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APPENDIX A: ACRONYMS 66
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READ THE ENTIRE OPERATING MANUAL PRIOR TO INSTALLATION AND USE.
Congratulations on purchasing the A4 FLEXFLO® variable speed Peristaltic Metering Pump.

Your FLEXFLO® A4 pump is pre-configured for the tubing that shipped with your metering pump. The tubing assembly has an Identification number printed for easy re-order.

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 pre-installed tube 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 A4 peristaltic metering pump:

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A4 Peristaltic Pump</td>
<td>With 6ft (1.8m) power cord</td>
</tr>
<tr>
<td>Standard Mounting Brackets</td>
<td></td>
</tr>
<tr>
<td>Suction Strainer</td>
<td></td>
</tr>
<tr>
<td>Injection Fitting</td>
<td></td>
</tr>
<tr>
<td>USB Flash Drive With Instruction Manual</td>
<td></td>
</tr>
<tr>
<td>Spare Tubing</td>
<td></td>
</tr>
</tbody>
</table>

See page 60 for additional accessories.
## 2.0 Engineering Specifications

**Maximum Working Pressure (excluding pump tubes)**

Up to 125 psig (8.6 bar)

*Note:* see individual pump tube assembly maximum pressure ratings.

**Maximum Fluid Temperature (excluding pump tubes)**

3/8" OD x 1/4" ID tubing connections: 130 °F (54 °C)

M/NPT connections: 185 °F (85 °C)

*Note:* see individual pump tube assembly max temperature ratings.

**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)

**Maximum Viscosity**

12,000 Centipoise

**Maximum Suction Lift**

30 ft. Water at sea level (14.7 atm psi)

**Operating Voltage**

115VAC/60Hz, 1ph (3.1 Amp Maximum)

230VAC/60Hz, 1ph (1.6 Amp Maximum)

220VAC/50Hz, 1ph (1.6 Amp Maximum)

240VAC/50Hz, 1ph (1.5 Amp Maximum)

230VAC/50Hz, 1ph (1.5 Amp Maximum)

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**

2,500:1 (0.04% – 100%) Max rpm = 125 rpm

**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

**Security**

Programmable 6-digit password

**Maximum Overall Dimensions**

12-1/8"W x 15-1/4"H x 16-1/2"D (30.8W x 38.8H x 41.9D cm)

**Product Weight**

45.5 lb. (20.64 Kg)

**Approximate Shipping Weight**

50 lb. (22.68 Kg)

**Enclosure**

NEMA 4X (IP66), Polyester powder coated aluminum & Noryl

**RoHS Compliant**

Yes

**Standards**

cETLus, CE
2.1 OUTPUT VERSUS FLUID VISCOSITY

Fluid viscosity and motor RPM both have an effect on fluid output. For your reference the charts below display the various tubes we offer and their output at different viscosities and different motor RPM. All testing was conducted with a three foot suction lift.
3.1 Non-Wetted Components

Materials of Construction

Non-wetted Components:

- **Pump Head**: Valox® (PBT) thermoplastic
- **Pump Head Cover**: Polycarbonate
  - Permanently lubricated sealed motor shaft support ball bearing.
- **Cover Screws**: Stainless steel
- **Roller Assembly**:
  - Rotor: Valox® (PBT)
  - Rollers: Nylon
  - Roller Bearings: SS Ball Bearings
- **Motor Shaft**: Chrome plated steel
- **TFD System Sensor**: Hastelloy C-276
- **Power Cord**: 3 conductor, SJTW-A water-resistant
- **Tube Installation Tool**: GF Nylon
- **Mounting Brackets and Hardware**: 316 Stainless steel

3.2 Wetted Components

Wetted Components:

- **Pump Tube Assembly**:
  - Tubing: Flex-A-Prene®, Flex-A-Chem or Flex-A-Thane®
  - Adapter Fittings: PVDF
- **Injection / Back-Flow Check Valve** (With “B” Tubing and “M” M/NPT Connections Only):
  - Body & Insert: PVDF
  - Check Ball: Ceramic
  - Spring: Hastelloy C-276
  - Ball Seat O-Ring: TFE/P (optional EPDM)
  - Static Seal O-Ring: TFE/P (optional EPDM)
- **Ancillary Items Provided**:
  - **Suction Strainer**:
    - Body/Connector: PVDF
    - Ball Seat O-Ring: TFE/P (Optional EPDM)
- **Ancillary Items Not Included (sold separately)**:
  - Suction Tubing/pipe, Discharge Tubing/pipe, Quick Disconnect Valves, or Communications Wire/Cable.

Output Specifications

<table>
<thead>
<tr>
<th>Tube</th>
<th>Feed Rate</th>
<th>Max Pressure</th>
<th>Max Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material / Size</td>
<td>GPH</td>
<td>LPH</td>
<td>mL/Min</td>
</tr>
<tr>
<td><strong>Flex-A-Thane®</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GH</td>
<td>.01 - 39.6</td>
<td>.06 - 150</td>
<td>1.0 - 2500</td>
</tr>
<tr>
<td>GHH</td>
<td>.03 - 71</td>
<td>.11 - 269</td>
<td>1.9 - 4480</td>
</tr>
<tr>
<td>GK</td>
<td>.02 - 55.5</td>
<td>.09 - 210</td>
<td>1.4 - 3500</td>
</tr>
<tr>
<td>GKK</td>
<td>.04 - 100</td>
<td>.20 - 378</td>
<td>2.5 - 6300</td>
</tr>
<tr>
<td><strong>Flex-A-Prene®</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NH</td>
<td>.01 - 28.5</td>
<td>.04 - 108</td>
<td>0.7 - 1800</td>
</tr>
<tr>
<td>NHL</td>
<td>.02 - 28.5</td>
<td>.07 - 108</td>
<td>1.2 - 1800</td>
</tr>
<tr>
<td>NK</td>
<td>.02 - 50.7</td>
<td>.08 - 192</td>
<td>1.3 - 3200</td>
</tr>
<tr>
<td>NHH</td>
<td>.02 - 54.0</td>
<td>.09 - 204</td>
<td>1.4 - 3400</td>
</tr>
<tr>
<td>NHHL</td>
<td>.02 - 54.0</td>
<td>.09 - 204</td>
<td>1.4 - 3400</td>
</tr>
<tr>
<td>NL</td>
<td>.04 - 100</td>
<td>.15 - 378</td>
<td>2.5 - 6300</td>
</tr>
<tr>
<td>NP</td>
<td>.06 - 158.5</td>
<td>.24 - 600</td>
<td>4.0 - 10000</td>
</tr>
<tr>
<td><strong>Flex-A-Chem®</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TH</td>
<td>.01 - 25.4</td>
<td>.04 - 96.0</td>
<td>0.6 - 1600</td>
</tr>
<tr>
<td>TK</td>
<td>.02 - 54.0</td>
<td>.08 - 204</td>
<td>1.4 - 3400</td>
</tr>
<tr>
<td>TKK</td>
<td>.05 - 126</td>
<td>.18 - 477</td>
<td>3.2 - 7950</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="https://example.com/warning.png" alt="Warning" /></td>
<td>Warning (Risk of electric shock)</td>
</tr>
<tr>
<td><img src="https://example.com/caution.png" alt="Caution" /></td>
<td>Caution (Refer to the user’s guide)</td>
</tr>
<tr>
<td><img src="https://example.com/ground.png" alt="Ground" /></td>
<td>Ground, Protective Conductor Terminal</td>
</tr>
</tbody>
</table>

