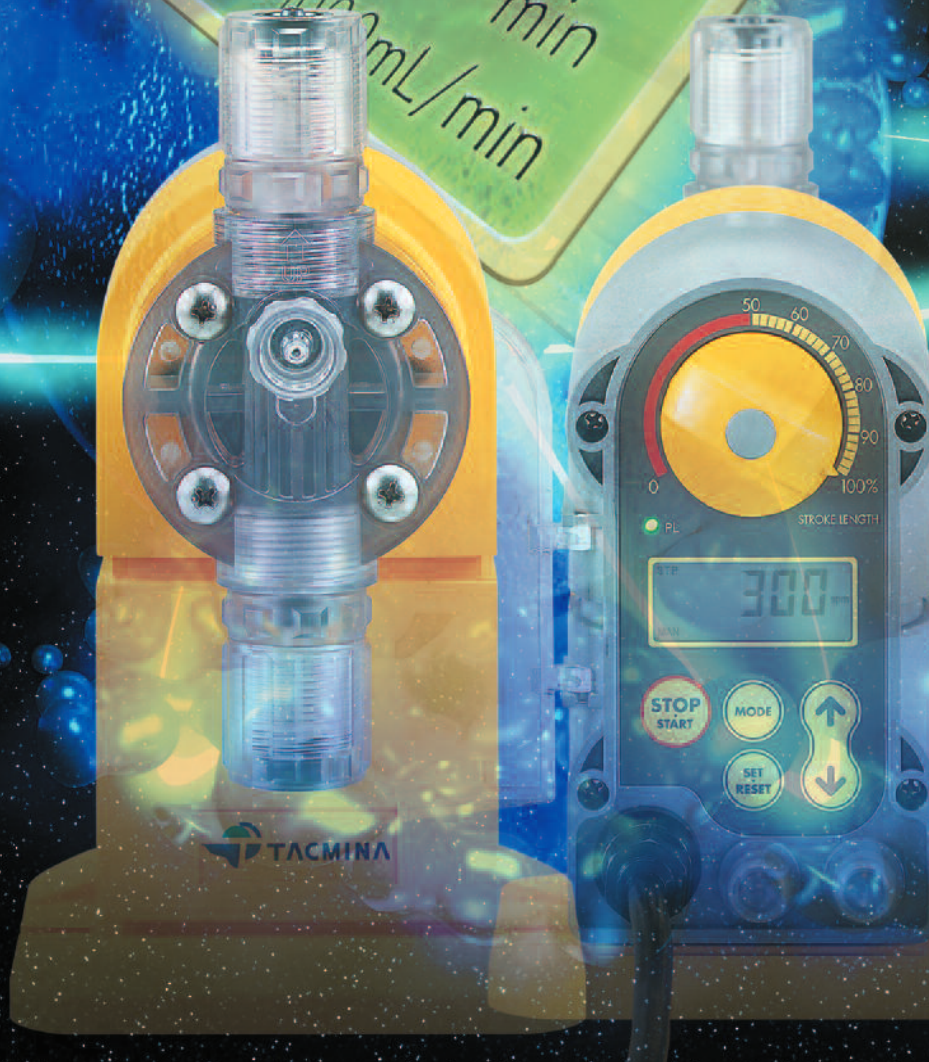


# ***Series PZ / PZi / PZiG Pulse Metering Pumps***

**Neptune**

A **DOVER** COMPANY



US Patent #6,283,717

***The Power of Intelligent Pumps Expands!***



**TYPE PZ  
(manual)**



**TYPE PZi4  
(automatic)**



**TYPE PZi8  
(programmable)**



## Features

|   | TYPE ►  | MANUAL CONTROL<br>EXTERNAL INPUT<br>PROGRAMMABLE INPUTS / OUTPUTS |     |      |      |      |
|---|---|---|-----|------|------|------|
|   |   | PZ  | PZD | PZi4 | PZi8 | PZiG |
| <b>Manual control</b>                               | • PZ Models (Speed only is adjustable from 15 to 300 SPM)   | ◆   | —   | —    | —    | —    |
|   | • PZD & PZi Models (Adjust speed 1 to 300 SPM plus stroke length adjustment <sup>1</sup> )                              | —   | ◆   | ◆    | ◆    | ◆    |
|   | • Enter desired flow directly in ml/min.  | —   | ◆   | —    | ◆    | ◆    |
| <b>Calibration function</b>                         | • Calibrate pump flow to actual condition of chemical, pressure, viscosity, etc.  | —   | ◆   | —    | ◆    | ◆    |
| <b>Control input</b>                                | • External interlock (Examples: level switch, remote start, reset)  | —   | —   | ◆    | ◆    | ◆    |
| <b>Operation display</b>                            | • Indicates speed and status  | —   | —   | ◆    | ◆    | ◆    |
|   | • Indicates speed, feed rate <sup>2</sup> , status and other operational data   | —   | —   | —    | ◆    | ◆    |
| <b>Signal input<sup>3</sup></b><br>4-pin connector  | • Pulse signal Frequency-divide 1/1 to 1/9999, Multiply 1 to 9999 (See pg.6)  | —   | —   | ◆    | ◆    | ◆    |
|   | • Analog signal Shift function, Proportional band function (See page 6)   | —   | —   | ◆    | ◆    | ◆    |
|   | • pH Control/Residual Chlorine Control (See page 8)   | —   | —   | —    | —    | ◆    |
| <b>Signal output<sup>4</sup></b><br>8-pin connector | • Alarm output (Level switch, injection monitor <sup>2</sup> )  | —   | —   | —    | ◆    | ◆    |
|   | • Operation pulse signal (Synchronous pulse output for each stroke)   | —   | —   | —    | ◆    | ◆    |
|   | • Operation progress signal (Time or number of strokes remaining in program)  | —   | —   | —    | ◆    | ◆    |
| <b>Alarms</b>                                       | • Alarm display, output and action (run, pause or stop) can be selected   | —   | —   | —    | ◆    | ◆    |
| <b>Other functions</b>                              | • Two point level control (See page 9)  | —   | —   | —    | ◆    | ◆    |
|   | • Power supply for flow checker   | —   | —   | —    | ◆    | —    |
|   | • Interval operation (Repeat cycle program, see page 9)<br>ON time: 1 to 999999 minutes / OFF time: 1 to 999999 minutes | —   | —   | —    | ◆    | ◆    |
|   | • Counter (Countdown batch injection, see page 9)<br>1 to 9999 strokes (X1, X10, X100, X1000)                           | —   | —   | —    | ◆    | ◆    |
|   | • Head can be turned 90° to allow base to be mounted to a vertical wall <sup>5</sup>                                    | ◆   | —   | ◆    | ◆    | —    |

NOTES: 1. PZi4 and PZi8 Models in sizes -31/-61/-12: 50% to 100% stroke length adjustment.

PZi4 and PZi8 Models in sizes -32/-52 plus all PZD and PZiG Models: 20% to 100% stroke length adjustment.

2. PZi8 only when used with Flow Checker shown on page 5.

3. PZi4 has one analog input and one high speed digital pulse input; PZi8 and PZiG have one analog input and two high speed digital pulse inputs. See page 9.

