### Features

<table>
<thead>
<tr>
<th>TYPE</th>
<th>MANUAL CONTROL</th>
<th>EXTERNAL INPUT</th>
<th>PROGRAMMABLE INPUTS/OUTPUTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>PZ</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>PZD</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>PW</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>PZi4</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>PZi8</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>PZiG</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

**Manual control**
- PZ Models (Speed only is adjustable from 15 to 300 SPM)
- PZD/PW/PZi Models (Adjust speed 1 to 300 SPM plus stroke-length adjustment)
- Enter desired flow directly in ml/min.

**Calibration function**
- Calibrate pump flow to actual condition of chemical, pressure, viscosity, etc.

**Control input**
- External interlock (Examples: level switch, remote start, reset)

**Operation display**
- Indicates speed and status
- Indicates speed, feed rate, status and other operational data

**Signal input**
- Pulse signal Frequency-divide 1/1 to 1/9999, Multiply 1 to 9999 (See page 6)
- Analog signal Shift function, proportional band function (See page 6)
- pHe Control/Residual Chlorine Control (See page 10)

**Signal output**
- Alarm output (Level switch, injection monitor)
- Operation pulse signal (Synchronous pulse output for each stroke)
- Operation progress signal (Time or number of strokes remaining in program)

**Alarms**
- Alarm display, output and action (run, pause or stop) can be selected
- Two-point level control (See page 11)
- Power supply for flow checker
- Interval operation (Repeat cycle program, see page 11)
- Counter (Countdown batch injection, see page 11)
- Head can be turned 90° to allow base to be mounted to a vertical wall

**Other functions**
- Interval operation (Repeat cycle program, see page 11)
- On time: 1 to 999999 minutes / OFF time: 1 to 999999 minutes
- Counter (Countdown batch injection, see page 11)
- 1 to 9999 strokes (X1, X10, X100, X1000)

NOTES:
1. PZi4 and PZi8 Models in sizes -32 / -52 plus all PZD and PZiG Models: 20-100% stroke-length adjustment. PW Models: 50-100% 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 11.
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.
6. Pulse Signal Frequency: divide 1/1 to 1 to 999; multiply 1 to 999 (Model PWP).
7. Alarm output with level device or high pressure.
8. Internal Operation: on time 1 to 9,999 minutes; off time 9,999 minutes (Model PWT).

### 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 or PW 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 pages 3 and 4. Sizes -31, -61 and -12 are available for type PZ and PW. Higher capacity sizes -32 and -52 are available for type PZD. Types PZi4 and PZi8 are not available in sizes -31, -61 or -12. The very high PZiG capacities are shown in a separate chart.

**MATERIAL CODE** – Select from charts on pages 3 and 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 PWM + Size -61 + Material code -FTCT**

The complete model number becomes **PWM-61-FTCF**

2
**Materials Chart: PZ / PW / PZD / PZi4 / PZi8**

<table>
<thead>
<tr>
<th>MATERIAL CODE</th>
<th>PUMP HEAD</th>
<th>TUBE JOINT</th>
<th>VALVE SEAT</th>
<th>CHECK BALL</th>
<th>DIAPHRAGM</th>
<th>FOOT VALVE &amp; STRAINER</th>
<th>BACKPRESSURE INJECTION ASSEMBLY</th>
<th>SUCTION CONNECTION – TUBE*</th>
<th>DISCHARGE CONNECTION – TUBE*</th>
</tr>
</thead>
<tbody>
<tr>
<td>VTCF</td>
<td>PVC</td>
<td>PVC</td>
<td>Viton®</td>
<td>Ceramic</td>
<td>PTFE</td>
<td>PVC</td>
<td>PVC</td>
<td>3/8&quot; Tube – Soft PVC</td>
<td>3/8&quot; Tube – PE</td>
</tr>
<tr>
<td>CL1</td>
<td>Acrylic</td>
<td>PVC</td>
<td>Viton®</td>
<td>Ceramic</td>
<td>PTFE</td>
<td>PVC</td>
<td>PVC</td>
<td>3/8&quot; Tube – Soft PVC</td>
<td>3/8&quot; Tube – PE</td>
</tr>
<tr>
<td>ARPZ1</td>
<td>Acrylic</td>
<td>PVC</td>
<td>Viton®</td>
<td>Ceramic</td>
<td>PTFE</td>
<td>PVC</td>
<td>PVC</td>
<td>3/8&quot; Tube – Soft PVC</td>
<td>3/8&quot; Tube – PE</td>
</tr>
<tr>
<td>SS</td>
<td>316SS</td>
<td>N/A</td>
<td>EPDM</td>
<td>316SS</td>
<td>PTFE</td>
<td>Not Included</td>
<td>Not Included</td>
<td>3/8&quot; MNPT – None</td>
<td>3/8&quot; MNPT – None</td>
</tr>
</tbody>
</table>

