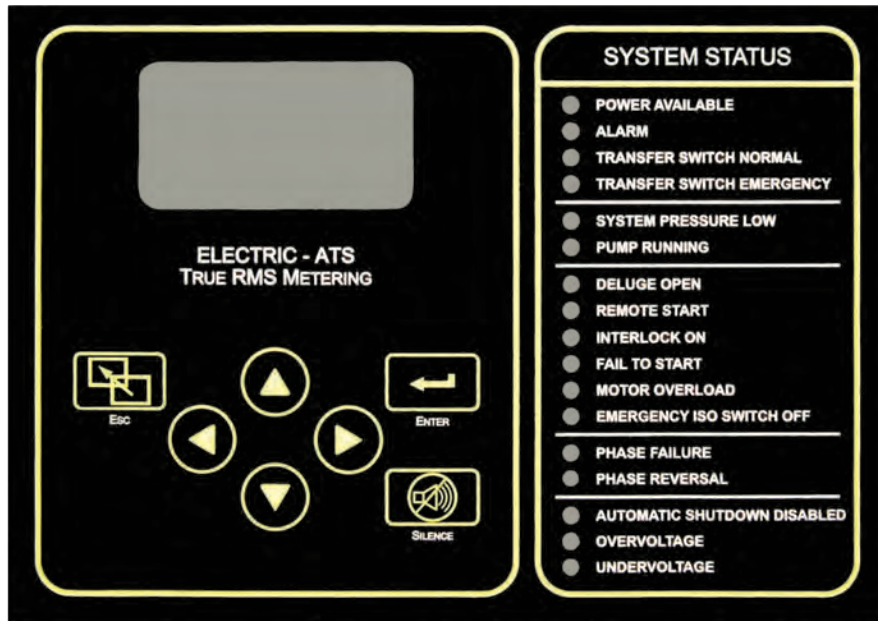


## Mark IIx6 Electric Fire Pump Controllers



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# California Proposition 65 Warning

Fire Pump Controllers

General Information

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**WARNING:** This product can expose you to chemicals including DINP, which is known to the State of California to cause cancer, and DIDP which is known to the State of California to cause birth defects or other reproductive harm.



**WARNING:** This product can expose you to chemicals including lead and lead compounds, which are know to the State of California to cause cancer and birth defects or other reproductive harm.

For more information go to: [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

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Publication GF100-85

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## DANGER

DO NOT ATTEMPT TO INSTALL OR PERFORM MAINTENANCE ON EQUIPMENT WHILE IT IS ENERGIZED! DEATH, PERSONAL INJURY, OR SUBSTANTIAL PROPERTY DAMAGE MAY RESULT FROM CONTACT WITH ENERGIZED EQUIPMENT. ALWAYS VERIFY THAT NO VOLTAGE IS PRESENT BEFORE PROCEEDING, AND ALWAYS FOLLOW GENERALLY ACCEPTED SAFETY PROCEDURES. CONTROLLER “ON-OFF” SWITCH MUST BE IN THE EXTREME “OFF” POSITION TO OPEN THE ENCLOSURE DOOR. FIRETROL BRAND PRODUCTS CANNOT BE LIABLE FOR ANY MISAPPLICATION OR INCORRECT INSTALLATION OF ITS PRODUCTS.

## INTRODUCTION

Firetrol® combined automatic and manual fire pump controllers are intended for starting electric motor driven fire pumps. This manual covers the following controllers:

FTA750 - Limited Service Controllers (Full Voltage Starting)

FTA1000 - Full Voltage Starting

FTA1250 - Part Winding Reduced Current  
Starting (Closed Circuit Transition)

FTA1300 - Wye-Delta Reduced Voltage  
Starting (Open Circuit Transition)

FTA1350 - Wye-Delta Reduced Voltage  
Starting (Closed Circuit Transition)

FTA1500 - Primary Resistance Reduced Voltage  
Starting (Closed Circuit Transition)

FTA1800 - Autotransformer Reduced Voltage  
Starting (Closed Circuit Transition)

FTA1930 - Digital Soft Starting

FTA2000 - High Voltage Starting

FTA2400 - Primary Reactor Reduced High Voltage Starting

Firetrol fire pump controllers are listed, approved or certified by the following approving authorities: Underwriters’ Laboratories, Inc., Underwriters’ Laboratories of Canada, Canadian Standards Association, New York Board of Standards and Appeals and Factory Mutual (Except FTA750 Limited Service Controllers). They are built to meet or exceed the requirements of the approving authorities listed above as well as NEMA and the latest editions of NFPA 20 and NFPA 70.

These instructions are intended to assist in the understanding of the installation and operation of these controllers. Read the instructions thoroughly prior to connecting or operating the controller. If there are any unanswered questions, please contact the local Firetrol representative or factory service department.

## MOUNTING CONTROLLER

NOTE—Consult the appropriate job plans to determine the controller mounting location. Tools and materials (all mounting) required:

1. Assortment of common hand tools of the type used to service electromechanical equipment.
2. Drill for drilling wall/floor anchor holes.
3. Hole (conduit) punch.
4. Hand level.
5. Tape measure.
6. Four anchors with bolts and washers, per enclosure - if wall mount.
7. Mounting hardware for floor / wall mount.

### Wall Mount— (Optional - If Ordered)

Procedure—

1. Locate bottom mounting brackets and hardware.
2. Inspect for damage.
3. Gently lay the controller on its back, using protection so the paint is not damaged. It is best to lay the controller in a location that is out of the way from actual mounting location.
4. Remove existing floor mounting legs if supplied. Attach each bracket to the bottom of the enclosure using the supplied hardware . Tighten nuts securely.



Note—Refer to the controller dimension drawing for necessary mounting dimensions.

The controller is wall mounted by using at least four (4) wall anchors, 2 or more anchors for the top ears and 2 or more anchors for the bottom mounting brackets (depending on enclosure size). The ears and brackets are dimensionally on the same center-line for ease in mounting.

5. Using either the dimension print or by measuring the distance between the center lines of the lower bracket slots, transcribe this dimension onto the wall. Note: The bottom edge of the enclosure should be a minimum of 12" (305 mm.) from the floor in case flooding of the pump room occurs.
6. Drill and put anchors into the wall for the lower bracket slot mounts.
7. Mark on the wall, the location of the holes in the upper mounting ears.
8. Drill and put anchors into wall for the upper mounts.
9. Install bolts and washers in lower anchors, leaving a gap between the washer and wall.
10. Lift the controller and place the bottom mounting slots down onto the lower anchor bolts.  
Do not tighten bolts.
11. Align holes in upper mounting ears and install bolts and washers in anchors.
12. Shim anchors as necessary to ensure rear of enclosure is vertically level and enclosure is not stressed. Tighten all anchor bolts.
13. Check to be sure enclosure door opens and closes freely and that enclosure is level.

### FLOOR/BASE PLATE MOUNT

#### MOUNTING LEGS

PROCEDURE- (If not pre installed)

1. If legs were supplied, unpack the legs and mounting hardware.
2. Inspect legs for damage.
3. Securely lift controller or lay it on it's back being careful not to damage painted surface.



4. Attach each leg to the bottom of the enclosure using the nuts, bolts, and washers provided for each leg. Tighten bolts securely.
5. After legs are securely attached, stand the controller up on its legs for floor mounting. Each leg has three holes on the bottom for anchoring to the floor or base plate.



NOTE—Consult the appropriate job plans to determine the controller mounting location. Refer to the controller dimension print for necessary mounting dimensions.

The controller is floor/base plate mounted by using the three pre-drilled holes in each leg. The holes are dimensionally on the same line for ease of mounting.

1. Using either the dimension print or by measuring the distance between the center lines of the holes on one leg, transcribe these dimensions onto floor/base plate.
2. Drill three holes in the floor/base plate for anchoring the leg.
3. Mark the location of the holes for the opposite leg and drill three more holes.
4. Secure the controller to the floor/base plate with bolts and washers and tighten.
5. Check to be sure the enclosure door opens freely and that the enclosure is level.

