



# STATION CONTROLLER SC5000

MADE IN  
THE U.S.A.

IND. CONT. EC



UL FILE #



## 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.

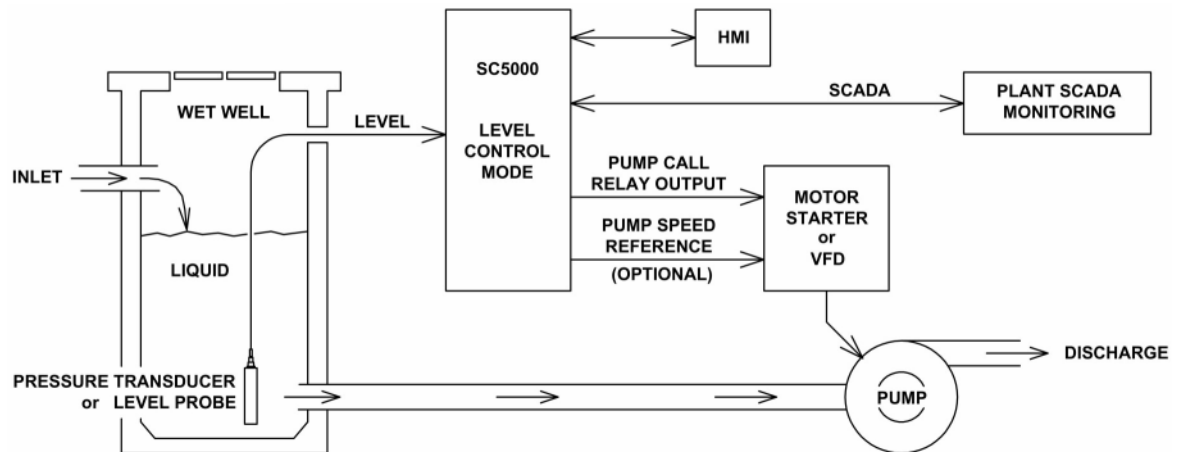
With up to 6 optional Analog Outputs it can also perform VFD speed control.

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.

# STATION CONTROLLER SC5000

## LEVEL CONTROL



### DESCRIPTION

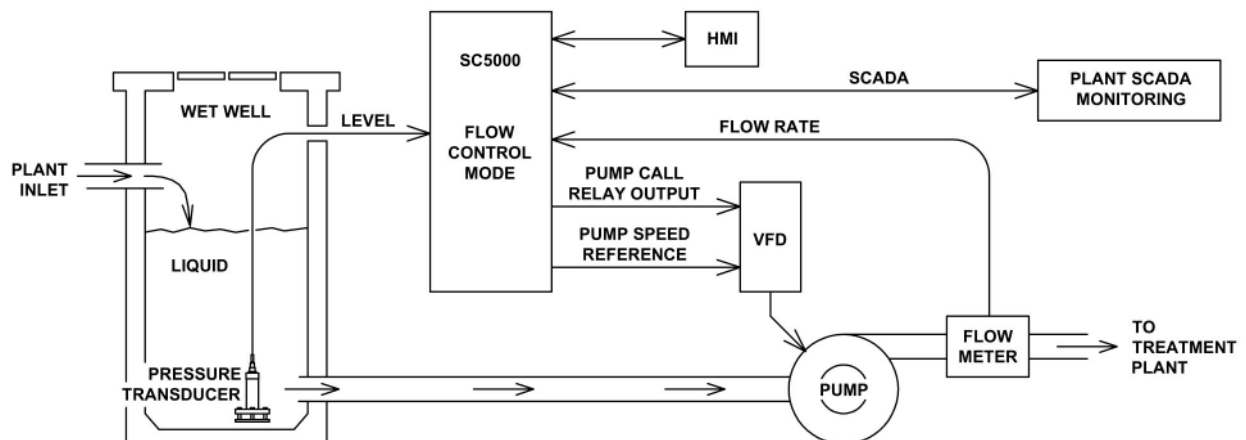
In the "Level Control" mode, the SC5000 can manage up to 6 pumps and perform in either a Pump Up or a Pump Down application. The Controller turns the pumps on or off based on a comparison of the Level Input with the Pump On/Off Level setup parameters.

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.

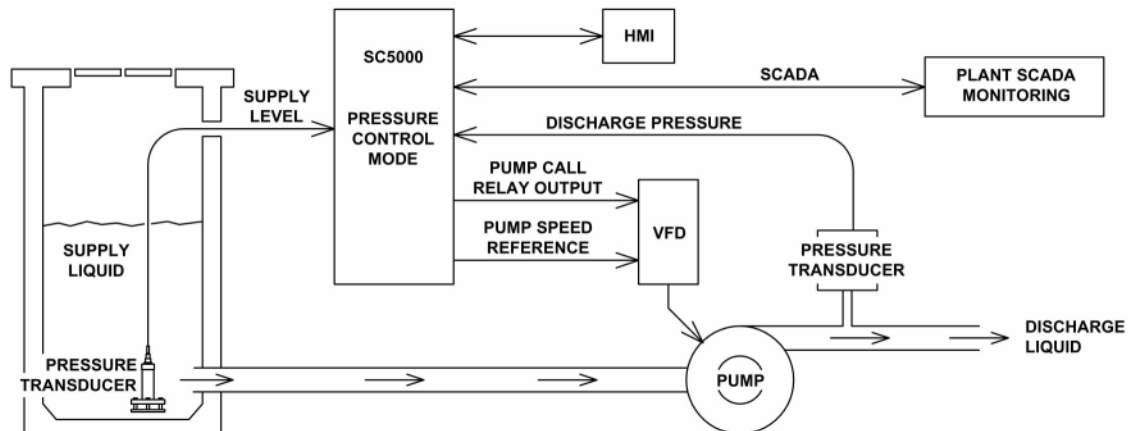
The Flow Control logic also determines the number of pumps required to run in order to maintain the Flow Rate at the Flow Rate Setpoint.

