

# PC-22D ValvApp™ Worksheet



This worksheet is intended for the configuration of ValvApps™ used in the VC-22D Valve Controller. From the information provided below, Cla-Val will determine whether a standard ValvApp™ should be used or if a custom ValvApp™ is required. Additionally, this worksheet acts as a check list during commissioning to verify all parameters have been correctly configured in the VC-22D Valve Controller. Once this worksheet is completed, please return to your Cla-Val representative for approval. If a custom ValvApp is required and approved, a custom wiring diagram and ValvApp™ will be created and emailed to you. Please verify all \*Required fields have been filled out prior to submittal.

<b>Information</b>		<b>Reset Form</b>	<b>Configuration:</b> PC-22D Modulating
*Project Name	N/A	*Today's Date	
*Cla-Val Representative	N/A	Project Completion Date	
Control Valve Model Number (if known)	133	Customer Approval Signature	
<b>Valve Regulation</b> (If more than 2 PID's are required, specify in logic on page 2)			
<input checked="" type="checkbox"/> PID 1 - Valve Regulation	*Solenoid Config NO / NC (P.F. Close)	<input type="checkbox"/> PID 2 - Valve Regulation	PID Selection Mode
*Control Type	Flow	*Signal Loss	Close Valve
Control Type		Signal Loss	
Deadband (+/-)		Ramping	
<b>DP Metering (133 Valve)</b>			
<input checked="" type="checkbox"/> DP Metering	Pressure Measurement	<input checked="" type="radio"/> P1+P2	<input type="radio"/> DPT
Output	Analog Out 1		
Size	16"	Body Style	100-01 Globe
Seat	Standard	Units	gpm
Output Scaling	0-2000		
<b>Totalizer</b>			
<input type="checkbox"/> Totalizer	Reset	Units	Output
<b>Analog Inputs (4-20mA) 6 Available</b>			
<input checked="" type="checkbox"/> *Analog Input #1 (Typically reserved for control setpoint signal)	Name	Flow SP	Units
	Units	gpm	
Scaling	4mA = 0	20mA = 2000	Decimal
			0
<input checked="" type="checkbox"/> *Analog Input #2 (Typically reserved for control feedback signal)	Name	Position Feedback	Units
	Units	%	
Scaling	4mA = 0	20mA = 100	Decimal
			0.0
<input checked="" type="checkbox"/> Analog Input #3	Name	Upstream Pressure	Units
	Units	psi	
Scaling	4mA = 0	20mA = 290	Decimal
			0.0
<input checked="" type="checkbox"/> Analog Input #4	Name	Downstream Pressure	Units
	Units	psi	
Scaling	4mA = 0	20mA = 290	Decimal
			0.0
<input type="checkbox"/> Analog Input #5	Name		Units
	Units		
Scaling	4mA =	20mA =	Decimal
<input type="checkbox"/> Analog Input #6	Name		Units
	Units		
Scaling	4mA =	20mA =	Decimal
<b>Digital Inputs 6 Available</b>			
<input checked="" type="checkbox"/> Digital Input 1	Name	Remote Start Request (opt)	Purpose
	Purpose	Remote start request from SCADA	
<input checked="" type="checkbox"/> Digital Input 2	Name	Valve Limit Switch	Purpose
	Purpose	Limit switch indicated when valve close	
<input checked="" type="checkbox"/> Digital Input 3	Name	Inlet Pressure Switch (opt)	Purpose
	Purpose	Indicates sufficient pressure reached	
<input checked="" type="checkbox"/> Digital Input 4	Name	Manual Start Pump Req	Purpose
	Purpose	Local start pump button	
<input checked="" type="checkbox"/> Digital Input 5	Name	Manual Stop Pump Req	Purpose
	Purpose	Local stop pump button	
<input checked="" type="checkbox"/> Digital Input 6	Name	Emergency Stop	Purpose
	Purpose	Emergency stop button	

