

THE 402 OPERATOR AND 450 MPS CONTROL PANEL: INSTALLATION MANUAL

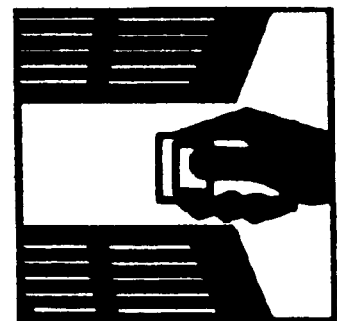
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INTERNATIONAL, INC.



FAAC is an ISO 9001 Certified Company

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.**

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	<ul style="list-style-type: none"> • Home use • Small apartment building, for example, up to 4 units in a building, with limited public access
422	760	
412	400	
620	640	
885		
	Limited duty	
Class II: Commercial/General Access Vehicular Gate Operator		
400	640	<ul style="list-style-type: none"> • Apartment buildings • Very public access
620	885	
	Continuous duty	
Class III: Industrial/Limited Access Vehicular Gate Operator		
400	640	<ul style="list-style-type: none"> • No public access
620	885	
	Continuous duty	
Class IV: Restricted Access Vehicular Gate Operator		
620	640	<ul style="list-style-type: none"> • Prison rated security
885		
	Continuous duty	

TECHNICAL DATA

THE 402 COMPACT OPERATOR

Parameter	402 Operator
Physical dimensions:	
Weight, lb (kg)	14-1/3 (6.5)
Length, in. (mm)	36 (914)
Width ´ height, in. (mm)	3-1/2 ´ 3-1/2 (90 ´ 90)
Motor speed, rpm	1400
90-deg opening time, sec	12
Thrust and traction force, lb (kg)	0-1100
Maximum duty cycle, motor run time	50%
Power voltage required, VAC (frequency, Hz) ¹	115 (50-60) ± 10% or 230, +6 or -10% (50-60) ¹
Current draw, amps	
115 VAC power source	2.4
220 VAC power source	1.2
Operating temperature range, deg F (deg C)	-4 to 131 (-20 to 55)
Thermal cut out, deg F (deg C)	212 (100)
Oil quantity, qt (liter)	1-1/2 (1.4)
Oil type	FAAC XD 220 or Shell/Tellus 15
Gate leaf constraints	
Maximum weight per leaf, lb (kg)	900 (410)
Maximum length per leaf, ft (m)	10 (3)

¹ Your standard 220 VAC power source meets the specification for the required power supply of 230 VAC, +6 or -10%.

THE CONTROL PANEL

The 402 Operator must be installed with a 450 MPS control panel to be a U.L. recognized installation. The 450 MPS can be used to control a single 402 operator or a dual (bi-parting) system. Both the control panel and the operator must use the same power supply voltage.

THE 450 MPS

To determine the voltage requirement of your 450 MPS control panel, refer to the label on the transformer of the control panel:

Label reads: 1450MPSUS = 220 VAC

1450MPSUS115 = 115 VAC

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

UNPACKING THE OPERATOR

When you receive your 402 Compact Operator, complete the following steps.

Inspect the shipping box for physical damage such as leaking oil or 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 (see Figure 1). If you have ordered a kit (a pair of operators), you will have twice the quantity of parts listed below (except where noted), and you will also have a radio receiver and two transmitters.

- 1 Control panel box with control panel inside (only 1 per kit)
- 1 402 Operator unit

- 1 Protective cover for the operator
- 1 End cap or guard cover
- 1 Rear mounting bracket (for post or wall)
- 1 Rear mounting plate (use is optional)
- 1 2 in. (50 mm) operator pin with 1 nut for attachment to rear mounting bracket
- 1 Mounting fork support
- 1 2-3/4 in. (70 mm) operator pin with 1 self-locking nut for attachment to rear flange of operator
- 1 1-1/8 in. (29 mm) pin for fixing the front coupling to the operator's piston rod
- 2 E clips for either end of the pin fixing the front coupling to the operator's piston rod
- 1 Front mounting brackets
- 1 Nameplate (with 2 screws) for covering pressure adjustment screws
- 1 Manual Release key

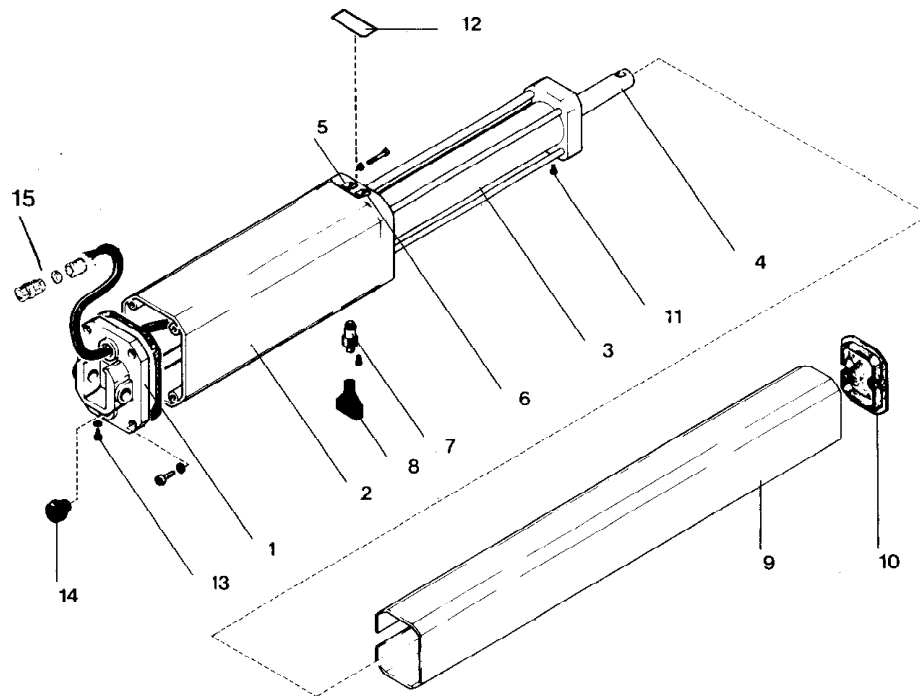


Figure 1. The 402 Compact Operator

- 1 Rear flange
- 2 Operator casing containing pump and motor
- 3 Cylinder body
- 4 Piston rod with hole for attaching to front mounting bracket
- 5 Green screw for adjusting pressure
- 6 Red screw for adjusting pressure
- 7 Manual Release Mechanism
- 8 Manual Release key
- 9 Cover
- 10 Cover end cap
- 11 Cover fixing screw (1 of 2)
- 12 Nameplate secured with screws
- 13 Oil vent screw
- 14 Oil loading cap

THE 402 COMPACT OPERATOR

GENERAL CHARACTERISTICS

The 402 Compact Operator is an automatic, light-duty gate operator it can accommodate a gate leaf up to 10 ft (3m) in length and up to 900 lbs (410 kg) in weight.

Note: The 402 Compact Operators are *not* recommended for use with solid gates.

The self contained 402 operator is an electro-hydraulic unit consisting of an electric motor, a pump, a valve assembly and a hydraulic cylinder, all housed in an anodized aluminum oil reservoir.

All models of the 402 operator have one hydraulic lock. The CBC version is designed to lock when the piston is extended. The CBA version is designed to lock when the piston is retracted.