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.
5.0 Installation

5.1 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:** Mounting the pump lower than the chemical container will gravity-feed chemical into it. This “flooded suction” installation will reduce output error due to increased suction lift. A shut-off valve, pinch-clamp, or other means to halt gravity-feed to the pump must be installed during servicing.

**NOTE:** Install a back flow prevention check valve at the discharge side of the pump to prevent the system fluid from flowing back through pump during tube replacement or during tube rupture.

**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 tube, in the event that the discharge line becomes blocked.

**NOTE:** The pump does not require back pressure. Keep the discharge pressure as low as possible to maximize the tube life.

**NOTE:**: Mounting the pump lower than the chemical container will gravity-feed chemical into it. This “flooded suction” installation will reduce output error due to increased suction lift. A shut-off valve, pinch-clamp, or other means to halt gravity-feed to the pump must be installed during servicing.

**NOTE:**: Mounting the pump lower than the chemical container will gravity-feed chemical into it. This “flooded suction” installation will reduce output error due to increased suction lift. A shut-off valve, pinch-clamp, or other means to halt gravity-feed to the pump must be installed during servicing.

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5.2 Pump Dimensions

Extended Brackets

Stainless Steel extended brackets allow the pump to be securely mounted to most any surface; floor, shelf, or skid. Brackets lift the pump up 4-1/2 inches (11.43 cm), for easy pump access in hard to reach areas.

- Raise metering pump 4-1/2 inches (11.43 cm) off ground or a surface.
- Made out of tough Stainless Steel.
- Provides a stable mounting surface.

Extended Brackets ordered separately. Part #72000-380.
5.3 Input Power Connections

- 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 voltage your power cord is rated for.
- 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.*
5.4 Wiring Terminals and I/O Schematics

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

<table>
<thead>
<tr>
<th>BLOCK DIAGRAM</th>
<th>KIT-M12 WIRING INSTRUCTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Diagram of M12 connector and wiring instructions]</td>
<td></td>
</tr>
</tbody>
</table>

Shielded cables should be used on all input signal wires.

<table>
<thead>
<tr>
<th>FUNCTION</th>
<th>M12 Connector PIN #</th>
<th>RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>INPUT: 4-20 mA</td>
<td>INPUT #2 2 (+) POSITIVE</td>
<td>1 AMP MAX @ 125V AC</td>
</tr>
<tr>
<td>INPUT: FREQUENCY, AC SINE WAVE, TTL, CMOS</td>
<td>INPUT #2 3 (-) NEGATIVE</td>
<td>0.8 AMP MAX @ 30V DC</td>
</tr>
<tr>
<td>INPUT: FVS SYSTEM (FLOW VERIFICATION SENSOR) FV SENSOR ONLY</td>
<td>INPUT #1 4 (+) POSITIVE</td>
<td>1 AMP MAX @ 125V AC</td>
</tr>
<tr>
<td>INPUT: FVS SYSTEM (FLOW VERIFICATION SENSOR) FS or FP MICRO-FLO FLOWMETER ONLY</td>
<td>INPUT #1 5 (-) NEGATIVE</td>
<td>0.8 AMP MAX @ 30V DC</td>
</tr>
<tr>
<td>INPUT: REMOTE START/STOP DRY CONTACT C PRIMARY</td>
<td>INPUT #1 1 (+) POSITIVE</td>
<td>4-20mA RECEIVER 600 OHM LOAD MAX.</td>
</tr>
<tr>
<td>INPUT: AUTO-PRIME/DRY CONTACT C SECONDARY</td>
<td>INPUT #2 5 (-) NEGATIVE</td>
<td>4-20mA RECEIVER 600 OHM LOAD MAX.</td>
</tr>
<tr>
<td>OUTPUT: 4-20 mA</td>
<td>OUTPUT #1 2 (-) NEGATIVE</td>
<td>DIGITAL PULSE RECEIVER CIRCUIT</td>
</tr>
<tr>
<td>OUTPUT: FREQUENCY-OPEN COLLECTOR</td>
<td>OUTPUT #2 2 (-) NEGATIVE</td>
<td>1.5K OHM EXTRA SOURCE 6-30V DC</td>
</tr>
<tr>
<td>OUTPUT: CONTACT CLOSURE #1</td>
<td>OUTPUT #1 3 NORMALLY OPEN</td>
<td>SWITCH LOAD 1 AMP MAX @ 125V AC</td>
</tr>
<tr>
<td>OUTPUT: CONTACT CLOSURE #2</td>
<td>OUTPUT #2 3 NORMALLY OPEN</td>
<td>0.8 AMP MAX @ 30V DC</td>
</tr>
<tr>
<td>OUTPUT: CONTACT CLOSURE #3</td>
<td>OUTPUT #3 3 NORMALLY OPEN</td>
<td>SWITCH LOAD 1 AMP MAX @ 125V AC</td>
</tr>
<tr>
<td>OUTPUT: RELAY 6 AMP</td>
<td>OUTPUT #4 3 NORMALLY OPEN</td>
<td>0.8 AMP MAX @ 30V DC</td>
</tr>
</tbody>
</table>

Never strap control (input / output) cables and power cables together.

