

R Y T E C

System 3[®]
Drive & Control
RY-WI[™] SYSTEM

RYTEC HIGH PERFORMANCE WIRELESS TECHNOLOGY

Installation & Owner's
Manual



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INTRODUCTION

NOTE: This manual is intended for the System 3 Drive & Control only. Installation and operation information specific to your door is detailed in the installation and owner's manuals that were shipped with the door.

The installation and operation of the System 3 Drive & Control® is not difficult, providing you follow the procedures outlined in this manual. Any unauthorized changes to these procedures, or failure to follow the steps as outlined, will automatically void our warranty. Any changes to the working parts, assemblies, or specifications as written, not authorized by Rytec Corporation, will also cancel our warranty. The responsibility for the successful operation and performance of this drive and control system lies with the owner of the door.

DO NOT INSTALL, OPERATE, OR PERFORM MAINTENANCE ON THIS DRIVE AND CONTROL SYSTEM UNTIL YOU READ AND UNDERSTAND THE INSTRUCTIONS IN THIS MANUAL.

If you have any questions, contact your Rytec representative or call the Rytec Customer Support Department at 800-628-1909. Always refer to the serial number of the door that your control system is connected to when calling the representative or Customer Support. Refer to the installation manual or the owner's manual provided with your door for the location of the serial number plate.

The wiring connections and schematics in this manual are for general information purposes only. A wiring schematic is provided with each individual door, specifically covering the control panel and electrical components of that door. That schematic was shipped inside the control panel.

DOOR SERIAL NUMBER(S)

Your **DOOR SERIAL NUMBER** information can be found in three universal locations. These are at the inside of either side column (approximately eye level), on the drive motor, and on the inside door of the System 3 control panel.

IMPORTANT: When installing multiple doors of the same model but in different sizes, verify the serial number in the control panel with the one on the door assembly.

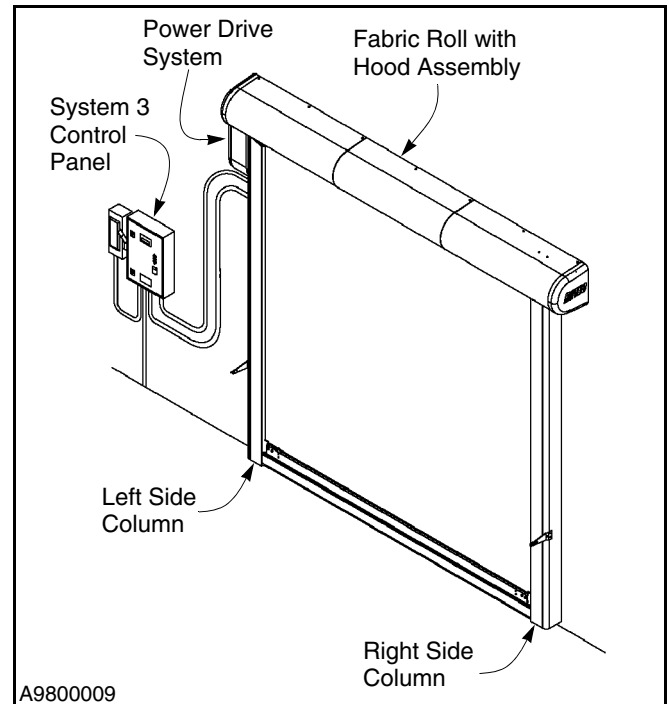


Figure 1

HOW TO USE MANUAL

Throughout this manual, the following key words are used to alert the reader of potentially hazardous situations, or situations where additional information to successfully perform the procedure is presented:



WARNING is used to indicate the potential for personal injury, if the procedure is not performed as described.



CAUTION is used to indicate the potential for damage to the product or property damage, if the procedure is not followed as described.

IMPORTANT: **IMPORTANT** is used to relay information **CRITICAL** to the successful completion of the procedure.

NOTE: **NOTE** is used to provide additional information to aid in the performance of the procedure or operation of the door, but not necessarily safety related.

INTRODUCTION—REQUIRED TOOLS AND EQUIPMENT

REQUIRED TOOLS AND EQUIPMENT

1. Wall anchor hardware (1/4-in. diameter).

NOTE: For most installations, the control panel is mounted to the wall using the four wall brackets supplied. You must provide the appropriate hardware to mount these brackets to the wall.

2. Stainless-steel spacers (optional item — Clean-Roll door only. Refer to Clean-Roll door installation manual for specific mounting requirements).
3. Carpenter's level.
4. Hammer drill and masonry drill bit sized for wall anchors (to install anchor hardware in concrete).
5. Assorted hand tools.

ADDITIONAL REQUIREMENTS

Labor and Site Requirements

1. An electrician is required for all electrical connections. (See "Electrician's Responsibilities" below.)

IMPORTANT: All electrical work must be performed in accordance with local and state building codes.

2. 100% accessibility to the door opening during the installation process. Traffic should not pass through the opening during the installation procedure.

Electrician's Responsibilities

1. Furnish and install fused disconnect(s).
2. Install Rytec control panel.
3. Install all necessary conduit.
4. Run electrical power lines to fused disconnect.
5. Run power lines from disconnect to control panel.
6. Run power and control lines from control panel to door head assembly (and defrost system if used).
7. Install conduit from control panel to floor for floor loop activators and wire activators (if used).

SHIPPING CRATE

The control panel was shipped from the factory in the crate containing your Rytec door.

SYSTEM OVERVIEW

CONTROL PANEL

The Rytec System 3 Drive & Control is a solid-state, microprocessor-based control system designed exclusively to operate your Rytec high-performance door. (See IMPORTANT below.) It combines an AC drive with the latest in door control technology.

The AC drive system controls the drive motor through soft accelerations and soft decelerations. The operating parameters are accessed through the up (▲), down (▼), and reset (●) keys located on the keypad on the front of the control panel. A two-line display shows all corresponding control and door status messages.

NOTE: The RESET key also serves as the ENTER key and the STOP key.



Figure 2

IMPORTANT: All conduit entering the control panel must enter from the bottom of the panel. DO NOT install conduit through the top or sides of the control panel — otherwise, the warranty will be void.

SYSTEM OVERVIEW—CONTROL PANEL

Controller

Located inside the control panel is an electronic controller. This controller includes a two-line display, a service switch, terminal blocks and screws, and other miscellaneous electrical components. (See Figure 3.)

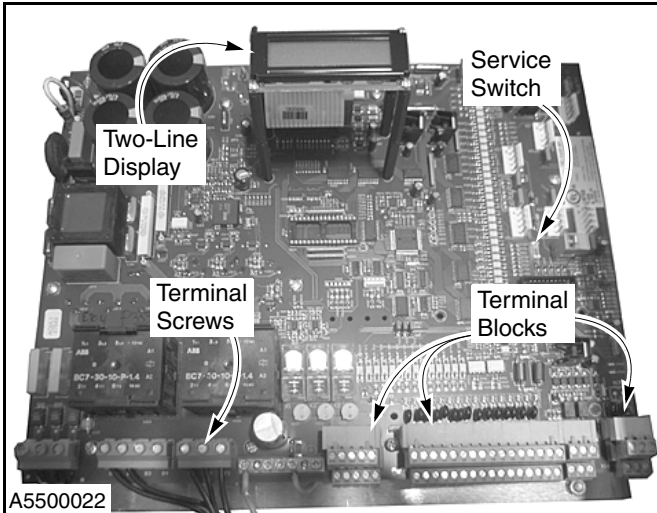


Figure 3

TWO-LINE DISPLAY

All door commands and door status messages appear on the two-line display. Also displayed are the cycle counter, timer settings, alarm conditions, program settings, and other miscellaneous messages.

The display is located near the top of the controller (Figure 3) and can be viewed through the window on the front of the control panel.

STATUS LEDs

Located on the controller are various light-emitting diodes (LEDs). These diodes are helpful when troubleshooting the door and control system. The LEDs indicate the operating status of the control system, the door, activators, safety devices, and any other input device connected to the control system. (See Figure 4.)

For detailed information on troubleshooting the control system using the status LEDs, see “TROUBLESHOOTING WITH STATUS LEDs” on page 54.

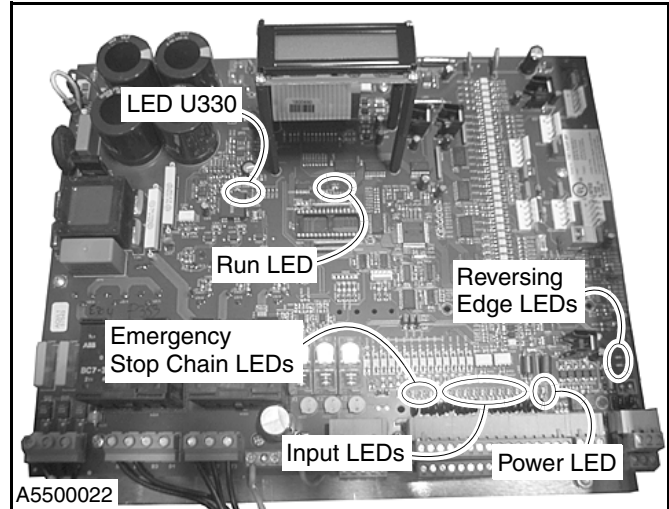


Figure 4

PLUG-IN MODULES

For a door set up to be operated by a radio control or a floor loop, a corresponding plug-in module for each type of activator is required. The connectors for these modules are located in the upper right corner of the control board. (See Figure 5.)

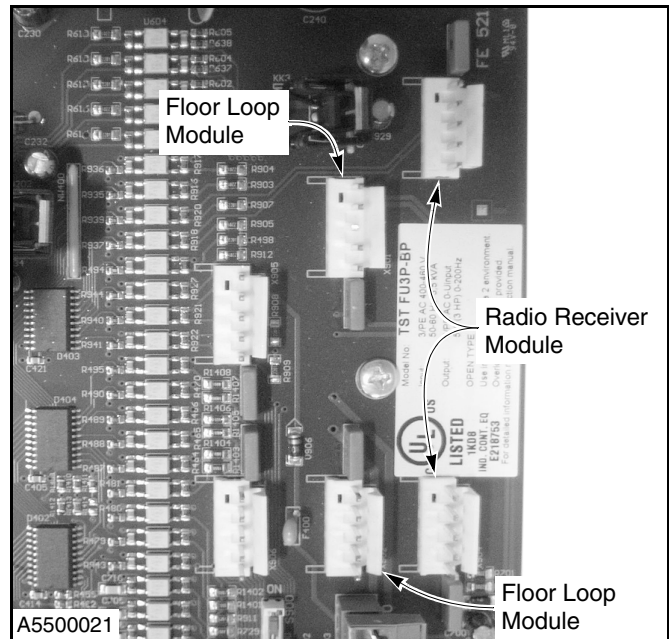


Figure 5

INSTALLATION

CONTROL PANEL INSTALLATION

IMPORTANT: The control panel must be installed in an area having a temperature range of 14° F to 149° F. Consult the factory if the temperature is below 14° F.

IMPORTANT: The fused disconnect and the control panel must be installed within sight of the door.

NOTE: The control panel and fused disconnect are generally located adjacent to the drive end of the head assembly.

Install the System 3 control panel and the fused disconnect as shown in Figure 6.

The mounting brackets and associated hardware (Figure 7) were packed for shipping inside the control panel. You must provide the hardware necessary to attach these brackets to the wall.

IMPORTANT: The mounting surface must be structurally sound and free of mechanical shock or vibration.

IMPORTANT: To maintain the enclosure rating (Type-4 standard), the control panel must be mounted with the brackets and hardware provided.

IMPORTANT: All conduit entering the control panel must enter from the bottom of the panel. DO NOT install conduit through the top or sides of the control panel — otherwise, the warranty will be void.

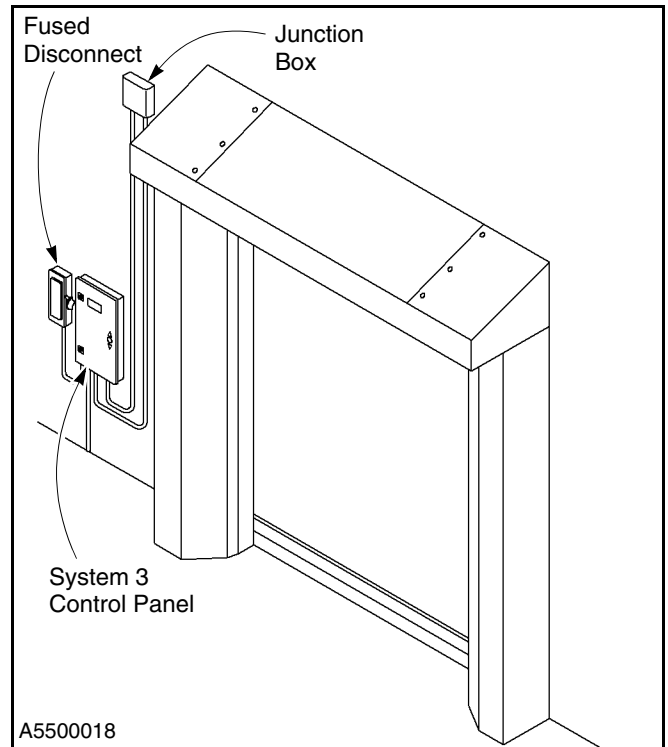


Figure 6

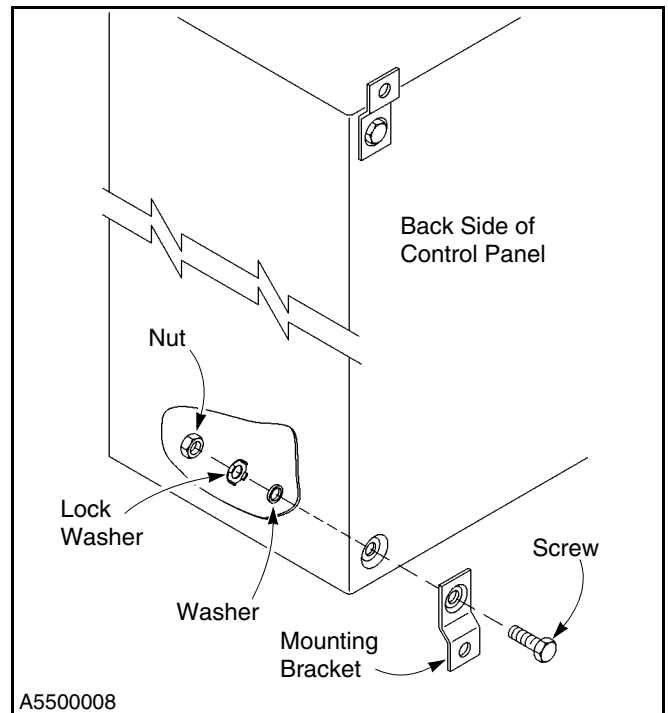
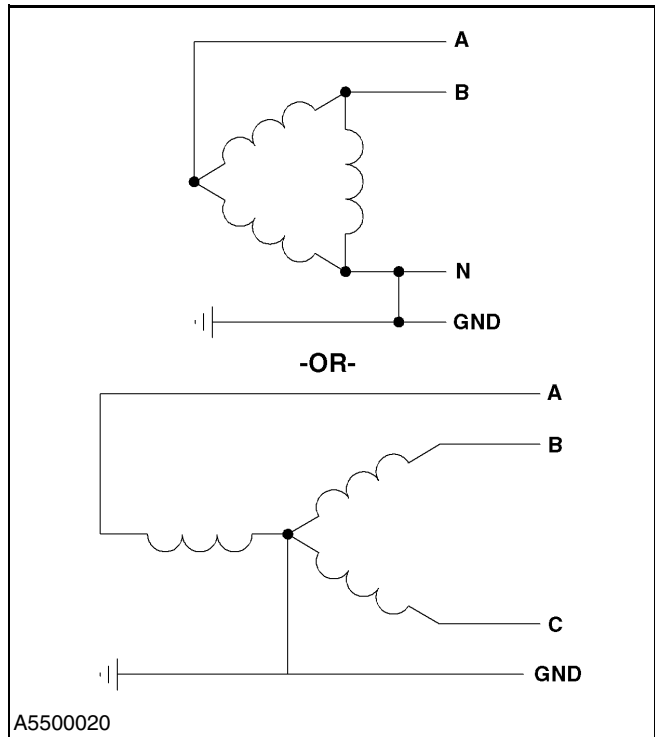


Figure 7

⚠ WARNING

Grounding of the power supply is essential to the safety of personnel as well as the operation of the System 3 Drive & Control. A floating, ungrounded or open delta type power supply can permit dangerously high voltage between the chassis of the drive and the internal power structure components (see Figure 8). In many cases this voltage could exceed the rating of the input MOV protection devices of the drive causing catastrophic failure of the System 3 Drive & Control. In all cases, the input power to this controller must be referenced to ground (see Figure 9). If the service transformer cannot be grounded, then an isolation transformer must be installed with the secondary of the transformer grounded. Please consult the factory for additional information regarding isolation transformers or service suitability.



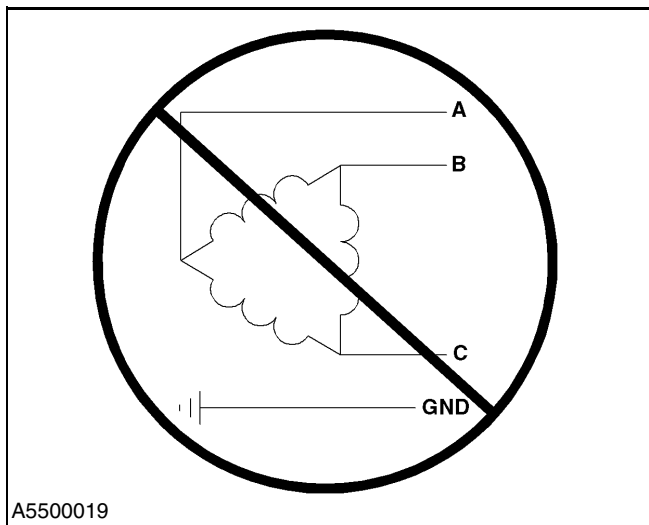
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Figure 9

WIRING NOTE: All wiring from the fused disconnect to the control panel, from the control panel to the optional junction box and the door, and from the conduit between the control panel and the floor (if a floor loop is used) must be supplied by the owner of the door. The wiring and conduit must meet all local and state building codes. Wires leading from the door are labeled with the terminal numbers that are associated with the control panel. The high and low voltage lines must run in separate conduit — otherwise, the warranty will be void.

Use shielded wire as indicated on the schematic. If a wire cable is to be extended or spliced, a like cable must be used throughout the entire length of that cable. Likewise, if a shielded cable is to be extended or spliced, a like cable must be used throughout the entire length of that cable as well — otherwise, the warranty will be void.

All conduit entering the control panel must enter from the bottom of the panel. DO NOT install conduit through the top or sides of the control panel — otherwise, the warranty will be void.



A5500019

Figure 8

NOTE: Cables must be cut to length. There cannot be any excess cable present in the control panel or any excessive cable bundles present on the outside of the control panel.

IMPORTANT: *The foam gasket, located in the control panel, must be installed with the knockout plate to maintain the NEMA rating.*

Remove the knockout plate along the bottom of the control panel before drilling holes for conduit.

IMPORTANT: *If your door is to be mounted on a freezer, mount the control panel and the fused disconnect on the warm side of the wall. It may also be necessary for you to install more than one fused disconnect. To ensure the equipment is de-energized during maintenance or service, turn off all disconnects.*

IMPORTANT: *Protect the components inside the control panel from metal chips when installing conduit. Seal inside the conduit and panel if the conduit entering the panel is coming from an area having a different temperature (warmer or colder) than the area where the panel is located.*

The schematics shown throughout this manual are for information purposes only. Due to varying requirements of each customer, a schematic has been prepared for your particular door and it must be used for this installation. That schematic was shipped inside the control panel.

WARNING

The disconnect must be in the OFF position and properly locked and tagged before wiring of the control panel begins.

IMPORTANT: *All conduit entering the control panel must enter from the bottom of the panel. DO NOT install conduit through the top or sides of the control panel — otherwise, the warranty will be void.*

WARNING

High voltage is present inside this control panel. Do not touch the circuit board, electrical components, or wiring inside this panel with power applied.

You must wait at least five minutes after power is turned off before you can begin work on this control panel. The drive control inside the panel contains high-voltage capacitors which take time to discharge once power is turned off.



The control system contains electrostatic-discharge sensitive devices. To prevent damage to the control system, follow all electrostatic-discharge practices when working in and around the control panel. Static electricity can severely damage the control system.

SYSTEM INPUTS

⚠ WARNING

The disconnect must be in the OFF position and properly locked and tagged before performing the following procedure.

⚠ CAUTION

Input terminals 1 through 28 support +24 VDC only. All remaining input terminals are dedicated for specific devices. Connecting any other voltage or device other than those intended may result in damage to the control system.

All connections (e.g., power supply lines, drive motor control lines, encoder, and activators) to the controller are made by way of terminal screws and terminal blocks. The screws and blocks are located along the bottom edge of the control board. (See Figure 10.)

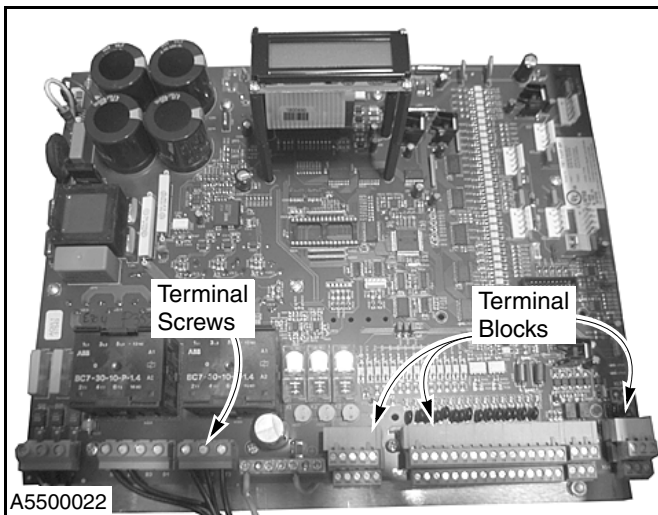


Figure 10

Power Supply Lines

Connect the power supply lines from the fused disconnect to the control panel as shown on the schematic that was shipped with the door.

Motor

Connect the motor wires to the control panel as shown on the schematic that was shipped with the door.

Motor Brake

Connect the motor brake to the control panel as shown on the schematic that was shipped with the door.

Encoder

Connect the encoder to the control panel as shown on the schematic that was shipped with the door.

External Emergency Stop Switches (N.C. Contacts)

E-STOP 1

Connect emergency stop switch E-Stop 1 to the control panel (terminals 1 and 2) as shown on the schematic that was shipped with the door.

If this input is disabled, the door will become disabled. The controller will then display a corresponding emergency stop message: “F:211 emergency stop T2”.

E-STOP 2

Connect emergency stop switch E-Stop 2 to the control panel (terminals 3 and 4) as shown on the schematic that was shipped with the door.

If this input is disabled, the door will become disabled. The controller will then display a corresponding emergency stop message: “F:211 emergency stop T4”.

Breakaway Bottom Bar (Input 1 — N.C. Contact)

Connect the breakaway bottom bar kill switch(es) to the control panel (terminals 5 and 6) as shown on the schematic that was shipped with the door.

If the bottom bar becomes disconnected from either side column, a loss of this input will immediately stop the door and “Door Ajar” will appear on the display. (See Figure 11.)

