimum of 3 1/8 in. (8 cm)**	
F	**N/A**	

Figure 6. Important mounting dimensions for outward-swinging 412 operators, top view

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 7).

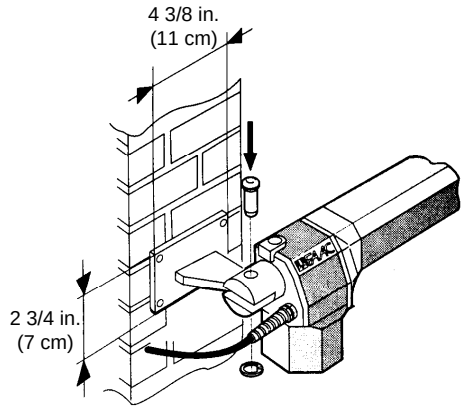


Figure 7. Attach the operator to the rear mounting bracket (an SX version is shown)

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 8).

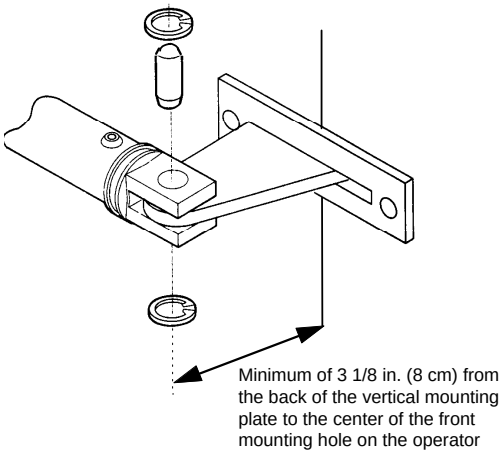


Figure 8. Secure the operator to the front mounting bracket with the short pin and two snap rings

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 by pulling or pushing it. 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 one inch.

Outward swinging: Shorten the worm screw completely and then pull the cylinder out one 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 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 (bottomed out). Remove the operator from the front mounting bracket and push or pull the cylinder in the direction of it opening direction of travel:

Inward swinging: You should be able to push the cylinder in about an inch.

Outward swinging: You should be able to pull the cylinder out about 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 9).

WARNING! Allowing the cylinder to bottom out can seriously damage the operator.

WARNING! Do not weld the front bracket to the gate with the operator still attached. Weld splatter will seriously damage the cylinder.

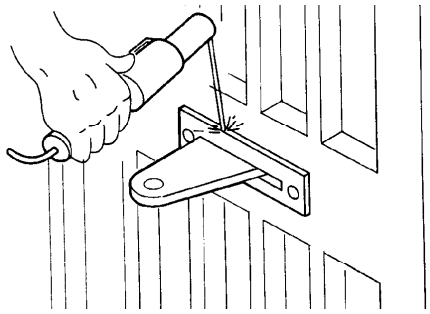


Figure 9. Weld the front mounting bracket into position after insuring the operator is level in the fully closed and fully opened positions

If the worm screw was at the full extent of its travel, try moving the front mounting bracket toward the hinge and retesting. If the cylinder still bottoms out, then the rear mounting dimensions are incorrect (see Figure 5 or 6, 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 10).

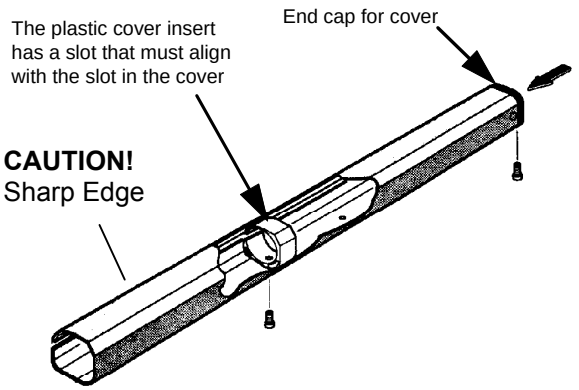


Figure 10. Attach the cover with two screws (SX model shown)

Install the 424 MPS Control Panel

Locate the control panel in the most convenient position possible, considering the movement of the gate. Figure 11 shows the typical layout for a two-leaf gate system.

