Blue-White®

Operating Manual

CHEM-FEED®

Multi-Diaphragm Metering Pump

CD3

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READ THE ENTIRE OPERATING MANUAL PRIOR TO INSTALLATION AND USE.


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Congratulations on purchasing the CD3 CHEM-FEED® variable speed Multi-Diaphragm Metering Pump.

Your CHEM-FEED® CD3 pump is shipped with all fitting connections for easy installation. Configured flow rate on pump display is set for the maximum flow rate. Your flow rate may vary depending on discharge pressure. Calibration is recommended during initial set-up of the pump.

Please Note: Your new pump has been pressure tested at the factory with clean water before shipping. You may notice trace amounts of clean water in the pump head assembly. This is part of our stringent quality assurance program at Blue-White Industries.

For more information please visit us at: www.blue-white.com

For videos and tutorials please visit as at:
https://www.blue-white.com/resources/videos

1.1 What's In The Box

The following items are included with every CD3 Multi-Diaphragm metering pump:

CD3 Multi-Diaphragm Pump
With 6ft (1.8m) power cord

USB Flash Drive With Instruction Manual

Fittings Kit

1/2" Barb Fittings (Straight & Elbow Adapters), 1/2" MNPT Fittings (Straight and Elbow Adapters) & 1/2" MNPT Foot valve

Mounting Brackets

(2) Stainless Steel brackets with hardware to mount to pump. Hardware to mount brackets to surface provided by others.

1.2 Features

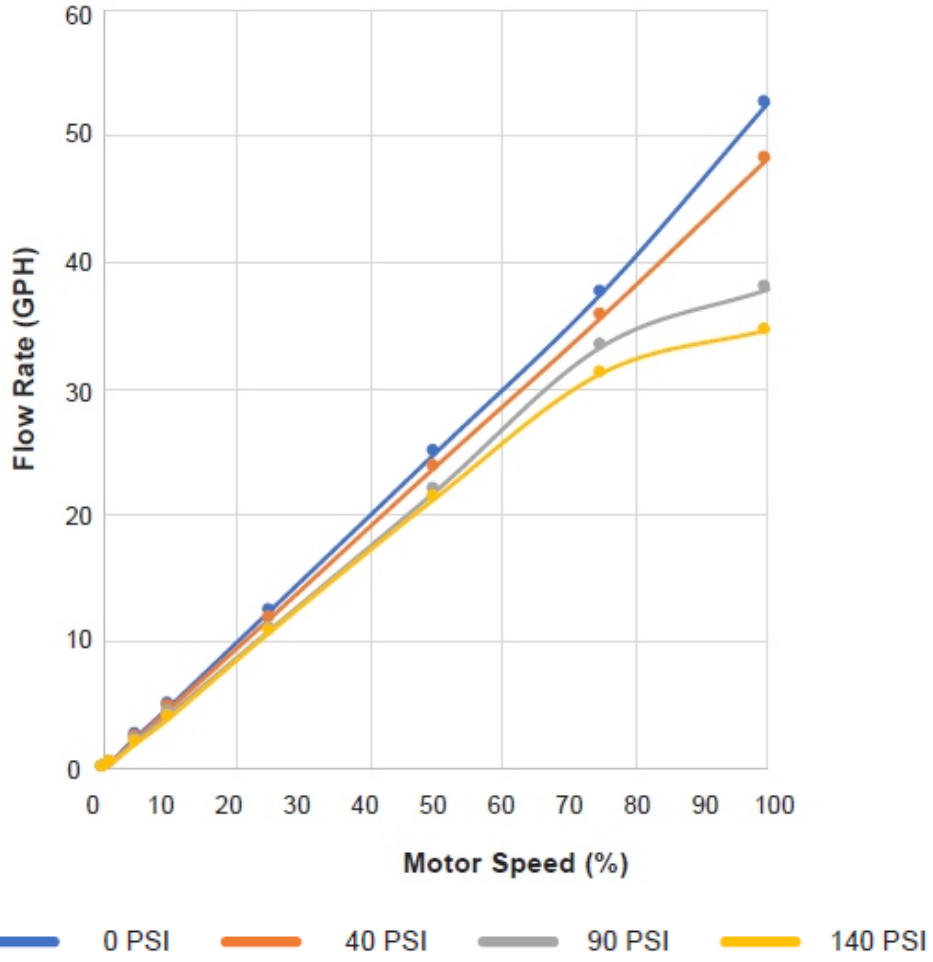
The following items are included with every CD3 diaphragm metering pump:

- Motor driven diaphragm pump offers smooth and quiet chemical dosing. No hard pulses as seen with solenoid driven pumps.
- 1,000:1 turndown ratio.
- Full stroke every time avoids vapor lock.
- Brushless DC motor.
- Rated for continuous duty (24/7).
- Exclusive DIAFLEX® Diaphragm guaranteed to last the life of the pump.
- PVDF / Ceramic pump head components.
- Diaphragm Failure Detection (DFD) system. Senses diaphragm failure by detecting chemical in pump head.
- Intuitive 5” touchscreen color display and user interface.
- Controls and I/O include:
  Manual Speed Control, 4-20 mA input, Pulse and frequency input, Remote Start/Stop, Communications options = Ethernet IP, Modbus TCP, Profibus, Scalable 4-20mA output or frequency output, one 250V/6A relay and three 115V/1A contact closures assignable to monitor various pump functions including DFD, FVS, stroke counter, remote/local, input signals, output signals, motor on, motor fault, operating mode setting, and others.
- CNC precision machined cam and piston for optimum efficiency, unparalleled accuracy, and linearity.
- Heavy duty PVDF pump head and valves are standard.
- Compatible with Blue-White’s output Flow Verification Sensor (FVS) system.
- Includes stainless steel extended mounting brackets. Lifts pump 4-1/2” (11.43 cm), for easy access in hard to reach areas.

Maximum Working Pressure	145 psig (10 bar)
	NOTE: See pump curve details.
Maximum Fluid Temperature	185 °F (85 °C)
	NOTE: Tested with water. Some chemicals may affect pump at higher temp
Maximum Viscosity	1,000 Centipoise
Maximum Suction Lift	23 ft. Water, 0 psig (7 m, 0 bar)
Ambient Operating Temperature	14 °F to 115 °F (-10 °C to 46 °C)
Ambient Storage Temperature	-40 °F to 158 °F (-40 °C to 70 °C)
Operating Voltage	115VAC/60Hz, 1ph (2.0 Amp Maximum)
	230VAC/60Hz, 1ph (1.0 Amp Maximum)
	220VAC/50Hz, 1ph (1.0 Amp Maximum)
	240VAC/50Hz, 1ph (1.0 Amp Maximum)
	230VAC/50Hz, 1ph (1.0 Amp Maximum)
Power Cord Options	115V60Hz = NEMA 5/15 (USA)
	230V60Hz = NEMA 6/15 (USA)
	220V50Hz = CEE 7/VII (EU)
	240V50Hz = AS 3112 (Australia/New Zealand)
	230V50Hz = BS 1363/A (UK)
Motor	Brushless DC, 1/4 hp
Motor Speed Adjustment Range	1,000:1 (0.1% - 100% motor speed) Max RPM = 190, SPM = 380
Motor Speed Adjustment Resolution	0.1% increments > 1% motor speed and < 100%
	0.01% increments < 1% motor speed
Display	5” touchscreen color LCD, UV resistant.
Display Languages	English, Spanish, French, German, and Portuguese selectable
Maximum Overall Dimensions	16-1/8”W x 15-1/4”H x 15-5/16”D (40.9W x 37.8H x 38.9D cm)
Product Weight	40lb. (18.2 Kg)
Security	Programmable 6-digit password
Approximate Shipping Weight	50 lb. (22.7 Kg)
Enclosure	NEMA 4X (IP66), Polyester powder coated aluminum & Noryl
RoHS Compliant	Yes
Standards	cETLus, CE

2.1 PERFORMANCE / FLOW CURVE

Discharge pressure and motor RPM both have an effect on fluid output. For your reference the charts below display the various pressures and their output at different motor RPM/SPM. All testing was conducted with water at a three foot suction lift.



Motor Speed 380 Strokes/min	Flow Rate GPH Pressure				
	RPM	0 PSIg	40 PSIg	90 PSIg	140 PSIg
0%	0	0	0	0	0
1%	1.3	0.5	0.5	0.4	0.4
5%	10	2.6	2.4	2.3	2.1
10%	19	5.0	4.8	4.4	4.1
25%	48	12.5	11.9	11.0	10.8
50%	95	25.0	23.9	22.0	21.4
75%	142	37.6	35.7	33.4	31.2
100%	190	52.6	48.2	37.9	34.6

3.1 Non-Wetted Components

Non-wetted Components:
Enclosure: 413 Aluminum (Polyester powder coated) & Noryl
Drive Enclosure: Valox (PBT) thermoplastic
Permanently lubricated sealed motor shaft support ball bearing.
Drive Enclosure Cover: Polycarbonate
Cover Screws: 300 Series stainless steel
Pump Head Cover: 316 Stainless Steel
Motor Shaft: Chrome plated steel
DFD System Sensor pins: Hastelloy C-276
Power Cord: 3 conductor, SJTW-A water-resistant
Mounting Brackets and Hardware: 316 Stainless steel

3.2 Wetted Components

Wetted Components:	
Pump Head Assembly:	Pump Head: PVDF
	Adapter Connections: PVDF
	Valve Cartridges: PVDF
	Valve Balls: Ceramic
	Elastomers: TFE/P
	Static Seals: TFE/P (optional EP)
	Diaphragm: DiaFlex® (optional Flex-A-Prene®) *
Foot Valve / Strainer:	Body & Adapter: PVDF
	Check Ball: Ceramic
	Spring: Hastelloy C-276, 6 lbs.
	O-Ring Seals: TFE/P (optional EP)
	Filter Screen: PVDF
Recommended Ancillary Items Sold Separately	
Injection / Back-Flow Check Valve:	Body & Insert: PVDF
	Check Ball: Ceramic
	Spring: Hastelloy C-276, 6 lbs.
	O-Ring Seals: TFE/P (optional EP)

* Consult factory for chemical compatibility

4.1 Agency Listings

This pump is ETL listed to conforms to the following: UL Standard 778 as a motor operated water pump. CSA Standard C22.2 as process control equipment

This pump complies to the Machinery Directive 2006/42/EC, BS, EN 60204-1, Low Voltage Directive 2014/35/EU BS EN 61010-1, EMC Directive 2014/30/EU, BS EN 50081-1/BS EN 50082-1.

Symbol	Description
	Warning (Risk of electric shock)
	Caution (Refer to the user's guide)
	Ground, Protective Conductor Terminal

ENCLOSURE RATING

NEMA 4X Constructed for either indoor or outdoor use to provide a degree of protection to personnel against incidental contact with enclosed equipment; to provide a degree of protection against falling dirt, rain, sleet, snow, windblown dust, splashing water, and hose-directed water; and that will be undamaged by external formation of ice on enclosure.

IP66 No ingress of dust; complete protection against contact. Water projected in powerful jets against enclosure from any direction shall have no harmful effects.

CAUTION

The pump should be serviced by qualified persons only. If equipment is used in a manner not specified in this manual, the protection provided by the equipment may be impaired.

CAUTION

Always wear protective clothing, face shield, safety glasses and gloves when working on or near your metering pump. Additional precautions should be taken depending on solution being pumped. Refer to MSDS precautions from your solution supplier.

