
**SINGER SPC-IDC-2LS -- PUMP CONTROLLER
I.O.M. A-9006A
For SINGER Booster Pump Control Valves with
Single or Dual Limit Switch**

DESCRIPTION:

SINGER Booster Pump Control Valves are designed for installation on the discharge side of pumps, to prevent starting and stopping surges in normal operation.

The SINGER pre-wired electronic control panel provides the logic and supervision to coordinate the pump motor starter and the control valve in the correct sequencing.

The motor starter is supplied by others. A pressure switch, set at the “normal operating pressure”, is also provided by others and installed near the pump discharge, ahead of the Singer control valve.

The panel provides several premium functions and features in addition to the minimum wiring requirements. Simpler panel designs are available - contact the factory. Refer to drawing A-0408A for the wiring diagram representing the minimum requirements.

GENERAL OPERATION:

The pump control valve is closed when the pump is stopped. The valve is installed downstream of the booster pump. A pressure switch is supplied and installed by others near the pump discharge.

HAND-OFF-AUTO switch is provided for local (HAND) start-stop or remote (AUTO) start-stop. All necessary logic for controls is pre-programmed via a single logic module. A digital timer is incorporated with the module, and is easily adjustable via built-in pushbuttons.

Normal Starting Sequence:

The system can be started by pressing **START** when in **HAND** or a contact closure from remote when in **AUTO**. The pump motor starter is energized, the blue “PRESSURE OK” light will start flashing. Simultaneously, the system start-up pressure delay timer (B14:T) is activated and the time interval is initiated. While the timed interval is active, the blue “PRESSURE OK” light will keep flashing. During this time, the valve will remain fully closed.

The pressure switch connected to the panel monitors the pump discharge pressure. When the pressure reaches the normal operating pressure, the pressure switch contact should close. The blue “PRESSURE OK” light will stop flashing and stays ON.

The valve-mounted solenoid is then energized and pressure is released from above the diaphragm and out of the bonnet. “VALVE OPENING” green light will begin flashing as the pump control valve begins to open. The start-up valve opening timer (B28:T) is activated simultaneously.

Once the valve opens, the valve mounted limit switch (LS1) will actuate. The green “VALVE OPENING” light stops flashing and stays ON.

This concludes to normal start-up sequence for the system. The pump continues to run normally.

If conditions arise where the start-up pressure delay timer expires and the pressure switch (PS1) does not close because to insufficient pressure, the system will shutdown and blue **PRESSURE OK** and red **ALARM** lights will flash. An **ALARM** dry contact closure is provided for remote alarm indication.

If conditions arise where the start-up valve opening timer expires and the valve limit switch does not actuate because of the valve not opening, the system will shutdown and green **VALVE OPEN** and red **ALARM** lights will flash. An **ALARM** dry contact closure is provided for remote alarm indication.

Normal Shutdown Sequence:

Pressing **STOP** when in **HAND**, turning the **HAND-OFF-AUTO** switch to **OFF**, or opening the remote contact input de-energizes the solenoid pilot valve. The pump control valve begins to close as the valve-mounted solenoid is de-energized and the pressure is directed into the bonnet and above the diaphragm.

The pump motor is kept running by limit switch (LS1). When approximately 95% closed (adjustable), limit switch (LS1) closes. Motor Starter Contact opens. This in turn de-energizes the pump motor starter. All indicator lights will be extinguished.

The pump control valve uses residual system pressure to close 100%. When the pump is turned off, the discharge pressure drops rapidly. Once it falls below normal operating pressure, the pressure switch (PS1) opens and the green **PRESSURE OK** light goes out.

The system is completely reset once the valve closes fully, and is now ready for the next cycle.

Faults and Indicators:

If a fault occurs during the start-up sequence or during normal run operations, the panel will shut the pump down and provide a visual indication of the cause.

