



# ***Instruction Bulletin***

## **Fire Pump Controller *For* Electric Driven Fire Pumps (Produced after September 2002)**

### **Installation- Start Up - Service**



This instruction is a guide for personnel involved with Maintenance, Engineering and approval of Fire Pump equipment. It provides an understanding of the Joslyn Clark controller operation, to aid in installing start-up.

Operation, Installation and test requirements are specified by the National Fire Protection Association, Publications NFPA 20, NFPA 70, NFPA 25 and Factory Mutual.

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# Instruction Bulletin

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## INSTALLATION

Installation must meet requirements of the National Fire Protection Association publication "NFPA-20 and NFPA-70".

### SETTING IN PLACE

The controller must be located "within sight" of the motor, but so located that it will not be injured by water escaping from the pump or connections.

Mount the controller in a substantial manner on the wall, at a height which places current carrying parts not less than 12" above floor level (NFPA-20" requirements). Larger size floor mounted enclosures include the necessary 12" floor clearance. A housekeeping floor pad is recommended.

### WIRING

Space available for entry of electrical conduits are detailed on controller submittal sheets and dimension outlines. All connections and service are made from the front. Rear access is not required.

Incoming line power connects to top terminals of Isolating Switch IS, terminals L1-L2-L3. For use as service entrance equipment application, connect service ground conductor.

**Check controller nameplate to assure controller voltage is same as service voltage being installed.**

Outgoing motor leads connect to bottom of Motor Contactor M, terminals T1, T2, T3 (Part winding and Wye-Delta types connect to 1 M-2M contactors).

Ground cabinet by wiring to **ground lug** provided near Isolating Switch.

External control leads connect to control terminal board. Push Buttons: An optional remote "Start" push button can be added, wire to terminals 1-2.

**Note that remote "Stop" push buttons cannot be added. "NFPA-20" regulations permit the use of no other "Stop" push button than the one mounted on the controller.**

Deluge Valve: When used, this connects to terminals 3-6, remove jumper 3-6. Valve contacts are closed when valve is closed.

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Remote Alarms: "NFPA-20" requires that remote alarms be connected when the pump room is not constantly attended. Alarms must be powered by a separate reliable supervised power source. Make the following contact connections:

- Connect "Pump Power Failure" to terminals 10-11 for contact "close" to alarm or terminals 11-12 for contact "open" to alarm.
- Connect "Pump Running" alarm to terminals 13-14 for contact "close" to alarm or terminals 13A-14A for contact "open" to alarm.
- Connect "Reverse Phase" alarm to terminals 76-77 for contacts "Close" to alarm.

**NOTE: Joslyn Clark Bulletin 10665 Alarm Panels are designed for use with all bulletins of Joslyn Fire Pump Controllers.**

### ELECTRICAL MAKE-READY

Remove all packing and bindings which protect relays and contactors during shipment. Operate all contactors and relays by hand to assure free motion. Operate the "Start-Stop" push buttons and the emergency start handle a few times to clean operating contacts from possible moisture or dust accumulated during shipping and installation work.

### PIPING

Threaded connection on the pressure sensor is accessible from front. Recommended pipe entry is through the bottom of wall-mounted controllers, and through the lower left side of floor-mounted types. Dimension details are shown on the outline diagram. When tightening piping, hold the square part of pressure sensor adaptor with wrench to avoid strain on transducer.

#### **"NFPA-20" requires:**

- a. Provision on the piping for relieving the pressure to test operation of the pressure switch (i.e.: drain valve).
- b. Pressure piping outside the controller may be not less than 1/2" nonferrous. Piping entering controller may be 1/4".

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## ADJUSTMENTS

1. Field setting of the Circuit Breaker is not needed. The Joslyn Clark Locked Rotor Protector is factory set at 300% motor full load current, there are no adjustments.

Circuit Breaker "instantaneous trip" is factory set to operate at no more than 2000% motor full load current. This set-point is stamped on controller nameplate, handy when needed for future verification.

2. Adjust Pressure Control start and stop pressure settings to suit the exact installation (see adjustment instruction page)

3. The Running Period Timer, please refer to the Programming Mode for Recording Pressure Switch (RPS)

4. On Reduced Voltage Controllers Accelerating Timer 1AT is factory set.  
10640 Autotransformer, Set 1AT - 3.0 Sec.  
10650 Primary Resistor, Set 1AT - 3 Sec.  
10670 Part Winding, Set 1AT - 1.5 Sec.  
10680 Y-Delta (Closed), Set 1AT - 2 Sec.  
10690 Y-Delta (Open), Set 1AT - 2.5 Sec.

5. On Sequence Starting Controllers, the Sequential Timer, ST must be field set, as determined by the controller position in the "sequence." Set timer at:  
0 Seconds for Number 1 pump  
5 Seconds for Number 2 pump  
10 Seconds for Number 3 pump, etc., at 5 second intervals.

## OPERATING INFORMATION ELECTRIC FIRE PUMP CONTROLLER WITHOUT TRANSFER SWITCH.

### TRYOUT FOR CHECKING DIRECTION OF MOTOR ROTATION

1. Power Supply switch (DISCONNECTING MEANS) should be open.
2. Push "STOP" button while closing power supply switch. Release STOP button.
3. Pump will start if water pressure is lower than the setting of the pressure switch.
4. If pump starts, open power supply switch to "STOP". (Check motor rotation).
5. If pump does not start, press "START" button and stop by opening the power supply switch. (Check motor rotation).
6. While doing the above, you will note the green light in the Display Unit indicates "Power Available & Voltage O.K.", and the red light is off indicating that phases are in the correct sequence.

NOTE: This controller is phase sequence sensitive. Correct phase sequence is indicated when the Phases Reversed light in the Display Panel is "OFF". To correct, interchange any two incoming power leads. To change motor rotation, interchange any two motor leads at the controller or at the motor.

### INITIAL START-UP

- 1) Power supply switch should be open.
- 2) Check pressure switch setting for START (low setting) and STOP (High setting). For programming P.S. "settings" refer to Operating Instructions provided with the controller.
- 3) Push the "STOP" button while closing the power supply switch. Green light indicates "Power Available". Pump starts if pressure is low.

