Professional Series

Chemical Feed System
Model # 22152-02

US Patent No. 6,752,930 B2

Product Manual

SureWater Technologies, Inc.
“The Solution X-2”
Model # 22152-02

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(1) Prior to Installation

1. Read Entire Product Manual. It is recommended unit be installed by **qualified technician**.

2. Bypass stream must be capable of delivering approximately 5 gpm.

3. Minimum venturi inlet pressure requirement is 10 psi.

4. Pressure and flow requirements are to be met by creating back pressure on the upstream side of the main return line valve by throttling down the main return line valve (differential valve).

Note: If required recirculation rate cannot be maintained after throttling main return line valve, it may be necessary to install a booster pump in the by-pass stream, upstream of inlet side of the venturi prior to pressure gauge. **Consult with a qualified technician or engineer.**

5. Inlet side of the venturi is to be fed by post filtered water.

(2) Installation Requirements

1. Top of unit should be mounted at approximately eye level.

2. Unit flow meter **MUST** be installed in an exact vertical plane to insure accuracy. Wall mounting is preferred.

3. All piping and fittings should be SCHED 40 PVC or better and must be supported and strapped securely to avoid vibration. (Use only purple PVC cleaner and grey PVC cement.)

4. Unit is to be electrically connected to chemical controller (electronic chemical controller is to be supplied by others).

5. It is highly recommended that pipe cutters are used on all PVC cuts.

IMPORTANT: When using hacksaw or drilling PVC pipe it is extremely important that all shavings or filings be removed and cleaned from PVC pipe prior to gluing. Any debris left in pipes may cause clogging of venturi, resulting in unit failure.

(3) Installation Instructions

Unit flow meter **MUST** be installed in exact vertical plane to ensure accuracy. Wall mounting is preferred.
Feeder comes with mounting hardware (Tap Con screws) to be used with existing mounting holes in unit (two at top and one in center of bottom) also for mounting pre-assembled t-strainer valve assembly (four) and channel brackets to wall (four).
Feeder is to be plumbed on a by-pass stream on main recirculation system. Inlet side of venturi is to be fed by post-filtered water prior to the main return line valve (differential valve). Discharge (outlet) side of venturi is to be plumbed into main return line down stream of the main return line valve. (See basic installation drawing)

(a) Mounting Unit

Place unit on desired location (wall), use level to ensure flow meter is in exact vertical plane and mark the three holes in top section of unit. Pre-drill holes with 3/16" drill bit and mount unit with provided Tap Cons. Align the t-strainer valve assembly; using the pre drill holes, drill and mount with Tap Cons.

When mounting venturi assembly, suction port of venturi should be in direct line with outline port of unit. Two pieces of channel with brackets are provided for mounting. (See basic installation drawing for placement)

(b) Labeling – Acid or Chlorine Feeder

Unit comes with two labels. If unit is to be used as an acid feeder, place the **Acid Feeder** label in the space on the front of the unit under the flow meter. If the unit is to be used as a chlorine feeder, place the **Chlorine Feeder** label in the space on front of the unit under the flow meter.