1 Not available in -32 or -52 size codes. PW not available in ARPZ configuration.
2 PZ-32 and PZ-52 Models – 18 x 12 mm Soft PVC Tube for VTFC and VTCE Models; 15 x 12 mm PTFE Tube for FTCT Models
3 Ceramic Weight Included
4 220 psi Model PZ/PW-31-FTCE – 1/4" Tube Joint and Tube – PP

**Type and Size Selection Chart: PZ / PW / PZD / PZi4 / PZi8**

<table>
<thead>
<tr>
<th>MANUAL MODEL</th>
<th>EXTERNAL INPUT MODEL</th>
<th>PROGRAMMABLE MODEL</th>
<th>GPD</th>
<th>MAX. CAPACITY GPH</th>
<th>MAX. ML/MIN.</th>
<th>MAX. PRES. PSI</th>
<th>DWG./CURVE</th>
<th>STROKE LENGTH (IN)</th>
<th>MAX. PWR. (VA)</th>
<th>AVG. PWR. (Watts)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PZ-31-HP</td>
<td>PW-31-1/2-HP/PWP-31-1/2-HP/PWT-31-1/2-HP</td>
<td>10.5</td>
<td>0.44</td>
<td>28</td>
<td>290</td>
<td>pages 8-9</td>
<td>1.0</td>
<td>200</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>PZ-31</td>
<td>PW-31/1/PWP-31/PWT-31</td>
<td>12</td>
<td>0.5</td>
<td>30</td>
<td>145</td>
<td>pages 8-9</td>
<td>1.0</td>
<td>200</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>PZ-61</td>
<td>PW-61/PWP-61/PWT-61</td>
<td>24</td>
<td>1.0</td>
<td>60</td>
<td>145</td>
<td>pages 8-9</td>
<td>1.0</td>
<td>250</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>PZ-12</td>
<td>PW-12/PWP-12/PWT-12</td>
<td>38</td>
<td>1.6</td>
<td>100</td>
<td>100</td>
<td>pages 8-9</td>
<td>1.0</td>
<td>250</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>PZD-32</td>
<td>PZ-32/PZi8-32</td>
<td>137</td>
<td>5.7</td>
<td>360</td>
<td>45</td>
<td>pages 8-9</td>
<td>1.5</td>
<td>500</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>PZD-32</td>
<td>PZ-32/PZi8-32</td>
<td>204</td>
<td>8.5</td>
<td>540</td>
<td>30</td>
<td>pages 8-9</td>
<td>1.5</td>
<td>500</td>
<td>30</td>
<td></td>
</tr>
</tbody>
</table>

NOTES: 1 PW and PZi4 models provided with terminal strips, not pin connectors.
2 PZi8 models include two separate 2-meter cables, one each 4-pin and 8-pin connector end.
3 High Pressure models are available as PZ-31, PWP-31 or PWT-31 only; available in FTCE or SS only. Refer to Material Code Chart above.

**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
- Not available for PW models

**Standard Model: PVC (VTCF/VTCE)**
- General chemical applications
- Valve seats and O-rings are available in Viton® or EPDM
- Built-in relief valve

**Universal Model: PVDF (FTCF/FTCE/FTCT)**
- 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

**NOTES:**
- 3/8" Tube is 3/8" OD x 1/4" ID; Adapters for NPT connection are available
- PW and PZi4 models provided with terminal strips, not pin connectors.
- PZi8 models include two separate 2-meter cables, one each 4-pin and 8-pin connector end.
- High Pressure models are available as PZ-31, PWP-31 or PWT-31 only; available in FTCE or SS only. Refer to Material Code Chart above.