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- 4) Pump continues to run for a period of 10 minutes (the minimum “setting” on the Running Period Timer – RPT), and longer if pressure is still low. The motor will then stop automatically. Motor may be stopped during the running period by pressing the “STOP” button, but will re-start when the button is released if pressure is still low. For programming RPT “setting” refer to Operating Instructions provided with the controller.
- 5) For “Manual Stop” (RPT function is omitted) the pump will run until “stopped” by pressing the STOP button.
- 6) To stop the motor while pressure is low, open the power supply switch.

### **START FROM PUSHBUTTON**

- 1) Low water pressure starts the motor automatically, but the motor may be started manually at any water pressure by pressing the “START” pushbutton on the controller cabinet or the remote “START” pushbutton, if used. A green light must be ON in the Display Unit indicating that power is available before the motor can be started. (If light is not ON, follow initial start-up instructions).
- 2) Following a pushbutton start, the motor will continue to run until stopped by the pushbutton on the controller. The Running Period Timer nor the pressure switch will stop the motor.

### **START FROM MANUAL EMERGENCY START HANDLE**

- 1) For Manual Emergency operation, if motor does not start with the START button, raise the manual emergency Start handle quickly all the way and latch it in the raised position.
- 2) To stop when the handle is latched in raised position
  - A) Open the power supply switch
  - B) Unlatch the manual emergency handle
  - C) Close the power supply switch.

### **OPERATING SEQUENCE FOR DEVICES**

- 1) Under normal operating conditions
  - A) Power Supply Switch (Disconnecting Means) is closed.
  - B) Green light in Display Unit is ON indicating 3Ph Power Available & Voltage(s) OK.
  - C) Red light in Display Unit is OFF indicating that phase sequence is OK.
  - D) Recording Pressure Switch will have been programmed for water pressure settings, Running Period Timer function (if used) and Sequential Timer function (if used). (see Operating Instructions supplied with the controller).
  - E) The Power Monitor clock will have been programmed for the local time (see Operating Instructions supplied with the controller).
  - F) Relay CR1 is de-energized unless manual Pump Run was initiated by depression of the local or remote Start button. (CR1 energizes to start/run the pump)
  - G) Relay CR2 is energized (drops out to start/run the pump).
  - H) Relay CR3 will de-energize only when a phase failure is detected.
  - I) Relay CR4 will energize only when Phases Reversed condition is detected.
  - J) If the voltage drops below minimum voltage and then returns to above minimum (This can happen during motor starting) the green Power Available light in the Display Unit will blink for 5 seconds. This indicates that the power supply is marginal and may cause the fire pump not to start.
- 2) Relay CR1 is energized to start the motor when the “START” pushbutton is pressed or manual emergency handle is raised.
- 3) Relay CR2 is de-energized to start the motor when:
  - A) Pressure switch (PS) contact open due to low water pressure,
  - B) Remote “Automatic Start” contact opens to start the motor (if used).
- 4) Running Period Timer RPT (when used) starts timing on Automatic Start when CR2 drops out. Pressure switch operation will not stop the motor until (RPT) reaches its timed-out interval of 10 minutes minimum. The red RPT light in the recorder unit shows that the timer is timing or timed out but not reset. Timer resets when the motor stops.
- 5) Sequence Timing function (when used) delays starting (5 seconds) so that on a two pump installation both pumps do not start at once.

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## **CIRCUIT BREAKER OPERATION**

- 1) The circuit breaker with a shunt trip and the locked rotor protection units are factory set and not field adjustable. The LRP provides a trip-time delay of not over 20 seconds. It is factory set to trip at 300(+)% of the motor full load current.
- 2) The circuit breakers instantaneous trip is factory set to operate at not more than 20 times motor full load current.

## **OPERATING INFORMATION ELECTRIC FIRE PUMP CONTROLLER WITH TRANSFER SWITCH FOR ON-SITE POWER GENERATION.**

### **TRYOUT FOR CHECKING DIRECTION OF MOTOR ROTATION**

1. Both Normal & Alternate Power Supply Switches (Disconnecting Means) should be open.
2. Push "STOP" button while closing the Normal power supply switch. Release STOP button.
3. Pump will start if water pressure is lower than the setting of the pressure switch.
4. If pump starts, open Normal power supply switch to "STOP". (Check motor rotation).
5. If pump does not start, press "START" button and stop by opening the Normal power supply switch. (Check motor rotation).
6. Check rotation from the Alternate power supply by opening the Normal power supply switch and closing the Alternate power supply switch.
7. While doing the above, you will note the green light in the Display Unit indicates "Power Available & Voltage O.K.", and the red light is off indicating that phases are in the correct sequence. Also, note the white light which indicates transfer switch on Normal Power supply and Yellow light to indicate transfer switch is on Alternate power supply.

NOTE: This controller is phase sequence sensitive. Correct phase sequence is indicated when the Phases Reversed light in the Display Panel is "OFF". To correct, interchange any two incoming power leads. To change motor rotation, interchange any two motor leads at the controller or at the motor. Also, the Automatic Transfer Switch is shipped for operation from the Normal power supply. If in Alternate power supply position, it will automatically transfer to Normal in step 2 above prior to pump starting.

### **INITIAL START-UP**

1. Normal and Alternate Power supply switches should be open.
2. Check pressure switch setting for START (low setting) and STOP (High setting). For programming P.S. "settings" refer to Operating Instructions provided with the controller.
3. Push the "STOP" button while closing the Normal power supply switch. Green light indicates "Power Available". Pump starts if pressure is low.
4. Pump continues to run for a period of 10 minutes (the minimum "setting" on the Running Period Timer – RPT), and longer if pressure is still low. The motor will then stop automatically. Motor may be stopped during the running period by pressing the "STOP" button, but will re-start when the button is released if pressure is still low. For programming RPT "setting" refer to Operating Instructions provided with the controller.
5. For "Manual Stop" (RPT function is omitted) the pump will run until "stopped" by pressing the STOP button.
6. To stop the motor while pressure is low, open the power supply switches.