## MAKING ELECTRICAL CONNECTIONS

Important Precautions—

Prior to making any field connections:

1. Open door of enclosure and inspect internal components and wiring for any signs of frayed or loose wires or other visible damage.
2. Verify that the controller information is what is required on the project:
  - Firetrol catalog number
  - Motor voltage and horsepower
  - Incoming line voltage and frequency
  - Maximum system pressure
3. Project electrical contractor must supply all necessary wiring for field connections in accordance with the National Electrical Code, local electrical code and any other authority having jurisdiction.
4. Refer to the appropriate field connection drawing for wiring information.

Procedure—

All field connections, remote alarm functions and AC wiring are brought into the enclosure through the top, bottom, or side conduit entrances as indicated on the dimension drawing.

1. Use a hole (conduit) punch, not a torch nor a drill, and punch a hole in the enclosure for the size conduit being used.
2. Install necessary conduit.
3. Pull all wires necessary for field connections, remote alarm functions, AC power and all other optional features. Allow enough excess wire inside the enclosure to make up connections to the appropriate line, load and control terminal block points. Be sure to consult the appropriate field connection diagram included with the manual. For proper wire sizing, refer to the National Electrical Code, NFPA 70.
4. Make all field connections to the remote alarm functions and any other optional features. Connect motor to controller load terminals. Do not connect AC power.

5. Verify AC line voltage, phase and frequency with the controller data plate on the enclosure door prior to connecting.
6. Check to see that all connections are both correctly wired (in accordance with the field connection diagram) and tight.
7. Close the enclosure door.

### **MAKING SYSTEM PRESSURE CONNECTIONS**

The controller requires one (1) “System Pressure” connection from the system piping to the enclosure. The connection fitting, 1/2” FNPT, is provided on the bottom, external side of the enclosure for this purpose. The “Test Drain” connection, located next to the “System Pressure” connection, should be piped to a vented drain or to waste. The “Test Drain” is used only briefly during the weekly test cycle.

Note—Test drain line must be free flowing. Do not use any valves or plugs on this line.

Refer to NFPA 20 for correct field piping procedure of sensing line between the pumping system and the controller.

### **GENERAL PRE-START UP OPERATION**

1. Controllers are shipped with the EMERGENCY RUN handle in the latched position. Before placing the controller in service, turn the EMERGENCY RUN handle and release to unlatch.
2. Check the controller for bolts, nuts and electrical connections which may have loosened during shipment.
3. If a remote start push-button is used, connect the wires to terminals as shown on field connection diagram.
4. If a deluge valve is used, remove the factory installed jumper from terminals as shown on field connection diagram. Connect wires from the normally closed contact on the deluge valve to terminals.
5. If a FTA200 remote alarm panel is used, connect like numbered terminals in the remote alarm panel to terminals in the fire pump controller. Terminals H and N must be connected if a FTA200 alarm panel is used.
6. If a FTA200 remote alarm panel is used, connect a reliable, separate, supervisory 120 volt power supply to terminals L1 and L2 in the alarm panel.

### **GENERAL START UP OPERATION**

General operating procedures are indicated on the data plate fastened to the front of the controller enclosure door.

Voltage Check—

1. Energize the incoming power feeder.
2. Observe the Mark IIXG screen. Confirm that the displayed voltage and frequency matches the voltage stamped on the data plate.

**At this time, it is necessary to prepare the controller for normal operation. See setup instructions for the Mark IIXG. After the Mark IIXG has been configured, return to this section.**

## Phase Rotation

If the Mark IIXG is reporting a phase reversal, see instructions in “Setting/Motor & Power/Phase Sequence”.

To simulate a phase reversal for testing purposes, push and hold the phase reversal push-button located on the right hand side of the Mark IIXG with the door open (see photo on right). The phases will be reversed internal to the Mark IIXG and a phase reversal alarm will be initiated. The alarm will clear when the button is released.



## MOTOR ROTATION

Confirm direction of motor rotation as follows:

### FTA750, 1000, 1500, 1800, 2000, 2400 CONTROLLERS

1. On FTA2000, 2400 controller, place “Normal-Off-Test” switch in the Normal position.
2. Close enclosure door.
3. Momentarily close the isolating switch/circuit breaker handle, i.e. move up to the ON position and then back to OFF.
4. The pump motor should rotate immediately if system pressure is low. If system pressure is not low, press the manual START push-button and immediately press the manual STOP push-button.
5. Observe direction of motor rotation.
6. If rotation is incorrect, confirm that the isolating switch/circuit breaker is in the OFF position, open enclosure door and reverse any two of the motor leads (T1, T2, T3) on the load side of contactor 1M. For example, T1 and T2, T1 and T3 or T2 and T3.
7. Retest for proper rotation following steps 1 through 4.

### FTA1250 CONTROLLERS

1. Close enclosure door.
2. Momentarily close the isolating switch/circuit breaker handle, i.e. move up to the ON position and then back to OFF.
3. The pump motor should rotate immediately if system pressure is low. If system pressure is not low, press the manual START push-button and immediately press the manual STOP push-button.
4. Observe direction of motor rotation.
5. If rotation is incorrect, confirm that the isolating switch/circuit breaker is in the OFF position, open enclosure door and reverse any two of the corresponding motor leads (T1, T2, T3, T7, T8, T9) on the load side of both contactors 1M and 2M. For example reverse T1 and T2 on contactor 1M and T7 and T8 on contactor 2M; or T1 and T3 on contactor 1M and T7 and T9 on contactor 2M; or T2 and T3 on contactor 1M and T8 and T9 on contactor 2M.
6. Retest for proper rotation following steps 1 through 4.

### FTA1300, 1350 CONTROLLERS

1. Close enclosure door.
2. Momentarily close the isolating switch/circuit breaker handle, i.e. move up to the ON position and then back to OFF.

3. The pump motor should rotate immediately if system pressure is low. If system pressure is not low, press the manual START push-button and immediately press the manual STOP push-button.
4. Observe direction of motor rotation.
5. If rotation is incorrect, confirm that the isolating switch/circuit breaker is in the OFF position, open enclosure door and reverse any two of the corresponding motor leads (T1, T2, T3, T6/T12, T4/T10, T5/T11) on the load side of both contactors 1M and 2M. For example, reverse T1 and T2 on contactor 1M and T6/T12 and T4/T10 on contactor 2M; or T1 and T3 on contactor 1M and T6/T12 and T5/T11 on contactor 2M; or T2 and T3 on contactor 1M and T4/T10 and T5/T11 on contactor 2M.
6. Retest for proper rotation following steps 1 through 4.

#### FTA1930 Controllers

1. Close enclosure door.
2. Momentarily close the isolating switch/circuit breaker handle, i.e. move up to the ON position and then back to OFF.
3. The pump motor should rotate immediately if system pressure is low. If system pressure is not low, press the manual START push-button and immediately press the manual STOP push-button.
4. Observe direction of motor rotation.
5. If rotation is incorrect, confirm that the isolating switch/circuit breaker is in the OFF position, open enclosure door and reverse any two of the motor leads (T1, T2, T3) on the load side of contactor 1M. For example, T1 and T2, T1 and T3 or T2 and T3.
6. Retest for proper rotation following steps 1 through 4

#### FTA900, 975 POWER TRANSFER SWITCH

1. Confirm motor rotation from the normal power source for the controller as outlined above.
2. Open both the controller isolating disconnect switch/circuit breaker and the transfer switch isolating disconnect switch by moving the operating handles to the OFF position.
3. Refer to the Automatic Transfer Switch Operator's Manual. Manually transfer the switch to the emergency power source.
4. Start the generator set at the generator control panel.
5. With the generator running at stable voltage and frequency momentarily close the power transfer switch isolating disconnect switch. The pump motor should rotate immediately if system pressure is low. If system pressure is not low, press the manual START push-button and immediately press the manual STOP push-button.
6. Observe motor rotation. Confirm that the isolating switch is in the OFF position. Shutdown generator set.
7. If rotation is incorrect, reverse any two of the line leads at the power transfer switch isolating disconnect switch (L1, L2, L3). For example, L1 and L2, or L2 and L3, or L1 and L3.
8. Retest for proper rotation following steps 1 through 6.

