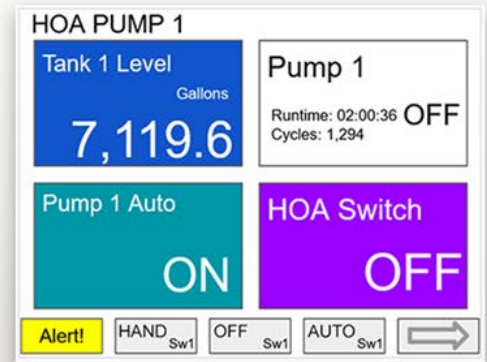
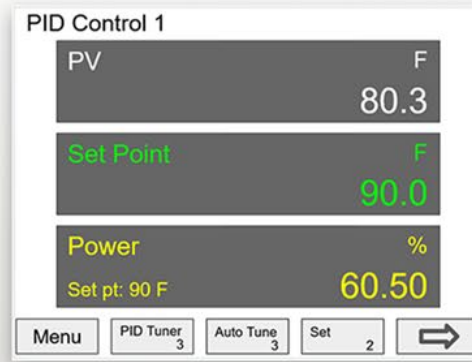


# New Features & Approvals on PD9000 ConsoliDator+ Multivariable Controller



ConsoliDator+





## Joe Ryan

VP of Sales & Marketing

Joe brings more than 15 years of process industry experience in the design, support, manufacturing, marketing, and sales of process measurement and control devices. Joe has extensive field and support experience with process displays and controls, and a strong technical background including a bachelor's degree in Electromechanical Engineering and a master's degree in Computer & Electrical Engineering.

# Agenda and Takeaways



01

Quick Overview of the PD9000 ConsoliDator+ Multivariable Controller

02

Introduce the New Features of the PD9000 ConsoliDator+ Multivariable Controller

03

How to Take Advantage of the ConsoliDator+'s PID Control and HOA Operation Features