### **START FROM PUSHBUTTON**

1. Low water pressure starts the motor automatically, but the motor may be started manually at any water pressure by pressing the "START" pushbutton on the controller cabinet or the remote "START" pushbutton, if used. A green light must be ON in the Display Unit indicating that power is available before the motor can be started. (If light is not ON, follow initial start-up instructions).
2. Following a pushbutton start, the motor will continue to run until stopped by the pushbutton on the controller. The Running Period Timer nor the pressure switch will stop the motor.
- 3.

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## **START FROM MANUAL EMERGENCY START HANDLE**

1. For Manual Emergency operation, if motor does not start with the START button, raise the manual emergency Start handle quickly all the way and latch it in the raised position.
2. To stop when the handle is latched in raised position
  - a. Open the power supply switches
  - b. Unlatch the manual emergency handle
  - c. Close the power supply switches.

## **POWER SUPPLY TRANSFER FROM TEST SWITCH**

- 1) Close Alternate power supply switch
- 2) Place manual test selector in Alternate position and hold, allowing time for engine to start. Transfer switch goes to Alternate supply. Selector switch will spring return to "Auto" position when released. Yellow light indicates transfer switch is on Alternate supply. The alarm sounds indicating it is in Alternate mode. If the Normal circuit breaker is closed the transfer switch will return to Normal automatically in 30 minutes.

## **NORMAL POWER SUPPLY FAILURE AUTOMATIC TRANSFER**

- 1) Close Alternate power supply switch.
- 2) Open Normal power supply switch.
- 3) After slight delay, control provides signal to start the engine
- 4) Automatic transfer to Alternate supply occurs when Alternate supply reaches required voltage and frequency. Yellow light indicates transfer to Alternate supply.
- 5) Alarm may be silenced by pressing Silence alarm button.
- 6) Pump will start on Alternate supply same as with Normal supply.
- 7) To STOP the motor while pressure is low or manual emergency start handle is latched in raised position, open Alternate power supply switch.

## **RE-TRANSFER TO NORMAL FROM ALTERNATE**

- 1) Close Normal power supply switch
- 2) Re-transfer to Normal will occur automatically after 30 minutes' time delay. Time delay may be bypassed by placing test selector switch momentarily (approximately 3 seconds) in Normal position or by opening alternate supply switch.

## **OPERATING SEQUENCE FOR DEVICES**

1. Under normal operating conditions
  - a. Both Normal & Alternate Power Supply Switch (Disconnecting Means) are closed.
  - b. Green light in Display Unit is ON indicating 3Ph Power Available & Voltage(s) OK.
  - c. Red light in Display Unit is OFF indicating that phase sequence is OK.
  - d. Recording Pressure Switch will have been programmed for water pressure settings, as have Running Period Timer function (if used) and Sequential Timer function (if used). (see Operating Instructions supplied with the controller).
  - e. The Power Monitor clock will have been programmed for the local time (see Operating Instructions supplied with the controller).
  - f. Relay CR1 is de-energized unless manual Pump Run was initiated by depression of the local or remote Start button. (CR1 energizes to start/run the pump)
  - g. Relay CR2 is energized (drops out to start/run the pump).
  - h. Relay CR3 will de-energize only when a phase failure is detected.
  - i. Relay CR4 will energize only when Phases Reversed condition is detected.
  - j. If the voltage drops below minimum voltage and then returns to above minimum (This can happen during motor starting) the green Power Available light in the Display Unit will blink for 5 seconds. This indicates that the power supply is marginal and may cause the fire pump not to start.
2. Relay CR1 is energized to start the motor when the "START" pushbutton is pressed or manual emergency handle is raised.
3. Relay CR2 is de-energized to start the motor when:

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- a. Pressure switch (PS) contact open due to low water pressure,
  - b. Remote "Automatic Start" contact opens to start the motor (if used).
4. Running Period Timer RPT (when used) starts timing on Automatic Start when CR2 drops out. Pressure switch operation will not stop the motor until (RPT) reaches its timed-out interval of 10 minutes minimum. The red RPT light in the recorder unit shows that the timer is timing or timed out but not reset. Timer resets when the motor stops.
  5. Sequence Timing function (when used) delays starting (5 seconds) so that on a two pump installation both pumps do not start at once.

### **CIRCUIT BREAKER OPERATION**

1. The circuit breaker with a shunt trip and the locked rotor protection units are factory set and not field adjustable. The LRP provides a trip-time delay of not over 20 seconds. It is factory set to trip at 300(+) % of the motor full load current.
2. The circuit breakers instantaneous trip is factory set to operate at not more than 20 times motor full load current.

### **TRANSFER SWITCH OPERATION**

- 1) Normal supply voltage sensing is set to pick up at 95% and drop out at 90% of rated motor voltage
- 2) Alternate supply sensing, set to pick up at 95% rated motor voltage and 95% of rated frequency.
- 3) There is a 3 second time to over-ride momentary Normal source outages and delays all transfer switch and engine start signals.
- 4) There is a 30 minute time delay on re-transfer to Normal supply from Alternate. This time delay is automatically by-passed if the Alternate supply fails and Normal supply is available.
- 5) There is a 5 minute unloaded running time delay for diesel engine cool-down

## **OPERATING INFORMATION ELECTRIC FIRE PUMP CONTROLLER WITH TRANSFER SWITCH FOR 2 UTILITY POWER SOURCES**

### **TRYOUT FOR CHECKING DIRECTION OF MOTOR ROTATION**

1. Both Normal & Alternate Power Supply Switches (Disconnecting Means) should be open.
2. Push "STOP" button while closing the Normal power supply switch. Release STOP button.
3. Pump will start if water pressure is lower than the setting of the pressure switch.
4. If pump starts, open Normal power supply switch to "STOP". (Check motor rotation).
5. If pump does not start, press "START" button and stop by opening the Normal power supply switch. (Check motor rotation).
6. Check rotation from the Alternate power supply by opening the Normal power supply switch and closing the Alternate power supply switch.
7. While doing the above, you will note the green light in the Display Unit indicates "Power Available & Voltage O.K.", and the red light is off indicating that phases are in the correct sequence. Also, note the white light which indicates transfer switch on Normal Power supply and Yellow light to indicate transfer switch is on Alternate power supply.