4. Two separate configurable outputs, either open collector (alarm, error, run) or pulse (operational sync or end of cycle).

5. Sizes -31/-61/-12 only.

## MODEL NUMBER SELECTION – The complete model number consists of three parts: TYPE + SIZE + MATERIAL CODE

**TYPE** – Specify **PZ** or **PZD** for manual control; specify **PZi4** for external input; specify **PZi8** for programmable models.  
The largest models are the **PZiG** Series, available in full programmable type only.

**SIZE** – Size code selects the capacities per the charts on page 3. Sizes **-31**, **-61** and **-12** are available for type PZ.  
Higher capacity sizes **-32** and **-52** are available for type PZD. All five sizes are available for types PZi4 and PZi8.  
The very high PZiG capacities are shown in a separate chart.

**MATERIAL CODE** – Select from charts on page 4.

**Example** – The complete model for a pump with a Kynar liquid end with Viton seals rated at 160 ml/min capable of accepting a 4-20mA input would be:

Type **PZi4** + Size **-61** + Material code **-FFC**

The complete model number becomes

**PZi4-61-FFC**

## Type PZD/PZi-32/52 High Capacity Models

PZD Series pumps offer higher capacities. These models feature an extra large keyboard and the injection rate can be entered directly in milliliters per minute.

The injection rate can be set three ways by direct entry of:

- Stroke speed: 1 to 300 spm
- Percentage: 1 to 100%
- Injection rate: ml/min.

- **Onboard calibration** measures the actual discharge volume under the exact operating condition of the specific installation and chemical, then stores that value to insure the correct injection rate.

High Capacity models are available in material codes VFC, VEC, SS and FTC only. VFC model is shown.



- Manual stroke length adjustment 20% to 100%.
- Set points can be easily viewed on the LCD.
- Pump head may be rotated to face in any of the three positions other than where the keypad and display are located.
- Pump head can be decoupled from the controller base for remote mounting.

## Type PZiG Programmable Large Volume Models

PZiG Models offer capacities typically requiring motor driven pumps. Special models easily handle viscosities of 1000 CPS (up to 4000 CPS at reduced volume).

Powerful onboard controls allow proportional flow rate, pH and residual chlorine control by direct analog connection eliminating the PID Controller and Inverter (plus the control panel to house them), that are required by similar sized motor driven pumps.

The injection rate can be set three ways by direct entry of:

- Stroke speed: 1 to 300 spm
- Percentage: 1 to 100%
- Injection rate: ml/min.

- Manual stroke length adjustment 20% to 100%.

**Control Functions also include (see pages 8 & 9):**

- **Onboard calibration** measures the actual discharge volume under the exact operating condition of the specific installation and chemical, then stores that value to insure the correct injection rate.
- Multi-pump proportional flow rate injection from a single direct flowmeter signal (pulse/analog).
- Two point level switch control (see page 9)
- Batch injection
- Interval injection
- Proportional control with shift and proportional band function.
- Two line LCD screen displays injection rate and/or operational progress.

**Note:** Install a pulsation dampener for discharge lines greater than 7 feet to achieve maximum pressure capability.



### TYPE & SIZE SELECTION CHART: PZ / PZD / PZi4 / PZi8 Head can be turned 90° to allow base to be mounted to a vertical wall (-31/-61/-12 only).

| MANUAL MODEL          | EXTERNAL INPUT MODEL <sup>1</sup> | PROGRAMMABLE MODEL <sup>1</sup> | MAX. CAPACITY GPD | MAX. CAPACITY GPH | MAX. CAPACITY ML/MIN. | MAX. PRES. PSI | DWG./ CURVE | STROKE LENGTH (MM) | MAX. PWR. (VA) | AVG. PWR. (WATTS) |
|-----------------------|-----------------------------------|---------------------------------|-------------------|-------------------|-----------------------|----------------|-------------|--------------------|----------------|-------------------|
| PZ-31-HP <sup>2</sup> | PZi4-31-HP <sup>2</sup>           | PZi8-31-HP <sup>2</sup>         | 10.5              | 0.44              | 28                    | 220            | page 7      | 1.0                | 200            | 15                |
| PZ-31                 | PZi4-31                           | PZi8-31                         | 12                | 0.5               | 30                    | 140            | page 7      | 1.0                | 200            | 15                |
| PZ-61                 | PZi4-61                           | PZi8-61                         | 24                | 1.0               | 60                    | 115            | page 7      | 1.0                | 250            | 18                |
| PZ-12                 | PZi4-12                           | PZi8-12                         | 38                | 1.6               | 100                   | 60             | page 7      | 1.0                | 250            | 18                |
| PZD-32                | PZi4-32                           | PZi8-32                         | 137               | 5.7               | 360                   | 45             | page 7      | 1.5                | 500            | 30                |
| PZD-52                | PZi4-52                           | PZi8-52                         | 204               | 8.5               | 540                   | 30             | page 7      | 1.5                | 500            | 30                |

NOTES: <sup>1</sup> PZi4 models include 2-meter cable with 4-pin connector on one end; PZi8 models include separate 2-meter signal cables, one each with 4-pin and 8-pin connector end.

<sup>2</sup> High Pressure models are available as PZ-31, PZi4-31 or PZi8-31 only; available in FEC or SS only. Refer to Material Code Chart on page 4.

### TYPE & SIZE SELECTION CHART: PZiG

**Available Only in Programmable Models**

(See page 8 for Direct Connection of pH and Residual Chlorine Control Instruments)

| PROGRAMMABLE MODEL | MAX. CAPACITY GPD | MAX. CAPACITY GPH | MAX. CAPACITY ML/MIN. | MAX. PRESSURE PSI | DRAWING/ CURVE | STROKE LENGTH (MM) | MAX. POWER (VA) | AVG. POWER (WATTS) |
|--------------------|-------------------|-------------------|-----------------------|-------------------|----------------|--------------------|-----------------|--------------------|
| PZiG-300           | 130               | 5.4               | 340                   | 140               | page 7         | 1.5                | 750             | 100                |
| PZiG-500           | 200               | 8.4               | 530                   | 100               | page 7         | 1.5                | 750             | 100                |
| PZiG-700           | 288               | 12.0              | 760                   | 60                | page 7         | 1.5                | 750             | 100                |
| PZiG-1000          | 380               | 15.8              | 1000                  | 45                | page 7         | 1.5                | 750             | 100                |
| PZiG-1300          | 495               | 20.6              | 1300                  | 30                | page 7         | 1.5                | 750             | 100                |

# Variety of Liquid End Materials

## Standard Model: PVC ▶ (VFC/VEC)

- General chemical applications
- Valve seats and O-rings are available in Viton® or EPDM
- Built-in relief valve



## Universal Model: PVDF ▶ (FFC/FEC/FTC)

- For most chemicals and highly corrosive chemicals
- Valve seats and O-rings are available in Viton®, EPDM or Teflon®
- Built-in relief valve



## Stainless Steel Model (SS) ▼

- For solvents and other chemicals where plastics are not suitable



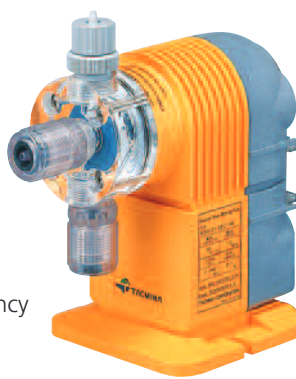
## Chlorine Model: ◀ Acrylic (CL)

- Transparent pump head allows visual check of valves
- Reduced head volume and upward sloping ports vent gas away from diaphragm
- Improved pump efficiency for countering gas lock
- Built-in relief valve



## Chlorine Model: ◀ Acrylic (ARPZ)

- CL model with automatic air release mechanism
- Derate capacity 5% for air release models



To specify pump, choose the type from the chart on page 2 plus the size from the chart on page 3 (ex: PZi4-31). Then add the appropriate material code from the chart below (ex: PZi4-31-FFC). Complete instructions regarding Model Number Selection are on page 2.

