Instruction Bulletin

G-Series

Fire Pump Controller *For* Electric Driven Fire Pumps

(Produced after Dec 20, 2010)

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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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, normally open, remote "Start" push button can be added, wire to terminals 5-6.

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 1-2, remove jumper 1-2. Switch contacts are closed when valve is closed.

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 18-19 for contact "close" to alarm or terminals 19-20 for contact "open" to alarm.

- Connect "Pump Running" alarm to terminals 25-26 for contact "close" to alarm or terminals 24-25 for contact "open" to alarm.

- Connect "Reverse Phase" alarm to terminals 13-14 for contacts "Close" to alarm or terminals 12-13 for contact "open" 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 by hand to assure free motion. Operate the "E-Stop" push button 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 on the left side wall of wall-mounted and 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".

ADJUSTMENTS

1. Field setting of the Circuit Breaker is not needed. The Joslyn Clark Locked Rotor Protector is factory set at 400% 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, please refer to the Installation Programming Section of this manual.

3. The Running Period Timer is disabled. To enable and set run time, please refer to the Installation Programming Section of this manual.

4. On Reduced Voltage Controllers Accelerating Timer 1AT is factory set.

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 Start Delay Timer 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.

To enable and set delay time, please refer to the Installation Programming Section of this manual.

OPERATING INFORMATION
G-SERIES 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 “E-STOP” button while closing power supply switch. Release “E-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, Press the “Esc” key on the Display Unit Until “Main Menu” appears in top line. Press ↵ to change Display to “Main Menu – Installation Setup”. Press “Enter” to select and then ↵ to display “Phase Sequence”. Press “Enter” again to change from A-B-C to A-C-B. (Note: This does not change motor Rotation, only Alarm Trigger. 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) Push and Hold the "E-STOP" button while closing the power supply switch. Green light indicates "Power Available". The Pressure Settings and Line Pressure are displayed.
3) Check pressure settings for START (I: XXX) and STOP (O:XXX). For programming P.S. "settings" refer to Operating Instructions provided with the controller.
4) Release the "E-Stop" button. The pump starts if pressure is low and continues until the "Stop" button is pressed. The motor will then stop, but will re-start when the button is released if pressure is still low. The controller is shipped set for "Manual Stop".
5) For "Automatic Stop" (RPT function must be enabled) the pump starts and 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.
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 display unit 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 display unit. 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) Display Unit 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 energized unless Pump Run was initiated by a starting condition. (CR1 De-energizes to start/run the pump)
   G) Relay CR2 is de-energized (picks up or drops out to start/run the pump based on type of reduced voltage starting).
   H) 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) Relays CR1 and CR2 work together to start the motor when a starting condition exists. (For Across-The-Line Starting, CR2 is not used.)

3) Manual Starting Conditions may be one or more of the following:
   A) "START" pushbutton on Display Unit is pressed
   B) Normally Open "Remote Start" Input is Closed
   C) Manual emergency handle is raised.
4) Automatic Starting Conditions may be one or more of the following:
   A) System Pressure drops below "Cut In" setting due to low water pressure
   B) Remote "Deluge Valve" contact opens to start the motor (if used)
   C) Weekly Test Start/Run (Day of week, Start Time, and Duration set by program).
5) Running Period Timer RPT (when enabled) starts timing on Automatic Start when CR1 drops out. The motor will not stop until RPT reaches its timed-out interval of 10 minutes minimum and the pressure is above the Cut Out setpoint. The RPT countdown will be displayed as the timer is timing out. Timer resets when the motor stops.
6) Sequence Timing function (when enabled) delays starting (0 to 30 seconds, adjustable) so that on a two pump installation both pumps do not start at once. The countdown will be displayed as the timer is timing out.
7) Low Suction Pressure Lockout (Requires Optional Suction Transducer) signals alarm when Low Suction Transducer input is below Setpoint. Adjustable Time delay before shutdown (0-30 sec), Adjustable Time delay before Reset (Manual, 0-30 sec.)