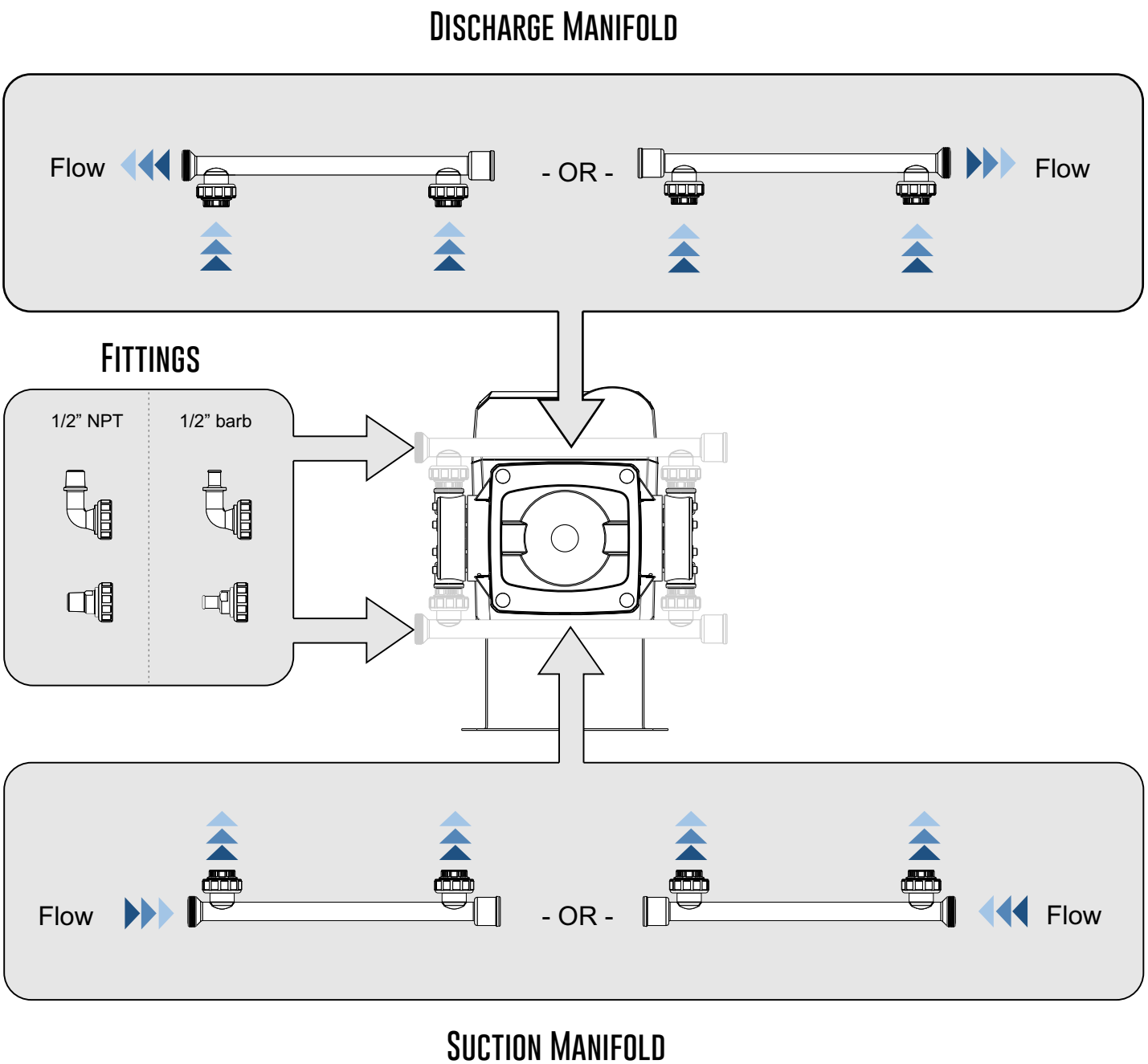
CAUTION

All diagrams are strictly for guideline purposes only. Always consult an expert before installing metering pump on specialized systems. Metering pump should be serviced by qualified persons only.

CAUTION

The pump should be supplied by an isolating transformer or RCD (operating current less or equal 30 mA).

5.1 Pump Manifold and Fitting Configuration



5.2 Mounting Location

1. Choose an area located near the chemical supply tank, chemical injection point, and electrical supply. Also, choose an area where the pump can be easily serviced.

2. Finding a secure surface and using the provided mounting hardware, mount the pump close to the injection point. Keep the inlet (suction) and outlet (discharge) tubing as short as possible. Longer discharge tubing increases back pressure at pump head.

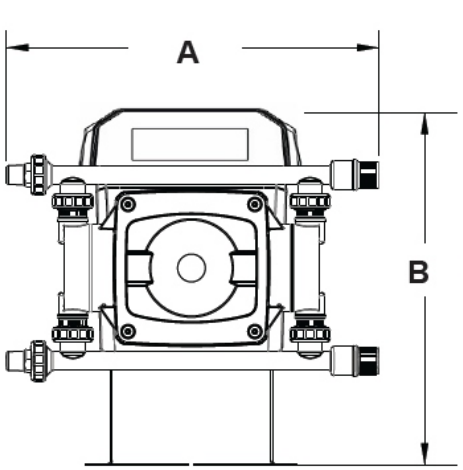
NOTE: Mount the pump securely using the provided mounting bracket and hardware.

NOTE: It is recommended to have a pressure relief valve at the discharge side of the of pump to prevent premature wear and damage to the pump, in the event that the discharge line becomes blocked.

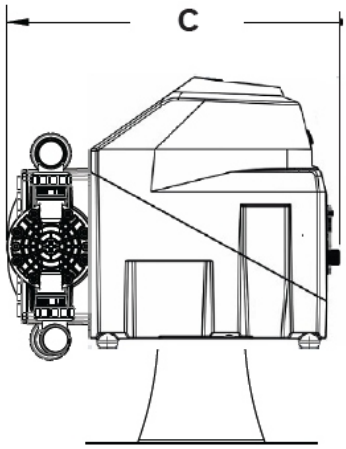
NOTE: The pump does not require back pressure. Back-pressure may be desire to maintain consistent flow when pressure varies at discharge/injection point.

NOTE: Install a back flow prevention check valve at discharge side of pump to prevent system fluid from flowing back through pump during pump maintenance.

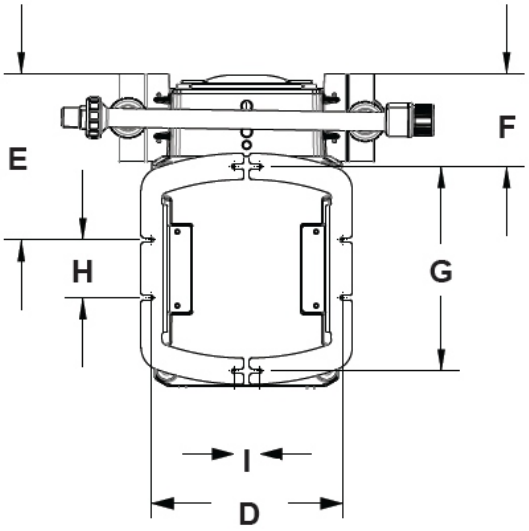
5.3 Pump Dimensions



Front View

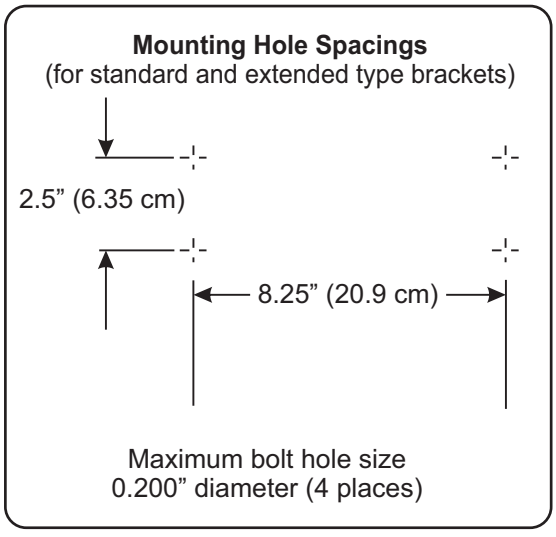


Side View



Bottom View

Dim	Inch	cm	Dim	Inch	cm
A	16.13”	40.97	F	4.00”	10.15
B	16.25”	41.28	G	8.86”	22.50
C	13.58”	34.49	H	2.50”	6.35
D	8.30”	21.08	I	1.10”	2.79
E	7.18”	18.22			



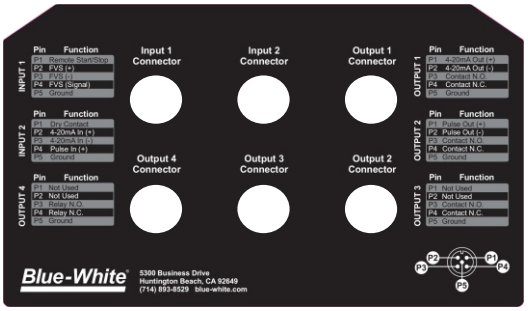
5.4 Input Power Connections

WARNING 	Risk of electric shock – cord connected models are supplied with a grounding conductor and grounding-type attachment plug. To reduce risk of electric shock, be certain that it is connected only to a properly grounded, grounding-type receptacle.
WARNING 	Electrical connections and grounding (earthing) must conform to local wiring codes.
WARNING 	Risk of electric shock - Disconnect electricity before removing the wiring compartment cover.

- Be certain to connect pump to proper supply voltage. Using incorrect voltage will damage pump and may result in injury. Voltage requirement is printed on pump serial label.
- Input power range is 96VAC to 264VAC 50/60 Hz.
- Voltage Selection is automatically detected and adjusted by power supply. No mechanical switch necessary.
- Use power cord which is rated for your voltage.
- Power cord models are supplied with a ground wire conductor and a grounding type attachment plug (power cord). To reduce risk of electric shock, be certain that power cord is connected only to a properly grounded, grounding type receptacle.
- Be sure all M12 wiring cable glands are properly installed and sealed.
- Never strap control (input / output) cables and power cables together.
- **Power Interruption:** This pump has a user programmable auto-restart feature which will can either restore the pump to the operating state it was in when power was lost or require a user action to restart.

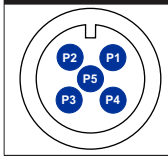
! ***Note:*** *When in doubt regarding your electrical installation, contact a licensed electrician.*

5.5 Wiring Terminals and I/O Schematics



WARNING

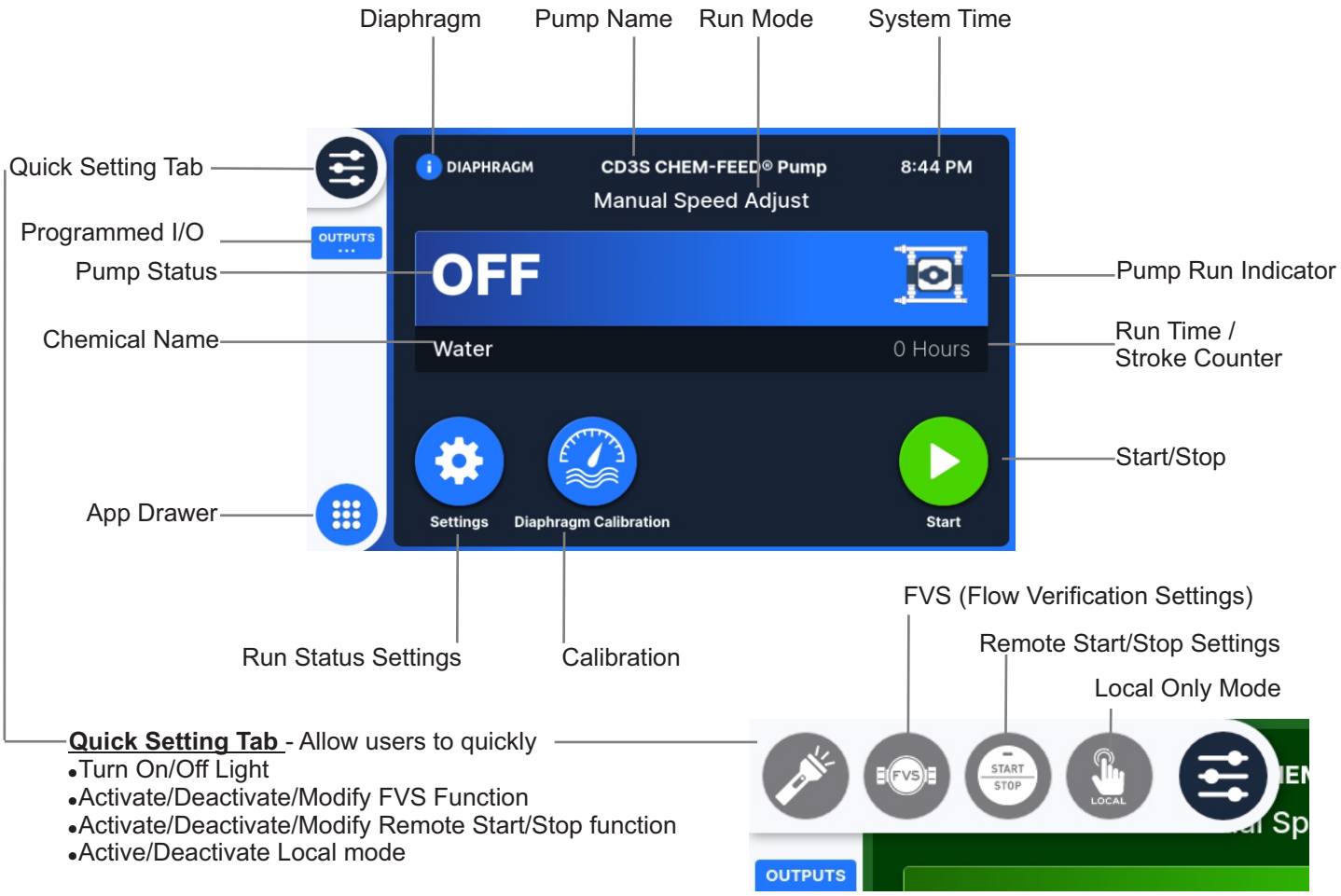
Risk of electric shock - All wiring must be insulated and rated 300V minimum.