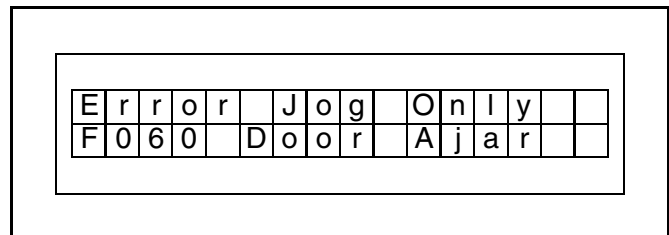


Figure 11

NOTE: Later on with power applied, if you find it necessary to reposition the bottom bar in order to reattach it, the door can be jogged up or down by pressing and holding the up (▲) or down (▼) key.

Once the bar is reattached and the control system reset, the up (▲), down (▼), and reset (●) keys will automatically return to their normal operation.

The RESET key also serves as the ENTER key and the STOP key.

Photo Eye — Front (Input 2 — N.C. Contact)

Connect the front set of photo eyes to the control panel (terminal 8) as shown on the schematic that was shipped with the door.

An interruption of this input (object between photo eyes) while the door is closing will immediately reverse the door and move it to the open position. Only after the object is removed from between the photo eyes will the door be allowed to close.

If the door was initially opened by a non-automatic activator, the door must be closed with a non-automatic activator. If the door was initially opened by an automatic activator, the door will automatically close after the automatic close timer (ACL1 or ACL2) times out.



Figure 12

Photo Eye — Rear (Input 3 — N.C. Contact)

Connect the rear set of photo eyes to the control panel (terminal 10) as shown on the schematic that was shipped with the door.

An interruption of this input (object between photo eyes) while the door is closing will immediately reverse the door and move it to the open position. Only after the object is removed from between the photo eyes will the door be allowed to close.

If the door was initially opened by a non-automatic activator, the door must be closed with a non-automatic activator. If the door was initially opened by an automatic activator, the door will automatically close after the auto-close delay timer (ACL1 or ACL2) times out.



Figure 13

Alternate-Action Activator (Input 4 — N.O. Contact)

Connect the alternate-action activator to the control panel (terminals 11 and 12) as shown on the schematic that was shipped with the door.

If this input is enabled (momentary contact) with the door closed, closing, or stopped between the door limits, the door will open. When this input is enabled with the door open, the door will close.

Typical activators tied to this input include pull cords, push buttons, and radio controls.

Auto-Close Activator 1 (Input 5 — N.O. Contact)

Connect auto-close activator 1 to the control panel (terminals 13 and 14) as shown on the schematic that was shipped with the door.

If this input is enabled with the door closed, closing, or stopped between the door limits, the door will open. The door will remain open as long as the input is enabled. Once the input is disabled, the auto-close delay timer (ACL1) will start. When the timer times out, the door will automatically close.

An activated timer will automatically reset when the auto input is enabled. To disable a timer, set its time delay parameter to zero (0) seconds.

Typical activators tied to this input include floor loops and motion detectors. (This input is exclusive to the inputs described in “PLUG-IN MODULES” on page 4.)

Auto-Close Activator 2 (Inputs 6 and 7 — N.O. Contact)

Connect auto-close activator 2 to the control panel (terminals 15 and 16 or terminals 17 and 18) as shown on the schematic that was shipped with the door.

If this input is enabled with the door closed, closing, or stopped between the door limits, the door will open. The door will remain open as long as the input is enabled. Once the input is disabled, the auto-close delay timer (ACL2) will start. When the timer times out, the door will automatically close.

An activated timer will automatically reset when the auto input is enabled. To disable a timer, set its time delay parameter to zero (0) seconds. Parameter P:015 = 0 to turn timer.

Typical activators tied to this input include floor loops and motion detectors. (This input is exclusive to the inputs described in “PLUG-IN MODULES” on page 4.)

SYSTEM START-UP—MODES OF OPERATION

Open (Input 8 — N.O. Contact)

Connect the open input to the control panel (terminals 19 and 20) as shown on the schematic that was shipped with the door.

If this input is enabled (momentary contact) with the door closed, closing, or stopped between the door limits, the door will open. This input is ignored while the door is opening.

Close (Input 9 — N.O. Contact)

Connect the close input to the control panel (terminals 21 and 22) as shown on the schematic that was shipped with the door.

If this input is enabled (momentary contact), the door will close if the door is open or stopped. This input is disabled when the door is closing and ignored if the door is closed or opening.

Stop (Input 10 — N.C. Contact)

Connect the stop input to the control panel (terminals 23 and 24) as shown on the schematic that was shipped with the door.

An interruption of this input (momentary open) while the door is moving, will immediately stop the door. The input is disabled anytime the door is stopped.

Programmable (Inputs 11 and 12 — N.O. or N.C. Contact)

Programmable inputs (if used) are connected to the control panel (terminals 25 and 26 or terminals 27 and 28) as shown on the schematic that was shipped with the door.

These inputs can be assigned various functions such as a third set of photo eyes or an air lock activator.

DC Power Supply — Photo Eyes

Connect the 24 VDC power supply for the photo eyes to the control panel as shown on the schematic that was shipped with the door.

DC Power Supply — Auxiliary Device

Connect the 24 VDC power supply for an auxiliary device (such as a motion detector) to the control panel as shown on the schematic that was shipped with the door.

Reversing Edge

Anytime the door is closing and the reversing edge (bottom edge) of the door makes contact with an object, the door will immediately reverse direction and move to the open position. The door will remain in the open position until the control system is manually reset.

To ensure the reversing edge wiring has continuity, the control system monitors a resistor installed on the pressure switch located in the bottom bar. If the control system does not detect the correct resistance, the control system will not allow the door to close.

IMPORTANT: After control system start-up, test the reversing edge according to the instructions provided in the owner's manual that came with the door. You must verify that the bottom bar reversing edge operates properly before placing the door into service.

Timers

The control system includes three programmable auto-close delay timers. Each timer is assigned to a specific input on the control panel and is set to delay closing the door when opened by its associated activator.

Two timers (ACL1 and ACL2) can be programmed to automatically close the door from the open position. The third timer (ACL3) can be programmed to close the door from the optional passage position. (The optional passage position is reserved for setting the open position of the door to a height other than the open position.

See "SYSTEM PARAMETERS" on page 24 for additional information on setting the auto-close delay timers and the optional passage option.

SYSTEM START-UP

MODES OF OPERATION



Once electrical power is connected to the control system, the fused disconnect must be placed in the OFF position and properly locked and tagged before the door to the control panel can be opened.

Once the fused disconnect is placed in the OFF position, you must wait five minutes for all electricity to dissipate from the control panel — otherwise, severe electrical shock resulting in serious injury or even death may occur.

⚠ WARNING

The control panel door must always be closed every time the control panel is powered up. There is a potential for serious personal injury in the case of component failure.

The System 3 Drive & Control is configured for two modes of operation: run mode and parameter mode.

Run Mode

Run mode includes the automatic and non-automatic modes of operation.

AUTOMATIC MODE

If a *momentary* contact activator such as a push button, pull cord or radio control is used to activate the door:

- The door will open when the device is activated.
- A timer, internal to the control system, will start up when the door is open.
- When the internal timer times out, the door will automatically begin to close.

If a *maintained* contact activator device such as a floor loop or motion detector is used to activate the door:

- The door will open and remain open for as long as the device is active.
- Once the device becomes inactive, the internal timer will start up.
- When the internal timer times out, the door will automatically begin to close.

In the automatic mode, while the timer is running, at any time an activator such as a floor loop or motion detector is enabled, the timer will reset and the door will not be allowed to close. It is only when the timer times out that the door will begin to close. (To change the timer setting, see “SYSTEM PARAMETERS” on page 24.)

In summary, in the automatic mode, an activator is used to open the door and a timer is used to close the door.

NON-AUTOMATIC MODE

If a *momentary* contact activator such as a push button, pull cord or radio control is used to operate the door:

- The door will open when the device is activated.
- After passing through the door, a similar type of device must be used to close the door.

In summary, in the non-automatic mode, an activator is used to open and close the door.

Parameter Mode

The control system includes various parameters that are used to operate your door. A number of parameters are set at the factory. Other parameters must be set in the field.

The parameters, beginning on page 24, are organized according to the Operator/Service Level authorized to access each parameter. Table 6 lists the parameters available at the Operator Level. Table 7 lists the parameters available at Service Level 1. Table 8 lists the parameters available at Service Level 2.

Display

The two-line display shows all door status and system information messages. Figure 14 through Figure 16 detail information typically displayed during routine controller functions and system errors.

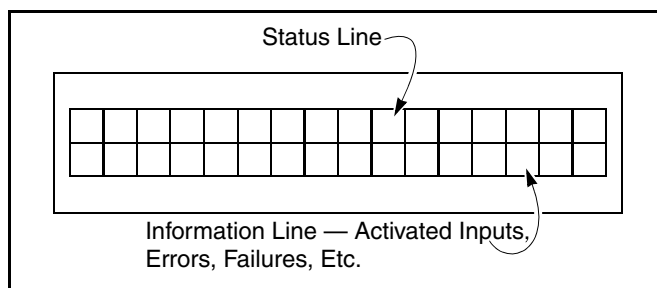


Figure 14

NOTE: If the photo eyes are activated during a door close cycle, the door will move to the open position and the display will indicate which set of eyes is activated. (See Figure 15.)

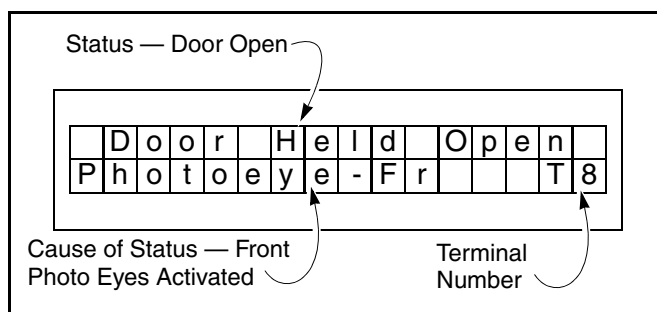


Figure 15

NOTE: If a system error is detected, the status of the door and the associated fault code will appear on the display. (See Figure 16.)

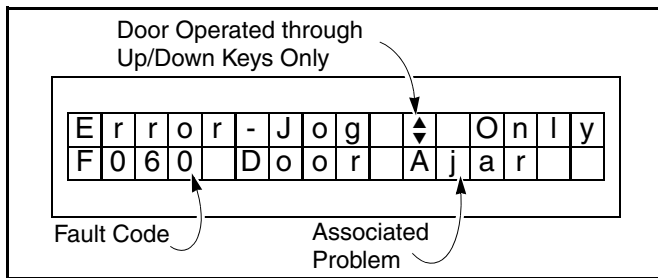


Figure 16

SYSTEM CONTROLS

All door commands and control system menus are accessed through the control panel keypad. The keypad includes three keys: up (▲), down (▼), and reset (●).

During normal operation with the door closing or closed, momentarily pressing the up (▲) key will automatically move the door to the open position. Pressing the down (▼) key will move the door to the closed position. Pressing the reset (●) key as the door is moving in either direction will immediately stop the door.

NOTE: The RESET key also serves as the ENTER key and the STOP key.

SERVICE LEVELS

In addition to operating the door, the up (▲), down (▼), and reset (●) keys are used to navigate through the control system parameters. See “Navigating Parameters” on page 14.

NOTE: The RESET key also serves as the ENTER key and the STOP key.

The parameters, beginning on page 24, are grouped into three service levels.

- Operator Level — password not required. Access limited to auto-close timers and select defrost control functions (if configured with defrost control).
- Service Level 1 — password is the number 5. Access to Operator Level parameters as described above, initial door installation start-up routine, operator parameters, and error history.
- Service Level 2 — password required (available only through factory). Access to Service Level 1 parameters as described above, activator parameters, and other miscellaneous parameters. All remaining parameters are available as read-only.

The service switch in the control box is factory set to the on position. This allows access to all password levels. Access to all parameters can be disabled by placing the service switch to the off position and locking the control panel door. Cycling power off and on places the controller in the run mode.

If the controller is in any service level and there is no keypad activity for 30 minutes, the controller will automatically reset and return to the run mode.

INITIAL START-UP



Initial system start-up is only to occur once the door and control panel have been properly installed, wired, and all preliminary door adjustments made. Failure to follow the instructions as outlined in the installation manual that was provided with your door can result in damage to the door upon initial system start-up.

1. Release the brake located on the end of the motor and manually move the door to the half-open position.
2. Apply power to the control system. During the system initialization, the display will indicate that the door open and close limits must be set by displaying “! Set Limits !”. (See Figure 17.)

Then the message Push ● [press reset (●) key] will appear on the display.

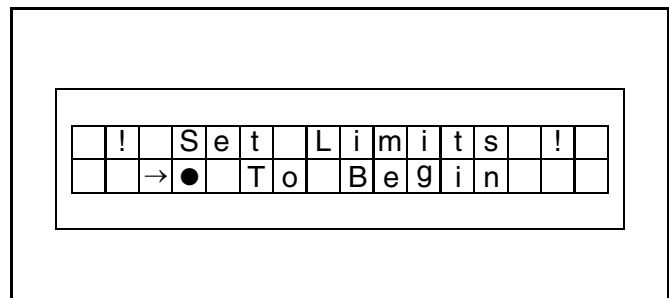


Figure 17



The door open and door close limits are to be set only after verifying that the motor (door) operates in the proper direction when the up (▲) and down (▼) keys are pressed.

3. After the reset (●) key has been pressed one time, verify the motor rotation by briefly pushing the up (▲) and down (▼) keys on the control panel.

The door should open with the up (▲) key and close with the down (▼) key. If the door does not operate in this manner, reverse two of the motor wires (not the incoming three-phase supply wires).

NOTE: Reversing the incoming supply voltage lines will not solve the problem if the motor is running in the wrong direction.

The RESET key also serves as the ENTER key and the STOP key.

- Now set the door open and close limits according to the instructions on the display.

If any error messages are displayed, some of the required input connections may be missing. Once the missing inputs are connected, perform the open and close limit set-up. Otherwise, refer to “FAULT CODES” on page 44.

NOTE: When establishing the open- and close-limit positions, refer to the installation manual that came with your door.

- Once the limit-setting procedures have been completed, use the up (▲) or down (▼) key to cycle the door and calibrate the door’s speed profile. This is done to optimize performance and will allow the door to run smoothly and efficiently.

NOTE: The door will fine-tune the speed setting based on the programmed limits during the first several cycles.

- Set ACL1 and ACL2 timers as required. (See “SYSTEM PARAMETERS” on page 24.)

Jog Mode

The door can be jogged up or down through the control system by using the keys on the keypad.

- To enter the jog mode, simultaneously press the reset (●) and down (▼) keys. “Jog Mode” will then appear on the display.
- Press the up (▲) or down (▼) key, as required, to jog the door up or down.
- Simultaneously pressing the reset (●) and down (▼) keys again will return the control system to normal operation.

NOTE: The RESET key also serves as the ENTER key and the STOP key.

ACCESSING PARAMETERS

NOTE: To access Operator Level, Service Level 1, or Service Level 2 parameters, the control board service switch must be in the ON position. (See Figure 18.)

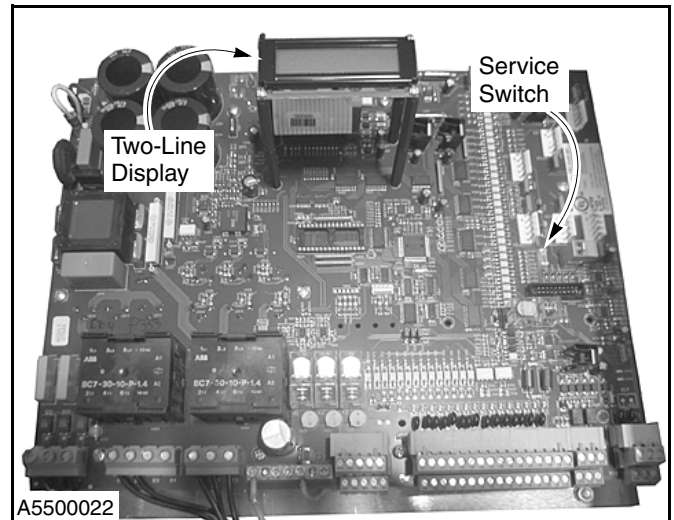


Figure 18

Parameter Messages

A two-line display on the control panel (as shown in Figure 19) displays all parameter settings when the control system is placed in a service level (Operator Level, Service Level 1, or Service Level 2). Figure 19 details a typical parameter.

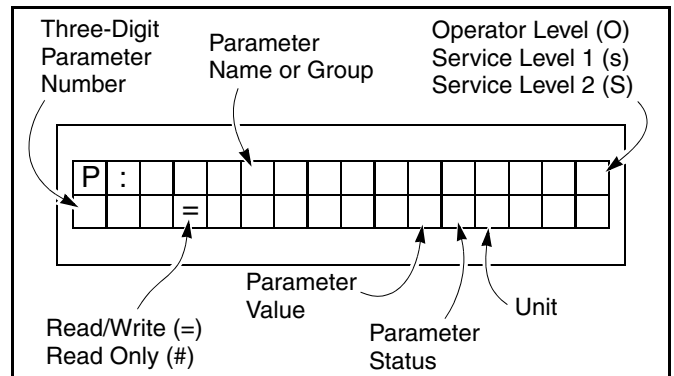


Figure 19

For example, Figure 20 details door limit set-up parameter 210 (P.210).

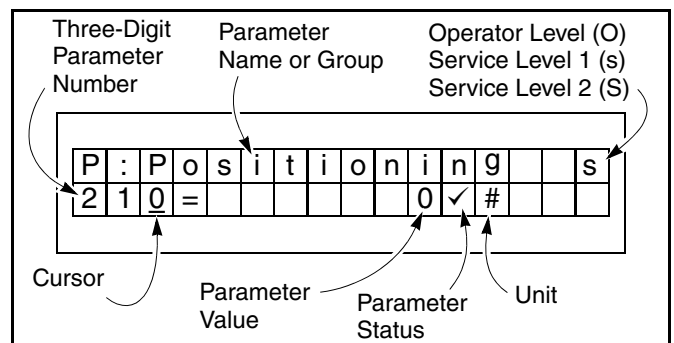


Figure 20

SYSTEM START-UP—ACCESSING PARAMETERS

Figure 21 details password parameter 999 (P.999).

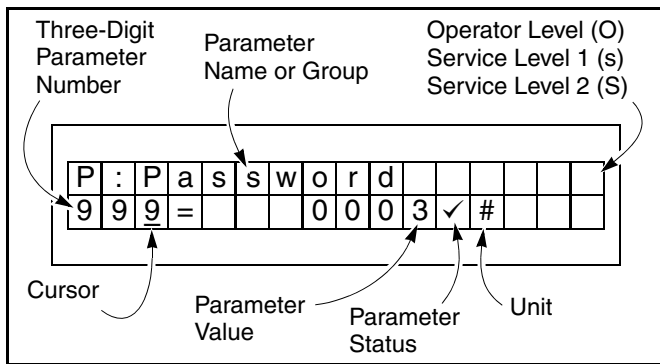


Figure 21

Navigating Parameters

The following procedure explains how to navigate through the parameters. The procedure is the same regardless of the service level.

1. To navigate the parameters:

- Simultaneously press and hold the up (▲) and reset (●) keys for approximately three seconds. The control system will enter the Operator Level and display the last-saved operator parameter. (To access the upper service levels, see “Accessing Service Levels 1 and 2” on page 14.)
- Continually press the up (▲) or down (▼) key to loop through the list of available parameters. Holding either key speed-scrolls you through the list.
- Press the reset (●) key to access the displayed parameter. The parameter is accessed when the cursor jumps over to the currently saved value for that parameter. (See Figure 22.)
- Continually press the up (▲) or down (▼) key to loop through the list of available parameter values. Holding either key speed-scrolls you through the list.
- Pressing the enter (●) key saves the displayed value. (Note: If the enter (●) key is not held down long enough, the display will return to the previously saved setting.) A checkmark next to the displayed value indicates the currently saved value. An asterisk next to the displayed value indicates a value that is not saved. (See Figure 23.)
- Holding the enter (●) key jumps the cursor back over to the three-digit parameter number.

NOTE: The RESET key also serves as the ENTER key and the STOP key.

See Table 6 on page 24 for a complete list of parameters available through the Operator Level.

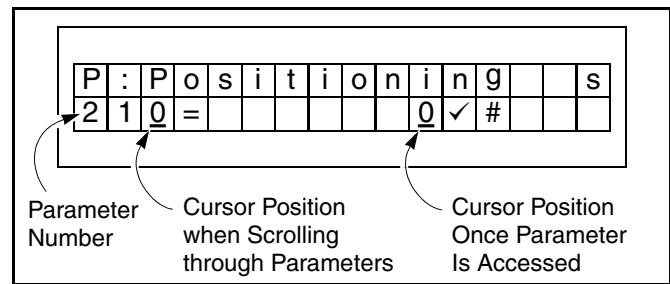


Figure 22

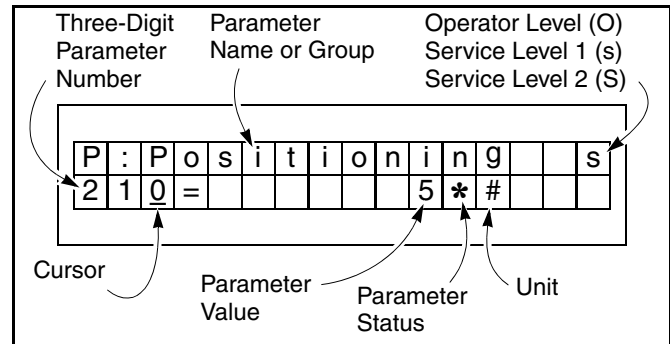


Figure 23

Accessing Service Levels 1 and 2

1. Access the Operator Level. (See “Navigating Parameters” on page 14.)
2. To access Service Level 1 or Service Level 2, scroll to password parameter 999 (P.999). Then briefly press the reset (●) key. The cursor will jump from the three-digit parameter number over to the parameter value on the display. (See Figure 24.)

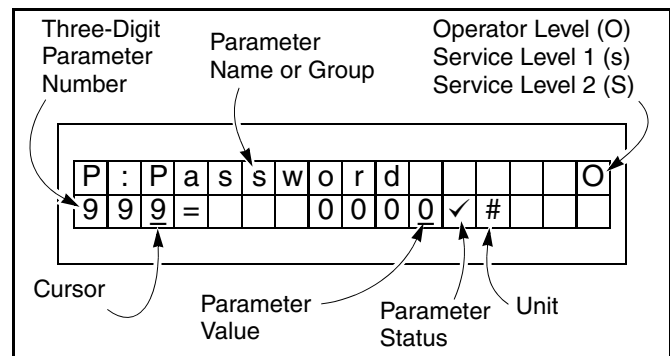


Figure 24

3. Enter the password by first pressing the up (▲) or down (▼) key until the numerical password required for the desired service level is displayed. (See Figure 25.)

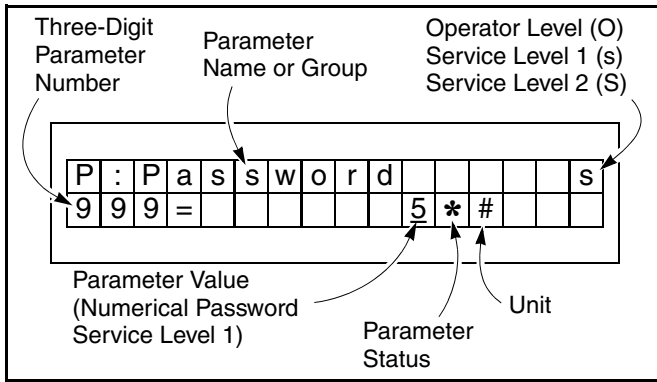


Figure 25

- Press the enter (●) key to accept the password and enter that particular service level. The cursor will jump back under the three-digit parameter number and a small “s” will appear on the display to indicate that Service Level 1 is accessed.