NOTE: This controller is phase sequence sensitive. Correct phase sequence is indicated when the Phases Reversed light in the Display Panel is "OFF". To correct, interchange any two incoming power leads. To change motor rotation, interchange any two motor leads at the controller or at the motor. Also, the Automatic Transfer Switch is shipped for operation from the Normal power supply. If in Alternate power supply position, it will automatically transfer to Normal in step 2 above prior to pump starting.

### **INITIAL START-UP**

- 1) Normal and Alternate Power supply switches should be open.
- 2) Check pressure switch setting for START (low setting) and STOP (High setting). For programming P.S. "settings" refer to Operating Instructions provided with the controller.
- 3) Push the "STOP" button while closing the Normal power supply switch. Green light indicates "Power Available". Pump starts if pressure is low.

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- 4) Pump continues to run for a period of 10 minutes (the minimum “setting” on the Running Period Timer – RPT), and longer if pressure is still low. The motor will then stop automatically. Motor may be stopped during the running period by pressing the “STOP” button, but will re-start when the button is released if pressure is still low. For programming RPT “setting” refer to Operating Instructions provided with the controller.
- 5) For “Manual Stop” (RPT function is omitted) the pump will run until “stopped” by pressing the STOP button.
- 6) To stop the motor while pressure is low, open the power supply switches.

### **START FROM PUSHBUTTON**

- 1) Low water pressure starts the motor automatically, but the motor may be started manually at any water pressure by pressing the “START” pushbutton on the controller cabinet or the remote “START” pushbutton, if used. A green light must be ON in the Display Unit indicating that power is available before the motor can be started. (If light is not ON, follow initial start-up instructions).
- 2) Following a pushbutton start, the motor will continue to run until stopped by the pushbutton on the controller. The Running Period Timer nor the pressure switch will stop the motor.

### **START FROM MANUAL EMERGENCY START HANDLE**

- 1) For Manual Emergency operation, if motor does not start with the START button, raise the manual emergency Start handle quickly all the way and latch it in the raised position.
- 2) To stop when the handle is latched in raised position
  - a. Open the power supply switches
  - b. Unlatch the manual emergency handle
  - c. Close the power supply switches.

### **POWER SUPPLY TRANSFER FROM TEST SWITCH**

- 1) Close Alternate power supply switch
- 2) Place manual test selector in Alternate position and hold, allowing time for engine to start. Transfer switch goes to Alternate supply. Selector switch will spring return to “Auto” position when released. Yellow light indicates transfer switch is on Alternate supply. The alarm sounds indicating it is in Alternate mode. If the Normal circuit breaker is closed the transfer switch will return to Normal automatically in 30 minutes.

### **NORMAL POWER SUPPLY FAILURE AUTOMATIC TRANSFER**

- 1) Close Alternate power supply switch.
- 2) Open Normal power supply switch.
- 3) After slight delay, Automatic transfer to Alternate supply occurs when Alternate supply reaches required voltage and frequency. Yellow light indicates transfer to Alternate supply.
- 4) Alarm may be silenced by pressing Silence alarm button.
- 5) Pump will start on Alternate supply same as with Normal supply.
- 6) To STOP the motor while pressure is low or manual emergency start handle is latched in raised position, open Alternate power supply switch.

### **RE-TRANSFER TO NORMAL FROM ALTERNATE**

- 1) Close Normal power supply switch
- 2) Re-transfer to Normal will occur automatically after 30 minutes’ time delay. Time delay may be bi-passed by placing test selector switch momentarily (approximately 3 seconds) in Normal position or by opening alternate supply switch.

### **OPERATING SEQUENCE FOR DEVICES**

- 1) Under normal operating conditions
  - A) Both Normal & Alternate Power Supply Switch (Disconnecting Means) are closed.
  - B) Green light in Display Unit is ON indicating 3Ph Power Available & Voltage(s) OK.
  - C) Red light in Display Unit is OFF indicating that phase sequence is OK.

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- D) Recording Pressure Switch will have been programmed for water pressure settings, as have Running Period Timer function (if used) and Sequential Timer function (if used). (see Operating Instructions supplied with the controller).
  - E) The Power Monitor clock will have been programmed for the local time (see Operating Instructions supplied with the controller).
  - F) Relay CR1 is de-energized unless manual Pump Run was initiated by depression of the local or remote Start button. (CR1 energizes to start/run the pump)
  - G) Relay CR2 is energized (drops out to start/run the pump).
  - H) Relay CR3 will de-energize only when a phase failure is detected.
  - I) Relay CR4 will energize only when Phases Reversed condition is detected.
  - J) If the voltage drops below minimum voltage and then returns to above minimum (This can happen during motor starting) the green Power Available light in the Display Unit will blink for 5 seconds. This indicates that the power supply is marginal and may cause the fire pump not to start.
- 2) Relay CR1 is energized to start the motor when the "START" pushbutton is pressed or manual emergency handle is raised.
  - 3) Relay CR2 is de-energized to start the motor when:
    - 4) Pressure switch (PS) contact open due to low water pressure,
    - 5) Remote "Automatic Start" contact opens to start the motor (if used).
  - 6) Running Period Timer RPT (when used) starts timing on Automatic Start when CR2 drops out. Pressure switch operation will not stop the motor until (RPT) reaches its timed-out interval of 10 minutes minimum. The red RPT light in the recorder unit shows that the timer is timing or timed out but not reset. Timer resets when the motor stops.
  - 7) Sequence Timing function (when used) delays starting (5 seconds) so that on a two pump installation both pumps do not start at once.