KIT-M12 WIRING INSTRUCTIONS		
DIAGRAM	PIN #	WIRE
	PIN 1	BROWN
	PIN 2	WHITE
	PIN 3	BLUE
	PIN 4	BLACK
	PIN 5	GRAY

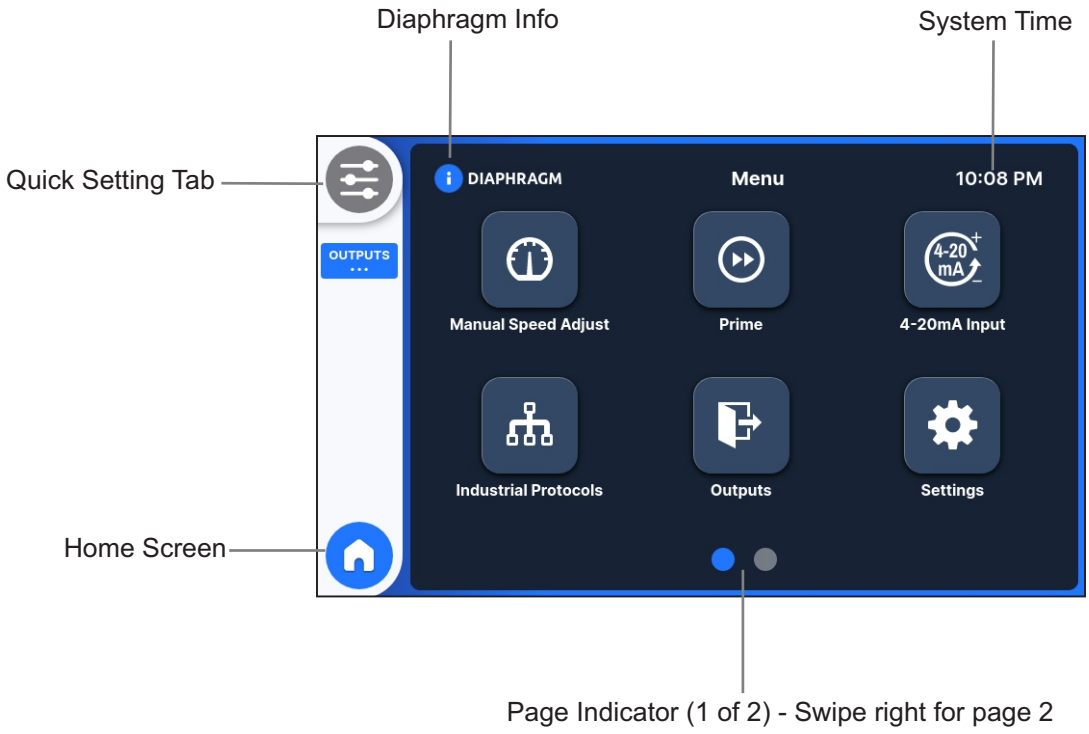
Shielded cables should be used on all input signal wires.

FUNCTION	M12 Connector	PIN #	RATING	BLOCK DIAGRAM
INPUT: 4-20 mA	INPUT #2	2	(+) POSITIVE	(+) ACTIVE 4-20mA TRANSMITTER SOURCE (-) (OPTIONAL PUMP #2) Single or dual pump (series) input. Loop voltage must not exceed 24 Volts.
		3	(-) NEGATIVE	
INPUT: FREQUENCY, AC SINE WAVE, TTL, CMOS	INPUT #2	4	(+) POSITIVE	(-) FREQUENCY TRANSMITTER SOURCE (+)
		5	(-) NEGATIVE	
INPUT: FVS SYSTEM (FLOW VERIFICATION SENSOR) FV SENSOR ONLY	INPUT #1	2	(+) POSITIVE	RED (+) BARE BLACK (-) BLUE-WHITE FVS SENSOR
		3	(-) NEGATIVE	
		4	SIGNAL	
INPUT: FVS SYSTEM (FLOW VERIFICATION SENSOR) FS or FP MICRO-FLO FLOWMETER ONLY	INPUT #1	2	(+) POSITIVE	SIGNAL BLACK (-) BLUE-WHITE MICRO-FLO FLOWMETER PULSE OUTPUT
		3	(-) NEGATIVE	
		4	SIGNAL	
INPUT: REMOTE START/STOP DRY CONTACT C PRIMARY	INPUT #1	1	(+) POSITIVE	(+) OPEN CIRCUIT IMPEDANCE MUST BE GREATER THAN (-) 50K OHM
		5	(-) NEGATIVE	
INPUT: AUTO-PRIME/ DRY CONTACT C SECONDARY	INPUT #2	1	(+) POSITIVE	(+) OPEN CIRCUIT IMPEDANCE MUST BE GREATER THAN (-) 50K OHM
		5	(-) NEGATIVE	
OUTPUT: 4-20 mA	OUTPUT #1	1	(+) POSITIVE	(-) 4-20mA RECEIVER 600 OHM LOAD MAX. (+) Excitation voltage = 15V
		2	(-) NEGATIVE	
OUTPUT: FREQUENCY-OPEN COLLECTOR	OUTPUT #2	1	(+) POSITIVE	(-) (+) DIGITAL PULSE RECEIVER CIRCUIT 1.5K OHM EXTERNAL SOURCE 6-30V DC
		2	(-) NEGATIVE	
OUTPUT: CONTACT CLOSURE #1	OUTPUT #1	3	NORMALLY OPEN	NO C NC SWITCH LOAD 1 AMP MAX @ 125V AC 0.8 AMP MAX @ 30V DC
		4	NORMALLY CLOSED	
		5	COMMON (GROUND)	
OUTPUT: CONTACT CLOSURE #2	OUTPUT #2	3	NORMALLY OPEN	NO C NC SWITCH LOAD 1 AMP MAX @ 125V AC 0.8 AMP MAX @ 30V DC
		4	NORMALLY CLOSED	
		5	COMMON (GROUND)	
OUTPUT: CONTACT CLOSURE #3	OUTPUT #3	3	NORMALLY OPEN	NO C NC SWITCH LOAD 1 AMP MAX @ 125V AC 0.8 AMP MAX @ 30V DC
		4	NORMALLY CLOSED	
		5	COMMON (GROUND)	
OUTPUT: RELAY 6 AMP	OUTPUT #4	3	NORMALLY OPEN	NO C NC SWITCH LOAD 6 AMP MAX @ 250V AC 5 AMP MAX @ 30V DC
		4	NORMALLY CLOSED	
		5	COMMON (GROUND)	

6.1 HOME SCREEN LAYOUT

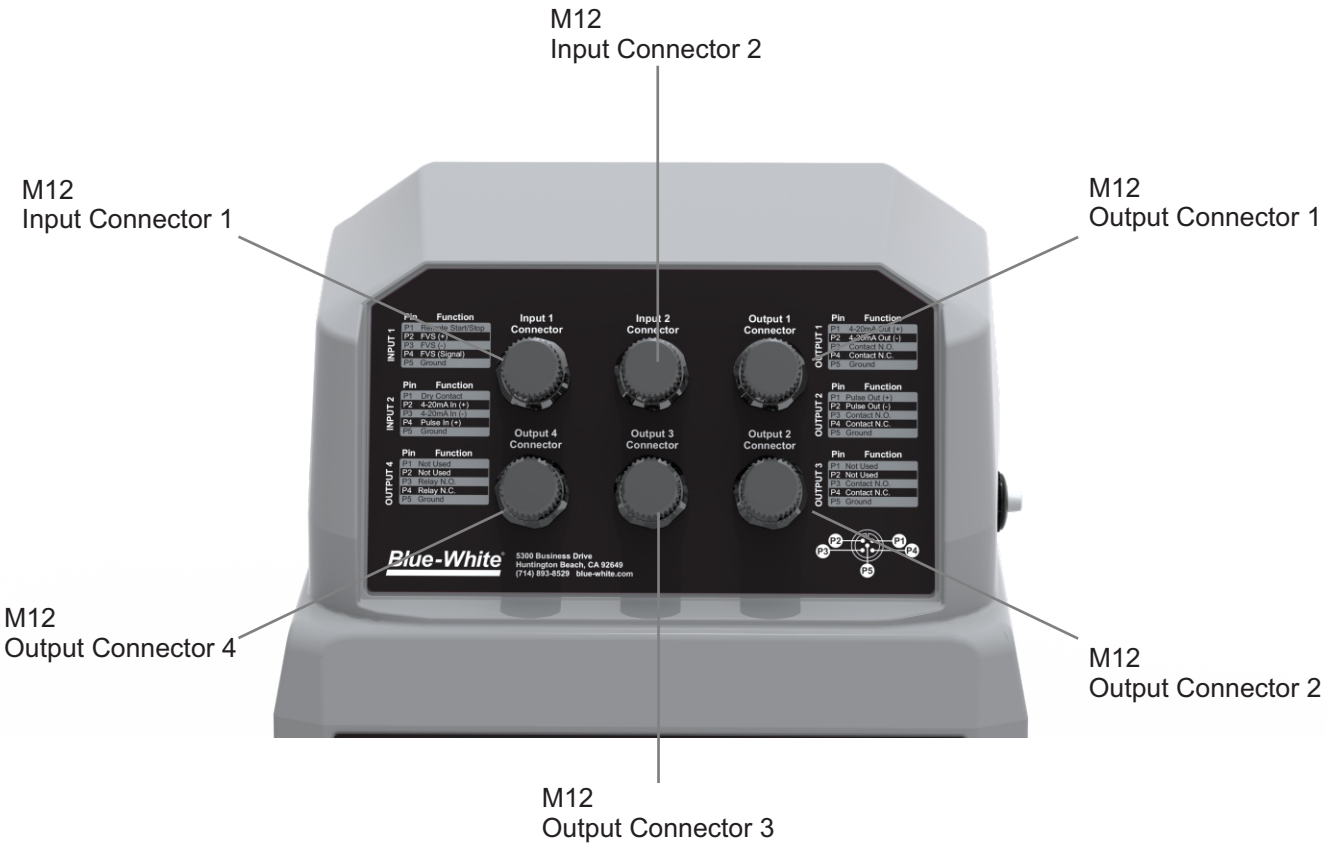


6.2 APP SCREEN LAYOUT



6.3 M12 Connector

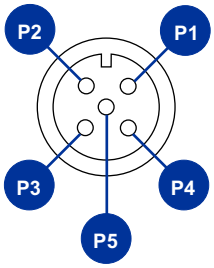
Pump (Rear Upper Panel)



