

SIMPLEXER



UL FILE # E101681

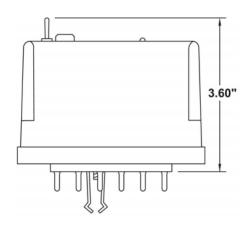


FEATURES

Float or Conductance Probe Level Inputs
Level Input Indication
Pump Call Indication
High Level Alarm Indication
Surge Protected Level Inputs
Level Simulation / Alarm Silence Push-Button
HOA Switch
Pump Call Relay

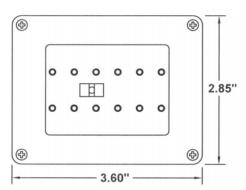
Pump Call Relay High Level Alarm Light Relay High Level Alarm Horn Relay RS232 Serial Port with Modbus Protocol UL Listed only When used with SD12-PC socket.

> MADE IN THE U.S.A.



DESCRIPTION

The SIMPLEXER is a low cost SCADA ready pump controller designed to perform level control for simplex lift station applications. The level inputs can be connected to either three float switches or to a conductance probe. LED's provide level input status, pump call status, and high level alarm status indication. Output relays are provided for pump run, high level alarm for alarm light and high level alarm for alarm horn. HOA switch is also provided. Level simulation is accomplished by pressing and holding the push-button. Releasing the push-button allows the simulated level to return to normal. The push-button may also be pressed to silence the alarm horn. Connecting the serial port to a SCADA system allows the lift station to be monitored and controlled remotely. By connecting a programming device to the serial port (MPE p/n TSID), a number of settings may be accessed to customize the unit.



SPECIFICATIONS

Input Power: 120 VAC ±10%, 10 VA max Relay Outputs: 6 A Resistive @ 120 VAC

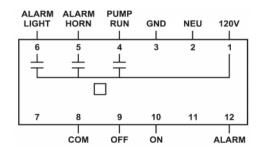
3.6 A Inductive @ 120 VAC

Agency Approval: UL 508, CAN/CSA

Indicators: LED's

Sensor Output Voltage: ±12 V Square wave
Sensor Output Current: ±1.2 mA max (per sensor)

Operating Temp: -20 to +60 °C Storage Temp: -45 to +85 °C Enclosure: Lexan

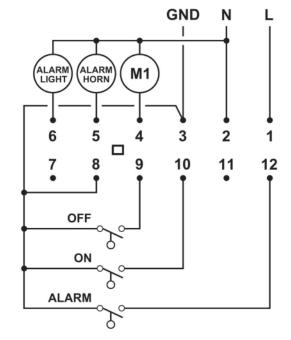


ORDERING INFORMATION

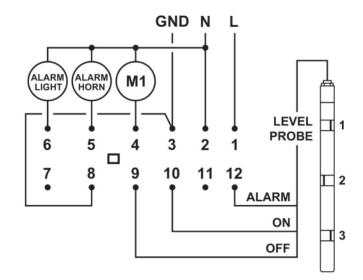
Part Number: 010-120-121P

SIMPLEXER

CONNECTION DIAGRAMS

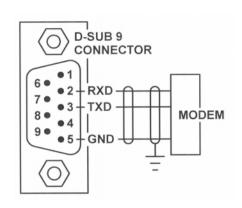


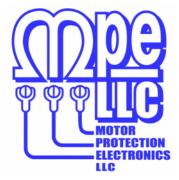
FLOAT SWITCH



LEVEL PROBE

RS-232 SERIAL PORT





DUPLEXER

MADE IN THE U.S.A.





FEATURES:

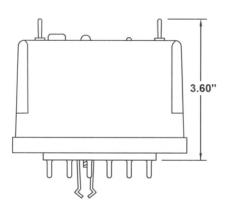
Float or Conductance Probe Level Inputs
Duplex Alternation
Level Input Indication
Pump Call Indication
High Level Alarm Indication
Power On Indication
Surge Protected Level Inputs
Power Up and Lag Pump Delays
Level Simulation Push-Button
HOA and Lead Select Switches
Pump Call and High Level Alarm Relays
RS232 Serial Port with Modbus RTU Protocol

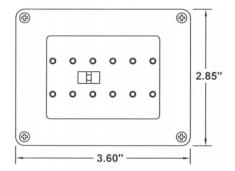
UL FILE # E101681

UL Listed only when used with an SD12 or SD12-PC socket.