The hydraulic lock is a service device rather than a security device. Additional external locks are recommended under the following conditions:

- Your gate leaf is 10 ft or longer.
- Your installation site requires tight security.
- Your gate site is subject to vandalism.
- Your gate site is subject to strong or very gusty wind.
- Your gate system has an open-hold-open device.

The electronic control panel is a microprocessor-based controller that accepts a range of product accessories and reversing devices to allow flexibility in designing the gate system. The 450 MPS control panel allows you to set the opening/closing time, a leaf delay for a two-leaf gate system, the operating logic for your gate system, the pause time, the reversing stroke, and the behavior of reversing devices.

For its protection, the single phase, bi-directional electric motor shuts off automatically if its operating temperature reaches 212 deg F (100 deg C). Also for the protection and proper operation of the 402 operator, each gate leaf on which it is installed must have a fixed positive stop in both the open and closed positions.

The 402 Operator also includes a triangular key operated Manual Release Mechanism and two bypass valves which precisely control the force applied to the gate leave(s). The Manual Release Mechanism is a key operated device that disengages or engages the hydraulic system of the 402 Operator. When the hydraulic system is disengaged, you can open and close the gate leaf by hand. Such manual operation of the gate leaf is necessary during installation and useful during power failures.

The two bypass valves located on the top of the

operator needs to be adjusted to meet the safety standards of FAAC International, Inc. The standards state the gate leaf should stop, if it encounters a force greater than 33 lbs. (15 kg). Once the pressures are adjusted, the by pass valve screws are covered so that the pressures are not altered.

Additional reversing devices such as photobeams or reversing edges should be installed to provide more complete safety for people and property.

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.

450 MPS LOGIC MODES

Note: The 450 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 on 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 or closing causes the gate leaves to stop. A third command then closes 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 leaves 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.

A (Automatic) Logic (450 MPS)

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 immediately	Opens leaf immediately	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 (450 MPS)

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 immediately	Closes leaf immediately	Stops	Stops; gate closes when reversing device no longer triggered	No effect	On
Opened	Closes both leaves immediately	Closes leaf immediately	Stops	No effect	Gate remains open until reversing devices no longer triggered	On
Closing	Opens both leave immediately	Opens leaf immediately	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 (450 MPS)

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 (450 MPS)

Gate Status	Open A	Open B	Stop	Opening Reversing Device(s)	Closing Reversing Device(s)	Warning Light
Closed	Opens both leaves	Opens single leaf connected to Motor 1	No effect	No effect	No effect	Off
Opening	Stops	Stops	Stops	Stops; gate closes when reversing device no longer triggered	No effect	On
Opened	Closes both leaves immediately	Closes leaf immediately	Stops	No effect	No effect (opening is inhibited)	On
Closings	Stops	Stops	Stops	No effect (opening is inhibited)	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

EP (Semi-automatic, Step by Step) Logic (450 MPS)

Gate Status	Open A	Open B	Stop	Opening Reversing Device(s)	Closing Reversing Device(s)	Warning Light
Closed	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
Opening	Stops	Stops	Stops	Stops; gate closes when reversing device no longer triggered	No effect	On
Opened	Closes both leaves immediately	Closes leaf immediately	Stops	No effect	No effect (opening is inhibited)	On
Closing	Stops	Stops	Stops	No effect (opening is inhibited)	Depends on DIP switch 4	Flashes
Stopped	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 (450MPS)

Gate Status	Open A	Open B	Stop	Opening Reversing Device(s)	Closing Reversing Devices(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

INSTALLATION INSTRUCTIONS

Installing the 402 Compact Operator involves preparing the gate, installing the operator(s), installing the control panel, and fine-tuning the pressure adjustments on the operator(s).

Note: The following installation instructions assume you are fully capable of installing an operator. This manual does not instruct you in designing a gate, installing a gate, or basic electrical wiring. The installation tasks discussed in this manual are tasks peculiar to the 402 Operator.

PREPARING THE GATE

Before installing the 402 Operator, you need to prepare the gate itself for the operator. Be sure to do the following things:

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

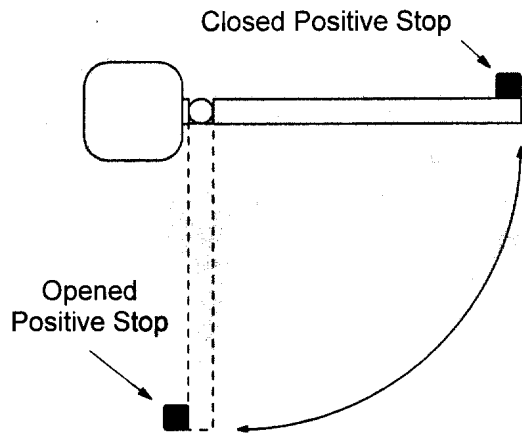


Figure 2. Positive Stops

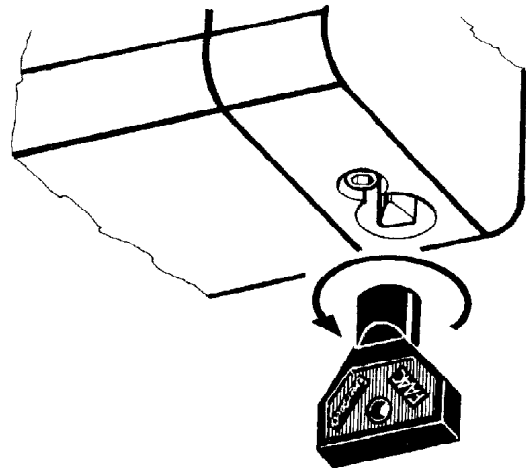
MANUAL RELEASE MECHANISM

Insert the key and turn it counterclockwise one full turn to disengage the operator's hydraulic system (see Figure 3).

You can now move the gate leaf slowly by hand to open or close the gate.

Operating the gate leaf by hand is necessary during installation and is useful during power failures.

You re-engage the hydraulic system by turning the key clockwise one full turn.



Turn the key counterclockwise 1/2 turn to disengage the hydraulic drive

Figure 3. The Manual Release key, bottom view

INSTALLING THE OPERATOR

Installing the model 402 operator consists of the following steps:

1. Attaching the rear mounting bracket
2. Attaching the operator to the rear mounting bracket
3. Attaching the front mounting bracket to the operator
4. Attaching the operator to the gate leaf
5. Adjusting the hydraulic pressures for the operator

ATTACH THE REAR MOUNTING BRACKET

Attach the rear mounting bracket according to the dimensions in Figure 4.

WARNING! You must achieve the A and B dimensions, dimensions as specified in Figure 4. 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.

For an outward swing gate refer to Figure 5.

ATTACH THE MOUNTING HARDWARE

Place the operator so that the red and green pressure adjusting screws face up. Place the mounting fork (hex cut up if you have a nylon rear fork) in the operator's rear flange, secure with the long brass pin and self-locking nut.

Attach the fork assembly to the rear mounting bracket and secure with the short pint, washer, and nut.

Push the front pin through the front mounting bracket then the piston rod to temporarily attach them together.