**Analog Outputs (4-20mA)** Note: Analog Outputs are sourced with controller power.

<input checked="" type="checkbox"/> Analog Output #1	Name <input type="text" value="Flow"/>	Units <input type="text" value="gpm"/>	Scaling	4mA = <input type="text" value="0"/>	20mA = <input type="text" value="2000"/>	Decimal <input type="text" value="0"/>
<input type="checkbox"/> Analog Output #2	Name <input type="text"/>	Units <input type="text"/>	Scaling	4mA = <input type="text"/>	20mA = <input type="text"/>	Decimal <input type="text"/>
<input type="checkbox"/> Analog Output #3	Name <input type="text"/>	Units <input type="text"/>	Scaling	4mA = <input type="text"/>	20mA = <input type="text"/>	Decimal <input type="text"/>
<input type="checkbox"/> Analog Output #4	Name <input type="text"/>	Units <input type="text"/>	Scaling	4mA = <input type="text"/>	20mA = <input type="text"/>	Decimal <input type="text"/>

**Solenoid Outputs**

<input checked="" type="checkbox"/> *Solenoid Output #1 (SO1)	Name <input type="text" value="Closing Solenoid"/> <small>Default: Closing Solenoid</small>	<input checked="" type="checkbox"/> Solenoid Output #2 (SO2)	Name <input type="text" value="Opening Solenoid"/> <small>Default: Opening Solenoid</small>	<small>Note: SO1 and SO2 are a powered solid state output typically reserved for solenoids used on a 131 or 133 series valve. The output can be configured as PWM (default) or Discrete ON/OFF. If configured as discrete, a value of 0 represents an open circuit, and 1 a closed circuit.</small>
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**Relay Output**

<input checked="" type="checkbox"/> Relay Output #1 (RO1)	Name <input type="text" value="Pump Start Command"/>	<input checked="" type="checkbox"/> Relay Output #2 (RO2)	Name <input type="text" value="Alarm Output"/>	<small>Note: RO1 and RO2 are configured as dry contact mechanical relays typically used for alarms. These outputs are configured as Discrete ON/OFF, a value of 0 represents an open circuit, and 1 a closed circuit.</small>
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**Actions/Alarms**

<input type="checkbox"/> Action #1	Name <input type="text"/>	Describe <input type="text"/>	<small>Additional Comments</small> <input type="text"/>
<input type="checkbox"/> Action #2	Name <input type="text"/>	Describe <input type="text"/>	<small>Additional Comments</small> <input type="text"/>
<input type="checkbox"/> Action #3	Name <input type="text"/>	Describe <input type="text"/>	<small>Additional Comments</small> <input type="text"/>
<input type="checkbox"/> Action #4	Name <input type="text"/>	Describe <input type="text"/>	<small>Additional Comments</small> <input type="text"/>

**Communication**

<input type="checkbox"/> GSM/GPRS	<input checked="" type="checkbox"/> Modbus TCP/IP	<input type="checkbox"/> Modbus RTU (RS485/RS232)	<small>Note: See ModBus specification page for register mapping and implementation. Refer to manual for more details.</small>
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**\*Control Logic** (Please specify all control logic using sketches, diagrams, etc. Attach additional sheets if necessary)