04

See Examples of PID/HOA Setup and Control Screens

# PD9000 Quick OverView



# PD9000 Quick Overview

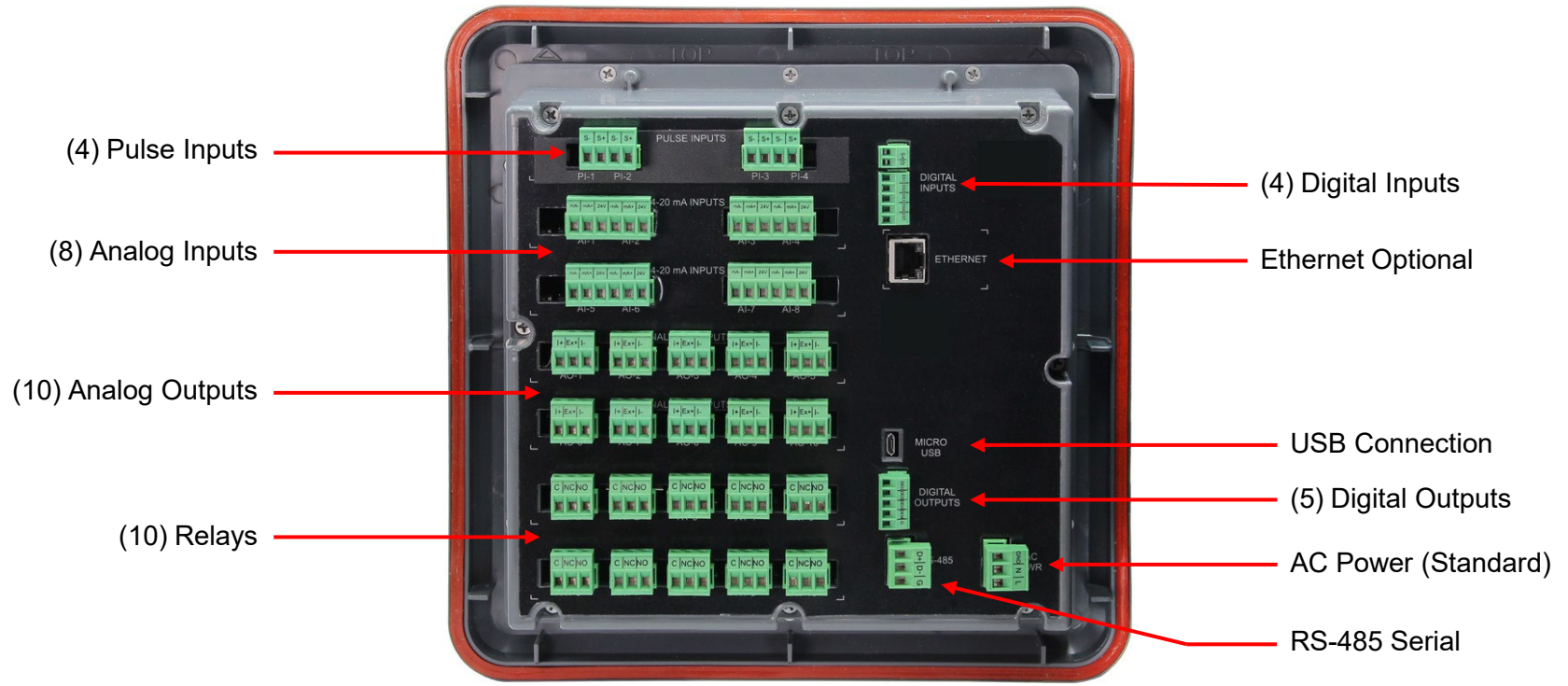
## Features

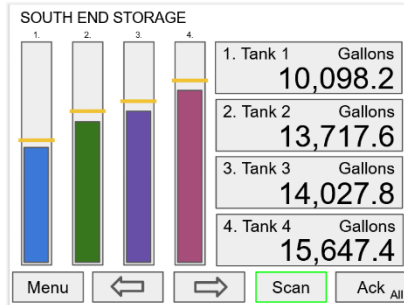


- NEMA 4X Panel Mount Multi-Channel Controller for Process Display, Alarm and Control Applications
- Accepts 4-20 mA Inputs, Flow Meter Pulse Inputs, Digital Inputs, and Modbus RTU
- Displays Numeric and Bargraph Format on a Large, 5.7" Color Display
- Multiple Relays with User-Definable Actions, 4-20 mA Outputs, Digital Outputs, Modbus RTU, and Ethernet Modbus TCP/IP
- 32 Timers to Control Many Processes or Events
- Free Consolidator+ Configuration Software
- **NEW** UL and C-UL Listed for Hazardous and Ordinary Locations
- **NEW** Auto-Tune PID Control for Multiple Control Loops
- **NEW** PID Control with Analog, Digital, or Relay Outputs
- **NEW** HOA and Other 2, 3, and 4-Way Switch Functions to Route Inputs & Outputs
- **NEW** Specify Models with Either AC or DC Power