---

**Variety of Liquid-End Materials**

**Standard Model: PVC (VTCF/VTCE)**
- General chemical applications
- Valve seats and O-rings are available in Viton® or EPDM
- Built-in relief valve

**Universal Model: PVDF (FTCF/FTCE/FTCT)**
- For most chemicals and highly corrosive chemicals
- Valve seats and O-rings are available in Viton®, EPDM or Teflon®
- Built-in relief valve

**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
- Not available for PW models

To specify pump, choose the type from the chart on page 2 plus the size from the chart below (ex: PZi4-32). Then add the appropriate material code from the chart below (ex: PZi4-32-FTCF). Complete instructions regarding Model Number Selection are on page 2.
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 s/min
- 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 ensure the correct injection rate.

---

**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 s/min
- Percentage: 1% to 100%
- Injection rate: ml/min

• Manual stroke length adjustment 20% to 100%

**Control Functions also include (see pages 10-11):**

- **Onboard calibration** measures the actual discharge volume under the exact operating condition of the specific installation and chemical, then stores that value to ensure 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 11)
- Two-line LCD screen displays injection rate and/or operational progress

**Materials Chart: PZiG**

<table>
<thead>
<tr>
<th>MATERIAL CODE</th>
<th>PUMP HEAD</th>
<th>VALVE SEAT</th>
<th>CHECK BALL</th>
<th>DIA-PHRAGM</th>
<th>STRAINER</th>
<th>BACKPRESSURE</th>
<th>SUCTION/</th>
<th>INJECTION CONNECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>VTCE</td>
<td>PVC</td>
<td>EPDM</td>
<td>Ceramic</td>
<td>Teflon*</td>
<td>Not Included</td>
<td>Not Included</td>
<td>1/2&quot; FNPT</td>
<td></td>
</tr>
<tr>
<td>VTCF</td>
<td>PVC</td>
<td>Viton®</td>
<td>Ceramic</td>
<td>Teflon*</td>
<td>Not Included</td>
<td>Not Included</td>
<td>1/2&quot; FNPT</td>
<td></td>
</tr>
<tr>
<td>VTCF-V¹</td>
<td>PVC</td>
<td>Viton®</td>
<td>Ceramic</td>
<td>Teflon*</td>
<td>Not Included</td>
<td>Not Included</td>
<td>3/4&quot; FNPT</td>
<td></td>
</tr>
<tr>
<td>FTCT</td>
<td>PVDF</td>
<td>Teflon®</td>
<td>Ceramic</td>
<td>Teflon*</td>
<td>Not Included</td>
<td>Not Included</td>
<td>1/2&quot; FNPT</td>
<td></td>
</tr>
<tr>
<td>FTCT-A²</td>
<td>PVDF</td>
<td>Teflon®</td>
<td>Ceramic</td>
<td>Teflon*</td>
<td>PVDF</td>
<td>PVDF</td>
<td>15 x 12 PTFE²</td>
<td></td>
</tr>
</tbody>
</table>

¹ High-Viscosity Model rated 1000 to 4000 cps. Consult factory for applications greater than 2000 cps.
² Only these models include Foot Valve Strainer, Antisiphon Check Valve, plus 15 x 12 mm Teflon Suction and Discharge Tubing. Tubing rated 75 psi max.