#### FTA950, 976 POWER TRANSFER SWITCH

1. Confirm motor rotation from the normal power source for the controller as outlined above.
2. Open both the controller and transfer switch isolating disconnect/circuit breakers by moving the operating handles to the OFF position.
3. Refer to the Automatic Transfer Switch Operator's Manual. Manually transfer the switch to the emergency power source.
4. Momentarily close the power transfer switch isolating disconnect switch/circuit breaker. The pump motor should rotate immediately if system pressure is low. If system pressure is not low, press the manual START push-button and immediately press the manual STOP push-button.
5. Observe motor rotation.
6. If rotation is incorrect, confirm that the isolating disconnect switch/circuit breakers are in the OFF position. Request the utility company to disconnect the second utility incoming power at the source, then reverse any two of the line leads at the power transfer switch isolating disconnect switch (L1, L2, L3). For example, L1 and L2, L1 and L3, or L2 and L3.
7. Retest for proper rotation following steps 1 through 5 above.

## **INITIAL START-UP OPERATION**

1. Place circuit breaker in ON position. The pump may start immediately if system pressure is low. The PUMP RUNNING and LOW PRESSURE LED's will be lit.
2. If the Mark IIXG is configured for automatic shutdown (AUTOMATIC STOP enabled), the pump motor will continue to run for the period of time set in the MIN RUN (or OFF DELAY) screen and then stop automatically, providing the STOP pressure setting has been reached. Both the system pressure and MIN RUN (or OFF DELAY) time remaining will be shown on the display. Depressing the STOP push-button during the running period will stop the motor as long as the button is held in. However, the motor will restart when the button is released if system pressure is below the stop setting.
3. If the controller is configured for manual shutdown (AUTOMATIC STOP disabled), the pump will continue to run until the STOP push-button is depressed.
4. To stop the motor otherwise, press and hold the STOP push-button and place the CIRCUIT BREAKER DISCONNECTING MEANS handle in the OFF position.

## **FOR MANUAL START**

1. Follow the initial start-up instructions. The isolating switch/circuit breaker should be closed, the POWER AVAILABLE LED should be illuminated and system pressure normal, i.e. higher than the programmed START PRESSURE setting.
2. Press the START push-button. The pump motor should start and continue to run. It will not stop automatically. The running period timer and pressure switch have no control over this manual operation.
3. To stop, press the STOP push-button.
4. Starting from a remote START push-button (if used) functions in the same way as the local START push-button.
5. If the pump motor restarts, system pressure is below the START PRESSURE setting.

## **FOR EMERGENCY RUN START**

1. Put the circuit breaker/isolating switch in the "off" position.
2. Push and lock the EMERGENCY RUN handle. Place the circuit breaker/isolating switch handle in the "on" position. The motor will start and continue to run until both of the following conditions have been satisfied:
  - a. The EMERGENCY RUN handle has been turned to "unlock" position and released.
  - b. The STOP push-button is pushed.
3. To stop the motor with the handle locked in the "run" position, place the circuit breaker handle in the OFF position, then turn the EMERGENCY RUN handle and release.
4. Return the circuit breaker operator to the ON position.
5. If the pump restarts, system pressure is below the START PRESSURE setting.

## **ABBREVIATED STARTING SEQUENCE**

### **FTA750, FTA1000, 2000 FULL VOLTAGE CONTROLLER**

1. Follow all of the initial start-up instructions.
2. The motor will start and run at full line voltage.

### **FTA1250 PART WINDING CONTROLLERS**

1. Follow all of the initial start-up instructions.
2. MOTOR ACCELERATION timer is factory set for 2 seconds and may be field adjusted if necessary. (See Mark IIXG Programming for details).

CAUTION: DO NOT EXCEED FOUR (4) SECONDS MAXIMUM OR MOTOR MANUFACTURER'S LIMITS.

3. Contactor 1M connects 1/2 of motor windings during starting cycle. The motor may not reach full speed until the MOTOR ACCELERATION timer has timed out and both contactors 1M and 2M are energized.

#### FTA1300-1350 WYE-DELTA CONTROLLERS

1. Follow all of the initial start-up instructions.
2. MOTOR ACCELERATION timer is factory set for 2 seconds and may be field adjusted if necessary. (See Mark IIXG Programming for details).

CAUTION: DO NOT EXCEED THIS TIMER SETTING WITHOUT CONSULTING YOUR FIRETROL REPRESENTATIVE.

3. a. FTA1300 - Contactors 1M and 1S connect the motor in the WYE configuration. The motor may not reach full speed until the MOTOR ACCELERATION timer has timed out, deenergizing 1S and energizing 2M, connecting the motor in the DELTA configuration.  
b. FTA1350 - Contactors 1M and 1S connect the motor in the WYE configuration. The motor may not reach full speed until the MOTOR ACCELERATION timer has timed out, energizing 2S and connecting the resistor bank, then energizing 2M and connecting the motor in the DELTA configuration. 2S contacts deenergize contactor 1S.

CAUTION: A minimum run timer setting of less than 3 minutes can cause overheating of the resistors in FTA1350 and FTA1500 controllers. The resultant overheating may damage the controller.

#### FTA1500 PRIMARY RESISTANCE CONTROLLERS

1. Follow all of the initial start-up instructions.
2. MOTOR ACCELERATION timer is factory set for 2 seconds and may be field adjusted if necessary. (See Mark IIXG Programming for details).

CAUTION: DO NOT EXCEED FOUR (4) SECONDS MAXIMUM.

3. Contactor 1S connects the motor in series with the resistor bank. The motor may not reach full speed until the MOTOR ACCELERATION timer has timed out and contactor 1M is energized.

#### FTA1800, 2400 AUTOTRANSFORMER CONTROLLERS

1. Follow all of the initial start-up instructions.
2. MOTOR ACCELERATION timer is factory set for 2 seconds and may be field adjusted if necessary. (See Mark IIXG Programming for details).

CAUTION: DO NOT EXCEED THIS TIMER SETTING WITHOUT CONSULTING YOUR FIRETROL REPRESENTATIVE.

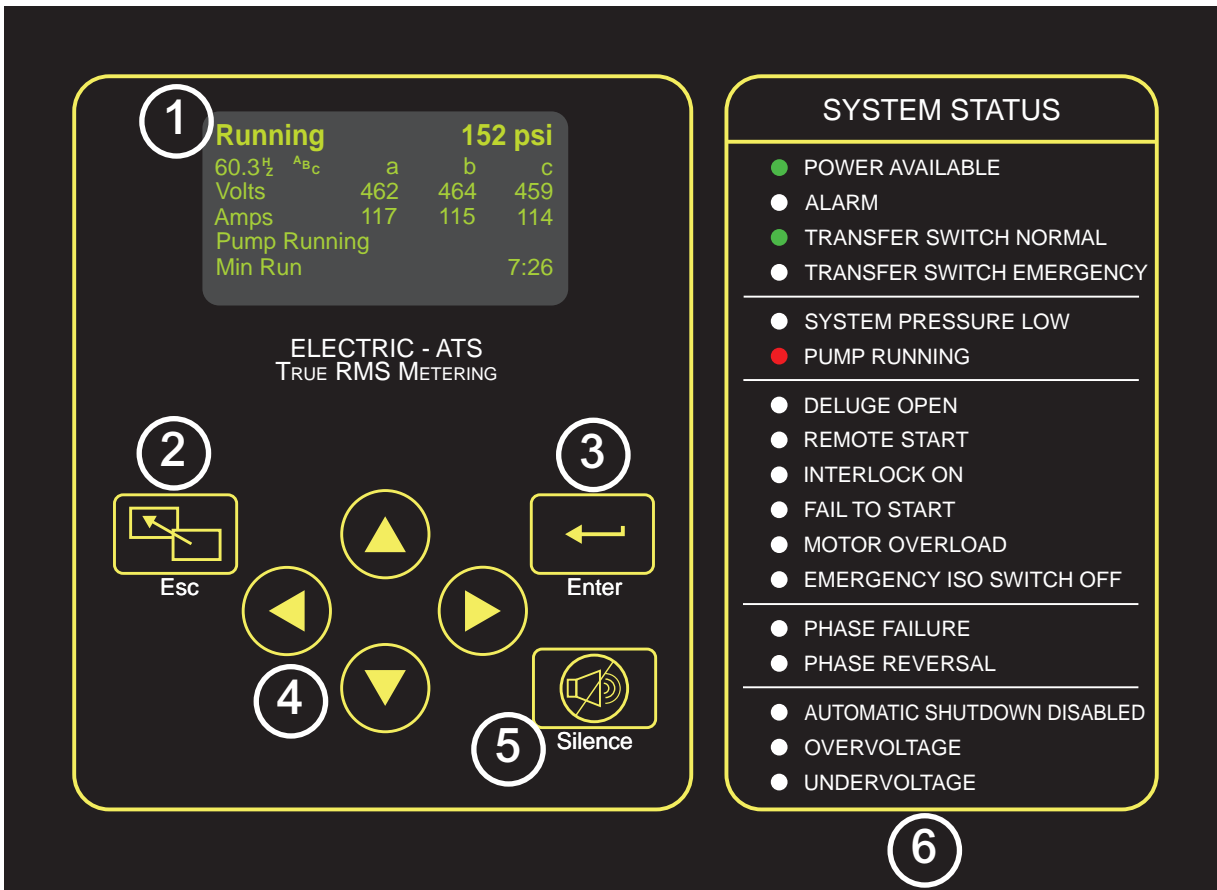
3. Contactor 1S and 2S close and connect the motor to the autotransformer/primary reactor during the starting cycle. The motor may not reach full speed until the MOTOR ACCELERATION timer has timed out, deenergizing contactor 1S and energizing contactor 1M, connecting the motor to full line voltage.