DESCRIPTION

The DUPLEXER is a low cost SCADA ready pump controller designed to perform level control for duplex lift station applications. The level inputs can be connected to either four float switches or to a conductance probe. The Duplexer provides a 10 second powerup start delay, 5 second lag pump delay, and duplex alternation. LEDs provide power on status, level input status, pump call status, and high level alarm status indication. Pump 1&2 call and high level alarm relays are provided. HOA and lead select toggle switches are also provided. The high level status indication latches upon high level, until reset by pressing the reset push-button (the relay does not stay latched). Level simulation is accomplished by pressing and holding the push-button. Releasing the push-button allows the simulated level to return to normal. Connecting the serial port to a SCADA system allows the lift station to be monitored and controlled remotely. By connecting a programming device to the serial port (MPE p/n TSID), a number of settings may be accessed to customize the unit.





SPECIFICATIONS

Input Power: 120 VAC ±10%, 10 VA max Relay Outputs: 6A Resistive @ 120 VAC

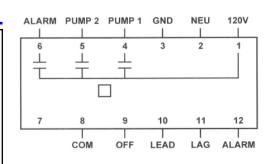
3.6A Inductive @ 120 VAC

Agency Approval: UL 508, CAN/CSA

Indicators: LED's

Sensor Output Voltage: ±12V Square wave Sensor Output Current: ±1.2 mA max (per sensor)

Operating Temp: -20 to +60 °C
Storage Temp: -45 to +85 °C
Enclosure: Lexan
Base: Rhynite



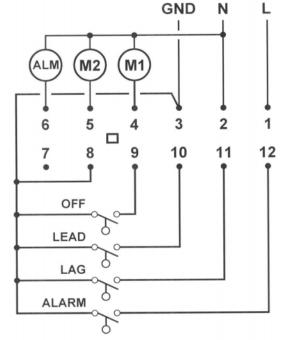
ORDERING INFORMATION

Part Number: 010-120-122P

DUPLEXER

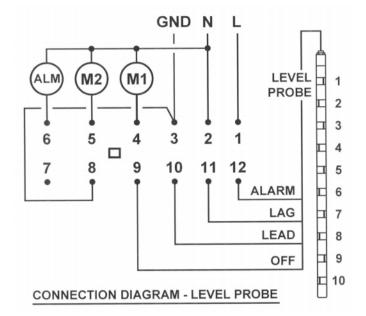
CONNECTION DIAGRAMS

FLOAT SWITCH

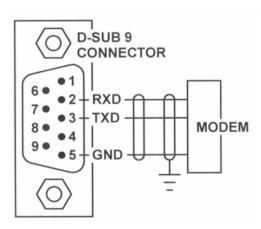


CONNECTION DIAGRAM - FLOAT SWITCH

LEVEL PROBE



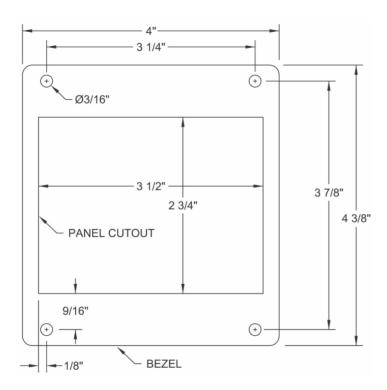
SERIAL PORT





DUPLEXER MOUNTING BRACKET KIT

MADE IN THE U.S.A.







The Duplexer Mounting Bracket Kit provides a simple and economical method of securing a Duplexer Controller to the deadfront of a control panel.

TYPICAL APPLICATIONS

 Where the HOA switches, lead select switch and station status indication must be on the deadfront.

FEATURES

- Sturdy aluminum construction.
- Stainless steel Mounting hardware included.
- Faceplate painted white to match Duplexer Enclosure.