**Type and Size Selection Chart: PZiG**

<table>
<thead>
<tr>
<th>PROGRAMMABLE MODEL</th>
<th>GPD</th>
<th>MAX. CAPACITY GPH</th>
<th>ML/MIN.</th>
<th>MAX. PRESSURE PSI</th>
<th>DRAWING/CURVE</th>
<th>STROKE LENGTH (MM)</th>
<th>MAX. POWER (VA)</th>
<th>AVG. POWER (WATTS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PZiG-300</td>
<td>130</td>
<td>5.4</td>
<td>340</td>
<td>140</td>
<td>pages 8-9</td>
<td>1.5</td>
<td>750</td>
<td>100</td>
</tr>
<tr>
<td>PZiG-500</td>
<td>200</td>
<td>8.4</td>
<td>530</td>
<td>100</td>
<td>pages 8-9</td>
<td>1.5</td>
<td>750</td>
<td>100</td>
</tr>
<tr>
<td>PZiG-700</td>
<td>288</td>
<td>12.0</td>
<td>760</td>
<td>60</td>
<td>pages 8-9</td>
<td>1.5</td>
<td>750</td>
<td>100</td>
</tr>
<tr>
<td>PZiG-1000</td>
<td>380</td>
<td>15.8</td>
<td>1000</td>
<td>45</td>
<td>pages 8-9</td>
<td>1.5</td>
<td>750</td>
<td>100</td>
</tr>
<tr>
<td>PZiG-1300</td>
<td>495</td>
<td>20.6</td>
<td>1300</td>
<td>30</td>
<td>pages 8-9</td>
<td>1.5</td>
<td>750</td>
<td>100</td>
</tr>
</tbody>
</table>

**Available Only in Programmable Models**

(See page 10 for Direct Connection of pH and Residual Chlorine Control Instruments)
Material Selection Chart

<table>
<thead>
<tr>
<th>PUMPING LIQUID (in alphabetical order)</th>
<th>CONCENTRATION</th>
<th>RECOMMENDED TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetic acid</td>
<td>50%</td>
<td>VTCF/FTCF</td>
</tr>
<tr>
<td>Acetic acid concentrated 24°C</td>
<td></td>
<td>FTCT</td>
</tr>
<tr>
<td>Aluminum sulfate</td>
<td>—</td>
<td>VTCE</td>
</tr>
<tr>
<td>Amine*</td>
<td>—</td>
<td>SS</td>
</tr>
<tr>
<td>Aqueous ammonia</td>
<td>—</td>
<td>VTCE</td>
</tr>
<tr>
<td>Calcium/Sodium hypochlorite — 12%</td>
<td></td>
<td>CL/AR</td>
</tr>
<tr>
<td>Caustic soda</td>
<td>—</td>
<td>VTCE</td>
</tr>
<tr>
<td>Ferric/Ferrous chloride</td>
<td>—</td>
<td>VTCF</td>
</tr>
<tr>
<td>Ferric/Ferrous sulfate</td>
<td>—</td>
<td>VTCF</td>
</tr>
<tr>
<td>Hydrochloric acid — 10% to conc.</td>
<td></td>
<td>VTCF</td>
</tr>
<tr>
<td>Hydrogen peroxide</td>
<td>30%</td>
<td>VTCF</td>
</tr>
<tr>
<td>Nitric acid</td>
<td>10%</td>
<td>VTCF</td>
</tr>
<tr>
<td>Nitric acid — 30% to conc.</td>
<td></td>
<td>FTCT</td>
</tr>
<tr>
<td>Phosphoric acid — 10% to conc.</td>
<td></td>
<td>FTCT</td>
</tr>
<tr>
<td>Poly-aluminum chloride (PAC) — —</td>
<td></td>
<td>VTCE</td>
</tr>
<tr>
<td>Potassium permanganate</td>
<td>—</td>
<td>VTCE</td>
</tr>
<tr>
<td>Sulfuric acid — to 40%</td>
<td></td>
<td>VTCF/FTCF</td>
</tr>
<tr>
<td>Sulfuric acid — concentrated</td>
<td></td>
<td>FTCT</td>
</tr>
</tbody>
</table>

* Boiler compounds with small amounts of Amine – FTCE

Caution – All Models

- Ambient temperature: 32°F to 104°F (0°C to 40°C)
- Pumped liquids:
  - Temperature: 32°F to 104°F (0°C 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

Flow Checker Selection Chart

<table>
<thead>
<tr>
<th>MODEL NO.</th>
<th>MATERIAL</th>
<th>USE w/ PUMP MODEL†</th>
</tr>
</thead>
<tbody>
<tr>
<td>FC-1P-N1</td>
<td>Ryton*</td>
<td>PZ or PZi-31</td>
</tr>
<tr>
<td>FC-1N-N1</td>
<td>Noryl**</td>
<td>PZ or PZi-31</td>
</tr>
<tr>
<td>FC-1P-N2</td>
<td>Ryton*</td>
<td>PZ or PZi-61 or -12</td>
</tr>
<tr>
<td>FC-1N-N2</td>
<td>Noryl**</td>
<td>PZ or PZi-61 or -12</td>
</tr>
</tbody>
</table>