#### FTA1930 SOLID STATE STARTING CONTROLLERS

1. Follow the initial start-up instructions.
2. Motor will start at reduced voltage on soft start contactor 1MS.
3. When soft start contactor 1MS reaches full voltage, contactor 1M closes, bypassing 1MS.

CAUTION: Acceptance testing of each controller shall be for a minimum of six (6) automatic and six (6) manual starts at a minimum run time of five (5) minutes per NFPA 20 to insure resistor cooling between starts. Motor manufacturer's data must be consulted for maximum number of starts per hour and other starting conditions.

# Mark IIXG User Interface and Display



- 1 Informational Display**  
Control Status and System Pressure  
Frequency, Phase Rotation & Phases  
Line Voltage/Phase  
Motor Current/Phase  
Active Alarms - Primary Status Notification  
Date-Time or Active Timer  
Secondary Status Notification

- 2 ESC Button**  
Used to go backwards through  
menu screens

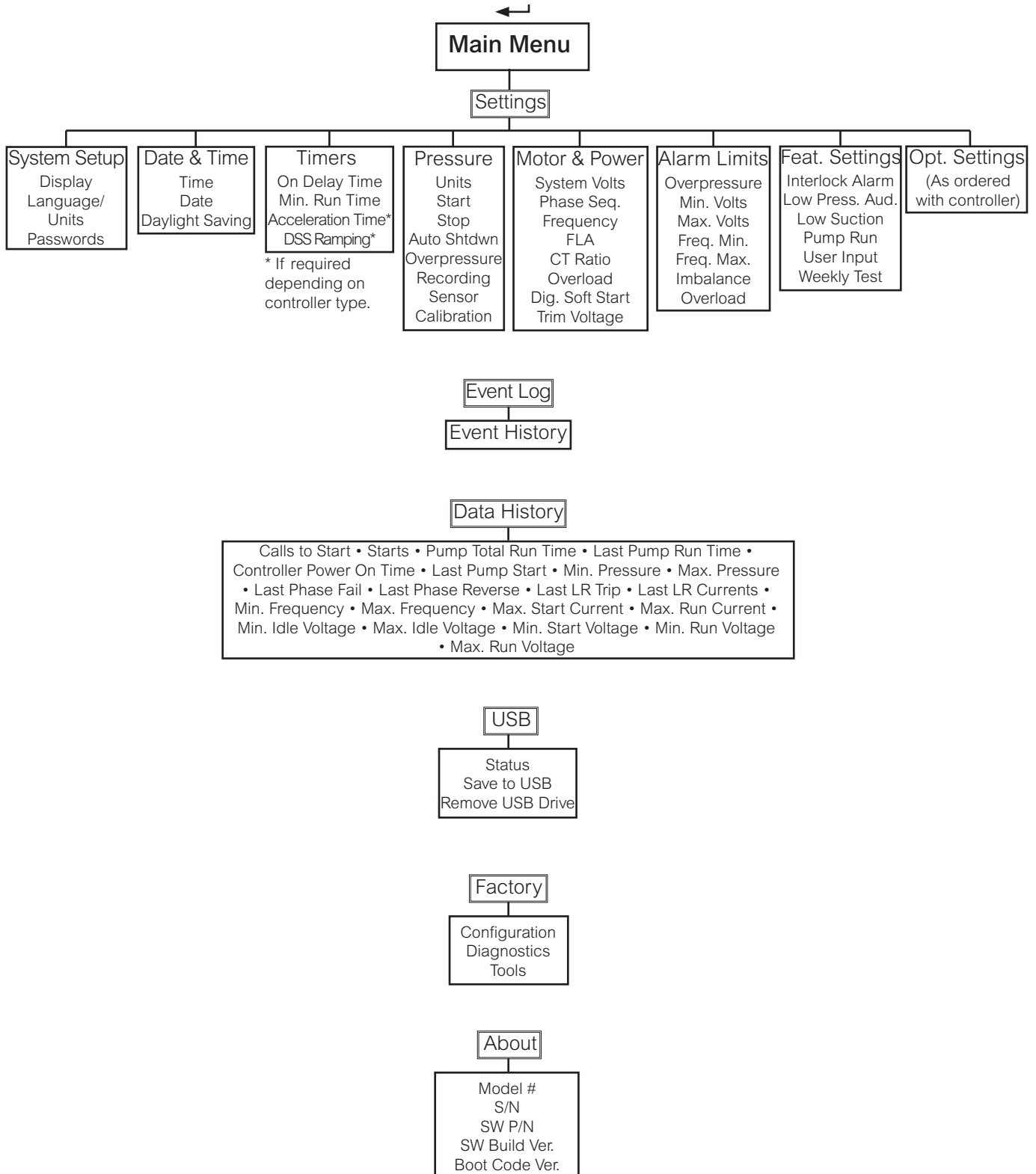
- 3 Enter Button**  
Used to go forwards through  
menu screens and save user de-  
fined  
settings

- 4 Directional Arrows**  
Used to go up and down in  
menu screens and change user  
defined values

- 5 Silence Alarm Button**  
Used to silence audible alarm

- 6 System Status LED's**  
Provide visual indication of  
important system information

# Mark IIXG User Menu Structure





# Programming Notes

The Firetrol Mark IIxG is multi-level password protected. User programmable functions are protected by a Level 1 password.

## LEVEL 1 PASSWORD

2 - 1 - 1 - 2

<sub>1</sub> Indicates the level of password required to modify a setting.

**Note:** Many menu settings feature an “enable/disable” option. These options are indicated by a “✓” for enabled or a “X” for disabled. In many cases this can also be interpreted as “✓” for yes or a “X” for no.




# Mark IIXG User Menu Settings

**Note:** Many menu settings feature an “enable/disable” option. These options are indicated by a “✓” for enabled or a “x” for disabled.

<sub>1</sub> Indicates the level of password required to modify setting.

## System Setup - Display

← SETTINGS ← SYSTEM SETUP ← DISPLAY ← **BRIGHTNESS** ← <sub>1</sub>

Use  and  arrows to set desired display brightness. Press  to confirm.




← SETTINGS ← SYSTEM SETUP ← DISPLAY ←  **CONTRAST** ← <sub>1</sub>

Use  and  arrows to set desired display contrast. Press  to confirm.