NOTE: The RESET key also serves as the ENTER key and the STOP key.

- Press the up (▲) or down (▼) key to scroll through the list of available parameters for that particular service level. (Only the parameters associated with the accessed service level will be available.)
- Access a displayed parameter by briefly pressing the enter (●) key. The parameter is accessed when the cursor jumps over to the currently saved value for that parameter.

Setting Door Limits (Open, Intermediate, and Close)

- Access parameter P.210. (See “Navigating Parameters” on page 14.)
- Press the up (▲) or down (▼) key until the desired door limit option is displayed. Pressing the enter (●) key will access the displayed option.

NOTE: The RESET key also serves as the ENTER key and the STOP key.

- Follow the instructions on the display to set the door limits.

Fine-Tuning Limit Settings

After the door limits are set, as described in “Setting Door Limits (Open, Intermediate, and Close)” above, if you find it necessary, each limit can be fine-tuned.

- Access Service Level 1. (See “Accessing Service Levels 1 and 2” on page 14.)
- Press the up (▲) or down (▼) key until the close-limit (P.221) or open-limit (P.231) parameter is displayed.

- Refer to “CLOSE-LIMIT ADJUSTMENT” or “OPEN-LIMIT ADJUSTMENT” below to make the necessary adjustments.

CLOSE-LIMIT ADJUSTMENT

- Press the enter (●) key to access close-limit setting parameter P.221. The cursor will jump to the parameter value and display the currently saved value. (See Figure 26.)

NOTE: The RESET key also serves as the ENTER key and the STOP key.

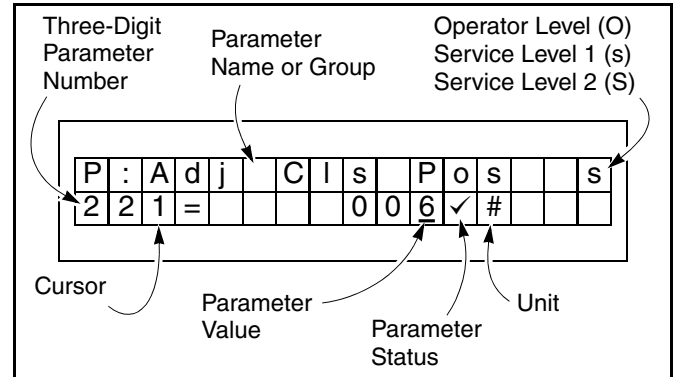


Figure 26

- Press the up (▲) or down (▼) key to change the displayed value.

NOTE: The close-limit setting has an adjustable range of ±125 increments. If the door limits are reset [see “Setting Door Limits (Open, Intermediate, and Close)” on page 15], the adjustable range default will be reset to 0.

Depending on the position of the door, decreasing the range setting will move the door toward the closed position; increasing the setting will move the door away from the closed position.

- Briefly press the enter (●) key to save the displayed value. The cursor will then jump over to the three-digit parameter number. (See Figure 27.)

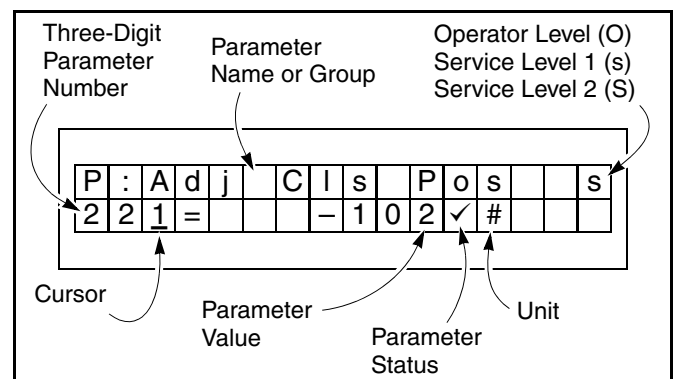


Figure 27

SYSTEM START-UP—ACCESSING PARAMETERS

OPEN-LIMIT ADJUSTMENT

1. Press the enter (●) key to access close-limit setting parameter P.231. The cursor will jump to the parameter value and display the currently saved value. (See Figure 28.)

NOTE: The RESET key also serves as the ENTER key and the STOP key.

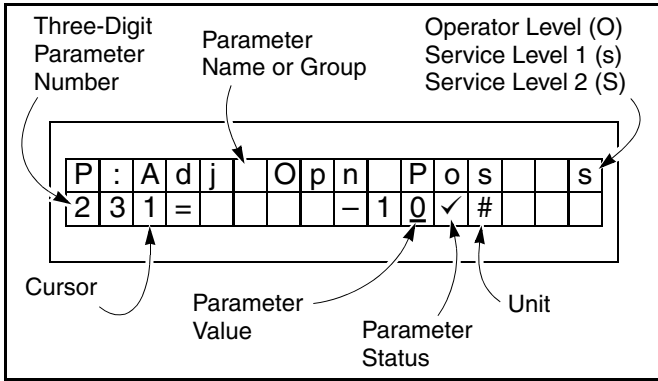


Figure 28

2. Press the up (▲) or down (▼) key to change the displayed value.

NOTE: The open-limit setting has an adjustable range of ±60 increments. When the limits are reset [see “Setting Door Limits (Open, Intermediate, and Close)” on page 15], the adjustable range default will be set to 0.

Depending on the position of the door, increasing the range setting will move the door toward the open position; decreasing the setting will move the door away from the open position.

3. Briefly press the enter (●) key to save the displayed value. The cursor will then jump over to the three-digit parameter number. (See Figure 29.)

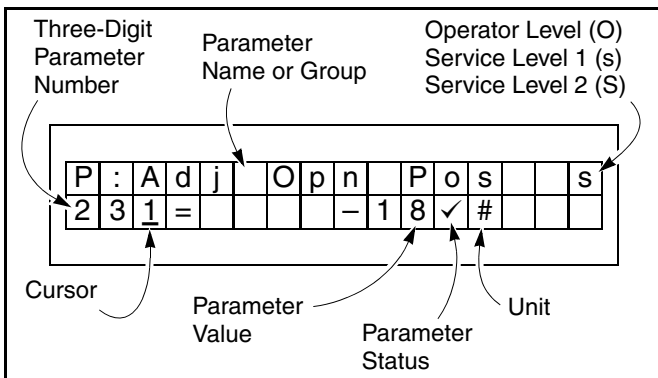


Figure 29

Setting Automatic Delay Timers

1. Access the Operator Level. (See “Navigating Parameters” on page 14.)
2. Press the up (▲) or down (▼) key until the desired delay timer parameter is displayed (P.010 = ACL1, P.011 = ACL3, P.015 = ACL2).

Figure 30 shows that auto-close delay timer ACL1 is currently set with an eight (8) second delay.

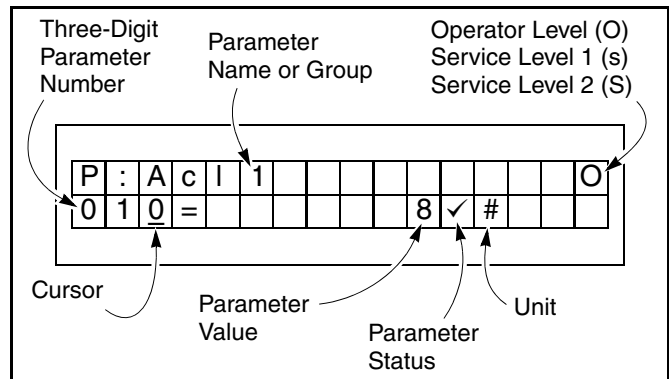


Figure 30

3. With the desired timer parameter displayed, press the enter (●) key to access that parameter. The cursor will jump over to the parameter value.

NOTE: The allowable time delay range for a timer is 0 to 200 seconds.

The RESET key also serves as the ENTER key and the STOP key.

4. Press the up (▲) or down (▼) key to change the displayed value. Press the enter (●) key to save the displayed value.

Accessing Error Log

The controller will log the last eight system errors. To access the error log, perform the following procedure.

1. Access Service Level 1. (See “Accessing Service Levels 1 and 2” on page 14.)
2. Press the up (▲) or down (▼) key until parameter P.920 is displayed.
3. Press the enter (●) key one time to access P.920 and view the log. (See Figure 31.)

NOTE: The RESET key also serves as the ENTER key and the STOP key.

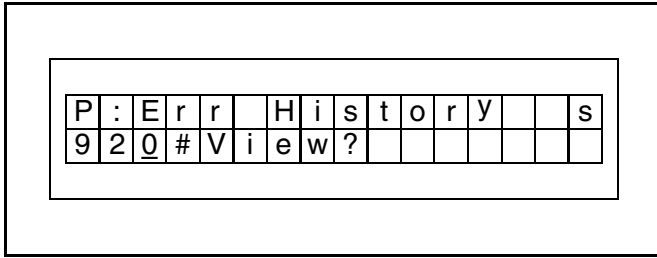


Figure 31

- After entering the error log, the first recorded error (Err1) will be displayed (F.700, for example). (See Figure 32.)

NOTE: Refer to Table 11 through Table 18 for a detailed description of the displayed error.

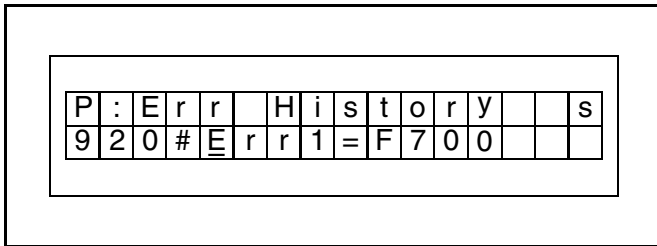


Figure 32

- To scroll through any other errors in the log, press the up (▲) or down (▼) key to cycle through the log. (See Figure 33 through Figure 35.)

NOTE: Only the last eight errors are logged.

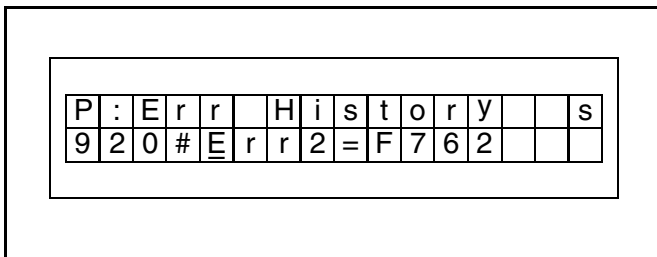


Figure 33

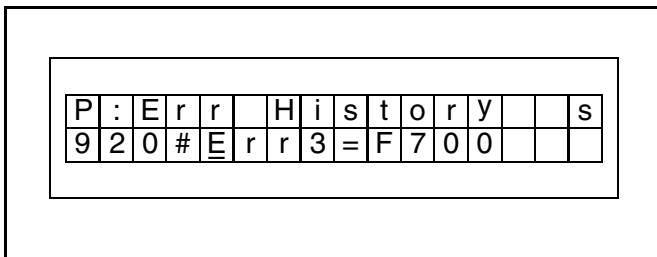


Figure 34

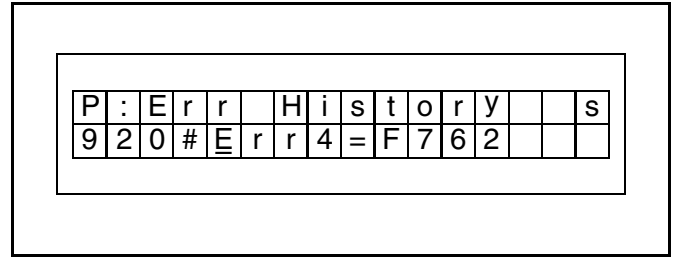


Figure 35

- Continuously scrolling through the list with the up (▲) or down (▼) key will eventually loop you to the “Clear?” message (Figure 36), or the “Exit?” message (Figure 37).

Pressing the enter (●) key will execute the displayed message (function).

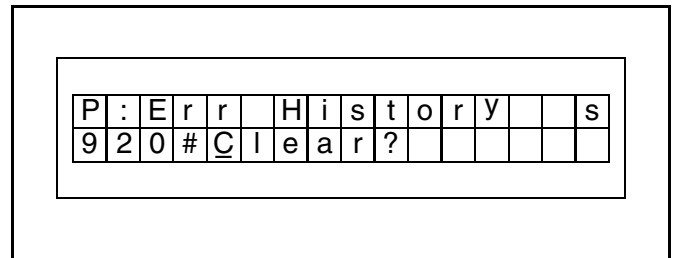


Figure 36

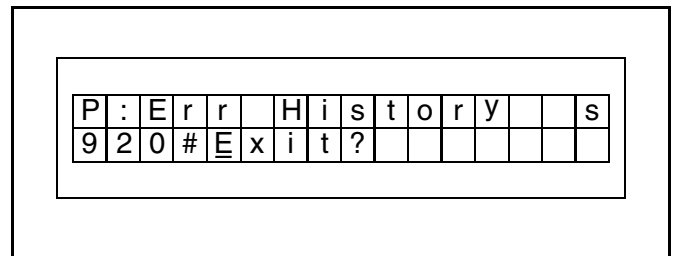


Figure 37

SYSTEM RESET (MANUAL RESET)

A system reset is necessary after the control system displays an error message and the problem resulting in that error message has been corrected. To reset the control system, press and hold the reset (●) key for approximately three to five seconds.

NOTE: The RESET key also serves as the ENTER key and the STOP key.

Once the reset is complete, if the door was in the full-open or -closed position prior to the error message, the display will indicate the door type and cycle count. If the door was in a position other than the full-open or -closed position, the display will indicate the door is stopped.

After the system is reset, the door can be normally operated with the up (▲), down (▼), and reset (●) keys.

SYSTEM START-UP—DEFROST SYSTEM

DEFROST SYSTEM

If your door is configured with an optional defrost system, the System 3 Drive & Control is designed to operate and monitor that system.

See “SYSTEM PARAMETERS” on page 24 for additional information on setting the defrost system controls.

RESETTING THE ENCODER

1. Remove the six screws and the cover from the encoder. (See Figure 38.)

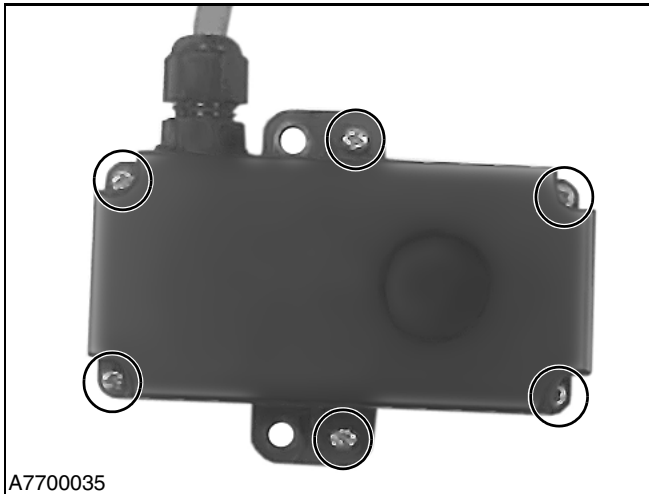


Figure 38

2. Short the top two solder dots with a metal tool (tip of a screwdriver, paperclip, etc.). (See Figure 39.)

NOTE: If the power is on, the System 3 control panel will get an error code F.766 while shorting out the two solder dots on the board. This is normal procedure.

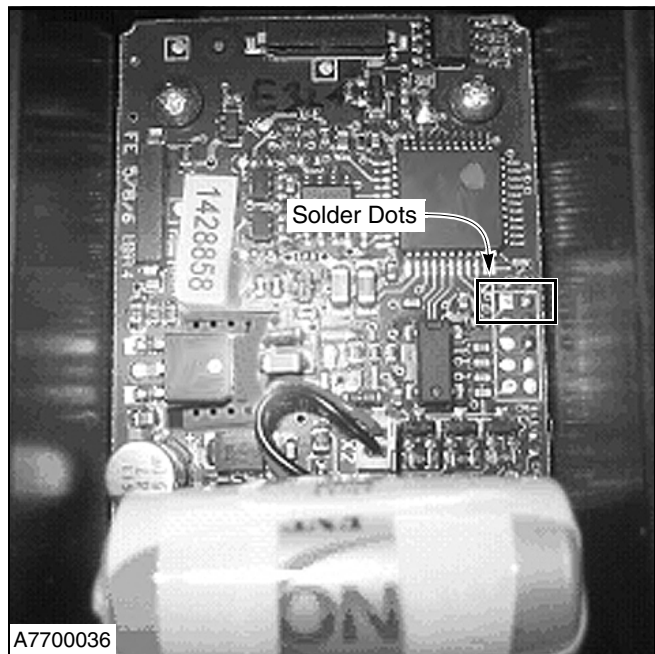


Figure 39

3. Install the cover and the six screws onto the encoder.
4. Reset the F.766 error code.
5. Reset the door limits.

WIRELESS REVERSING EDGE

The wireless system has two main assemblies: the mobile unit located in the bottom bar under the plastic cover and the stationary antenna located in the head assembly. (See Figure 40 and Figure 41.) The wireless antenna and mobile unit are installed at Rytec prior to shipping. The antenna has a tan-colored cable that runs to the encoder which is mounted to the back of the motor, and a black cable from the encoder that carries the signals for the reversing edge and the breakaway back to the System 3 control board.

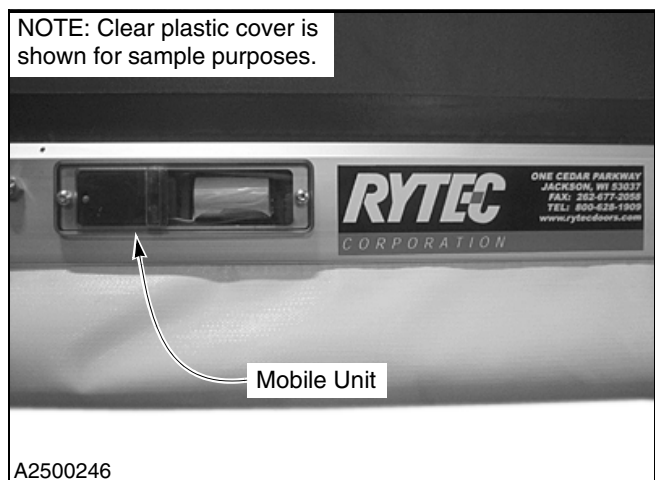


Figure 40

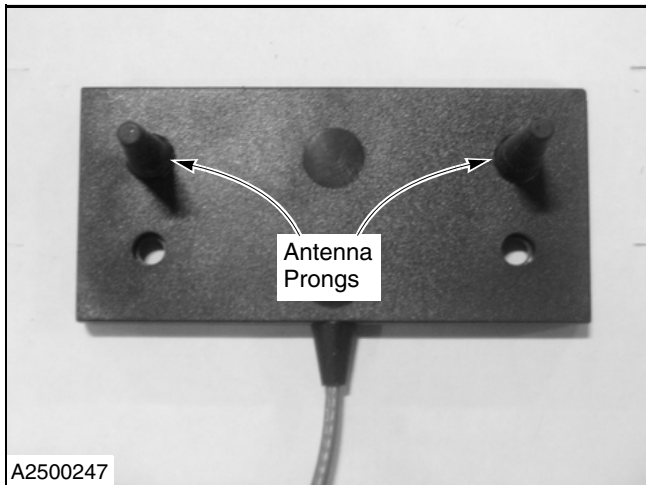


Figure 41

Attached to the electric motor is a small tan-colored cable. The tan cable is routed from inside the motor assembly, through the front head assembly, and to the mounting bracket of the front spreader. When the bracket is installed, the 2-inch prongs from the antenna will point toward the drum roll. (See Figure 42 and Figure 43.)

NOTE: No bends, kinks, or loops are allowed in the tan cable. The antenna is fragile and should be handled with extreme care.

Any leftover packaging material should be removed from the antenna prior to installation.

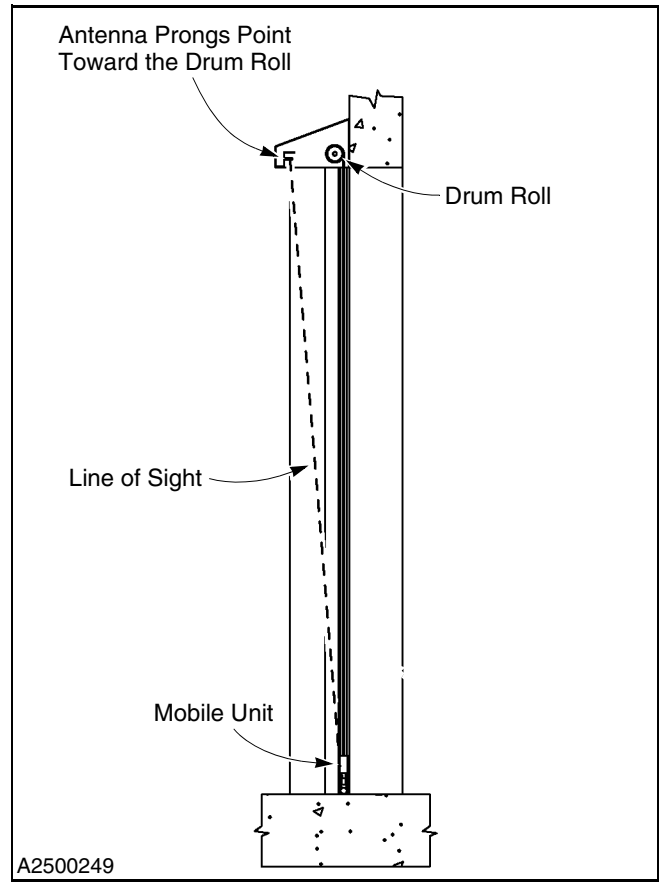


Figure 43

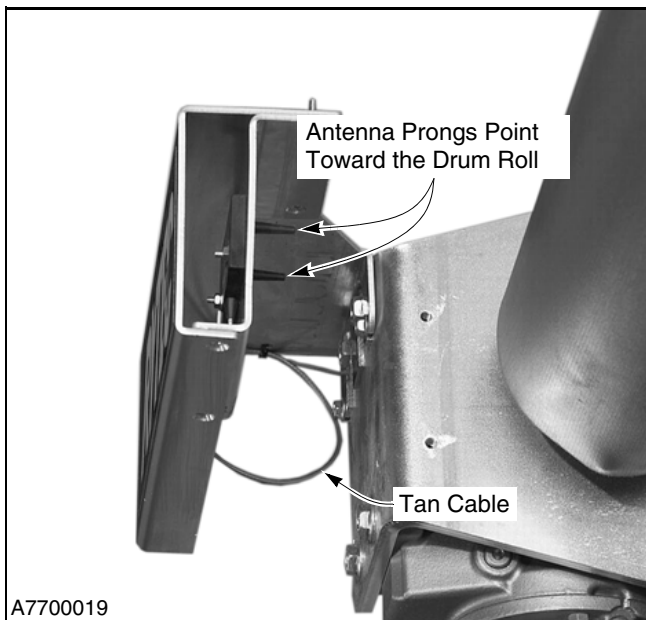


Figure 42

SYSTEM START-UP—WIRELESS REVERSING EDGE

Parameters for Wireless System

The control system for the wireless reversing edge has been programmed at Rytec. However, field adjustments may be required. Below is a list of the applicable parameters and fault codes associated with the wireless reversing edge system.