ATTACH THE FRONT MOUNTING BRACKET TO THE OPERATOR

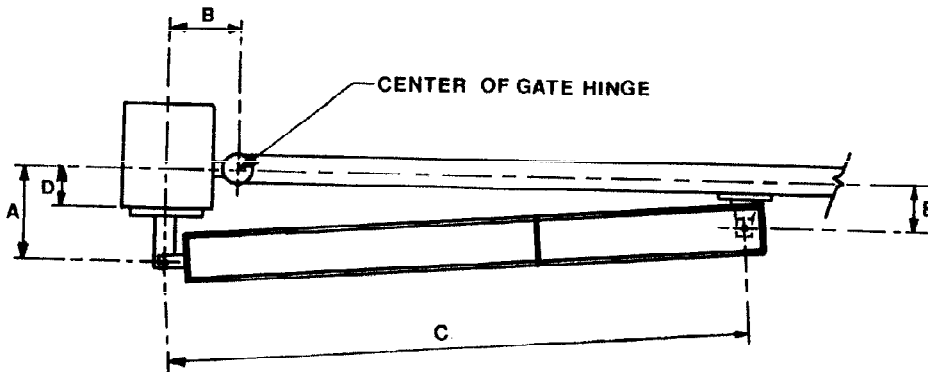
Insert the triangular key over the Manual Release mechanism on the underside of the operator and turn the key counterclockwise one turn.

For inward swing, pull the piston completely out and push it back inward approximately 1/4" (6mm).

For outward swing, push the piston in completely and pull it back out approximately 1/4" (6mm).

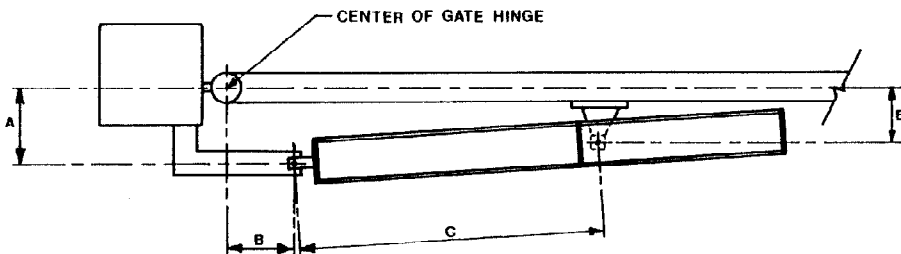
NOTE: Be sure the operator is level and that the gate is against the closed positive stop.

Hold the front mounting bracket flush against the gate, mark the location of the front mounting bracket, remove the operator from the gate. Remove the front mounting bracket from the piston rod.



402 Standard	
A	4-1/2 in. (114 mm)
B	4-1/2 in. (114 mm)
C	35-1/2 in. (902 mm)
D	If greater than 2 in. (50 mm), construct a recess liner.
E	Must be less than A

Figure 4. An inward swinging gate, top view: important mounting dimensions



402 Standard	
A	4-1/2 in. (114 mm)
B	4-1/2 in. (114 mm)
C	26-1/2 in. (673 mm)
E	Must be less than A

Figure 5. An outward swinging gate, top view: important mounting dimensions

NOTE: Clamping the front mounting bracket at the marked location before checking the swing, as instructed below, will ensure proper location of the front mounting bracket.

Bolt or weld the front mounting bracket to the marked location on the gate.

WARNING! Do Not Weld the front mounting bracket with the operator attached. Doing so will seriously damage the operator.

ATTACH THE OPERATOR TO THE GATE

Re-attach the operator to the mounting brackets. Once the operator is mounted and level, remove the vent screw from the bottom of the valve body. Use a 3mm hex wrench.

WARNING! Failure to remove the vent screw may result in erratic operation of the operator or blown seals.

Slowly move the gate open and close.

WARNING! The piston should not bottom out in either direction. Doing so will seriously damage the operator.

Be sure that the gate reaches the positive stop before the piston bottoms out.

After checking the swing of the gate, secure all nuts and bolts.

Once the operator is secure, install the protective cover over the piston of the operator, first insert the two

spacers (items labeled 2 in Figure 6) in the front flange of the operator as shown. The spacers dampen any vibrations to the operator.

Next, slip the cover over the operator. The slit in the cover should face the gate, and the cover should be placed firmly over the rear of the operator cover (item 1 in the figure).

Finally, use the black plastic screws (items 3 and 4) to fix the cover to the operator and the end cap (item 5).

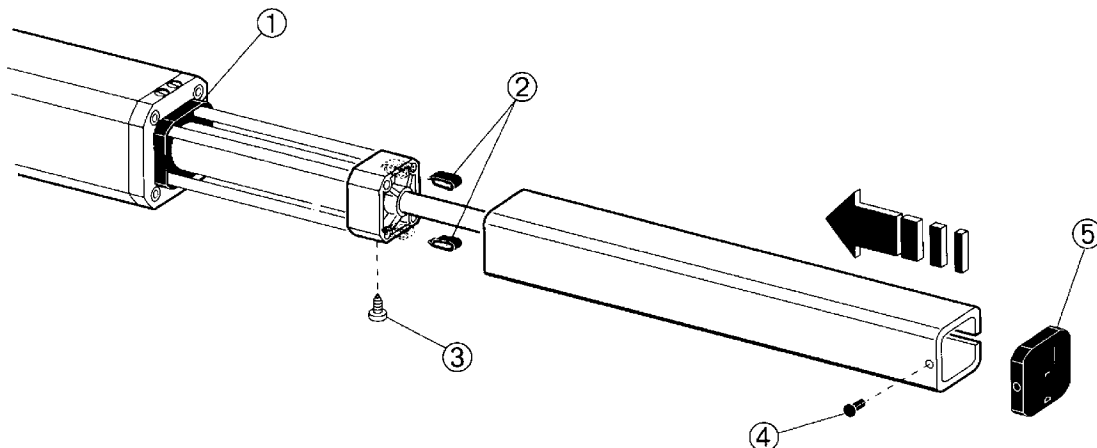


Figure 6. Install the cover for the 402 Operator

INSTALLING THE 450 MPS CONTROL PANEL

Locate the control panel in the most convenient position possible, considering the movement of the gate. Figure 6 shows a basic layout for a two-leaf gate with the 402 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