ORDERING INFORMATION

Bracket Kit - Part Number: DUPMK-W

12 Pin Socket - Part Number: SD12-PC

(Must Order 12 Pin Socket Separately)



MADE IN THE U.S.A.



UL FILE # E101681



DESCRIPTION

The SC100 controller is a low cost, simple to use simplex or duplex controller for lift station liquid level control. It operates the pumps based on the selected setup parameter values and the 4-20mA wet well level input signal. The controller has relays for two pump call outputs, and for high and low level alarms outputs. A regulated 24 VDC power supply is provided for powering the pressure transducer circuit. A four digit seven segment red LED display is provided for parameter setup and level display. Red LED's are provided for pump 1 and 2 call and for high and low level alarm indication. Alternation of the pumps is provided, and a fixed 1-2 or 2-1 sequence may also be selected through the menu. The controller can be setup to perform either pump up control (fill a tank) or pump down control (empty a tank). It also has a fixed 10 second power-up delay, and an adjustable lag pump delay to prevent the turning on of one or both of the pumps immediately after a power interruption. Zero and Span parameters are provided for field calibration of the level input for a wide variety of submersible pressure transducers. The level display is made even more flexible by the addition of a parameter to set the decimal point position, and by a parameter to adjust how fast the level display responds to changes in the level input signal, from very slow to fast. A level simulation feature is provided to test the lift station controls and pump operation.

SPECIFICATIONS

Input Power: 120 VAC ±10%, 7.8 VA max Power for Analog Input: 24 VDC ±1 V, Transient Protected

Agency Approval: UL 508, CAN/CSA Operating Temperature: -20 °C to +65 °C Storage Temperature: -45 °C to +85 °C

Display Type: 4 Digit, 7 Segment, Red LED

Display Range: 0 - 2310 Feet (Selectable Decimal Point Position)

Red LED Indicators:

Relay Outputs: 10 A Resistive @ 120 VAC 3.6 A Inductive @ 120 VAC

4-20 mA, 147 Ω Load, Transient Protected Level Analog Input:

White with Blue Lettering Color:

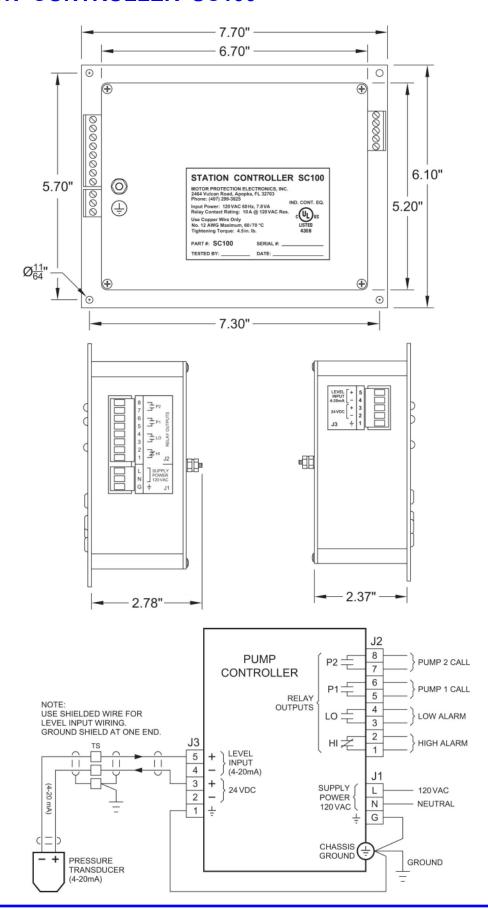
Enclosure Material: Aluminum

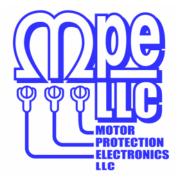
Dimensions: 6.10" H x 7.70" W x 2.78" D

ORDERING INFORMATION

Part Number:

SC100







MADE IN THE U.S.A.