### **CIRCUIT BREAKER OPERATION**

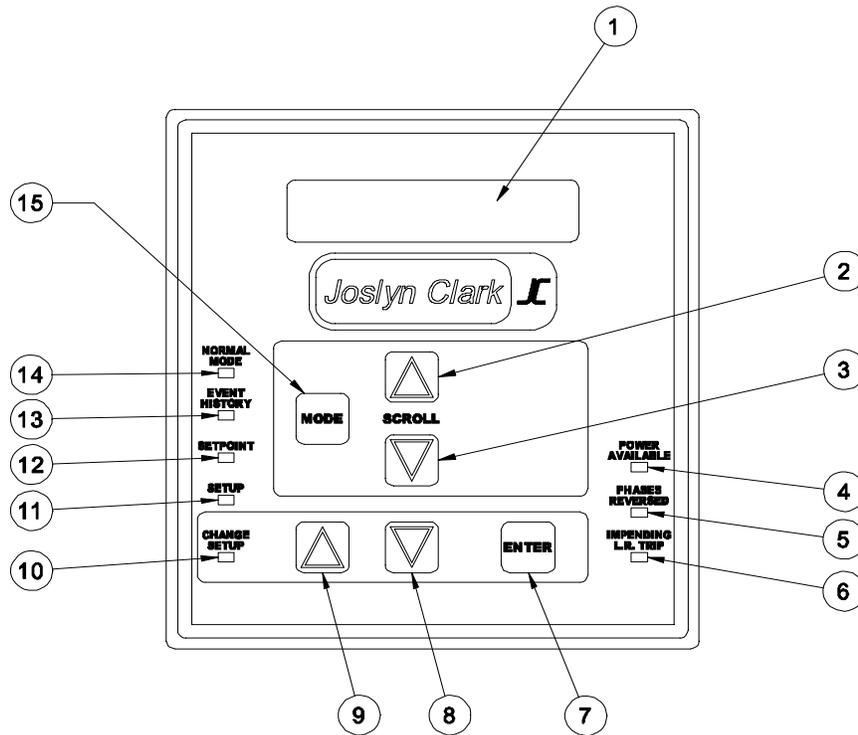
- 1) The circuit breaker with a shunt trip and the locked rotor protection units are factory set and not field adjustable. The LRP provides a trip-time delay of not over 20 seconds. It is factory set to trip at 300(+)%of the motor full load current.
- 2) The circuit breakers instantaneous trip is factory set to operate at not more than 20 times motor full load current.

### **TRANSFER SWITCH OPERATION**

- 1) Normal supply voltage sensing is set to pick up at 95% and drop out at 90% of rated motor voltage
- 2) Alternate supply sensing, set to pick up at 95% rated motor voltage and 95% of rated frequency.
- 3) There is a 3 second time to over-ride momentary Normal source outages and delays all transfer switch and engine start signals.
- 4) There is a 30 minute time delay on re-transfer to Normal supply from Alternate. This time delay is automatically by-passed if the Alternate supply fails and Normal supply is available.

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## Operator Interface



- 1 Display Area – Normal display will show the three phase current and voltage. Will also show any alarm conditions, event history, and settings.
- 2 Scroll Up Key – Scrolls forward through the menus.
- 3 Scroll Down Key – Scrolls reverse through the menus.
- 4 Power Available Indicator – Green indicator lights when incoming power is at an acceptable level on all three phases.
- 5 Phases Reversed Indicator – Red indicator lights when incoming power is not in proper rotation.
- 6 Impending L.R. Trip – Red indicator will flash when the motor current equals or exceeds locked rotor levels.
- 7 Enter Key – Use to accept new programmable parameter (time, date, etc.).
- 8 Down Arrow Key – Lower programmable parameters.
- 9 Up Arrow Key – Raises programmable parameters.
- 10 Change Setup Indicator – Red indicator lights when the unit is in the program mode.
- 11 Setup Indicator – Red indicator lights when in the setup view mode. Use the scroll keys to view the settings (time, date).
- 12 Setpoint Indicator – Red indicator lights when in the setpoint view mode. Use the scroll keys to view the operating paramagnets (current trip point, voltage setting, etc.).
- 13 Event History Indicator – Red indicator lights when in the event history mode. Use the scroll keys to view the events.
- 14 Normal Mode Indicator – Red indicator lights when in the normal operating mode.

## Operator Interface Operating Instructions

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## Normal Mode Operation

With the system operating in the normal mode, the Normal Mode Indicator (item 14) and the Power Available Indicator (item 4) will be lit. The display will be indicating the current and voltages of all three phases.

Motor Current			
Phase	Phase	Phase	
A	B	C	
I=	0.00	0.00	0.00
V=	460	460	460

Supply Voltage

Phases	Phases	Phases	
A-B	B-C	C-A	
<i>Typical Display</i>			

Other information capable of being displayed in the Normal Mode using the Scroll Up (item 2) or the Scroll Down (item 3) key is:

- Three phase motor current only with average current
- Three phase voltage only with average voltage
- Current and Voltage imbalance
- Number of motor starts
- Number of circuit breaker trips
- Any pending faults

## Event History Mode

In the Event History Mode, the user may view the last seventy events. Each event is sequentially numbered and date stamped. Enter the Event History by pressing the Mode Key (item 15) until the Event History (item 13) indicator lights. The display will read as shown below.

NO FAULTS DETECTED
-----------------------

*Event History Mode Start Display*

Using the Down Arrow (item 8) or Up Arrow (item 9), the display will scroll through the most recent event recorded (event 1) and the time of the last pump start. Use the Scroll Down (item 3) key to view the event history items in an ascending sequence (event 2, 3, 4...) or the Scroll Up (item 2) key to view the history items in a descending sequence (event 70, 69, 68...). Use the Up Arrow (item 9) key to return to the start display.

EVENT 2: AUTO START 01/02/02 03:45 P
---

*Typical Event Display*

## Setpoint Mode

In the Setpoint Mode, the operating parameters of the system can be viewed. Press the Mode Key (item 15) until the Setpoint (item 12) indicator lights and the display reads as shown.

CURRENT LIMIT (AMPS) 200.0
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## Setpoint Mode Display

The parameters include

- Current Limit – the ampere level where the locked rotor protection system starts to operate.
- Current Multiplier – shall equal the input ratio of the current transformers. If no current transformers are used, the value will be 1.
- Nominal Voltage – set to the motor voltage.
- Voltage Multiplier – shall equal the ratio of the input potential transformers on medium voltage controller. On low voltage controllers, the value will be 1.

## Operating Instructions

In the normal operating mode, the Normal Mode indicator (item 14) will be lit. If all three phases of the supply voltage are acceptable, the Power Available Indicator (item 4) will be lit. The display will show the motor current and supply voltage similar to the illustration below.