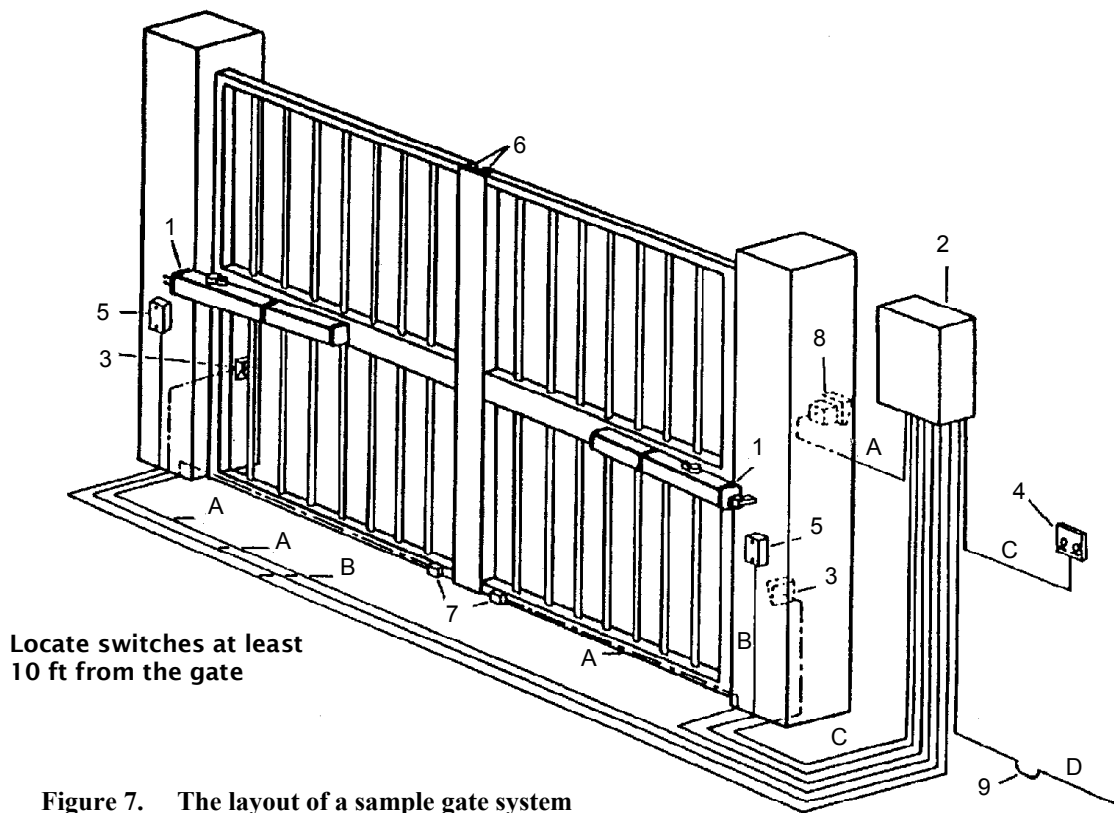


Figure 7. The layout of a sample gate system

- 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	115 VAC
A	2 × 18 AWG	2 × 18 AWG
B	4 × 14 AWG	4 × 14 AWG
C	5 × 18 AWG	5 × 18 AWG
D	4 × 14 AWG up to 414 ft	3 × 14 AWG up to 130 ft 3 × 10 AWG up to 340 ft

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.

Connect the ground to the grounding terminal in block J1 and connect the power wires to the terminals labeled N (neutral) and L (phase).

Wire the main power supply to control panel terminals in block J1 (see Figures 8 and 9). 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.

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

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 terminal).

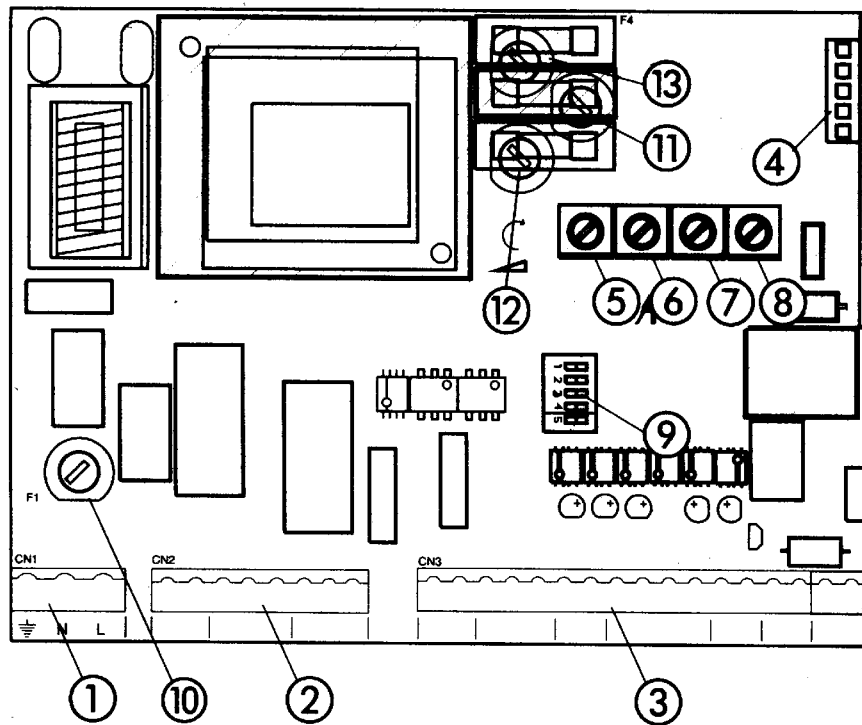
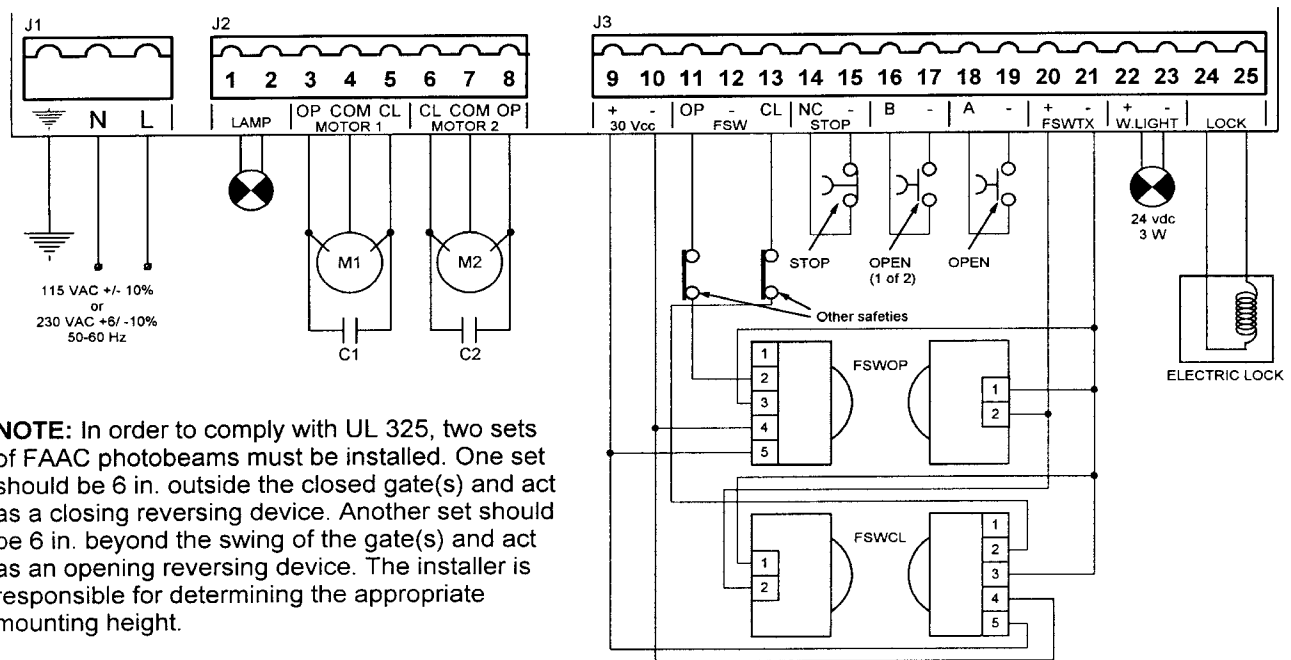


Figure 8. The 450 MPS control panel

		FUSES	220 VAC	115 VAC
1	J1 terminal block for main power supply			
2	J2 terminal block for connecting the operator(s)	10	F1, Main power	5 A 10 A
3	J3 terminal block for low-voltage accessories	11	F2, Accessories	800 mA 800 mA
4	J4 quick connector port	12	F3, Electric lock	1.6 A 1.6 A
5	Pressure adjustment potentiometer	13	F4, Microprocessor	250 mA 250 mA
6	Pause time potentiometer			
7	Potentiometer for adjusting open/close time			
8	Leaf delay potentiometer			
9	DIP switch assembly			



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.