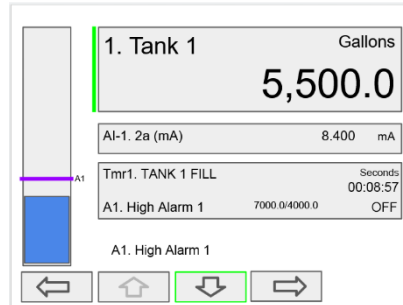
# PD9000 Quick Overview

## Lots of Inputs & Outputs and More!

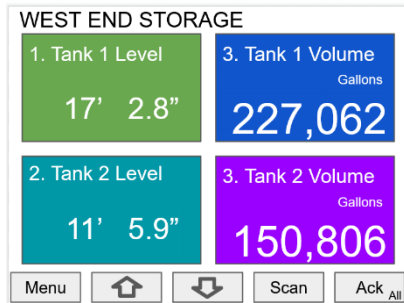




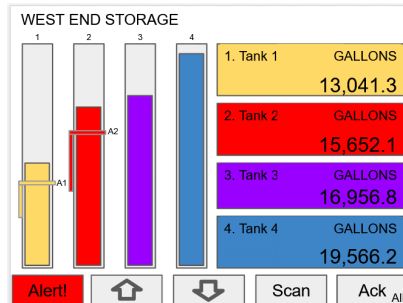
Main Screen



Channel Details Screen



Screen with Feet & Inches Units



Details Screen Showing High Alarm

## Features

- Display up to 20 different screens in a variety of formats and colors
- 65 colors to customize the screens for text (value), backgrounds, bargraphs, and alarm conditions for channels, totals, and timers.
- Display inputs in numeric, bargraph, and feet & inches formats
- Display main screen, channel details screens, and more.
- Soft keys for programming and operation



## Features

- Easiest and quickest way to program the ConsoliDator+ multivariable controller.
- ConsoliDator+ Configuration software is intuitive, and most customers can get their controller programmed without even looking in the manual.
- Convenient USB Connection





### Features

- NEMA 4 Steel Enclosures
- NEMA 4X Plastic Enclosures
- House One ConsoliDator+ PD9000
- Cutout for One ConsoliDator+ Provided
- Hinged Door
- ConsoliDator+ Mounts in Cover

# PD9000 New Features





### Hazardous Area Location

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<b>UL &amp; C-UL Listed</b>	For Hazardous Location Installations (US and Canada) Class I Division 2 Groups A, B, C, and D Class II Division 2 Groups F and G Class III Temperature Code: T4A
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### Ordinary Location

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<b>UL &amp; C-UL Listed</b>	USA and Canada UL 508 Industrial Control Equipment
<b>UL File Number</b>	E160849
<b>Front Panel</b>	UL Type 4X, NEMA 4X, IP66; Panel gasket provided

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# PD9000 New Features

# Benefits of the New Approvals

## Testing and certification to UL 508

UL 508, the Standard for Safety For Industrial Control Equipment, covers industrial control and related devices rated 1500 volts or less used for starting, stopping, regulating, controlling, or protecting electric motors. This equipment is for use in accordance with the National Electrical Code, NFPA 70 in an ambient temperature of 0 - 40°C (32 - 104°F), and includes devices or systems that store or process information and are provided with an output motor control function. Requirements include:

- Temperature Test
- Overvoltage & Under voltage Test
- Overload Test
- Endurance Test
- Calibration Test
- Dielectric Voltage Withstand Test
- Short Circuit Test
- Standard Fault Current Test
- High Fault Current Test
- Transient Voltage Surge Suppression Test
- Accelerated Aging Test
- Breakdown Of Components Test



## Ordinary Location

**UL & C-UL  
Listed**

USA and Canada  
UL 508 Industrial Control Equipment

**UL File Number**

E160849

**Front Panel**

UL Type 4X, NEMA 4X, IP66;  
Panel gasket provided

- The ConsoliDator+ is now perfect for UL Listed panel shops.
- Great addition to UL Listed OEM equipment.
- Offers trusted 3<sup>rd</sup> party verification of NEMA 4X rating with the UL Type 4X certification.

## Class I

Areas where flammable vapors or gases may be present

## Class II

Areas where combustible dust may be present

## Class III

Areas where ignitable fibers or flying debris may be present

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## Division 2

Hazardous or ignitable substance only present under abnormal conditions (i.e. leaks)



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## Hazardous Area Location

### UL & C-UL Listed

For Hazardous Location Installations  
(US and Canada)  
Class I Division 2 Groups A, B, C, and D  
Class II Division 2 Groups F and G  
Class III  
Temperature Code: T4A