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 14 seconds. It is factory set to trip at 400(+)%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
G-SERIES 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 "E-STOP" button while closing the Normal power supply switch. Release "E-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 green light which indicates transfer switch on Normal Power supply and red 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, Press the "Esc" key on the Display Unit "Main Menu" appears in top line. Press ↵ to change Display to "Main Menu – Installation Setup". Press "Enter" to select and then ↵ to display "Phase Sequence". Press "Enter" again to change from A-B-C to A-C-B. (Note: This does not change motor Rotation, only Alarm Trigger. 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. Push and Hold the "E-STOP" button while closing the power supply switch. Green light indicates "Power Available". The Pressure Settings and Line Pressure are displayed.
3. Check pressure settings for START (I: XXX) and STOP (O:XXX). For programming P.S. "settings" refer to Operating Instructions provided with the controller.
4. Release the "E-Stop" button. The pump starts if pressure is low and continues until the "Stop" button is pressed. The motor will then stop, but will re-start when the button is released if pressure is still low. The controller is shipped set for "Manual Stop".
5. For "Automatic Stop" (RPT function must be enabled) the pump starts and 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.
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 display unit 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. Red 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 3 sec. delay, control provides signal to start the engine
4. Automatic transfer to Alternate supply occurs when Alternate supply reaches required voltage and frequency. Red 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 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.
   D) Display Unit 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 energized unless Pump Run was initiated by a starting condition. (CR1 De-energizes to start/run the pump)
   G) Relay CR2 is de-energized (picks up or drops out to start/run the pump based on type of reduced voltage starting).
   H) 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. Relays CR1 and CR2 work together to start the motor when a starting condition exists. (For Across-The-Line Starting, CR2 is not used.)
3. Manual Starting Conditions may be one or more of the following:
   A) "START" pushbutton on Display Unit is pressed,
   B) Normally Open "Remote Start" Input is Closed,
   C) Manual emergency handle is raised.
4. Automatic Starting Conditions may be one or more of the following:
   A) System Pressure drops below "Cut In" setting due to low water pressure
   B) Remote "Deluge Valve" contact opens to start the motor (if used)
   C) Weekly Test Start/Run (Day of week, Start Time, and Duration set by program).
5. Running Period Timer RPT (when used) starts timing on Automatic Start when CR1 drops out. The motor will not stop until RPT reaches its timed-out interval of 10 minutes minimum and the pressure is above the Cut Out setpoint. The RPT countdown will be displayed as the timer is timing out. Timer resets when the motor stops.
6. Sequence Timing function (when used) delays starting (0-30 seconds, adjustable) so that on a two pump installation both pumps do not start at once. The countdown will be displayed as the timer is timing out.
7. Low Suction Pressure Lockout (Requires Optional Suction Transducer) signals alarm when Low Suction Transducer input is below Setpoint. Adjustable Time delay before shutdown (0-30 sec), Adjustable Time delay before Reset (Manual, 0-30 sec.)

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 14 seconds. It is factory set to trip at 400(+)%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
G-SERIES 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 "E-STOP" button while closing the Normal power supply switch. Release "E-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 green light which indicates transfer switch on Normal Power supply and red 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, Press the "Esc" key on the Display Unit "Main Menu" appears in top line. Press ↵ to change Display to "Main Menu – Installation Setup". Press "Enter" to select and then ↵ to display "Phase Sequence". Press "Enter" again to change from A-B-C to A-C-B. (Note: This does not change motor Rotation, only Alarm Trigger. 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. Push and Hold the "E-STOP" button while closing the power supply switch. Green light indicates "Power Available". The Pressure Settings and Line Pressure are displayed.
3. Check pressure settings for START (I: XXX) and STOP (O:XXX). For programming P.S. "settings" refer to Operating Instructions provided with the controller.
4. Release the "E-Stop" button. The pump starts if pressure is low and continues until the "Stop" button is pressed. The motor will then stop, but will re-start when the button is released if pressure is still low. The controller is shipped set for "Manual Stop".
5. For "Automatic Stop" (RPT function must be enabled) the pump starts and 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.
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 display unit 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 until 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. Red 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.
   D) Display Unit 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 energized unless Pump Run was initiated by a starting condition. (CR1 De-energizes to start/run the pump)
   G) Relay CR2 is de-energized (picks up or drops out to start/run the pump based on type of reduced voltage starting).

H) 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. Relays CR1 and CR2 work together to start the motor when a starting condition exists. (For Across-The-Line Starting, CR2 is not used.)
3. Manual Starting Conditions may be one or more of the following:
   D) "START" pushbutton on Display Unit is pressed,
   E) Normally Open "Remote Start" Input is Closed,
   F) Manual emergency handle is raised.
4. Automatic Starting Conditions may be one or more of the following:
   D) System Pressure drops below "Cut In" setting due to low water pressure
   E) Remote "Deluge Valve" contact opens to start the motor (if used)
   F) Weekly Test Start/Run (Day of week, Start Time, and Duration set by program).
5. Running Period Timer RPT (when used) starts timing on Automatic Start when CR1 drops out. Pressure switch operation will not stop the motor until (RPT) reaches its timed-out interval of 10 minutes minimum. The RPT countdown will be displayed as the timer is timing out. Timer resets when the motor stops.
6. Sequence Timing function (when used) delays starting (0-30 seconds, adjustable) so that on a two pump installation both pumps do not start at once.
7. Low Suction Pressure Lockout (Requires Optional Suction Transducer) signals alarm when Low Suction Transducer input is below Setpoint. Adjustable Time delay before shutdown (0-30 sec), Adjustable Time delay before Reset (Manual, 0-30 sec.)