Installing the control panel consists of the following general steps:

- Connect the Main Power Supply
- Connect the Batteries
- Connect the Operator(s) to the Control Panel
- Connect other Devices
- Set Operating Controls

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

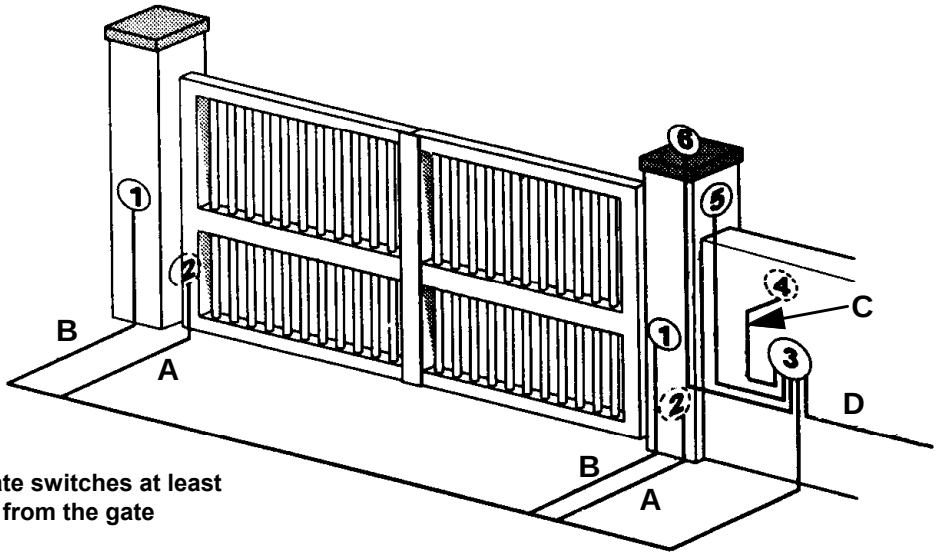
Connect the Main Power Supply

WARNING! Turn the main power off before you make any electrical connections or set any switches inside the control panel box.

When connecting power to the 424 MPS control panel, you have two options (See Figure 12):

1. Run 115 VAC to the control box terminal, plug the power supply transformer (provided) in to the receptacle, and run the 22 VAC to the 424 MPS.
2. Plug the power supply transformer into another 115 VAC outlet and run the 22 VAC to the 424 MPS in the control box.

The installer is responsible for insuring that the power supply transformer (provided) is used. Whether you plug it into the duplex receptacle in the control box, or use another receptacle, be sure that it is connected to a dedicated circuit protected by a circuit breaker. All wiring should conform to applicable electrical codes, and all wiring and fittings should be weatherproof and/or suitable for burial.



Gate Elements

1	412 Operators: **Note**: Each requires a junction box
2	Photocells
3	424 MPS control panel and enclosure
4	Operation switch (2 or 3 button)
5	Radio receiver
6	Warning light

Wire Gauges for Given Voltage

A	4 × 18 AWG for accessories
B	2 × 14 AWG for the operators
C	4 × 18 AWG for the activating devices
D	3 × 14 AWG up to 410 ft for the main power