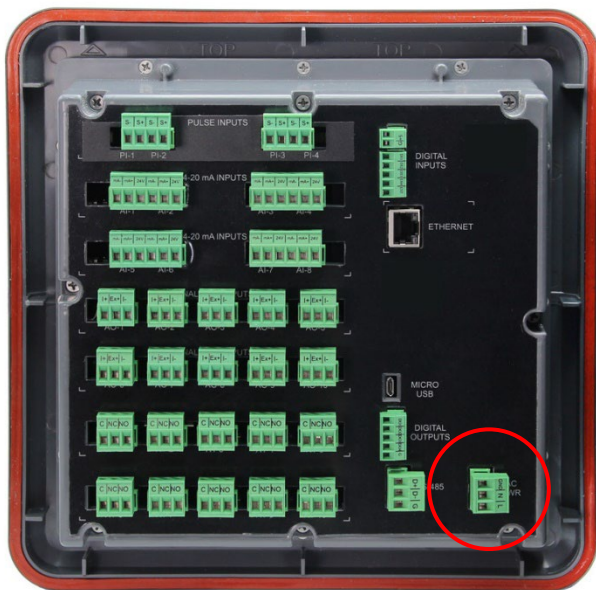
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- May generally be installed without the use of barriers back to the safe area, if wired in accordance with all applicable NEC or other national or local requirements.
- Most ConsoliDator+ installations will be in Division 2 areas.

# PD9000 New Features

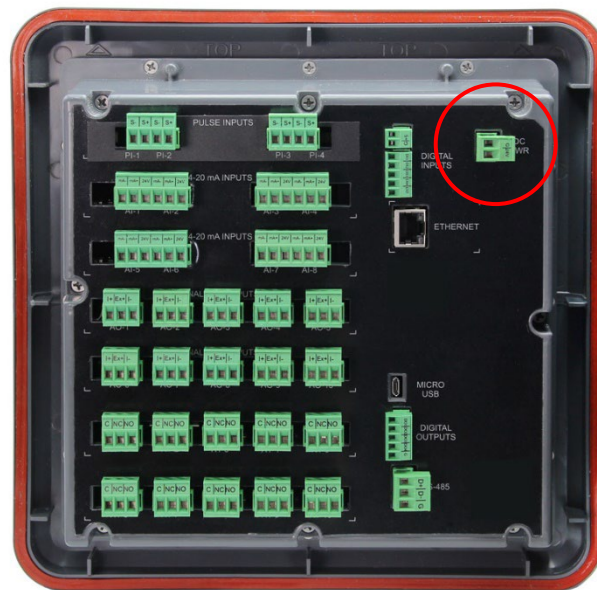
# Specify AC or DC Power

## 90-264 VAC Power

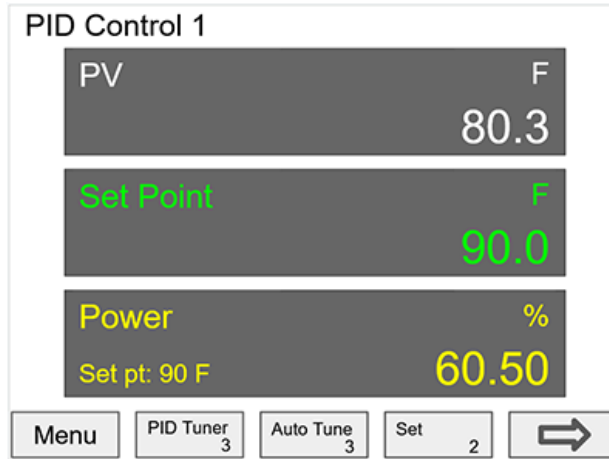


AC Power is Standard

## 24 VDC Power



\$200.00 Cost Adder for DC Powered Models



### What You Can Do with PID Control

- 4-20 mA Output for SCR Control
- Pulse Width Modulation (PWM) for SSR Control
- Heating & Cooling
- Switch Function to Quickly Change Target Set Point
- Switch Function for Easy Auto/Manual Mode Switching with Softkeys
- Enter New Set Points Easily On-Screen with Set Point Softkey
- Initiate Auto-Tune with Auto-Tune Softkey