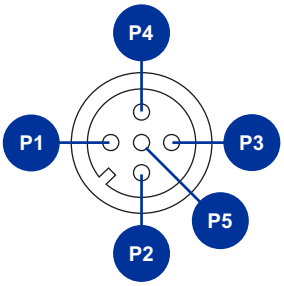
6.4 IO Connection

Pump (Rear Lower Panel)

6.5 M12 Connector



M12 Input/Output Connector



M12 Profibus Connector

M12 Input Connector 1

PIN	Function	Specifications	Reference
P1	Remote Start/Stop	No Voltage	
P2	FVS (+)	15 VDC @ 60 mA Supply	Power FVS Sensor
P3	FVS (-)	DC GND (0 VDC)	FVS Ground Input
P4	FVS (Signal)	Input Signal	FVS Input Signal
P5	Ground	DC Ground	0 VDC

M12 Input Connector 2

PIN	Function	Specifications	Reference
P1	Auto Prime	N.O. Dry Contact Closure	Open= Stop Gnd= Run
P2	4-20mA In (+)	120Ω Impedance Loop Ref. to Ground	Voltage = 15VDC to 24VDC
P3	4-20mA In (-)	DC GND (0 VDC)	
P4	Pulse In (+)	0-1000 Hz (AC. Square Wave) Ref. to Ground	FVS Input Signal
P5	Ground	DC GND (0 VDC)	

M12 Output Connector 1

PIN	Function	Specifications	Reference
P1	4-20mA Out (+)		250Ohm max load
P2	4-20mA Out (-)	DC GND (0 VDC)	
P3	N.O.	Contact closure output #1 N.O. Contact 1 Amp @ 125 VAC	.8 Amp Max @ 30VDC 1 Amp @ 125 VAC
P4	N.C.	Contact closure output #1 N.C. Contact	.8 Amp Max @ 30VDC 1 Amp @ 125 VAC
P5	Ground	Contact closure output #1 COM Contact	

M12 Output Connector 2

PIN	Function	Specifications	Reference
P1	Pulse Out (+)	0-1000 Hz (AC. Square Wave) Ref. to Ground	
P2	Pulse Out (-)	DC GND (0 VDC)	
P3	N.O.	Contact closure output #2 N.O. Contact	.8 Amp Max @ 30VDC 1 Amp @ 125 VAC
P4	N.C.	Contact closure output #2 N.C. Contact	.8 Amp Max @ 30VDC 1 Amp @ 125 VAC
P5	Ground	Contact closure output #2 COM Contact	

M12 Output Connector 3

PIN	Function	Specifications	Reference
P1	Not Used		
P2	Not Used		
P3	N.O.	Contact closure output #3 N.O. Contact	.8 Amp Max @ 30VDC 1 Amp @ 125 VAC
P4	N.C.	Contact closure output #3 N.C. Contact	.8 Amp Max @ 30VDC 1 Amp @ 125 VAC
P5	Ground	Contact closure output #3 COM Contact	

M12 Output Connector 4

PIN	Function	Specifications	Reference
P1	Not Used		
P2	Not Used		
P3	N.O.	Relay Out, N.O. Contact	6 Amp Max @ 250VAC, 5 Amp MAX @ 30VDC
P4	N.C.	Relay Out, N.C. Contact	6 Amp Max @ 250VAC, 5 Amp MAX @ 30VDC
P5	Ground	Relay Out, COM Contact	

M12 Profibus Connector

PIN	Function	Specifications	Reference
P1	VP		+5V supply for terminating resisters
P2	RxD/TxD-N		Data line minus (A-line)
P3	DGND		Data ground
P4	RxD/TxD-P		Data line plus (B-line)
P5	Shield		Ground connection

Note:

M12 connectors not included with product.

Input/Output Connectors requires any A-Type M12 connector with 5 position female sockets

Profibus Connectors requires any B-Type M12 connector with 5 position female sockets

If the pump is the last bus device connected to the PROFIBUS cable it must be terminated using terminating resistor (PROFIBUS standard EN 50170).

7.1 Powering On The Pump

The CD3 is equipped with a rocker switch to power ON/OFF the pump. Ensure that the power cord is securely plugged into the corresponding power source before powering on the pump.

“I” is pressed to turn on the pump

“O” is pressed to turn off the pump

7.2 Welcome Screen

The first time the pump is powered on, or after a factory reset, the pump will boot up to the Welcome Screen. Follow the onscreen instructions to configure your CD3 pump. Refer to section 11 of this manual to change any of these options after you have finished the initial configuration.

Welcome Screen Configuration

1
Local Language

2
Set Time
- Local Date
- Local Time Zone
- Local Time

3
Set Name
- Pump Name
- Chemical Name

4
Set Units
- Unit of Volume
- Unit of Time

5
Set User Password

8.1 Manual Speed Adjust

This input mode allows the user to set a specific speed and the pump will run at that speed until stopped. There are up and down arrows on the home screen to incrementally adjust the speed of the motor.

Default: Percent motor speed.

Also Available: Percent motor speed
SPM (Strokes per Minute)
Flow rate

To Enable Manual Speed Adjust:

1 

Open the **App Drawer**

2 

Select **Manual Speed Adust**

3 

Select **Start** to enable Manual Speed

4 

Tap on the feed rate to cycle through to the option you want to manually adjust

- Percent motor speed
- SPM (Strokes per Minute)
- Flow rate

5 

Adjust manual speed by selecting **Increase** or **Decrease**

Option: Stop pump and select settings to input desired motor speed. 

Confirm by pressing “Save”

8.2 4-20mA Input

This input mode allows the user to set a range of mA input signals to a given motor speed, flow rate or rpm. Used to remotely control the pump with an incoming 4-20mA signal.

Four points on the slope must be defined:

1) a low mA value
2) an output rate at the low mA value
3) a high mA value
4) an output rate at the high mA value

Default settings: 4mA = 0% motor speed
20mA = 100% motor speed

To Enable 4-20mA Input:

1 
Open the **App Drawer**

2 
Select **4-20mA Input**

3 
Select **Settings** to adjust 4-20mA input values

4
Confirm by selecting **Save**

5 
Select **Start** to enable 4-20mA Input

Option: Stop the pump and select the graph icon to easily adjust sliders to desired settings

Confirm by pressing “Save” 

8.3 Frequency Input

This input mode is used to remotely control the pump with an incoming high speed frequency signal.

Four points on the slope must be defined:

1) a low Hz value
2) an output rate at the low Hz value
3) a high Hz value
4) an output rate at the high Hz value

Default settings: 0 (Hz) = 0% motor speed
1000 (Hz) = 100% motor speed

To Enable Frequency Input:

1 
Open the **App Drawer**

2 
Select **Frequency Input**

3 
Select **Settings** to adjust Frequency Input

6
Confirm by pressing **Save**

5 
Select **Start** to enable Frequency Input

Option: Stop pump and select graph icon to easily adjust sliders to desired settings 

Confirm by pressing “Save”

8.4 Pulse Input

This input mode allows the user to trigger the pump to dispense a measured amount of chemical (Amount Per Trigger) over a specific period of time (Pump On Time), after a specific number of pulses (Pulses Count Trigger). Used to remotely control the pump with an incoming pulse signal.

Default settings: Pulse Count Trigger = 1

Pump On Time = 2.5 seconds

Amount Per Trigger = Fluid supplied per trigger

To Enable Pulse Input:

1 

Open the **App Drawer**

2 

Select **Pulse Input**

3 

Select **Settings** to adjust Pulse Input

- Input value for Pulse Count Trigger
- Input value for Amount Per Trigger
- Input value for Pump On Time

4

Confirm by pressing **Save**

5 

Select **Start** to enable

6

Pump will be in **Standby Mode**

8.5 Remote Start/Stop

This input mode is used to remotely start and stop the pump using a close=stop or open=stop signal.

Primary Remote Switch - Used to Start/Stop the pump

Secondary Remote Switch - Used in conjunction with a pressure switch or level switch

Default settings: Disabled

Dry Contact Closure (no voltage required)

To Enable Remote Start/Stop:

1 

Open the **App Drawer**

2 

Select **Settings**

3 

Select **Remote Start/Stop**

4

Set **Remote Switch**

- Disable
- Normally Open (Closed to stop the pump)
- Normally Closed (Open to stop the pump)

5

Set **Secondary Remote Switch**

- Disable
- Enable

6

Confirm by pressing **Save** Pump will be in Standby Mode.

IMPORTANT: To begin operation, press the START button to place pump in STANDBY. The display background will turn yellow indicating the pump has been stopped remotely. When the pump is started by the remote contact, the display background will turn green.

IMPORTANT: If the Remote Start/Stop Input is enabled, the pump will display STANDBY if the pump has been stopped by the Remote Start/Stop. **Please use caution in this mode as the pump may Start at anytime. If you must perform maintenance to the pump, Press STOP button.**

CAUTION

8.6 Set FVS (Flow Verification System)

This input mode is used to monitor the pump fluid input. If the pump does not dispense fluid when pump is moving, the pump will go into an alarm mode and stop. FVS requires a sensor that is connected to the inlet of the pump to monitor the fluid input. Blue-White offers two flow verification sensors: The MS6 & The MICRO-FLO Flow Sensor that easily install into the inlet of the M3.

Default settings: Disabled

When enabled set trigger display (in seconds)

To Enable FVS:

1 
Open the **App Drawer**

2 
Select **Settings**

3 
Select **FVS**

4
Enable **FVS Input**

5
Set **Desired Trigger Delay** (1-1000 seconds)

6
Confirm by pressing **Save**

8.7 Prime

This mode allows the user to prime the pump at 100% motor speed for sixty seconds. After the prime is complete the pump will remain in this mode ready to be primed again.

To exit: select another input method.

To Prime The Pump:

1 
Open the **App Drawer**

2 
Select **Prime**

3 
Select **Start** to Prime the pump

4
Pump will run at 100% motor speed for sixty seconds

5
Pump will remain in **Prime Input**

8.8 Auto-Prime

This mode will allow the user to prime the pump remotely using the dry contact. Both prime duration and percent motor speed is configurable.

Default settings: 60 Seconds at 100% Motor Speed

To Enable Auto-Prime:

1 Open the **App Drawer**

2 Select **Settings**

3 Select **Auto-Prime**

4 Enable **Auto-Prime**

5 Input Values
- Prime duration (in seconds)
- Percent Motor Speed

6 Select **Save** to save the settings

8.9 Manual Cycle Adjust

This input mode allows the user to run the pump at a set motor speed (Pump Speed) for a set amount of time (Duty Time) after which the pump will pause for a set amount of time (Cycle Time). This cycle will repeat until the user presses the STOP button.

Default settings: Pump Speed = 100% Motor Speed
Duty Time = 1.5 Seconds
Cycle Time = 4.0 Seconds

To Enable Manual Cycle Adjust:

1 
Open the **App Drawer**

2 
Select **Manual Cycle Adjustment**

3 
Select **Settings** to configure Manual Cycle Adjustment settings

4
Set **Pump Speed**
(0.04 - 100 percent)

5
Set **Duty Time**
(1 - 1,000,000 seconds)

6
Set **Cycle Time**
(1 - 1,000,000 seconds)

7
Confirm by pressing **Save**

Verify the time on the pump is in synch with your local time zone

8.10 Dispensing

This input mode allows the user to dispense a set amount of fluid (in milliliters) at a set rate (Motor % Speed).

Default settings: Amount Per Dispense = 1,000 mL
Motor % Speed = 50%

To Enable Dispensing:

1 
Open the **App Drawer**

2 
Select **Dispensing**

3 
Select **Settings** to configure Dispensing settings

4
Set **Amount Per Dispense** (in milliliters)

5
Set **Motor % Speed** (0.04 -100)

6
Dispense Run Time will be displayed.
Confirm by pressing **Save**

Note: If your Dispense run time is shorter than 1 second the pump will generate a "Run Time Too Short!" ERROR. Please reconfigure dispensing settings to be greater than 1 second

8.11 Time of Day

This mode allows the user to run the pump at a specific motor speed for a specific length of time beginning at a specific time of day.