Figure 9. The terminal strip wiring of the 450 MPS

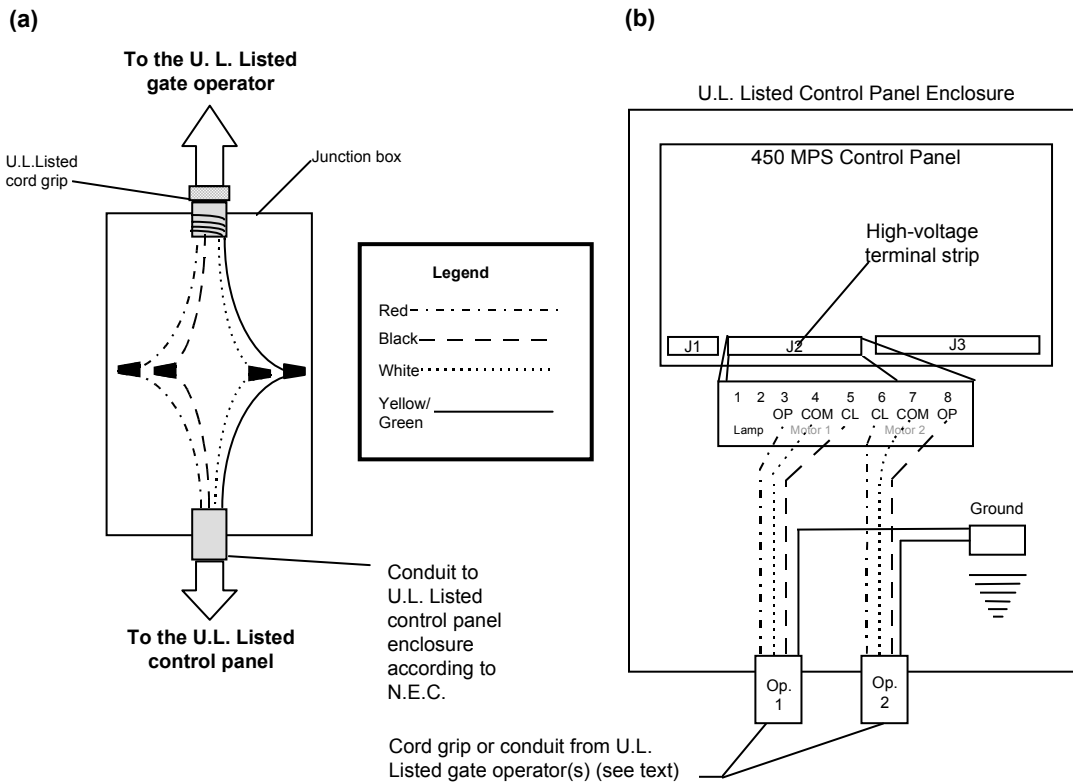


Figure 10. Wiring detail (a) inside the junction box and (b) from the junction box or operator to the high-voltage terminal strip on the 450 MPS control panel

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 10).

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.

CAUTION: The control panel will **NOT** operate without an operator connected to terminals 3, 4, and 5.

If your gate system has one operator, connect the capacitor and the brown and black (or red and black) wires from your operator to the terminals 3 and 5 in block J2 for Motor 1. Connect the blue (or white) wire from the operator to terminal 4 for Motor 1.

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 (terminals 3, 4, and 5).

If your gate system has two operators, connect the second operator to terminals 6, 7, and 8 in block J2 for Motor 2. Connect the second capacitor and the brown and black (or red and black) wires to terminals 6 and 8, and connect the blue (or white) wire from the operator to terminal 7 for Motor 2.

CHECK THE MOTOR'S DIRECTION OF ROTATION

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

To check a motor's direction of rotation, you must have three closed circuits on terminal block J3. Install one circuit between terminals 11 and 21, another circuit between 13 and 21, and another circuit (or stop device) between terminal 14 and 15.

You cannot check the motor's direction of rotation without these circuits (jumpers) or the accessories. When properly prepared for testing, the LEDs DL3, DL4, and DL5 should be illuminated.

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.

You also need to install a normally open activation device across terminals 18 and 19.

Disengage the operator(s) with the Manual Release key, 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).

Turn on the main power and send an activating signal to the operator(s). 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 brown and black (or red and black) wires on terminal block J2 for the operator controlling that leaf. Then you need to recheck the rotation direction again.

If your gate system has two operators, be sure the motor of each rotates in the correct direction.

After having completed your test of the motor's direction of rotation, replace any test circuits you installed (between terminals 11 and 21, between 13 and 21, and between 14 and 15) 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 or set any switches inside the control panel box.

Now you can connect additional reversing and activating devices to the control panel. Refer to Figure 11 for

the general control panel layout, and refer to Figure 9 for the layout of the terminal strip.

POWER SUPPLY FOR ACCESSORIES: You can access a 30 VDC output for supplying power to accessories that require DC voltage through terminals 9 and 10 (located above the label 30 Vcc) on terminal block J3. In most cases, this source can be used to power 24 VDC accessories.

NOTE: The 450 MPS control panel allows a maximum accessory load of 800 mA.

REVERSING DEVICES: Reversing devices include photobeams, 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.

Caution: Failure of a reversing device that operates during opening causes a gate to lock in the closed position and requires the use of the Manual Release.

To wire photobeams, refer to Figure 9 (see FSWOP for opening photobeams, and FSWCL for closing photobeams— wire the photobeams exactly as shown). See Figure 11 for the wiring of a variety of common accessories. In either case, if you have multiple devices, wire them in series.

ACTIVATING DEVICE: The activating device for your gate must have normally open (N.O.) contacts. If you have a dual gate, connect devices to terminals 18 and 19. If you have a dual gate and want a particular device to open only one leaf, connect it to terminals 16 and 17.

DECODER CARD: If you are installing a FAAC radio receiver, a Digicard magnetic card reader, or a Digikey keypad, use the quick-fit connector J4 for the radio receiver or the DS (formerly the MD01) decoder card (see Figure 8).

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

OPEN/HOLD OPEN DEVICE: To open hold the gate open, you must use a latching switch wired to terminals 18 and 19.

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 14 and 15.