UL FILE # E101681

TYPICAL APPLICATIONS

Simplex, Duplex, Triplex Single Speed Pump Control Level Pump Down (Empty a Tank) or Pump Up (Fill a Tank) Control

DESCRIPTION

The SC1000 is a SCADA ready pump controller designed to perform level control in a wide range of lift station applications. The SC1000 operates the pumps based on the selected setup values and the wet well level signal. The level input source is menu selectable for either a 4-20 mA pressure transducer, or a conductance probe. The S1000 alternates the pumps, performs lag pump delays, and provides high and low level alarms. The SC1000 has a variety of control options available in the setup menu that may be used to customize the controller for a specific application.

The SC1000 comes standard with 12 Discrete Inputs, 10 Level Probe Inputs, 5 Relay Outputs, an Analog Input for the level input, and an RS232 Serial Port with the Modbus RTU protocol.

The SC1000 can be ordered with the following options:

Isolation of the Analog (4-20mA) Level Input. Ethernet Port with the Modbus TCP protocol.

ORDERING INFORMATION

Part Number: SC1000

To add Isolation to the Analog Level Input, add S to end of part number.

To add an Ethernet Port with the Modbus TCP protocol, add E to end of part number.

STATION CONTROLLER SC1000 STANDARD FEATURES:

- ♦ All Setup Parameter Values May be Viewed or Changed From the Front of Unit
- ♦ 120 VAC input power
- ♦ Level Input Source Menu Selectable
 - Analog Level Input (4-20mA from Pressure Transducer)
 - Level Probe (Conductance Probe with 10 Electrodes)
- ♦ 20 VDC Power for Analog Level Input Loop
- ♦ 6 Amp Relay Outputs for: Pump Call, High Level, and Low Level Alarms
- ♦ RS-232 Serial Port, Modbus RTU Protocol
- ♦ Optional Ethernet Port for Modbus TCP and Modbus RTU Protocols
- ♦ Alternation Modes Menu Selectable
 - Standard Alternation
 - Pump 1 Always Lead Stays On with Other Pumps
 - Pump 1 Always Lead Turns Off with Other Pumps On
 - Pumps 1 & 2 Alternate, and Pump 3 Always Last
 - Fixed Sequence Pump 1 Always Leads
 - Stepped On/Off Only One Pump Runs at a Time
- ♦ Alternation First On Last Off or First On First Off
- ♦ Alternator Logic Skips Disabled Pumps
- Remembers Lead Pump Position During Power Outage
- ◆ Timed [1 minute] Level Simulation
- ♦ Plug-in Style Connectors
- ♦ 12 Discrete Inputs that can be Programmed for the Following Functions:
 - Pump Disable with HOA in OFF, or Pump Fault
 - External Lead Pump Selector Switch
 - All Pump Disable for Connection to Phase Monitor
 - Limit Number of Pumps Called While on Emergency Power
 - Alternation by External Time Clock
 - Float Switch Backup
 - A Variety of Telemetry Functions
- Status of Discrete Inputs May Be Viewed From Front of Controller
- ♦ Flush Cycle Feature to Reduce Sludge Build-up within the Wetwell
- Flow Calculator Feature for Latest Inflow Rate, Average Daily Flow, Pump Outflow Rate
- Unused Output Relays Programmable via SCADA for Additional Control Uses
- ♦ Full manual available in pdf format at our website: www.mpelectronics.com

SPECIFICATIONS

Input Power: 120VAC ±10%, 13VA max

Agency Approvals: UL 508, CAN/CSA
Ambient Operating Temp: -20°C to +65°C

Level Display: 3 Digit, 7 Segment LED

Level Display Range: 0 - 999 ft.

Decimal Point Position

Menu Selectable

Indicators: LED

Color: White with Blue Lettering

Relays: 6A @250VAC Level Analog Input: 4-20mA, 250Ω Load Transient Protected

External Dimensions: 6.9"H x 8.5" W x 4.1" D

Cut Out Dimensions: 6.0" H x 7.5" W

Power for Discrete

Inputs:

24VDC Unregulated Transient Protected

Power for Analog

Regulated

Input:

Transient Protected

Power For Level

±8V Square-Wave,

20VDC ±1V

Probe:

60 Hz.





MADE IN THE U.S.A.