Motor Current  
Phase    Phase    Phase  
A        B        C

I=	0.00	0.00	0.00
V=	460	460	460

Supply Voltage  
Phases    Phases    Phases  
A-B        B-C        C-A

### Typical Display

The above display is expandable for further information on motor current and supply voltage and to view any faults in the supply system. To view the expanded displays:

1. Press the Scroll Down Key (item 3). The expanded motor current display will appear. It shows the three phase motor current plus the average current.

I1=0.00	I2=0.00
I3=0.00	IAVG=0.00

2. Press the Scroll Down Key (item 3) again. The expanded supply voltage display will appear. It shows the three phase supply current plus the average voltage.

U12=458	U23=460
U31=462	UAV=460

3. Press the Scroll Down Key (item 3) again. The current and voltage unbalance screen will appear.

CURR. UNBALANCE=	0%
VOLT UNBALANCE=	0%

4. Press the Scroll Down Key (item 3) again. The screen that appears tracks the number of times the fire pump motor started and the number of times the locked rotor protector operated (tripped) since a clear history request.

NO. STARTS=	17
NO. TRIPS =	0

5. Press the Scroll Down Key (item 3) again. The fault menu will appear along with any faults present at the time.

PENDING FAULT
NONE

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Fault messages that can appear are:

- LV Low Voltage on one or more phases
- OC Motor Over Current, impending trip
- PR Phases Reversed
- VUB Voltage Un-Balance greater than 18%

6. Press the Scroll Down Key (item 3) once more to return to the normal operating mode display.

## Testing the System

The Operator Interface Panel can be used to test the power monitor system and the fire pump controller for Phase Loss, Phases Reverse and Locked Rotor Test. To test these functions:

1. Push and hold the Down Arrow (item 8) and Up Arrows (item 9) Keys. The display will show the following:

```
PRESS: MODE=Lock Rtr  
UP=Rev Ph DOWN=Phase
```

2. To test the Lock Rotor function, press the Mode Key (item 15) while holding the Down Arrow (item 8) and the Up Arrow (item 9) Keys. The Impending Locked Rotor Indicator (item 6) will start flashing and the display will show:

```
Initiating Locked  
Rotor Test Sequence
```

3. After 12 seconds, the system will energize the shunt trip mechanism in the fire pump circuit breaker causing the circuit breaker to trip, shutting off the fire pump controller.
4. Pull the Circuit Breaker (Disconnecting Means) handle on the fire pump controller to the full down position to reset the circuit breaker.
5. Press and hold the Stop pushbutton on the fire pump controller, move the Circuit Breaker (Disconnecting Means) handle to the full up position to restore power to the fire pump controller.
6. Release the Stop pushbutton.
7. To test the Phases Reversed function, press and hold the Down Arrow (item 8) and the Up Arrow (item 9) Keys to get the test menu, then press the Scroll Up Key (item 2). The Phases Reversed Indicator (item 5) will light and the display will show:

```
Initiating Reverse  
Phase Test sequence
```

8. Any remote alarm systems connected to the fire pump controller should indicate a phases reversed condition.
9. Release the keys, the display will return to the normal.
10. To test the Phase Failure Function, press and hold the Down Arrow (item 8) and the Up Arrow (item 9) Keys to get the test menu, then press the Scroll Down Key (item 3). The Power Available Indicator (item 4) will extinguish and the display will show:

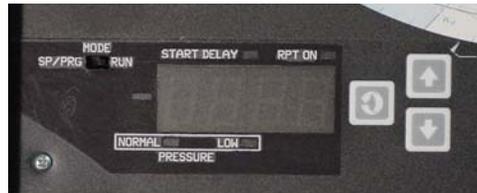
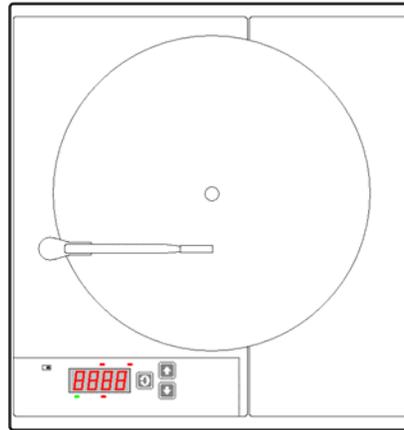
```
Initiating Phase  
Fault Test sequence
```

11. Any remote alarm systems connected to the fire pump controller should indicate a phase or power failure condition.
12. Release the keys, the display will return to the normal.

# Instruction Bulletin

## Pressure Control Display & Logging Operating Instructions

### Recording Pressure Switch (RPS)



#### Initial Set Up

1. Complete piping installation to pressure transducer.
2. Open the cover to gain access to the Recording Pressure Gauge.

#### Recording Pressure Switch (RPS) Power Up

1. Remove the security cover from the **MODE** selector switch at the lower left of the recording pressure gauge; verify the switch is in the **RUN** position.
2. Turn on the fire pump controller power. Close the disconnecting means of the fire pump controller.
3. The recorder power up sequence is as follows:

Sequence	Approx. Time (seconds)	Description	Display	Pen Movement
1	0	system test starts	<blank>	none
2	3	firmware revision level	PX.XX	starts to home (0) position
3	6 ½	display blanks	<blank>	at home position
4	7	system test complete	current system pressure	starts to current system pressure

#### Chart Change Mode

1. Depress the Scroll Key  once. The display should indicate **CC**.

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- 2 Depress the Down Arrow Key . The display should be flashing **CC** and the chart pen will start to move away from the chart hub.
- 3 Pull open the chart lock on the chart hub.
- 4 Place a chart onto the chart hub and seat the chart under the three chart guides.
- 5 Push to close the chart lock on the hub.
- 6 Press the Down Arrow Key , the display and chart pen should show the current system pressure.

### Set Point Adjustments

Note: the minimal differential setting between the set points is 1 pressure unit. The recording pressure switch will automatically maintain this differential if an attempt to overlap the set points is made.