Three values to be defined:

1) Percent Motor Speed
2) Run time (in minutes)
3) Time of Day that the pump will turn on

To Enable Time of Day:

1 

Open the **App Drawer**

2 

Select **Time of Day**

3 

Select **Settings** to configure

4

Input Values

- Motor Speed (percentage)
- Run Time (in minutes)
- Time of Day

5

Select **Save** to save the settings

Verify the time on the pump is in synch with your local time zone

8.12 Passcode

This setting is used to enable/disable the passcode, adjust the passcode time out and set or change the User Passcode.

Default settings: Pump will lockout after 30 seconds

To Input a Passcode:

1 Open the **App Drawer**

2 Open **Settings**

3 Open **Passcode**

4 Enable Passcode

5 Select **User Passcode** and create new a six digit code.

6 Confirm by pressing **Save**

Lost password? Email customerservice@blue-white.com to have your password reset

8.13 Local Only Mode

This mode will allow the user to put the pump into a state where all remote input signals are disabled. The pump may only be operated and run manually (Manual Speed Adjust) at the pump.

Features disabled are : Remote Start/Stop, 4-20ma Input, Frequency Input, Pulse Input, Auto Prime.

To Enable Local Only Mode:

1 Press the **Quick Setting Tab**

2 Press **Local Only Key**

3 **Local Mode is Enabled** and “Local” will be displayed

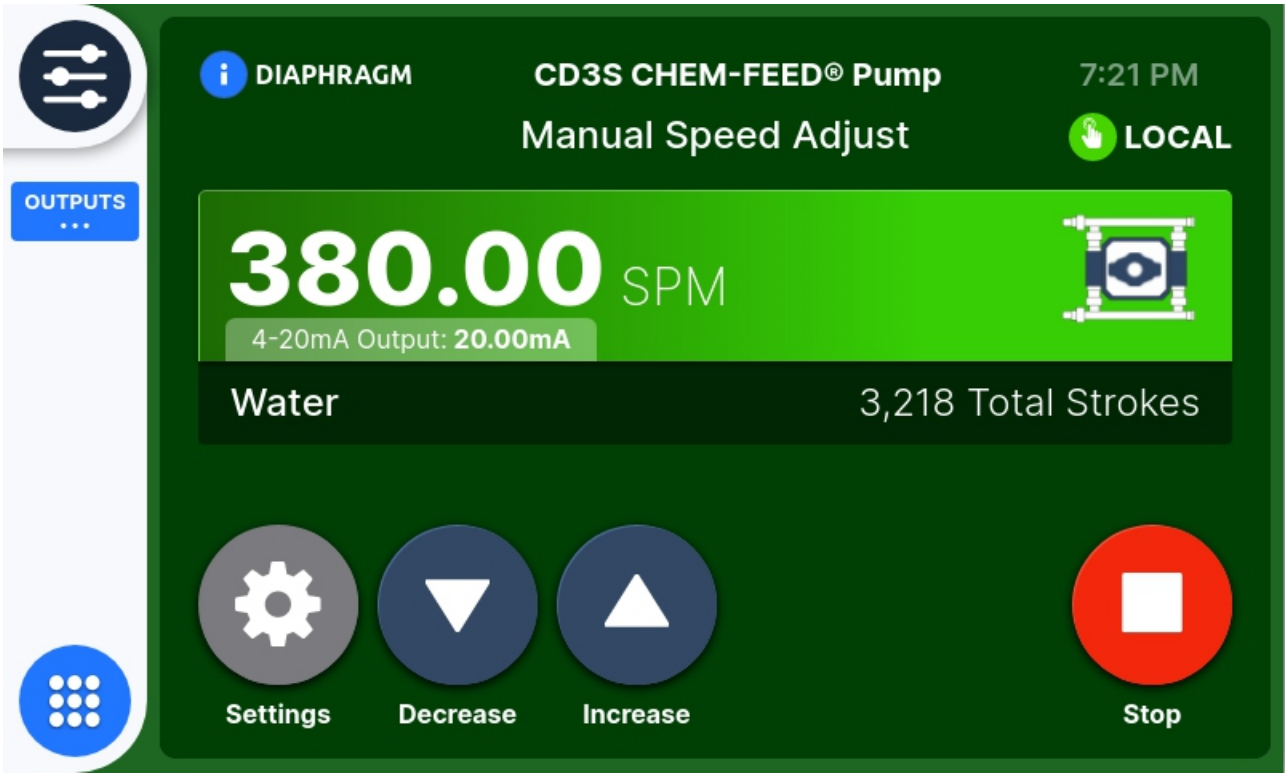
To Disable Local Only Mode:

1 Press the **Quick Setting Tab**

2 Press **Local Only Key**

3 **Local Mode is Disabled** and pump will be returned to previous operation

---



NOTES:

9.1 Set 4-20mA Output

This output sends a configurable 4-20mA. This feature can be used to control other pumps (in sync / proportionally), data logging systems, and other external devices for plant automation.

Four points on the slope must be defined:

1) a low mA value
2) an output rate at the low mA value
3) a high mA value
4) an output rate at the high mA value

Default settings: 4mA = 0 percent motor speed
20mA = 100 percent motor speed

To Enable 4-20mA Output:

1 
Open the **App Drawer**

2 
Select **Outputs**

3 
Select **4-20mA Output**

4
Enable **4-20mA Output**

5
Set desired values for the four points that is required.

6
Confirm by pressing **Save**

Option: Stop the pump and select the graph icon to easily adjust sliders to desired settings

Confirm by pressing “Save” 

9.2 Frequency Output

This output sends a configurable high speed frequency signal. This feature can be used to control other pumps (in sync / proportionally), data logging systems, and other external devices for plant automation.

Four points on the slope must be defined:

1) a low Hz value
2) an output rate at the low Hz value
3) a high Hz value
4) an output rate at the high Hz value

Default settings: 0 Frequency (Hz) = 0 percent motor speed
1000 Frequency (Hz) = 100 percent motor speed

To Enable Frequency Output:

1 
Open the **App Drawer**

2 
Select **Outputs**

3 
Select **Frequency Output**

4
Enable **Frequency Output**

5
Set **Desired Values**

6
Confirm by pressing **Save**

Option: Stop the pump and select the graph icon to easily adjust sliders to desired settings

Confirm by pressing “Save” 

9.3 Relay & Contacts

This feature is used to assign alarms to relay & contact closures

Four values to be defined:
1) Contact #1
2) Contact #2
3) Contact #3
4) Relay Output

To Enable Relay & Contacts:

1 
Open the **App Drawer**

2 
Select **Outputs**

3 
Select **Relay & Contacts**

4
Set **Desired Values (refer to chart below)**
- Contact #1
- Contact #2
- Contact #3
- Relay Output

5
Confirm by pressing **Save**

Selection:	Contact energizes when:
Pump Run/Stop	Motor turning
Monitor Input	Incoming analog or digital signal is not received or out of range
Monitor Output	Outgoing analog or digital signal not transmitted or out of range
Monitor Run/Fail	Motor fails to respond to commands
4-20 In Active	4-20mA mode is running
Frequency In Active	Frequency mode is running
Manual Speed Active	Manual Speed mode is running
Pulse In Active	Pulse In mode is running
Prime Active	Prime mode is running
Pump Available	Pump is On
FVS	After the programmed delay time pulses are not received from flow sensor.
DFD	Diaphragm failure is detected by sensors in the head
Both DFD/FVS	Either DFD or FVS system triggers
General Error	Motor Overload or other internal error

10.1 Control and Status Mapping for ProfiBus and Ethernet IP

Ethernet/IP and Profibus: Output Data (PLC to Pump) - Pump Control

Offset	Name	Description
0 - 1	Motor Percent Speed	Up to 2 decimal places, with most significant Offset representing the whole number and least significant Offset representing the decimal number. (Eg. 50.15 => MSB = 50, LSB = 15)
2	Motor Direction	0 = Clockwise, 1 = Counter-clockwise.
3	Run State	Set the current run state of the pump by toggling the corresponding bits, where 0 = deactivated and 1 = activated. Bit 0 = Prime, Bit 1 = Start, Bit 2 = Stop
4	Reset Alarms	Reset alarms (TFD, FVS) on the pump. 0 = nothing, 1 = reset alarms. Only reset on a 0 -> 1 transition
5	Reset Tube Stats	Reset tube revolutions counter and hours ran
6	Cyclic Counter Direction	Cyclic counter direction (debugging purpose only). 0 = count up, 1 = count down
7	Cyclic Counter Speed	Cyclic counter speed (debugging purpose only). 0 = counter not incremented/decremented. Values > 0 = number of cycles it takes to increment/decrement the counter by one

Ethernet/IP and Profibus: Input Data (Pump to PLC) - Pump Status

Offset	Name	Description
0	Run Status	Current run state of the pump represented by each bit, where 0 = Deactivated and 1 = Activated. Bit 0 = Prime, Bit 1 = Control Active, Bit 2 = Motor Running
1	Cover Status	0 = Cover Attached, 1 = Cover Detached
2	Motor Direction	0 = Clockwise, 1 = Counter-clockwise
3	TFD status	0 = No TFD alarm, 1 = TFD alarm
4	FVS status	0 = No FVS alarm, 1 = FVS alarm
5	Relay Output	Relay output statuses represented by each bit, where 0 = not triggered, and 1 = triggered. Bit 0 = Dry Contact 1, Bit 1 = Dry Contact 2, Bit 3 = Dry Contact 3, Bit 4 = Standard Relay
6 - 7	4-20 mA Output	Range: 400 - 2000 mA, where MSB represents the whole number and LSB represents the decimal number. Eg. 4.50 mA => Offset 6 = 4, Offset 7 = 50
8 - 9	Frequency Output	Range: 0 - 1000 Hz, where the MSB represent thousands and hundreds digits and LSB represents the tens and ones digits. Eg. 985 Hz => Offset 8 = 85, Offset 9 = 09
10 - 11	Motor Percent Speed	Up to 2 decimal places, with most significant Offset representing the whole number and least significant Offset representing the decimal number. (Eg. 50.15 => MSB = 50, LSB = 15)
12 - 15	Firmware Version	Firmware version in semantic versioning format. Channel can be one of three values: 0 = stable, a(0x61) = alpha, b(0x62) = beta. Example: (1.0.5-beta => Offset 15: 1, Offset 14: 0, Offset 13: 5, Offset 12: b(0x62))
16 - 19	Tube Revolutions	Current tube revolution counter
20 - 23	Tube Hours	Number of hours ran for current tube
24 - 25	Cyclic Counter	Cyclic counter (debugging purpose only)

10.2 Control and Status Mapping for ModBus TCP

Modbus TCP: Holding Registers (4x Reference, PLC to Pump) - Pump Control

Modbus Data Address	Name	Description
0000 - 0001	Motor Percent Speed	Up to 2 decimal places, with most significant byte representing the whole number and least significant byte representing the decimal number. (Eg. 50.15 => MSB = 50, LSB = 15)
0002	Motor Direction	0x00 = Clockwise, 0x01 = Counter-clockwise.
0003	Run State	Set the current run state of the pump by toggling the corresponding bits, where 0 = deactivated and 1 = activated. Bit 0 = Prime, Bit 1 = Start, Bit 2 = Stop
0004	Reset Alarms	Reset alarms (TFD, FVS) on the pump. 0x00 = nothing, 0x01 = reset alarms. Only reset on a 0 -> 1 transition
0005	Reset Tube Stats	Reset tube revolutions counter and hours ran
0006	Cyclic Counter Direction	Cyclic counter direction (debugging purpose only). 0 = count up, 1 = count down
0007	Cyclic Counter Speed	Cyclic counter speed (debugging purpose only). 0 = counter not incremented/decremented. Values > 0 = number of cycles it takes to increment/decrement the counter by one