† Not available for larger models

Liquid-End Materials

<table>
<thead>
<tr>
<th>PART NAME</th>
<th>MODEL FC -1P-</th>
<th>MODEL FC -1N-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body</td>
<td>Ryton*</td>
<td>Noryl**</td>
</tr>
<tr>
<td>Ball Check</td>
<td>Ceramic</td>
<td>Ceramic</td>
</tr>
<tr>
<td>Ball Guide/Joint</td>
<td>PVC</td>
<td>PVC</td>
</tr>
<tr>
<td>Valve Seat/O-Ring</td>
<td>EPDM</td>
<td>Fluororubber</td>
</tr>
</tbody>
</table>

* 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/cm²)
- Momentary maximum operating pressure: 200 psi (14 Kg/cm²)
- Temperature: 32°F–104°F (0°C–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/cm² at maximum flow rate using water.

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

- Settings from 15 to 300 pulses per minute on PZ models and from 1 to 300 pulses per minute on PW, 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).

Analog Signal Input
DC4 (0) to 20mA input

1. Proportional band function
   The proportional band can be adjusted within a range of ±1% to ±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 ±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

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

2. Multiplication (1 to 9999 adjustable)*

* Frequency division and multiplication functions on PWP 1/1 to 1/999 and 1 to 999 adjustable
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)

Timer Control

1. INTERVAL mode

Pump operation can be turned on and off in accordance with the setting of the timer. You can set any ON and OFF period for one pattern each in the range of 1 to 9999 minutes.

Setting example:

ON period: 5 minutes
OFF period: 3 minutes

2. DAY mode

The pump operates automatically every day using the same ON and OFF timing that is set. You can set up to nine program patterns within the range of 0:00 to 24:00 in 1-minute units.

Setting example:

ON time: 5 minutes
OFF time: 3 minutes

3. WEEK mode

The pump automatically operates every week at the same ON and OFF time being set for the day of the week. You can set one program pattern for each day of the week. You can set the ON time from 0:00 to 24:00 and OFF time within the range of 0:00 to 48:00 in 1-minute units.

Setting example:

ON time: 9:00
OFF time: 18:00

4. ECO mode

ECO mode is a programmable feature that is enabled through the control panel on the PW version pumps. A green indicator lamp labeled ECO on the control panel illuminates when this feature is operative. The factory default setting for this feature is enabled.

In the enabled mode, the pump automatically reduces the power-on time of the solenoid when the pump is injecting against low discharge pressures. This results in reduced power consumption of up to 55% when the discharge pressure is reduced to ~15 psi.

5. SAFE mode

SAFE mode is a programmable feature that is enabled through the control panel on the PW version pumps. A green indicator lamp labeled SAFE on the control panel illuminates when this feature is operative. The factory default setting for this feature is disabled.

Since the standard PW version pumps include built-in relief-valve protection, Neptune recommends this feature remain disabled.

* WEEK mode cannot be used together with DAY mode.

* DAY mode cannot be used together with the WEEK mode.

* The number of strokes will be the value set in each program.

The following combination of functions can also be used besides the above-mentioned combination.
## External Dimensions

*Dimensions are shown in inches (mm).*

### MODELS PZ

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>VTCF/VTCE</td>
<td>4¾ (120)</td>
<td>8½ (206)</td>
<td>3 (76)</td>
<td>3 (76)</td>
<td>⅜ (17)</td>
</tr>
<tr>
<td>FTCF/FTCE/FTCT</td>
<td>4¾ (120)</td>
<td>9 (228)</td>
<td>3¼ (98)</td>
<td>3¼ (98)</td>
<td>⅜ (17)</td>
</tr>
<tr>
<td>CL</td>
<td>3¼ (83)</td>
<td>8 (204)</td>
<td>2¼ (73)</td>
<td>3 (76)</td>
<td>1¼ (32)</td>
</tr>
<tr>
<td>ARPZ</td>
<td>3¼ (83)</td>
<td>8 (204)</td>
<td>2¼ (73)</td>
<td>3 (76)</td>
<td>2¼ (57)</td>
</tr>
<tr>
<td>SS</td>
<td>3¼ (83)</td>
<td>7½ (194)</td>
<td>2¼ (64)</td>
<td>2½ (64)</td>
<td>⅜ (19)</td>
</tr>
</tbody>
</table>