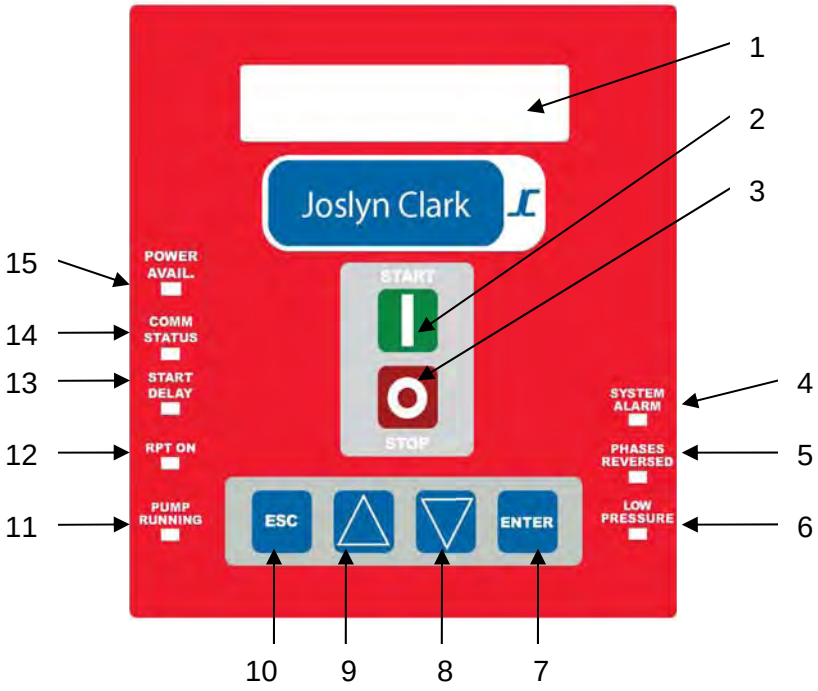
CIRCUIT BREAKER OPERATION

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 14 seconds. It is factory set to trip at 400(+)%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 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.

Operator Interface



1 Display Area – Normal display with pump in standby will show Line Pressure on the top Line with Cut-IN and Cut-Out Pressures Settings shown on the second line. While the pump is running, the two line display shows the three phase currents and voltages. Will also show any alarm conditions, event history, and settings.

2 START Pushbutton – Manual Start button which starts the pump.

3 STOP / RESET – Manual Stop button which stops the pump while running. Also used as RESET for Low Suction Shutdown option.

4 System Alarm Indicator – Red indicator lights when any Alarm or Fault is sensed by the microprocessor. Actual Fault or Alarm is displayed in System Status Area.

5 Phases Reversed Indicator – Red indicator lights when incoming power is not in proper rotation.

6 Low Pressure – Red indicator lights when system pressure is below the Cut-In Setpoint stored in I/O Memory

7 Enter Key – Use to enter new menu path or accept new programmable parameter (time, date, etc.).

8 Down Arrow Key – Step Down in existing Menu or to lower programmable parameters.

9 Up Arrow Key – Step Up in existing Menu or to raise programmable parameters.

10 Escape – Exit present menu path back to Root Path.

11 Pump Running Indicator – Red indicator lights when in the unit senses current flow.

12 Run Period Timer On – Red indicator lights when RPT is enabled and timing

13 Start Delay Timer On – Red indicator lights when unit is called to run and Start Delay is enabled. Display counts down before start.

14 Communication Status Indicator – Green indicator lights when communication between Display, I/O Board, and PMR are working.

15 Power Available Indicator – Red Indicator lights up when all three phases of input voltage are above 85% of rated voltage.