- Steady white **POWER ON** Indicator light: Indicates the 120VAC 60Hz is applied to panel.
- Flashing blue **PRESSURE OK** indicator light: Indicates that the pressure delay timer is ON.
- Steady blue **PRESSURE OK** indicator light: Indicates that desired pressure has been established.
- Flashing blue **PRESSURE OK** with flashing red **ALARM** indicator light: Indicates that the pressure delay timer expired without the desired pressure being established. System is shutdown until reset by turning the **HAND-OFF-AUTO** switch to **OFF**.
- Flashing green **VALVE OPEN** indicator light: Indicates that the valve opening timer is ON.
- Steady green **VALVE OPEN** indicator light: Indicates that the valve is fully open.
- Flashing green **VALVE OPEN** with flashing red **ALARM** indicator light: Indicates that the valve opening timer expired with the valve still fully closed. System is shutdown until reset by turning the **HAND-OFF-AUTO** switch to **OFF**.
- Steady blue **PRESSURE OK** with flashing red **ALARM** indicator light: Indicates that the pressure is not able to satisfy the desired pressure during the normal operation. System is shutdown until reset by turning the **HAND-OFF-AUTO** switch to **OFF**.
- Steady green **VALVE OPEN** with flashing red **ALARM** indicator light: Indicates that the valve closed completely during the normal operation without command. System is shutdown until reset by turning the **HAND-OFF-AUTO** switch to **OFF**.
- Steady amber **RESTART DELAY** indicator light: Indicates that a power failure has occurred and the ART timer is ON. Manual restarting during this period can be only by resetting the panel.

TECHNICAL SPECIFICATIONS:

<i>SINGER MODEL</i>		Singer Model SPC-IDC-LS
<i>SUPPLY VOLTAGE</i>		120 VAC, 60Hz
<i>CONTROL SYSTEM PROTECTION</i>		5A Circuit Breaker
<i>MOTOR STARTER CONTACT PROTECTION</i>		20A Circuit Breaker
<i>AC POWER CONSUMPTION</i>		10VA max.
<i>CONTROLLER</i>		LOGO! PRG_1203-70_9006A
<i>CONTROL OUTPUTS</i>		Isolated 20A 250 VAC Motor Starter Contact
<i>CONTROL INPUTS</i>		Isolated Pressure Switch Contact Limit Switch Contact Signal to Start Motor -- From Dry Contact
<i>BUILT-IN ADJUSTABLE TIMER</i>	<i>B14 Pressure Delay Timer</i>	Range 0 sec. to 99 min. (+/- 0.6 second max. deviation) Adjustable by 1-sec. increment Factory set at 30 seconds
	<i>B28 Valve Opening Timer</i>	Range 0 sec. to 99 min. (+/- 0.6 second max. deviation) Adjustable by 1-sec. increment Factory set at 30 seconds
	<i>B05 Restart Delay Timer</i>	Range 1 min. to 99 hour (+/- 0.6 minute max. deviation) Adjustable by 1-min. increment Factory set at 1 hour
<i>REPLACEMENT INDICATOR LAMP</i>		Bayonet Type, 120 VAC 2 W

DESCRIPTION OF FEATURES :

The Model SPC panel provides the following :

- 1. Start Protection** - pump will not start unless the pump control valve is fully closed.
- 2. System Start-Up Supervision** - panel will shut the system down if the pump discharge pressure is low and/or the valve is not open after a pre-set "normal start-up" interval. The timer is digitally adjustable.
- 3. Manual Reset** - after a "System Shutdown" **ALARM** fault, the panel must be reset manually, by turning the **HAND-OFF-AUTO** switch to **OFF**.
- 4. Power Failure Protection** - In the event of a power failure, even momentary, the pump motor will shutdown. The SINGER booster pump control valves include an Emergency Closing Solenoid that speeds up closure rate to prevent reverse flow. On power return, the valve can be configured to re-start system automatically after an adjustable time delay period. This Re-start delay feature is jumper enabled. **REMOVING THE JUMPER DISABLES THE TIME-DELAY FEATURE AND WILL RESTART THE SYSTEM AUTOMATICALLY ONCE POWER RETURNS. THIS MAY OR MAY NOT BE ACCEPTABLE.** Turning the **HAND-OFF-AUTO** switch to **OFF** position resets the RESTART DELAY timer.

DESCRIPTION OF FEATURES continued ...

5. **Emergency Stop** – when press, stops the system completely and disconnects power to the valve electrical systems.
6. **Valve Malfunction Protection** - should any event causes the valve to close without a normal pump shutdown command, the panel will shutdown the pump motor and control system. A manual reset is required to restart the pump.
7. **Pressure Loss Protection** - should the pump discharge pressure drop below the normal operating pressure at any time, the panel will initiate shutdown of the pump motor and control system. A manual reset is required to start the pump.
8. **Indicator Lights** to Monitor System Status, includes :
 - ◆ “**POWER**” - white
 - ◆ “**VALVE OPEN**” - green
 - ◆ “**PRESSURE OK**” - blue
 - ◆ “**RESTART DELAY**” - amber
 - ◆ “**ALARM**” - alarm

INSTALLATION:

DANGER! HIGH VOLTAGE!