Figure 11. The layout of a sample gate system

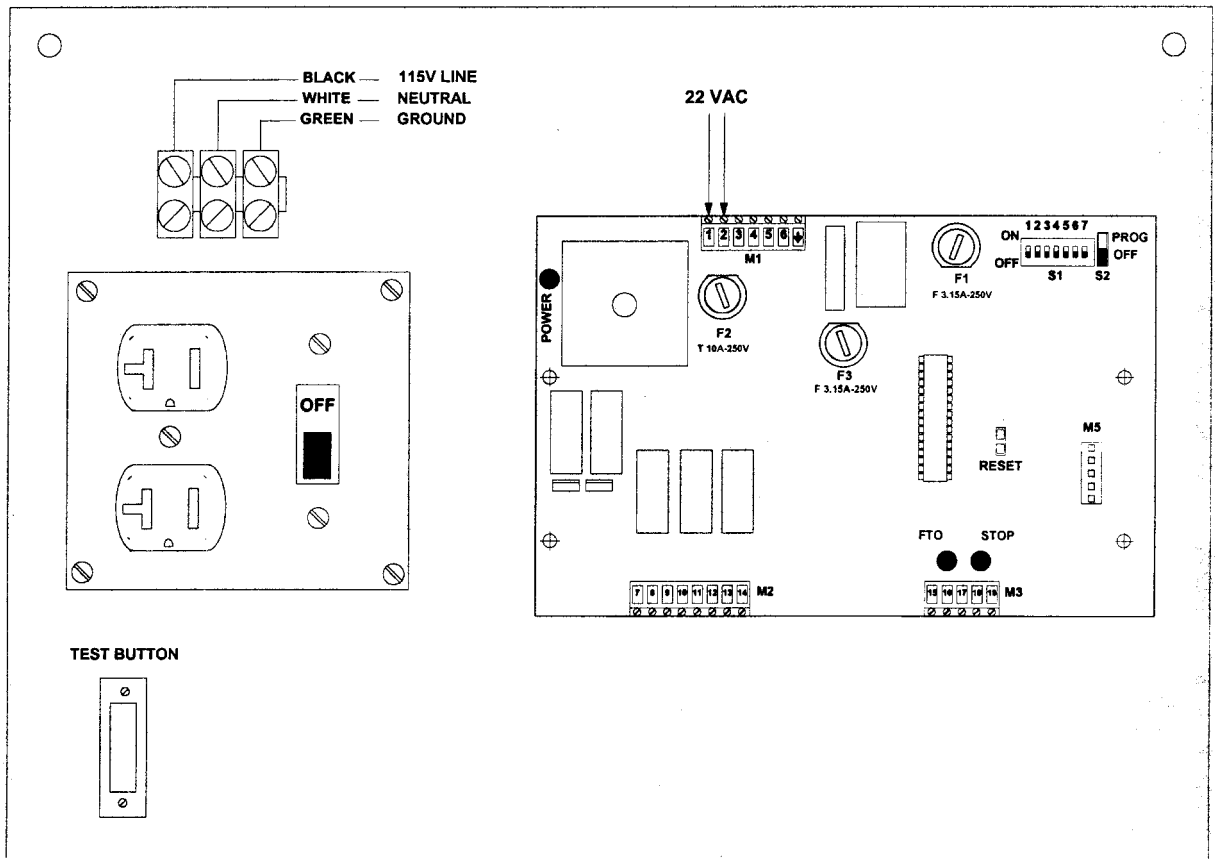


Figure 12. The 424 MPS control box

Connect the Batteries

WARNING! Turn the main power off before you make any electrical connections or set any switches inside the control panel box.

WARNING! The control panel will not function unless the batteries are connected.

Connect the two 12 volt, 7 amp hour batteries in series to terminals 3 and 4 on the M1 terminal block. (See Figure 14)

The batteries will provide back up power in the event that the AC power supply fails. When fully charged, the batteries can provide power for up to 50 cycles depending on gate size, wind load, force setting, etc.

Accessory Power

WARNING! Turn the main power off before you make any electrical connections or set any switches inside the control panel box.

Terminals 5 and 6 on the M1 terminal block provide a 24 volt dc output for accessories. Terminal 5 is positive and terminal 6 is negative. Maximum output is 500mA.

Connect the Operator(s) to the Control Panel

WARNING! Turn the main power off before you make any electrical connections or set any switches inside the control panel box.

Using a Junction Box

Connecting your operator(s) to the control panel may require the use of one or more junction boxes. Whether you need 0, 1, or 2 U.L. Listed junction boxes depends on your gate design (refer to Figure 13).

If any operator is more than 2 ft away from the U.L. Listed control panel enclosure, the connection must be made inside a junction box. Use a U. L. Listed cord grip where the operator cord enters the junction box; use conduit between the junction box and the enclosure.