NOTE: Do not make any changes to the wireless system until you have contacted Rytec Customer Support at 800-628-1909. Access for programming parameters can be found in the Rytec System 3 Drive & Control manual that is shipped with the door in the small parts carton.

Table 1

Parameters
P:F00 = Activates the wireless system 1 = On, 0 = Off
P:F01 = Packet timeout before “edge trip” occurs Adjustment made in milliseconds = 6ms to 50ms <i>NOTE: 20ms is default.</i>
P:F03 = Signal strength percentage Above 90% is good (can only be viewed in parameter mode)
P:F04 = Sleep/Awake mode 0 = Sleep 1 = Awake (use awake mode for troubleshooting)
P:F05 = Channel group 1-10 Factory setting (can only be viewed in parameter mode)
P:F06 = Shows the channel group selected

Parameters

P:F07 = Mobile unit address

- Unique to each unit
- Hexadecimal number located on the transmitter unit in the bottom bar (See Figure 44.)

NOTE: Hexadecimal address should be the same value as Parameter P:F07.

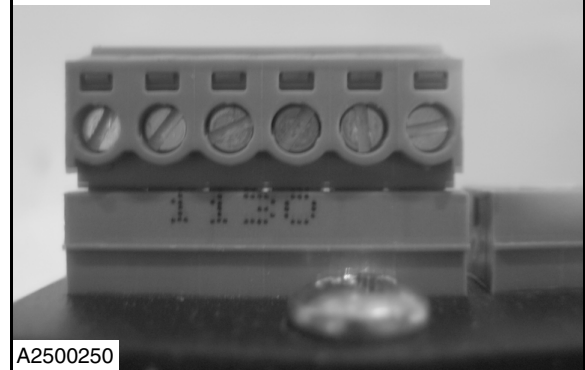


Figure 44

IMPORTANT: The hexadecimal number on the transmitter unit must be facing to the left when installed in the bottom bar. When facing the front of the door, the Rytec decal will be seen to the right of the mobile unit.

P:F08 = Battery low voltage value

When battery voltage drops below the pre-set value an error will be displayed = **F 857** Battery low

NOTE: Figure 45 shows the battery through a clear cover located in the bottom bar. Clear cover shown is a sample piece.

NOTE: Battery For Wireless Reversing Edge
 Blue Wire (+), Yellow Wire (-)



Figure 45

Parameters
<p>P:46B = Delay door movement until mobile unit is awake and edge is released</p> <p>1 = On</p> <p>0 = Off (door will not move)</p>
<p>P:46C = 1000ms</p> <p>Maximum time the edge will wait for edge to release</p> <p><i>NOTE: Measurement is made in milliseconds.</i></p>

Table 2

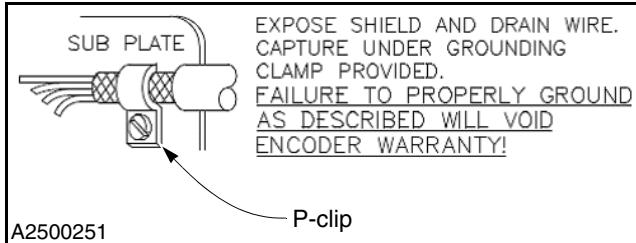
Error Codes
<p>F 856 = No communication between the stationary and mobile units for more than ten seconds</p> <ul style="list-style-type: none"> • Antenna not connected or poorly mounted • Battery is dead • Mobile unit address is incorrect • No mobile unit found • Strong electrical interference in the frequency range
<p>F 857 = Battery monitoring</p> <ul style="list-style-type: none"> • Battery voltage falls below value in P:F08 • New battery is required

Table 3

Troubleshooting System 3 Controller
<p>Voltage readings at terminals Si 1 & Si 2 with no connection to either terminal:</p> <ul style="list-style-type: none"> • Si 1 to Si 2 = 11.9VDC • Si 1 to Ground = 0VDC • Si 2 to Ground = 11.9VDC
<p>Voltage readings at Si 1 & Si 2 with encoder connections complete:</p> <ul style="list-style-type: none"> • Si 1 to Si 2 = 0.43VDC • Si 1 to Ground = 0VDC • Si 2 to Ground = 0.43VDC

Troubleshooting System 3 Controller
<p>Door moving with mobile unit in sleep mode:</p> <ul style="list-style-type: none"> • Si 1 to Si 2 = 2.36VDC • Si 1 to Ground = 0VDC • Si 2i to Ground = 2.36VDC
<p>Door moving with mobile unit in awake mode:</p> <ul style="list-style-type: none"> • Si 1 to Si 2 = 2.36VDC • Si 1 to Ground = 0VDC • Si 2i to Ground = 2.36VDC

Table 4

Encoder Cable Connections System 3 Control Panel	
<i>NOTE: The encoder cable is to be cut to length. DO NOT leave excessive cable inside the control panel.</i>	
Encoder Cable:	System 3 Control Board:
Brown (+24VDC)	to terminal #31
White (Ground)	to terminal #32
Green (RS485 b)	to terminal #36
Yellow (RS485 a)	to terminal #35
Pink (Si 2)	to terminal #Si 2
Red (Ajar)	to terminal #6
Blue & Gray	not used
<i>NOTE: Shield and drain wire should be captured under the P-clip below terminals 33-38. (See Figure 46.)</i>	
	
<p>EXPOSE SHIELD AND DRAIN WIRE. CAPTURE UNDER GROUNDING CLAMP PROVIDED. FAILURE TO PROPERLY GROUND AS DESCRIBED WILL VOID ENCODER WARRANTY!</p>	
Figure 46	

SYSTEM START-UP—WIRELESS REVERSING EDGE

Table 5

Jumpers on the System 3 Control Panel

The System 3 control panel requires the jumpers located on the control board to be in the following configuration.

NOTE: The configuration of the jumpers should have been done at Rytec prior to shipping. This information is provided just to confirm the accurate setting of the jumpers. (See Figure 47.)

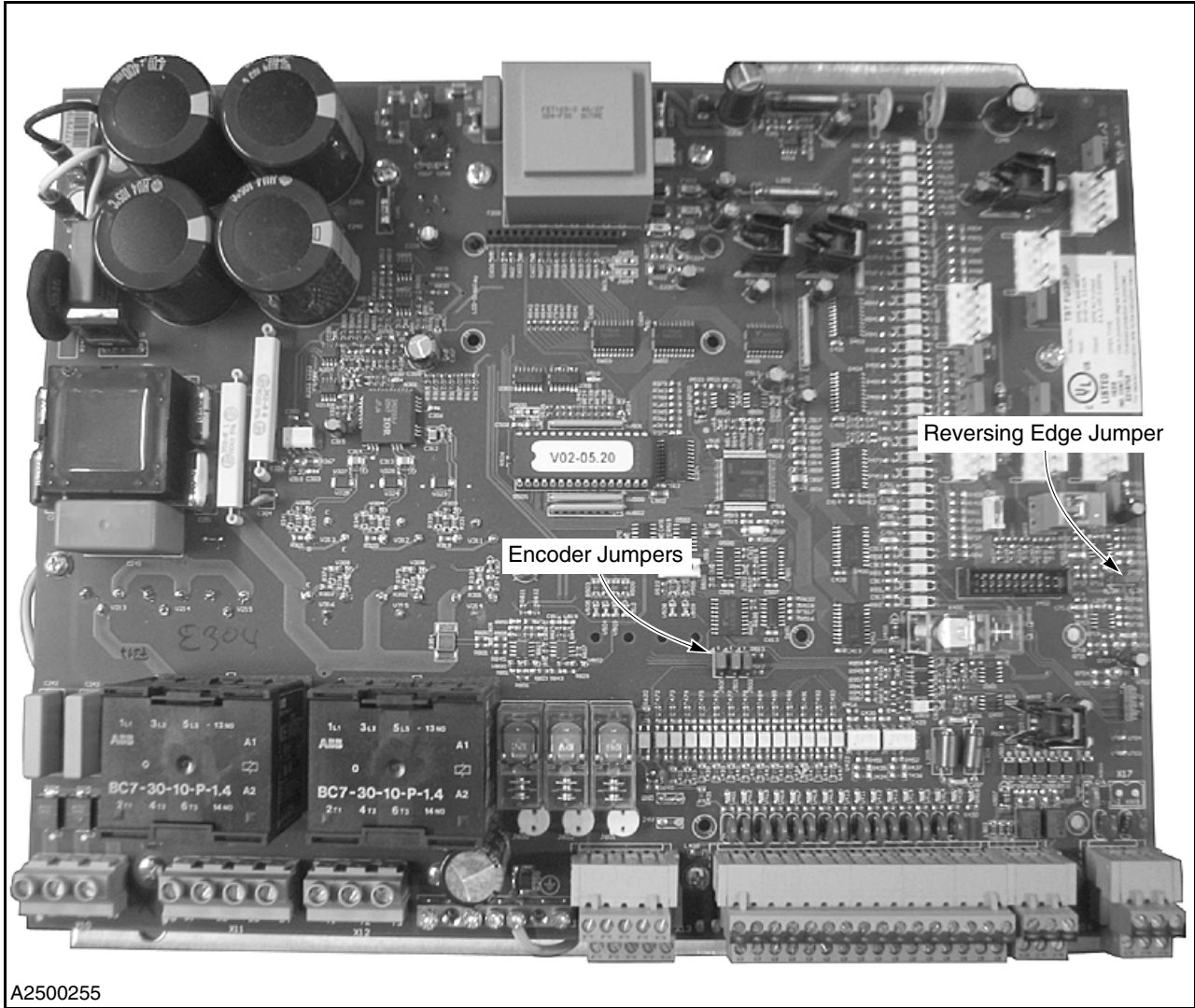


Figure 47

Jumpers on the System 3 Control Panel

Encoder jumpers J500, J501, and J502.
(See Figure 48.)

NOTE: All three jumpers to be put in the top two pins.

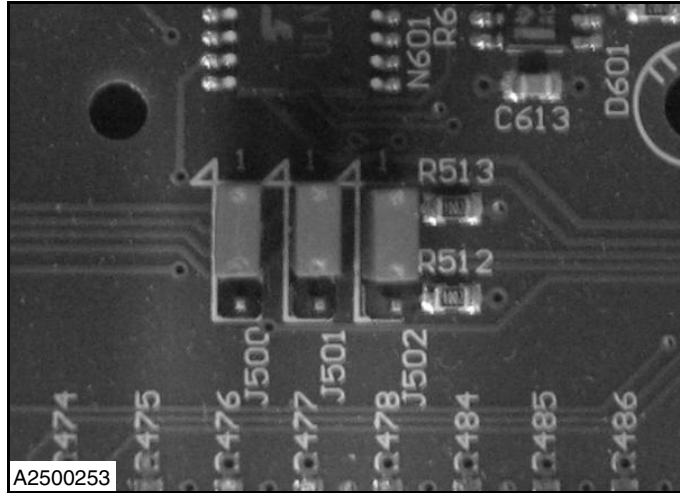


Figure 48

Jumper for the reversing edge should be configured for 8.2K ohms.
(See Figure 49.)

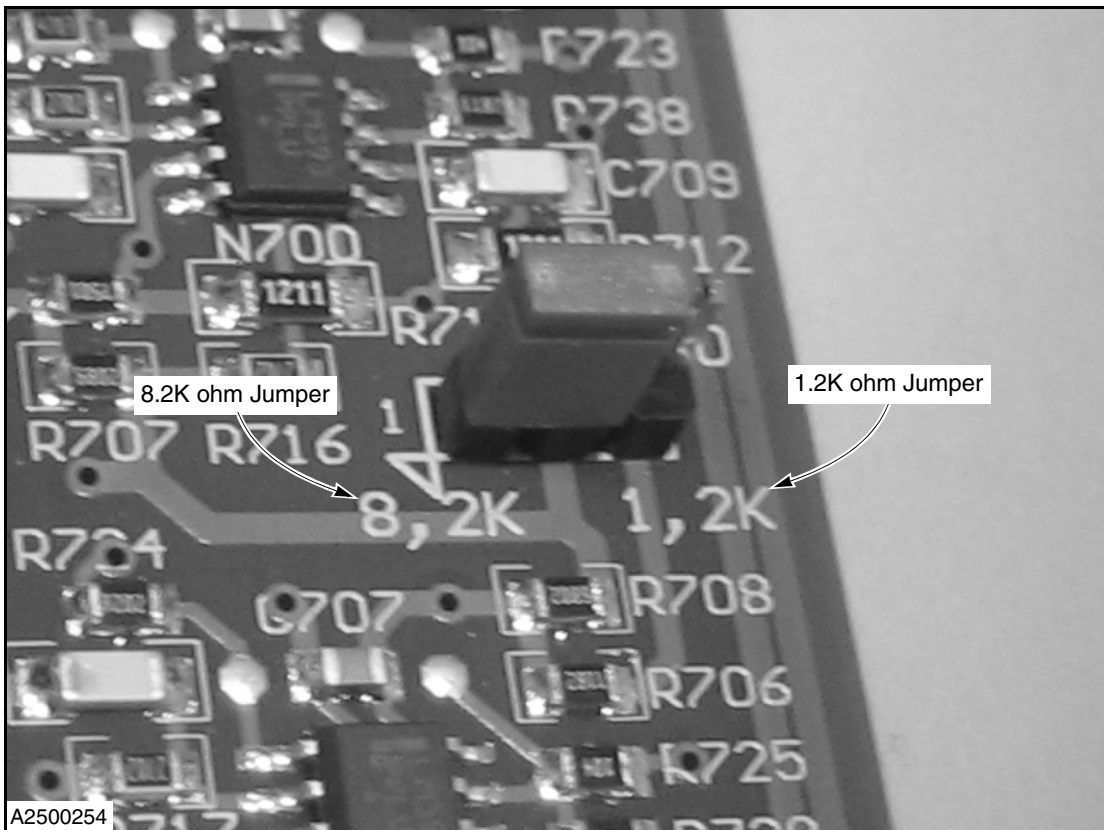


Figure 49

Please contact Rytec Customer Support at 800-628-1909 if there are any questions or concerns.

SYSTEM PARAMETERS—OPERATOR LEVEL PARAMETER

SYSTEM PARAMETERS

The system parameters are grouped into three levels; “OPERATOR LEVEL PARAMETER” below, “SERVICE LEVEL 1 PARAMETERS” on page 25, and “SERVICE LEVEL 2 PARAMETERS” on page 27.

OPERATOR LEVEL PARAMETER

Table 6 below lists the parameters available through the Operator Level. Included in this table is a description of each parameter and its available range and factory default setting.

Table 6

Parameter	Range	Operator Level Parameters (Password Not Required)	Factory Setting
P.010	0 – 200 seconds	Auto-close delay timer 1 — ACL1 (with activator connected to input 5 — terminals 13 and 14) 0 = Off Time door remains open after all activation and safeties are clear	10
P.011	0 – 200 seconds	Auto-close delay timer 3 — ACL3 (error position only) (0 = off)	0
P.015	0 – 200 seconds	Auto-close delay timer 2 — ACL2 (with activator connected to input 6 — terminals 15 and 16 or input 7 — terminals 17 and 18) 0 = Off Time door remains open after all activation and safeties are clear	5
P.050 (Defrost System Only)	0 – 3	Heater status 0: Off 1: On — low heat stage 1 heated blower or – heat lamps 2: On — medium heat stage 1 + 2 heated blower 3: On — high heat stage 1 + 2 + 3 heated blower	0
P.051 (Defrost System Only)	0 – 1	Heater control (parameter P.050 must be set to on) 0: Manual 1: Automatic timer	0
P.055 (Defrost System Only)	0 – 3	Blower control 0: Off 1: Low-speed 2: High-speed 3: Automatic (blower runs at high speed when door is open)	0
P.058 (Defrost System Only)	5 – 600 minutes	Heater timer on time	30
P.059 (Defrost System Only)	5 – 600 minutes	Heater timer off time	5
P.999		Password (for accessing Service Levels 1 and 2)	

SYSTEM PARAMETERS—SERVICE LEVEL 1 PARAMETERS

SERVICE LEVEL 1 PARAMETERS

Table 7 below lists the parameters available through Service Level 1. Included in this table is a description of each parameter and its available range and factory default setting.

Table 7

Parameter	Range	Service Level 1 Parameters (Password = 5)	Factory Setting
P.000		Door cycle counter (read only)	
P.001	N/A	Saved door cycle counter	
P.010	0 – 200 seconds	Auto-close delay timer 1 — ACL1 (with activator connected to input 5 — terminals 13 and 14) 0 = Off Time door remains open after all activation and safeties are clear	10
P.011	0 – 200 seconds	Auto-close delay timer 3 — ACL3 (error position only) (0 = off)	0
P.015	0 – 200 seconds	Auto-close delay timer 2 — ACL2 (with activator connected to input 6 — terminals 15 and 16 or input 7 — terminal 17 and 18) 0 = Off Time door remains open after all activation and safeties are clear	5
P.050 (Defrost System Only)	0 – 3	Heater status 0: Off 1: On — low heat stage 1 heated blower or heat lamps 2: On — medium heat stage 1 + 2 heated blower 3: On — high heat stage 1 + 2 + 3 heated blower	0
P.051 (Defrost System Only)	0 – 1	Heater control (parameter P.050 must be set to on) 0: Manual 1: Automatic timer	0
P.055 (Defrost System Only)	0 – 3	Blower control 0: Off 1: Low-speed 2: High-speed 3: Automatic (blower runs at high speed when door is open)	0
P.058 (Defrost System Only)	5 – 600 minutes	Heater timer on time	30
P.059 (Defrost System Only)	5 – 600 minutes	Heater timer off time	5
P.210	0 – 5	Limit set-up 0: Off 1: Open, close, and partial set-up (partial set using P.244) 2: Open 3: Open and close 4: Partial (P.244 ignored) 5: All (partial set using P.244)	0

SYSTEM PARAMETERS—SERVICE LEVEL 1 PARAMETERS

Parameter	Range	Service Level 1 Parameters (Password = 5)	Factory Setting
P.221	±125 increments	Close-limit adjustment (For minor adjustments to the close position of the door. This adjustment resets to 0 if the limits are reset. 10 increments equals approximately 1 inch of door travel.)	0
P.231	±60 increments	Open-limit adjustment. (For minor adjustments to the open position of the door. This adjustment resets to 0 if the limits are reset. 10 increments equals approximately 1 inch of door travel.)	0
P.244	0 – 3	Partial position 0: Parameter off 1: Half-open position 2: Two-thirds-open position 3: Operator-established position	
P.920		Error history (last eight errors saved) View? — press enter key to view errors (use up or down key to scroll through failures) #Clear? — press enter key to clear saved setting #Exit? — press enter key on keypad to exit parameter	
P.980	0 – 4	Operating mode 0: Standard door open and close 1: Jog door close/standard open 2: Jog door close/jog open 3: Emergency jog close/jog open with all inputs (photo eyes, encoder, reversing edge, etc.) ignored 4: Test mode — door automatically cycles open and closed (cycle time set with ACL1)	0
P.999		Password (for accessing Service Levels 1 and 2)	

SYSTEM PARAMETERS—SERVICE LEVEL 2 PARAMETERS

SERVICE LEVEL 2 PARAMETERS

Table 8 below lists some of the parameters available through Service Level 2. Included in this table is a description of each parameter and its available ranges and factory default settings.

At Service Level 2, the technician will be able to view all the parameters in the System 3 Control panel. However, some parameters (Safety) will require an additional Ryttec level password to do the changes.

Table 8

Parameter	Range	Service Level 2 Parameters	Factory Setting
P.000	Cycles	Door cycle counter (read only)	
P.001	Cycles	Saved door cycle counter	
P.005	Cycles	Maintenance counter	
P.010	0 – 200 seconds	Auto-close delay timer 1 — ACL1 (with activator connected to input 5 — terminal 14) 0 = Off	10
P.011	0 – 200 seconds	Auto-close delay timer 3 — ACL3 (used with optional passage position only) 0 = Off	0
P.015	0 – 200 seconds	Auto-close delay timer 2 — ACL2 (with activator connected to input 6 — terminal 16 or input 7 — terminal 18) 0 = Off	5
P.016	0 – 60 seconds	Minimum green time for traffic lights	
P.017	0 – 999 seconds	Saves open commands <i>NOTE: Changing the value to 0 will eliminate stored open commands.</i>	
P.018	0 – 255 minutes	Forced opening time (If the door remains closed for a longer period, it can be forced open after the time entered here, without needing an OPEN command.) <i>NOTE: This function is typically used in freezer areas in order to prevent freezing of the door to the ground.</i>	
P.020	0 – 1000 milliseconds	Pre-warning time before open	
P.025	0 – 20 seconds	Close time/pre-warning time before close	
P.026	0 – 1	Activate close time/pre-warning time before close between end positions (By activating this parameter the close time/pre-warning time set by input is running also between end positions not only in end OPEN. The used time is set by P.025.) 0: Close time/pre-warming time set by input is running only in end OPEN 1: Close time/pre-warming time set by input is running between end positions and end OPEN	

SYSTEM PARAMETERS—SERVICE LEVEL 2 PARAMETERS

Parameter	Range	Service Level 2 Parameters	Factory Setting
P.050 (Defrost System Only)	0 – 3	Heater status 0: Off 1: On — low heat stage 1 heated blower or heat lamps 2: On — medium heat stage 1 + 2 heated blower 3: On — high heat stage 1 + 2 + 3 heated blower	0
P.051 (Defrost System Only)	0 – 1	Heater control (parameter P.050 must be on) 0: Manual 1: Automatic timer	0
P.055 (Defrost System Only)	0 – 3	Blower control 0: Off 1: Low speed 2: High speed 3: Automatic (blower runs at high speed when door is open)	0
P.058 (Defrost System Only)	5 – 600 minutes	Heater timer on time	30
P.059 (Defrost System Only)	5 – 600 minutes	Heater timer off time	5
P.070 (Clean-Roll Door Only)	0 – 1	Clean position (for cleaning panel and drum assembly) 0: Off 1: Cleaning position (press close key with door closed)	1
P.100	30 – 200 Hz	Motor frequency (listed on nameplate) (requires Rytec level password to change this value)	60 Hz
P.101	0 – 9.9 amps	Motor current (listed on nameplate) (requires Rytec level password to change this value)	
P.102	40 – 100%	Motor power factor (listed on nameplate) (requires Rytec level password to change this value)	
P.103	100 – 500volts	Motor voltage (listed on nameplate) (requires Rytec level password to change this value)	
P.130	0 – 1	Motor rotary field (This parameter specifies the rotary field of the motor for OPEN move.) 0: Right rotating 1: Left rotating	

SYSTEM PARAMETERS—SERVICE LEVEL 2 PARAMETERS

Parameter	Range	Service Level 2 Parameters	Factory Setting
P.140	0 – 30%	<p>Torque boost — door open cycle (Boost is used to increase the power of drives in the lower speed range. Either a too little or a too high boost setting can result in improper door movement. If too much boost is already set, this will result in an overcurrent error (F.510/F.410). In this case you must reduce the boost. Due to the large number of possible door/gate types, the correct boost setting should be determined experimentally. The diagnostic function for motor current (see Parameter P.910) can be helpful here. By using the current indicator you can easily determine whether the changed setting has achieved the desired results.)</p> <p><i>NOTE: The boost should always be set as low as possible, but high enough to do the job.</i></p>	0
P.145	0 – 30%	<p>Torque boost — door close cycle (See Parameter P.140)</p>	0
P.201	0 – 10	<p>Baudrate 0: 100 kHz 1: 150 kHz 2: 200 kHz 3: 250 kHz 4: 300 kHz 5: 400 kHz 6: 500 kHz 7: 600 kHz 8: 700 kHz 9: 800 kHz 10: 1 MHz</p>	
P.202	0 – 20	<p>Resolution (Depends on mounting position of the encoder.)</p> <p><i>IMPORTANT: The resolution value may need to be changed when changing from one model of encoder to another. The value may need to be increased. Contact the Rytec Customer Support Department for instruction at 800-628-1909.</i></p> <p><i>NOTE: Have your door(s) serial number when calling the Rytec Customer Support Department.</i></p>	
P.210	0 – 5	<p>Limit set-up 0: Off 1: Open, close, and partial set-up (partial set using P.244) 2: Open 3: Open and close 4: Partial (P.244 ignored) 5: All (partial set using P.244)</p>	0