← SETTINGS ← SYSTEM SETUP ← DISPLAY ←  **INVERT** ← <sub>1</sub>

Use  or  arrows to enable/disable inverted display (bright background with dark letters). Press  to confirm.

← SETTINGS ← SYSTEM SETUP ← DISPLAY ←  **KEYBOARD** ← <sub>1</sub>

Use  or  arrows to set the amount of time of keyboard inactivity before the display returns to the main screen. Press  to confirm.

---

## System Setup - Language & Units

← SETTINGS ← SYSTEM SETUP ←  **LANGUAGE & UNITS** ← **LANGUAGE** ← <sub>1</sub>

Use  and  arrows to select preferred display language. Press  to confirm.

← SETTINGS ← SYSTEM SETUP ←  **LANGUAGE & UNITS** ←  **PRESSURE** ← <sub>1</sub>

Use  and  arrows to select preferred pressure unit display (psi, bar kPa). Press  to confirm.

---

## System Setup - Passwords

← SETTINGS ← SYSTEM SETUP ←  **PASSWORDS** ← **LEVEL 1** ← <sub>1</sub>

Use     arrows to set preferred password for level 1 access. Press  to confirm.

← SETTINGS ← SYSTEM SETUP ←  **PASSWORDS** ←  **LEVEL 2** ← <sub>2</sub>

Use     arrows to set preferred password for level 2 access. Press  to confirm.

NOTE: A higher level can change a lower level password (level 2 can change level 1). If passwords are changed from factory default and forgotten, charges may be incurred to reset the passwords.





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## Settings - Date & Time




← SETTINGS  **DATE & TIME** ← **TIME** ← <sub>1</sub>

Use     arrows to set current local time (24 hr format). Press  to confirm.

← SETTINGS  **DATE & TIME** ←  **DATE** ← <sub>1</sub>

Use     arrows to set current date (YYYY-MM-DD). The day of week will automatically update as required. Press  to confirm.

← SETTINGS  **DATE & TIME** ←  **DATE FORMAT** ← <sub>1</sub>

Use   arrows to set current date format (YYYY-MM-DD, DD-MM-YYYY, MM-DD-YYYY). Press  to confirm.

← SETTINGS ▼ DATE & TIME ← ▼ DAYLIGHT SAVING ← 🔒<sub>1</sub>

Use ▲▼ arrows to enable or disable automatic Daylight Saving time adjustments. Press ← to confirm.

▼ (+/-) ← Use ▲▼ arrows to set number of minutes to adjust for at the beginning or end of Daylight Saving time. Press ← to confirm.

▼ (DST +) "Begin" - HOUR ← Use ▲▼ arrows to set the hour of day that Daylight Saving time begins. Press ← to confirm.

▼ (DST +) "Begin" - DAY ← Use ▲▼ arrows to set the day of the month that Daylight Saving time begins. Press ← to confirm.

▼ (DST +) "Begin" - MONTH ← Use ▲▼ arrows to set the month of the year that Daylight Saving time begins. Press ← to confirm.

(Example: Hour=2:00, Day=2nd Sun, Month=Mar means Daylight Saving time would begin at 2:00a.m. on the 2nd Sunday in March)

▼ (DST -) "End" - HOUR ← Use ▲▼ arrows to set the hour of day that Daylight Saving time ends. Press ← to confirm.

▼ (DST -) "End" - DAY ← Use ▲▼ arrows to set the day of the month that Daylight Saving time ends. Press ← to confirm.

▼ (DST -) "End" - MONTH ← Use ▲▼ arrows to set the month of the year that Daylight Saving time ends. Press ← to confirm.

(Example: Hour=2:00, Day=1st Sun, Month=Nov means Daylight Saving time would end at 2:00a.m. on the 1st Sunday in November)

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## Timers

← SETTINGS ← ▼ TIMERS ← ON DELAY ← 🔒<sub>1</sub>

Use ▲▼◀▶ arrows to set preferred on delay time. Press ← to confirm.

Note: On Delay (also known as sequential start) time, delays the starting of the motor when an automatic call to start is received.

← SETTINGS ← ▼ TIMERS ← ▼ MIN RUN/OFF DELAY ← 🔒<sub>1</sub>

Use ▲▼ arrows to set timer mode to Minimum Run or Off Delay. Press ▶ key and use ▲▼◀▶ keys to set desired time. Press ← to confirm.

Note: Minimum Run time will begin when motor starts, Off Delay time will begin when system pressure has been restored to Stop pressure setting.

← SETTINGS ← ▼ TIMERS ← ▼ ACCELERATION ← 🔒<sub>2</sub>

Use ▲▼ arrows to set motor acceleration time. Press ← to confirm.

Note: Motor acceleration time is the time allotted for the motor to reach full speed during reduced voltage starting. The factory default should not be changed unless directed to by qualified service technician. Improper setting may cause damage to the controller and/or motor. (Acceleration setting only available on reduced voltage starting controllers FTA1250, 1300, 1350, 1500, 1800).

← SETTINGS ← ▼ TIMERS ← ▼ SS BYPASS ← 🔒<sub>2</sub>

Use ▲▼ arrows to set Soft Starter Bypass time. Press ← to confirm.

Note: The soft start bypass timer will energize the motor using a bypass (across-the-line) contactor if an up to speed signal is not given by the soft starter within the set time. This setting used only on soft start controllers (FTA1900, 1930)

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## Pressure

← SETTINGS ← ⏴ PRESSURE ← UNITS ← 🔒<sub>1</sub>

Use ⏴⏵ arrows to set preferred pressure unit system (psi, bar, kPa). Press ← to confirm.

← SETTINGS ← ⏴ PRESSURE ← ⏴ START ← 🔒<sub>1</sub>

Use ⏴⏵ arrows to set desired pump start pressure. Press ← to confirm.

← SETTINGS ← ⏴ PRESSURE ← ⏴ STOP ← 🔒<sub>1</sub>

Use ⏴⏵ arrows to set desired pump stop pressure. Press ← to confirm.

Note: Pump stop pressure must be set below the pump “churn” pressure (including minimum suction pressure), otherwise the pump will run continuously once started.

← SETTINGS ← ⏴ PRESSURE ← ⏴ AUTOMATIC SHUTDOWN DISABLED ← 🔒<sub>1</sub>

Use ⏴⏵ arrows to enable or disable the automatic shutdown disabled feature. Press ← to confirm.

Note: Enabling this feature makes the controller “manual stop only”.

← SETTINGS ← ⏴ PRESSURE ← ⏴ OVERPRESSURE ALARM ← 🔒<sub>1</sub>

Use ⏴⏵ arrows to enable or disable the overpressure alarm feature. Press ← to confirm.

⏴ Limit ← Use ⏴⏵ arrows to set the pressure limit for the overpressure alarm. Press ← to confirm.

← SETTINGS ← ⏴ PRESSURE ← ⏴ RECORDING - DELTA ← 🔒<sub>1</sub>

Use ⏴⏵ arrows to set pressure delta recording limit. Press ← to confirm.

Note: Pressure will be recorded whenever pressure changes by more than set limit.

⏴ HOURLY ← Use ⏴⏵ arrows to enable or disable hourly pressure recording. Press ← to confirm.

Note: Pressure will be recorded every hour, on the hour.

← SETTINGS ← ⏴ PRESSURE ← ⏴ SENSOR

The maximum operating pressure of the installed pressure sensor (transducer) is shown. This value cannot be modified from this location.

← SETTINGS ← ⏴ PRESSURE ← ⏴ CALIBRATION - SET TO ZERO ← 🔒<sub>2</sub>

Note: Before proceeding, place jumper wire between field terminals #1 & 10 to prevent starting of the motor. A calibrated pressure gauge will be required to correctly adjust the settings.

Remove/relieve system pressure from the controller sensing line. If gauge shows 0 psi, no adjustments are required; otherwise set zero calibration to same value as displayed on pressure gauge. (Example: With system pressure removed the gauge reads 3 psi, set zero calibration value to 3).

Use ⏴⏵ arrows to set zero calibration value. Press ← to confirm.