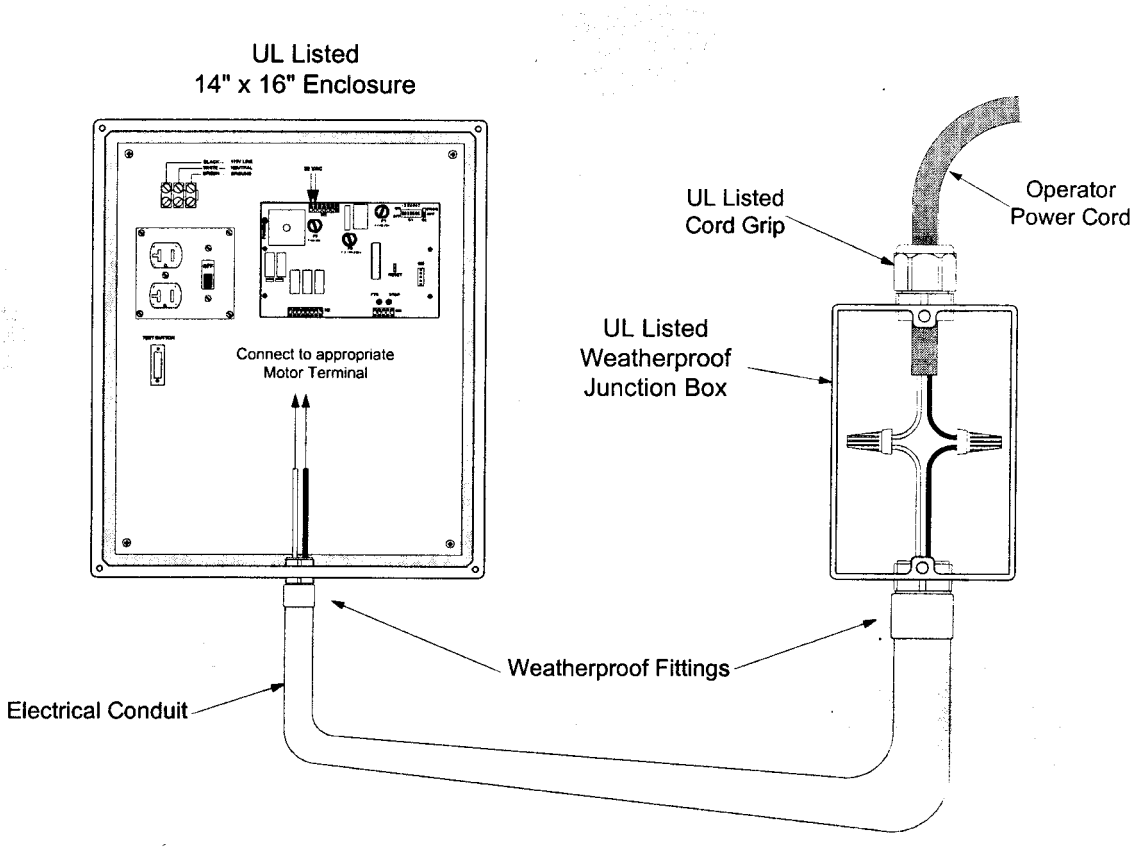


Figure 13. Wiring detail of the 412 operator to the 424 MPS

Connecting the Operator(s)

If your gate system has one operator, connect the brown and blue wires from your operator to the terminals 7 and 8 in terminal block M2 for Motor 1.

If your gate system has two operators, connect the second operator to terminals 9 and 10 in terminal block M2 for Motor 2.

> **Note**: If you want to delay the closing of one gate leaf in a two-leaf gate design, be sure to connect it's operator to Motor 1 (terminals 7 and 8).

Connect Other Devices

> **WARNING**! Turn the main power off before you make any electrical connections or set any switches inside the control panel box.

Electric Lock

If you are using the FAAC Electric Lock connect it to terminals 11 and 12 on the M2 terminal block. These terminals provide 24vdc to release a lock when the gate begins to open. If you have any problems with the lock releasing due to back pressure, it may be necessary to utilize the reversing stroke feature by turning DIP switch 5 on.

Flashlight

Terminals 12 and 13 provide a 24vdc output (15W max) that may be helpful during the programming stages. During programming the output will flash every ½ second during opening and every 1-½ seconds during closing. If you are in the automatic mode, upon reaching the open stop, the output will remain on for 5 seconds to inform you that the gate will close automatically. It will also flash for up to 10 seconds if the gate is open and a safety is triggered.

Warning Light

Terminals 12 and 14 provide a 24vdc output (3W max) for a warning light. The light is off when the gate is closed, and comes on during the opening, open, and closing of the gate.