SYSTEM PARAMETERS—SERVICE LEVEL 2 PARAMETERS

Parameter	Range	Service Level 2 Parameters	Factory Setting
P.221	±125 increments	Close-limit adjustment (For minor adjustments to the close position of the door. This adjustment resets to 0 if the limits are reset. 10 increments equals approximately 1 inch of door travel.)	0
P.231	±60 increments	Open-limit adjustment (For minor adjustments to the open position of the door. This adjustment resets to 0 if the limits are reset. 10 increments equals approximately 1 inch of door travel.)	0
P.244	0 – 3	Partial position 0: Parameter off 1: Half-open position 2: Two-thirds-open position 3: Operator-established position	0
P.310	6 – 200 Hz	Frequency setting (opening) — controls door-open speed	60
P.350	6 – 200 Hz	Frequency setting (closing) — controls door-close speed	40
P.630	0 – 2	Function foil keypad OPEN (Specifies the function (mode) of the OPEN key) 0: No door function 1: Only deadman move during deadman operation 2: Deadman and automatic	2
P.633	0 – 3	Open position — when door is activated with up (▲) key 0: Full-open position 1: Partial-open position 2: Press up (▲) key one time to move door to partial-open position, press up (▲) key a second time to move to full-open position 3: Press up (▲) key twice to move door to full-open position	
P.634	0 – 2	Auto-close delay timer — activated with up (▲) key 0: None 1: ACL1 2: ACL2	1
P.635	0 – 1	Delay to open/close timer — activated with up (▲) key 0: Off 1: On	1
P.636	0 – 3	Up (▲) key traffic direction assignment 0: None 1: Front-to-back 2: Back-to-front 3: Front-to-back and back-to-front	0

SYSTEM PARAMETERS—SERVICE LEVEL 2 PARAMETERS

Parameter	Range	Service Level 2 Parameters	Factory Setting
P.640	0 – 2	Function foil keypad STOP (Specifies the function (mode) of the STOP key) 0: No door function during automatic travel 1: After pressing the STOP key, the door is stopped and waits for any command 2: After pressing the STOP key, the door is stopped and waits for a keypad command <i>NOTE: The RESET key also serves as the ENTER key and the STOP key.</i>	0
P.650	0 – 2	Function foil keypad CLOSE (Specifies the function (mode) of the CLOSE key) 0: No door function 1: Only deadman move during deadman operation 2: Deadman and automatic	2
P.655	0 – 1	Delay to open/close timer — activated with down (▼) key 0: Off 1: On	1
P.660	0 – 4	Floor loop detector — channel 1 function 0: Off 1: Open signal 2: Safety — activating the loop with the door closing will reverse the door; the door will remain open until the loop is inactive and a timer or alternate action activator closes the door; the loop is always inactive when the door is closed 3: Safety — activating the loop with the door closing will reverse the door; the door will remain open until the loop is inactive and then immediately close once the loop becomes inactive; the loop is always inactive when the door is closed 4: Safety — activating the loop with the door closing will immediately stop the door; the door will remain stopped until the loop is inactive and then immediately close when the loop becomes inactive; the loop is inactive when the door is closed	1
P.663	0 – 1	Open position — loop detector channel 1 0: Full-open position 1: Partial-open position	0
P.664	0 – 2	Auto-close delay timers — loop detector channel 1 0: None 1: ACL1 2: ACL2	1
P.665	0 – 1	Delay to open/close timer — loop detector channel 1 0: Off 1: On	1
P.666	0 – 3	Traffic direction assignment — loop detector channel 1 0: None 1: Front-to-back 2: Back-to-front 3: Front-to-back and back-to-front	0

SYSTEM PARAMETERS—SERVICE LEVEL 2 PARAMETERS

Parameter	Range	Service Level 2 Parameters	Factory Setting
P.667	0 – 1	Loop detector channel 1 disabled by: 0: Loop detector channel 2 1: Loop detector channel 2 and another activator	0
P.668	0 – 120 seconds	Time loop detector channel 1 is disabled by loop detector channel 2 or another activator	0
P.66A	0 – 20 seconds	Turn on delay Detector Channel 1	
P.670	0 – 4	Floor loop detector — channel 2 function 0: Off 1: Open signal 2: Safety — activating the loop with the door closing will reverse the door; the door will remain open until the loop is inactive and a timer or alternate action activator closes the door; the loop is always inactive when the door is closed 3: Safety — activating the loop with the door closing will reverse the door; the door will remain open until the loop is inactive and then immediately close once the loop becomes inactive; the loop is always inactive when the door is closed 4: Safety — activating the loop with the door closing will immediately stop the door; the door will remain stopped until the loop is inactive and then immediately close when the loop becomes inactive; the loop is inactive when the door is closed	1
P.673	0 – 1	Open position — loop detector channel 2 0: Full-open position 1: Partial-open position	0
P.674	0 – 2	Auto-close delay timers — loop detector channel 2 0: None 1: ACL1 2: ACL2	1
P.675	0 – 1	Delay to open/close timer — loop detector channel 2 0: Off 1: On	1
P.676	0 – 3	Traffic direction assignment — loop detector channel 2 0: None 1: Front-to-back 2: Back-to-front 3: Front-to-back and back-to-front	0
P.677	0 – 1	Loop detector channel 2 disabled by: 0: loop detector channel 1 1: loop detector channel 1 and another activator	0
P.678	0 – 120 seconds	Time loop detector channel 2 is disabled by loop detector channel 1 or another activator	0
P.67A	0 – 20 seconds	Turn on delay detector channel 2	

SYSTEM PARAMETERS—SERVICE LEVEL 2 PARAMETERS

Parameter	Range	Service Level 2 Parameters	Factory Setting
P.681	0 – 5	Transmitter operating sequence — radio channel 1 0: Pushing the button opens door, stops door, and opens door to open limit (requires additional activator to close the door) 1: Pushing the button opens door, stops door, opens door to open limit, closes door 2: Pushing the button opens door to open limit (partial or full-open), closes door 3: Pushing the button opens door, stops door, closes door 4: Pushing the button opens door, stops door, closes door, stops door 5: Pushing button opens door to open limit (partial or full-open)	2
P.683	0 – 3	Open position — radio channel 1 0: Full-open position 1: Partial-open position 2: Partial open when radio is activated one time, full-open when activated a second time 3: Full-open when radio is activated twice	0
P.684	0 – 2	Auto-close delay timer — radio channel 1 0: None 1: ACL1 2: ACL2	1
P.685	0 – 1	Delay to open/close timer — radio channel 1 0: Off 1: On	1
P.686	0 – 3	Traffic direction assignment — radio channel 1 0: None 1: Front-to-back 2: Back-to-front 3: Front-to-back and back-to-front	0
P.691	0 – 5	Transmitter operating sequence — radio channel 2 0: Pushing the button opens door, stops door, and opens door to open limit (requires additional activator to close the door) 1: Pushing the button opens door, stops door, opens door to open limit, closes door 2: Pushing the button opens door to open limit (partial or full-open), closes door 3: Pushing the button opens door, stops door, closes door 4: Pushing the button opens door, stops door, closes door, stops door 5: Pushing the button opens door to open limit (partial or full-open)	2
P.693	0 – 3	Open position — radio channel 2 0: Full-open position 1: Partial-open position 2: Partial-open when radio is activated one time, full-open when activated a second time 3: Full-open when radio is activated twice	0

SYSTEM PARAMETERS—SERVICE LEVEL 2 PARAMETERS

Parameter	Range	Service Level 2 Parameters	Factory Setting
P.694	0 – 2	Auto-close delay timer — radio channel 2 0: None 1: ACL1 2: ACL2	1
P.695	0 – 1	Delay to open/close timer — radio channel 2 0: Off 1: On	1
P.696	0 – 3	Traffic direction assignment — radio channel 2 0: None 1: Front-to-back 2: Back-to-front 3: Front-to-back and back-to-front	0

Table 9

Parameter	Range	Service Level 2 Parameters	Factory Setting
NOTE: X = Number of the inputs you wish to configure.			
P:5X0		Basic function of the input Example: OPEN, CLOSE, SAFETY, AIRLOCK, STOP	
P:5X1		Mode can be locked or not locked Example: Open will not work unless a loop is occupied	
P:5X2		Contact type can be programmed for normally open or normally closed	
P:5X3		The end position the door will stop Example: Can be programmed for full or partial open	
P:5X4		Hold-open time Which hold-open timer that you would like the door to operate on P:010 or P:015	
P:5X5		Clear timer Activate a pre-warning timer P:025	
P:5X6		Direction of the input Example: The input only works if activated from outside or inside	
P:5X9		LCD text The message to be displayed on the LCD screen	
Contact Rytec Customer Support (800-628-1909) for specific information regarding input configuration. The Rytec Customer Support group has performed many different input configurations and can help you determine which configuration is best suited for your environment. Please provide door serial number when contacting Rytec Customer Support.			

SYSTEM PARAMETERS—SERVICE LEVEL 2 PARAMETERS

Parameter	Range	Service Level 2 Parameters	Factory Setting
<p>P.7x0</p> <p><i>NOTE: The "x" in P.7x0 represents the relay number. Example P:710 represents relay number 1 and P:720 represents relay number 2 and so forth. Up to eight possible relays can be used.</i></p>	<p>0 – 26</p>	<p>Switching condition output relay</p> <p>The selected output relay is energized under the following conditions:</p> <p>0: If end position door OPEN was reliably detected 1: If end position door OPEN was not reliably detected 2: If end position door CLOSE was reliably detected 3: If end position door CLOSE was not detected 4: If there is a fault condition or emergency stop, controller in automatic mode 5: Courtyard light function, during every OPEN and CLOSE move with 10 turn-off delay after opening 6: Command forwarding</p> <p><i>NOTE: This setting involves additional setting under P.7x7.</i></p> <p>7: During each OPEN and CLOSE move 8: During each OPEN and CLOSE move and during active clearing time 9: Forward external door release (e.g., airlock operation) 10: Forward external door locking (e.g., airlock operation) 11: Switched magnet voltage 12: Traffic light function</p> <p><i>NOTE: This setting involves additional setting parameter P.7x6 to P.7xd.</i></p> <p>13: Freezer output 14: Position forwarding</p> <p><i>NOTE: This setting involves additional settings under P.7x5.</i></p> <p>15: Output warning message from maintenance counter 16: Airock OPEN, forwards OPEN command to second airlock door 17: Test of draw in safety device Relay is active in end position CLOSE and is used e.g. to switch of the photo eye of the draw in safety in order to test it 18: Reserved 19: Reserved 20: Reserved 21: Reserved 22: Reserved 23: Reserved 24: Reserved 25: Test at the end position door OPEN Relay works at the end position door OPEN 26: Reserved</p>	
<p>P.7x1</p>	<p>0 – 1000 seconds</p>	<p>Relay Kx switching behavior</p> <p>0: Flashing at 1 Hz 1-999: Time on in seconds 1000: Constant on</p>	<p>1000</p>

SYSTEM PARAMETERS—SERVICE LEVEL 2 PARAMETERS

Parameter	Range	Service Level 2 Parameters	Factory Setting
P.7x2	0 – 999 seconds	On delay for relay Kx — relay Kx is turned on with a delay for the set time	0
P.7x3	0 – 999 seconds	Off delay for relay Kx — relay Kx is turned off with a delay for the set time	0
P.7x5	0 – 9999	Position forwarding <i>NOTE: This function is only practical if electronic limit switches are used.</i>	
P.7x6 (This Parameter Determines Which Relay Controls Which Traffic Light.)	0 – 3	Relay Kx used for traffic light control (P.7x0 set to “Traffic Light Function”) 0: Green traffic light front 1: Red traffic light front 2: Green traffic light back 3: Red traffic light back	0
The Following Parameters Apply Only to the Traffic Light Function			
P.7x7	0 – 1	Relay Kx switching behavior with door closed 0: Off 1: On 2: Flashing .5Hz 3: Flashing 1 Hz 4: Flashing 2 Hz	
P.7x8	0 – 2	Relay Kx switching behavior while door opens 0: Off 1: On 2: Flashing .5Hz 3: Flashing 1 Hz 4: Flashing 2 Hz	
P.7x9	0 – 2	Relay Kx switching behavior with door open 0: Off 1: On 2: Flashing .5Hz 3: Flashing 1 Hz 4: Flashing 2 Hz 5: Off if condition of P:7xF is fulfilled 6: On if condition of P:xF is fulfilled 7: Flashing at 1HZ if condition of P:7xF is fulfilled	
P.7xA	0 – 3	Relay Kx switching behavior during delay to close time 0: Off 1: On 2: Flashing .5Hz 3: Flashing 1 Hz 4: Flashing 2 Hz	

SYSTEM PARAMETERS—SERVICE LEVEL 2 PARAMETERS

Parameter	Range	Service Level 2 Parameters	Factory Setting
P.7xB	0 – 3	Relay Kx switching behavior while door is closing 0: Off 1: On 2: Flashing .5Hz 3: Flashing 1 Hz 4: Flashing 2 Hz	
P.7xC	0 – 3	Relay Kx switching behavior with door stopped between limits 0: Off 1: On 2: Flashing .5Hz 3: Flashing 1 Hz 4: Flashing 2 Hz	
P.7xD	0 – 3	Relay Kx switching behavior when the door is not ready for automatic operation (e.g., during a failure or set-up mode) 0: Off 1: On 2: Flashing .5Hz 3: Flashing 1 Hz 4: Flashing 2 Hz	

SYSTEM PARAMETERS—SERVICE LEVEL 2 PARAMETERS

Parameter	Range	Service Level 2 Parameters	Factory Setting
P.7xF	0 – 54	<p>Command Forwarding The selected relay is activated when one of the following inputs is activated:</p> <p>0: Off 1 – 12: Input 1 to 12 13: Internal emergency STOP 14: External emergency STOP 1 15: External emergency STOP 2 16: Foil key OPEN 17: Foil key STOP 18: Foil key CLOSE 19: Detector channel 1 20: Detector channel 2 21: Radio channel 1 22: Radio channel 2 23 – 30: Input 21-28 (only with TST RFU3P)</p> <p>Combinations:</p> <p>31: One of the above listed inputs 32: One of the photo eyes 33: One of the detectors 34: OPEN commands from direction 1 (from outside) 35: OPEN commands from direction 2 (from inside) 36: Reserved 37: Reserved 38: Reserved 39: Reserved 40: Automatic closing because of tripped internal safety edge not possible 41: Reserved 42: One of the safety edges is disturbed 43: Reserved 44: Forwarding F.060 45: One of the OPEN commands 46: Detector 1 is released 47: Detector 2 is released 48: Reserved 49: Reserved 50: Reserved 51: Reserved 52: Opening 53: Closing 54: Immediate stop/partial open 55: Reserved 56: Reserved 57: Output wakeup safety edge 58: Output wakeup safety edge (only in closing direction)</p>	

SYSTEM PARAMETERS—SERVICE LEVEL 2 PARAMETERS

Table 10

Parameter	Range	Service Level 2 Parameters	Factory Setting
P.810	0 – 30 seconds	Block time detector channel 1 and OPEN 1	
P.820	0 – 30 seconds	Block time detector channel 2 and OPEN 2	
P.890	0 – 2	<p>Locking of close commands given by detectors (The closing of the door in case of oncoming traffic or convoy traffic can be specifically prevented. With this function you can prevent the door from closing by the loop close command of the first vehicle after getting two open commands given from the same or different direction.)</p> <p>0: No locking of close commands by detectors 1: Locking of close command in case of recognized oncoming traffic 2: Locking of close command in case of recognized oncoming traffic and convoy traffic</p>	
P.910	0 – 22	<p>Display mode selection The following variables are displayed:</p> <p>0: The control sequence is displayed (Automatic) 1: [Hz] The current travel speed 2: [A] The current motor current 3: [V] The current motor voltage 4: [A] The current DC bus current 5: [V] The current DC bus voltage 6: [°C] The power stage temperature in °Celsius 7: [°F] The power stage temperature in °Fahrenheit 8: [s] The run time of the motor during the last door operation 9: [Increments] The current position 10: [Increments] The position of the reference 11: [Dig] Channel 1 value of the absolute encoder 12: [Dig] Channel 2 value of the absolute encoder 13: [V] Current reference voltage 14: Reserved 15: Reserved 16: Reserved 17: Reserved 18: Rotation speed of the TST PD shaft</p> <p><i>NOTE: Only with TST PD.</i></p> <p>19: Reserved 20: Reserved 21: Number of position requisition without answer 22: Number of wrong received signs in TST PD encoder (activates also the output in P.955)</p> <p><i>NOTE: Settings 9 to 12 only have meaning when using an electronic limit switch.</i></p> <p><i>Settings 16 to 22 only have meaning when using an TST PD absolute limit switch.</i></p>	

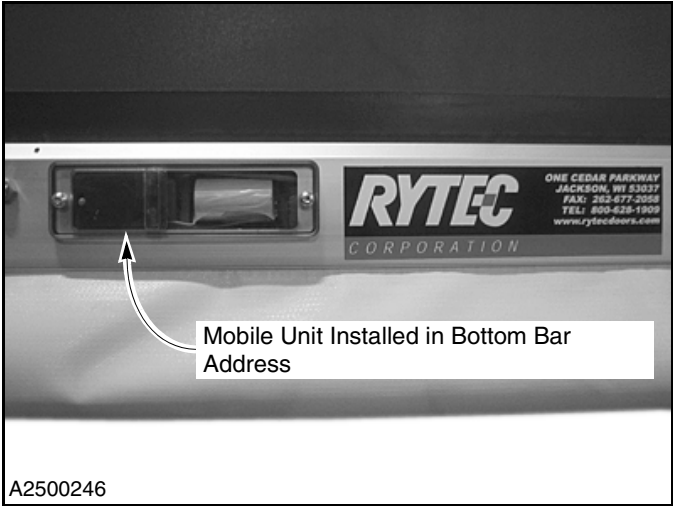
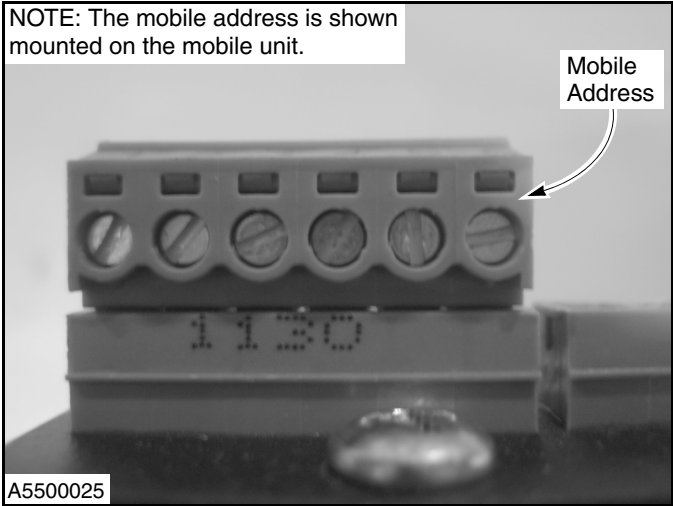
SYSTEM PARAMETERS—SERVICE LEVEL 2 PARAMETERS

Parameter	Range	Service Level 2 Parameters	Factory Setting
P.920	EB1 – EB8, EBcl, EB--	<p>Error memory (The controller stores the last four errors in the error memory) After opening parameter P.920:</p> <ul style="list-style-type: none"> • Change level using OPEN and CLOSE keys • Opening the error memory with A STOP • Closing the error memory with A STOP • Exiting parameter P.920 with Eb-- <p>EB1: Error message 1 (most recent error) EB2: Error message 2 EB3: Error message 3 EB4: Error message 4 EB5: Error message 5 EB6: Error message 6 EB7: Error message 7 EB8: Error message 8 EBcl: Clear the complete error memory EB--: Exit the error memory, jump back to parameter</p> <p><i>NOTE: Er-in the display means that no error was entered.</i></p>	
P.940	Volt	<p>Input voltage (In this parameter the amount of the currently present input voltage is displayed)</p>	
P.941	Volt	<p>Highest measured input voltage (Highest measured input voltage, value is kept in permanent memory and can be reset on highest password level by open and save the parameter)</p>	
P.950	-999 – 9999	<p>Current position (In this parameter the current position of the door referenced to the door CLOSE end position is displayed)</p>	
P.970	0 – 3	<p>Response to due maintenance. Messages or errors will be output:</p> <p>0: Service counter is deactivated 1: Warning I.080 is output 2: Error F.080 is output and the CLOSE move of the door is only possible in deadman mode 3: Error F.080 is output and CLOSE and OPEN move is only possible in deadman mode</p>	
P.971	1 – 9999	<p>Number of door cycles after resetting</p>	
P.972	0 – 9999	<p>Warning before expiration of the maintenance counter <i>NOTE: Function only active if P.970 = 2 or 3</i></p>	
P.973	0 – 1	<p>Resetting the maintenance counter. (By setting this parameter to 1 the maintenance counter is reset)</p>	

SYSTEM PARAMETERS—SERVICE LEVEL 2 PARAMETERS

Parameter	Range	Service Level 2 Parameters	Factory Setting
P.980	0 – 5	<p>Operating mode (This parameter is used to set the operating mode for the controller) The following modes are possible: 0: OPEN and CLOSE move in self-holding (automatic) 1: OPEN move in self-holding, CLOSE move in manual mode (partial automatic) 2: OPEN and CLOSE move in manual mode (deadman) 3: Deadman emergency operation</p> <p align="center">⚠ WARNING</p> <p align="center">All safety devices and limit switches are ignored.</p> <p>4: Endurance test with safety devices automatic OPEN and CLOSE operation. Before each new operation the hold-open time P.010 is in effect 5: Endurance test without safety devices</p> <p align="center">⚠ WARNING</p> <p align="center">All safety devices are ignored.</p> <p><i>NOTE: The endurance test setting is lost after turning off the controller. The controller then reverts to manual mode.</i></p>	0
P.985	0 – 3	<p>Text language 0: English text 1: German text 2: Spanish text 3: French text</p>	0
P.999		Password (for accessing Service Levels 1 and 2)	
P.F00	0 – 1	<p>Activation of the wireless (Activate the functions of the wireless in the controller)</p>	
P.F01	6 – 50 milliseconds	<p>Timeout for the wireless (This sets the wireless timeout within the controller) <i>NOTE: If the mobile unit doesn't send a message within the specified time, the wireless edge will be seen as tripped.</i></p>	
P.F02	Volt	<p>Battery voltage (Shows the voltage of the battery attached to the mobile unit)</p>	
P.F03	0 – 100%	<p>Wireless status <i>NOTE: A percentage of 90% is preferred.</i></p>	

SYSTEM PARAMETERS—SERVICE LEVEL 2 PARAMETERS

Parameter	Range	Service Level 2 Parameters	Factory Setting
P.F04	0 – 1	Awake mode 0: Mobile unit uses sleep modes to save energy 1: The mobile unit is permanently awake (only for testing, consumes a lot of power)	
P.F05	1 – 10	Channel group (The channel group of the wireless connection)	
P.F06	1 – 10	Used channel group (Testing parameter for the auto channel mode, which will be implemented later)	
P.F07	0 – FFFF	Mobile unit address (The address on the mobile unit is used to communicate with the encoder via the antenna in the head assembly. Each mobile unit has its own address number.)  <p style="text-align: center;">A2500246</p> <p style="text-align: center;">Figure 50</p> <p>NOTE: The mobile address is shown mounted on the mobile unit.</p>  <p style="text-align: center;">A5500025</p> <p style="text-align: center;">Figure 51</p>	

SYSTEM PARAMETERS—SERVICE LEVEL 2 PARAMETERS

Parameter	Range	Service Level 2 Parameters	Factory Setting
P.F08	0 – 3, 5 Volts	Battery voltage warning level (The warning level for the battery voltage. If the battery voltage is less than the specified value, a F857 will occur. A setting of 0.0V means that the warning is turned off)	

SYSTEM PARAMETERS—FAULT CODES

FAULT CODES

GENERAL OPERATION FAULT CODES

Table 11 below lists the fault codes associated with the general operation of the door. Included in this table are the available fault codes, a description of each fault code, and the suggested corrective action to clear the fault. (Door is in the error jog only mode.)