Using calibrated gauge, restore pressure to controller sensing line. Adjust span setting to match the value shown on the gauge.

⏴ SET TO SPAN ← Use ⏴⏵ arrows to set span calibration value. Press ← to confirm.

Note: Remove interlock jumper wire when calibration is complete.

← SETTINGS ← ⏴ PRESSURE ← ⏴ RESET TO DEFAULT ← 🔒<sub>2</sub>

Use ⏴⏵ arrows to enable the reset (pressure) to default option. Press ← to confirm. All user calibration settings will be reset to factory defaults and reset setting will revert back to disabled.

---

## Motor & Power

← SETTINGS ← ⏴ MOTOR & POWER ← SYS VOLTS

System voltage is shown. This is factory setting and can only be modified by a qualified service technician. This setting is set in Factory/Configuration menu.

← SETTINGS ← ⓪ MOTOR & POWER ← ⓪ PHASE SEQUENCE ← 🔒<sub>1</sub>

Use ⓪⓪ to select required phase sequence (1~, abc, cba). Press ← to confirm.

Note: This setting is used to clear a false phase reversal alarm. On 3-phase systems, once proper motor rotation is confirmed, if phase reversal alarm is present, change this setting to clear the alarm. (If set to abc, change to cba or vice-versa). Single phase mode (1~) is only used for demo purposes or on rare limited service applications.

← SETTINGS ← ⓪ MOTOR & POWER ← ⓪ FREQUENCY ← 🔒<sub>3</sub>

Use ⓪⓪ to select required frequency (50 or 60 hz.). Press ← to confirm.

Note: This is a factory setting and can only be modified by a qualified service technician.

← SETTINGS ← ⓪ MOTOR & POWER ← ⓪ FULL LOAD ← 🔒<sub>3</sub>

Use ⓪⓪ to set the Full Load Amps of the motor being used. Press ← to confirm.

Note: This is a factory setting and can only be modified by a qualified service technician.

← SETTINGS ← ⓪ MOTOR & POWER ← ⓪ CT RATIO ← 🔒<sub>3</sub>

Use ⓪⓪ to set the value of the CT's being used. Press ← to confirm.

Note: This is a factory setting and can only be modified by a qualified service technician.

← SETTINGS ← ⓪ MOTOR & POWER ← ⓪ OVERLOAD ← 🔒<sub>1</sub>

Use ⓪⓪ to set the amp value at which the motor overload alarm will activate. Press ← to confirm.

Note: Default setting is 150% of motor FLA.

← SETTINGS ← ⓪ MOTOR & POWER ← ⓪ DIGITAL SOFT START ← MOTOR FLA

The programmed motor FLA value is displayed. This setting cannot be changed from this location.

⓪ INIT CURRENT ← 🔒<sub>3</sub>

Use ⓪⓪ to set the Initial Starting Current (100-250% FLA). Press ← to confirm.

⓪ MAX CURRENT ← 🔒<sub>3</sub>

Use ⓪⓪ to set the Maximum Starting Current (250-600% FLA). Press ← to confirm.

⓪ ACCEL RAMP ← 🔒<sub>3</sub>

Use ⓪⓪ to set the Acceleration Ramp time (2 - 7 sec.). Press ← to confirm. This is the time allowed for the soft starter to ramp from the initial starting current to the maximum starting current.

#### ⓪ UTS TIMER

Value is shown for the UTS (Up To Speed) Timer. This timer determines how long to wait for the soft starter to reach full speed before a fault is indicated.

⓪ DECEL BEGIN LEVEL ← 🔒<sub>3</sub>

Use ⓪⓪ to set the Deceleration Begin Level (70-95% FLA). Press ← to confirm. The starter will reduce current to set level at the beginning of the deceleration ramp.

⓪ DECEL PAUSE LEVEL ← 🔒<sub>3</sub>

Use ⓪⓪ to set the Deceleration Pause Level (32-60% FLA). Press ← to confirm. The starter will reduce current to set level at the beginning of the pause cycle (sincerity test).

⓪ DECEL PAUSE TIME ← 🔒<sub>3</sub>

Use ⓪⓪ to set the Deceleration Pause Time (2 - 7 sec.). Press ← to confirm. The starter will pause and hold for set time to ensure no starting causes are present.

#### ⓪ DECEL END LEVEL

Soft starter will decel to 25% motor FLA before disconnecting power from the motor. This setting cannot be changed.

⓪ DECEL TIME ← 🔒<sub>3</sub>

Use ⓪⓪ to set the Deceleration Ramp Time (2 - 7 sec.). Press ← to confirm. This is the time of the deceleration ramp from begin level to end level (not including the decel pause time).

#### ⓪ PHASE ROTATION

Controller phase rotation is shown. This setting cannot be changed from this location.

#### ⓪ TIMEOUT ENABLED

This is a read only setting that is transmitted to the digital soft starter.

#### ⓪ TIMEOUT

This is a read only setting that is transmitted to the digital soft starter.

### ▼ NO CURRENT AT RUN

This is a read only setting that is transmitted to the digital soft starter.

### ▼ CT RATIO

This is a read only setting that is transmitted to the digital soft starter.

### ▼ TX

This is a value representing communications sent to the digital soft starter.

### ▼ RX

This is a value representing communications received from the digital soft starter.

### ▼ ERROR

This is a value representing communication errors between the Mark IIxG and the digital soft starter.

← SETTINGS ← ▼ MOTOR & POWER ← ▼ TRIM VOLTAGE ← 🔒<sub>2</sub>

Use ▲▼ to adjust the displayed voltage for each phase in the Mark IIxG. Press ← to confirm. Adjustment can be made in 0.1% increments to more closely match actual voltage. These discrepancies are due to tolerances in the potential transformers used for the voltage conversions.

Note: This setting only available on high voltage controllers, 2300 - 7200 Volts (FTA2000, FTA2400).

## Alarm Limits

← SETTINGS ← ▼ ALARM LIMITS ← OVERPRESSURE ALARM

ENABLED ← 🔒<sub>1</sub>

Use ▲▼ arrows to enable or disable the Overpressure Alarm. Press ← to confirm.

▼ LIMIT ← 🔒<sub>1</sub>

Use ▲▼ arrows to set the pressure limit for the Overpressure Alarm. Press ← to confirm.

← SETTINGS ← ▼ ALARM LIMITS ← ▼ VOLT MIN 🔒<sub>1</sub>

Use ▲▼ arrows to set the voltage limit for the Undervoltage Alarm. Press ← to confirm.

Note: The maximum and default setting is approximately -15% of nominal voltage.

▼ ENABLED ← 🔒<sub>1</sub>

Use ▲▼ arrows to enable or disable the Undervoltage Alarm. Press ← to confirm.

← SETTINGS ← ▼ ALARM LIMITS ← ▼ VOLT MAX 🔒<sub>1</sub>

Use ▲▼ arrows to set the voltage limit for the Overvoltage Alarm. Press ← to confirm.

Note: The maximum and default setting is approximately +10% of nominal voltage.

▼ ENABLED ← 🔒<sub>1</sub>

Use ▲▼ arrows to enable or disable the Overvoltage Alarm. Press ← to confirm.

← SETTINGS ← ▼ ALARM LIMITS ← ▼ FREQ MIN 🔒<sub>1</sub>

Use ▲▼ arrows to set the frequency limit for the Under frequency Alarm. Press ← to confirm.

▼ ENABLED ← 🔒<sub>1</sub>

Use ▲▼ arrows to enable or disable the Under frequency Alarm. Press ← to confirm.

← SETTINGS ← ▼ ALARM LIMITS ← ▼ FREQ MAX 🔒<sub>1</sub>

Use ▲▼ arrows to set the frequency limit for the Over frequency Alarm. Press ← to confirm.

▼ ENABLED ← 🔒<sub>1</sub>

Use ▲▼ arrows to enable or disable the Over frequency Alarm. Press ← to confirm.

← SETTINGS ← ▼ ALARM LIMITS ← ▼ IMBALANCE 🔒<sub>1</sub>

Use ▲▼ arrows to set the percentage of deviance between phases for the Phase Imbalance alarm. Press ← to confirm.