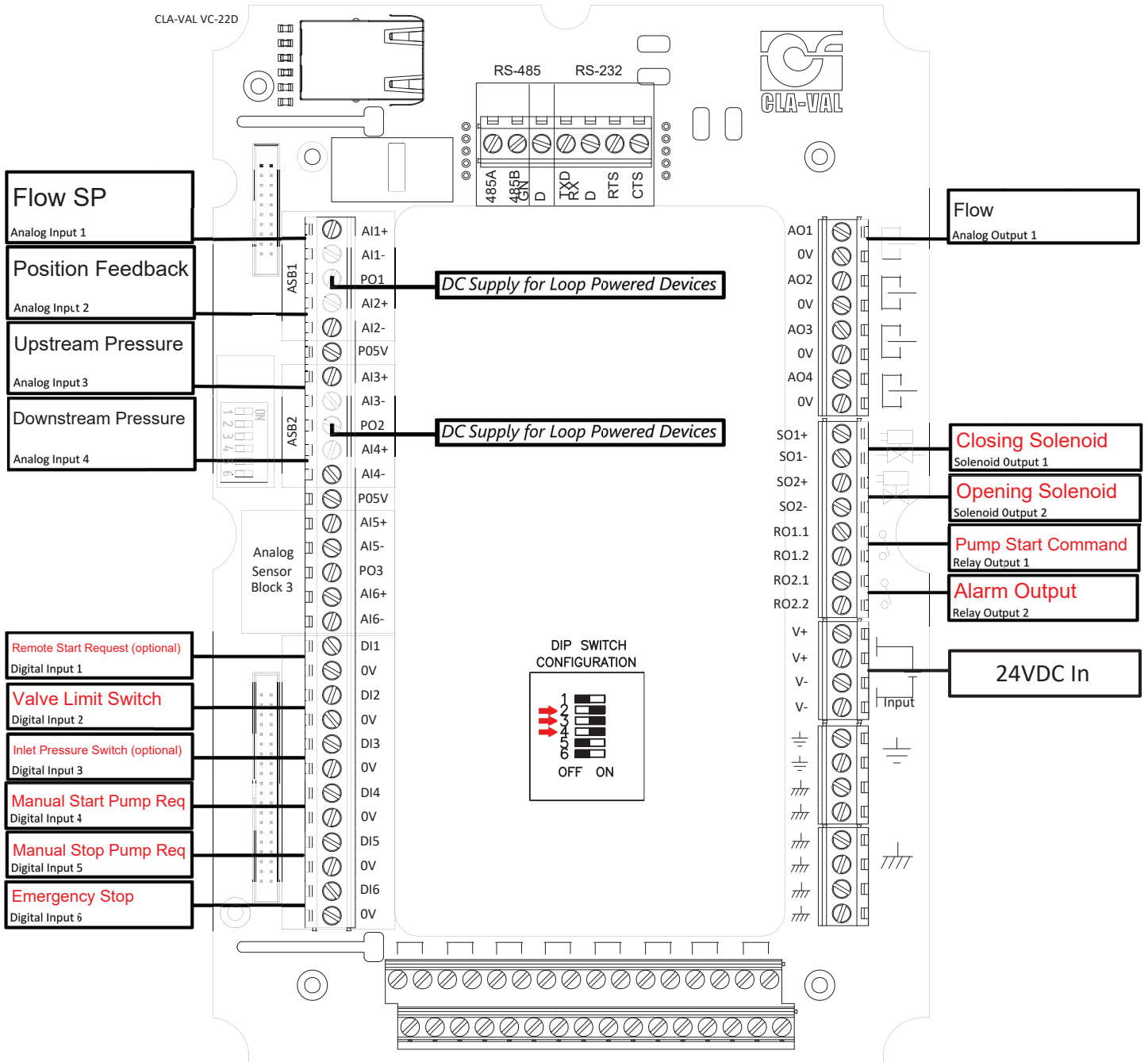
This app will control Flow through a 133 Series Pump Control Valve. Flow will be calculated using Valve Position and Upstream and Downstream Pressure. For valve operation, an OpeningConfig variable has been added in the short-down menu. This variable will allow you to define whether to use the limit switch or the position transmitter to determine if the valve is open or closed.

Once a Start Command is received, either through the pushbutton or remotely, a command will be sent to start the pump. Once pressure has been reached, valve will begin to open and control selected process variable. If the feedback is below the setpoint, the valve will modulate open. If the feedback is above the setpoint, the valve will modulate closed.

If the selected Process Variable losses any of its inputs (Setpoint, Feedback, or Flow Calculation Inputs), the valve will throw a fault and close.

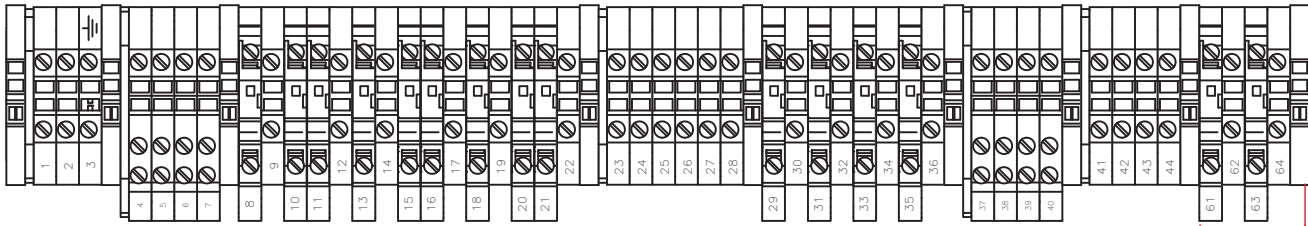
\* This is only to give an idea of where wires will be landed. Does not account for number of wires and Loop or Field powered. Please refer to **Electrical Wiring** section of VC-22D IOM for help wiring loop or field powered devices.