## MATERIALS CHART: PZ / PZD / PZi4 / PZi8

Adapters for NPT connection are available

| MATERIAL CODE     | PUMP HEAD | TUBE JOINT      | VALVE SEAT | CHECK BALL | DIAPHRAGM | FOOT VALVE & STRAINER | BACKPRESSURE INJECTION ASSEMBLY | SUCTION CONNECTION – TUBE*        | DISCHARGE CONNECTION – TUBE* |
|-------------------|-----------|-----------------|------------|------------|-----------|-----------------------|---------------------------------|-----------------------------------|------------------------------|
| VFC               | PVC       | PVC             | Viton      | Ceramic    | PTFE      | PVC                   | PVC                             | 3/8" Tube – Soft PVC <sup>2</sup> | 3/8" Tube – PE <sup>2</sup>  |
| VEC               | PVC       | PVC             | EPDM       | Ceramic    | PTFE      | PVC                   | PVC                             | 3/8" Tube – Soft PVC <sup>2</sup> | 3/8" Tube – PE <sup>2</sup>  |
| CL <sup>1</sup>   | Acrylic   | PVC             | Viton      | Ceramic    | PTFE      | PVC                   | PVC                             | 3/8" Tube – Soft PVC              | 3/8" Tube – PE               |
| ARPZ <sup>1</sup> | Acrylic   | PVC             | Viton      | Ceramic    | PTFE      | PVC                   | PVC                             | 3/8" Tube – Soft PVC              | 3/8" Tube – PE               |
| SS                | 316SS     | N/A             | EPDM       | 316SS      | PTFE      | Not Included          | Not Included                    | 3/8" MNPT – None                  | 3/8" MNPT – None             |
| FFC <sup>1</sup>  | PVDF      | PP              | Viton      | Ceramic    | PTFE      | PVDF – Molded         | PVDF – Molded                   | 3/8" Tube – PE <sup>3</sup>       | 3/8" Tube – PE               |
| FEC <sup>1</sup>  | PVDF      | PP <sup>4</sup> | EPDM       | Ceramic    | PTFE      | PVDF – Molded         | PVDF – Molded                   | 3/8" Tube – PE <sup>3</sup>       | 3/8" Tube – PE <sup>4</sup>  |
| FTC               | PVDF      | PVDF            | Teflon     | Ceramic    | PTFE      | PVDF – Molded         | PVDF – Machined                 | 3/8" Tube – FEP <sup>2,3</sup>    | 3/8" Tube – FEP <sup>2</sup> |

<sup>1</sup> Not available in -32 or -52 size codes.

<sup>2</sup> PZ-32 and PZ-52 Models – 18x12 mm Soft PVC Tube for VFC and VEC Models; 15x12 mm PTFE Tube for FTC Models

<sup>3</sup> Ceramic Weight Included      <sup>4</sup> 220 psi Model PZ/PZi-31-FEC – 1/4" Tube Joint and Tube – PP

\*NOTE: 3/8" Tube is 3/8" OD x 1/4" ID; Adapters for NPT connection are available

## MATERIALS CHART: PZi6

| MATERIAL CODE       | PUMP HEAD | VALVE SEAT | CHECK BALL | DIA-PHRAGM | STRAINER     | BACKPRESSURE INJECTION ASSEMBLY | SUCTION/ DISCHARGE CONNECTION |
|---------------------|-----------|------------|------------|------------|--------------|---------------------------------|-------------------------------|
| VTCE                | PVC       | EPDM       | Ceramic    | Teflon     | Not Included | Not Included                    | 1/2" FNPT                     |
| VTCT                | PVC       | Viton      | Ceramic    | Teflon     | Not Included | Not Included                    | 1/2" FNPT                     |
| VTCT-V <sup>1</sup> | PVC       | Viton      | Ceramic    | Teflon     | Not Included | Not Included                    | 3/4" FNPT                     |
| FTCT                | PVDF      | Teflon     | Ceramic    | Teflon     | Not Included | Not Included                    | 1/2" FNPT                     |
| FTCT-A <sup>2</sup> | PVDF      | Teflon     | Ceramic    | Teflon     | PVDF         | PVDF                            | 15x12 PTFE <sup>2</sup>       |

<sup>1</sup> High Viscosity Model rated 1000 to 4000 cps. Consult factory for applications greater than 2000 cps.

<sup>2</sup> Only these models include Foot Valve Strainer, Antisiphon Check Valve, plus 15x12 mm Teflon Suction and Discharge Tubing. Tubing rated 75 psi max.

## PZi6 with ▶ VTCF Liquid Head



TRIM 5/8" OFF OF THIS SIDE TO CLEAR HOLE DRILL



## INCLUDED WITH EACH PUMP:

Foot Valve Strainer\*

Back Pressure/Check Valve Injector with Quill\*

Suction, Discharge and Air Release Tubing\*

Power Cord with 3-Prong Plug

Signal Cable with Multi-Pin Connectors  
(one with PZi4 & two with PZi8 & PZiG models)

\*except some PZiG models (see page 4)



Foot Valve Strainer

Back Pressure Injector

## MATERIAL SELECTION CHART

| PUMPING LIQUID<br>(in alphabetical order) | CONCENTRATION     | RECOMMENDED TYPE |
|---|-------------------|------------------|
| Acetic acid                               | 50%               | VFC/FFC          |
| Acetic acid                               | concentrated 24°C | FTC              |
| Aluminum sulfate                          | —                 | VEC              |
| Amine*                                    | —                 | SS               |
| Aqueous ammonia                           | —                 | VEC              |
| Calcium/Sodium hypochlorite               | 12%               | CL/AR            |
| Caustic soda                              | —                 | VEC              |
| Ferric/Ferrous chloride                   | —                 | VFC              |
| Ferric/Ferrous sulfate                    | —                 | VFC              |
| Hydrochloric acid                         | 10% to conc.      | VFC              |
| Hydrogen peroxide                         | 30%               | VFC              |
| Nitric acid                               | 10%               | VFC              |
| Nitric acid                               | 30% to conc.      | FTC              |
| Phosphoric acid                           | 10% to conc.      | FTC              |
| Poly-aluminum chloride (PAC)              | —                 | VEC              |
| Potassium permanganate                    | —                 | VEC              |
| Sulfuric acid                             | to 40%            | VFC/FFC          |
| Sulfuric acid                             | concentrated      | FTC              |

\*Boiler compounds with small amounts of Amine – FEC

## CAUTION - ALL MODELS

- Ambient temperature: 32 to 104°F (0 to 40°C)  
Pumped liquids:  
Temperature: 32 to 104°F (0 to 40°C),  
Viscosity: 100 CPS max. except as noted
- This pump is designed for outdoor use. Avoid installing pump in a location where service life could be shortened (i.e., where it is exposed to direct sunlight or driving rain).
- This pump cannot pump liquids containing a slurry.
- A relief valve should be installed on the discharge side, if the pump does not have a built-in relief valve and the discharge piping has a shutoff valve.