Modbus TCP: Input Registers (3x Reference, Pump to PLC) - Pump Status

Modbus Data Address	Name	Description
0000	Run Status	Current run state of the pump, represented by each bit, where 0 = Deactivated and 1 = Activated. Bit 0 = Prime, Bit 1 = Control Active, Bit 2 = Motor Running
0001	Cover Status	0 = Cover Attached, 1 = Cover Detached
0002	Motor Direction	0 = Clockwise, 1 = Counter-clockwise
0003	TFD status	0 = No TFD alarm, 1 = TFD alarm
0004	FVS status	0 = No FVS alarm, 1 = FVS alarm
0005	Relay Output	Relay output statuses represented by each bit, where 0 = not triggered, and 1 = triggered. Bit 0 = Dry Contact 1, Bit 1 = Dry Contact 2, Bit 3 = Dry Contact 3, Bit 4 = Standard Relay
0006 - 0007	4-20 mA Output	Range: 400 - 2000 mA, where MSB represents the whole number and LSB represents the decimal number. Eg. 4.50 mA => Byte 6 = 4, Byte 7 = 50
0008 - 0009	Frequency Output	Range: 0 - 1000 Hz, where the MSB represent thousands and hundreds digits and LSB represents the tens and ones digits. Eg. 985 Hz => Byte 8 = 85, Byte 9 = 09
000A - 000B	Motor Percent Speed	Up to 2 decimal places, with most significant byte representing the whole number and least significant byte representing the decimal number. (Eg. 50.15 => MSB = 50, LSB = 15)
000C - 000F	Firmware Version	Firmware version in semantic versioning format. Channel can be one of three values: 0 = stable, a(0x61) = alpha, b(0x62) = beta. Example: (1.0.5-beta => Byte 15: 1, Byte 14: 0, Byte 13: 5, Byte 12: b(0x62))
0010 - 0013	Tube Revolutions	Current tube revolution counter
0014 - 0017	Tube Hours	Number of hours ran for current tube
0018 - 0019	Cyclic Counter	Cyclic counter (debugging purpose only)

10.3 EtherNet/IP

This is used to configure the EtherNet/IP

Four values to be defined:
1) IP Address
2) Subnet Mask
3) Gateway
4) Always On (Connection will remain active even when mode is inactive/OFF)

To Enable EtherNet/IP:

1 
Open the **App Drawer**

2 
Select **Industrial Protocols**

3 

Select **EtherNet/IP**

4
Pump will go to home screen

5 
Select **Settings** to input:
- IP Address
- Subnet Mask
- Gateway
- Always On

6
Confirm by pressing **Save**

10.4 Modbus TCP/IP

This is used to configure the Modbus TCP/IP

Three values to be defined:
1) IP Address
2) Subnet Mask
3) Gateway
4) Always On (Connection will remain active even when mode is inactive/OFF)

To Enable Modbus TCP:

1 Open the **App Drawer**

2 Select **Industrial Protocols**

3 Select **Modbus TCP/IP**

4 Pump will go to home screen

5 Select **Settings** to input:
- IP Address
- Subnet Mask
- Gateway
- Always On

6 Confirm by pressing **Save**

10.5 Profibus

This is used to configure the Profibus

Three values to be defined:
1) IP Address
2) Subnet Mask
3) Gateway
4) Always On (Connection will remain active even when mode is inactive/OFF)

To Enable Profibus:

1 Open the **App Drawer**

2 Select **Industrial Protocols**

3 Select **Profibus**

4 Pump will go to home screen

5 Select **Settings** to input:

- IP Address
- Subnet Mask
- Gateway
- Always On

6 Confirm by pressing **Save**

11.1 Diaphragm Info

This feature will display information regarding the diaphragm within the pump including:

· Diaphragm type
· Diaphragm Size
· Current maximum flow rate
· Run time & strokes

To View The Diaphragm Info:

1 Tap on the **Diaphragm Info** text in the top portion of the screen

2 Diaphragm info will be displayed

3 Click “reset” to reset the hours and revolutions

11.2 Pump Calibration

This feature allows the user to calibrate the pump's indicated flow rate to the system. After calibration, the Max Flow Rate will be adjusted.

To Calibrate Your Pump:

1
On the home screen select the **Calibration Icon**

2
Enter values:
·Pump Speed
·Run Time (seconds)

3
Select **Start** to begin

4
Select **Start**

5
Enter the measured flow rate into the field

6
Confirm by selecting **Save**

12.1 Pump Name

This is to change the name of the pump that is displayed on the home screen.

To Input Pump Name:

1 
Open the **App Drawer**

2 
Open **Settings**

3 
Open **System**

4
Select “**Pump Name**”

5
Enter desired **Pump Name**

6
Confirm by pressing **OK**

12.2 Unit of Volume

This is to change the units of volume that is displayed. Options are Milliliters, Ounces, Liters, or Gallons.

To Input Units of Volume:

1 

Open the **App Drawer**

2 

Open **Settings**

3 

Open **System**

4

Select **Unit of Volume**

5

Select desired **Units of Volume**

- Milliliters
- Ounces
- Liters
- Gallons

6

Confirm by pressing **OK**

12.3 Unit of Time

This will change the Unit of Time that is displayed for the flow rate

To Input Unit of Time:

1 Open the **App Drawer**

2 Open **Settings**

3 Open **System**

4 Select **Unit of Time**

5 Select **Desired Time**
- Minutes (mL & ounces only)
- Hours
- Days (Gallons only)

6 Confirm by pressing **OK**

12.4 Chemical Name

This is used to change the Chemical Name that is displayed on the home screen.

To Input a Chemical Name:

1 
Open the **App Drawer**

2 
Open **Settings**

3 
Open **System**

4
Select “**Chemical Name**”

5
Enter desired **Chemical Name**

6
Confirm by pressing **OK**

12.5 Set Language

This setting is used to change the system language.

To Input a Language:

1 
Open the **App Drawer**

2 
Open **Settings**

3 
Open **System**

4
Select **Locale**

5
Select **Desired Language**
- English
- Deutch
- Español
- Français
- Portugues

6
Confirm by pressing **OK**

NOTES:

12.6 System Time

This setting is used to change the local time that is displayed.

To Input The System Time:

1 

Select the **Time** in the upper right hand corner

2

Select **Desired Hour**

3

Select **Desired Minute**

4

Select **AM or PM**

5

Confirm by pressing **OK**

12.7 Resume Operation on Start-Up

This setting is used to choose whether to resume operation in the same state prior to turning off pump, or after power interruption.

Note: Pump will require approx. 30 seconds for initialization before resuming operation.

Default settings: Enabled

Disabled = Pump will be stopped at Start-Up

To Modify Setting:

1 

Open the **App Drawer**

2 

Open **Settings**

3 

Open System

4

Scroll down to Resume Operation

5

Select **Enable /Disable**

6

Confirm by pressing **Save**

12.8 Factory Reset

This setting is used to factory reset the pump. This will erase all of the configurations and restore the pump to it's original configuration when it left Blue-White factory.

To Conduct A Factory Reset:

1 
Open the **App Drawer**

2 
Open **Settings**

3 
Open **System**

4
Select **Reset to Factory Defaults**

5
Confirm by pressing **Continue**

6
Pump will **Reboot** and run through the initial setup process

Lost password? Email customerservice@blue-white.com to have your password reset

13.1 SYSTEM INFORMATION

This is to view the System Information

Information to be displayed:

- Pump Name
- Chemical Name
- Firmware Version
- System Build
- Manufactured Data & Time
- Serial Number
- Model
- I/O Port Firmware Version
- Motor Firmware Version
- Industrial Protocol Firmware Version
- Lifetime Run Hours & Revolutions

To View The System Information:

1 
Open the **App Drawer**

2 
Select **System Information**

13.2 Firmware Update

To update the firmware for your pump you first need to download and install Blue-Central® which is available at:

https://www.blue-white.com/resources/

To Update The System Firmware:

1

Plug pump into a computer via USB cable and open Blue-Central® program

2

Select firmware tab and select “Start Upgrade”

3

The firmware upgrade box will appear showing the progress of the install.

4

Once the install is complete select “Close” to exit screen.

CAUTION

Always wear protective clothing, face shield, safety glasses and gloves when working on or near your metering pump. Additional precautions should be taken depending on solution being pumped. Refer to MSDS precautions from your solution supplier.

14.1 Routine Inspection and Maintenance

The pump requires very little maintenance. However, the pump and all accessories should be checked weekly. This is especially important when pumping aggressive chemicals. Inspect all components for signs of leaking, swelling, cracking, discoloration or corrosion. Replace worn or damaged components immediately.

Cracking, crazing, discoloration and the like during first week of operation are signs of severe chemical attack. If this occurs, immediately remove chemical from pump. Determine which parts are being attacked and replace them with parts that have been manufactured using more suitable materials.

14.2 Cleaning the Pump

The pump will require occasional cleaning, especially injection fitting, foot valve, strainer, and pump head valves (ball checks). The frequency will depend of the severity of service and the amount of debris in the chemical.

- Inspect and replace pump head valves as required.

- Periodically clean injection / check valve assembly, especially when injecting fluids that calcify such as sodium hypochlorite. These deposits and other build ups can clog fittings, increase back pressure and interfere with valve operation.

- Periodically clean suction strainer.

- Periodically inspect pump housing (enclosure) for chemical attack. Protect pump housing from continuous exposure to chemicals, such as drips or fumes from surrounding equipment and plumbing.

- The motor does not require maintenance or lubrication.

CAUTION ⚠	Prior to service, pump clean water through the pump and suction / discharge line to remove chemical.
CAUTION ⚠	Always wear protective clothing, face shield, safety glasses and gloves when working on or near your metering pump. Additional precautions should be taken depending on solution being pumped. Refer to MSDS precautions from your solution supplier.

14.3 Replacing the Diaphragm and Ball Check Cartridges

The pump requires very little maintenance. However, the pump and all accessories should be checked weekly. This is especially important when pumping aggressive chemicals.

1. Remove all pressure from the system before servicing pump. If possible, flush and drain pump. Note there will always be trace amounts of fluid in the pump head and manifolds when servicing. Where gloves and proper safety gear at all times.

2. Put pump into Manual or Local run mode.

3. Disconnect piping or tubing from the discharge and suction manifolds.

4. Remove top and bottom manifolds by unscrewing the unions nuts. Be careful not to misplace o-rings.

5. At this point, ball check cartridges / adapters can be removed and inspected. Remove adapters by hand and clean thoroughly or replace. Be careful to keep all pieces together, and note position of arrows on cartridges. Keep arrows pointed in direction of flow.

6. Remove pump head cover and pump head by unscrewing the eight pump head screws. Pull out the pump head cover. Keep all parts together.

7. If replacing both diaphragms, repeat process for other side.

8. When removing the diaphragm, run the pump slowly so the diaphragm is extended to furthest outward point. This will make removal easiest. Unscrew the diaphragm counterclockwise.

9. Your diaphragm replacement Kit will include a diaphragm, Teflon backing piece and back-up washer. Install the pieces in proper order and screw new diaphragm onto pump. Hand tighten only. Do not use tools. Repeat process with other diaphragm.