Use voltage your power cord is rated for.

Input power range is 96VAC to 264VAC 50/60 Hz.

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.

When in doubt regarding your electrical installation, contact a licensed electrician.

Risk of electric shock - Disconnect electricity before removing the wiring compartment cover.

Electrical connections and grounding (earthing) must conform to local wiring codes.

This pump has a user programmable auto-restart feature which can be set to restart or require a user action to restart.

Note: If power is lost, the pump will stop running. Either restore the pump to the operating state it was in when power was lost or require a user action to restart.
6.1 HOME SCREEN LAYOUT

Quick Setting Tab - Allow users to quickly
- Activate/Deactivate/Modify Remote Start/Stop function
- Active/Deactivate/Modify FVS function

6.2 APP SCREEN LAYOUT
6.3 M12 Connector

Pump (Rear Upper Panel)

- M12 Input Connector 1
- M12 Input Connector 2
- M12 Output Connector 1
- M12 Output Connector 2
- M12 Output Connector 3
- M12 Output Connector 4

6.4 IO Connection

Pump (Rear Lower Panel)

- USB-C
- Ethernet/Modbus
- ON/OFF
- Power Supply
- M12 Profibus
### M12 Connector

![M12 Input/Output Connector](image1)

#### M12 Input Connector 1

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

#### M12 Input Connector 2

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

#### M12 Output Connector 1

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

#### M12 Output Connector 2

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

---

**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).
### M12 Output Connector 3

<table>
<thead>
<tr>
<th>PIN</th>
<th>Function</th>
<th>Specifications</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>Not Used</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P2</td>
<td>Not Used</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P3</td>
<td>N.O.</td>
<td>Contact closure output #3</td>
<td>.8 Amp Max @ 30VDC</td>
</tr>
<tr>
<td>P4</td>
<td>N.C.</td>
<td>Contact closure output #3</td>
<td>1 Amp @ 125 VAC</td>
</tr>
<tr>
<td>P5</td>
<td>Ground</td>
<td>Contact closure output #3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>COM Contact</td>
<td></td>
</tr>
</tbody>
</table>

### M12 Output Connector 4

<table>
<thead>
<tr>
<th>PIN</th>
<th>Function</th>
<th>Specifications</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>Not Used</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P2</td>
<td>Not Used</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P3</td>
<td>N.O.</td>
<td>Relay Out, N.O. Contact</td>
<td>6 Amp Max @ 250VAC, 5 Amp MAX @ 30VDC</td>
</tr>
<tr>
<td>P4</td>
<td>N.C.</td>
<td>Relay Out, N.C. Contact</td>
<td>6 Amp Max @ 250VAC, 5 Amp MAX @ 30VDC</td>
</tr>
<tr>
<td>P5</td>
<td>Ground</td>
<td>Relay Out, COM Contact</td>
<td></td>
</tr>
</tbody>
</table>

### M12 Profibus Connector

<table>
<thead>
<tr>
<th>PIN</th>
<th>Function</th>
<th>Specifications</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>VP</td>
<td>+5V supply for terminating resistors</td>
<td></td>
</tr>
<tr>
<td>P2</td>
<td>RxD/TxD-N</td>
<td>Data line minus (A-line)</td>
<td></td>
</tr>
<tr>
<td>P3</td>
<td>DGND</td>
<td>Data ground</td>
<td></td>
</tr>
<tr>
<td>P4</td>
<td>RxD/TxD-P</td>
<td>Data line plus (B-line)</td>
<td></td>
</tr>
<tr>
<td>P5</td>
<td>Shield</td>
<td>Ground connection</td>
<td></td>
</tr>
</tbody>
</table>

**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 A4 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 A4 pump. Refer to section 11 of this manual to change any of these options after you have finished the initial configuration.

![Welcome Screen](image)

**Welcome Screen Configuration**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong></td>
<td></td>
<td><strong>3</strong></td>
</tr>
<tr>
<td>Local Language</td>
<td></td>
<td>Set Name</td>
</tr>
</tbody>
</table>

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

**4** Set Units
- Unit of Volume
- Unit of Time

**5** Set Tube Type

**6** 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: RPM
Flow rate

To Enable Manual Speed Adjust:

1. Open the App Drawer
2. Select Manual Speed Adjust
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
   • RPM
   • 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
4. 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 (M12 Input Connector 2) - Will stop pump if closed.

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.

Note: Remote Start/Stop can also be accessed via the Quick Setting Tab on the Home Screen

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.
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 head rotor is turning, 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 S6A & The MICRO-FLO Flow Meter that easily install into the inlet of the A4.

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

Note: FVS Settings can also be accessed via the Quick Setting Tab on the Home Screen
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

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.
8.10 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. Select Profile to Program (4 Profiles)
5. Set Amount Per Dispense (in milliliters)
   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 Stop the Pump
2 Press Local Only Key
3 Local Mode is Enabled and “Local” will be displayed

To Disable Local Only Mode:
1 Stop the Pump
2 Press Local Only Key
3 Local Mode is Disabled and pump will be returned to previous operation
To Enable Local Only Mode:
1. Stop the Pump
2. Press Local Only Key
3. Local Mode is Enabled and “Local” will be displayed

To Disable Local Only Mode:
1. Stop the Pump
2. Press Local Only Key
3. Local Mode is Disabled and pump will be returned to previous operation

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.
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