Table 11

Fault Code (Displayed Message)	Description	Corrective Action
F.000 (Beyond Opn) <i>(beyond open)</i>	Door opens past full-open position. 1. Motor brake faulty or improperly adjusted 2. Door position parameters incorrect	1. Repair or adjust motor brake 2. Consult factory
F.005 (Beyond Clsd) <i>(beyond closed)</i>	Door closes past full-closed position. 1. Motor brake faulty or improperly adjusted 2. Door position parameters incorrect	1. Repair or adjust motor brake 2. Consult factory
F.020 (Beyond Runt) <i>(beyond run time)</i>	Door open run time exceeded. 1. Blocked door 2. Sluggish motor 3. Run time set too low	1. Check mechanical operation of door 2. Check motor 3. Consult factory
F.030 (Mtr Stalled) <i>(motor stalled)</i>	Door travel incomplete. 1. Blocked door 2. Jammed motor 3. Encoder incorrectly installed 4. Encoder problem 5. Low start torque or speed	1. Check mechanical operation of door 2. Check motor and brake 3. Check encoder mounting 4. Check encoder operation 5. Consult factory
F.031 (Trv Direct) <i>(travel direction)</i>	Door moves in wrong direction. 1. Encoder wired incorrectly 2. Motor running in wrong direction 3. Motor brake releases early	1. Check encoder and encoder connections. Adjust motor operating frequency (P.185) or brake release timing (P.186). 2. Check motor rotation 3. Consult factory
F.043 (Pe Prelimit) <i>(photo eye prelimit)</i>	Photo eye deactivation position problem.	Check encoder operation.
F.050	Does not apply.	Consult factory.
F.060 (Door Ajar) <i>(door ajar)</i>	Bottom bar breakaway input activated.	Reassemble bottom bar or repair break-away switch.
F.070 (Clean Pos) <i>(clean position)</i>	Door panel closed past cleaning position. 1. Motor brake faulty or improperly adjusted 2. Door position parameters incorrect	Adjust cleaning position (P.070). 1. Repair or adjust motor brake 2. Consult factory
F.080 <i>(maint. req.)</i>	Maintenance is required.	Service counter is deactivated.

SYSTEM PARAMETERS—DOOR SAFETY/EMERGENCY FAULT CODES

DOOR SAFETY/EMERGENCY FAULT CODES

Table 12 lists the fault codes associated with the door safety/emergency system. Included in this table are the available fault codes, a description of each fault, and the suggested corrective action to clear the fault. (The door is in the emergency stop mode and will not operate.)

Table 12

Fault Code (Displayed Message)	Description	Corrective Action
F.201 (E-Stop Int) <i>(E-Stop internal)</i>	Internal emergency stop or control system watchdog activated. 1. Door stopped and does not operate 2. Corresponding error message displayed	1. Check internal E-Stop jumper 2. Consult factory if watchdog is activated
F.211 (E-Stop Ext1) <i>(E-Stop external 1)</i>	External Emergency Stop 1 activated. 1. Door stopped and does not operate 2. Corresponding error message displayed	1. Reset E-Stop 1 2. Terminals 1 and 2
F.212 (E-Stop Ext2) <i>(E-Stop external 2)</i>	External Emergency Stop 2 activated. 1. Door stopped and does not operate 2. Corresponding error message displayed	1. Reset E-Stop 2 2. Terminals 3 and 4

REVERSING EDGE CIRCUIT FAULT CODES

Table 13 below lists the fault codes associated with the reversing edge circuit. Included in this table are the available fault codes, a description of each fault code, and the suggested corrective action to clear the fault. (The door is in the error jog only mode.)

Table 13

Fault Code (Displayed Message)	Description	Corrective Action
F.360	Edge short circuit.	Edge short circuit.
F.361 (Edge Trip) <i>(edge trip)</i>	Reversing edge tripped. 1. Bottom edge of door made contact with object in door opening 2. Short circuit in reversing edge wiring 3. Pressure switch faulty or not adjusted	1. Reset control system 2. Check and repair wiring 3. Check and adjust switch <i>NOTE: Ohm reading on terminals Si1 and Si2 is 1.2K or 1200 ohms.</i> <i>All wireless units use a 8.2K ohm resistor. The 1.2K ohm resistor is used on the coil cord reversing edge system.</i>
F.362 (Edge Sys1) <i>(edge system 1)</i>	Internal control check.	Consult factory.

SYSTEM PARAMETERS—REVERSING EDGE CIRCUIT FAULT CODES

Fault Code (Displayed Message)	Description	Corrective Action
F.363 (Edge Open) <i>(edge open)</i>	Reversing edge circuit open. 1. Reversing edge wiring disconnected 2. Reversing edge coil cord cut or damaged 3. Reversing edge resistor is wrong value or missing	Check all parts of reversing edge circuit including coil cord and resistor. Make any necessary repairs or adjustments. Verify proper operation of reversing edge after all repairs and adjustments are made. Ohm reading is 1200 ohms at terminals Si1 and Si2. <i>NOTE: All wireless units use a 8.2K ohm resistor. The 1.2K ohm resistor is used on the coil cord reversing edge system.</i>

SYSTEM PARAMETERS—DRIVE SYSTEM FAULT CODES (400-LEVEL CODES)

DRIVE SYSTEM FAULT CODES (400-LEVEL CODES)

Table 14 below lists the fault codes associated with the drive system. Included in this table are the available fault codes, a description of each fault code, and the suggested corrective action to clear the fault.

NOTE: All 400-level codes are warnings. The door will continue to operate until the maximum allowable value is exceeded.

Table 14

Fault Code (Displayed Message)	Description	Corrective Action
F.400 (Sys. Reset) <i>(system reset)</i>	Controller hardware reset detected.	<ol style="list-style-type: none"> 1. Significant noise on the supply voltage 2. Internal watchdog tripped 3. RAM error
F.410 (Mtr OC L1) <i>(motor over current limit 1)</i>	Over current. <ol style="list-style-type: none"> 1. Mechanical problem 2. Motor brake not releasing 3. Motor nameplate parameters (frequency, current, etc.) incorrectly set 4. Motor torque boost incorrectly set 	<ol style="list-style-type: none"> 1. Check operation of door 2. Check brake 3. Check motor parameter settings and verify settings match listing on motor nameplate 4. Consult factory
F.420 (Dcb OV L1) <i>(DC buss over voltage limit 1)</i>	Over voltage. <ol style="list-style-type: none"> 1. Excessive supply voltage 2. Excessive motor speed 3. Motor speed cannot be properly reduced by motor brake 4. Faulty brake resistor 	<ol style="list-style-type: none"> 1. Measure supply 2. Consult factory 3. Consult factory 4. Consult factory
F.425 (Power OV) <i>(power over voltage)</i>	High supply voltage. <ol style="list-style-type: none"> 1. Incoming voltage too high 	<ol style="list-style-type: none"> 1. Check incoming voltage
F.426 (Power Low) <i>(power low)</i>	Low supply voltage. <ol style="list-style-type: none"> 1. Incoming voltage too low 	<ol style="list-style-type: none"> 1. Check incoming voltage
F.430 (Sink OT L1) <i>(sink over temperature limit 1)</i>	Excessive heat sink temperature. <ol style="list-style-type: none"> 1. Ambient air temperature above or below acceptable operating range 2. Door operating problems 	<ol style="list-style-type: none"> 1. Adjust ambient air temperature as required 2. Check operation of door
F.435	Temperature in housing above 75°C.	<ol style="list-style-type: none"> 1. Excessive load on frequency converter and/or circuitry 2. Control cabinet not sufficiently cooled
F.440 (Dcb OC L1) <i>(DC buss over current limit 1)</i>	DC buss over current. <ol style="list-style-type: none"> 1. Excessive load on 24 VDC dc supply 2. Motor problem 	<ol style="list-style-type: none"> 1. Check 24 V supply 2. Check motor

SYSTEM PARAMETERS—DRIVE SYSTEM FAULT CODES (500-LEVEL CODES)

DRIVE SYSTEM FAULT CODES (500-LEVEL CODES)

Table 15 below lists the fault codes associated with the drive system. Included in this table are the available fault codes, a description of each fault code, and the suggested corrective action to clear the fault.

NOTE: All 500-level codes are warnings indicating the maximum allowable value has been exceeded. The door will operate only in the failure error jog mode.

Table 15

Fault Code (Displayed Message)	Description	Corrective Action
F.510 (Mtr OC L2) <i>(motor over current limit 2)</i>	Over current. 1. Mechanical problem 2. Motor brake not releasing 3. Motor nameplate parameters (frequency, current, etc.) incorrectly set 4. Motor torque boost incorrectly set	1. Check operation of door 2. Check brake 3. Check motor parameter settings and verify settings match listing on motor nameplate 4. Consult factory
F.515 (Mtr OC Ext) <i>(motor over current external)</i>	Maximum motor over current. 1. Motor or motor connection problem 2. Incorrect motor nameplate parameters 3. Incorrect motor parameters	1. Check motor connections 2. Verify motor nameplate parameter settings P.100 and P.102 3. Consult factory
F.519 (IGBT OC) <i>(insulated gate bipolar transistor over current)</i>	IGBT over current (LED 330 on). 1. Faulty motor winding or motor shorted to ground 2. Incorrect motor nameplate parameters 3. Incorrect motor parameters	1. Check motor 2. Verify motor nameplate parameter settings P.100 and P.102 3. Consult factory
F.520 (Dcb OV L2) <i>(DC buss over voltage limit 2)</i>	Over voltage. 1. Excessive supply voltage 2. Excessive motor speed 3. Motor speed cannot be properly reduced by motor brake 4. Faulty brake resistor	1. Measure supply 2. Consult factory 3. Consult factory 4. Consult factory
F.521 (Dcb Low V) <i>(DC buss low voltage)</i>	Under voltage. 1. Low supply voltage or undersized service	1. Check supply voltage or service
F.524 (24 VDC Low) <i>(24 VDC low)</i>	24 volt supply problem. 1. 24 volt power supply is overloaded, shorted, or has failed (24 volt LED off)	1. Check 24 volt power supply, check activators or other devices connected to 24 volt supply, eliminate overload condition, check for short
F.525 (Power OV) <i>(power over voltage)</i>	High supply voltage (>+10%). 1. Incoming voltage too high	1. Check incoming voltage, check parameter P:940 = incoming voltage to control board

SYSTEM PARAMETERS—DOOR POSITION FAULT CODES

Fault Code (Displayed Message)	Description	Corrective Action
F.530 (Sink OT L2) <i>(sink over temperature limit 2)</i>	Excessive heat sink temperature. 1. Ambient air temperature above or below acceptable operating range 2. Door operating problems	1. Adjust ambient air temperature as required 2. Check operation of door
F.535	Temperature in housing above critical 80°C.	Internal temperature too high.
F.540 (Dcb OC L2) <i>(DC buss over current limit 2)</i>	DC buss over current. 1. Excessive load on 24 VDC supply 2. Motor problem	1. Check 24 V supply 2. Check motor

DOOR POSITION FAULT CODES

Table 16 below lists the fault codes associated with the position of the door. Included in this table are the available fault codes, a description of each fault code, and the suggested corrective action to clear the fault.

NOTE: The encoder is sensitive to electromagnetic interference (EMI) and many of the F:700 codes are the result of electromagnetic interferences. The encoder cable should be installed in conduit with low voltage wiring.

The encoder cable must be separated from the high voltage wiring, cables cuts to length and excessive length of cable wrapped up near the motor or in the System 3 control panel.

*The encoder shield wire must also be grounded to the P-clip located under the System 3 board to capture the encoder cable. **DO NOT** ground the encoder shield wire to the ground bus on the System 3 board.*

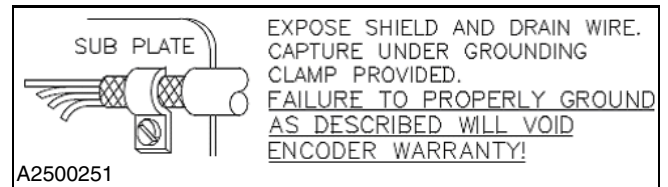


Figure 52

Table 16

Fault Code (Displayed Message)	Description	Corrective Action
F.700 (Pos Sys 1) <i>(position system 1)</i>	Door limits not set. 1. Set limits 2. Possible encoder failure	1. Set limit P.210 2. Check encoder
F.720	Door limits not set. 1. Limits not adjusted 2. Possible encoder failure 3. Door travel problem	1. Set limits 2. Check encoder 3. See F.030 and F.031
F.750 (Protocol 1) <i>(protocol 1)</i>	Data transmission error. 1. Possible electromagnetic interference (EMI) to control system 2. Encoder problem	1. Shielded cable broken, no longer grounded, or not used where required 2. Check encoder
F.751 (Encoder 1) <i>(encoder 1)</i>	Data transmission error. 1. Possible electromagnetic interference (EMI) to control system 2. Encoder problem	1. Shielded cable broken, no longer grounded, or not used where required 2. Check encoder

SYSTEM PARAMETERS—WIRELESS SYSTEM FAULT CODES

Fault Code (Displayed Message)	Description	Corrective Action
F.752 (Protocol 2) <i>(protocol 2)</i>	Data transmission error. 1. Possible electromagnetic interference (EMI) to control system 2. Encoder problem	1. Shielded cable broken, no longer grounded, or not used where required 2. Check encoder
F.760 (Encoder 2) <i>(encoder 2)</i>	Position of door does not correspond to position of encoder. 1. Possible electromagnetic interference (EMI) to control system 2. Encoder or encoder mounting problem 3. Incorrect resolution setting	1. Shielded cable broken, no longer grounded, or not used where required 2. Check encoder 3. Consult factory
F.761	Does not apply.	Consult factory.
F.762 < F762 >	Limit switches incorrectly set. 1. Limit settings not valid or properly set 2. Open or partial limit settings out of range 3. Control system not initialized	1. Limits P.210 reset 2. Reset limits 3. Consult factory
F.768	Battery voltage TST PD low	Battery in TST PD should be changed
F.770 (Protocol 3)	Overflow from SSI encoder Protocol 3 encoder	1. The current position of the door compared to the fixed closed position has exceed the maximal allowed range of 4095 increments 2. Set P.202 (used resolution of the encoder) to a higher value and repeat limit setting 3. Reset P.210 - reset limits <i>NOTE: Fault F:760 may appear.</i>

WIRELESS SYSTEM FAULT CODES

Table 17 below lists the fault codes associated with the control system. Included in this table are the available fault codes, a description of each fault code, and the suggested corrective action to clear the fault.

Table 17

Fault Code (Displayed Message)	Description	Corrective Action
F.852	RS485 communication error between controller and stationary unit.	1. Hardware defect 2. Bad wiring
F.856	Wireless communication error between stationary and mobile unit.	1. Wrong address parametrized 2. Mobile unit broken 3. Battery empty 4. Heavy wireless noise 5. Stationary antenna broken or mounted wrong
F.857	Battery empty.	Battery empty.

SYSTEM PARAMETERS—CONTROL SYSTEM FAULT CODES

CONTROL SYSTEM FAULT CODES

Table 18 below lists the fault codes associated with the control system. Included in this table are the available fault codes, a description of each fault code, and the suggested corrective action to clear the fault.

NOTE: Control system errors happen most commonly when the high voltage power supply varies erratically. This could be due to other machinery on the same supply circuit, incoming supply of electricity to the facility or lighting during a thunderstorm.

Table 18

Fault Code (Displayed Message)	Description	Corrective Action
F.920 (Hardware 1) <i>(hardware 1)</i>	2.5 volt internal reference voltage failure.	Cycle power. If problem is not resolved, consult factory.
F.921 (Hardware 2) <i>(hardware 2)</i>	18 volt internal supply voltage failure.	Cycle power. If problem is not resolved, consult factory.
F.922 (Estop Chain) <i>(E-Stop chain)</i>	Emergency stop input problem.	Check the internal and the two external emergency stop connections.
F.930 (Hardware 3) <i>(hardware 3)</i>	External watchdog failure. 1. Electrical noise, hardware problem	1. Cycle power, check wiring, consult factory
F.931 (ROM) <i>(read-only memory)</i>	ROM error. 1. EPROM problem, hardware problem, or electrical noise	1. Cycle power, check wiring, consult factory
F.932 (RAM) <i>(random-access memory)</i>	RAM error. 1. Hardware problem or electrical noise	1. Cycle power, check wiring, consult factory
F.952	System interrupt failure. 1. Hardware problem or electrical noise	1. Cycle power, check wiring, consult factory
F.960 (Par Set E1) <i>(parameter set error 1)</i>	Checksum failure. 1. Control system not initialized with new EPROM	1. Cycle power, consult factory
F.961 (Code Set E1) <i>(code set error 1)</i>	Checksum failure. 1. Control system not initialized with new EPROM	1. Cycle power, consult factory
F.962 (Par Set E2) <i>(parameter set error 2)</i>	Incorrect drive parameters. 1. Control system not initialized with new EPROM	1. Check parameters, cycle power, consult factory
F.963 (Par Set E3) <i>(parameter set error 3)</i>	Incorrect ramp parameters. 1. Control system not initialized with new EPROM	1. Check parameters, cycle power, consult factory
F.964 (New Program) <i>(new program)</i>	Program version. 1. Control system not initialized with new EPROM	1. Cycle power, consult factory

MISCELLANEOUS MESSAGES—DELAY TIMERS

Fault Code (Displayed Message)	Description	Corrective Action
F.970 (Par Set E4) <i>(parameter set error 4)</i>	Incorrect parameter. 1. Parameters incorrectly set	1. Check parameters, cycle power, consult factory

DELAY TIMERS

Table 19 below lists the delay timers associated with the control system. Included in this table are the available timers and their descriptions.

Table 19

Delay Timer	Description
Acl1 = x Sec	Auto close delay timer 1. (Terminals 13 and 14)
Acl2 = x Sec	Auto close delay timer 2. (Terminals 15 and 16, 17 and 18)
Acl3 = x Sec	Auto close delay timer 3. (Can be programmed to any output)

MISCELLANEOUS MESSAGES

DOOR MESSAGES

Table 20 below lists the miscellaneous messages associated with the control system. Included in this table are the available displayed messages and a description and definition of each message.

Table 20

Displayed Message	Description
Door Held Open	Door held open. Input terminal shown in lower right of display.
Door Is Closing	Door is closing.
Door Is Open	Door open in full-open position.
Door Is Opening	Door is opening.
Door Is Stopped	Door is stopped — controller waiting for next incoming command.

Displayed Message	Description
Emergency Jog	Door travel possible in jog mode only — all safety and limits ignored.
Emergency Stop	One of the emergency stops is activated.
Error Jog ⚡ Only	Door fault — door travel in jog mode only.
Jog Mode ⚡	Manual door operation — jog mode only. To enter and exit jog mode, push stop and down arrow simultaneously.
Locked Closed	Door locked in closed position. Input terminal shown in lower right corner of display.
Partial Open Position	Door in partial-open position.
Rytec Door Type	Cycle count.
Set Limits	Start limit set-up procedure.

SPECIAL STATUS MESSAGES

Table 21 below lists the special status messages associated with the control system. Included in this table are the available displayed messages and a description and definition of each message.

Table 21

Displayed Message	Description
Automatic	Denotes controller in automatic mode.
Jog Mode	Denotes controller in jog mode. To enter and exit jog mode, push stop and down arrow simultaneously.

DOOR LIMIT MESSAGES

Table 22 below lists the door limit messages associated with the control system. Included in this table are the displayed messages and a description of each message.

Table 22

Displayed Message	Description
! Set Limits !	Limit set-up initialization.
→ ● To Begin	Initialize limit setting.
→⇅ To Closed Pos.	Close limit set-up.
→⇅ To Open Pos.	Open limit set-up.
→⇅ To Part. Pos.	Partial limit set-up.
Close Limit Set	Close limit setting.
Hold ● If Ok	Save limit setting.
Open Limit Set	Open limit setting.
Part. Limit Set	Partial limit setting.

DOOR JOG MESSAGES

Table 23 below lists the door jog messages associated with the control system. Included in this table are the displayed messages and a description of each message.

Table 23

Displayed Message	Description
Bynd Opn P. (beyond open position)	Door jogged past full-open position.
Jogg. Close (jog close)	Jogging door closed with down (▼) key.
Door Is Opn (door is open)	Door jogged fully open, additional door open travel not possible.
Door Is Cls (door is closed)	Door jogged fully closed, additional door close travel not possible.
Jogg. Open (jog open)	Jogging door open with (▲) key.

DOOR STATUS MESSAGES

Table 24 below lists door status messages associated with the control system. Included in this table are the displayed messages and a description of each message.

Table 24

Displayed Message	Description
I.060	Self repair after door ajar in progress.
I.080	Maintenance required soon – service counter nearly expired.
I.100 ✓ Open Spd. (check open speed)	Excessive door speed near full-open position.
I.150 ✓ Close Spd. (check close speed)	Excessive door speed near full-closed position.
I.160 Close Req. (close requested)	Continuous OPEN still active.
I.170 Timed Open (timed open)	Forced opening being performed.
I.199 Counter Err (counter error)	Door cycle counter error.
I.300 Air Locked (air locked)	Locked by another door.
I.310 Open A12 (open A12)	Door open command initiated to other door in air lock.
I.400 HD Limit (freezer only)	Hard door not open.
I.401 Defrost Off (freezer only)	Defrost deactivated.
I.510	Limit switch correction finished.
I.515	Controller is preparing automatic teach-in of the limit switches.
I.520	Maximum speed during automatic limit switch correction is not reached.
I.555	Limit switches being corrected.

TROUBLESHOOTING—PROGRAMMABLE TEXT MESSAGES

PROGRAMMABLE TEXT MESSAGES

Table 25 below lists the programmable text messages associated with the control system. Included in this table are the available strings and their description.

Table 25

Text Message Number	Description
0	Not defined.
1 (Open)	Open door. (Terminals 19 and 20)
2 (Open — ACL1)	Open/close with ACL1 timer. (Terminals 13 and 14)
3 (Open — ACL2)	Open/close with ACL2 timer. (Terminals 15 and 16 and terminals 17 and 18)
4 (A/A Op — C1)	Door open and close. (Terminals 11 and 12)
5 (Close)	Close door. (Terminals 21 and 22)
6 (Stop)	Stop door. (Normally closed: remove jumper terminals 23 and 24)
7 (Photoeye — Fr)	Front photo eye. (Terminal 8)
8 (Photoeye — Rr)	Rear photo eye. (Terminal 10)
9 (Photoeye — Aux)	Auxiliary photo eye.
10 (Door Ajar)	Breakaway bottom bar disconnected from side column. (Terminals 5 and 6)
11 (Blower On)	Freezer blower on.
12 (Blower High)	Freezer blower on high.
13 (Blower Auto)	Freezer blower on auto.
14 (Heater St.1)	Freezer heater stage 1 or heat lamps on.
15 (Heater St.2)	Freezer heater stage 2 on.
16 (Heater St.3)	Freezer heater stage 3 on.
17 (Heater Auto)	Freezer heater on auto.
18 (HW Interlock)	Freezer hard door interlock.