# Feed Verification

## Model FC-1 FLOW CHECKER

The Model FC-1 Flow Checker output provides vital information for water treatment programs requiring feed verification to manage chemistry and monitor drum inventory.

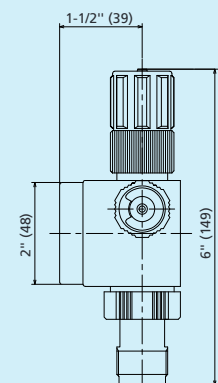
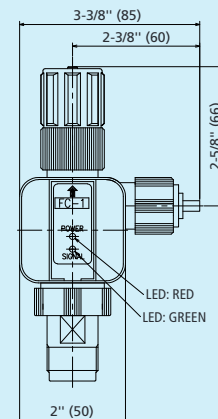
- The flow checker mounts directly to the discharge of PZ and PZi metering pumps.
- The flow checker is an oval gear flow meter which measures the pump output and transmits one pulse for each 1 ml of flow.
- Flow checker output can be connected to Model PZi8 Pumps for instantaneous indication of pump output displayed on the pump LCD.
- Connect the flow checker output to your controller or PLC (external power supply required if not used with PZi8 type pump).



(shown with PZi8 type pump)

## DIMENSIONS

inches (mm)



## FLOW CHECKER SELECTION CHART

| MODEL NO.  | MATERIAL | USE w/ PUMP MODEL†  |
|------------|----------|---------------------|
| FC-1P-P-N1 | Ryton*   | PZ or PZi-31        |
| FC-1N-P-N1 | Noryl**  | PZ or PZi-31        |
| FC-1P-P-N2 | Ryton*   | PZ or PZi-61 or -12 |
| FC-1N-P-N2 | Noryl**  | PZ or PZi-61 or -12 |

† Not available for larger models.

## LIQUID-END MATERIALS

| PART NAME         | MODEL FC-1P-□ | MODEL FC-1N-□ |
|-------------------|---------------|---------------|
| Body              | Ryton*        | Noryl**       |
| Ball Check        | Ceramic       | Ceramic       |
| Ball Guide/Joint  | PVC           | PVC           |
| Valve Seat/O-Ring | EPDM          | Fluororubber  |

\* Ryton: PPS —Polyphenylene-sulfide (for general chemicals)

\*\* Noryl: PPO —Polyphenylene-oxide (for sodium hypochlorite)

## SPECIFICATIONS

|                                      |  |
|--------------------------------------|--|
| Pulse constant                       | 1mL/pulse  |
| Accuracy                             | ±3% (Depends on nature of chemical, flow rate, temperature and back pressure.) |
| Normal operating pressure            | 140 psi (10 Kg/cm <sup>2</sup> )   |
| Momentary maximum operating pressure | 200 psi (14 Kg/cm <sup>2</sup> )   |
| Temperature                          | 32–104°F (0–40°C) (Liquid should not freeze.)                                  |
| Liquid viscosity                     | 1 to 50 cps  |
| Output                               | Open collector (Collector capacity: 30V, 30mA)                                 |
| Power requirement                    | 4.5 to 25VDC (20mA Max.)*  |

Green LED lights for each pulse output. Red LED on when the power is ON.

NOTES: 1. Use flow checker only for clear liquids.

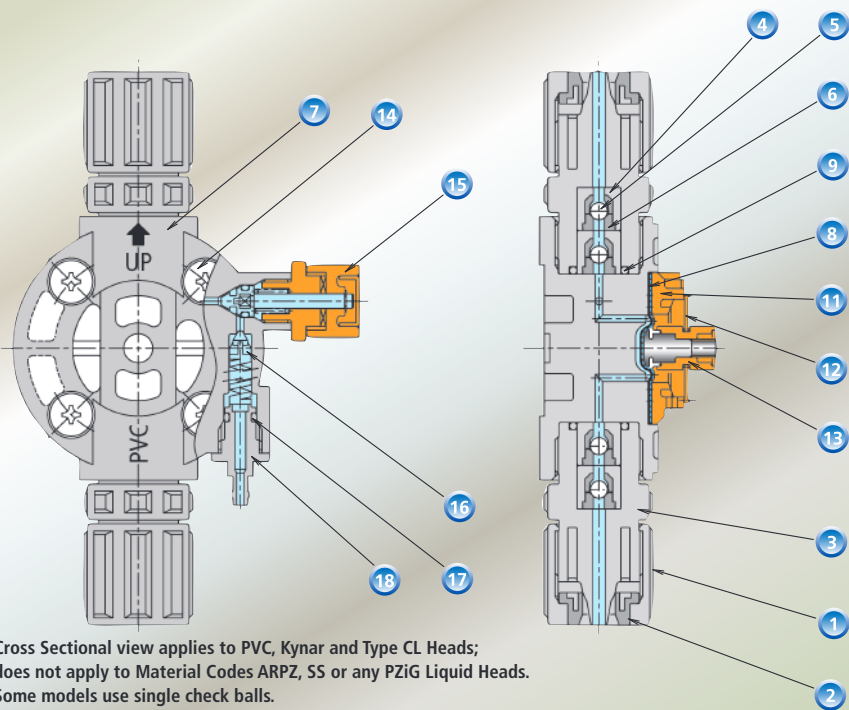
2. Pressure loss is 0.5 Kg/cm<sup>2</sup> (at maximum flow rate using water).

\* + 5V Power Supply provided on board PZi8 Models.

## Advantages

- Digital settings from 15 to 300 pulses per minute on PZ models and from 1 to 300 pulses per minute on PZi and PZD models
- High stroking speed ensures more uniform distribution of chemical at low feed rates
- Pump delivery is constant at any voltage from 94 to 264 VAC single phase and is not affected by voltage fluctuations
- Outdoor use—pump is water and UV resistant. Equivalent to IEC specification IP65. Dust proof, wash down duty (with proper electrical connection).