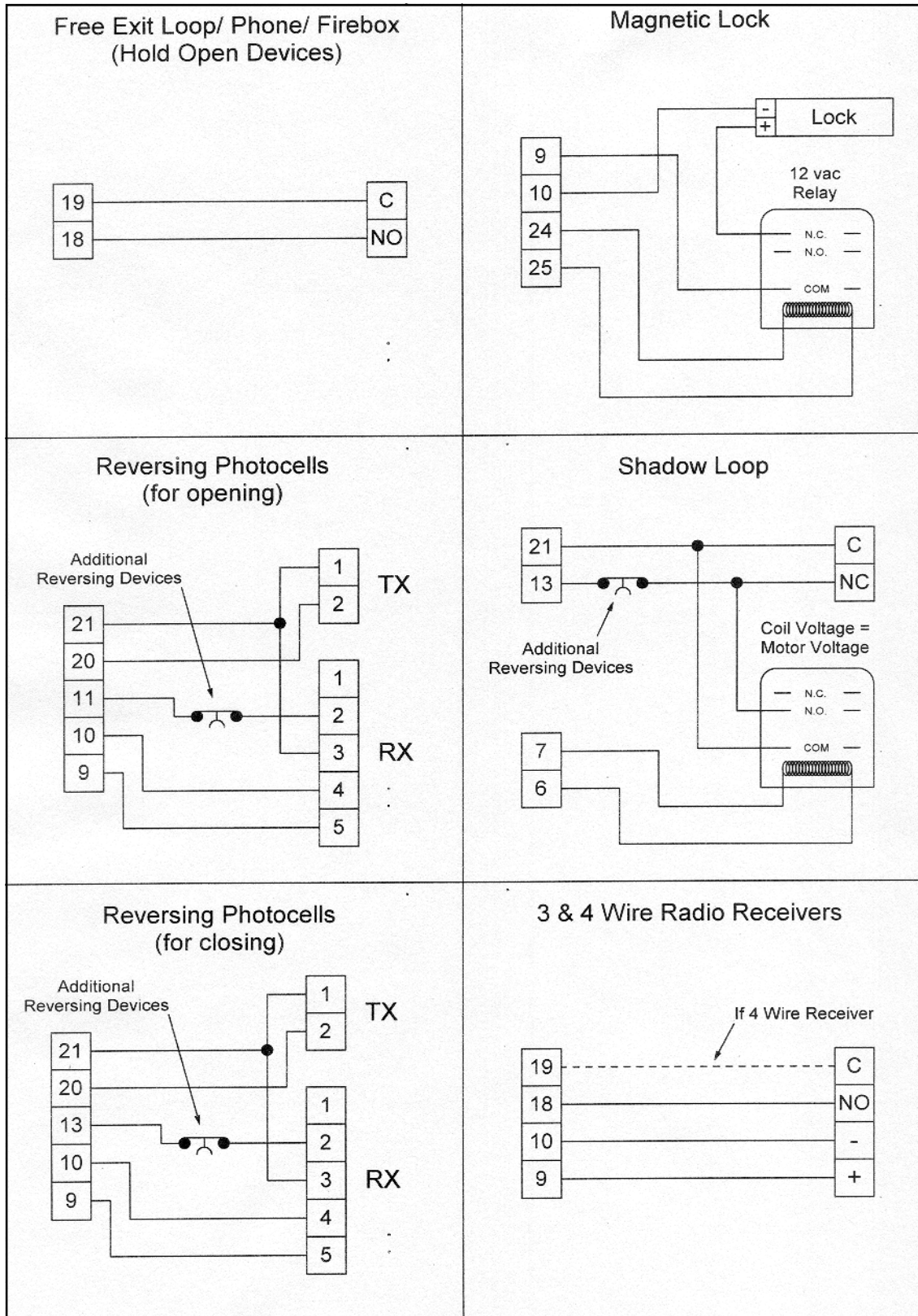
THE LED INDICATORS: The five light-emitting diodes (LEDs) on the control panel can be used to check for the proper functioning of the devices you attach to the control panel. The LED lights are on whenever the contacts are closed across each of the respective terminals.

DL1 and DL2 should illuminate only when an activating signal is sent for 2 and 1 gate leaves, respectively. DL3 should be illuminated except when the stop button is pressed. DL4 and DL5 should be illuminated except when the reversing devices, for 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.

LED	On	Off
DL1, Open 2 leaves	Command active	Command inactive
DL2, Open 1 leaf	Command active	Command inactive
DL3, Stop	Command not active	Command active
DL4, FTSW Open	Opening reversing devices not triggered	Reversing device triggered
DL5, FTSW Close	Closing reversing devices not triggered	Reversing device triggered

ELECTRIC LOCK: Connect your lock to the terminals 24 and 25. The terminals provide 12 VAC that pulses for 4 seconds whenever the gate starts to open. An electric lock can make use of the reversing stroke function controlled by DIP switch 5. A reversing stroke is a short closing phase that allows the electric lock time to disengage itself before the operator starts its opening. Turn DIP switch 5 on only if necessary for your lock to function correctly.

See Figure 11 for the wiring of a magnetic locking device.



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

Figure 11. Wiring diagram showing loop detector

WARNING LIGHT: Connect a warning light to terminals 22 and 23 in the group labeled *W.LIGHT* in terminal block J3. The terminals provide an output voltage of 30 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 off the main power before you make any electrical connections or set any switches inside the control panel box.

You need to set DIP switches and adjust the potentiometers on the control panel for your gate's operation. The 450 MPS Control Panel has 5 DIP switches and 4 potentiometers that control a wide range of functions.

SET DIP SWITCHES

Switches 1, 2, and 3 (Operating Logic): The 450 MPS Control Panel offers six operating modes: A, S, E, EP, B, and C. For more details about the logical modes, refer to the operating modes previously listed in this manual.

Switches 1, 2, and 3 control the operating logic according to the following scheme:

Logic	DIP Switch		
	1	2	3
A	on	off	on
S	on	off	off
E	off	on	off
EP	on	on	off
B	on	on	on
C	off	off	on

Switch 4 (Reversing Device Behavior on Closing): Refer to the operating logic tables earlier in these instructions and to the following table for how to set DIP switch 4.

Gate Behavior During Closing	DIP Switch 4
Gate immediately reverses its direction	off
Gate stops and reverse its direction when reversing device is no longer triggered	on

SWITCH 5 (REVERSING STROKE): Sometimes electric locks require a reversing stroke to disengage the lock. If your gate does not always open because your lock is hanging up, you may want to activate the Reversing Stroke.

Reversing Stroke	DIP Switch 5
Not activated	off
Activated	on

Adjust the Potentiometers

The four potentiometers control the torque, the pause time, the opening/closing time of operation, and the leaf delay on closing.

TORQUE: The torque potentiometer on the 450 MPS **must** be turned all the way clockwise for the 402 Operator. The potentiometer is for the FAAC Model 412, a screwdrive operator. The torque potentiometer cannot be used to adjust the operator's hydraulic operating pressures.

CAUTION: Failure to turn the torque potentiometer to maximum in the clockwise direction jeopardizes the life of the motor of your operator.

WARNING! Adjust the operating pressure on the 402 Operator only by means of the hydraulic bypass valve screws. See pages 12 and 20.

PAUSE TIME: The pause time between opening and closing can be adjusted from 0 to 240 seconds. Turn the potentiometer clockwise to increase the pause time and counterclockwise to decrease the pause time.

OPENING/CLOSING TIME: The opening/closing time is adjustable from 10 to 62 seconds. The approximate opening/closing time for a 90-degree opening is about 12 seconds. Turn the potentiometer clockwise to increase the time and counterclockwise to decrease the time.

For optimal operation, set the time so that the motor remains active for a couple of seconds after the leaf has reached its limit stop for opening and for closing.

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: You cannot *adjust* this opening delay of the operator connected to Motor 2. However, you can turn off the delay by closing the jumper labeled "Leaf Delay Disable".

The closing leaf-delay time is adjustable from 0 to 28 seconds. Turn the potentiometer clockwise to increase the time and counterclockwise to decrease the time.

Note: If one-leaf gate designs, be sure to set the potentiometer for leaf delay to its minimum (0 seconds).

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.

MAINTENANCE

THE 402 OPERATOR

The FAAC recommended maintenance schedule varies according to the frequency of use of the operators, whether lightly used operators (once or twice an hour) or heavily used operators (many cycles per hour), operators used in a humid, salt air climate should follow the heavy duty use schedule.

CHECK THE OIL.