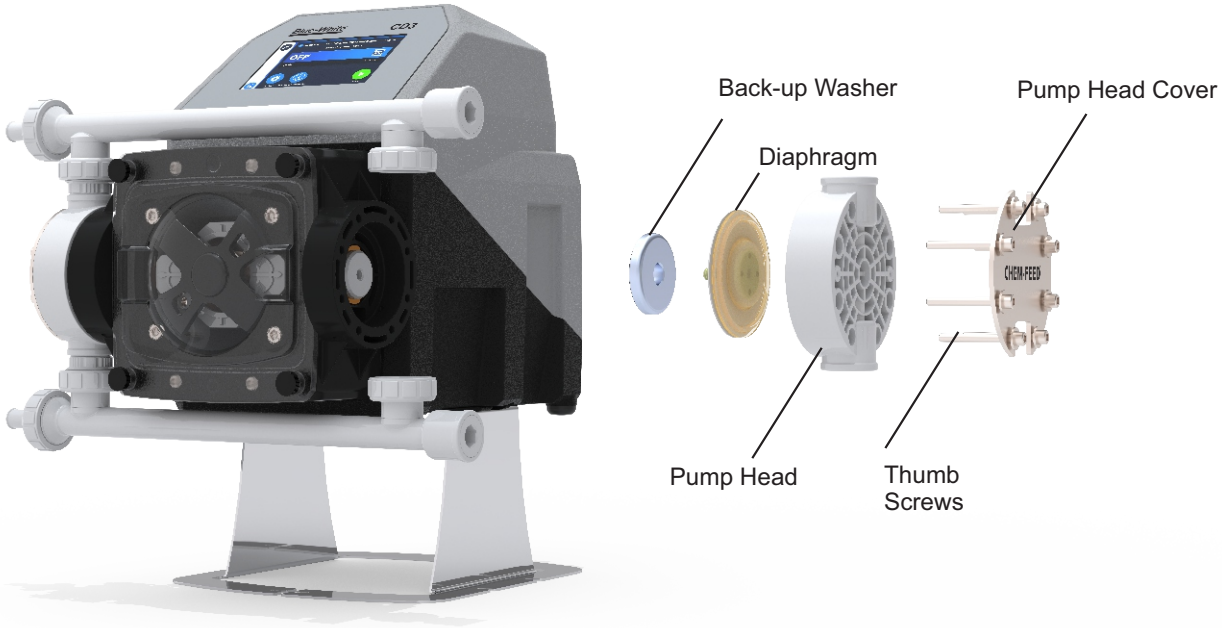
10. Once both diaphragms are installed, replace pump heads. When re-installing pump heads, run the pump so the diaphragm is pulled to back into the pump. This will allow for easier installation and prevent leaks.

11. Install the eight pump heads screws and washers. Install and tighten screws using a star pattern for uniform tightening. Over-tightening on one side of the diaphragm may cause leaks. Tighten each screw to 38 in-lbs. (it is recommended to check screws and torque after 1-2 hours of operation, as materials may soften or shift during break-in period.)

12. Repeat process with other diaphragm and pump head.

13. Re-install upper and lower manifolds. (Be sure all ball check cartridges and o-rings are in place.) Re-connect piping and tubing, as necessary.

14.4 Pump Head and Diaphragm Exploded View



Pump Head and Diaphragm

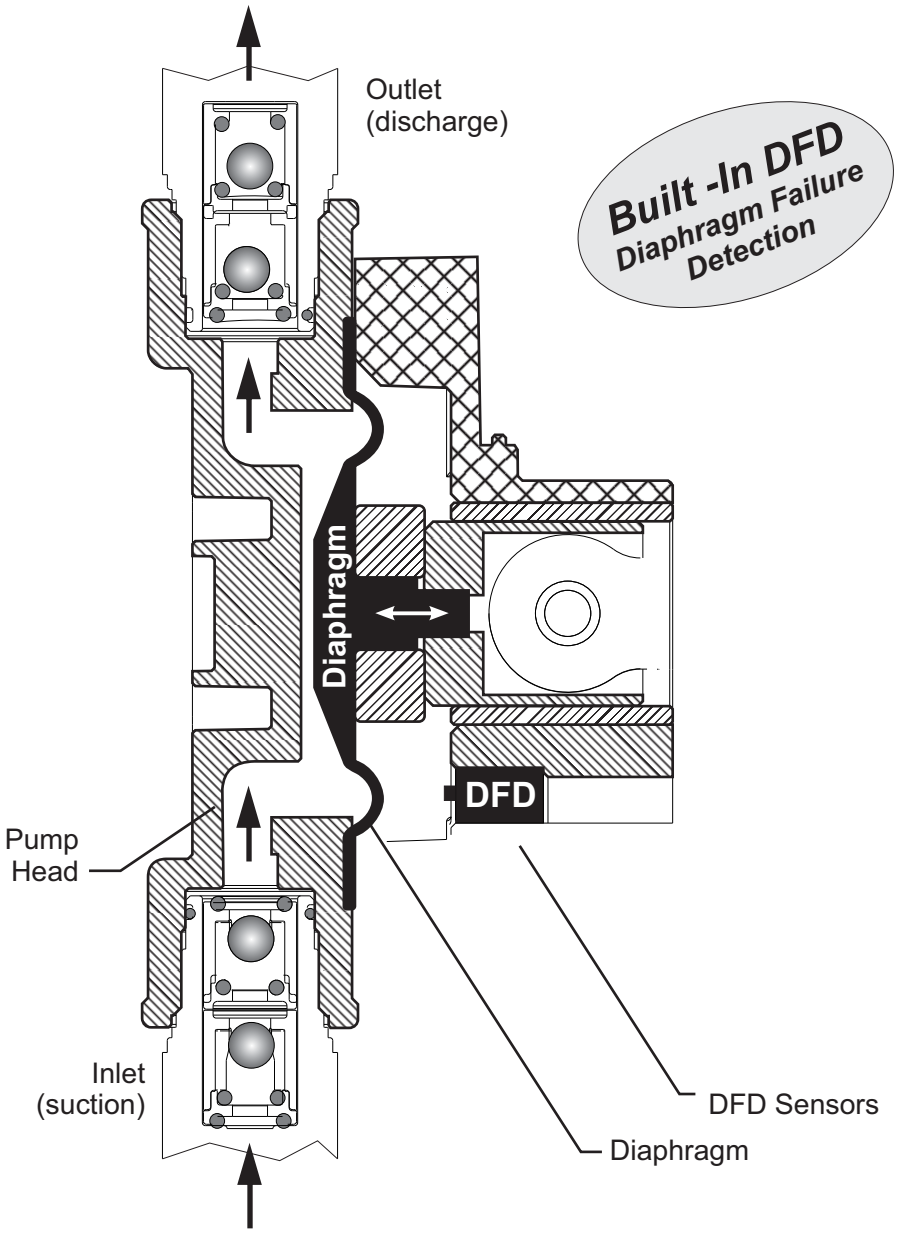
14.5 DFD

This pump is equipped with a Diaphragm Failure Detecting System which is designed to stop the pump and provide an output alarm (see Output menu) in the event that a leak occurs at the diaphragm.

This system is capable of detecting the presence of a large number of chemicals including Sodium Hypochlorite (Chlorine), Hydrochloric (muriatic) Acid, Sodium Hydroxide, and many others. The system will may not be trigger with solutions with less than 430 microsiemens.

If a DFD alarm occurs, the pump will stop and the screen will show a red alarm message.

Please refer to instructions on replacing the diaphragms. Proper cleaning after leaks are critical for maintaining the best possible pump life. Check DFD pins for signs of corrosion or fouling.



Confirming Chemical Detection (when replacing diaphragms)

To determine if a chemical will be detected by the system:

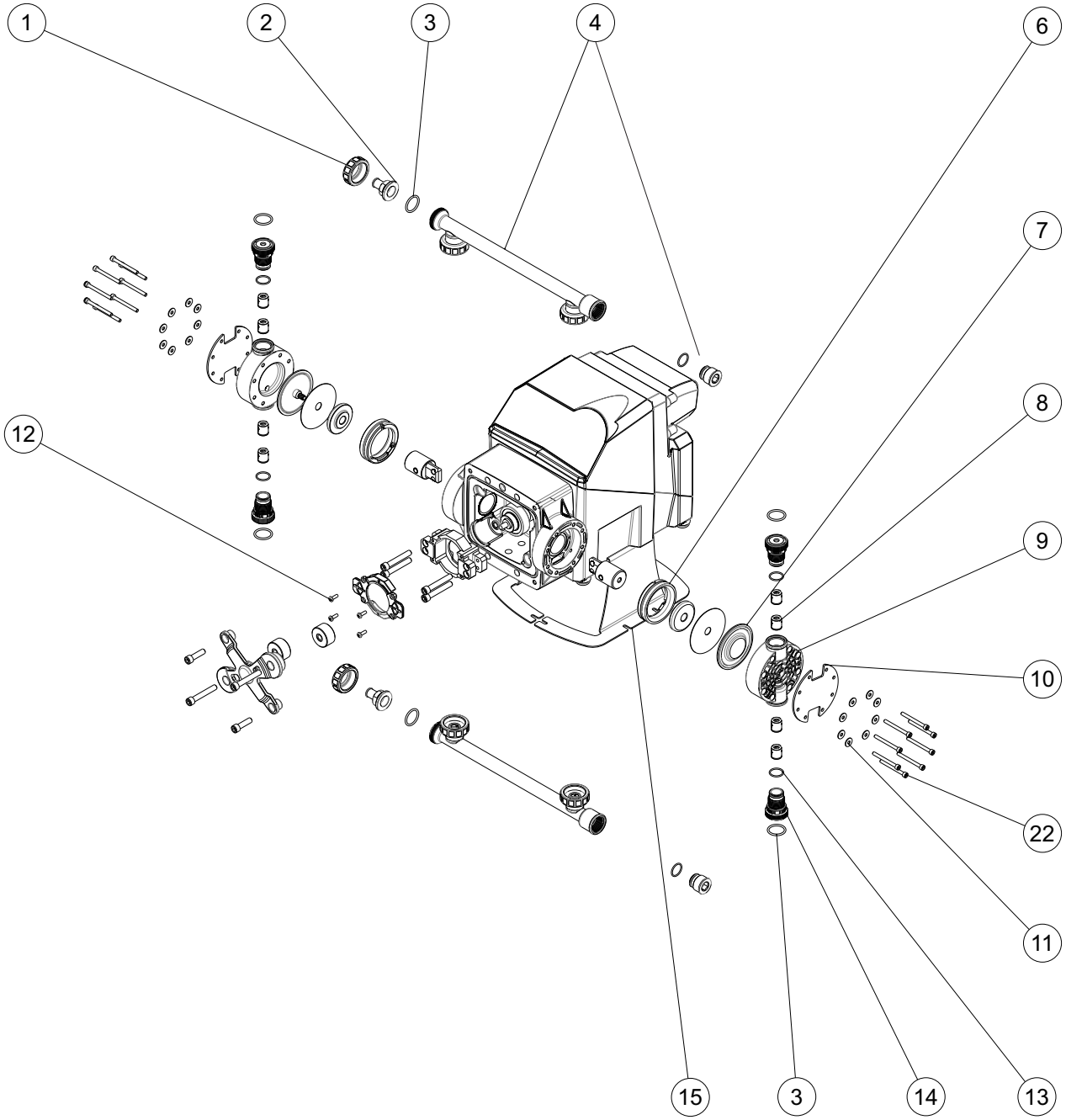
1. Remove the pump head and diaphragm.
2. Place a small amount of chemical in the bottom of the pump head that is enough to cover the sensors.
3. Turn on the pump by pressing the START button.

   NOTE: If the DFD system **detects** a chemical, the pump will stop after a two-second confirmation period.

   NOTE: If the DFD system **does not detect** a chemical, the pump will continue to operate after the confirmation period.

4. Carefully clean the chemical out of the pump head. Ensure to remove all the chemical traces from the sensor probes.
5. Replace the diaphragm, pump head, and manifolds/fitting connections.
7. Follow instructions on pump to clear alarm condition.
8. Restart the pump.

15.1 Pump Exploded View



15.2 Spare Parts List

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	91001-301	NUT UNION CD3 MOLDED PVDF	6
2	91001-295	.50" BARB ADAPTER	2
	91001-296	.50" BARB ADAPTER ELBOW	
	91001-288	.50" M/NPT ADAPTER ELBOW	
	91001-287	.50" M/NPT ADAPTER	
3	90003-577	O-RING 2-119 (AFLAS 75)	6
	90003-627	O-RING 2-119 (EP)	
4	70001-504	MANIFOLD WITH FLANGE AND UNION NUT, PLUG WITH O-RING (TFE/P)	2
	70001-505	MANIFOLD WITH FLANGE AND UNION NUT, PLUG WITH O-RING (EP)	2
6	90002-350	DRIVE HEAD INSERT	2
7	72000-583	KIT DIAPHRAGM PVDF CD3	2
	72000-601	KIT DIAPHRAGM FLEX-A-PRENE® CD3	
8	70001-500	CARTRIDGE VALVE KIT (TFE/P)	4
	70001-501	CARTRIDGE VALVE KIT (EP)	
9	90002-272	PUMP HEAD	2
10	70004-541	PUMP HEAD FACE PLATE	2
11	90011-094	WASHER #10	16
12	90011-063	SCREW 8-32 X .37 RD PH SS	4
13	90003-141	O-RING 2-018 (TFE/P)	4
	90003-610	O-RING 2-018 (EP)	
14	90002-353	ADAPTER CART CD3	4
15	90008-651	MOUNTING BRACKET	2
22	90011-210	SCREW 10-32 X 2.0 SOC HD	16

16.0 ACCESSORIES

The following accessories are available for the CD3 CHEM-FEED® Diaphragm Metering Pump. Please visit Blue-white.com for more information. All accessories are sold separately.