## PID Control Screen Examples

PID Control

PV AVG C  
23.3

Active SP C  
0.0

Cool 1  
0.0

POWER  
Set pt: 0 C  
**STOPPED**

Menu PID Tuner 4 Auto Tune 4 Cool 2 Sw1 →

Main PID Control screen after power up. The Power channel displays the message STOPPED. The next screen has the function key to start the PID control.

Set Points

7. SP1 COOL C  
0.0

9. SP3 HEAT C  
65.0

8. SP2 COOL C  
10.0

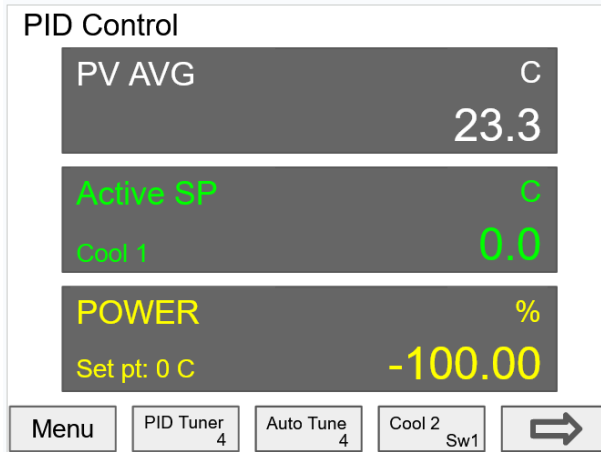
10. SP4 HEAT C  
85.0

Menu Start 4 Set 7 Set 8 →

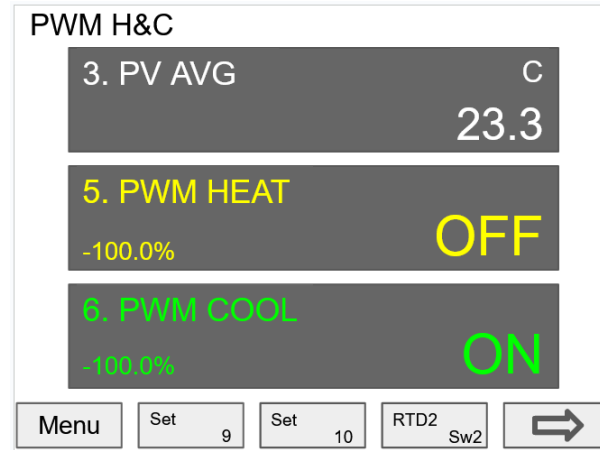
Set Point screen showing four temperature set points. The F1-F4 function keys are assigned to start PID control, change SP1, change SP2, and Next screen.