UL FILE # E101681

TYPICAL APPLICATIONS

Simplex, Duplex, Triplex or Quadraplex Pump Control Single Speed or Variable Speed Control

DESCRIPTION

The SC2000 is a SCADA ready pump controller designed to perform level control in a wide range of lift station applications. The SC2000 operates the pumps based on the selected setup values and the wet well level signal. The level input source is menu selectable for either a 4-20 mA pressure transducer, or a conductance probe. The SC2000 alternates the pumps, performs lag pump delays, and provides high and low level alarms. The SC2000 has a variety of control options available in the setup menu that may be used to customize the controller for a specific application.

The SC2000 comes standard with 18 Discrete Inputs, 10 Level Probe Inputs, 6 Relay Outputs, an Analog Input for the level input, and an RS232 Serial Port with the Modbus RTU protocol.

The SC2000 can be ordered with the following options:

Up to 4 Isolated Analog Outputs for VFD speed control.

Up to 4 Isolated Analog Inputs for collecting analog data. Isolation of the Analog (4-20mA) Level Input.

Ethernet Port with the Modbus TCP and DNP3 protocols.

ORDERING INFORMATION

Part Number: SC2000 - X X

Analog Outputs

0 = No Analog Outputs

1 = 1 Analog Output

2 = 2 Analog Outputs

3 = 3 Analog Outputs

4 = 4 Analog Outputs

Analog Inputs

0 = No Aux. Analog Inputs

1 = 1 Aux. Analog Input

2 = 2 Aux. Analog Inputs 3 = 3 Aux. Analog Inputs

4 = 4 Aux. Analog Inputs

To add Isolation to the Analog Level Input, add S to end of part number.

To add an Ethernet Port with Modbus TCP and DNP3 protocols, add E to end of part number.

STATION CONTROLLER SC2000 STANDARD FEATURES:

- ♦ All Setup Parameter Values May be Viewed or Changed From the Front of Unit
- ♦ 120 VAC input power
- ♦ Level Input Source Menu Selectable
 - Analog Level Input (4-20 mA from Pressure Transducer)
 - Level Probe (Conductance Probe with 10 Electrodes)
- ♦ 20 VDC Power for Analog Level Input Loop
- ♦ 6 Amp Relay Outputs for: Pump Call, High Level, and Low Level Alarms
- RS-232 Serial Port, Modbus RTU Protocol
- Optional Ethernet Port for Modbus TCP and Modbus RTU Protocols
- Alternation Modes Menu Selectable
 - Standard Alternation
 - Pump 1 Always Lead Stays On with Other Pumps
 - Pump 1 Always Lead Turns Off with Other Pumps On
 - Split Alternation Pumps 1 & 2, and Pumps 3 & 4
 - Fixed Sequence Pump 1 Always Leads
 - Stepped On/Off Only One Pump Runs at a Time
- ♦ Alternation First On Last Off or First On First Off
- ♦ Alternator Logic Skips Disabled Pumps
- Remembers Lead Pump Position During Power Outage
- ♦ Timed [1 minute] Level Simulation
- ♦ Security Code Protected Parameter Setup
- ♦ 18 Discrete Inputs that can be Programmed for the Following Functions:
 - Pump Disable with HOA in OFF, or Pump Fault
 - External Lead Pump Selector Switch
 - All Pump Disable for Connection to Phase Monitor
 - Limit Number of Pumps Called While on Emergency Power
 - Alternation by External Time Clock
 - Call Pump Last for Connection to VFD/Bypass Logic
 - Float Switch Backup
 - A Variety of Telemetry Functions
- ♦ Status of Discrete Inputs May Be Viewed From Front of Controller
- ♦ Flush Cycle Feature to Reduce Sludge Build-up within the Wetwell
- ♦ Flow Calculator Feature for Latest Inflow Rate, Average Daily Flow, Pump Outflow Rate
- Unused Output Relays Programmable via SCADA for Additional Control Uses
- Plug-In Style Connectors
- ♦ Full manual available in pdf format at our website: www.mpelectronics.com

SPECIFICATIONS

Input Power: 120VAC ±10%, 13VA max

Agency Approvals: UL 508, CAN/CSA

Ambient Operating Temp:

Indicators:

Without Analog Outputs: -20°C to +65°C With Analog Outputs: -20°C to +50°C

Level Display: 3 Digit, 7 Segment LED

Level Display Range: 0 - 999 ft.