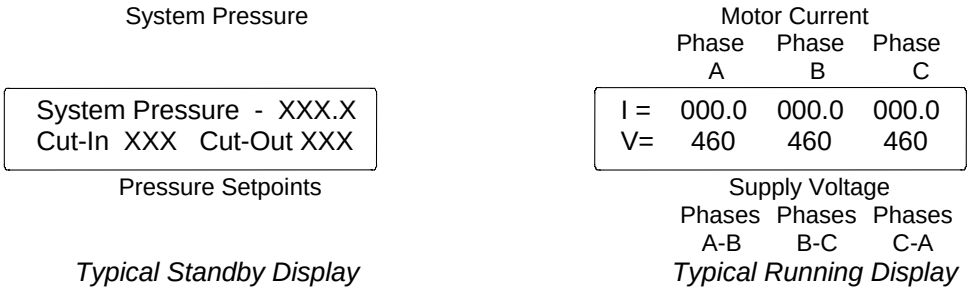
Operator Interface Operating Instructions

Main Menus

- **Real Time Values**
- **System Status**
- **Events**
- **Factory Setpoints**
- **Installation Setup**

Main Menu – Real Time Values

With the system operating in the ready mode, the Power Available Indicator (item 15) and Comm. Status (item 14) will be lit. The display will be indicating the System Pressure, Cut-In and Cut-Out pressure setpoints. While the pump is running, the display changes to show current and voltages of all three phases.



Typical Standby Display *Typical Running Display*

Other information capable of being displayed in the Normal Mode using the Scroll Up (item 9) or the Scroll Down (item 8) 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
- Optional Pump Room Temperature
- Run Hours and Run Time of Last Run

System Status Menu

If the System Alarm LED is ON, this screen will show UNHEALTHY. Using the Enter Key and Down Arrow, the actual Fault or Alarm will be displayed.

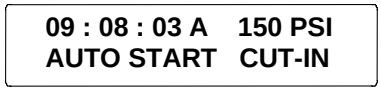
a. Reverse Phase – 3-phase power is reversed.
b. Locked Rotor – The 3-phase current was greater than the locked rotor trip point.
c. Overload – The 3-phase current was greater than the overcurrent set point.
d. Low Voltage – The voltage was 83% below the nominal value.
e. High Voltage – The voltage was greater than 115% of the nominal value.
f. Fail to Start – This occurs when the system attempts to start the fire pump and no current is detected after 10 seconds. Reset by pressing Stop/Reset (item3).

g. Low Frequency – The 3-phase power frequency was lower than the low threshold.
h. High Frequency – The 3-phase power frequency was greater than the high threshold.
i. Voltage Unbalance – The voltage unbalance was greater than 5%
j. No comm. with LRD – Occurs when Modbus communication is lost between the display and the locked rotor detector.
k. Low Temperature – Occurs when the temperature drops below the low room temperature setpoint.
l. Low Suction – Occurs when the suction pressure drops below the low suction trip setting.
m. No comm. with IO board – Occurs when Modbus communication is lost between the display and the I/O board.

Events Menu

In the Events Menu, the user may view the any stored events. Each event is sequentially numbered and date stamped. Enter the Event Menu by pressing the Esc Key (item 10) until the Display shows Main Menu Events.

Using the Enter (item 7), Down Arrow (item 8) or Up Arrow (item 9), the display will ask for a date. The events for that day will then be available by scrolling through the earliest event recorded for that date through the last event for that date. Use the Down (item 8) key to view the event history items in an ascending sequence (event 2, 3, 4…) or the Up (item 9) key to view the history items in a descending sequence (event 69, 68, 67…). Use the Esc (item 10) key to return to the start display. Each event shows Time of the event, system pressure, and Description of the event.



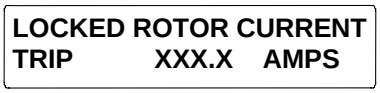
Typical Event Display

A listing of the possible events follows:

a. Manual Start (key press)
b. Auto Start Cut In
c. Manual Stop (key press)
d. Auto Stop Cut Out
e. Power Off
f. Power On
g. Locked Rotor Trip
h. Motor Overload
i. Fail to Start
j. Low Voltage
k. High Voltage
l. Communication Failure
m. Low Frequency
n. High Frequency
o. Auto Start Weekly Test
p. Auto Stop Weekly Test
q. Communication Restored

Factory Setpoint Menu

In the Factory Setpoint Menu, the operating parameters of the system can be viewed and adjusted. Press the Esc Key (item 10) until the Main Menu appears. Then use the UP or Down keys to select Factory Setpoint Menu. A Factory Password is required to enter this menu. Contact the Factory for Information. After a successful Password, the display reads as shown.