## PID Control Screen Examples

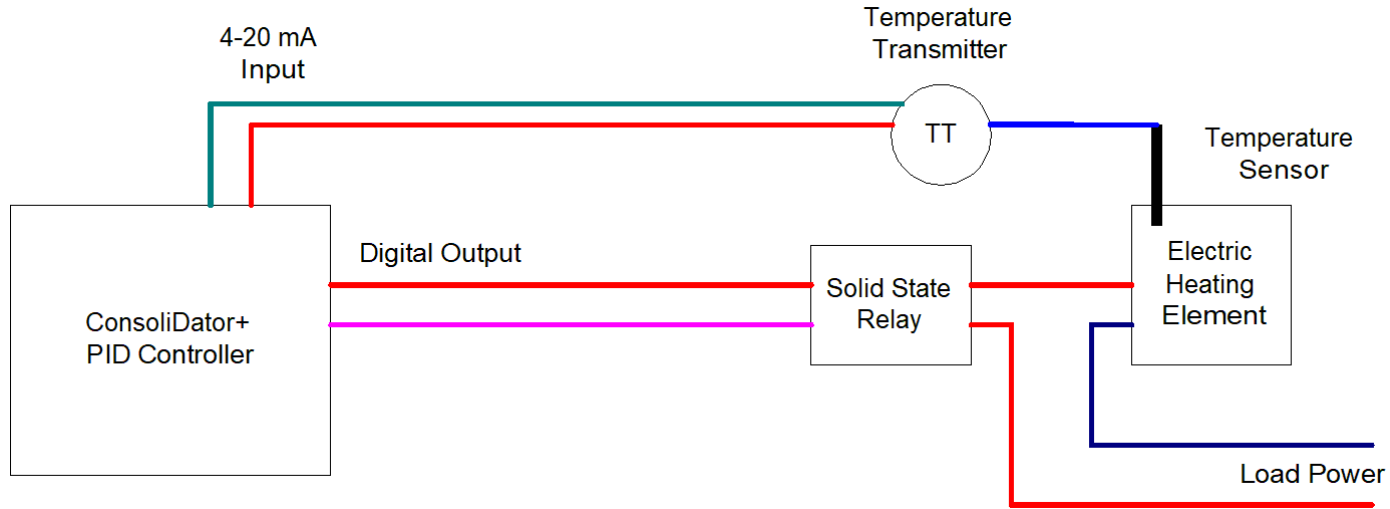


The Power channel outputs -100% indicating that is driving the compressor at full power.

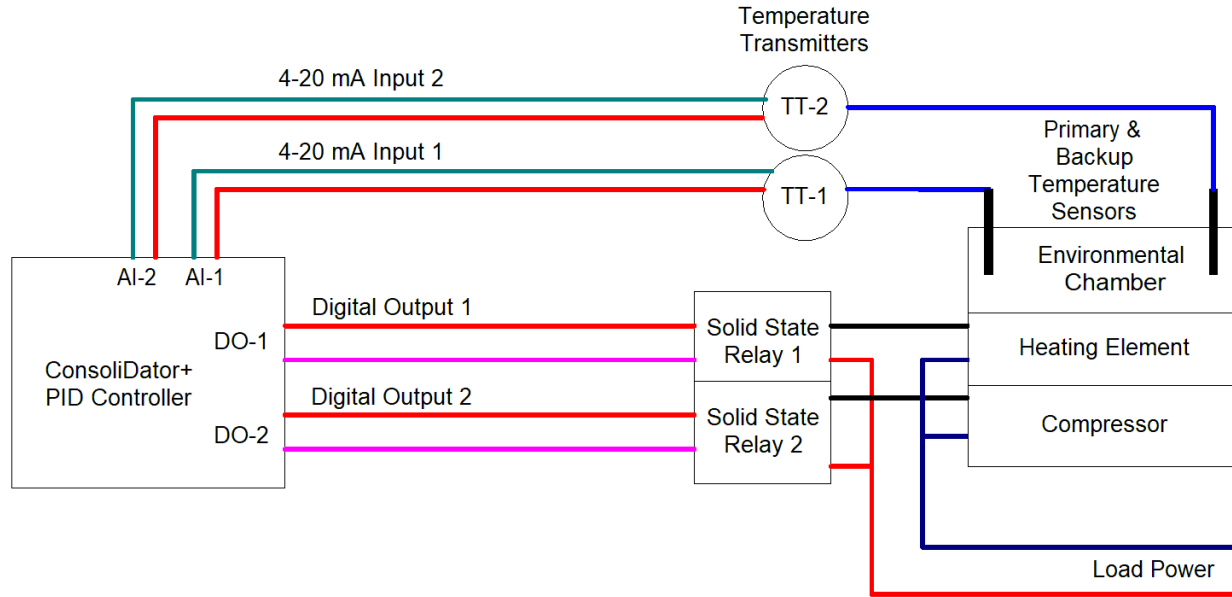


PWM H&C screen showing the PV and the status of the heating and cooling channels.