\*\* This page for troubleshooting and reference only! Red text represents predefined I/O within the App. Controller wiring should not be changed in the field, but additional I/O can be landed at the DIN rail. To add functionality or use optional I/O for something else, contact your Cla-Val Rep.



\*Please refer to individual I/O sensor documents for correct wiring. This is only to give an idea of where wires will be landed. Does not account for number of wires and Loop or Field powered.

\*\*Optional I/O does not need to be landed for App to function. To add functionality or additional I/O, contact Cla-Val rep.



**Only on panels manufactured after 9/30/2022**

Land AC Solenoids here

CUSTOMER CONNECTIONS	
TERM	DESCRIPTION
POWER SUPPLY	
1 ; (L)	120 - 240 VAC/ 50 - 60 HZ
2 ; (N)	
3 ; GROUND	
SOLENOID OUTPUTS 120-240 VAC/50-60 HZ	
4 ; SO1+ (L)	Closing Solenoid
5 ; SO1- (N)	
6 ; SO2+ (L)	Opening Solenoid
7 ; SO2- (N)	
ANALOG INPUTS 4-20MA	
8 ; AI1+	Flow SP
9 ; AI1-	
10 ; PO1	DC Supply For Loop Powered Devices
11 ; AI2+	Position Feedback
12 ; AI2-	
13 ; AI3+	Upstream Pressure
14 ; AI3-	
15 ; PO2	DC Supply For Loop Powered Devices
16 ; AI4+	Downstream Pressure
17 ; AI4-	
18 ; AI5+	Not used
19 ; AI5-	
20 ; PO3	Not used
21 ; AI6+	Not used
22 ; AI6-	
DIGITAL INPUTS (USE WITH DRY CONTACT ONLY)	
23 ; DI1+	Remote Start Request (optional)
24 ; DI1-	

CUSTOMER CONNECTIONS	
TERM	DESCRIPTION
25 ; DI2+	Valve Limit Switch
26 ; DI2-	
27 ; DI3+	Inlet Pressure Switch (optional)
28 ; DI3-	
ANALOG OUTPUTS 4-20MA	
29 ; AO1+	Flow
30 ; AO1-	
31 ; AO2+	Not used
32 ; AO2-	
33 ; AO3+	Not used
34 ; AO3-	
35 ; AO4+	Not used
36 ; AO4-	
SOLENOID OUTPUTS 24 VDC	
37 ; SO1+ (24VDC)	Closing Solenoid
38 ; SO1- (0VDC)	
39 ; SO2+ (24VDC)	Opening Solenoid
40 ; SO2- (0VDC)	
DIGITAL OUTPUTS (OPEN/CLOSES DRY CONTACT)	
41 ; RO1.1	Pump Start Command
42 ; RO1.2	
43 ; RO2.1	Alarm Output
44 ; RO2.2	
SPARE 24 VDC OUTPUTS (on panels manufactured after 9/30/2022)	
61	24 VDC
62	0 VDC
63	24VDC
64	0 VDC