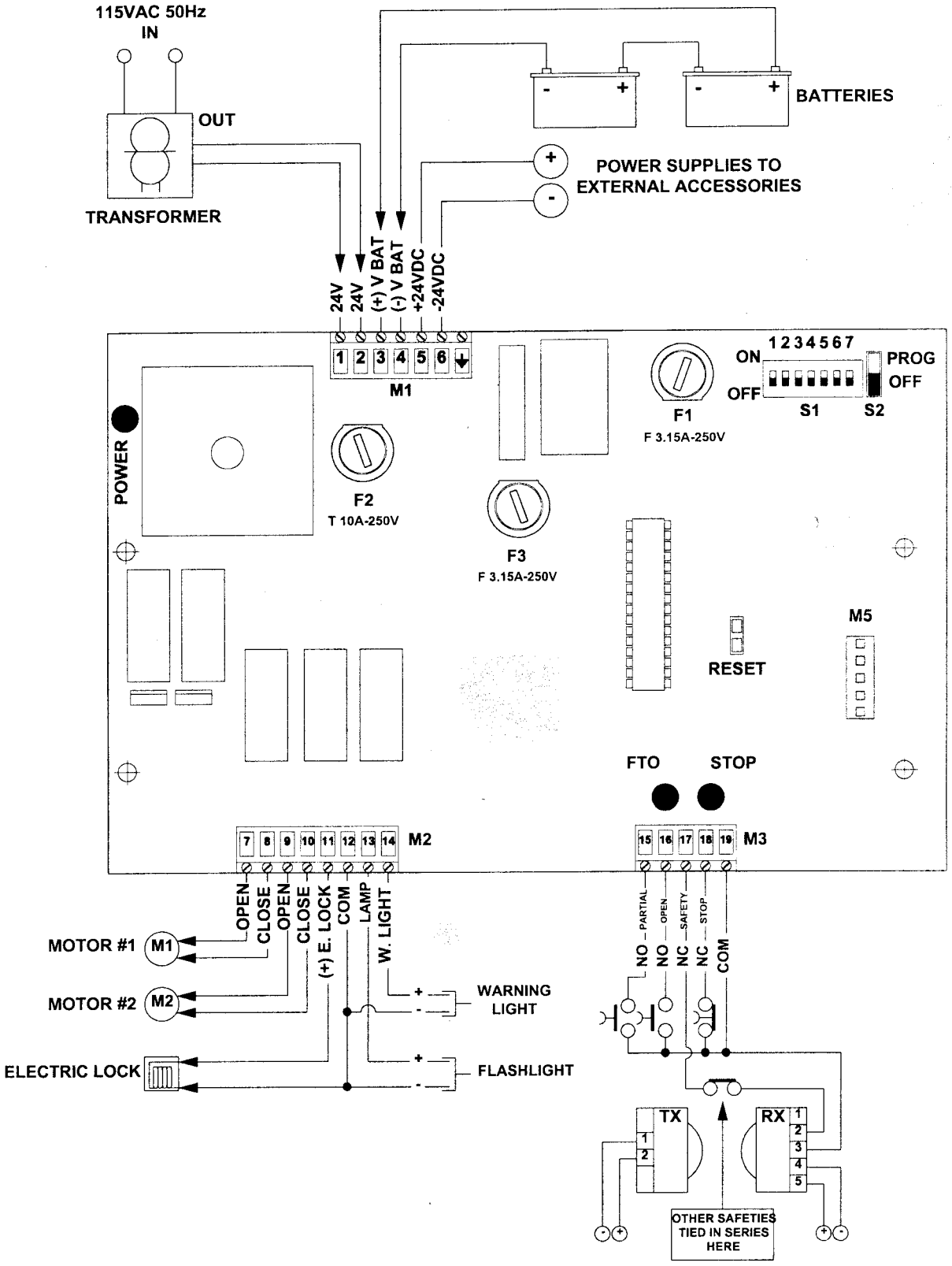


Figure 14. The 424 MPS layout and wiring diagram

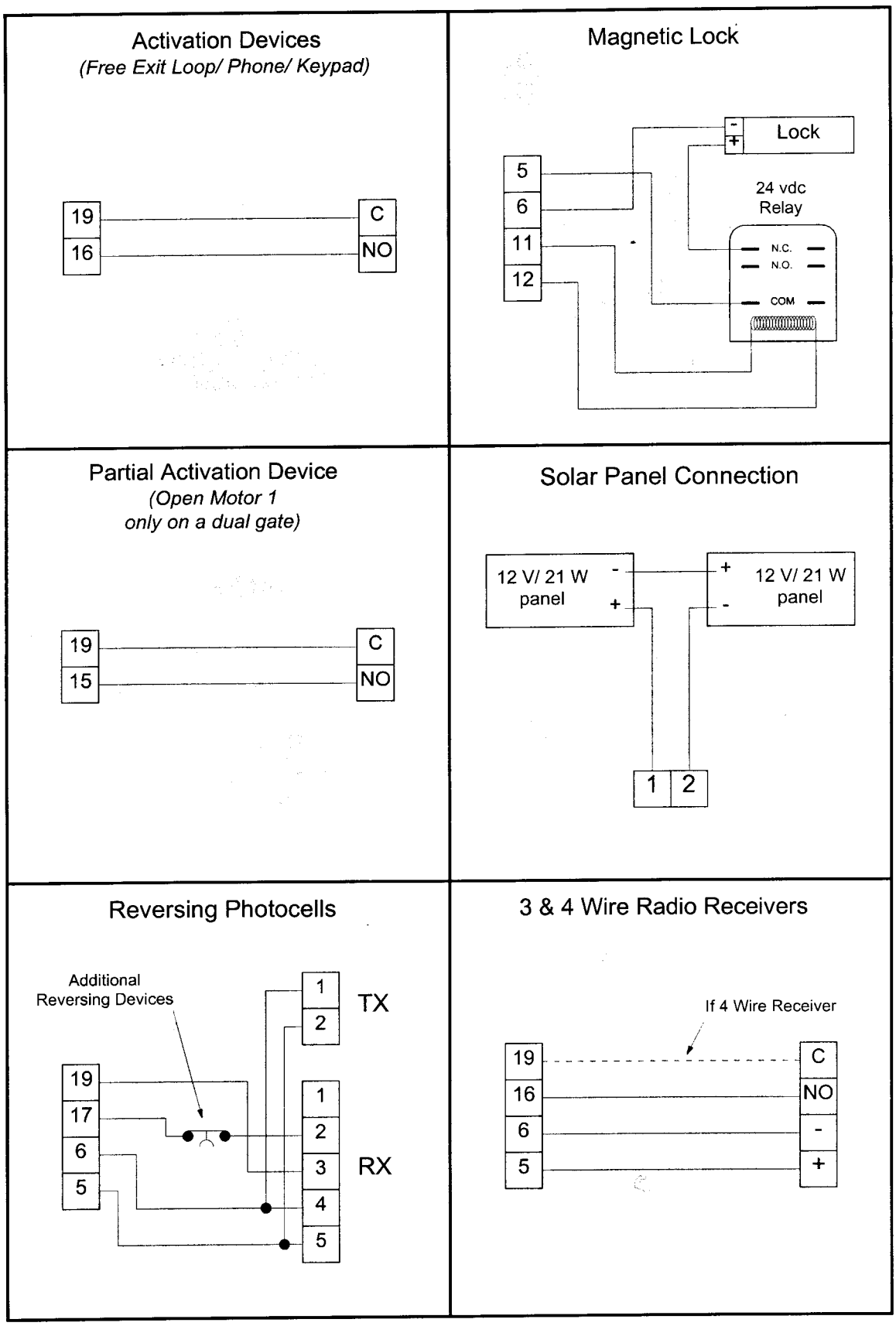


Figure 15. Common accessories wired to the 424 MPS

Activation Devices

The activating devices for your gate must have normally open (N.O.) contacts. Connect the devices to terminals 16 and 19. Multiple activation devices should be connected in parallel.

> **Note:** The way that the control panel responds to an input from an activating device depends on how DIP switches 2 and 3 are set.

If you have a dual gate and want to have a certain activation device open one leaf only, connect it to terminals 15 and 19. Multiple devices should be connected in parallel.

In the automatic mode, a maintained activation signal will hold the gate(s) open until the signal is removed.

FAAC Radio Receiver

If you are using the FAAC plug-in receiver, connect it to the five prong plug labeled "M5" on the 424 MPS control panel. The orientation in which you plug the receiver in is indicated by an outline of the receiver printed on the 424 MPS circuit board.

Reversing Devices

Reversing devices include photobeams and other devices that keep the gate from opening or closing when something or someone is in the way. All of the reversing devices should have contacts of the normally closed (N.C.) type. Multiple reversing devices should be connected in series.

> **Note:** A reversing device is required for a U.L. recognized installation.

> **Note:** The way that the gate responds to an input from a reversing device depends on how DIP switch 4 is set.

FAAC International, Inc., strongly recommends that you install reversing devices. If you choose not to install such devices, then you must install a circuit between terminals 17 and 19.

Stop Devices

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 18 and 19.

> **Note**: If you choose not to install a stop button, you must install a circuit between these terminals for the control panel to work.