<table>
<thead>
<tr>
<th>Selection</th>
<th>Contact energizes when:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump Run/Stop</td>
<td>Motor turning (roller assembly is rotating)</td>
</tr>
<tr>
<td>Monitor Input</td>
<td>Incoming analog or digital signal is not received or out of range</td>
</tr>
<tr>
<td>Monitor Output</td>
<td>Outgoing analog or digital signal not transmitted or out of range</td>
</tr>
<tr>
<td>Monitor Run/Fail</td>
<td>Motor fails to respond to commands</td>
</tr>
<tr>
<td>4-20 In Active</td>
<td>4-20mA mode is running</td>
</tr>
<tr>
<td>Frequency In Active</td>
<td>Frequency mode is running</td>
</tr>
<tr>
<td>Manual Speed Active</td>
<td>Manual Speed mode is running</td>
</tr>
<tr>
<td>Pulse In Active</td>
<td>Pulse In mode is running</td>
</tr>
<tr>
<td>Prime Active</td>
<td>Prime mode is running</td>
</tr>
<tr>
<td>Pump Available</td>
<td>Pump is On</td>
</tr>
<tr>
<td>FVS</td>
<td>After the programmed delay time pulses are not received from flow sensor.</td>
</tr>
<tr>
<td>TFD</td>
<td>Tube failure is detected by sensors in the head</td>
</tr>
<tr>
<td>Both TFD/FVS</td>
<td>Either TFD or FVS system triggers</td>
</tr>
<tr>
<td>General Error</td>
<td>Motor Overload or other internal error</td>
</tr>
</tbody>
</table>
### 10.1 Control and Status Mapping for Profibus and Ethernet/IP

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

<table>
<thead>
<tr>
<th>Offset</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 1</td>
<td>Motor Percent Speed</td>
<td>Up to 2 decimal places, with most significant Offset representing the whole number and least significant Offset representing the decimal number. (Eg. 50.15 =&gt; MSB = 50, LSB = 15)</td>
</tr>
<tr>
<td>2</td>
<td>Motor Direction</td>
<td>0 = Clockwise, 1 = Counter-clockwise.</td>
</tr>
<tr>
<td>3</td>
<td>Run State</td>
<td>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</td>
</tr>
<tr>
<td>4</td>
<td>Reset Alarms</td>
<td>Reset alarms (TFD/DFD, FVS) on the pump. 0 = nothing, 1 = reset alarms. Only reset on a 0 -&gt; 1 transition</td>
</tr>
<tr>
<td>5</td>
<td>Reset Tube Stats</td>
<td>Reset tube revolutions counter and hours ran</td>
</tr>
<tr>
<td>6</td>
<td>Cyclic Counter Direction</td>
<td>Cyclic counter direction (debugging purpose only). 0 = count up, 1 = count down</td>
</tr>
<tr>
<td>7</td>
<td>Cyclic Counter Speed</td>
<td>Cyclic counter speed (debugging purpose only). 0 = counter not incremented/decremented. Values &gt; 0 = number of cycles it takes to increment/decrement the counter by one</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Offset</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Run Status</td>
<td>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</td>
</tr>
<tr>
<td>1</td>
<td>Cover Status</td>
<td>0 = Cover Attached, 1 = Cover Detached</td>
</tr>
<tr>
<td>2</td>
<td>Motor Direction</td>
<td>0 = Clockwise, 1 = Counter-clockwise</td>
</tr>
<tr>
<td>3</td>
<td>TFD/DFD status</td>
<td>0 = No TFD/DFD alarm, 1 = TFD/DFD alarm</td>
</tr>
<tr>
<td>4</td>
<td>FVS status</td>
<td>0 = No FVS alarm, 1 = FVS alarm</td>
</tr>
<tr>
<td>5</td>
<td>Relay Output</td>
<td>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</td>
</tr>
<tr>
<td>6 - 7</td>
<td>4-20 mA Output</td>
<td>Range: 400 - 2000 mA, where MSB represents the whole number and LSB represents the decimal number. Eg. 4.50 mA =&gt; Offset 6 = 4, Offset 7 = 50</td>
</tr>
<tr>
<td>8 - 9</td>
<td>Frequency Output</td>
<td>Range: 0 - 1000 Hz, where the MSB represent thousands and hundreds digits and LSB represents the tens and ones digits. Eg. 985 Hz =&gt; Offset 8 = 85, Offset 9 = 09</td>
</tr>
<tr>
<td>10 - 11</td>
<td>Motor Percent Speed</td>
<td>Up to 2 decimal places, with most significant Offset representing the whole number and least significant Offset representing the decimal number. (Eg. 50.15 =&gt; MSB = 50, LSB = 15)</td>
</tr>
<tr>
<td>12 - 15</td>
<td>Firmware Version</td>
<td>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 =&gt; Offset 15: 1, Offset 14: 0, Offset 13: 5, Offset 12: b(0x62))</td>
</tr>
<tr>
<td>16 - 19</td>
<td>Tube Revolutions</td>
<td>Current tube revolution counter</td>
</tr>
<tr>
<td>20 - 23</td>
<td>Tube Hours</td>
<td>Number of hours ran for current tube</td>
</tr>
<tr>
<td>24 - 25</td>
<td>Cyclic Counter</td>
<td>Cyclic counter (debugging purpose only)</td>
</tr>
</tbody>
</table>

Terminology:
- TFD/DFD = Tube/Diaphragm Failure Detection
- FVS = Flow Verification System
- LSB = Least Significant Byte
- MSB = Most Significant Byte
### 10.2 Control and Status Mapping for Modbus TCP

**Modbus TCP: Holding Registers (4x Reference, PLC to Pump, 16-bit word) - Pump Control**

<table>
<thead>
<tr>
<th>Register</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0000</td>
<td>Motor Percent Speed</td>
<td>Up to 2 decimal places, with MSB representing the whole number and LSB representing the decimal number. (Eg. 50.15 -&gt; MSB = 50, LSB = 15)</td>
</tr>
<tr>
<td>0001</td>
<td>Motor Direction and Run State</td>
<td>LSB is the motor direction where 0x00 = Clockwise, 0x01 = Counter-clockwise. MSB is to 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</td>
</tr>
<tr>
<td>0002</td>
<td>Reset Alarms and Tube Stats</td>
<td>LSB is to reset alarms (TFD/DFD, FVS) on the pump, where 0x00 = nothing, 0x01 = reset alarms. Only reset on a 0 -&gt; 1 transition. MSB is to reset tube revolutions counter and hours ran</td>
</tr>
<tr>
<td>0003</td>
<td>Cyclic Counter Direction and Speed</td>
<td>LSB is to set cyclic counter direction, where 0 = count up and 1 = count down. MSB is to set the cyclic counter speed, where 0 = counter not incremented/decremented. Values &gt; 0 = number of cycles it takes to increment/decrement the counter by one. These are meant for debugging purposes only</td>
</tr>
</tbody>
</table>