## PUMP HEAD CROSS SECTIONAL VIEW



## Applications

- Injection of chemicals to boilers and cooling towers
- Chlorine sterilization for food plants, small-scale water-supply systems, buildings and swimming pools
- Injection of nutrients and disinfectants in the livestock industry, such as poultry and hog producers, as well as for hydroponic cultivation
- Very low flow rate injection of low viscosity liquids for any application (100 CPS max. except high viscosity models)

- |                  |                        |
|------------------|------------------------|
| ① Hose Nut       | ⑪ Support ring         |
| ② Retaining ring | ⑫ Protective diaphragm |
| ③ Hose joint     | ⑬ Spacer               |
| ④ Ball guide     | ⑭ Truss screw          |
| ⑤ Check ball     | ⑮ Relief valve         |
| ⑥ Valve seat     | ⑯ Air release valve    |
| ⑦ Pump head      | ⑰ O-ring               |
| ⑧ Diaphragm      | ⑱ Air release nozzle   |
| ⑨ O-ring         |                        |

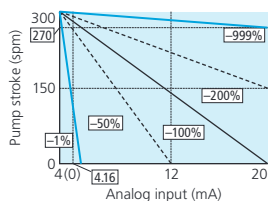
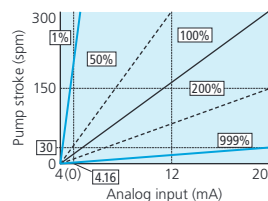
## ANALOG SIGNAL INPUT

PZi4 / PZi8 / PZiG

DC4(0) to 20mA input

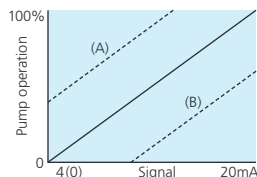
### 1. Proportional band function

The proportional band can be adjusted within a range of  $\pm 1\%$  to  $\pm 999\%$ . Pump response to increasing input signal is easily reversed from min. 4mA and max. flow at 20mA to max. flow 20mA and min. flow at 4mA. 0mA to 20mA range on PZi8 models.



### 2. Shift function

Shift can be set within the range  $\pm 100\%$  allowing a min. preset flow at 0 (4mA) signal or allowing no flow until the input signal exceeds a preset value.

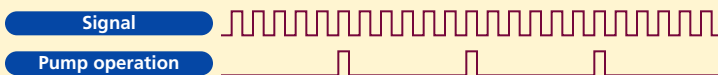


## PULSE SIGNAL INPUT

PZi4 / PZi8 / PZiG

### 1. Frequency-division (1/1 to 1/9999 adjustable)

Example: 1/6 frequency-division



### 2. Multiplication (1 to 9999 adjustable)

Example: 5 times multiplication

(A) Pulses 5 times—next 5 strokes at normal operating speed.



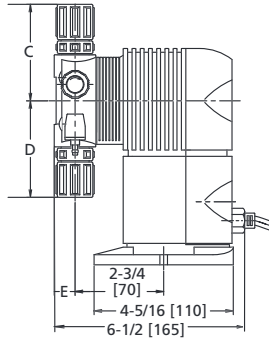
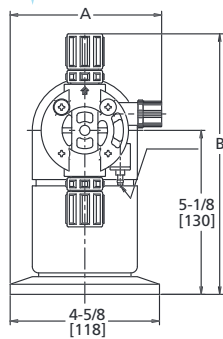
(B) Pulses 5 times evenly spaced over one minute.



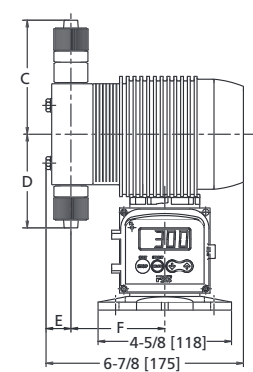
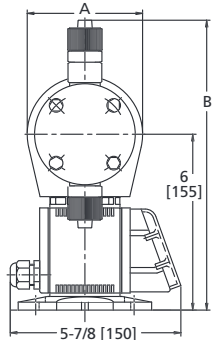
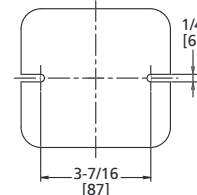
(B) Injection is more uniform.

## EXTERNAL DIMENSIONS

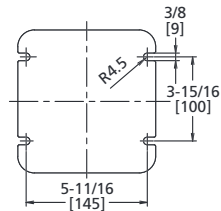
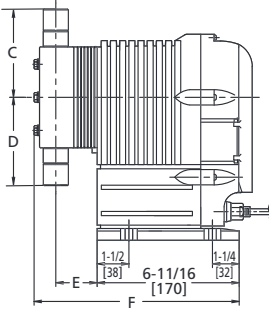
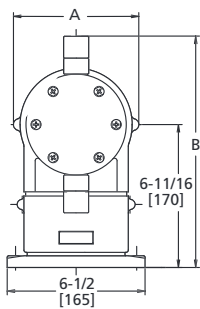
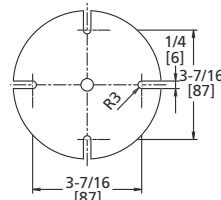
Dimensions are shown in inches (mm).



\*The mounting slots allow mounting from 3-7/16" (87) to 4-5/16" (110) centers.



\*The mounting slots allow mounting from 3-7/16" (87) to 4-5/16" (110) centers.



### MODELS PZ/PZi-31/61/12

| MATERIAL    | A           | B           | C          | D          | E          |
|-------------|-------------|-------------|------------|------------|------------|
| VFC/VEC     | 4 3/4 (120) | 8 3/8 (206) | 3 (76)     | 3 (76)     | 1 1/8 (17) |
| FFC/FEC/FTC | 4 3/4 (120) | 9 (228)     | 3 3/8 (98) | 3 3/8 (98) | 1 1/8 (17) |
| CL          | 3 3/4 (83)  | 8 (204)     | 2 3/8 (73) | 3 (76)     | 1 1/4 (32) |
| ARPZ        | 3 3/4 (83)  | 8 (204)     | 2 3/8 (73) | 3 (76)     | 2 1/4 (57) |
| SS          | 3 3/4 (83)  | 7 3/8 (194) | 2 1/2 (64) | 2 1/2 (64) | 3/4 (19)   |

### MODELS PZD/PZi-32/52

| MATERIAL | A       | B            | C          | D          | E        | F          |
|----------|---------|--------------|------------|------------|----------|------------|
| VFC/VEC  | 4 (102) | 9 3/8 (244)  | 3 3/8 (88) | 3 3/8 (88) | 1 (25)   | 3 3/8 (86) |
| FTC      | 4 (102) | 10 3/8 (256) | 4 (101)    | 3 3/8 (83) | 3/4 (22) | 3 3/8 (83) |
| SS       | 4 (102) | 9 (227)      | 3 3/8 (83) | 2 3/8 (72) | 1 (24)   | 3 3/8 (89) |