KIT-M12
TWO M12 CABLES

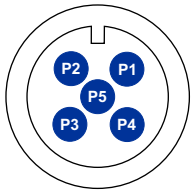
*KIT-M12-3 for 3 Cables
*KIT-M12-6 for 6 Cables

KIT-M12

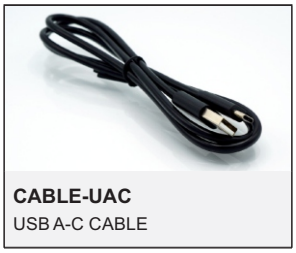
Kit contains: Two M12 cables. 10 foot length.

KIT-M12-2-5	5 foot length.
KIT-M12-2-15	15 foot length.
KIT-M12-2-30	30 foot length.

KIT-M12 WIRING INSTRUCTIONS

DIAGRAM	PIN #	WIRE COLOR
	**PIN 1**	BROWN
	PIN 2	WHITE
	PIN 3	BLUE
	PIN 4	BLACK
	PIN 5	GRAY

NOTE: THIS DIAGRAM IS FOR THE PUMP'S M12 PORT



CABLE-UAC
USB A-C CABLE

CABLE-UAC

Kit contains: One 3' USB-A to USB-C cable.

KIT-PB3
One 3ft Profibus Cable

KIT-DP3

Kit contains: One 3' profibus cable.

POWER CORDS - DETACHABLE

90010-663 115V/60Hz NEMA 5/15
90010-664 220V/50Hz CEE 7/V11
90010-665 230V/50Hz BS 1363/A
90010-666 240V/50Hz AS 3112
90010-696 230V/60Hz NEMA 6/15
90010-711 115V/60Hz NEMA 5/15 (Lockable)

KIT-PSM
WALL MOUNT BRACKET, HDPE

KIT-PSM

Kit contains: One HDPE Bracket, (4) 3/8" x 2-3/4" long dia anchor bolts.

NOTES:

9.0 WARRANTY

9.1 Limited Warranty

Your Blue-White product is a quality product and is warranted for a specific time from date of purchase (proof of purchase is required). The product will be repaired or replaced at our discretion. Failure must have occurred due to defect in material or workmanship and not as a result of operation of the product other than in normal operation as defined in the product manual. Warranty status is determined by the product's serial label and the sales invoice or receipt. The serial label must be on the product and legible. The warranty status of the product will be verified by Blue-White or a factory authorized service center.

CHEM-FEED® CD3 pumps are warranted for 2 years from date of purchase (proof of purchase is required). Pumps will be repaired or replaced at our discretion.

9.2 DIAFLEX® Warranty

DIAFLEX® diaphragms are warranted for the life of the pump. Blue-White will replace a damaged diaphragm at no cost to the customer provided the pump was at all times operated within the guidelines included in the pump's operation manual. This warranty only applies to DIAFLEX® diaphragms, not the pumps themselves. Blue-White pumps are separately covered by warranties specific to them.

9.3 What is not Covered

- **Flex-A-Prene diaphragm and rubber components - They are perishable and require periodic replacement**
- **Pump removal, or re-installation, and any related labor charge.**
- **Freight to the factory, or service center**
- **Pumps that have been tampered with, or in pieces.**
- **Damage to the pump that results from misuse, carelessness (such as chemical spills on the enclosure), abuse, lack of maintenance, or alteration that is out of Blue-White control.**
- **Pumps damaged by faulty wiring, power surges, or acts of nature.**

Blue-White does not assume responsibility for any loss, damage, or expense directly or indirectly related to or arising out of the use of its products. Failure must have occurred due to defect in material or workmanship and not as a result of operation of the product other than in normal operation as defined in the pump operation manual.

The warranty status is determined by the pump's serial label and the sales invoice or receipt. The serial label must be on the pump and be legible. The warranty status of the pump will be verified by Blue-White or a factory authorized service center.

9.4 Procedure for In-Warranty Repair

Warranty service must be performed by the factory or an authorized service center. Contact the factory or local repair center to obtain a RMA (Return Material Authorization) number. It is recommended to include foot strainer and injection/check valve fitting since these devices may be clogged and part of the problem. Decontaminate, dry, and carefully pack the product to be repaired. Please enclose a brief description of the problem and proof of purchase. Prepay all shipping and insurance cost. COD shipments will not be accepted. Damage caused by improper packaging is the responsibility of the sender. When In-Warranty repair is completed, the factory pays for return shipping to the dealer or customer.

9.5 Product Use Warning

Blue-White products are manufactured to meet the highest quality standards in the industry. Each product instruction manual includes a description of the associated product warranty and provides the user with important safety information. Purchasers, installers, and operators of Blue-White products should take the time to inform themselves about the safe operation of these products. In addition, Customers are expected to do their own due diligence regarding which products and materials are best suited for their intended applications. Blue-White is pleased to assist in this effort but does not guarantee the suitability of any particular product for any specific application as Blue-White does not have the same degree of familiarity with the application that the customer/end user has. While Blue-White will honor all of its product warranties according to their terms and conditions, Blue-White shall only be obligated to repair or replace its defective parts or products in accordance with the associated product warranties. **BLUE-WHITE SHALL NOT BE LIABLE EITHER IN TORT OR IN CONTRACT FOR ANY LOSS OR DAMAGE WHETHER DIRECT, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL, ARISING OUT OF OR RELATED TO THE FAILURE OF ANY OF ITS PARTS OR PRODUCTS OR OF THEIR NONSUITABILITY FOR A GIVEN PURPOSE OR APPLICATION.**

9.6 Chemical Resistance Warning

Blue-White offers a wide variety of wetted parts. Purchasers, installers, and operators of Blue-White products must be well informed and aware of the precautions to be taken when injecting or measuring various chemicals, especially those considered to be irritants, contaminants or hazardous. Customers are expected to do their own due diligence regarding which products and materials are best suited for their applications, particularly as it may relate to the potential effects of certain chemicals on Blue-White products and the potential for adverse chemical interactions.

Blue-White tests its products with water only. The chemical resistance information included in this instruction manual was supplied to Blue-White by reputable sources, but Blue-White is not able to vouch for the accuracy or completeness thereof. While Blue-White will honor all of its product warranties according to their terms and conditions, Blue-White shall only be obligated to repair or replace its defective parts or products in accordance with the associated product warranties.

BLUE-WHITE SHALL NOT BE LIABLE EITHER IN TORT OR IN CONTRACT FOR ANY LOSS OR DAMAGE, WHETHER DIRECT, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL, ARISING OUT OF OR RELATED TO THE USE OF CHEMICALS IN CONNECTION WITH ANY BLUE-WHITE PRODUCTS.

APPENDIX A: ACRONYMS

°C	Celsius
°F	Fahrenheit
AC	Alternating current
bar	Unit of pressure
CIP	Clean-in-place
cm	Centimeters
COD	Cash on Delivery
D	Depth
DC	Direct current
EEE	Electrical and electronic equipment
EP	Ethylene propylene
ETL	Electrical Testing Labs/Intertek
EU	European Union
FDA	Food and Drug Administration
FKM	Fluoroelastomer
FVS	Flow Verification Sensor
GF	Glass fiber
GPD	Gallons per day
GPH	Gallons per hour
H	Height
Hz	Hertz
ID	Inside diameter
IO	Input/Output
Kg	Kilogram
lb.	Pound
LLDPE	Linear low-density polyethylene
LPH	Liters per hour
mA	Milliampere
min	Minute
mL	Milliliters
MSDS	Material Safety Data Sheet
N.C.	Normally Close
N.O.	Normally Open
NPT	National Pipe Thread
NSF	National Sanitation Foundation
OD	Outside diameter
P.N.	Part Number
PBT	Polybutylene Terephthalate
PE	Polyethylene
PSI	Pounds per Square Inch
PVC	Polyvinyl chloride
PVDF	Polyvinylidene fluoride
RCD	Residual-current device
Rev.	Revision
RMA	Return Material Authorization
RPM	Revolutions per minute
SIP	Steam-in-place
SS	Solid state
TFD+	Enhanced Tube Failure Detection
TFE/P	Tetrafluoroethylene propylene
UL	Underwriters Laboratories
US	United States
V	Volt
W	Watt
W	Width
WEEE	Waste Electrical and Electronic Equipment

Model Number Matrix

CD3

CHEM-FEED® Model Number

CD3S	CHEM-FEED® Multi-Diaphragm Metering Pump

Maximum Strokes per Minute

2	190 SPM

Input Voltage / Power Cord

4	115V / 60Hz, power cord NEMA 5/15 plug (US)
6	220V / 50HZ, power cord CEE 7/VII plug (EU)
X	No Power Cord (Pump requires power cord. See accessories for other power cord options)

Stroke Length / Diaphragm Size

4	.090” Stroke - Large Diaphragm

Electrical

X	Standard Equipment - C13 power cord connector, six M12 signal connectors, Ethernet port & Profibus M12 connector.

Elastomer Material (O-Rings)

V	DiaFlex Diaphragms and TFE/P 0-rings (For most chemicals, not compatible with Sodium Hydroxide and Aqeuous Ammonia)
E	Flex-A-Prene Diaphragms and EPDM o-rings (for use with Sodium Hydroxide and Aqueous Ammonia)

Pump Head Fittings and Foot Valve

X	Standard Equipment - Includes 1/2” Barb Fittings (Straight & Elbow Adapters), 1/2” MNPT Fittings (Straight and Elbow Adapters) & 1/2” MNPT Footvalve & Injector

Miscellaneous Options (leave blank for standard model)

H	PTFE balls (double ball check valves) low viscosity/density fluids only

CD3S	2	4	4	X	V	X	-	H	**Sample Model Number**

Accessories

KIT-PSM
Wall Mount Bracket, HDPE

71000-579
PVDF INJECTOR,1/2” Hose Barb
71000-577
PVDF INJECTOR,1/2” MNPT

76001-361
Suction Tubing, Clear PVC, 1/2” ID, 8ft
90008-437
Discharge Tubing, Braided PVC, 1/2” ID

Ball Check Cartridge Options

20000-228 (2 req.)
Ball Check Cart. Hastelloy Balls
70001-409 (4 req.)
Ball Check Cart., Single Ceramic Ball with Hastelloy Spring

KIT-M12
Two M12 Cables - 9.8 ft.

KIT-DP3
Profibus Cable, 3 ft

90010-663 115V/60Hz NEMA 5/15
90010-664 220V/50Hz CEE 7/V11
90010-665 230V/50Hz BS 1363/A
90010-666 240V/50Hz AS 3112
90010-696 230V/60Hz NEMA 6/15

POWER CABLES - 6 ft

Visit Accessory Pages for More Options

Users of electrical and electronic equipment (EEE) with the WEEE marking per Annex IV of the WEEE Directive must not dispose of end of life EEE as unsorted municipal waste, but use the collection framework available to them for the return, recycle, recovery of WEEE and minimize any potential effects of EEE on the environment and human health due to the presence of hazardous substances. The WEEE marking applies only to countries within the European Union (EU) and Norway. Appliances are labeled in accordance with European Directive 2002/96/EC.

Contact your local waste recovery agency for a *Designated Collection Facility* in your area.

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Rev 0.9 20231010