Decimal Point Position
Menu Selectable

LED

Color: White with Blue Lettering

Relays: 6A @250VAC Analog Level Input: 4-20mA, 250Ω Load Transient Protected

External Dimensions: 6.9"H x 8.5" W x 4.9" D

Cut Out Dimensions: 6.0" H x 7.5" W

Power for Discrete 24VDC Unregulated

Inputs: Transient Protected

Power for Analog 20VDC ±1V Regulated Input: Transient Protected

Analog Outputs: Isolated 4-20mA

Maximum Load 600Ω Transient Protected

Aux. Analog Inputs: Isolated 4-20mA

250Ω Load

Transient Protected

Power for Level ±8V Square-Wave,

Probe: 60 Hz



INTRODUCTION

The SC5000 is a Six Pump Controller with Four Control Modes capable of performing:

Level Control Flow Control Pressure Control Booster Control

The four Control Modes are menu selectable and within each Control Mode there are a variety of control options in the setup menu that make the Controller customizable for a large number of applications.

The SC5000 comes with a door mounted HMI, either a **Color Touch Screen HMI** or a **5 Digit Numerical LED HMI**. The HMI makes the Station Status and Setup Parameters readily available to the operator. Dedicated Communication Ports ENET2 or COM1 are provided for connection to the HMI.

A din-rail mounted 24VDC Power Supply is also provided with the Controller.

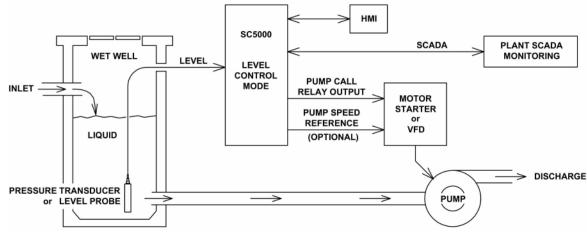
The Controller alternates the pumps, performs Lag Pump Delays, provides High and Low Level, Flow Rate or Pressure Alarms and many other optional features. It has parameters in the menu that allow the operator to set the Number of Pumps Present, the Maximum Number of Pumps Allowed to Run At the Same Time, and the Maximum Number of Pumps Allowed to Run While On a Generator.

With up to 6 optional Analog Outputs it can also perform VFD speed control.

While the SC5000 functions as a stand alone Pump Controller, it is designed to be easily integrated into a SCADA System. Ethernet Port ENET1 (with Modbus/TCP) is provided on all units for connection to a SCADA system. All units come with 30 Discrete Inputs that may be used to collect discrete telemetry. All units come with 12 Output Relays, any of which can be setup to perform remote control functions. Also available are 8 optional Analog Inputs and 3 optional Pulse Type Flow Meter Inputs for the collection of data. Parameter Security can be enabled to protect the Controller Setup and Remote Control Parameters from being remotely tampered with. The Modbus Registers for all Setup, Status and Remote Control Parameters are fully documented in the manual.

The Controller comes with a USB Host Port for Backup and Restore of Setup Parameters.

LEVEL CONTROL



DESCRIPTION

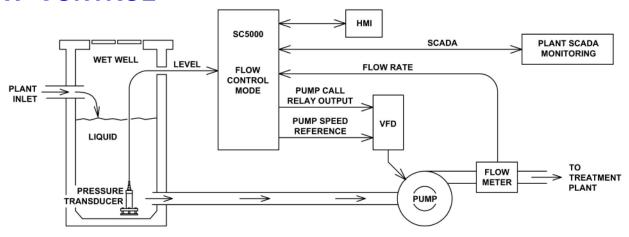
In the "Level Control" mode, the SC5000 can manage up to 6 pumps and perform in either a Pump Up or a Pump Down application. The Controller turns the pumps on or off based on a comparison of the Level Input with the Pump On / Off Level setup parameters.