- 1 Remove the anti-tamper cover from the **MODE** switch.
- 2 Place the **MODE** switch in the **PROG/CAL TEST** position. The display will show **SP** (for **Set Point**).
- 3 Press the Down Arrow Key  once; the display will show **CIn** (for **Cut in** or start pressure setting).
- 4 Press the Scroll Key  once; the display will show the current start pressure set point.
- 5 Use the Up Arrow Key  or the Down Arrow Key  to adjust the start pressure set point. Pushing the keys once will change the setting one pressure unit. To change a setting rapidly, push and hold the appropriate key, the setting will start changing slowly at first; the speed will increase the longer the key is held.
- 6 Once the **Cut in** is set, press the Scroll Key  once to accept the new setting. The display will now show **COut** (for **Cut Out** or stop pressure setting).
- 7 Press the Scroll Key  once; the display will show the current stop pressure set point.
- 8 Use the Up Arrow Key  or the Down Arrow Key  to adjust the stop pressure set point. Pushing the keys once will change the setting one pressure unit. To change a setting rapidly, push and hold the appropriate key, the setting will start changing slowly at first, the speed will increase the longer the key is held.
- 9 When the **Cut Out** is set, press the Scroll Key  once to accept the new setting. The display will show the **CIn** indication again.
- 10 Place the **MODE** switch back into the **RUN** position. The display will indicate the current system pressure. Install the anti-tamper cover.
- 11 To verify the current **CIn** and **COut** settings, momentarily press the Down Arrow Key . The display will first show **CIn** followed by the present setting, then **COut** followed by the present setting and return back to the system pressure display.

### Programming Mode –

This procedure is used to set the operating parameters of the recording pressure switch. The settings shown in the following chart are the standard factory settings and in some cases will be modified to suit the customer's requirements.

- 1 Remove the anti-tamper cover from the **MODE** switch.
- 2 Place the **MODE** switch in the **PROG/CAL TEST** position. The display will show **SP** (for **Set Point**).
- 3 Press and hold the Scroll Key  until the display shows **Prog** (for **Program** mode).
- 4 Press the Down Arrow Key  to enter the programming mode; the display will show **InP1** (for **InPut 1**). The following chart describes the programmable parameters and their default settings.  
Use the Scroll Key  to move to the next menu item, use the Up Arrow Key  or the Down

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Arrow Key  to change the setting. The new setting will automatically be saved when the

Scroll Key  is pressed to move to the next menu item.

- 5 After the programming is complete, place the **MODE** switch into the **RUN** position, install the anti-tamper cover.

Parameter Code	Description	Setting or Range	Default Setting	Factory Setting
<b>InP1</b> InPut #1	Pressure transducer input range	0 = 0-5 volt device 1 = 1-5 volt device	1	1
<b>Icor</b> Input Correction	Calibrates the input signal (if needed)	-999 to +999	0	As required
<b>EUU</b> Engineered Units Upper	Sets the maximum displayed value to that of the pressure transducer	0 to +9999	300	300 (psi) or as needed by customer requirements
<b>EUL</b> Engineered Units Lower	Sets the minimum displayed value to that of the pressure transducer	0 to +9999	0	0
<b>ChUP</b> Chart UPper Limit	Sets the upper range of the chart, usually the same as the EUU value	-9999 to +9999	300	300 (psi) or as needed by customer requirements
<b>ChLO</b> Chart LOwer Limit	Sets the lower range of the chart, usually the same as the EUL value	-9999 to +9999	0	0
<b>InP2</b> InPut #2	Manual Stop switch input	0 = 0-5 volt device 1 = 1-5 volt device	0	0
<b>ChSP</b> Chart SPeed	Sets the chart speed, match with type of chart used	OFF = no rotation 8Hr = 8 hour 12Hr = 12 Hour 24Hr = 24 Hour 48Hr = 48 Hour 7dAy = 7 Days	7dAy	7dAy
<b>rPt</b> running Period timer	Enables the timer function and selects the time range	OFF = Manual Stop 10 = 10 Minutes 15 = 15 Minutes 20 = 20 Minutes 30 = 30 Minutes	Off	10 Minutes
<b>SSt</b> Sequential Start Timer	Selects start delay time period	0 to 30 Seconds	0	0 or as needed by customer requirements
<b>Stt</b> System test timer	Selects the number of days between automatic system tests	0 to 30 days	0	0

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## Test Mode –

The test mode checks and confirms the functionality of the recording pressure switch.

- 1 Remove the anti-tamper cover from the **MODE** switch.
- 2 Place the **MODE** switch in the **PROG/CAL TEST** position. The display will show **SP** (for **Set Point**).
- 3 Press and hold the Scroll Key  until the display shows **Prog** (for **Program mode**).
- 4 Press the Scroll Key  once more, the display will read **tEst**.
- 5 Press the Down Arrow Key  to start the test. The following sequence shall occur:
  - a. All segments in the display area and all status LED's will illuminate for 5 seconds.
  - b. The display area and all status LED's will turn off for 5 seconds.
  - c. The display will show **SCrL**, press the Scroll Key .
  - d. The display will show **UAro**, press the Up Arrow Key .
  - e. The display will show **dAro**, press the Down Arrow Key .
  - f. The display will show **diSP**, the display and keypad test function is complete.
- 6 Press the Scroll Key , the display will read **Chrt** for the **Chart** test.
- 7 Press the Down Arrow Key  to start the test. The following sequence shall occur:
  - a. The chart will start rotating at about  $\frac{3}{4}$  revolutions per minute. The pen will start swinging towards the full scale of the chart. When the pen reaches the full scale position, it will reverse and start swinging towards the center of the chart. When the pen reaches the minimum scale of the chart, it will again reverse direction. The sequence will continue until the test is ended.
  - b. Press any key to terminate the chart test, the display will show **Chrt**.
  - c. Press the Up Arrow Key , the display will show **tEst**.
- 8 Place the **MODE** switch in the **RUN** position.
- 9 Install the anti-tamper cover.