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 ratio of the input 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.
- Starter Type - Across-the-Line, Soft Start, Autotransformer, Primary Resistor, Part Winding, Wye Delta Closed and Wye-Delta Open. Additional Password is required in this item.
- Discharge Pressure Transducer Rating – Disabled, 300, 600 PSI – 600 PSI Standard
- Suction Pressure Transducer Rating – Disabled, 300, 600 PSI – Disabled is Standard
- Built-in Low Suction Control Settings – Optional, See Low Suction Control Section
- Settings for Aux Relays 1 thru 4 - Optional, See Aux Relays Section
- Settings for Aux Input 1 thru 3 – Optional, See Aux Input Section

Installation Setpoint Menu

In the Installation Setpoint Menu, the field adjustable operating parameters of the system can be viewed and adjusted. Press the Esc Key (item 10) until the Main Menu appears. Then use the UP or Down keys to select Installation Setpoint Menu. A Installation Password is required to enter this menu. The Installation Password is **2008**. After a successful Password, the display reads as shown.

Installation Setpoint Menu Display

The parameters include

- Cut-In Pressure – The lower pressure limit where if the pump will start automatically.
- Cut-Out Pressure – The upper pressure limit where the pump can be stopped without automatically restarting.
- Minimum Pump On Time - Automatic Stop Timer setpoint
- Start Delay Timer – Sequential Start Time Delay.
- Low Suction Trip Point
- Clock and Calendar Settings
- Phase Rotation Alarm setting (A-B-C) or (A-C-B)
- Temperature Display Units – Deg F or Deg C
- Low Room Temperature Alarm

- Pressure Display Units – PSI or kPa
- Pressure Data Storage Interval – from 2 PSI Delta to 10 PSI Delta
- Weekly Automatic Test Setup, - Day, Time, Duration
- Communication Parameters – IP Addresses, Subnet Mask, Gateway address
- Alarm Testing – Power Fail Alarm, Phase Reversal Alarm, and Locked Rotor Trip Simulation

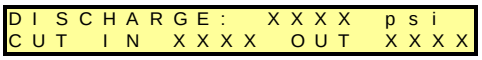
Operating Instructions

Joslyn Clark JC-200 Display Screens

June 1, 2008

Pressure Setup Menus

Note: Before Programming, confirm Jumper is in place on rear of Display Module.
Note: Before Programming, confirm Jumper is in place on Terminals 3 and 4 on Terminal Block below I/O Board
Remove Jumper between 3 and 4 to allow pump to run. Without Jumper, Pump may Start at any time.



This is the Default Screen if Pump NOT Running

This is the Default Screen if Pump IS Running

1 **Pres ESC Key to move up one level to Main Menu**
Display Shows Real Time Info

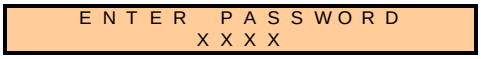
2 **Press ⇩ to go to System Status**
Display Shows System Status

3 **Press ⇩ to go to Events**
Display Shows Events

4 **Press ⇩ to go to Factory Setpoints**
Display Shows Factory Setpoints
Password Protected:

5 **Press ⇩ to go to Installation Setup**
Display Shows Installation Setup

6 **Press ENTER key to Select**
Password Protected: 2008



7 **Press ⇩ or ⇧ until 2008 shows in Display**

8 **Press ENTER key to Accept Password**
Display Shows Cut In Pressure

9 **Press ⇩ or ⇧ until Desired Pressure shows in Display**
Factory Set Point is 25 PSI Press ENTER key to Save

10 **Press ⇩ to go to Cut Out Pressure**
Display Shows Cut Out Pressure

11 **Press ⇩ or ⇧ until Desired Pressure shows in Display**
Factory Set Point is 35 PSI Press ENTER key to Save

12 **Press ⇩ to go to Run Period Timer**
Display Shows Minimum Pump On Time in Minutes

13 **Press ⇩ or ⇧ until Desired Minutes shows in Display**
Factory Set Point is OFF Press ENTER key to Save

14 **Press ⇩ to go to Sequence Start Timer**
Display Shows Start Delay Time in Seconds

15 **Press ⇩ or ⇧ until Desired Seconds shows in Display**
Factory Set Point is 0 Seconds Press ENTER key to Save

16 **If no button is pressed for 1 minute, the display defaults Back to the Default Display shown above.**

Joslyn Clark JC-200 Display Screens

June 1, 2008

Installation Programming Menus

Note: Before Programming, confirm Jumper is in place on rear of Display Module.
Note: Before Programming, confirm Jumper is in place on Terminals 3 and 4 on Terminal Block below I/O Board
Remove Jumper between 3 and 4 to allow pump to run. Without Jumper, Pump may Start at any time.

```
DISCHARGE:  XXXX psi
CUT IN XXXX  OUT XXXX
```

This is the Default Screen if Pump NOT Running

```
I =     XXXX   XXXX  XXXX
V =     XXXX   XXXX  XXXX
```