TROUBLESHOOTING

TROUBLESHOOTING WITH STATUS LEDs

If a problem occurs with the control system or the door, the controller is configured with various light-emitting diodes (LEDs) that can be helpful when troubleshooting the problem. The LEDs are grouped in various functions and indicators as detailed in Figure 53 on page 55. Table 26 below details the interpretation of each group of LEDs.

Table 26

LED Group	Associated LED Function
Emergency Stop Chain LEDs	LED (numbered left to right) 1 = Internal emergency stop (internal plug located near service panel) 2 = First external emergency stop 3 = Second external emergency stop <i>Note: LEDs 1, 2, and 3 must all be on for normal operation.</i>
Input LEDs (LEDs on = contact connection closed LEDs off = contact connection open)	LED (numbered left to right) 4 = breakaway input 5 = front photo eyes 6 = rear photo eyes 7 = alternate action activator 8 = auto-close activator 1 9 = auto-close activator 2 10 = auto-close activator 2 11 = open 12 = close 13 = stop 14 = is a programmable input 15 = is a programmable input
Reversing Edge LEDs	Normal operation = upper LED on, lower LED off Reversing edge tripped = upper and lower LEDs off Resistor or wire missing = upper and lower LEDs on

LED Group	Associated LED Function
<p>Power LED (monitors 24 VDC power)</p>	<p>Normal operation = LED on</p> <p>24 Volt failure = LED off</p> <p><i>Note: If the 24 V power supply is overloaded or has a defective device (such as a shorted photo eye) connected to it, the power supply will automatically power down for self-protection.</i></p>
<p>Run LED</p>	<p>Controller (door) ready and waiting for next command = LED flashes one time per second</p> <p>Motor running at steady speed = LED flashes four times per second</p> <p>Motor acceleration or decelerating = LED flashes eight times per second</p> <p>LED is on continuously = software problem</p>
<p>LED 330</p>	<p>LED 330 on = upon initial controller power up; when door is open; or if bridge rectifier located on controller has failed, or there is a short in the motor winding or IGBT circuit</p> <p>LED 330 off after first door command following controller initialization</p> <p><i>Note: Use LED for troubleshooting only after first door command has been executed or when door is not in full-open position.</i></p>

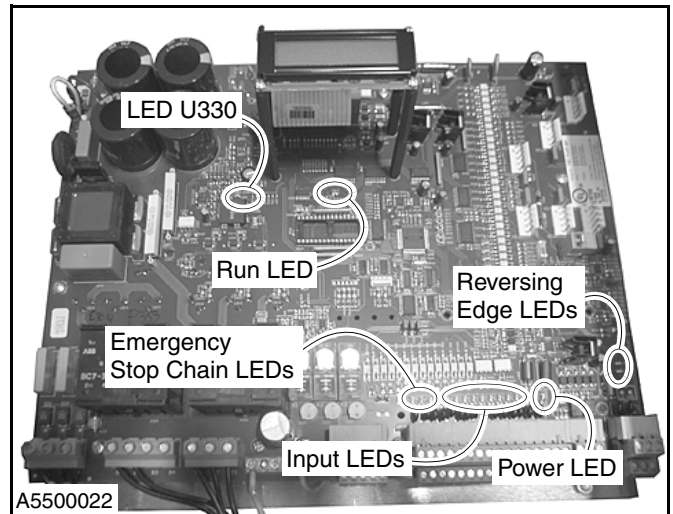


Figure 53

SPECIFICATIONS—MECHANICAL

SPECIFICATIONS

MECHANICAL

Enclosure	Painted steel box with window (not including mounting brackets) <ul style="list-style-type: none"> • standard version: 14.95 in. (w) x 23.62 in. (h) x 8.27 in. (d) • freezer version: 23.62 in. (w) x 23.62 in. (h) x 8.27 in. (d)
Mounting Brackets (Four)	Brackets (maximum 0.4 in. tall)
Weight	Type-A and -B enclosure: 58 lb. (approximately) Type-C enclosure: 75 lb. (approximately)
Protection Class	NEMA Type-4
Operating Temperature Range	14°F to 149°F
Conduit Entry	Removable knockout plate along bottom of enclosure (appropriately sized holes for conduit must be drilled in knockout plate)

INPUTS

Power Supply (Line Voltage)	Standard 230 volt: <ul style="list-style-type: none"> • 180–253 volt, 50–60 Hz, three-phase Standard 460 volt: <ul style="list-style-type: none"> • 360–506 volt, 50–60 Hz, three-phase Freezer: <ul style="list-style-type: none"> • 360–506 volt, 50–60 Hz, three-phase • 115 volt, 50–60 Hz, single-phase
Emergency Input (E-Stop 1 and E-Stop 2)	For dry contacts only (normally closed): <ul style="list-style-type: none"> • maximum load: 26 volt/200 mA • input level less than 5 volts, input on • input level greater than 7 volts, input off • both inputs indicated by associated LED (LED lit with 24 volts present)
Standard Inputs (IN1–IN12)	For dry contacts or 24-volt active PNP outputs: <ul style="list-style-type: none"> • maximum load: 26 volt/200 mA • input level greater than 8 volts, input on • input level less than 5 volts, input off N.O. (normally open) functions: <ul style="list-style-type: none"> • input level less than 5 volts, input on • input level greater than 8 volts, input off N.C. (normally closed) functions: <ul style="list-style-type: none"> • some programmable • all inputs indicated by associated LED (LED lit with 24 volts present)
Inputs SSI-Data A and B (Interface Position): Output SSI-Clock A and B	For absolute encoder
Input for Safety Edge	N.O. (normally open) contacts of safety edge with 1.2k-ohm resistor or 8.2 k-ohm resistor
Inputs for Induction Loops (Floor Loops)	Usable with optional in-floor wiring for loop detector plug-in module
Wireless Safety Edge	N.O. (normally open) contacts at safety edge with 8.2k-ohm resistor

OUTPUTS

Supply Output Voltage (24 Volts)	Nominal value: 24 VDC ± 5% For external 24 VDC devices Maximum load: <ul style="list-style-type: none"> • 1 amp, without plug-in modules installed • 0.75 amp, with plug-in modules installed Protected by self-resetting semiconductor fuse (short circuit protected)
Supply Output Voltage (12 Volt)	Nominal value: 11.5 VDC ± 5%, maximum 250 mA (encoder only)
Motor Output	For 3-phase motor, maximum 3 hp 230-volt control panel: <ul style="list-style-type: none"> • nominal current: 10 amp • switching on-time 50%, ambient temperature up to 104°F • switching on-time 25%, ambient temperature up to 122°F 460-volt control panel (including freezer): <ul style="list-style-type: none"> • nominal current: 5 amp • switching on-time 50%, ambient temperature up to 104°F • switching on-time 25%, ambient temperature up to 122°F Output overload protection: <ul style="list-style-type: none"> • 1.5 x nominal current for 60 seconds • 3.2 x nominal current for 10 seconds Normal operation up to 176°F heat sink temperature Warning above 176°F heat sink temperature Thermal-overload protection active above 212°F heat sink temperature
Brake (Output Contacts)	For operation of electromechanical brakes with brake rectifier <ul style="list-style-type: none"> • maximum load: 460 VAC +15% — 3 amp
Auxiliary Relays (Three)	N.O. (normally open)/N.C. (normally closed), dry contacts Switching current: 10 mA–3 amps, AC/DC Control voltage: 48 VAC/24 VDC Contact rating: Pilot Duty B300. If contacts were used for high-current (greater than 100 mA) switching, do not use for low-current switching.
Brake Resistor	Maximum power consumption: 1.5 kilowatts for 0.5 seconds Allowable repetition rate: 20 seconds
Generator Operation Mode	Maximum generator feedback current from motor to inverter — 4 amp Maximum DC bus voltage: <ul style="list-style-type: none"> • 230-volt version: 400 VDC • 460-volt version: 800 VDC
Additional Outputs (Freezer Only)	Blower LO/HI: 115 VAC, 50–60 Hz, 15 amps/1 hp Brake Heater: 115 VAC, 50–60 Hz, 15 amps Heat Lamps (three lamps): 400–600 VAC, 50–60 Hz, 15 amps 24 VAC: for internal contactors and external supply <ul style="list-style-type: none"> • output: 24 VAC, 50–60 Hz • maximum external load: 4.5 amps • internal protection: 6 amps, class CC fuse

SPECIFICATIONS—PLUG-IN MODULES (OPTIONAL ITEMS)

PLUG-IN MODULES (OPTIONAL ITEMS)

Expansion Board	<p>Included in freezer version, optional for standard versions Electronic board with plug-in terminal strips Master switch Relay outputs (total of five):</p> <ul style="list-style-type: none"> • common in groups of two and three relays • programmable • dry contacts N.O. (normally open)/N.C. (normally closed) • switching current: 10 mA–3 volts AC/DC <p>Contact rating: Pilot Duty B300. If contacts were used for high-current (greater than 100 mA) switching, do not use for low-current switching.</p> <p>Inputs (total of eight):</p> <ul style="list-style-type: none"> • for dry contacts or 24-volt active PNP outputs • maximum load: 26 volt/200 mA • input level greater than 7 volts, input on • input level less than 5 volts, input off • N.O. (normally open) functions • programmable <p>Interlock inputs (four total):</p> <ul style="list-style-type: none"> • 48 VAC/24 VDC • maximum 3 amps
Radio Receiver	Dual-channel receiver, 433 MHz
Loop Detector	Single-channel detector or dual-channel detector
Wireless Safety Edge	2.4 to 2.485 GHz, using frequency hopping N.O. (normally open) switch with 8.2 k-ohm resistor located in the door bottom bar

24-VAC TRANSFORMER (STANDARD CONTROL PANEL ONLY — OPTIONAL ITEM)

Supply (Primary Side)	Single-phase, 230/400/460/520 ± 20 VAC Internally protected by two 1 amp, class CC fuse
Secondary Side	24 volt, 50–60 Hz Maximum load: 5.5 amps Internally protected by single, 6 amp, class CC fuse

ABBREVIATIONS

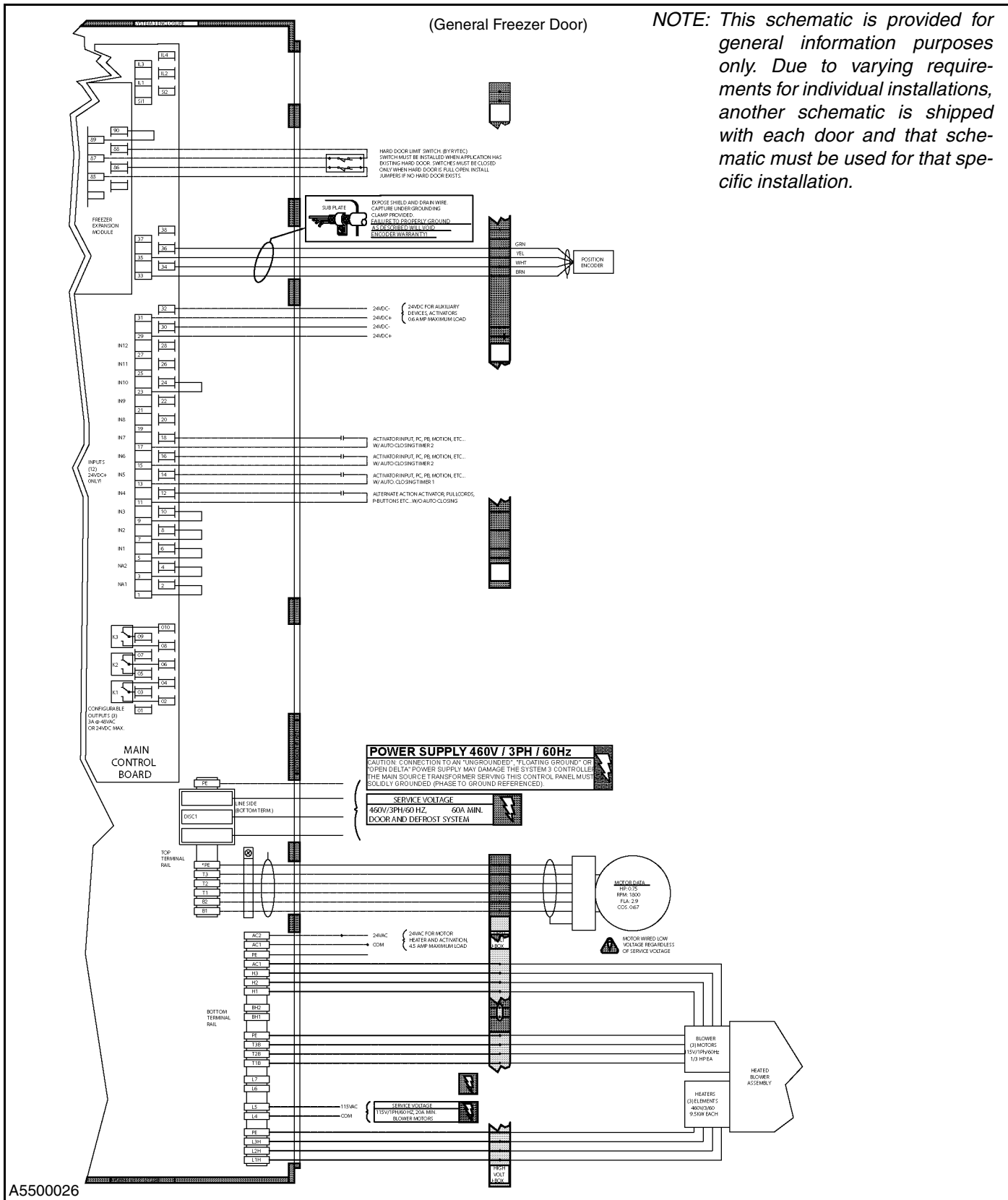
Table 27 below lists the abbreviation of each unit of measurement referenced throughout the control system program menu and this manual.

Table 27

Unit	Abbreviation
Celsius	°C
Counter	Cnt
Current (Ampere)	A
Cycles	Cyc
Digits	Dig
Fahrenheit	°F
Hertz (Frequency)	Hz
Increments	Inc
Milliseconds	Ms
Minute	Min
Number	#
Percentage	%
Seconds	Sec
Voltage (Volt)	V

SCHEMATICS

GENERAL FREEZER DOOR (SHEET 1)



A5500026

Figure 54

SCHEMATICS—GENERAL FREEZER DOOR (SHEET 2)

GENERAL FREEZER DOOR (SHEET 2)

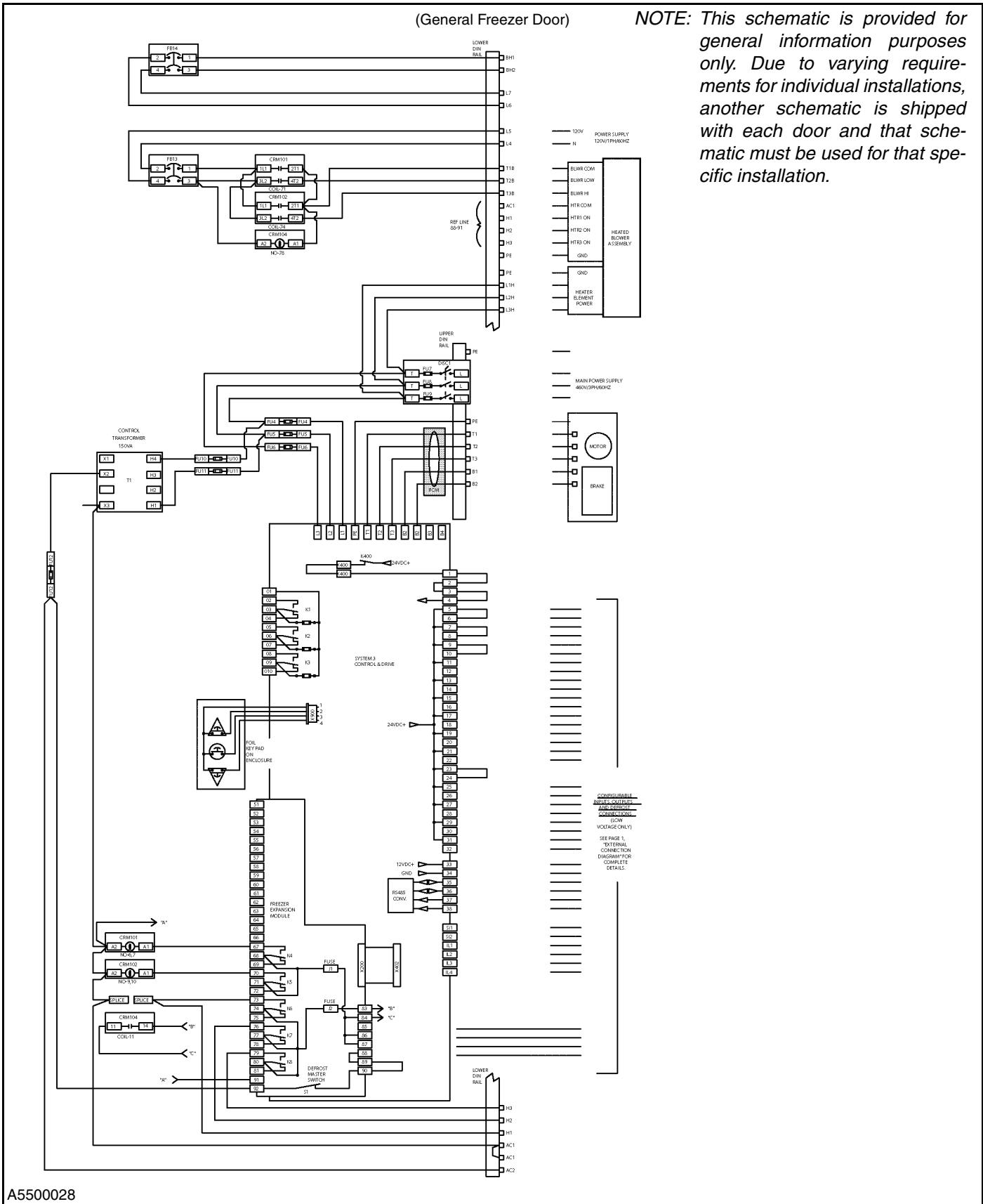
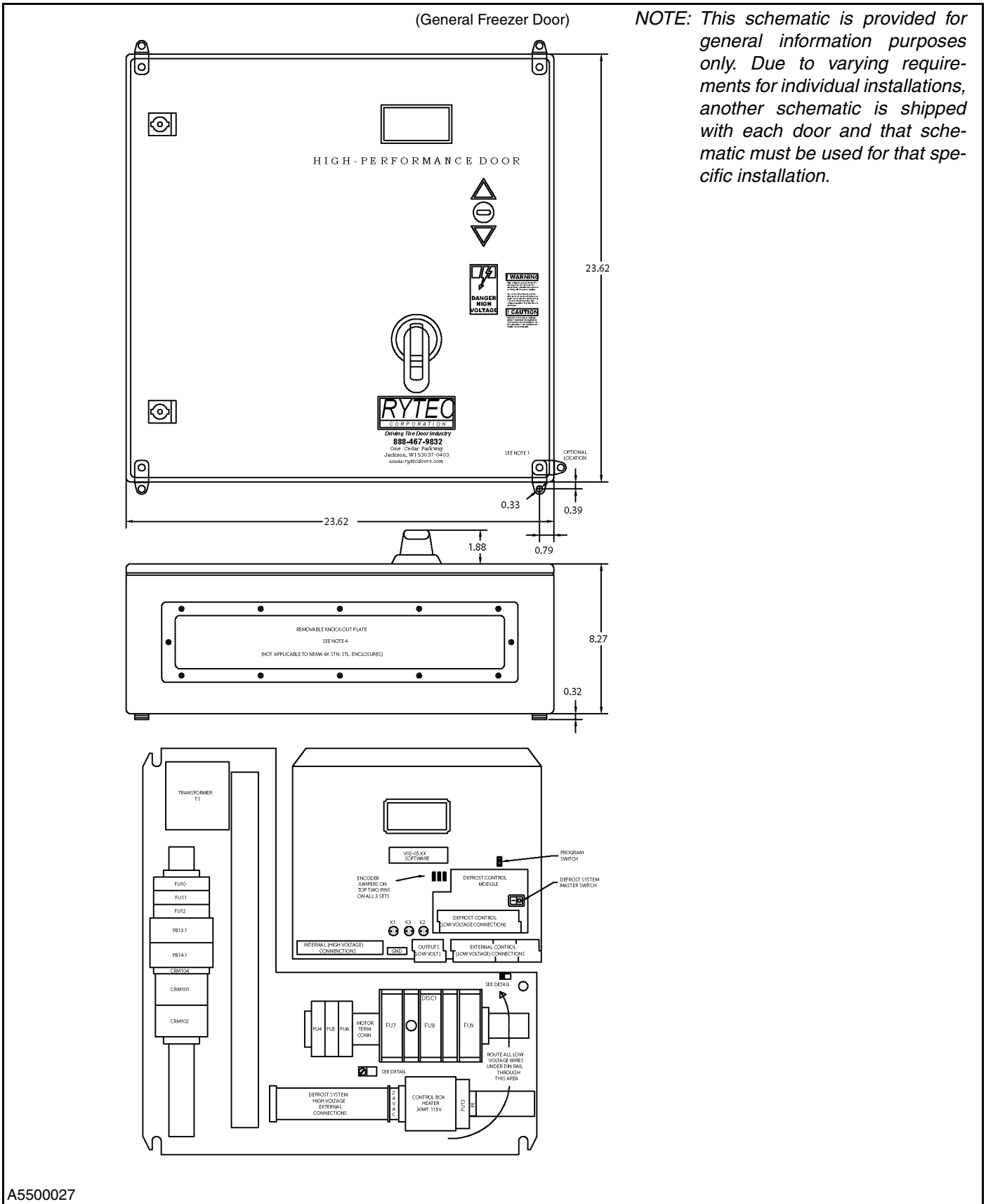


Figure 55

GENERAL FREEZER DOOR (SHEET 3)



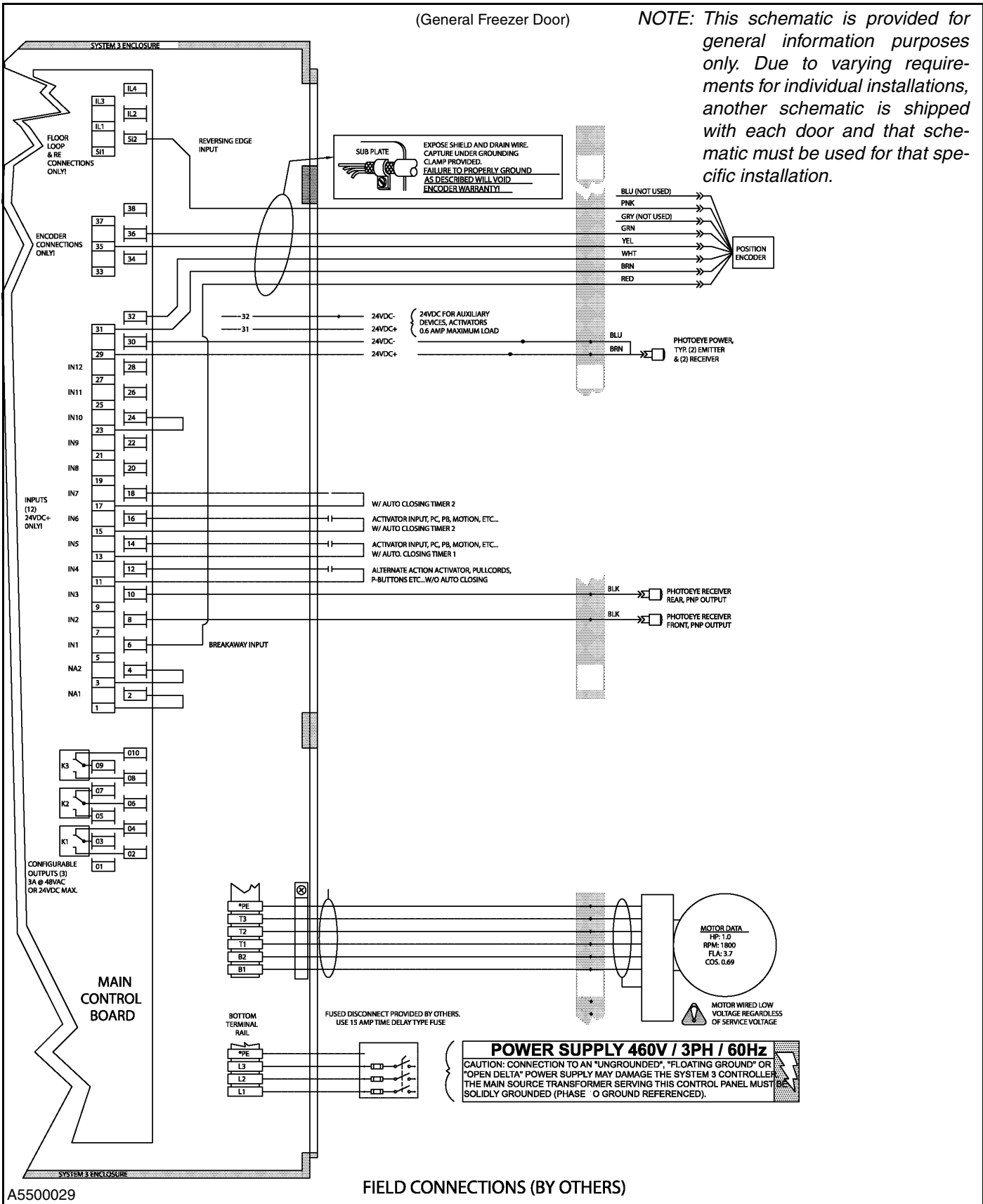
NOTE: This schematic is provided for general information purposes only. Due to varying requirements for individual installations, another schematic is shipped with each door and that schematic must be used for that specific installation.