Risk of Electric Shock. Ensure that no power is connected before making any field wirings.

1. Mount the panel in a suitable location according to all local and federal regulations.
2. Check the valve mounted pilot solenoid for operation and correct voltage.
3. Wire the solenoids to the panel as required. Refer to wiring diagram.
4. Wire the isolated pressure switches contact to the panel. Refer to the wiring diagram.
5. Wire the remote AUTO dry contacts to the panel. Refer to the wiring diagram.
6. Wire the Motor Starter Contacts output to pump starter panel. Refer to the wiring diagram. **DO NOT CONNECT THE PUMP DIRECTLY TO THE SPC PUMP CONTROL PANEL.**
7. Verify that correct terminal wiring connections have been made.
8. Following all local and federal codes, connect the 120 VAC power to the panel. Refer to wiring diagram.

CONFIGURATION:

A) General Setup:

1. With AC power to the panel, verify that the “**POWER ON**” light is lit when the switch is in ON.
2. Verify that the LOGO! logic module is ON.
3. To set the clock to the current time and date, press **ESC**.
4. The LOGO! screen switches to parameterization mode and displays the parameterization menu. Move the cursor to **Set Clock** and press **OK**.
5. Use the left or right arrow keys on the LOGO! to move the cursor across the screen.
6. Use the up or down arrow keys on the LOGO! to change the value on the current cursor position. The UP arrow key increases the value, the DOWN arrow key decreases the value.
7. Once all desired values are set, press **OK** to accept.
8. Press **ESC** to return to main screen.

B) Timer Adjustments:

1. The built-in Start-Up Timer can be adjusted at anytime the power switch is ON.
2. To access the timer parameters, press **ESC**.
3. The LOGO! screen switches to parameterization mode and displays the parameterization menu. Move the cursor to **Set Param** and press **OK**.

RESTART DELAY TIMER

1. The Restart-Delay Timer has a factory default setting of 1 hour (**01:00h**). During the restart delay, the panel will not start the pumping system.
2. Use the up or down arrow keys on the LOGO! to display the timer parameter **B05**, which is the Restart-Delay Timer parameter. Press **OK**.
3. Use the left or right arrow keys to move the cursor across the time range **T**.
4. Use the up or down arrow keys on the LOGO! to change the value on the current cursor position. The UP arrow key increases the value, the DOWN arrow key decreases the value.
5. Once all desired values are set, press **OK** to accept.