To check the oil level correctly, remove the operator from the gate leaf. With the piston rod completely retracted and pointing to the ground, remove the rear flange and look at the oil level in the casing of the operator. The oil level should be about 3/4 in. (20 mm) from the top edge of the operator casing. If the operator is too full, it will bleed oil out the vent hole.

Light duty use: every 12 mo

Heavy duty use: every 6 mo

CHANGE THE OIL.

Light duty use: every 48 mo or 4 yrs

Heavy duty use: every 24 mo or 2 yrs

CHECK THE PRESSURE SETTINGS.

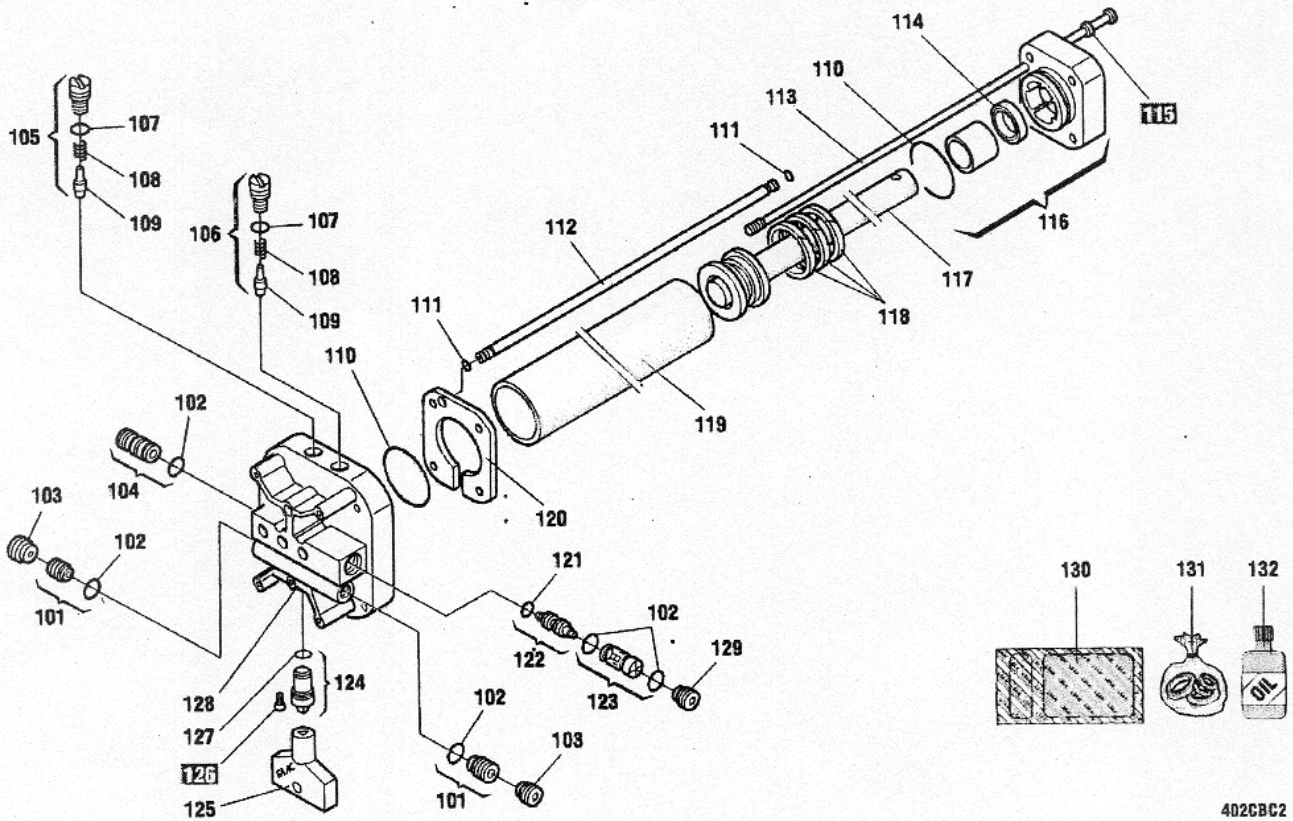
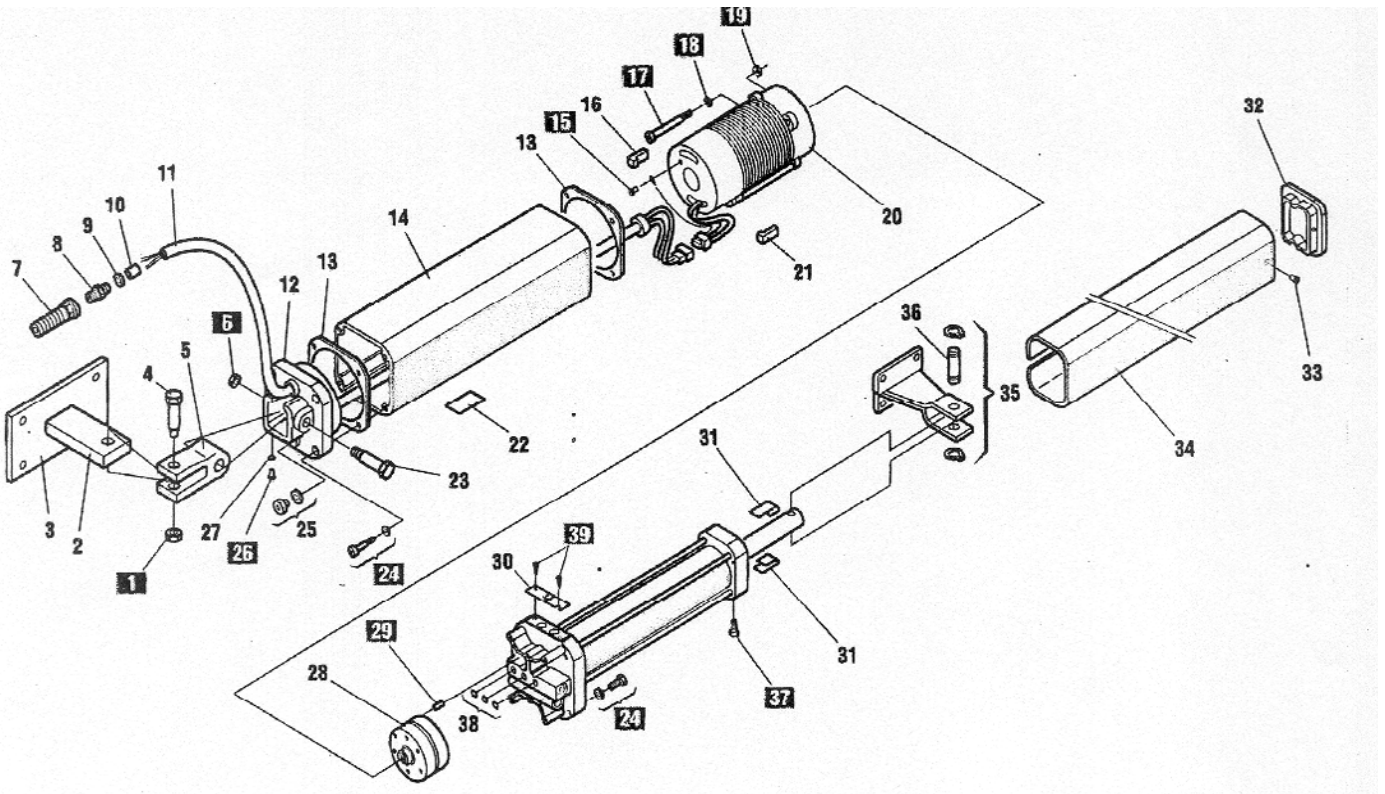
Light duty use: every 12 mo