**Modbus TCP: Input Registers (3x Reference, Pump to PLC, 16-bit word) - Pump Status**

<table>
<thead>
<tr>
<th>Register</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0000</td>
<td>Run Status and Cover Status</td>
<td>LSB is the 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. MSB is the cover status, where 0 = Cover Attached, 1 = Cover detached</td>
</tr>
<tr>
<td>0001</td>
<td>Motor Direction and TFD/DFD status</td>
<td>LSB is the motor direction where 0 = Clockwise, 1 = Counter-clockwise. MSB is the TFD/DFD status where 0 = No TFD/DFD alarm, 1 = TFD/DFD alarm</td>
</tr>
<tr>
<td>0002</td>
<td>FVS status and Relay Output</td>
<td>LSB is the FVS status where 0 = No FVS alarm, 1 = FVS alarm. MSB is the 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</td>
</tr>
<tr>
<td>0003</td>
<td>4-20 mA Output</td>
<td>Range: 400 - 2000 mA, where MSB represents the whole number and LSB represents the decimal number. Eg. 4.50 mA -&gt; MSB = 4, LSB = 50</td>
</tr>
<tr>
<td>0004</td>
<td>Frequency Output</td>
<td>Range: 0 - 1000 Hz, where the MSB represent thousands and hundreds digits and LSB represents the tens and ones digits. Eg. 985 Hz -&gt; Byte B = 85, Byte 9 = 09</td>
</tr>
<tr>
<td>0005</td>
<td>Motor Percent Speed</td>
<td>Up to 2 decimal places, with MSB representing the whole number and LSB representing the decimal number. (Eg. 50.15 -&gt; MSB = 50, LSB = 15)</td>
</tr>
<tr>
<td>0006</td>
<td>Firmware Patch and Build</td>
<td>Firmware patch number and build channel. LS is the firmware build channel. Channel can be one of three values: 0 = stable, a(0x61) = alpha, b(0x62) = beta. MSB is the firmware patch number Example: (1.0.5-beta -&gt; MSB = 5, LSB = b(0x62))</td>
</tr>
<tr>
<td>0007</td>
<td>Firmware Major and Minor Version</td>
<td>Firmware major and minor version. MSB is the major version and LSB is the minor version Example: (1.0.5-beta -&gt; MSB = 1 and LSB = 0)</td>
</tr>
<tr>
<td>0008 - 0009</td>
<td>Tube Revolutions</td>
<td>Current tube revolution counter</td>
</tr>
<tr>
<td>0010 - 0011</td>
<td>Tube Hours</td>
<td>Number of hours ran for current tube</td>
</tr>
<tr>
<td>0012</td>
<td>Cyclic Counter</td>
<td>Cyclic counter (debugging purpose only)</td>
</tr>
</tbody>
</table>
10.3 EtherNet/IP

This is used to configure the EtherNet/IP

Three values to be defined:
1) IP Address
2) Subnet Mask
3) Gateway
4) Always on

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

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) Bus Address
2) Baud Rate
3) Watchdog Time
4) Always on

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:
   • Bus Address
   • Baud Rate
   • Watchdog Time
   • Always on
6 Confirm by pressing Save
11.1 Tube Info

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

- Tube type
- Tube installation date
- Tube run time
- Current maximum tube flow rate

To View The Tube Info:

1. Tap on the Tube Info text in the top portion of the screen
2. Tube info will be displayed
3. Click “reset” to reset the tube hours and revolutions
11.2 Tube Calibration

This feature allows the user to calibrate the pump’s indicated flow rate to the system.

To Calibrate Your Tube:

1. On the home screen select the Calibration Icon.
2. Enter values:
   - Pump Speed (% 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.

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
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**

This will change the Unit of Time that is displayed for the flow rate.
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
12.6  Pump Rotation Direction

This setting is used to change the rotational direction of pump. In most applications, the tube will fail by developing a small leak in the outlet side (pressure side) of the tube assembly. By reversing the roller rotation, the wear point in the tube is moved to the opposite side to the pump tube assembly, increasing the life of the tube.

**Important!** Changing the rotational direction of the pump reverses the inlet & outlet sides.

---

To Change The Direction Of The Pump Rotation

1. Open the App Drawer
2. Open Settings
3. Open System
4. Select Pump Direction
5. Select Desired Rotation
   - Clockwise
   - Counter Clockwise
6. Confirm by pressing OK

---

IMPORTANT! Swap sides of the suction (inlet) and discharge (outlet) tubing/piping. There is no need to remove the pump head cover.

NOTE: The pump tube will form a natural U-shaped curve. Do not attempt to install the pump tube against the natural U-shape direction as damage to the tube can result.
12.7 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
12.8 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
12.9 Factory Reset

This setting is used to factory reset the pump. This will erase all of the configurations and restore the pump to its 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
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

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”. (If this is the first time using Blue Central, it may take a few minutes to download firmware, depending on your internet speed.)
3. The firmware upgrade box will appear showing the progress of the download. (This should take 1-3 minutes)
4. Once the download is complete select “Close” to exit screen.
5. Follow instruction on pump screen to upgrade the firmware. You can choose to update at a later time if the pump is currently running.
6. If you choose to update at a later time, you can initiate the update later by going to the “System” key and selecting “Update” at the bottom of the screen.
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 How to Clean and Lubricate the Pump

When changing the pump tube assembly, the pump head chamber, roller assembly and pump head cover should be wiped free of any dirt and debris.

100% silicon lubrication may be used on the roller assembly.

Refer to www.blue-white.com/resources/videos for roller assembly maintenance video instructions.

Periodically clean the back flow prevention check valve assembly, especially when injecting fluids that calcify such as sodium hypochlorite. These lime deposits and other build ups can clog the fitting, increasing the back pressure at the pump (reducing tube life) and interfering with check valve operation.