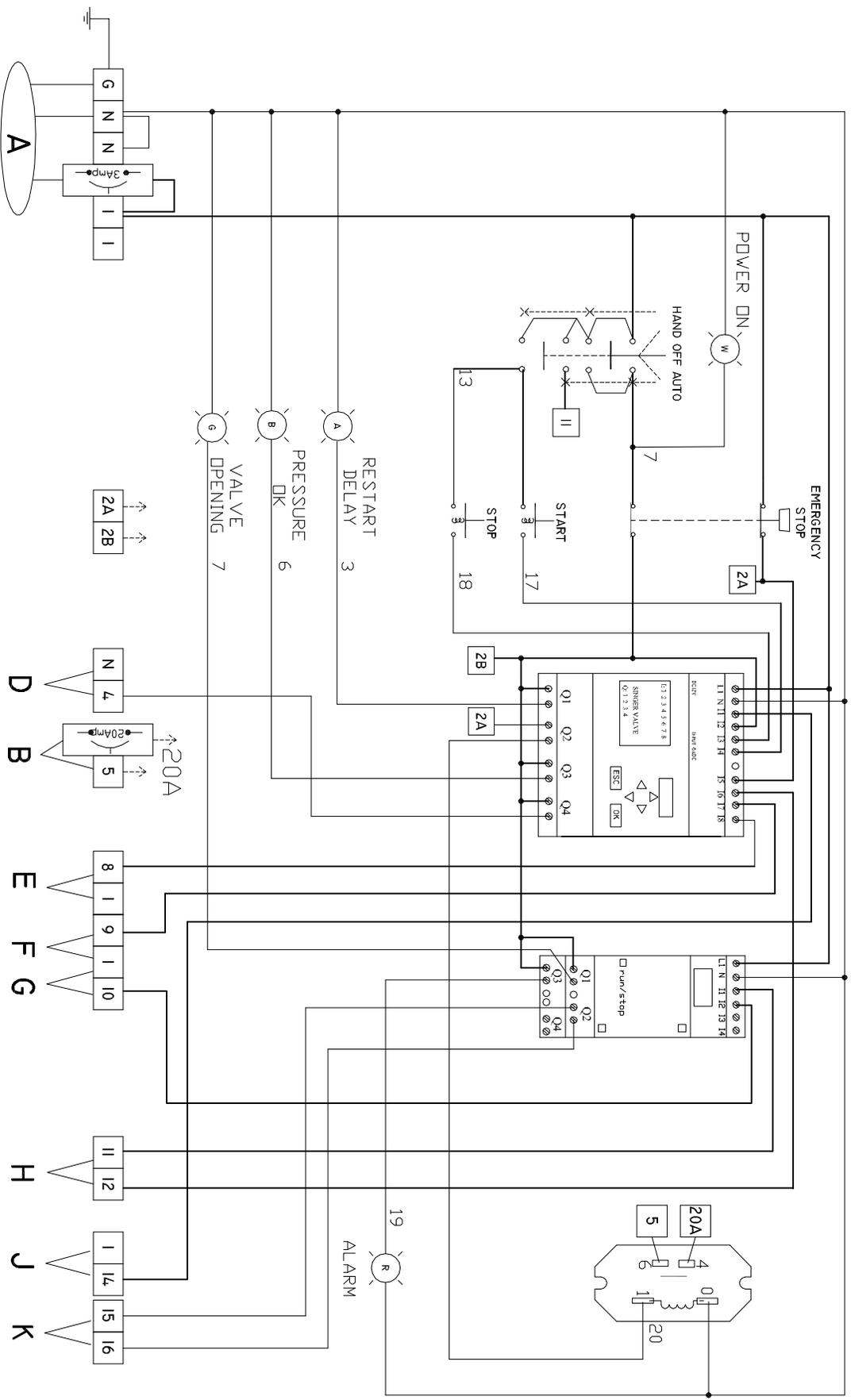
PRESSURE DELAY TIMER

1. The Pressure Delay Timer has a factory default setting of 30 seconds (**00:30m**). The system must establish pressure during the pressure delay.
2. Use the up or down arrow keys on the LOGO! to display the timer parameter **B14**, which is the Pressure Delay parameter. Press **OK**.
3. Use the left or right arrow keys to move the cursor across the time range **T**.
4. Use the up or down arrow keys on the LOGO! to change the value on the current cursor position. The UP arrow key increases the value, the DOWN arrow key decreases the value.
5. Once all desired values are set, press **OK** to accept.

VALVE OPENING TIMER

1. The Valve Opening Timer has a factory default setting of 30 seconds (**00:30m**). The system must establish pressure during the pressure delay.
2. Use the up or down arrow keys on the LOGO! to display the timer parameter **B28**, which is the Valve Opening parameter. Press **OK**.
3. Use the left or right arrow keys to move the cursor across the time range **T**.
4. Use the up or down arrow keys on the LOGO! to change the value on the current cursor position. The UP arrow key increases the value, the DOWN arrow key decreases the value.
5. Once all desired values are set, press **OK** to accept.

CAUTION: Never press any two or more arrow keys on the LOGO! simultaneously, internal program error may occur.



TERMINAL STRIP CONNECTIONS (FOR EACH PUMP SYSTEM)

- A 120VAC/60HZ FROM 20AMP CIRCUIT BREAKER
- B MOTOR STARTER CONTACTS (20AMP FUSED)
- C NORMAL CLOSING SOLENOID (120VAC)
- D PRESSURE SWITCH - BY OTHERS (WIRED TO N.O. TERMINALS)
- E VALVE CLOSE LIMIT SWITCH (WIRED TO N.C. TERMINALS)
- F OPTIONAL VALVE OPEN LIMIT SWITCH (WIRED TO N.C. TERMINALS)
- G REMOTE/AUTOMATIC START
- H LOSS OF POWER RESTART (JUMPER ENABLED)
- J REMOTE ALARM CONNECTIONS (NON-POWERED)
- K