The LED Indicators

The three light-emitting diodes (LEDs) on the control panel can be used to check the proper function of the devices you attach to the control panel and indicate whether there is power to the panel.

The POWER LED (DL1) indicates whether power is present on the control panel. The FTO (DL2) and STOP (DL3) LEDs indicate whether the input circuits for reversing and stop are open or closed. If the light is on, the circuit is closed. If the light is off, the circuit is open. See the table below for details.

LED	On	Off
DL1, POWER	Power ON	Power OFF
DL2, FTO	Reversing Device Normal	Reversing Device Triggered
DL3, STOP	Stop Device Normal	Stop Device Triggered

Set Operating Controls

DIP Switches

> **WARNING**! Turn off the main power before you make any electrical connections or set any switches inside the control panel box.

The 424 MPS has a block of seven DIP switches that are used to set how the control panel operates and responds to inputs. Use the following table to set the switches appropriately for your installation.

SW1		**ELECTRONIC CLUTCH**
	ON	Maximum force, minimum sensitivity
	OFF	Minimum force, maximum sensitivity
SW2		**LOGIC**
	ON	A (Gate closes automatically)
	OFF	EP (Command open, command close)
SW3		**RESULT OF ACTIVATION SIGNAL** (If another signal is sent before initial cycle is complete)
	ON	Gate status changes with each signal (open, stop, close, stop, open, etc.) Affects A and EP mode
	OFF	Direction changes with each signal (open, close, open, close, etc.) Only true for EP mode
SW4		**RESULT OF REVERSING SIGNAL**
	ON	Signal affects opening and closing
	OFF	Signal affects closing only
SW5		**REVERSING STROKE**
	ON	Gate runs closed 1.5sec before opening
	OFF	Disabled
SW6		**LEAF DELAY**
	ON	Open = 2 seconds, Close = 12 seconds
	OFF	Open = 2 seconds, Close = 4 seconds
SW7		**NUMBER OF OPERATORS**
	ON	Double gate (two motors)
	OFF	Single gate (one motor)

Programming

Note: The operator(s) will run at slow speed during the programming phase.