The motor does not require maintenance or lubrication.
14.3 Removing Pump Head Cover and Tubing Replacement

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

1. Remove the Pump Head Cover by unscrewing the Thumb Screws. Pull out the Pump Head Cover.

2. The pump will detect that the Pump Head Cover is removed and enter MAINTENANCE MODE.

3. Rotor will rotate at a maximum of 6 RPM for your safety.

4. Press the START button and rotate until one of the rollers is in the 9 O’clock position.

5. Rotate the Spider Ring and remove.

6. Remove Roller (pinch or guide) by sliding it off the rotor.

7. Run pump and repeat process with other rollers.

8. Remove Tube and clean pump head. Clean rollers, as necessary.

9. Install new Tube.

10. Install Roller, and rotate pump head to install remaining Rollers. Be sure pinch rollers are opposite of other.

11. Once all rollers are installed, attach and tighten the Spider Ring.

12. Re-attach Pump Head Cover with Thumb Screws.

13. Confirm Tube replacement and press Save. Pump is now ready for use.

For more information on tube replacement scan the QR Code here, or go to www.blue-white.com/bw-videos/the-blue-white-academy-how-to-replace-the-a4-m4-tubing/
14.3 Removing Pump Head Cover and Tubing Replacement

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

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2. The pump will detect that the Pump Head Cover is removed and enter MAINTENANCE MODE.
3. Rotor will rotate at a maximum of 6 RPM for your safety.
4. Press the START button and rotate until one of the rollers is in the 9 O'clock position.
5. Rotate the Spider Ring and remove.
6. Remove Roller (pinch or guide) by sliding it off the rotor.
7. Run pump and repeat process with other rollers.
8. Remove Tube and clean pump head. Clean rollers, as necessary.
9. Install new Tube.
10. Install Roller, and rotate pump head to install remaining Rollers. Be sure pinch rollers are opposite of other.
11. Once all rollers are installed, attach and tighten the Spider Ring.
12. Re-attach Pump Head Cover with Thumb Screws.
13. Confirm Tube replacement and press Save. Pump is now ready for use.

14.4 Pump Head and Roller Exploded Views

![Pump Head Diagram]

Pump Head

![Roller Assembly Diagram]

Roller Assembly

CAUTION

Prior to service, pump clean water through the pump and suction / discharge line to remove chemical.

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
14.5 TFD

This pump is equipped with a Tube Failure Detecting System which is designed to stop the pump and provide an output alarm (see Output menu) in the event pump the tube should rupture and chemical enters the pump head.

This patented 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 not be triggered by water (rain, condensation, etc.) or silicone oil (roller and tubing lubricant).

If a TFD alarm occurs, the pump will stop and the screen will turn red with “TFD”

Please refer to Section 14 for instructions on replacing tube and cleaning the pump head. Proper cleaning after tube leaks are critical for maintaining the best possible tube and roller life.

Confirming Chemical Detection

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

1. Remove the pump head cover, and the pump tube and roller assembly.
2. Place a small amount of chemical in the bottom of the pump head that is enough to cover the sensors.
3. Reinstall only the pump head cover.
4. Turn on the pump by pressing the START button.

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

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

5. Carefully clean the chemical out of the pump head. Ensure to remove all the chemical traces from the sensor probes.
6. Replace the roller assembly and tubing.
7. Reinstall the pump head cover.
8. Follow instructions on pump to clear alarm condition.
9. Restart the pump.
14.6 Predictive Tube Failure Detection (TFD)

This pump is equipped with a Predictive Tube Failure Detection feature that uses tube replacement history to let the operator know when a tube failure may occur. This feature must be activated in the Settings Tab. When activated before any tube failures, the default setting for the installed tube will be used.

When enabled, a warning will be displayed when a tube is approaching its previous failure threshold. This threshold is based on an average of tube replacement and TFD event history.

To Modify Setting:

1. Open the App Drawer
2. Open Settings
3. Open Predictive TFD
4. Enable the Alarm
5. Confirm by pressing Save
### 15.1 Replacement Parts

#### A4/M4 Replacement Parts

<table>
<thead>
<tr>
<th>Part No.</th>
<th>QTY Req'd</th>
</tr>
</thead>
<tbody>
<tr>
<td>90011-217</td>
<td>2</td>
</tr>
<tr>
<td>A4-MNL-R</td>
<td>1</td>
</tr>
<tr>
<td>A4-MTH-R</td>
<td>1</td>
</tr>
<tr>
<td>A4-MNH-R</td>
<td>1</td>
</tr>
<tr>
<td>A4-MNKL-R</td>
<td>1</td>
</tr>
<tr>
<td>A4-MGH-R</td>
<td>1</td>
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<tr>
<td>90011-183</td>
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<tr>
<td>90007-128</td>
<td>1</td>
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**Roller Assembly Parts**

<table>
<thead>
<tr>
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<th>QTY Req'd</th>
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</thead>
<tbody>
<tr>
<td>7</td>
<td>1</td>
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<tr>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>2</td>
</tr>
<tr>
<td>12</td>
<td>1</td>
</tr>
</tbody>
</table>

*NP flow rate reduced 16.5% with Quick Disconnect connections.

*Pump Head not for sale. For more information please contact a local sales representative.