## Sequence of Operation

- 1 Upon the system pressure dropping below the start setting, the red **PRESSURE LOW** indicator will light.
- 2 If the sequential start timer is set greater than zero seconds, the time cycle will start at this time, the red **START DELAY** indicator will light. If during this time delay the pressure restores above the stop setting, the recording pressure gauge will reset to the standby mode, and the green **PRESSURE NORMAL** indicator will light.
- 3 After the sequential start time delay, if set, or when the pressure drops to below the start setting if the timer is not set, the output relay of the recording pressure switch will change states. When the relay operates, it's control contact opens, which causes the fire pump controller to start the fire pump motor. The red **RPT ON** indicator will light if the running period timer is set, the time ranges available are 10, 15, 20 and 30 minutes. If the timer is set to off, the red indicator will not light.
- 4 The recording pressure switch will keep the fire pump operating until the system pressure rises above the stop setting and the running period time elapses. The red **RPT ON** indicator will turn off at the end of the time period. When the pressure is above the stop setting, the green **PRESSURE NORMAL** indicator will illuminate.
- 5 If the running period timer is set to off, the pump motor will continue to operate until the system pressure is above the stop setting as indicated by the green **PRESSURE NORMAL** indicator and the STOP pushbutton is depressed. If the STOP pushbutton is depressed before the system pressure increases to above the stop setting, the fire pump will continue to operate.

# Joslyn Clark Electric Fire Pump Controllers

## Type D10600 Renewal Parts

Used On	Description	Part Number
PMR	Fire Pump Power Monitor, 20-90 Amp, 200-480 Volt	A10-460313-1
PMR	Fire Pump Power Monitor, 90-180 Amp, 200-480 Volt	A10-460313-2
PMR	Fire Pump Power Monitor, 2-9 Amp, 200-480 Volt	A10-460313-3
PMR	Fire Pump Power Monitor, 20-90 Amp, 575 Volt	A10-460313-4
PMR	Fire Pump Power Monitor, 90-180 Amp, 575 Volt	A10-460313-5
PMR	Fire Pump Power Monitor, 2-9 Amp, 575 Volt	A10-460313-6
	Fire Pump Power Monitor, 2-9 Amp, 120-240 Volt	A10-460313-7
PMR	Communication Module	A10-460314
Display	User Interface Panel	A10-460315
RPS	Recording Pressure Gauge (Standard)	A10-460316-1
RPS	Recording Pressure Gauge W/Test Relay	A10-460316-2
RPS	Recording Pressure Gauge W/Watchdog Alarm Relay	A10-460316-3
RPS	Recording Pressure Gauge W/Test & Watchdog Alarm Relay	A10-460316-4
RPS	Recorder Chart 300 PSI	213884
RPS	Recorder Chart 600 PSI	213818
RPS	5 Pack Pens	60500402
	Pressure Transducer, 300 PSI, 1-5 VDC Output	A10-461070-1
	Pressure Transducer, 600 PSI, 1-5 VDC Output	A10-461070-2
TR2	100 VA Control Transformer 200 Volt Pri/120 Volt Sec.	TR67-96
TR2	100 VA Control Transformer 230/460 Volt Pri/120 Volt Sec	TR67-97
TR2	100 VA Control Transformer 575 Volt Pri/120 Volt Sec.	TR67-98
TR1	50 VA Control Transformer 200 Volt Pri/120 Volt Sec.	TR97-93
TR1	50 VA Control Transformer 230/460 Volt Pri/120 Volt Sec	TR67-94
TR1	50 VA Control Transformer 575 Volt Pri/120 Volt Sec.	TR67-95
CR1,CR2	RELAYS	A22-457280-3
CR1,CR2,	Relay Socket	A22-457281
AT	Accelerating Timer (Reduced Voltage Type Only)	A22-458328-5
1PB	Start Push Button + N5B10VN	N5CPNVG
2PB	Stop Push Button + N5B01VN & N5B11VN	N5CPNRG
F1	Mod. K Fuses FNM 1 amp	A22-421644-9
LS	Emergency Run Limit Switch	A10-308267
M,1M,2M	CONTACTORS WITHOUT AUXILARY CONTACTS	
	Add VOLTAGE SUFFIXES (-1=208V, -2=240V, -3=380V, -4=480V, -5=575)	
	SIZE 2	A77-358452A-
	SIZE 3	A77-358453A-
	SIZE 4	A77-358454A-
	SIZE 5	A77-357400A-
	SIZE 6	A77-302335A-

M,1M,2M COILS

SIZE 2 200V-208V	TB159-10
SIZE 2 220V-240V	TB159-2
SIZE 2 380V, 50Hz	TB159-11
SIZE 2 380V, 60Hz	TB159-6
SIZE 2 415V, 50Hz	TB159-3
SIZE 2 460V-480V	TB159-3
SIZE 2 575	TB159-4
SIZE 3 200V-208V	TB162-14
SIZE 3 220V-240V	TB162-8
SIZE 3 380V, 50Hz	TB162-15
SIZE 3 380V, 60Hz	TB162-15
SIZE 3 415V, 50Hz	TB162-9
SIZE 3 460V-480V	TB162-9
SIZE 3 575	TB162-10
SIZE 4 200V-208V	TB162-16
SIZE 4 220V-240V	TB162-2
SIZE 4 380V, 50Hz	TB162-17
SIZE 4 380V, 60Hz	TB162-17
SIZE 4 415V, 50Hz	TB162-3
SIZE 4 460V-480V	TB162-3
SIZE 4 575	TB162-4
SIZE 5 200V-208V	L7
SIZE 5 220V-240V	L2
SIZE 5 380V, 50Hz	L12
SIZE 5 380V, 60Hz	L13
SIZE 5 415V, 50Hz	L3
SIZE 5 460V-480V	L3
SIZE 5 575	L4
SIZE 6 200V-208V	TB163-5
SIZE 6 220V-240V	TB163-2
SIZE 6 380V, 50Hz	TB163-6
SIZE 6 380V, 60Hz	TB163-6
SIZE 6 415V, 50Hz	TB163-3
SIZE 6 460V-480V	TB163-3
SIZE 6 575	TB163-4

M,1M,2M AUXILIARY CONTACTS FOR MAIN CONTACTORS

SIZE 2,3, & 4 TM N.O. Aux	KTM10
SIZE 2,3, & 4 TM N.C. Aux	KTM11
SIZE 5 N.O.Aux	5M-063
SIZE 5 N.C.Aux	5M-064
SIZE 5 N.O. & N.C.Aux	5M-065
SIZE 6 N.O. Aux	KTM35-10
SIZE 6 N.C. Aux	KTM35-11
Surge Arrestor 208V	A19-453641-1
Surge Arrestor 220V-415VV	A19-453641-2
Surge Arrestor 460V & UP	A19-453641-3