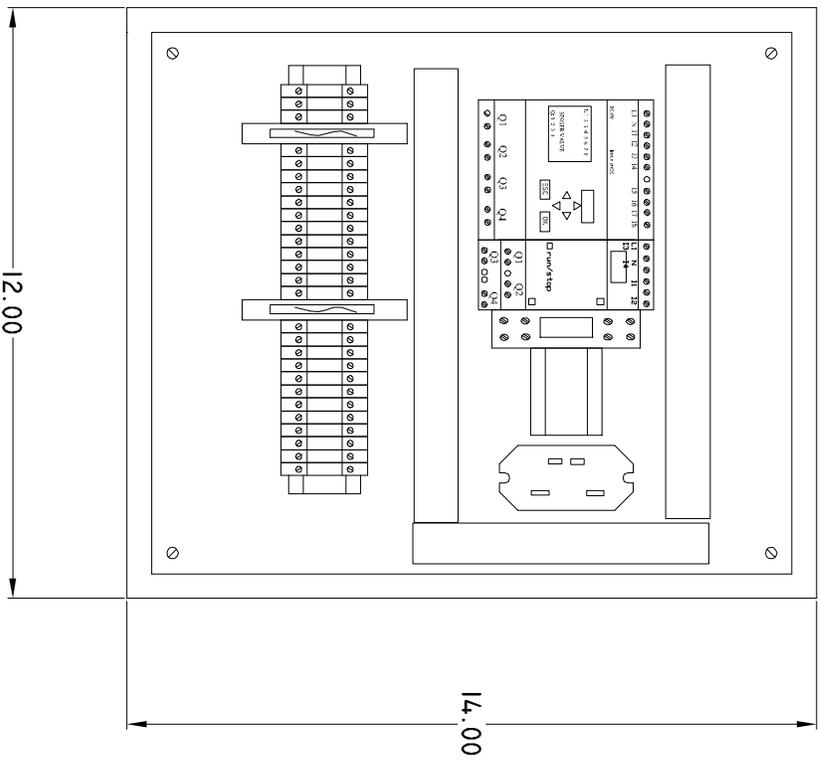
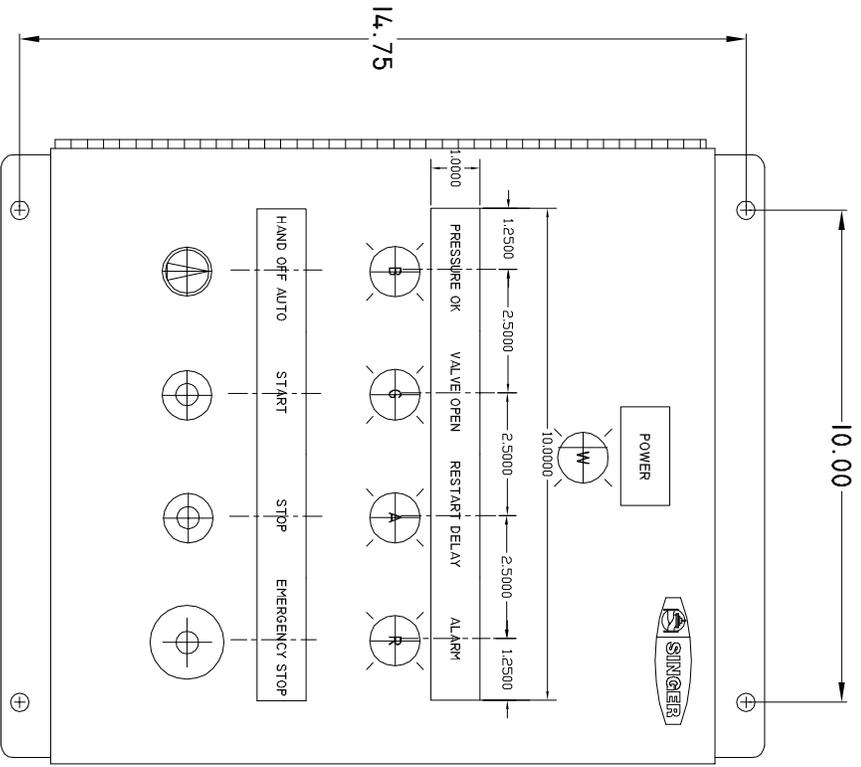


SINGER VALVE

Result-Based Solutions, Globally.

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Drawn By: Eugene Bahia DATE: February 2003	Checked By:  DATE: February 2003
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