#### Quick Disconnect Fittings*

<table>
<thead>
<tr>
<th>Part No.</th>
<th>QTY Req'd</th>
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</thead>
<tbody>
<tr>
<td>72000-379</td>
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<tr>
<td>72000-380</td>
<td>1</td>
</tr>
</tbody>
</table>

*For use only with "Q" style pump tubes

#### Miscellaneous Parts*

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<thead>
<tr>
<th>Part No.</th>
<th>QTY Req'd</th>
</tr>
</thead>
<tbody>
<tr>
<td>90003-561</td>
<td>1</td>
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</tbody>
</table>

*Sold Separately
### Inlet/Outlet Connection Size, Connection Type, Connection Material

<table>
<thead>
<tr>
<th></th>
<th>Connection Type</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>1/2&quot; Male NPT Fitting, Natural PVDF (Kynar)</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>1/2&quot; ID Tubing Barb Fitting, Natural PVDF (Kynar)</td>
<td></td>
</tr>
<tr>
<td>Q</td>
<td>Quick Disconnect, Natural PVDF (Kynar). NP flow rate reduced 16.5% with Quick Disconnect connections (Valves sold separately)</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>1/2&quot; - 3/4&quot; Tri-clamp connections, Natural PVDF (Kynar)</td>
<td></td>
</tr>
<tr>
<td>MB</td>
<td>1/2&quot; Male BSPT Fitting, Natural PVDF (Kynar)</td>
<td></td>
</tr>
</tbody>
</table>

### Pump Tube Material, Pump Tube Size

<table>
<thead>
<tr>
<th>GH</th>
<th>Flex-A-Thane® .312 ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>GHH</td>
<td>Flex-A-Thane® .312 ID (Dual Tube)</td>
</tr>
<tr>
<td>GK</td>
<td>Flex-A-Thane® .375 ID</td>
</tr>
<tr>
<td>GKK</td>
<td>Flex-A-Thane® .375 ID (Dual Tube)</td>
</tr>
<tr>
<td>NH</td>
<td>Flex-A-Prene® .250 ID</td>
</tr>
<tr>
<td>NHL</td>
<td>Flex-A-Prene® .250 ID</td>
</tr>
<tr>
<td>NHH</td>
<td>Flex-A-Prene® .250 ID (Dual Tube)</td>
</tr>
<tr>
<td>NHHL</td>
<td>Flex-A-Prene® .250 ID (Dual Tube)</td>
</tr>
<tr>
<td>NK</td>
<td>Flex-A-Prene® .375 ID</td>
</tr>
<tr>
<td>NL</td>
<td>Flex-A-Chem® .250 ID</td>
</tr>
<tr>
<td>NP</td>
<td>Flex-A-Chem® .250 ID</td>
</tr>
<tr>
<td>TK</td>
<td>Flex-A-Chem® .250 ID</td>
</tr>
<tr>
<td>T</td>
<td>Flex-A-Chem® .375 ID</td>
</tr>
</tbody>
</table>

### Output Specifications

<table>
<thead>
<tr>
<th>Tube Material / Size</th>
<th>Feed Rate</th>
<th>Max Speed</th>
<th>Max Pressure</th>
<th>Max Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GPH</td>
<td>LPH</td>
<td>mL/Min</td>
<td>RPM</td>
</tr>
<tr>
<td>Flex-A-Thane® Tube</td>
<td>GH Up to 39.6</td>
<td>Up to 150</td>
<td>Up to 2500</td>
<td>125</td>
</tr>
<tr>
<td></td>
<td>GHH Up to 71.0</td>
<td>Up to 268</td>
<td>Up to 4479</td>
<td>125</td>
</tr>
<tr>
<td></td>
<td>GK Up to 55.5</td>
<td>Up to 210</td>
<td>Up to 3500</td>
<td>125</td>
</tr>
<tr>
<td></td>
<td>GKK Up to 100</td>
<td>Up to 378</td>
<td>Up to 6300</td>
<td>125</td>
</tr>
<tr>
<td>Flex-A-Prene® Tube</td>
<td>NH Up to 28.5</td>
<td>Up to 108</td>
<td>Up to 1800</td>
<td>125</td>
</tr>
<tr>
<td></td>
<td>NHL Up to 28.5</td>
<td>Up to 108</td>
<td>Up to 1800</td>
<td>125</td>
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<tr>
<td></td>
<td>NHH Up to 54.0</td>
<td>Up to 204</td>
<td>Up to 3400</td>
<td>125</td>
</tr>
<tr>
<td></td>
<td>NHHL Up to 54.0</td>
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<tr>
<td></td>
<td>NK Up to 50.7</td>
<td>Up to 192</td>
<td>Up to 3200</td>
<td>125</td>
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<td></td>
<td>NL Up to 100</td>
<td>Up to 378</td>
<td>Up to 6300</td>
<td>125</td>
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<tr>
<td></td>
<td>NP Up to 158.5</td>
<td>Up to 600</td>
<td>Up to 10000</td>
<td>125</td>
</tr>
<tr>
<td>Flex-A-Chem® Tube</td>
<td>TH Up to 25.4</td>
<td>Up to 96</td>
<td>Up to 1603</td>
<td>125</td>
</tr>
<tr>
<td></td>
<td>TK Up to 54.0</td>
<td>Up to 204</td>
<td>Up to 3400</td>
<td>125</td>
</tr>
<tr>
<td></td>
<td>TKK Up to 126</td>
<td>Up to 477</td>
<td>Up to 8000</td>
<td>125</td>
</tr>
</tbody>
</table>

** NP flow rate reduced 16.5% with Quick Disconnect connections.
16.0 ACCESSORIES

The following accessories are available for the A4 FLEXFLO® Peristaltic Metering Pump. Please visit Blue-white.com for more information. All accessories are sold separately.

KIT-M12

Kit contains: Two M12 cables. 10 foot length.

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

KIT-M12 WIRING INSTRUCTIONS

<table>
<thead>
<tr>
<th>DIAGRAM</th>
<th>PIN #</th>
<th>WIRE COLOR</th>
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<tbody>
<tr>
<td></td>
<td>PIN 1</td>
<td>BROWN</td>
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<tr>
<td></td>
<td>PIN 2</td>
<td>WHITE</td>
</tr>
<tr>
<td></td>
<td>PIN 3</td>
<td>BLUE</td>
</tr>
<tr>
<td></td>
<td>PIN 4</td>
<td>BLACK</td>
</tr>
<tr>
<td></td>
<td>PIN 5</td>
<td>GRAY</td>
</tr>
</tbody>
</table>

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

CABLE-UAC

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

KIT-DP3

Kit contains: One 3’ profibus cable.

