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Chemical Metering Pump &Accessories Specifications for General Use

I. General

A. The metering pumps shall be hydraulically balanced diaphragm type, wherein a piston reciprocates within a cylinder and causes hydraulic fluid to deflect a flat diaphragm.Mechanical and solenoid pumps are unacceptable.

II. Pump Description

A. Pump capacity shall be adjustable through 100%of the range by manual micrometer dial while the pump is running or stopped.Pump stroking speed shall not exceed 150 spm. All parts of the power train must operate submerged in oil.

B. Pump shall be sized to deliver the required capacity at 85%of maximum stroke length.Stroke adjustment shall be variable oil bypass type mechanism with the plunger powered through its entire travel. Mechanical lost motion designs are not acceptable.

C. Pump shall include an automatic vent and refill mechanism on the hydraulic side,which operates once each stroke.The pump shall have an internal relief valve, which is externally adjustable.

D. Double ball check valves shall be provided in both the suction and discharge to insure accurate repeatable metering. The pump valves shall be removable for cleaning or replacement without the need to disconnect the suction or discharge piping.

(Note to Specification Writer: Statement regarding replacement valves is very important. The most frequent maintenance operation performed on any chemical metering pump is valve cleaning and inspection.)

E. Materials of construction –Pumps shall be of corrosion resistant material suitable for the intended service conditions.

Design Criteria of Metering Pumps

Equipment No.	Chemical Solution	Feed Range GPH Min./Max	Design Pressure	Type of Drive Constant Speed Variable Speed AC or DC	Power Available
Example #1	15%Sodium Hypochlorite	5-22 gph	100 psi	Constant Speed	115V-1PH
Example #2	Concentrated Sulfuric Acid	2-12 gph	100 psi	DC Variable Speed	115V-1PH
Example #3	50%Sodium Hydroxide	3-17 gph	100 psi	AC Variable Speed	460V-3PH

III. Spare Parts

A. Provide a routine preventative maintenance kit for each pump containing a diaphragm, a complete set of o-rings and check valves.

IV. Accessories

A. Calibration Cylinder – Provide a calibration cylinder for mounting in each pump suction line. Each calibration cylinder shall be sized for a 30 second minimum test, graduated in milliliters and labeled to allow easy conversion to gallons per hour. Construction shall be clear, PVC (except for Concentrated Sulfuric Acid, which will be shielded glass) and shall include a vent connection.

B. Y-Strainer – Each pump suction shall be supplied with a 40-60 mesh "Y "-strainer to prevent foreign material from getting into the ball checks of the metering pump. The strainer shall be constructed of material suitable for the chemical service.

C. Back Pressure Valve – Provide a properly sized diaphragm-type back pressure valve to be mounted in each pump discharge line. Valve construction shall be suitable for the chemical service with a Teflon diaphragm. Back pressure valve shall be field adjustable.

D. Relief Valve – Provide a properly sized relief valve for installation in the pump discharge line. Valve construction shall be suitable with the chemical service. Safety relief valve shall be field adjustable.

E. Pulsation Dampener – A pulsation dampener shall be provided in each pump discharge line sized to provide a 90% or 95% degree of dampening. The pulsation dampener shall be hydropneumatic vertical-type with two chambers separated by a single, elastomeric bladder. Pulsation dampener shall be supplied with a gas charge valve and 2 1/2" pressure gauge. Material of construction shall be suitable for the chemical service.

F. Injection Quill or Corporation Stop with Quill

The injection quill shall be a one-piece quill with spring-loaded check valve to prevent back flow. Material of construction shall be suitable for the chemical service.

OR

The corporation stop shall be furnished with a quill, which is retractable through the corporation stop and shall be removable for cleaning. Material of construction of the quill shall be suitable for the chemical service.

G. Pressure Gauge – Provide a pressure gauge for each pump discharge line. Pressure gauge shall be provided with a 2 1/2" dial and shall have a diaphragm seal constructed of a material, which is suitable for the chemical service.

H. Flow Indicator – A sight flow indicator shall be provided in each pump discharge line as visual indication of pump flow.Material of construction shall be suitable for the chemical service.

V. Constant Speed Motor and Control System

A. Motors

1. Pump shall be furnished with a factory mounted driver suitable for continuous operation. Motors will be of a type,speed and voltage specified without exceeding their nameplate current, power or temperature limitation. Constant speed motors shall be rated at 1750 RPM @ 60HZ unless otherwise specified. Motors specified as “standard ” duty shall have a service factor of 1.0 and Class B insulation. Motors specified as “severe” duty shall have a service factor of 1.15 and a Class F insulation. No belts or pulleys shall be used in the drive train or for capacity adjustment.

VI. Testing.

Each pump being furnished under this section shall be factory tested in accordance with the latest edition of the Hydraulics Institute’s standards.