### MODELS PZiG-300/500/700/1000/1300

| MATERIAL               | A           | B*           | C*          | D*         | E          | F           |
|------------------------|-------------|--------------|-------------|------------|------------|-------------|
| <b>VTCE &amp; VTCF</b> |             |              |             |            |            |             |
| 300/500                | 5 3/8 (150) | 10 3/8 (270) | 4 (100)     | 4 (100)    | 2 (50)     | 9 3/8 (247) |
| 700                    | 5 3/8 (150) | 10 3/8 (260) | 3 3/8 (90)  | 3 3/8 (90) | 2 (50)     | 9 3/8 (247) |
| 1000/1300              | 5 3/8 (150) | 10 3/8 (265) | 3 3/8 (95)  | 3 3/8 (95) | 2 1/8 (54) | 10 (253)    |
| <b>FTCT</b>            |             |              |             |            |            |             |
| 300/500                | 5 3/8 (150) | 11 3/8 (285) | 4 3/8 (115) | 3 3/8 (97) | 2 (50)     | 9 3/8 (247) |
| 700                    | 5 3/8 (150) | 11 3/8 (285) | 4 3/8 (115) | 3 3/8 (97) | 2 (50)     | 9 3/8 (247) |
| 1000/1300              | 5 3/8 (150) | 11 3/8 (298) | 5 (128)     | 5 (128)    | 2 1/8 (54) | 10 (253)    |

\*For high viscosity liquid end type VTCT-V (all sizes):

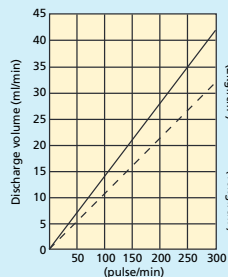
B = 11 3/8 (294) C = 4 3/8 (124) D = 4 3/8 (124)

## PERFORMANCE CURVES

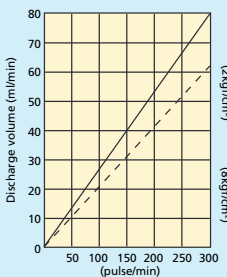
Conditions: Clean water, Room temperature

### Type PZ, PZi4 or PZi8

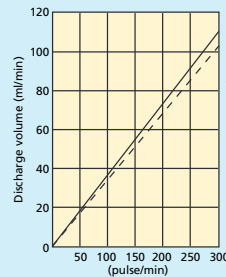
#### SIZE □-31



#### SIZE □-61

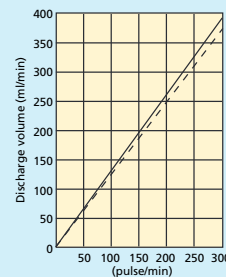


#### SIZE □-12

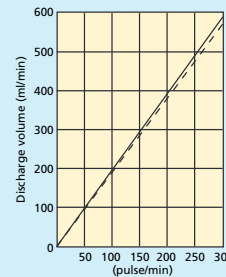


### Type PZD or PZi

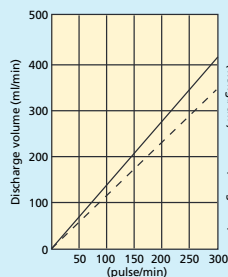
#### SIZE □-32



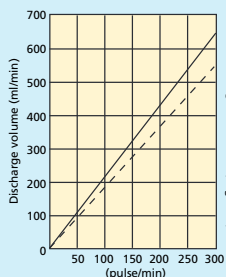
#### SIZE □-52



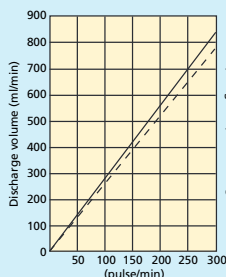
#### PZiG-300



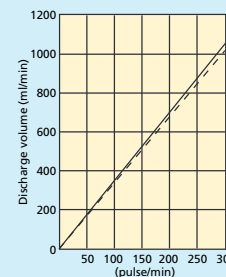
#### PZiG-500



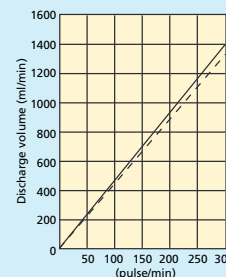
#### PZiG-700



#### PZiG-1000



#### PZiG-1300



# Programmable Models PZi8 & PZiG Control System Examples

YOUR SYSTEM IS ENHANCED BY OUTSTANDING CONTROLLABILITY

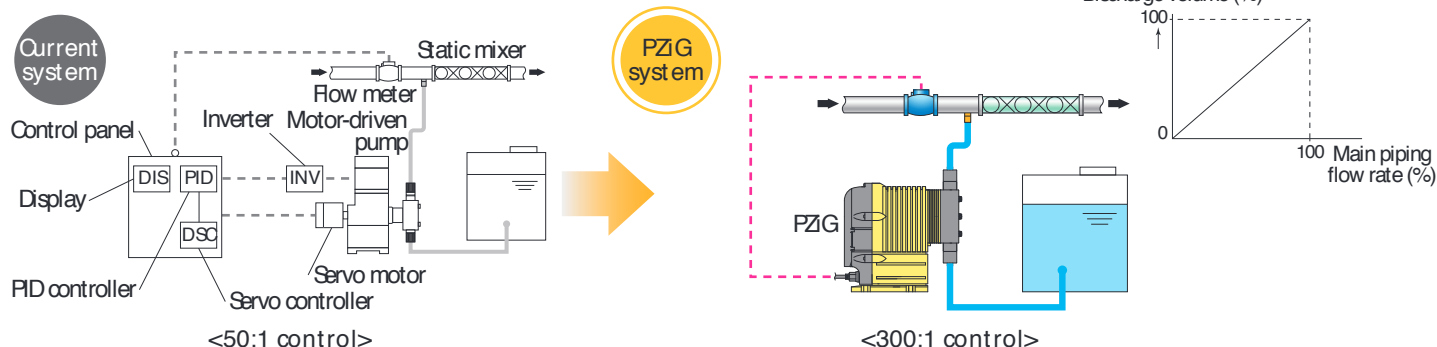
## Proportional Flow Rate Control - Models PZi8 & PZiG

### Advantage

Flow meter signals are received directly according to the flow rate of the main piping and the discharge volume is automatically controlled. This eliminates the need for control devices, which have been needed up until now, and reduces the cost of devices.

**Cost benefits:** Digital panel meters, PID controllers and inverters are no longer required.

Example: Any additive injected proportional to flow in a line



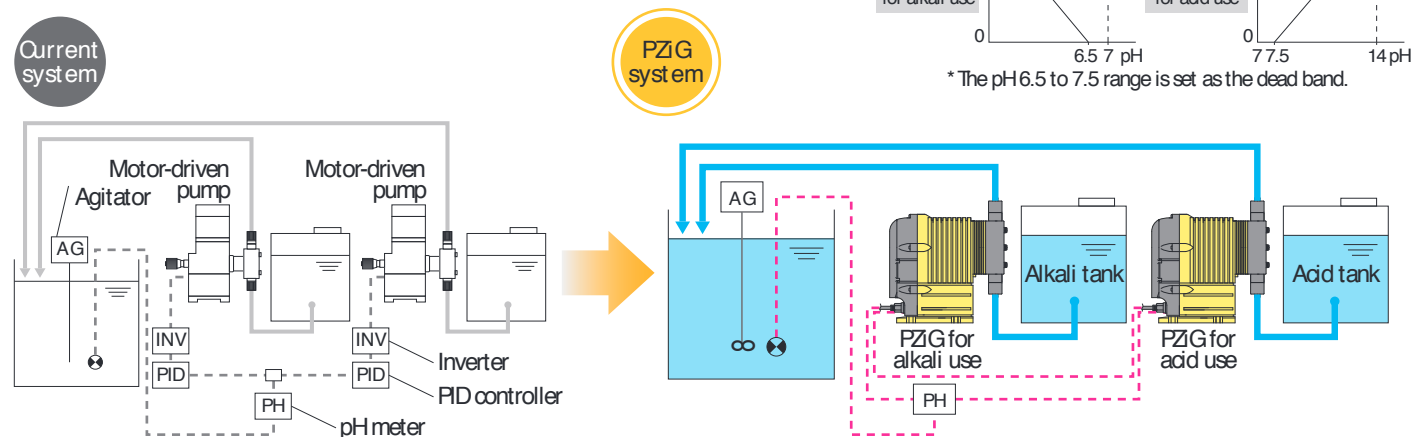
## pH Control - Model PZiG only

### Advantage

Control signals from the pH meter are received and chemicals are automatically injected according to the preset pH value. This simplifies the configuration of the control devices.