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.

# STATION CONTROLLER SC5000

## PRESSURE CONTROL



### DESCRIPTION

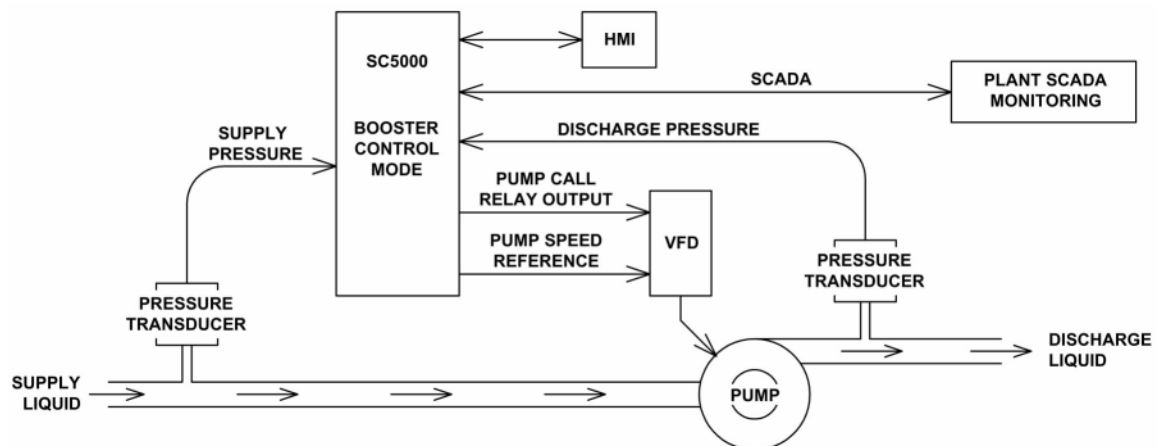
In the Pressure Control Mode, a PID Controller (Proportional, Integral, Derivative) is provided to regulate the pump speed in order to maintain the Discharge Pressure at the Discharge Pressure Setpoint.

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.

# STATION CONTROLLER SC5000

## 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  $\pm$ 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:  $\pm$ 6 V, 60 Hz Square Wave  $\pm$ 0.6mA max, Transient Protected
- Relay Outputs: 8 A @ 120 VAC Resistive
- Analog Outputs: Isolated 4-20mA, Transient Protected, Maximum Load: 900 $\Omega$
- Analog Inputs: Isolated 4-20mA, 100 $\Omega$  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 $\Omega$

# STATION CONTROLLER SC5000 ORDERING INFORMATION

<b>CONTROLLER</b>	<b>Part Number:</b> SC5000- X X - X X X	
<u><b>Standard I/O:</b></u> 2 Ethernet Ports: ENET1 & ENET2 1 RS232 Port: COM1 1 USB Host Port: USB 2 Analog Inputs: AIX1 & AIX2 1 Analog Output: AOX1 30 Discrete Inputs: D1 - D30 12 Relays Outputs: ROX1 - ROX12	<u><b>Additional Analog Outputs:</b></u> 0 = None 1 = AO1 2 = AO1 - AO2 : : 6 = AO1 - AO6	<u><b>Additional Analog Inputs:</b></u> 0 = None 1 = A1 2 = A1 - A2 : : 8 = A1 - A8
<u><b>Discrete Pulse Capture Input DPC1:</b></u> Blank = None A = +5VDC Power Supply B = +12VDC Power Supply C = +24VDC Power Supply	<u><b>Discrete Pulse Capture Input DPC2:</b></u> Blank = None A = +5VDC Power Supply B = +12VDC Power Supply C = +24VDC Power Supply	<u><b>Discrete Pulse Capture Input DPC3:</b></u> Blank = None A = +5VDC Power Supply B = +12VDC Power Supply C = +24VDC Power Supply

<b>OPERATOR INTERFACE</b>	<b>Part Number:</b> SC5000- XXX - HMI
<u><b>OPERATOR INTERFACE with Communication Cable:</b></u> CTS = Color Touchscreen HMI <span style="color: red;">See Section W in Manual</span> LED = 5 Digit Numerical LED HMI <span style="color: red;">See Section X in Manual</span>	

<b>POWER SUPPLY</b>	<b>Part Number:</b> SC5000- PS24
24 VDC 3.8A 35mm DIN Rail Mount	