### MODELS PW-31 / 61 / 12

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>VTCF/VTCE</td>
<td>8½ (216)</td>
<td>6 (152)</td>
<td>3 (76)</td>
<td>3 (76)</td>
<td>⅜ (16.5)</td>
<td></td>
</tr>
<tr>
<td>FTCF/FTCE/FTCT</td>
<td>9¼ (237)</td>
<td>7¼ (195)</td>
<td>3¼ (98)</td>
<td>3¼ (98)</td>
<td>⅜ (16.5)</td>
<td></td>
</tr>
</tbody>
</table>

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

### MODELS PZD / PZi-32 / 52

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>VTCF/VTCE</td>
<td>4 (102)</td>
<td>9½ (244)</td>
<td>3½ (98)</td>
<td>⅜ (86)</td>
<td>1 (25)</td>
<td></td>
</tr>
<tr>
<td>FTCT</td>
<td>4 (102)</td>
<td>10½ (256)</td>
<td>4 (101)</td>
<td>3¼ (83)</td>
<td>⅜ (22)</td>
<td></td>
</tr>
<tr>
<td>SS</td>
<td>4 (102)</td>
<td>9 (227)</td>
<td>3¼ (83)</td>
<td>2½ (72)</td>
<td>1 (24)</td>
<td></td>
</tr>
</tbody>
</table>

*The shape and dimensions differ slightly depending on the liquid-end material and connection type.

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

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>A</th>
<th>B*</th>
<th>C*</th>
<th>D*</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>VTCF/VTCE</td>
<td>300/500</td>
<td>⅞ (150)</td>
<td>10½ (270)</td>
<td>4 (100)</td>
<td>4 (100)</td>
<td>2 (50)</td>
</tr>
<tr>
<td></td>
<td>700</td>
<td>⅞ (150)</td>
<td>10½ (260)</td>
<td>3½ (90)</td>
<td>3½ (90)</td>
<td>2 (50)</td>
</tr>
<tr>
<td></td>
<td>1000/1300</td>
<td>⅞ (150)</td>
<td>10½ (265)</td>
<td>3¼ (95)</td>
<td>3¼ (95)</td>
<td>2½ (54)</td>
</tr>
<tr>
<td>FTCT</td>
<td>300/500</td>
<td>⅞ (150)</td>
<td>11½ (285)</td>
<td>4½ (115)</td>
<td>3½ (97)</td>
<td>2 (50)</td>
</tr>
<tr>
<td></td>
<td>700</td>
<td>⅞ (150)</td>
<td>11½ (285)</td>
<td>4½ (115)</td>
<td>3½ (97)</td>
<td>2 (50)</td>
</tr>
<tr>
<td></td>
<td>1000/1300</td>
<td>⅞ (150)</td>
<td>11½ (298)</td>
<td>5 (128)</td>
<td>5 (128)</td>
<td>2½ (54)</td>
</tr>
</tbody>
</table>

*For high-viscosity liquid end type VTDF-V (all sizes):
B = 11½ (294)  C = 4½ (124)  D = 4½ (124)
Performance Curves

Conditions: Clean water, Room temperature

Cross-Sectional view applies to PVC, Kynar and Type CL Heads; does not apply to Material Codes ARPZ, SS or any PZiG Liquid Heads. Some models use single check balls.

Pump Head Cross-Sectional View

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

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.