Land DC Solenoids here

**Cla-Val VC-22D Modbus Addresses**

**Project Name:**  
**Date:**

N/A

Modbus Input	Description	Data Type	Access	I/O Mapping	Comments
40007 Bit 0	Flow SP	Analog Input Modbus Override Bit	Write	N/A	Overrides 4-20mA AI1 Input to use Modbus Address 43000/43001
40007 Bit 1	Position Feedback	Analog Input Modbus Override Bit	Write	N/A	Overrides 4-20mA AI2 Input to use Modbus Address 43002/43003
40007 Bit 2	Upstream Pressure	Analog Input Modbus Override Bit	Write	N/A	Overrides 4-20mA AI3 Input to use Modbus Address 43004/43005
40007 Bit 3	Downstream Pressure	Analog Input Modbus Override Bit	Write	N/A	Overrides 4-20mA AI4 Input to use Modbus Address 43006/43007
40007 Bit 4	--	Analog Input Modbus Override Bit	Write	N/A	Overrides 4-20mA AI5 Input to use Modbus Address 43008/43009
40007 Bit 5	--	Analog Input Modbus Override Bit	Write	N/A	Overrides 4-20mA AI6 Input to use Modbus Address 43010/43011
40008 Bit 0	Remote Start Request (optional)	Digital Input Modbus Override Bit	Write	N/A	Overrides Hardware DI1 Input to use Modbus Address 41000
40008 Bit 1	Valve Limit Switch	Digital Input Modbus Override Bit	Write	N/A	Overrides Hardware DI2 Input to use Modbus Address 41001
40008 Bit 2	Inlet Pressure Switch (optional)	Digital Input Modbus Override Bit	Write	N/A	Overrides Hardware DI3 Input to use Modbus Address 41002
40008 Bit 3	Manual Start Pump Req	Digital Input Modbus Override Bit	Write	N/A	Overrides Hardware DI4 Input to use Modbus Address 41003
40008 Bit 4	Manual Stop Pump Req	Digital Input Modbus Override Bit	Write	N/A	Overrides Hardware DI5 Input to use Modbus Address 41004
40008 Bit 5	Emergency Stop	Digital Input Modbus Override Bit	Write	N/A	Overrides Hardware DI6 Input to use Modbus Address 41005
41000	Remote Start Request (optional)	Digital Input	Read/Write	DI1	Register Holds/Reads DI1 Value
41001	Valve Limit Switch	Digital Input	Read/Write	DI2	Register Holds/Reads DI2 Value
41002	Inlet Pressure Switch (optional)	Digital Input	Read/Write	DI3	Register Holds/Reads DI3 Value
41003	Manual Start Pump Req	Digital Input	Read/Write	DI4	Register Holds/Reads DI4 Value
41004	Manual Stop Pump Req	Digital Input	Read/Write	DI5	Register Holds/Reads DI5 Value
41005	Emergency Stop	Digital Input	Read/Write	DI6	Register Holds/Reads DI6 Value
41006	Closing Solenoid	Digital Output	Read	S01	Monitory Purposes (Optional)
41007	Opening Solenoid	Digital Output	Read	S02	Monitory Purposes (Optional)
41008	Pump Start Command	Digital Output	Read	R01	Monitory Purposes (Optional)
41009	Alarm Output	Digital Output	Read	R02	Monitory Purposes (Optional)
43000/43001	Flow SP	Analog Input	Read/Write	AI1	Register Holds/Reads AI1 Value x100 for Two Implied Decimals
43002/43003	Position Feedback	Analog Input	Read/Write	AI2	Register Holds/Reads AI2 Value x100 for Two Implied Decimals
43004/43005	Upstream Pressure	Analog Input	Read/Write	AI3	Register Holds/Reads AI3 Value x100 for Two Implied Decimals
43006/43007	Downstream Pressure	Analog Input	Read/Write	AI4	Register Holds/Reads AI4 Value x100 for Two Implied Decimals
43008/43009	--	Analog Input	Read/Write	AI5	Register Holds/Reads AI5 Value x100 for Two Implied Decimals
43010/43011	--	Analog Input	Read/Write	AI6	Register Holds/Reads AI6 Value x100 for Two Implied Decimals
43036/43037	Flow	Analog Output	Read	AO1	Monitory Purposes (Optional) - Register Holds AO1 Value x100 for Two Implied Decimals
43038/43039	--	Analog Output	Read	AO2	Monitory Purposes (Optional) - Register Holds AO2 Value x100 for Two Implied Decimals
43040/43041	--	Analog Output	Read	AO3	Monitory Purposes (Optional) - Register Holds AO3 Value x100 for Two Implied Decimals
43042/43043	--	Analog Output	Read	AO4	Monitory Purposes (Optional) - Register Holds AO4 Value x100 for Two Implied Decimals

\*\*\* Additional ModBus information can be found in the manual.