← SETTINGS ← ▼ ALARM LIMITS ← ▼ OVERLOAD 🔒<sub>1</sub>

Use ▲▼ arrows to set the motor amps for the Motor Overload alarm (FLA - 150% FLA). Press ← to confirm.

## Feature Settings

← SETTINGS ← (▼) FEATURE SETTINGS ← (▼) INTERLOCK ALARM ← (🔒)<sub>1</sub>

Use (▲) (▼) arrows enable or disable the alarm for Interlock On. Press ← to confirm.

← SETTINGS ← (▼) FEATURE SETTINGS ← (▼) LOW PRESSURE AUD ← (🔒)<sub>1</sub>

Use (▲) (▼) arrows enable or disable the audible alarm for Low System Pressure. Press ← to confirm.

← SETTINGS ← (▼) FEATURE SETTINGS ← (▼) LOW SUCTION ←

ENABLE ← (🔒)<sub>1</sub>

Use (▲) (▼) arrows to enable or disable the Low Suction Alarm. Press ← to confirm.

(▼) AUDIBLE ← (🔒)<sub>1</sub>

Use (▲) (▼) arrows to enable or disable the Low Suction Alarm. Press ← to confirm.

(▼) COMMON ALARM ← (🔒)<sub>1</sub>

Use (▲) (▼) arrows to enable or disable the common alarm output for the Low Suction Alarm. Press ← to confirm.

← SETTINGS ← (▼) FEATURE SETTINGS ← (▼) PUMP RUN ALARM ←

(▼) AUDIBLE ← (🔒)<sub>1</sub>

Use (▲) (▼) arrows to enable or disable the Pump Run Alarm. Press ← to confirm.

(▼) COMMON ALARM ← (🔒)<sub>1</sub>

Use (▲) (▼) arrows to enable or disable the common alarm output for the Pump Run Alarm. Press ← to confirm.

← SETTINGS ← (▼) FEATURE SETTINGS ← USER INPUT

← ENABLE (🔒)<sub>1</sub>

Use (▲) (▼) arrows to enable or disable the user defined alarm. Press ← to confirm.

(▼) ← ON DELAY (🔒)<sub>1</sub>

Use (▲) (▼) arrows to select an on delay time before the alarm is acknowledged (0-99 seconds). Press ← to confirm.

(▼) ← AUDIBLE (🔒)<sub>1</sub>

Use (▲) (▼) arrows to select if the user input activates the audible alarm. Press ← to confirm.

(▼) ← COMMON ALARM (🔒)<sub>1</sub>

Use (▲) (▼) arrows to select if the user input activates the common alarm output. Press ← to confirm.

(▼) ← ON MESSAGE TEXT (🔒)<sub>1</sub>

Use (▲) (▼) (◀) (▶) arrows to program the message that is displayed and recorded when the user defined alarm is activated. Press ← to confirm.

(▼) ← OFF MESSAGE TEXT (🔒)<sub>1</sub>

Use (▲) (▼) (◀) (▶) arrows to program the message that is displayed and recorded when the user defined alarm is deactivated. Press ← to confirm.

← SETTINGS ← (▼) FEATURE SETTINGS ← WEEKLY TEST SETUP

← ENABLE (🔒)<sub>1</sub>

Use (▲) (▼) arrows to disable or define the frequency of the Weekly Test feature (Disabled, Every Week, Every 2 Weeks, .....Every 5 Weeks). Press ← to confirm.

(▼) ← ON (🔒)<sub>1</sub>

Use (▲) (▼) arrows to choose the day of the week that the Weekly Test is performed. Press ← to confirm.




(▼) ← AT (🔒)<sub>1</sub>

Use (▲) (▼) (◀) (▶) arrows to choose the time of day that the Weekly Test is performed. Press ← to confirm.

(▼) ← FOR (🔒)<sub>1</sub>

Use (▲) (▼) arrows to choose the duration (motor run time) of the Weekly Test. Press ← to confirm.

## ⏪ ← NOW IN WEEK 1

Use   arrows to choose current time frame in reference to the Weekly Test schedule. Press  to confirm. (Example: If test is programmed for every 2 weeks on Sunday and today were Friday then - If testing is desired to start this week, then every other week thereafter, we would now be in week 2 of 2 - If testing is desired to start on the following Sunday, not the coming Sunday, then we would now be in week 1 of 2).

---

## Option Settings



### ⏪ ← SETTINGS ← OPTION SETTINGS ←

**NOTE:** The list of available options and the settings associated with them will vary with each controller. Below are the most common user defined settings that may appear.




### ⏪ ← DELAY 1

Use   arrows to set the “on” delay time for selected option. Press  to confirm.

### ⏪ ← AUDIBLE 1

Use   arrows to enable or disable the audible alarm for selected option. Press  to confirm.

### ← COMMON ALARM 1





Use   arrows to enable or disable the common alarm output for selected option. Press  to confirm.

---

## Event Log

### ⏪ ← EVENT LOG ←

The Event Log is a record of events (pressure recording, alarms, starts, etc...) that are stored in the memory of the Mark IIxG. The last 3000 events are kept in this memory. The events are stored in the order that they occur, with the most recent being “first” (the last event that occurred will be event #1). The following keys are used to browse through the event log:

-  Move forward through the events one at a time (1 - 2 - 3....etc)
-  Move backward through the events one at a time (55 - 54 - 53....etc)
-  Move forward through the events ten at a time (60 - 70 - 80....etc)
-  Move backward through the events ten at a time (91 - 81 - 71....etc)



Pressing and holding of the arrow keys will allow the scrolling to move faster.

---

## Data History

### ⏪ ← DATA HISTORY ←

The Data History is a record of important data and events that are kept throughout the life of the controller.

Use   arrows to scroll through the information stored in the Data History log. The available information is: Numbers of calls to start • Number of actual starts • Pump total run time • Pump last run time • Total controller power on time • Last pump start time/date • Minimum system pressure • Maximum system pressure • Last phase failure • Last phase reversal • Last locked rotor trip • Last locked rotor currents • Frequency minimum • Frequency maximum • Maximum starting currents • Maximum run currents • Minimum voltage/phase while idle (not running) • Maximum voltage/phase while idle (not running) • Minimum voltage/phase during start • Minimum voltage/phase during run • Maximum voltage/phase during run

---

## USB

### ⏪ ← USB ←

### ⏪ ← SAVE TO USB 1

Use   arrows to enable or disable the Save to USB function. Press  to confirm.

The following is saved to the USB flash drive: Event Log, Data History, Controller Information and all user defined settings (pressure settings, timer settings, alarm settings....etc.). The saved file is a text file named the same as the controller serial number (87654321.txt) and can be viewed using most word processing software.

Note: Use of a flash drive larger than 1GB may result in excessively long read/write operations. If a flash drive larger than 1GB must be used, create a 1GB or less partition on that drive.



## REMOVE DRIVE 1

Use   arrows to enable or disable the Remove Drive feature. Press  to confirm.

Much like a computer, the Remove Drive feature ensures file closure prior to removing the USB flash drive from the Mark IIXG. Use of this feature helps prevent file corruption.

NOTE: The Mark IIXG also features an automatic daily save function. Every day at midnight (0:00) the events for that day are written to a file on the USB flash drive. This file is also a text file (.txt) and is named for the month, in the current year folder under Firetrol (x:\Firetrol\2009\Sept.txt).

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## MOTORSCOPE

### MOTORSCOPE

Information is displayed for the following:

Startup Time

Sampling Rate

Voltage Min.

Current Max.

### **VOLTAGE GRAPH**

A graphical display of the controller voltage is shown representing the first 10 seconds of the last motor start.

### **CURRENT GRAPH**

A graphical display of the motor current is shown representing the first 10 seconds of the last motor start.

---

## Configuration - Model




### FACTORY CONFIGURATION **MODEL**

### **SERIAL NUMBER** 3

Use     arrows to enter the controller serial number. Press  to confirm.

NOTE: This is a factory set parameter and under normal circumstances would never be changed.

### **MODEL** 3

Use   arrows to select required model number. Press  to confirm.