Note: The batteries must be connected for the control panel to function during the programming phase.

The 424 MPS features a self-learning function for programming the motor run time, pause time, and deceleration of the 412 Operator(s). Follow the procedure below to complete this function.

1. Manually release the 412 operator(s), move the gate(s) to the halfway position, and reengage the operator(s). See figure 3.
2. Turn the power to the control panel on. Ensure that the power LED (DL1) is illuminated.
3. Turn the S2 switch (located to the right of the other DIP switches) to the PROG (ON) position. See figure 14. If you have a 24v flashlight connected to terminals 12 and 13, it should illuminate at this point.
4. Give the control panel an activation signal with any normally open device connected to terminals 16 and 19 or with the plug in FAAC radios. When the signal is given, the gate(s) should close. Motor 2 should close first, followed shortly by Motor 1.
5. If either gate moves toward the open position, touch the two RESET (JMP1) pins (located between the M5 connector and the microprocessor, see figure 14) with a small screwdriver or piece of wire. This will cause the gates to stop.
6. Disconnect the power to the control panel and reverse the wires of any motor that ran open. Reconnect power and start again at step 1.
7. Once the motor(s) is (are) running toward the close position, it (they) should do so until the closed positive stop(s) is (are) reached.
8. After two seconds, Motor 1 should begin to run open, and after another two seconds, (if you have a dual gate) Motor 2 should run open. It (they) should continue until the opened positive stop(s) is(are) reached.
9. When the gate(s) reach the open position, the control panel begins to count the pause time. Once the desired pause time (time before automatic close) has elapsed, give the panel another activation signal. Motor 2 should begin to close, followed by Motor 1 (time depends on DIP switch 6 setting). The gate(s) should run until the closed positive stop(s) is (are) reached.
10. Programming is now complete. Turn the S2 switch back to the OFF position. If you have the 24v flashlight connected, it should go out at this point.

Electronic Clutch

The 424 MPS control panel features an Electronic Clutch that can sense when the gate(s) have encountered an obstruction. When this happens, the gate(s) reverse direction. Be sure to set DIP switch 1 for your desired force/ sensitivity ratio.

In the event that two obstacles are sensed in succession, the motor(s) will stop. At this point the control panel will require an activation signal which will cause the motor(s) to run open and then close at slow speed to reprogram the location of the opened and closed positive stop(s).

Fuses

Fuse	Protects
F1 = 3.15Amp, 250V	Accessory output
F2 = 10Amp, 250V	Motor
F3 = 3.15Amp, 250V	Logic

Maintenance

The 412 Operator

The FAAC 412 Operator requires no maintenance. Periodically inspect the operator, however, to confirm the suitability of the hardware.

The Control Panel

The control panel requires no maintenance, but every six months you should verify that the torque adjustment setting is appropriate. FAAC recommends that the torque be set so that the gate leaf stops if it encounters a force of more than about 33 lb (15 kg).

Troubleshooting

WARNING! Turn the main power off before you make any electrical connections or set any switches inside the control panel box.

Problem: The gate does not respond to an activating signal.

Solutions: Verify that you have correctly wired the operator to the control panel.

Verify that you have correctly wired the activating device to the control panel.

Check the LED DL3. The LED should be illuminated. If it is not, then the stop device is preventing your gate from opening or closing.

Check fuses F2 (for the motor[s] of the operator[s]) and F1 (for accessories such as activating devices). If necessary, replace a blown fuse.

Verify that your activating device works properly. Use an ohm meter to determine that the contacts are open normally and close when you activate the device.

Problem: The radio controlled opener does not open the gate.

Solutions: Check the light on the front of the remote transmitter. It should illuminate when you signal the gate. If it does not illuminate and if the batteries are okay, repair or replace the transmitter.

Be sure that the radio receiver is plugged in properly.

Be sure that the LED on the receiver illuminates when a signal is given.

Problem: The gate doesn't open (or close) though the motors are running.

Solutions: Make sure that the motor is running in the right direction, and make sure the Manual Release mechanism has fully engaged the worm screw drive.

Problem: The gate opens but does not close.

Solutions: Make sure you have selected the desired operating mode.

Verify that the reversing devices are working properly. The LED DL2 should be illuminated. If it is not illuminated, then one of your reversing devices is preventing the gate from responding to your signal. Check the devices.