A5500027

Figure 56

SCHEMATICS—GENERAL ROLL-UP DOOR (SHEET 1)

GENERAL ROLL-UP DOOR (SHEET 1)



GENERAL ROLL-UP DOOR (SHEET 2)

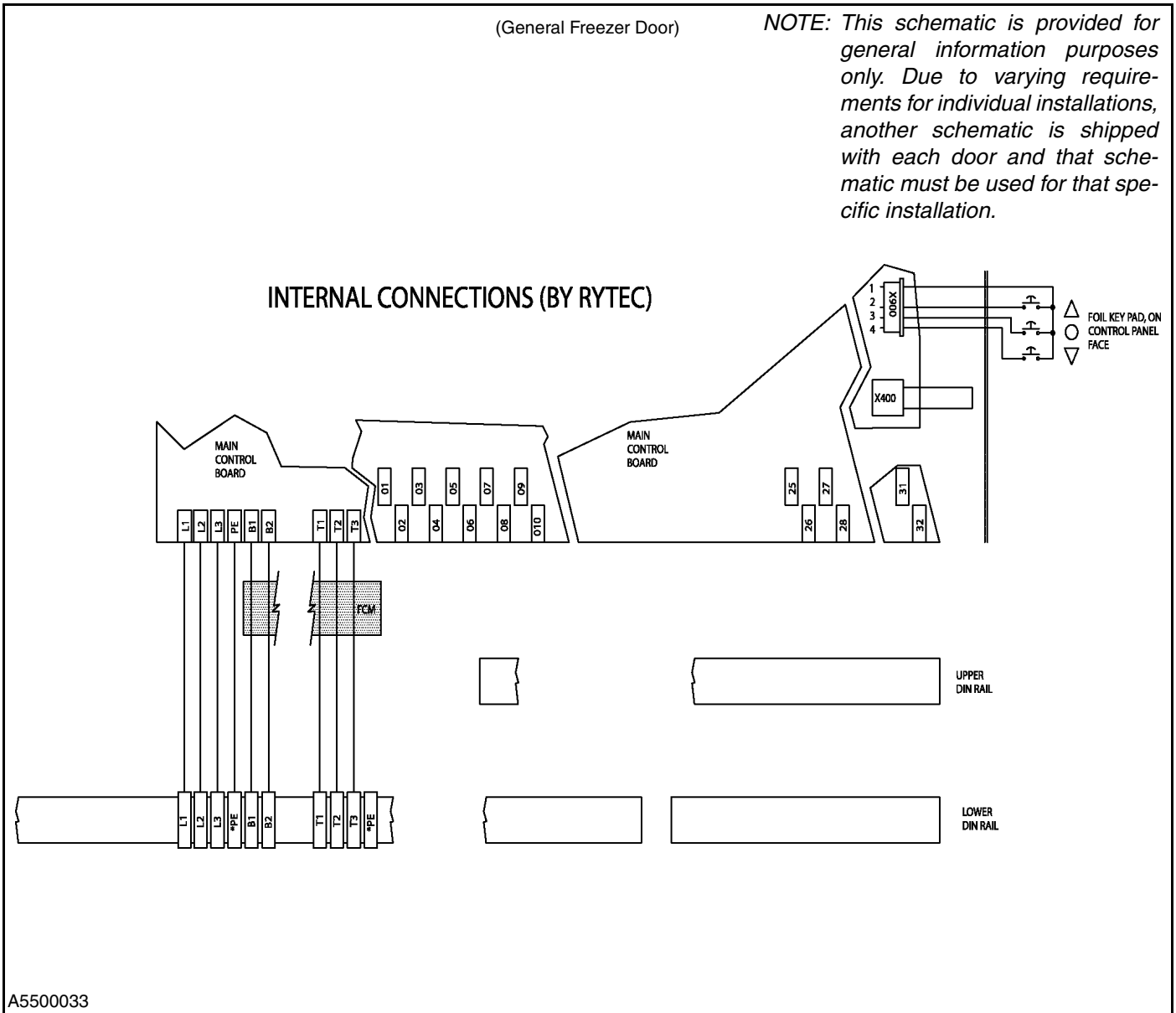


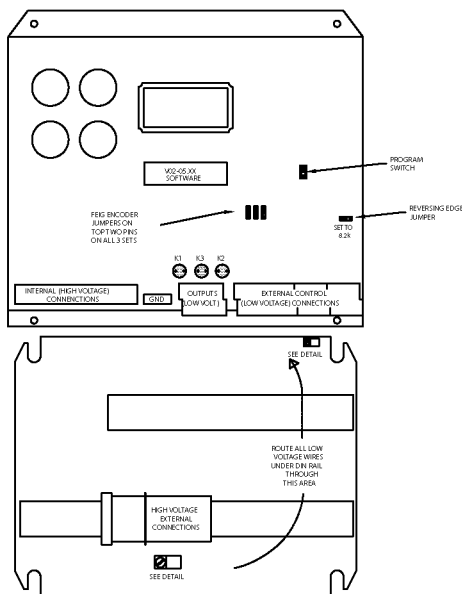
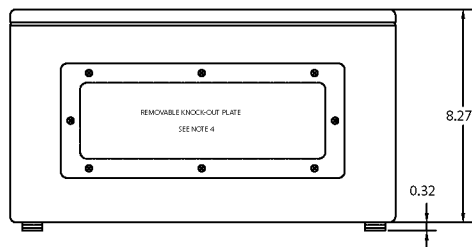
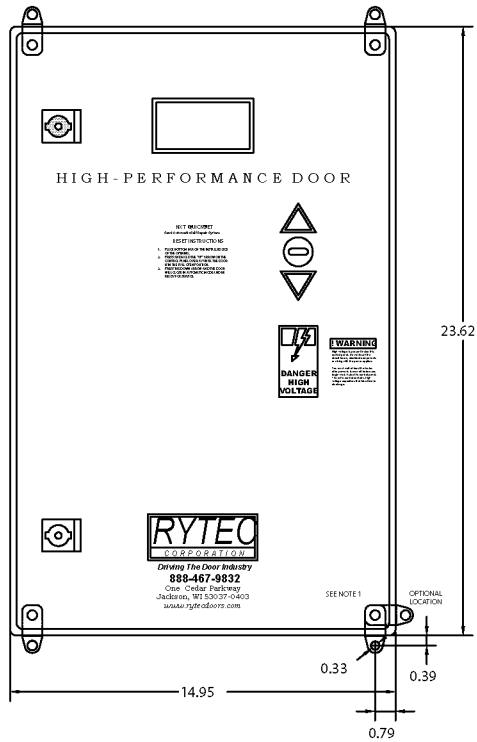
Figure 57

SCHEMATICS—GENERAL ROLL-UP DOOR (SHEET 3)

GENERAL ROLL-UP DOOR (SHEET 3)

(General Freezer Door)

NOTE: This schematic is provided for general information purposes only. Due to varying requirements for individual installations, another schematic is shipped with each door and that schematic must be used for that specific installation.



A5500030

Figure 58

PARTS LIST

PARTS ORDERING INFORMATION

How to Order Parts

1. Identify the parts required by referring to the following pages for part numbers and part descriptions.
2. To place an order, contact your local Rytec representative or the Rytec Customer Support Department at: 800-628-1909 or 262-677-2058 (fax).
3. To ensure that the correct parts for your controller are shipped, please include the serial number of your door with the order. Refer to the owner's manual of your door to determine the location of the serial number plate. The serial number plate is generally located inside one of the side columns. (See Figure 59.)

SERIAL NUMBER(S)

Your **DOOR SERIAL NUMBER** information can be found in three universal locations. These are at the inside of either side column (approximately eye level), on the drive motor, and on the inside door of the System 3 control panel.

IMPORTANT: *When installing multiple doors of the same model but in different sizes, verify the serial number in the control panel with the one on the door assembly.*

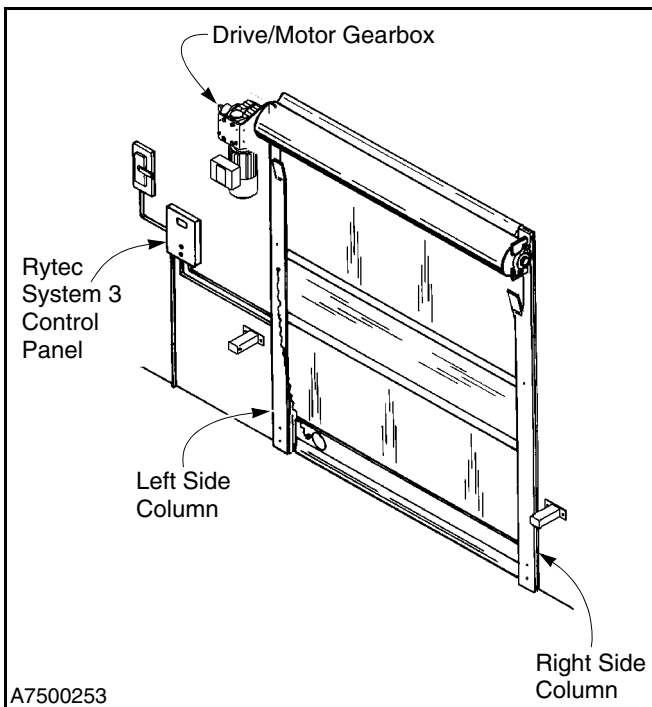


Figure 59

Substitute Parts

Due to special engineering or product enhancement, the actual parts used on your control system may be different from those shown in this manual.

If a part has been improved in design and bears a revised part number, the improved part will be substituted for the original part ordered.

Return of Parts

Rytec will not accept the return of any parts unless they are accompanied by a Return Merchandise Authorization (RMA) form.

Before returning any parts, you must first contact the Rytec Customer Support Department to obtain authorization and an RMA form.

NOTE: *You must provide the door serial number for all control panels and enclosures. The door serial number can be found on a white decal inside the control panel door.*

CONTROL PANEL — STANDARD PANEL

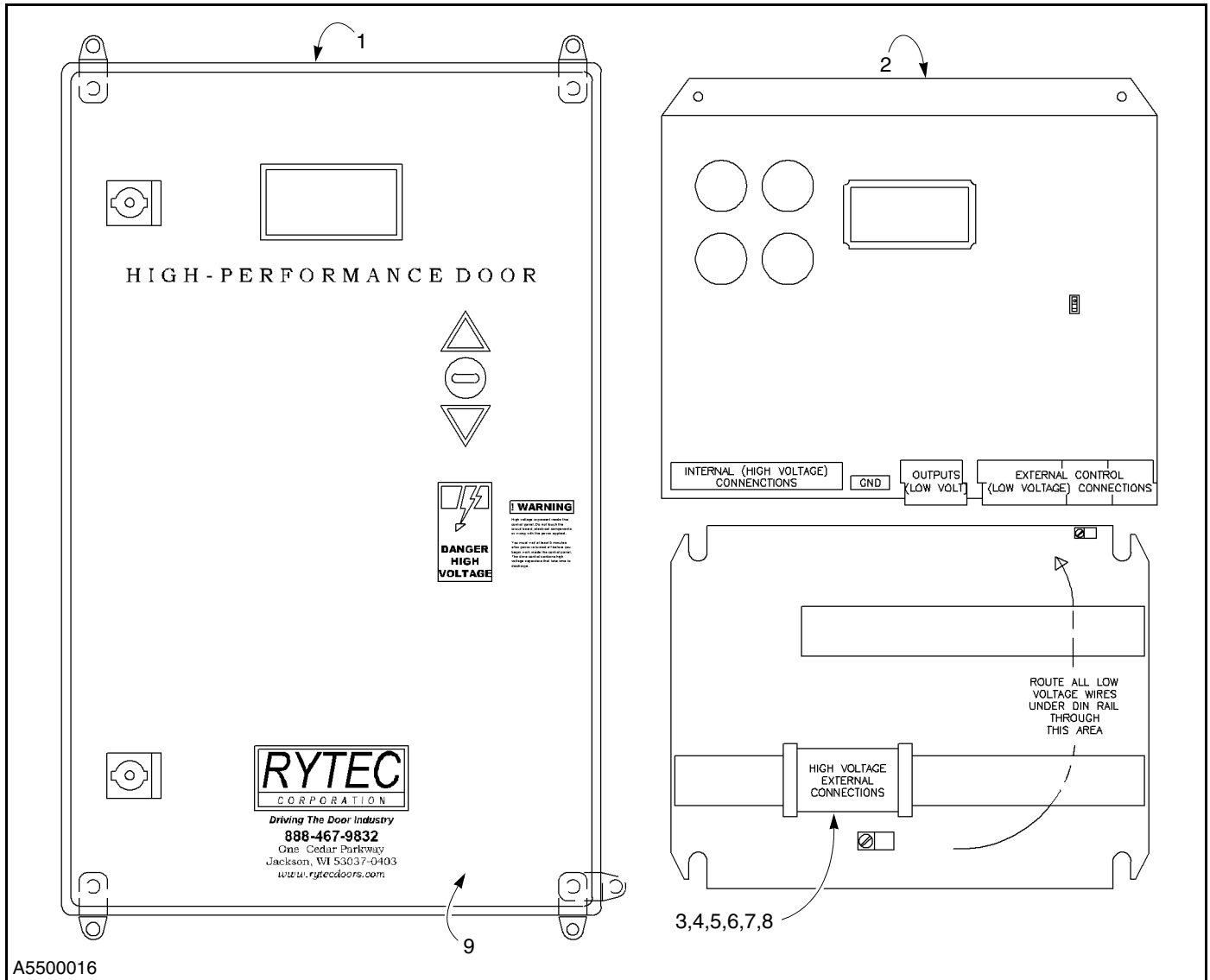


Figure 60

ITEM	QTY.	PART #	DESCRIPTION	ITEM	QTY.	PART #	DESCRIPTION
-	1	Consult Factory*	System 3 Control Panel, Type A, Standard Assembly, 230V	3	1	00111018	Terminal Block, Large, Green/Yellow
	1	Consult Factory*	System 3 Control Panel, Type B, Standard Assembly, 460V	4	5	00111019	Terminal Block, Small, Gray
1	1	Consult Factory*	Enclosure, NEMA 4, 380mm x 600mm x 210mm	5	1	00111020	Terminal Block, Small, Green/Yellow
2	1	Consult Factory*	Main Control Board w/ VFD, 208-230V	6	1	00111021	Terminal Block, End Stop
	1	Consult Factory*	Main Control Board w/ VFD, 400-460V	7	1	00111022	Terminal Block, Barrier
				8	3	00111017	Terminal Block, Large, Gray
				9	1	00141008	Keypad, Membrane Overlay, 380mm x 600mm

*Be sure to include the door serial number when consulting the factory about the System 3 Control Panel.

PARTS LIST—CONTROL PANEL — FREEZER PANEL

CONTROL PANEL — FREEZER PANEL

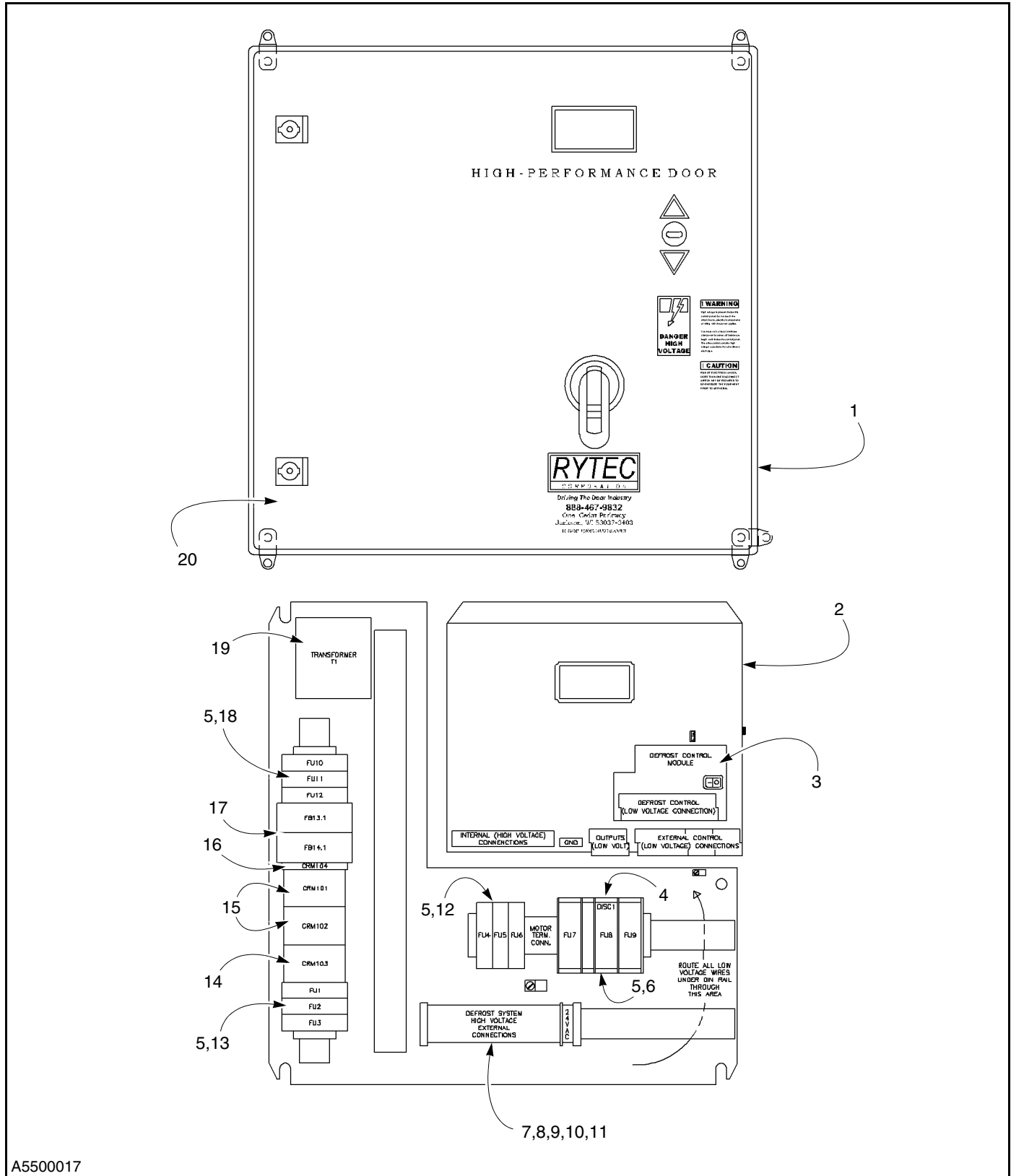


Figure 61

PARTS LIST—CONTROL PANEL — FREEZER PANEL

ITEM	QTY.	PART #	DESCRIPTION	ITEM	QTY.	PART #	DESCRIPTION
-	1	Consult Factory	System 3 Control Panel, Type B, Standard Assembly, 460V	9	1	00111020	Terminal Block, Small, Green/Yellow
1	1	Consult Factory	Enclosure, NEMA 4, 600mm x 600mm x 210mm	10	6	00111021	Terminal Block, End Stop
2	1	Consult Factory	Main Control Board w/ VFD, 400-460V	11	8	00111022	Terminal Block, Barrier
3	1	Consult Factory	Expansion Board, Defrost Control Module	12	1	0011614	Fuse, 15Amp, Class CC, 600V or equivalent (FU4, FU5, & FU6)
4	1	00111000	Disconnect Kit, 30 Amp, w/ NEMA 4x Handle (DISC1)	13	1	0011076	Fuse, 60Amp, Class CC, 600V or equivalent (FU1, FU2, & FU3)
	1	00111052	Disconnect Kit, 60 Amp, w/ NEMA 4x Handle (DISC1)	14	1	00111047	Contactactor, 4 N.O., 24VAC Coil, 21A (CR103)
5	9	00111023	Fuse Holder, Single-Pole, 600V (FU1–FU6, FU10–FU12)	15	2	00111046	Contactactor, 4 N.O., 24VAC Coil, 30A (CR101 & CR102)
6	1	0011612	Fuse, 30Amp, Class CC, 600V or equivalent (FU7, FU8, & FU9)	16	1	00111049	Relay, 1 N.O./1 N.O., w/ 115VAC Coil (CR104)
	1	0011032	Fuse, 50Amp, Class J, 600V or equivalent (FU7, FU8, & FU9)	17	1	00111048	Circuit Breaker, 300VAC, 20A (FB13 & FB14)
7	6	00111018	Terminal Block, Large, Green/Yellow	18	1	0011098	Fuse, 1Amp, Class CC, 600V or equivalent (FU10 & FU11)
8	11	00111019	Terminal Block, Small, Gray	19	1	00111024	Control Transformer, 460/230-24VAC, 380Volt Amps (T1)
				20	1	00141009	Keypad, Membrane Overlay, 600mm x 600mm