KIT-QMV

Kit contains: One Quick Connect Inlet with .50”M/NPT (assembled with FKM O-rings) and One Quick Connect Outlet with .50”M/NPT (assembled with FKM O-rings)

KIT-QBV

Kit contains: One Quick Connect Inlet with .50” hose barb connection (assembled with FKM O-rings), One Quick Connect Inlet with .50” hose barb connection (assembled with FKM O-rings) and two #5 Clamps.
**KIT-PSM**

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

**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)
17.1 LIMITED WARRANTY

Your new FLEXFLO pump is a quality product and is warrantied for 24 months from date of purchase (proof of purchase is required). The pump 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 pump manual. 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 legible. The warranty status of the pump will be verified by Blue-White or a factory authorized service center.

Pump Head and roller assembly is warrantied against damage from chemical attack when proper TFD (Tube Failure Detection) system instructions and maintenance procedures are followed.

17.2 WHAT IS NOT COVERED

• Pump Tube Assemblies 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 which is out of our control.
• Pumps damaged by faulty wiring, power surges or acts of nature.

17.3 PROCEDURE FOR IN WARRANTY REPAIR

Contact the factory to obtain a RMA (Return Material Authorization) number. Carefully pack the pump to be repaired. It is recommended to include foot strainer and injection/check valve fitting since these devices may be clogged and part of the problem. Please enclose a brief description of the problem as well as the original invoice or sales receipt, or copy showing the date of purchase. Prepay all shipping costs. COD shipments will not be accepted. Warranty service must be performed by the factory or an authorized service center. Damage caused by improper packaging is the responsibility of the sender. When In-Warranty repair or replacement is completed, the factory pays for return shipping to the dealer or customer.

17.4 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.

17.5 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.

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17.0 WARRANTY

17.1 LIMITED WARRANTY
Your new FLEXFLO pump is a quality product and is warrantied for 24 months from date of purchase (proof of purchase is required). The pump 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 pump manual. 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 legible. The warranty status of the pump will be verified by Blue-White or a factory authorized service center.

Pump Head and roller assembly is warranted against damage from chemical attack when proper TFD (Tube Failure Detection) system instructions and maintenance procedures are followed.

17.2 WHAT IS NOT COVERED
• Pump Tube Assemblies 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 which is out of our control.
• Pumps damaged by faulty wiring, power surges or acts of nature.

17.3 PROCEDURE FOR IN WARRANTY REPAIR
Contact the factory to obtain a RMA (Return Material Authorization) number. Carefully pack the pump to be repaired. It is recommended to include foot strainer and injection/check valve fitting since these devices may be clogged and part of the problem. Please enclose a brief description of the problem as well as the original invoice or sales receipt, or copy showing the date of purchase. Prepay all shipping costs. COD shipments will not be accepted. Warranty service must be performed by the factory or an authorized service center. Damage caused by improper packaging is the responsibility of the sender. When In-Warranty repair or replacement is completed, the factory pays for return shipping to the dealer or customer.

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## APPENDIX A: ACRONYMS

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

**FLEXFLO® A4 Peristaltic Metering Pump**

### Power Cord (operating voltage requirement 96VAC to 264VAC)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>115V / 60HZ, power cord NEMA 5/15 plug (US)</td>
</tr>
<tr>
<td>6</td>
<td>220V / 50HZ, power cord CEE 7/11 plug (EU)</td>
</tr>
<tr>
<td>X</td>
<td>No Power Cord</td>
</tr>
</tbody>
</table>

### Inlet/Outlet Connection Size, Connection Type, Connection Material

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>1/2&quot; Male NPT Fitting, Natural PVDF (Kynar)</td>
</tr>
<tr>
<td>B</td>
<td>1/2&quot; ID Tubing Barb Fitting, Natural PVDF (Kynar)</td>
</tr>
<tr>
<td>C</td>
<td>1/2&quot; - 3/4&quot; Tri-clamp connections, Natural PVDF (Kynar)</td>
</tr>
<tr>
<td>Q</td>
<td>Quick Disconnect, Natural PVDF (Kynar), NP flow rate reduced 16.5% with Quick Disconnect connections (Valves sold separately)</td>
</tr>
<tr>
<td>MB</td>
<td>1/2&quot; Male BSPT Fitting, Natural PVDF (Kynar)</td>
</tr>
</tbody>
</table>

### Pump Tube Material, Pump Tube Size

**NOTE:** * = Dual tube

<table>
<thead>
<tr>
<th></th>
<th>Flex-A-Prene® .250 ID</th>
<th>.01-28.5 GPH</th>
<th>125 PSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>NH</td>
<td>Flex-A-Thane® .312 ID</td>
<td>.01-39.6 GPH</td>
<td>65 PSI</td>
</tr>
<tr>
<td>NHH</td>
<td>Flex-A-Prene® .250 ID</td>
<td>.02-54.0 GPH</td>
<td>100 PSI</td>
</tr>
<tr>
<td>NHHL</td>
<td>Flex-A-Prene® .250 ID</td>
<td>.02-54.0 GPH</td>
<td>65 PSI</td>
</tr>
<tr>
<td>NHL</td>
<td>Flex-A-Thane® .375 ID</td>
<td>.01-28.5 GPH</td>
<td>65 PSI</td>
</tr>
<tr>
<td>NK</td>
<td>Flex-A-Thane® .375 ID</td>
<td>.01-28.5 GPH</td>
<td>65 PSI</td>
</tr>
<tr>
<td>NL</td>
<td>Flex-A-Thane® .375 ID</td>
<td>.01-28.5 GPH</td>
<td>65 PSI</td>
</tr>
<tr>
<td>NP</td>
<td>Flex-A-Thane® .375 ID</td>
<td>.01-28.5 GPH</td>
<td>65 PSI</td>
</tr>
</tbody>
</table>

### Pumphead Orientation

- **(Blank)** Standard - Left facing pumphead
- **R** Right facing pumphead
- **D** Down facing pumphead

### Sample Model Number

<table>
<thead>
<tr>
<th>A4</th>
<th>S</th>
<th>V</th>
<th>2</th>
<th>4</th>
<th>M</th>
<th>NH</th>
</tr>
</thead>
</table>

- **A4** FLEXFLO® A4 Peristaltic Metering Pump
- **S** Power Cord
- **V** Inlet/Outlet Connection
- **2** Connection Material
- **4** Pump Tube Material
- **M** Pump Tube Size
- **NH** Pumphead Orientation
- **Sample Model Number**
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.