Heavy duty use: every 6 mo

THE CONTROL PANEL

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

EXPLODED VIEW, 402 CBC



402 PARTS LIST

POS	PART NO.	DESCRIPTION	QTY
1	2036	Galvanized Nut (8mm)	1
2	7220015	Rear Bracket	1
3	7284005	Rear Bracket Plate	1
4	7182075	Short Pin	1
5	7221115	Rear Fork	1
6	2037	Self-Locking Nut (8mm)	1
7*	7109145	Strain Relief	1
8*	7109155	Strain Relief Nut	1
9*	7039305	Strain Relief Brass Washer	1
10*	2581	Fiber Washer	1
11	7514055	Electric Power Cord	1
12	7170435	Rear Flange	1
13	7099101	Gasket (D80)	2
14	7450005	Operator Body	1
15	N/A	Self-Threading Screw	1
16	7119475	Silent Block	2
17	2365	Motor Bolt (4mmX50)	4
18	2366	Lock Washer	4
19	2367	Hex Nut (4mm)	4
20**	77000425	115V 1400 RPM Motor	1
21	7119485	Vibration Dampener	2
22	N/A	Vent Screw Label	1
23	7182175	Long Pin	1
24	N/A	Torx (Self-Threading) T20	8
25	7110015	Plug (Oil)	1
26	2274	Vent Screw (4x6mm)	1
27	7094065	Gasket (Copper)	1
28	3204395	1 Lt Lobe Pump	1
29	N/A	Pump Pin	2
30	7203275	By-Pass Protection Cover	1
31	760285	Spacers (Protective Cover)	2
32	7271545	Protective Cover End Cap	1
33	7114025	Protective Cover Plug	1
34	7272085	Protective Cover	1
35	4304015	Front Mounting Bracket	1
36	7182355	Pin Front Bracket	1
37	N/A	Black Plastic Screw	1
38	7090010015	O-Ring (3)	3
39	N/A	Stainless Steel Screw (2.9mm x 6.5mm)	2

POS	PART NO.	DESCRIPTION	QTY
101	4404065	Inlet Valve	2
102	N/A	O-Ring	5
103	7049135	Valve Retainer	2
104	4180205	Blank Lock Valve	1
105***	4180135	Green By-Pass Valve	1
106***	4181045	Red By-Pass Valve	1
107	7090150	O-Ring (By-Pass Valve)	2
108	7210025	By-Pass Spring	2
109	7119335	By-Pass Seat	2
110	7090350	O-Ring (Front Flange)	2
111	7090665	O-Ring (Alum Retract Tube)	2
112	7361315	Retract Tube (Alum)	1
113	7230225	Tie-Rod (Cylinder)	4
114	N/A	O-Ring (Front Flange Internal)	1
115	N/A	Star Washer	4
116	4994165	Front Flange	1
117	4350065	Piston Assembly	1
118	7095035	Piston Rod Packing	1
119	7366065	Cylinder	1
120	7271555	Protective Cover Guide	1
121	7090300	O-Ring (Shuttle Piston)	1
122	4180285	Shuttle Piston	1
123	4404085	Lock Valve	1
124	4180355	Manual Release	1
125	713002	Triangular Release Key	1
126	N/A	Galvanized Screw	1
127	709069	O-Ring (Manual Release)	1
128	4994365	Valve Body (CBC)	1
129	7049005	Brass Retainer	1
130	3905235	Skin Pack	1
131	2168*	Seal Kit	1
132	6105	1 Qt. Monolec Oil	1

* Included in Kit #2167A*

* * 220V 1400RPM Motor Part #77000415

* ** Items include item #107, 108, and 109 in a kit

TROUBLESHOOTING

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

PROBLEM: THE GATE DOES NOT OPEN COMPLETELY.

SOLUTION:

Check the gate for mechanical obstacles that might prevent the gate from opening.

If the motor stops running before the gate is completely open (or closed), you need to adjust the opening/closing time for the operator or check the bypass valve adjustment. On the one hand, you can increase the opening/closing time of the operator so that it runs long enough to close the gate. You can, on the other hand, increase the pressure. If the pressure is too weak the leaf movement may slip, preventing full closure before the motor stops running.

Check your dimensions for mounting the rear bracket. Incorrect dimensions can make a full 90-deg swing impossible.

PROBLEM: THE GATE OPENS BUT DOES NOT CLOSE.

SOLUTION:

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

Verify that the reversing devices are working properly.

If you have installed no reversing devices, make sure that you have installed a jumper wire across the reversing device terminals on the control panel.

If the motors are running, insure that the bypass valve pressure adjustment is correct.

PROBLEM: THE RADIO CONTROLLED OPENER DOES NOT OPEN THE GATE.

SOLUTION:

Check the light on the front of the remote transmitter. It should illuminate when you signal the gate. If it doesn't illuminate and if the batteries are okay, repair or replace the transmitter.

Verify that the codes on the receiver and transmitter are the same.

Verify that the wiring for the radio controlled devices is correct.

Check the fuses on the control panel.

Check the wiring for the antenna and correct it if necessary.

Determine if the fault is in the receiver by temporarily connecting a push button device across the control panel activating terminals. If such a push button device opens the gate, repair or replace the receiver

LIMITED WARRANTY

To the original purchaser only: FAAC International, Inc., warrants, for twenty-four (24) months from the date of invoice, the gate operator systems and other related systems and equipment manufactured by FAAC S.p.A. and distributed by FAAC International, Inc., to be free from defects in material and workmanship under normal use and service for which it was intended *provided* it has been properly installed and operated. FAAC International, Inc.'s obligations under this warranty shall be limited to the repair or exchange of any part of parts manufactured by FAAC S.p.A. and distributed by FAAC International, Inc. Defective products must be returned to FAAC International, Inc., freight prepaid by purchaser, within the warranty period. Items returned will be repaired or replaced, at FAAC International, Inc.'s option, upon an examination of the product by FAAC International, Inc., which discloses, to the satisfaction of FAAC International, Inc., that the item is defective. FAAC International, Inc. will return the warranted item freight prepaid. The products manufactured by FAAC S.p.A. and distributed by FAAC International, Inc., are not warranted to meet the specific requirements, if any, of safety codes of any particular state, municipality, or other jurisdiction, and neither FAAC S.p.A. or FAAC International, Inc., assume any risk or liability whatsoever resulting from the use thereof, whether used singly or in combination with other machines or apparatus.

Any products and parts not manufactured by FAAC S.p.A. and distributed by FAAC International, Inc., will carry only the warranty, if any, of the manufacturer. This warranty shall not apply to any products or parts thereof which have been repaired or altered, without FAAC International, Inc.'s written consent, outside of FAAC International, Inc.'s workshop, or altered in any way so as, in the judgment of FAAC International, Inc., to affect adversely the stability or reliability of the product(s) or has been subject to misuse, negligence, or accident, or has not been operated in accordance with FAAC

International, Inc.'s or FAAC S.p.A.'s instructions or has been operated under conditions more severe than, or otherwise exceeding, those set forth in the specifications for such product(s). Neither FAAC S.p.A. 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

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