The Controller can receive an Analog 4-20mA Level Input from a Transducer or receive a Level Input from a 10 Conductor Level Probe. It can also operate from Float Switches as the primary or backup level input.

The Controller's logic Alternates the pumps, performs Lag Pump Delays, and provides High Level and Low Level alarms.

With optional Analog Outputs, it can provide a pump speed reference for VFD Speed Control.

FLOW CONTROL



DESCRIPTION

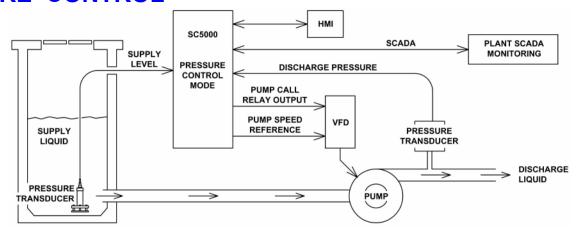
In the Flow Control Mode, a PID Controller (Proportional, Integral, Derivative) is provided to regulate the pump speed in order to maintain the Flow Rate at the Flow Rate Setpoint.

The Flow Control logic also determines the number of pumps required to run in order to maintain the Flow Rate at the Flow Rate Setpoint.

The Flow Control logic also Alternates the pumps and provides a Low Level Alarm, High Level Alarm, Low Flow Rate Alarm and a High Flow Rate Alarm.

The Flow Control Mode requires the use of VFDs, so the Controller must be ordered with an optional Analog Output for the speed reference of each pump.

PRESSURE CONTROL



DESCRIPTION

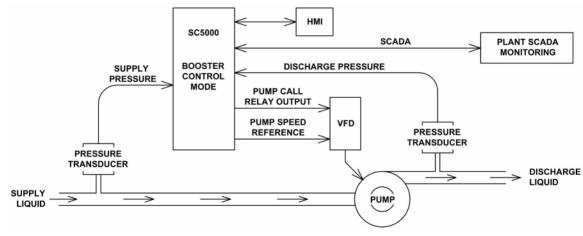
In the Pressure Control Mode, a PID Controller (Proportional, Integral, Derivative) is provided to regulate the pump speed in order to maintain the Discharge Pressure at the Discharge Pressure Setpoint.

The Pressure Control logic also determines the number of pumps required to run in order to maintain the Discharge Pressure at the Discharge Pressure Setpoint.

The Pressure Control logic also Alternates the pumps and provides a Low Supply Liquid Level Alarm, High Supply Liquid Level Alarm, Low Discharge Pressure Alarm and a High Discharge Pressure Alarm.

The Booster Control Mode requires the use of VFDs, so the Controller must be ordered with an optional Analog Output for the speed reference of each pump.

BOOSTER CONTROL



DESCRIPTION

In the Booster Control Mode, a PID Controller (Proportional, Integral, Derivative) is provided to regulate the pump speed in order to maintain the Discharge Pressure at the Discharge Pressure Setpoint.

The Booster Control logic also determines the number of pumps required to run in order to maintain the Discharge Pressure at the Discharge Pressure Setpoint.

The Booster Control logic also Alternates the pumps and provides a Low Supply Pressure Alarm, High Supply Pressure Alarm, Low Discharge Pressure Alarm and a High Discharge Pressure Alarm.

The Booster Control Mode requires the use of VFDs, so the Controller must be ordered with an optional Analog Output for the speed reference of each pump.