This is the Default Screen if Pump IS Running

```
*** MAIN MENU ***
REAL TIME INFO
```

1 Pres ESC Key to move up one level to Main Menu
Display Shows Real Time Info

```
*** MAIN MENU ***
INSTALLATION SETUP
```

2 Press ⇧ to go to Installation Setup
Display Shows Installation Setup

```
ENTER PASSWORD
      XXXX
```

3 Press ENTER key to Select
Password Protected: 2008
4 Press ⇩ or ⇧ until 2008 shows in Display
5 Press ENTER key to Accept Password

```
CUT IN PRESSURE:
      XXXX psi
```

Display Shows Cut In Pressure

```
LOW SUCTION TRIP:
      XXXX psi
```

6 Press ⇩ 5 times to go to Low Suction Trip
Display Shows Low Suction Trip Pressure
7 Press ⇩ or ⇧ until Desired Pressure shows in Display
Factory Set Point is 15 Press ENTER key to Save

```
PHASE SEQUENCE
    A - B - C
```

8 Press ⇩ to go to Phase Squence Adjustment
Display Shows Phase Squence
Press ⇩ or ⇧ until Desired Sequence shows in Display
Factory Set Point is A-B-C Press ENTER key to Save

```
LOW ROOM TEMP TRIP
      XXXº F
```

9 Press ⇩ to go to Optional Low Room Temp Trip
Display Shows Low Room Temp Trip
Press ⇩ or ⇧ until Desired Temperature shows in Display
Factory Set Point is 45 Deg F. Press ENTER key to Save

```
CLOCK        YEAR: 2007
MONTH: 09      DAY: 06
```

10 Press ⇩ to go to Clock
Display shows Year, Month, Day. Press enter to select
Press ⇩ or ⇧ until Desired entry shows in Display
Press ENTER to SAVE and then ⇩ to move to next item.

```
HOUR: 10A      (AM/PM)
MINUTE: 30     SEC: 18
```

10 Press ⇩ to go to Hour
Display shows Hour, AM/PM, Minute, Sec. Press enter to select
Press ⇩ or ⇧ until Desired entry shows in Display
Press ENTER to SAVE and then ⇩ to move to next item.

```
CURRENT DAY OF
WEEK:   THURSDAY
```

10 Press ⇩ to go to Day of the Week
Display shows Current Day of Week. Press enter to select
Press ⇩ or ⇧ until Current Day of Week shows in Display
Press ENTER to SAVE. ⇩

```
TEMPERATURE DISPLAY
UNITS:          ºF
```

10 Press ⇩ to go to Temperature Units
Press enter to select, then ⇩ or ⇧ to select Deg F or Deg C
Press ENTER to SAVE.

```
PRESSURE DISPLAY
UNITS:          psi
```

10 Press ⇩ to go to Pressure Units
Press enter to select, then ⇩ or ⇧ to select PSI or kPa
Press ENTER to SAVE.

```
TRIG. DATA STORAGE
PRESSURE:      2psi
```

10 Press ⇩ to go to Trigger Data Storage
Press enter to select, then ⇩ or ⇧ to select 2 to 10 PSI
Factory Default is 2 PSI. Press ENTER to SAVE.

```
RESET: MINS/MAXS
AUTO LCD DIM: YES
```

10 Press ⇩ to go to Reset Mins/Maxs and Auto LCD Dim
Press enter to select, then ⇩ or ⇧ to change entry
Press ENTER to SAVE.

```
WEEKLY TEST: EN.
WT DAY:  SUNDAY
```

10 Press ⇩ to go to Weekly Test
Press enter to select, then ⇩ or ⇧ to Enable / Disable
Press ENTER to SAVE. Select Test Day, Time, and Duration.

```
WT TIME:  12:00 A
DURATION:     1 MIN
```

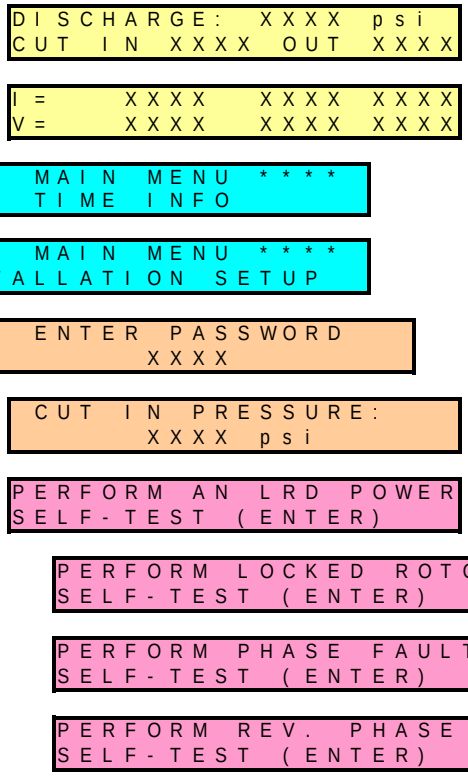
If no button is pressed for 1 minute, the display defaults Back to the Default Display shown above.
If you wish to Manually Go To Default Display, Press ESC, then ⇩ one time, then ENTER, then ⇩.