Problem: The gate does not fully open (or close).

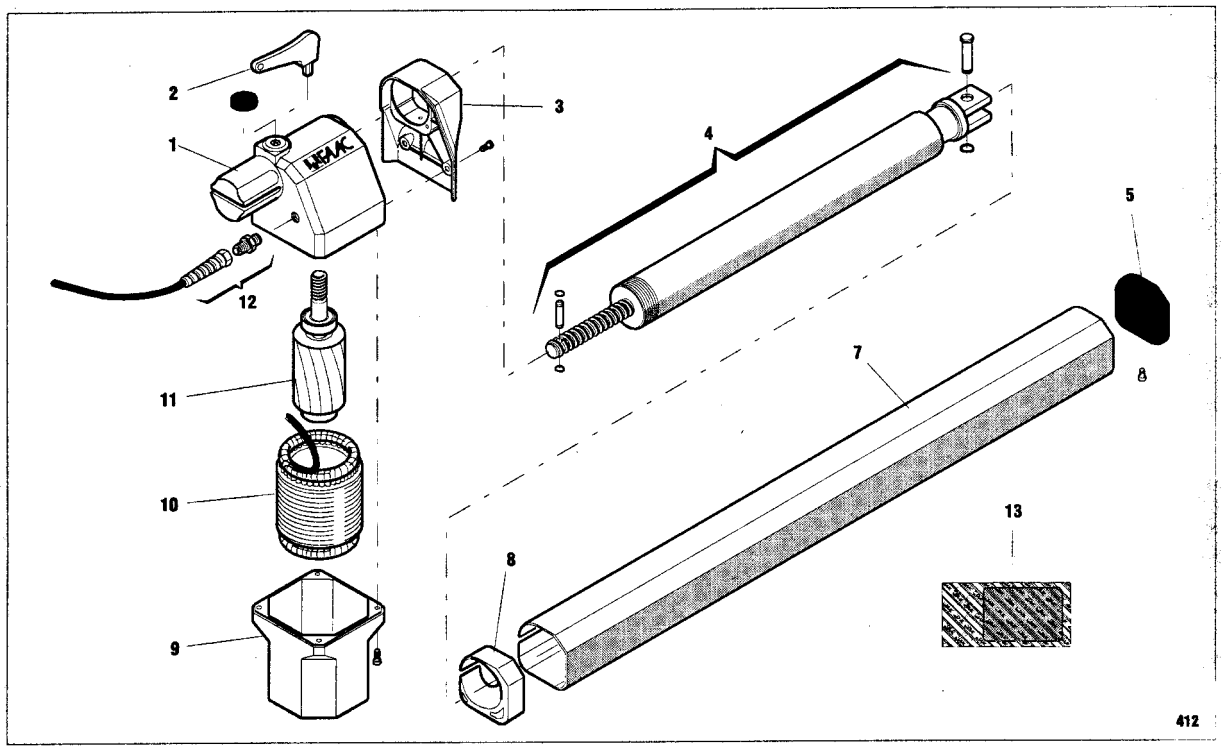
Solutions: Reprogram the control panel.

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 closes.

Solutions: 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.



	Part Number	Description
1	799360	Motor housing, SX top section
1	799359	Motor housing, DX top section
2	713009	Manual release key, 412
3	717110	Flange, protective cover, 412 SX
3	717109	Flange, protective cover, 412 DX
4	736060	Cylinder assembly, 412 slide on
5	727148	End cap, 412 protective cover SX
5	727147	End cap, 412 protective cover DX
6		
7	727216	Protective cover, 412
8	722298	Protective cover support, 412
9	716056	Motor housing, bottom section, 412
10		Motor
11		Rotor
12	710919	Strain relief, 412
13	390009	Skin pack, 412 (1 pack = 2 operators)

Figure 16. 412 Exploded view and parts list

Limited Warranty

To the original purchaser only: FAAC International, Inc., warrants, for twelve (12) 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. or 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. Neither FAAC S.p.A. or FAAC International, Inc., assumes nor authorizes any person to assume for them any other liability in connection with the sale or use of the products of FAAC S.p.A. or FAAC International, Inc. The warranty hereinabove set forth shall not be deemed to cover maintenance parts, including, but not limited to, hydraulic oil, filters, or the like. No agreement to replace or repair shall constitute an admission by FAAC S.p.A. or FAAC International, Inc., of any legal responsibility to effect such replacement, to make such repair, or otherwise. This limited warranty extends only to wholesale customers who buy directly through FAAC International, Inc.'s normal distribution channels. FAAC International, Inc., does not warrant its products to end consumers. 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.

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