NOTE: This is a factory set parameter and under normal circumstances would never be changed.

### **HP (HORSEPOWER)** 3

Use   arrows to select required motor horsepower. Press  to confirm.

NOTE: This is a factory set parameter and under normal circumstances would never be changed.

### **VOLTAGE** 3

Use   arrows to select required voltage. Press  to confirm.

NOTE: This is a factory set parameter and under normal circumstances would never be changed.

### **FULL LOAD** 3

Use   arrows to set the full load amps (FLA) of the motor. Press  to confirm.

NOTE: This is a factory set parameter and under normal circumstances would never be changed.

### **CT RATIO** 3

Use   arrows to set required CT ratio for the controller. Press  to confirm.

NOTE: This is a factory set parameter and under normal circumstances would never be changed.

### **FREQUENCY** 3

Use   arrows to select required frequency (hertz) for the supplied power. Press  to confirm.

NOTE: This is a factory set parameter and under normal circumstances would never be changed.

### **PHASE SEQUENCE** 1

Use   to select required phase sequence (1~, abc, cba). Press  to confirm.

### ▼ PRESSURE SENSOR ← ↵ 🔒<sub>3</sub>

Use ▲▼ to enable or disable the use of a pressure sensor (transducer). Press ←↵ to confirm.  
NOTE: This is a factory set parameter and under normal circumstances would never be changed.

### ▼ AUTOSTART NC ← ↵ 🔒<sub>3</sub>

Use ▲▼ to enable or disable the use of a Normally Closed contact for the autostart input. Press ←↵ to confirm.

### ▼ USER INPUT NUMBER ← ↵ 🔒<sub>3</sub>

Use ▲▼ to select input used for user defined option. Press ←↵ to confirm.

### ▼ LOW SUCTION ← ↵ 🔒<sub>3</sub>

Use ▲▼ to set the input for low suction pressure option. Press ←↵ to confirm.

### ▼ ← SCREEN SAVER 🔒<sub>1</sub>

Use ▲▼ arrows to enable or disable the screen saver function. Press ←↵ to confirm.

NOTE: The display screen is designed to automatically dim 5 minutes after returning to the home screen and without any activity. The screen will “wake up” or return to set brightness on a key press or any event that would cause a message to appear on the screen. This feature is designed to prolong the life of the display. It is not recommended that this function be disabled.

---

## Configuration - Options

### ← ↵ ▼ FACTORY ← ↵ CONFIGURATION ← ↵ ▼ OPTIONS ← ↵ 🔒<sub>3</sub>

This is area where ordered options are added by the factory. Any user defined parameters for these options would appear in the SETTING/OPTION SETTINGS menu.

---

## Configuration - ADC Calibration

### ← ↵ ▼ FACTORY ← ↵ CONFIGURATION ← ↵ ▼ ADC CALIBRATION ← ↵ 🔒<sub>4</sub>

This area displays the values of the Analog to Digital Converter calibrations. This calibration is done by the manufacturer. Any changes to these settings would have to be made by the factory.

---

## Diagnostics

### ← ↵ ▼ FACTORY ← ↵ ▼ DIAGNOSTICS ← ↵

#### ▼ RAW INPUT: ANALOG ← ↵

Input values are shown. This information is for factory level troubleshooting purposes.

#### ▼ RAW INPUT: DISCRETE ← ↵

Input values are shown. This information is for factory level troubleshooting purposes.

#### ▼ RAW INPUT: KEYS ← ↵

Input values are shown. This information is for factory level troubleshooting purposes.

#### ▼ RAW OUTPUT: DISCRETE ← ↵

Output values are shown. This information is for factory level troubleshooting purposes.

#### ▼ MARK IIXG STARTS

Displays the total number of times the Mark IIXG has been booted.

#### ▼ LAMP TEST ← ↵ 🔒<sub>1</sub>

Use ▲▼ arrows to enable the lamp test. Press ←↵ to begin test. All System Status LED's should illuminate.

←↵ Use ▲▼ arrows to disable the lamp test. Press ←↵ to end test. System Status LED's should turn off and return to normal indications.

### ▼ AUDIBLE TEST ← ↩ 🔒<sub>1</sub>

Use ▲ ▼ arrows to enable the audible test. Press ← ↩ to begin test. The audible alarm should sound.  
← ↩ Use ▲ ▼ arrows to disable the audible test. Press ← ↩ to end test. The audible alarm will turn off.

### ▼ USB TEST ← ↩ 🔒<sub>1</sub>

Use ▲ ▼ arrows to enable the USB test. Press ← ↩ to begin test. A small test file is written to the USB flash drive then read back from the drive. If the write/read is successful, the test is passed. After completion of the test the setting will automatically return to disabled.

### ▼ PHASE FAIL ← ↩ 🔒<sub>2</sub>

Use ▲ ▼ arrows to enable the phase failure test. Press ← ↩ to begin test. The phase failure should be indicated.  
← ↩ Use ▲ ▼ arrows to disable the phase failure test. Press ← ↩ to end test. The phase failure should clear.

### ▼ PHASE REVERSE ← ↩ 🔒<sub>2</sub>

Use ▲ ▼ arrows to enable the phase reversal test. Press ← ↩ to begin test. The phase reversal should be indicated.  
← ↩ Use ▲ ▼ arrows to disable the phase reversal test. Press ← ↩ to end test. The phase reversal should clear.

### ▼ SHUNT 1 ← ↩ 🔒<sub>2</sub>

Use ▲ ▼ arrows to enable the shunt trip #1 test. Press ← ↩ to begin test. The normal (fire pump) circuit breaker should trip. Note: If the controller is supplied with a power transfer switch, the generator should start and transfer to the emergency power source.

← ↩ Use ▲ ▼ arrows to disable the shunt trip #1 test. Press ← ↩ to end test. Reset the fire pump circuit breaker. Note: If power transfer switch supplied and now in the emergency position, the generator will continue to run for 30 minutes before transferring back to normal power. To transfer back to normal power sooner, use the retransfer selector switch on the power transfer switch.

### ▼ SHUNT 2 ← ↩ 🔒<sub>2</sub>

Use ▲ ▼ arrows to enable the shunt trip #2 test. Press ← ↩ to begin test. The emergency (transfer switch) circuit breaker (if supplied) should trip. Note: If the transfer switch is in the normal position, the circuit breaker will trip and that is all. If the transfer switch is in the emergency position, the circuit breaker will trip and the transfer switch will transfer to the normal position if normal power is available.

← ↩ Use ▲ ▼ arrows to disable the shunt trip #2 test. Press ← ↩ to end test. Reset the transfer switch circuit breaker.

### ▼ FLAGS

These flags are a part of a manufacturer level testing tool.

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## Tools

← ↩ ▼ FACTORY ← ↩ ▼ TOOLS ← ↩

### ← ↩ CLEAR DATA HISTORY 🔒<sub>3</sub>

Use ▲ ▼ arrows to enable this option. Press ← ↩ to confirm. Data History will be cleared and option will automatically revert back to disabled.

NOTE: Once cleared, this data cannot be recovered.

### ← ↩ CLEAR EVENT LOG 🔒<sub>3</sub>

Use ▲ ▼ arrows to enable this option. Press ← ↩ to confirm. The Event Log will be cleared and option will automatically revert back to disabled.

NOTE: Once cleared, this data cannot be recovered.

### ← ↩ RESET TO DEFAULTS 🔒<sub>3</sub>

Use ▲ ▼ arrows to enable this option. Press ← ↩ to confirm. The Mark IIXG will be reset to “out of the box” default settings.

NOTE: All user and factory configuration settings will be lost.

### ← ↩ FIRMWARE UPDATE 🔒<sub>3</sub> ← ↩

This is a tool for installing firmware updates. Updates are installed from a USB flash drive. On screen instructions will guide the process. Installing firmware usually takes just a few minutes, however, the controller is out of service during this time.

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## About

← ▾ ABOUT ←

Information is shown for: Model Number, Serial Number, Software (Part Number, Build Number, Date), and Boot Code (Part Number, Version Information and Checksum Information).