Testing the System

Joslyn Clark JC-200 Display Screens

June 1, 2008

Alarm Testing Menu



This is the Default Screen if Pump NOT Running

This is the Default Screen if Pump IS Running

1 Pres ESC Key to move up one level to Main Menu
Display Shows Real Time Info

2 Press ⇧ to go to Installation Setup
Display Shows Installation Setup

3 Press ENTER key to Select
Password Protected: 2008

4 Press ⇩ or ⇧ until 2008 shows in Display

5 Press ENTER key to Accept Password
Display Shows Cut In Pressure

6 Press ⇧ 1 time to go to Locked Rotor Detector Self-Test
Display Shows Perform An LRD Power Self-Test. Press Enter.

7 Press ⇩ or ⇧ until Desired Test shows in Display
Press Enter to activate Test.
Locked Rotor Test Causes Circuit Breaker Trip after 12 seconds.
Do this test last!

Phase Fault Test Trips Power Available Alarm Contacts for 5 seconds
After 5 second transistion, Contacts return to present state.

Phase Reversal Test Trips Phases Reversed Alarm Contacts for 5 sec.
Transfer Switch Units will start engine and may transfer to Alternate.
After 5 second transistion, Contacts return to present state.

If no button is pressed for 1 minute, the display defaults
Back to the Default Display shown above.
If you wish to Manually Go To Default Display, Press ESC,
then ⇩ one time, then ENTER, then ⇩.

Joslyn Clark JC-200 Display Screens

June 1, 2008

Communication Parameters Setup

DISCHARGE: XXXX psi CUT IN XXXX OUT XXXX	This is the Default Screen if Pump NOT Running
I = XXXX XXXX XXXX V = XXXX XXXX XXXX	This is the Default Screen if Pump IS Running
	1 Pres ESC Key to move up one level to Main Menu
**** MAIN MENU **** REAL TIME INFO	Display Shows Real Time Info
	2 Press ⇧ to go to Installation Setup
**** MAIN MENU **** INSTALLATION SETUP	Display Shows Installation Setup
	3 Press ENTER key to Select
ENTER PASSWORD XXXX	Password Protected: 2008
	4 Press ⇩ or ⇧ until 2008 shows in Display
	5 Press ENTER key to Accept Password
CUT IN PRESSURE: XXXX psi	Display Shows Cut In Pressure
	6 Press ⇧ 8 times to go to IP Address
IP ADDRESS: 169. 254. 1. 1	Display shows Factory Default 169.254.1.1 address
	7 Press ⇩ or ⇧ until each section shows proper address
	Press Enter after each section, ⇩ to go to next screen
SUBNET MASK: 255. 255. 0. 0	Display shows Factory Default 255.255.0.0 Subnet Mask
	7 Press ⇩ or ⇧ until each section shows proper Mask
	Press Enter after each section, ⇩ to go to next screen
GATEWAY: 169. 254. 1. 1	Display shows Factory Default 169.254.1.1 Gateway address
	7 Press ⇩ or ⇧ until each section shows proper address
	Press Enter after each section, ⇩ to go to next screen
	If no button is pressed for 1 minute, the display defaults
	Back to the Default Display shown above.
	If you wish to Manually Go To Default Display, Press ESC,
	then ⇩ one time, then ENTER, then ⇩ .