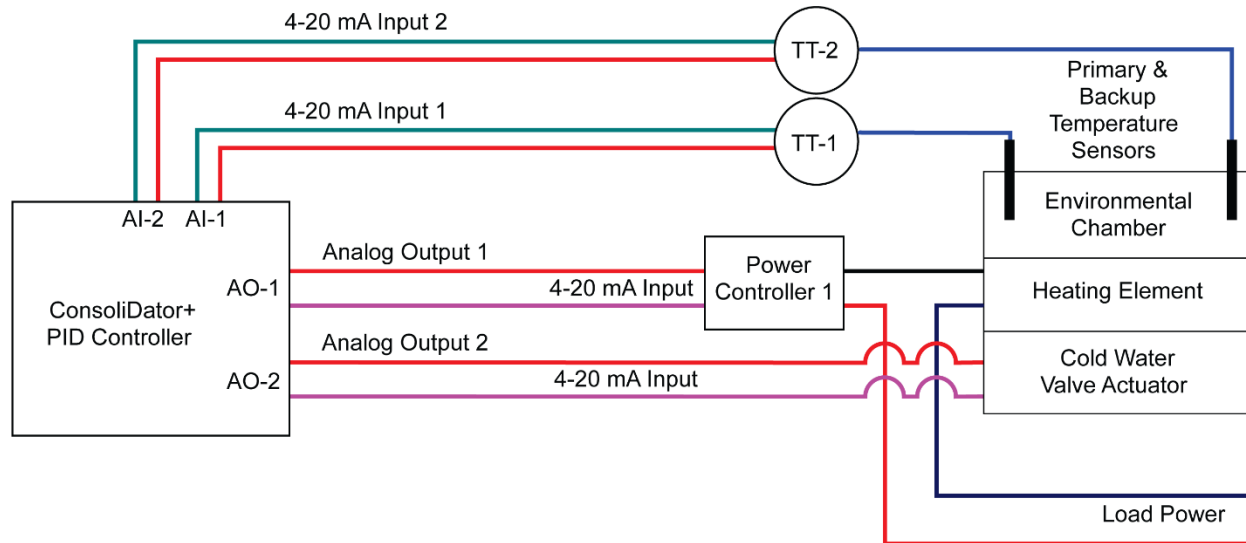
## Block Diagram for Heating

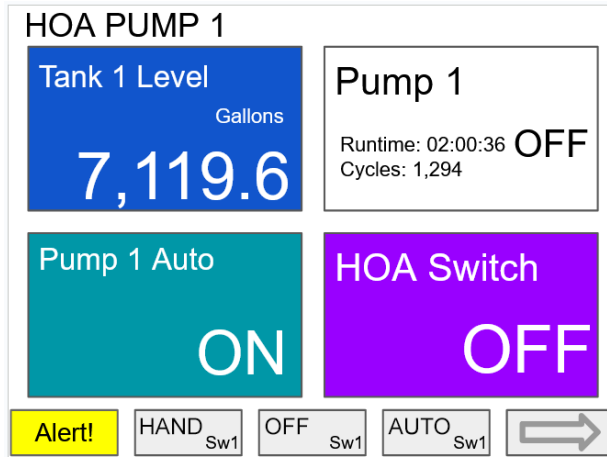


## Block Diagram for Heating & Cooling Using SSR



## Block Diagram for Heating & Cooling Using Analog Outputs

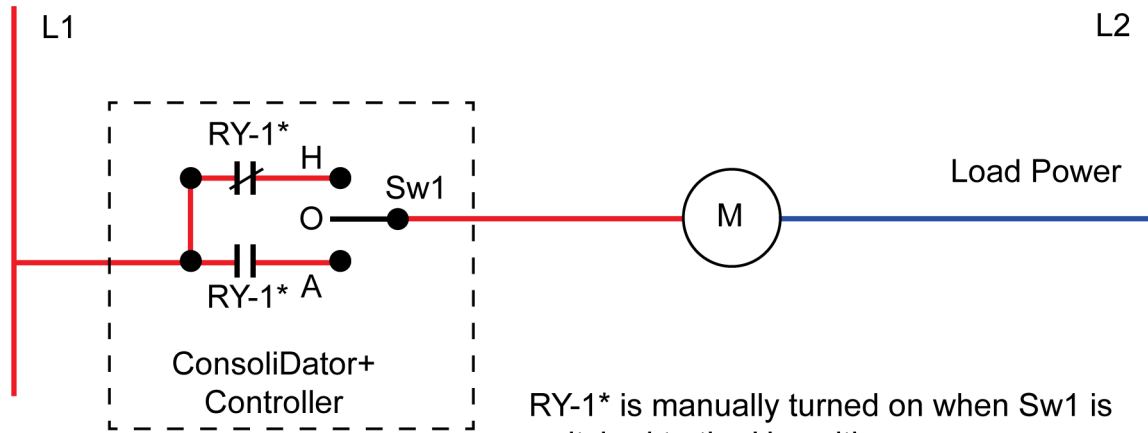




### What You Can Do with HOA Operation

- Program for Hand-Off-Auto control or PID Output Auto-Manual Switching
- Two, Three, and Four Way Switching
- Each Position Can Reference Any Channel, Input, Output, Total, Etc.
- Unique Name for Each Digital Switch and Switching Position
- Programmable Actions to Execute a Pushbutton Function in Addition to Changing Switch Position

### Block Diagram for HOA Switch



### Setup Switches Screen

MENU - SETUP Thursday, March 16, 2023 14:40:00

TIMERS

ALARMS

**SWITCHES**

INPUTS

OUTPUTS

SCREENS

DATA LOGS

No Switches

← ↑ ↓ → New

The Setup Switches screen is used to create and configure the digital switches.

### Setup HOA Switch

Sw1. HOA PUMP 1

Type: 3 Way  Remember

Pos 1. 3. Pump 1 Manual MAN

Pos 2. 4. Pump 1 Off OFF

Pos 3. 2. Pump 1 Auto AUTO

Pos 1 Action: Manual ON - RY-1. Pump 1

Pos 2 Action: Manual OFF - RY-1. Pump 1

Pos 3 Action: Automatic - RY-1. Pump 1

Cancel ↑ ↓ Edit Ok

Setup of a HOA switch to control a pump used to fill a tank based on the tank level.

- Select Switch as the Input for the Output