CONTROL MODES

- Level Control Mode
- Flow Control Mode
- Pressure Control Mode
- Booster Control Mode

STANDARD I/O

- Ethernet Port ENET1 with Modbus TCP Protocol for connection to: SCADA System
 Ethernet Port ENET2 with Modbus TCP Protocol for connection to: SC5000-CTS-HMI
 RS232 Port COM1 with Modbus RTU Protocol for connection to: SC5000-LED-HMI
- 1 USB Host Port for Backup and Restore of Setup Parameters
- 1 Analog Output, Isolated 4-20mA (AOX1)
 May be Assigned to Application Specific Functions
- 2 Analog Inputs, Isolated 4-20mA (AIX1 AIX2)
 May be Assigned to Application Specific Functions
- 12 Relay Outputs (ROX1 ROX12)
 May be Assigned to Application Specific Functions
- 30 Discrete Inputs (D1 D30)
 May be Assigned to Application Specific Functions

OPTIONAL I/O

- 6 Analog Outputs, Isolated 4-20mA (AO1 AO6)
 May be Assigned to Application Specific Functions
- 8 Analog Inputs, Isolated 4-20mA (A1 A8)
 May be Assigned to Application Specific Functions
- 3 Discrete Pulse Capture Inputs, Isolated (DPC1 DPC3)

Discrete Pulse Capture Input DPC1 - Assigned Function of: Pulse Flow Meter PFM1 Discrete Pulse Capture Input DPC2 - Assigned Function of: Pulse Flow Meter PFM2 Discrete Pulse Capture Input DPC3 - Assigned Function of: Pulse Flow Meter PFM3

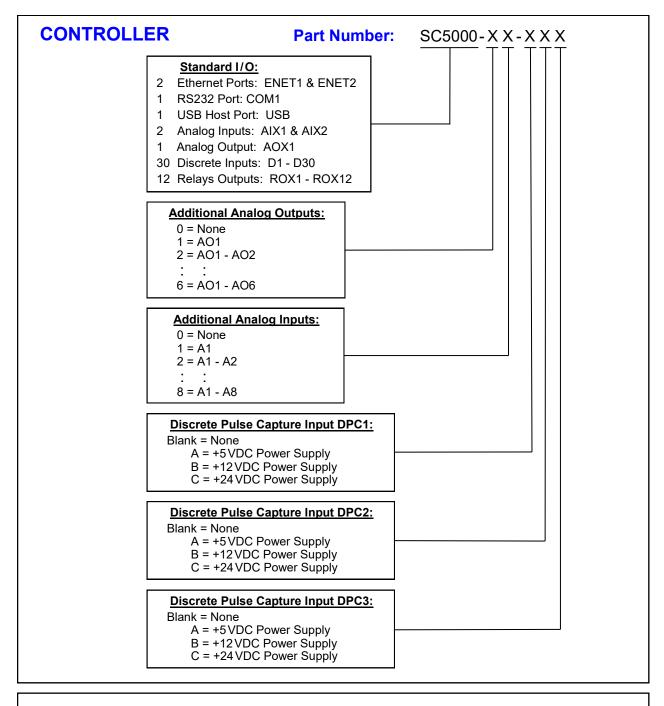
SPECIFICATIONS

- Input Power: 24 VDC ±10%, 0.6 A max
- Agency Approvals: UL 508, CAN/CSA
- Dimensions (Width x Height x Depth): 10.340" x 6.750" x 6.208"
- Ambient Operating Temperature: -20°C to +65°C (-4°F to +149°F)
- Color: White with Blue Graphics
- Discrete Inputs: ±6 V, 60 Hz Square Wave ±0.6mA max, Transient Protected
- Relay Outputs: 8A @ 120 VAC Resistive
- Analog Outputs: Isolated 4-20mA, Transient Protected, Maximum Load: 900Ω
- Analog Inputs: Isolated 4-20mA, 100 Ω Load, Transient Protected
- Pulse Capture Inputs: Isolated, Transient Protected

Maximum Pulse Frequency: 60kHz (with Duty Cycle Between 40% - 60%)

Power Supply Options: +5 VDC, +12 VDC, or +24 VDC Pull Up or Pull Down Resistor Supplied with Controller: 5.1 K Ω

STATION CONTROLLER SC5000 ORDERING INFORMATION



OPERATOR INTERFACE Part Number: SC5000-XXX-HMI

OPERATOR INTERFACE with Communication Cable:

CTS = Color Touchscreen HMI See Section W in Manual LED = 5 Digit Numerical LED HMI See Section X in Manual

POWER SUPPLY Part Number: SC5000-PS24

24 VDC 3.8A 35mm DIN Rail Mount