**Cost benefits:** Two PID controllers and two inverters are no longer required.

Example: On-site pH control



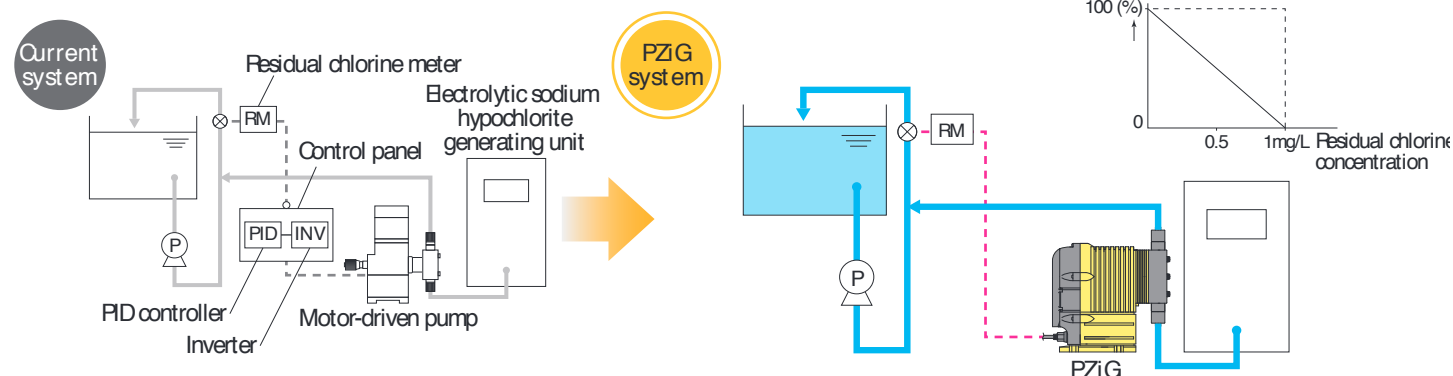
## Sterilization - Model PZiG only

### Advantage

Automatic control is possible on the pump unit merely by receiving signals directly from the residual chlorine meter and setting the target residual chlorine value.

**Cost benefits:** Control panels (PID controllers and inverters) are no longer required.

Example: Disinfection using electrolytic sodium hypochlorite in swimming pools

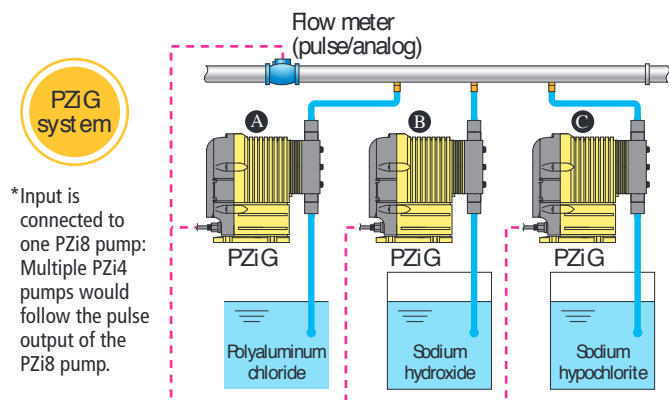




## Multi-liquid Proportional Flow Rate Injection – Models PZi8\* & PZiG

### Advantage

Multiple PZiGs inject different chemicals according to preset values while calculating the signal from a single flow meter. This eliminates the need for a signal distributor.



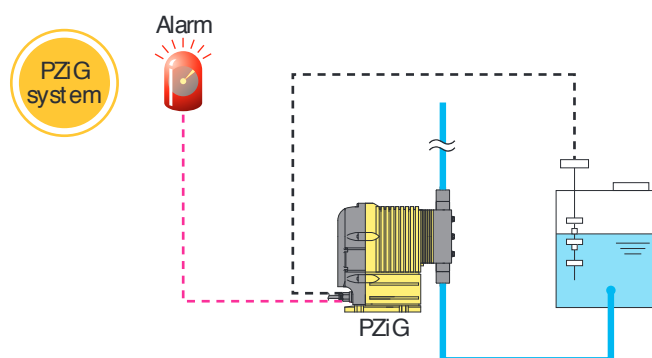
### Note:

Multiple PZiG pumps take pulse or analog signal directly: A single PZi8 pump would take a pulse or analog signal directly and slave a second or third pump to its output.

## 2-point Level Switch-based Control – Models PZi8 & PZiG

### Advantage

A 2-point level control enables output of an alarm at the liquid level “low limit” and stops pump operation at the “low-low limit.”



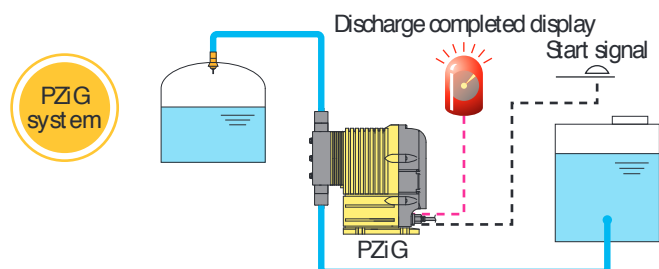
## Batch Injection (counter)\* – Models PZi8 & PZiG

### Advantage

Pump operation starts on command signal. Operation automatically stops and operator is notified of completion when a preset count is reached. Maximum number of pulses 9999x1, x10, x100 or x1000 (555 hours max. run time).\*\*

\*Calibration function assures accuracy greater than ordinary pumps in these applications (see page 3).

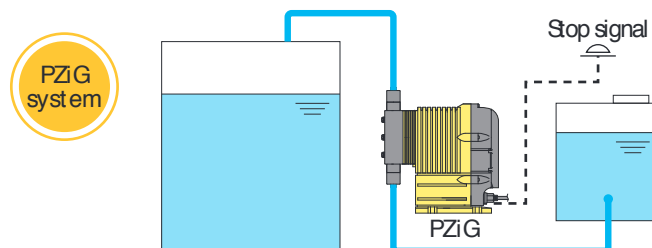
\*\*Pump operation can be interrupted by a remote signal at any time; program resumes when restarted.