Renewal Parts

All Parts use JC80 Discount Schedule

Used On	Description	Part Number
PMR	Fire Pump Power Monitor, 20-90 Amp, 200-480 Volt	A10-466580-1
PMR	Fire Pump Power Monitor, 90-180 Amp, 200-480 Volt	A10-466580-2
PMR	Fire Pump Power Monitor, 2-9 Amp, 200-480 Volt	A10-466580-3
PMR	Fire Pump Power Monitor, 20-90 Amp, 575 Volt	A10-466580-4
PMR	Fire Pump Power Monitor, 90-180 Amp, 575 Volt	A10-466580-5
PMR	Fire Pump Power Monitor, 2-9 Amp, 575 Volt	A10-466580-6
PMR	Fire Pump Power Monitor, 2-9 Amp, 120-240 Volt	A10-466580-7
I/O	I/O Control Board	A10-466581
	4 Conductor Shielded Cable, 20 AWG (per Foot)	019311 -RM11
Display	User Interface Panel	A10-466582
Special	Pressure Transducer, 300 PSI, 1-5 VDC Output Series 3100	A10-466477-1
Standard	Pressure Transducer, 600 PSI, 1-5 VDC Output Series 3100	A10-466477-2
	3 Pin Connector	A10-466478
	3 Conductor Shielded Cable for Transducers - 20 AWG (per Foot)	019310 -RM11
	Assembled Transducer Cable	466891-3
TR1	50VA Control Trans., Volt Pri: 200/380/460/575 Volt Sec:24/120.	467070-1
TR2	50VA Control Trans., Volt Pri: 200/380/460/575 Volt Sec:24	467070-2
CR1,CR2	RELAYS	466655 -1
2PB	Stop Push Button + (2)N5B01VN	N5CPNRG N5B01VN
	Selector - 3-Pos, Spring return to Center - Transfer Switch Door	N5CSMZ3N
	N5B10VN Contact Block N.O. (2 Reqd)	N5B10VN
F1	Mod. K Fuses FNM 1 amp	A22-421644-9
LS	Emergency Run Limit Switch	A10-308267

Renewal Parts

All Parts use JC80 Discount Schedule

Used On	Description	Part Number
	CONTACTORS	
	467086 -0001	A40 Contactor, 3P, 208/60
	467086 -0002	A40 Contactor, 3P, 240/60
	467086 -0003	A40 Contactor, 3P, 380/50
	467086 -0004	A40 Contactor, 3P, 415/50
	467086 -0005	A40 Contactor, 3P, 480/60
	467087 -0001	A75 Contactor, 3P, 208/60
	467087 -0002	A75 Contactor, 3P, 240/60
	467087 -0003	A75 Contactor, 3P, 380/50
	467087 -0004	A75 Contactor, 3P, 415/50
	467087 -0005	A75 Contactor, 3P, 480/60
	467088 -0001	A145 Contactor, 3P, 208/60
	467088 -0002	A145 Contactor, 3P, 208/60
	467088 -0003	A145 Contactor, 3P, 208/60
	467088 -0004	A145 Contactor, 3P, 208/60
	467088 -0005	A145 Contactor, 3P, 208/60
	467089 -0001	A145 Contactor, 3P, 208/60
	467089 -0002	A145 Contactor, 3P, 208/60
	467089 -0003	A145 Contactor, 3P, 208/60
	467089 -0004	A145 Contactor, 3P, 208/60
	467089 -0005	A145 Contactor, 3P, 208/60
	467090 -0001	A145 Contactor, 3P, 208/60
	467090 -0002	A145 Contactor, 3P, 208/60
	467090 -0003	A145 Contactor, 3P, 208/60
	467090 -0004	A145 Contactor, 3P, 208/60
	467090 -0005	A145 Contactor, 3P, 208/60
	Surge Arrestor 208V	A19-453641-1
	Surge Arrestor 220V-415VV	A19-453641-2
	Surge Arrestor 460V & UP	A19-453641-3

Renewal Parts

All Parts use JC80 Discount Schedule

Used On	Description		Part Number
	Bulbs and LED(s)		
	120volt Bulbs (Also known as PN A100-351305-5)	BA9S130	A100-351305-5
	(You may be able to order these 120MB bulbs at your local electric supplier)		
	120volt LEDs to replace standard incandescent bulbs shown above		
	A22-457278-1(green)		A22-457278-1
	A22-457278--2(red)		A22-457278-2
	A22-457278--3(amber)		A22-457278-3
	A22-457278-4(blue)		A22-457278-4
	6.3volt Bulbs(#755 on side) Transformer type pilot lights		A22-272163-13
	Socket(120v full voltage, incls Bulb)		N5PDNVL
	Lens and block		N5CL*D
	colors—*Use R for red, V for Green, G for Yellow, I for clear, B for white, L for Blue, A for amber		
	100T Red Transformer Type	460 V	100T-PLT4R
		200/230 Volt	100T-PLT2R
	Beeper, 120 Volt		A22-308266
	Zenith Transfer Switch Parts		
	MX150 LCD Control Panel GE# 50P1160RPL		354400 -670
	RT Box Replacement Numbers - GE 50P & 57P		463364 -xx
	see Dwg A10-463364 for item numbers		