- Switch Positions Determine Output Operation
- Each Position Can Reference Any Channel

## Setup Screens to Operate Digital Switches

Sw1:   Color 1  
Type:   Remember  
Pos 1:    
Pos 2:    
Pos 1 Action:   
Pos 2 Action:

4-20 mA outputs of two temperature sensors being switched with the digital switch Sw1

Sw1:   Color 1  
Type:   Remember  
Pos 1:    
Pos 2:    
Pos 3:    
Pos 4:    
Pos 1 Action:   
Pos 2 Action:   
Pos 3 Action:   
Pos 4 Action:

4-way switch connecting the signal from four RTD transmitters.

- Uses On-Screen Softkeys, No Panel Switches Required
- Set a Specific Softkey to Select Any Single Position on the Digital Switch
- Set a Softkey to Cycle Next or Previous Position
- Display Switch Status on the Screen





### Features

- ConsoliDator+ demonstrator has everything you need to show off all its great features.
- Comes with a signal generator, so you can simulate almost any application.
- Equipped with a light/horn on the top of the unit to show indication of alarming conditions.
- Built-in feet to stabilize the unit while demonstrating.
- Protective carrying case makes it easy and convenient for transporting.



# Questions?

If you have any questions, then reach out to us.



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VP of Sales & Marketing

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