## Interval Injection (repeat cycle)\* – Models PZi8 & PZiG

### Advantage

The pump is repeatedly started and stopped by a preset timed program. ON time and OFF interval can be easily set from 1 to 9999 minutes respectively.\*\*



## CONTROL VARIATIONS – Models PZi8 & PZiG

|                      |                     |   |                   |                                 |
|----------------------|---------------------|---|-------------------|---------------------------------|
| Basic specifications | Adjustment range    | Stroke speed  |                   | 1~300 spm (1 spm step)          |
|                      |                     | Stroke length adjustment                              |                   | 20~100%*                        |
|                      | Number of inputs    | Analog input 4~20 mADC (110 ohm)                      |                   | 1                               |
|                      |                     | Digital input high speed (125 Hz max.) Open collector |                   | 2                               |
|                      |                     | Digital input low speed (10 Hz max.) Open collector   |                   | 2                               |
| Run mode             | Other               | Power supply output +5VDC (10 mA max.)                |                   | 1                               |
|                      | LCD display         | Display unit selection (% , mL, spm)                  |                   |                                 |
|                      | Manual operation    | Manual mode   |                   |                                 |
|                      |                     | Analog mode   | Analog signal     | 4~20 mADC                       |
|                      | Automatic operation | Pulse signal  |                   | 1/1~1/9999                      |
|                      |                     | Pulse signal  |                   | 1 to 9999 times                 |
|                      |                     | Count mode  | Number of strokes | 1~9999 (x1, 10, 100, 1000)      |
|                      |                     | Interval mode   | ON/OFF time       | 1 to 9999 mins / 1 to 9999 mins |

\*50~100% for sizes -31/-61/-12

|         |                |   |
|---------|----------------|---|
| Inputs  | Control input  | Stop input                                      |
|         |                | Level switch input                              |
|         |                | Alarm reset input                               |
| Outputs | Control output | Start/reset input                               |
|         |                | Operation signal output                         |
|         |                | Operation sync pulse output <sup>1</sup>        |
|         | Alarm output   | End signal output <sup>2</sup>                  |
|         |                | Analog input error alarm <sup>3</sup>           |
|         |                | Inpule pulse buffer overflow alarm <sup>3</sup> |
|         |                | Level error alarm <sup>3</sup>                  |
|         |                | Injection monitor error alarm <sup>3</sup>      |

1. Output in sync with solenoid operation.

2. Output when operation for preset count is completed.

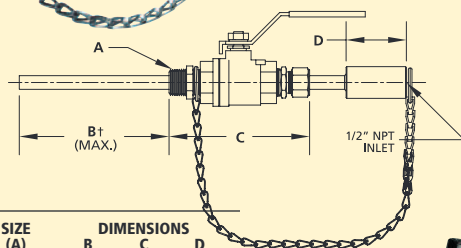
3. Alarm display, alarm output and pump operation can be selected in response to an alarm condition.

# Quality Accessories by Neptune



**Use:** Injection of chemicals pumped by metering pumps into tanks, mains, cooling towers and process systems.

Request Bulletin CS



| MODEL       | MATERIAL OF CONST. | SIZE (A) | DIMENSIONS B | C      | D      |
|-------------|--------------------|----------|--------------|--------|--------|
| CS2-75-PVC  | CPVC               | 3/4" NPT | 7 3/4"       | 5 1/4" | 2"     |
| CS2-100-PVC | CPVC               | 1" NPT   | 7 1/4"       | 6 1/4" | 1 1/2" |

Kynar, 316 SS and C-20 also available.

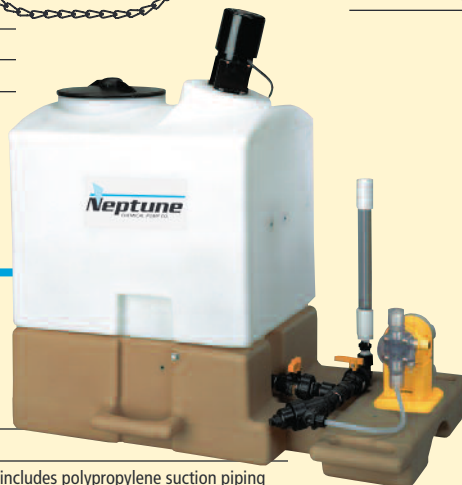
## PORTABLE MINI-TANK FEEDERS

Mini-tank system offers portability and economy. Compact 23 1/2" wide, 36" long, 29" high size fits through doorways, in elevators and allows installation in small areas. Tank removes from base for ease of transport and handling.

- Total weight: 40 lbs. plus pump
- Use with electronic or motor driven pumps
- 8" manway standard

Request Bulletin FDP/CFS

| MODEL                          | DESCRIPTION  |
|--------------------------------|--|
| MT-30                          | 30 Gallon System includes polypropylene suction piping with isolation valve and "Y" strainer (pump not included) |
| MT-30T                         | 30 Gallon Molded Tank and Base Only  |
| <b>OPTIONS AND ACCESSORIES</b> |  |
| MT-CC                          | Calibration Column   |
| MT-CT                          | Containment Basin  |
| MTA                            | 1/20 HP Mixer  |



**MODEL  
MT-30**

Specifications and dimensions for the products in this bulletin are subject to change without notice.

## POLYETHYLENE SOLUTION TANKS & AGITATORS

### For PZ Series Pumps (Top Mounted)

- Self Supporting
- For Corrosive or Non-Corrosive Solutions
- Molded cover will accept "PZ" Series Pumps and Neptune Economy Agitators
- 30 or 50 Gallon Sizes

#### TANKS

| MODEL | SIZE    | HEIGHT  | DIA. MAX. | WEIGHT  |
|-------|---------|---------|-----------|---------|
| ST-30 | 30 Gal. | 23"     | 22"       | 19 lbs. |
| ST-50 | 50 Gal. | 32 1/2" | 22"       | 20 lbs. |



**MODEL  
ST-50**

#### AGITATORS — PVC suction tubing protector pipe included

| MODEL     | DESCRIPTION   | WEIGHT  |
|-----------|---|---------|
| AN-316-30 | 316SS shaft and propeller, fits 30-gallon polyethylene tank; 19" long shaft       | 14 lbs. |
| AN-316-50 | 316SS shaft and propeller, fits 50-gallon polyethylene tank; 29" long shaft       | 14 lbs. |
| AN-E-30   | Epoxy-coated shaft and impeller, fits 30-gallon polyethylene tank; 19" long shaft | 14 lbs. |
| AN-E-50   | Epoxy-coated shaft and impeller, fits 50-gallon polyethylene tank; 29" long shaft | 14 lbs. |

## NIMBLE SKID FLEXIBLE PUMP PACKAGES

Nimble Skids offer a complete chemical feed system ready for use with bulk or semi bulk tanks.

Standardized design with a menu of options allows design flexibility and rapid delivery at an affordable cost. Controls and Automation are available.

Request  
Bulletin FDP/CFS



**Neptune**  
A DOVER COMPANY

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Toll-Free Fax: 1-800-255-4017  
Web Site: <http://www.neptune1.com>  
E-mail: [pump@neptune1.com](mailto:pump@neptune1.com)

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