



**ChemTUFF**

## PERISTALTIC CHEMICAL METERING PUMPS

### ENGINEERING SPECIFICATIONS

#### 1.1 PRODUCT AND MANUFACTURER

A. Provide peristaltic chemical metering pumps of the product and manufacturer as listed below:

1. **ChemTUFF Series, manufactured by Periflo, Inc.**

#### 1.2 DETAILS OF CONSTRUCTION

- A. Pump: Each pump shall consist of an enclosed housing with bolted clear cover and roller compressor mechanism designed for operation with EITHER TUBE or HOSE. Tube/Hose shall be rigidly mounted to the pump body with NPT piping connections. The pump assembly shall be three (3) component consisting of a standard pump head close-coupled to a commercial gearbox that is directly connected to a NEMA C-Face motor.
1. Housing: Cast aluminum with a corrosion resistant ECTFE Halar® fluoropolymer powder coating. Housing may be mounted in any of four (4) mounting orientations with the suction and discharge connections located at twelve (12), three (3), six (6) or nine (9) o'clock positions.
  2. Rotor: Corrosion resistant ECTFE Halar fluoropolymer powder coated carbon steel with selectable shaft positions for tube or hose.
  3. Shafts: Corrosion resistant 316 stainless steel.
  4. Rollers: Two (2) reinforced Delrin® rollers located 180 degrees apart for compression of the tube/hose against the housing. (optional three (3) rollers for applications < 5rpm). One roller shall at all times be fully engaged with tubing providing complete compression to prevent back flow or siphoning.
  5. Cover: Removable one (1) piece clear polycarbonate viewing cover.
  6. Connections: Rigid inlet and outlet connections shall be MNPT with Polypropylene, Kynar, PVC or 316SS material required by the process. Tubes/Hoses shall be secured without the use of radiator style hose clamps. Tube connections to process are not acceptable.
  7. Baseplate: Supporting base shall be corrosion resistant stainless steel

8. Assembly: Rotor and housing are bolted directly to the output flange of the gearmotor, which serves to support the rotor and center the rotor assembly in the pump housing. Pump to gearbox connection shall be close coupled and self-aligning requiring no flexible couplings. Long-coupled pumps with external couplings are not acceptable.
9. Gearbox: Gearbox shall be of the in-line helical footed design, polyester epoxy powder coated cast aluminum with a minimum service factor of 1.4 based on motor nameplate rating and an AGMA Class II continuous duty rating, NEMA 56C input.
10. Performance: Each pump shall be capable of self-priming when completely dry with a suction lift capability of up to 27 feet of water. The pump shall be capable of running dry without damaging effects to the pump or tube. The pump shall use no check valves or diaphragms and not utilize any dynamic seals in contact with the fluid being pumped.

B. Tubing/Hose: Tubing or hose may be installed as required by the application:

1. Tubing: Thermoplastic tubing shall be designed specifically for use with peristaltic pumps and working pressures to 30 psi. They shall be constructed from the highest quality compounded thermoplastic materials, shall meet FDA, 3-A and NSF criteria, and have a durometer rating of 60 to 63 Shore A. Wetted materials shall be Norprene or Tygon as required for the service. Tubing lubrication will be with a food-grade silicon grease.
2. Hose: Rubber hose shall be designed specifically for use with peristaltic pumps, working pressures to 115 psi. They shall be constructed from the highest quality compounded rubber materials, reinforced with multiple layers of braided nylon and have a durometer rating of 55 to 70 Shore A. Wetted layer shall be Natural Rubber, Buna-N, EPDM or Hypalon as required for the service. Hose lubrication will be with a food grade silicon grease.

C. Connections:

1. Provide 316SS, polypropylene, PVC, or PVDF port connections as required by the application.
2. MNPT port connection size to be determined by model number.

D. Motor

1. Motor shall be AC-TENV, Inverter Duty/Chemical Duty, Stainless Steel Shaft, Moisture Resistant Windings, Corrosion Resistant Powder Epoxy Coating, Footless, 1725 rpm, NEMA 56C, 230/460VAC/3PH/60Hz with a minimum continuous turndown capability of 1000:1. Meets NEMA MG-1 Parts 30 & 31. Horsepower to meet maximum speed and pressure requirements. Mounted motor shall not exceed 1/2HP. Alternate DC motor as required by application.

2. Pump motor to gearbox connection shall be close coupled and self-aligning requiring no flexible couplings.

E. Drives and Controls

1. Drive shall be rated for continuous 24-hour operation at ambient temperature to 40 degrees C.
2. Voltage shall be 100-120VAC 50/60 Hz, 1 phase. (alternate three phase can be supplied if required).
3. Drive enclosure shall be NEMA 4X and shall include 10 ft power cord with standard 115VAC three-prong plug.
4. Drive speed shall not exceed 60 rpm and shall be variable to a low speed of 0.2 rpm.
5. Local controls on keypad shall include: START, STOP, FORWARD, REVERSE. AUTO, MANUAL, SPEED INCREASE, SPEED DECREASE, RAPID PRIME. Programming functions also accessed through keypad
6. Drive shall be capable of accepting a 4-20mA signal in AUTO mode. Signal may be scaled over any part of the drive speed range as required to meet the performance criteria specified.
7. Programmable features include: AUTO RESTART, KEYPAD LOCK , MAXIMUM and MINIMUM SPEED
8. Drive shall include an analog output signal 4-20mA proportional to actual pump speed.
9. Drive shall include (1) dry contact to indicate DRIVE FAIL. It shall also include (2) TTL outputs programmable.
10. Drive shall be a sensor-less vector VFD with load compensation and protection.
11. Operator interface requirements shall include the following:
12. Tube Leak Detector (**option**): Hose leak detector shall be of the capacitance type located at the lowest point of the pump cover. Switch will be 3-Wire DC, PNP Sourcing, NO, 10-30VDC, Short Circuit and Overload Protected, rated <200mA continuous load. Detector shall sense leak while the leak is still contained in pump housing. Leak detection outside of pump housing is not acceptable.

F. Control Interface. When required to interface with SCADA system these additional features shall be provided:

1. Remote Control Inputs:
  - a. Analog speed input signal 4-20mA or 0-10 VDC with input signal scalable to match the flow range set on the controller.
  - b. Auxiliary potentiometer input.
  - c. START/STOP control to cause RUN command on remote contact CLOSE. (Optional RUN on remote contact OPEN)
  - d. AUTO/MANUAL control by remote contact closure
  - e. Tube leak detector/External Fault command. Stops pump on tube leak.

2. Control Outputs:
  - a. Up to six (6) relay contacts rated 2A at 120 VAC, NO or NC can be configured for the following
  - b. RUN status
  - c. AUTO/MANUAL status
  - d. DRIVE FAIL status
  - e. TUBE LEAK status
  - f. (2) AUXILIARY INPUTS (eg HIGH PRESSURE, HIGH LEVEL, HIGH MOTOR TEMPERATURE)
  - g. Speed Output signal 4-20mA or 0-10 VDC proportional to actual pump speed.
  - h. RS485 data transmission

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