Proportional Flow Rate Control – Models PZi8 & PZiG

Example: Any additive injected proportional to flow in a line

pH Control – Model PZiG only

Example: On-site pH control

Sterilization – Model PZiG only

Example: Disinfection using electrolytic sodium hypochlorite in swimming pools
**Control Variations – Models PZi8 & PZiG**

<table>
<thead>
<tr>
<th>Adjustment range</th>
<th>Stroke speed 1~300 spm (1 spm step)</th>
<th>Stroke-length adjustment 20%~100%*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic specifications</td>
<td>Number of inputs</td>
<td>Inputs (Control input)</td>
</tr>
<tr>
<td>Analog input 4~20 mADC (110 ohm)</td>
<td>1</td>
<td>Level switch input</td>
</tr>
<tr>
<td>Digital high speed (125 Hz max.) Open collector</td>
<td>2</td>
<td>Start/reset input</td>
</tr>
<tr>
<td>Digital low speed (10 Hz max.) Open collector</td>
<td>2</td>
<td>Operation signal output</td>
</tr>
<tr>
<td>Power supply output +5VDC (10 mA max.)</td>
<td>1</td>
<td>End signal output 2</td>
</tr>
<tr>
<td>LCD display</td>
<td>Display unit selection (% mL, spm)</td>
<td></td>
</tr>
<tr>
<td>Manual operation</td>
<td>Manual mode</td>
<td></td>
</tr>
<tr>
<td>Analog mode</td>
<td>Analog signal 4~20 mADC</td>
<td></td>
</tr>
<tr>
<td>Pulse signal</td>
<td>1/1/1~9999</td>
<td></td>
</tr>
<tr>
<td>Pulse signal</td>
<td>1 to 9999 times</td>
<td></td>
</tr>
<tr>
<td>Count mode</td>
<td>Number of strokes 1~9999 (x1, 10, 100, 1000)</td>
<td></td>
</tr>
<tr>
<td>Interval mode</td>
<td>ON/OFF time 1 to 9999 mins / 1 to 9999 mins</td>
<td></td>
</tr>
<tr>
<td>Run mode</td>
<td>Automatic operation</td>
<td></td>
</tr>
<tr>
<td><strong>Note:</strong></td>
<td>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.</td>
<td></td>
</tr>
</tbody>
</table>

**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 9999 x 1, x10, x100 or x1000 (555 hours max. run time).** |

**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.** |

---

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

**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.”**

**Input is connected to one PZi8 pump: Multiple PZi4 pumps would follow the pulse output of the PZi8 pump.**

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

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

**Discharge completed display**

**Stop signal**

**Alarm**

**Flow meter (pulse/analog)**

**PZiG system**

**PZiG**

— Polyaluminum chloride

— Sodium hydrosulfate

— Sodium hypochlorite

**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 9999 x 1, x10, x100 or x1000 (555 hours max. run time).**

**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.**

**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.

* Calibration function ensures 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.

---

**CONTROL VARIATIONS – Models PZi8 & PZiG**
Polyethylene Solution Tanks and 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

<table>
<thead>
<tr>
<th>MODEL</th>
<th>SIZE</th>
<th>HEIGHT</th>
<th>DIA. MAX.</th>
<th>WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST-30</td>
<td>30 Gal.</td>
<td>23”</td>
<td>22”</td>
<td>19 lbs.</td>
</tr>
<tr>
<td>ST-50</td>
<td>50 Gal.</td>
<td>32 ½”</td>
<td>22”</td>
<td>20 lbs.</td>
</tr>
</tbody>
</table>

### AGITATORS – PVC suction tubing protector pipe included

<table>
<thead>
<tr>
<th>MODEL</th>
<th>DESCRIPTION</th>
<th>WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>AN-316-30</td>
<td>316SS shaft and propeller, fits 30-gallon polyethylene tank; 19” long shaft</td>
<td>14 lbs.</td>
</tr>
<tr>
<td>AN-316-50</td>
<td>316SS shaft and propeller, fits 50-gallon polyethylene tank; 29” long shaft</td>
<td>14 lbs.</td>
</tr>
<tr>
<td>AN-E-30</td>
<td>Epoxy-coated shaft and impeller, fits 30-gallon polyethylene tank; 19” long shaft</td>
<td>14 lbs.</td>
</tr>
<tr>
<td>AN-E-50</td>
<td>Epoxy-coated shaft and impeller, fits 50-gallon polyethylene tank; 29” long shaft</td>
<td>14 lbs.</td>
</tr>
</tbody>
</table>

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

Portable Mini-Tank Feeders

Mini-tank system offers portability and economy. Compact 23 ½” 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

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Options and Accessories

- MT-CC Calibration Column
- MT-CT Containment Basin
- MTA 1/20-HP Mixer

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.

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