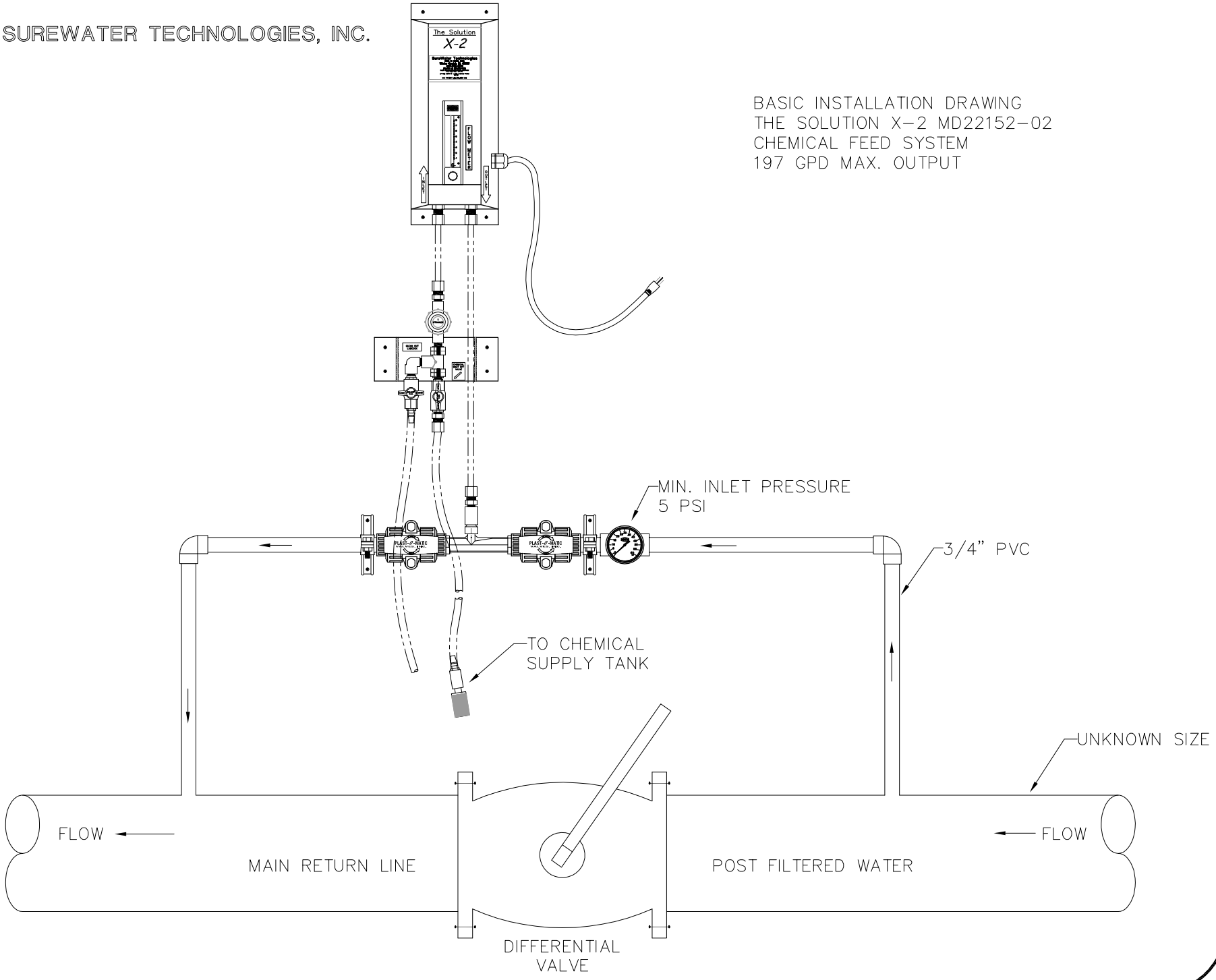
(c) Plumbing

WARNING: Specialized plumbing knowledge may be required to ensure damage is not caused to unit.
Unit venturi assembly (pressure gauge T-assembly prior to inlet side of venturi) is to be plumbed on ¾" by-pass stream. Inlet side of venturi is to be fed by post-filtered water prior to (up stream of) main return line valve (differential valve). Discharge (outlet) side of venturi is to be plumbed into main return line down stream of main return line valve (differential valve), after all other feed or injection lines.

After mounting venturi assembly install Teflon (3/8" heavy wall, 36" piece provided with orange tape label, cut to fit), connecting the outlet port of the unit to the suction port of the venturi using the existing Jaco compression fittings. Strainer check valve pre-installed in thin wall 3/8" Teflon tubing (8' provided) is to be placed in chemical storage tank, connect other end of tubing to Jaco compression fitting on bottom (inlet side) of chemical shut off valve.

SUREWATER TECHNOLOGIES, INC.

BASIC INSTALLATION DRAWING
THE SOLUTION X-2 MD22152-02
CHEMICAL FEED SYSTEM
197 GPD MAX. OUTPUT



(4) Electrical

After mounting, unit is ready for electrical connection. Unit is to be electrically connected to and operated by an **electronic chemical controller only**.

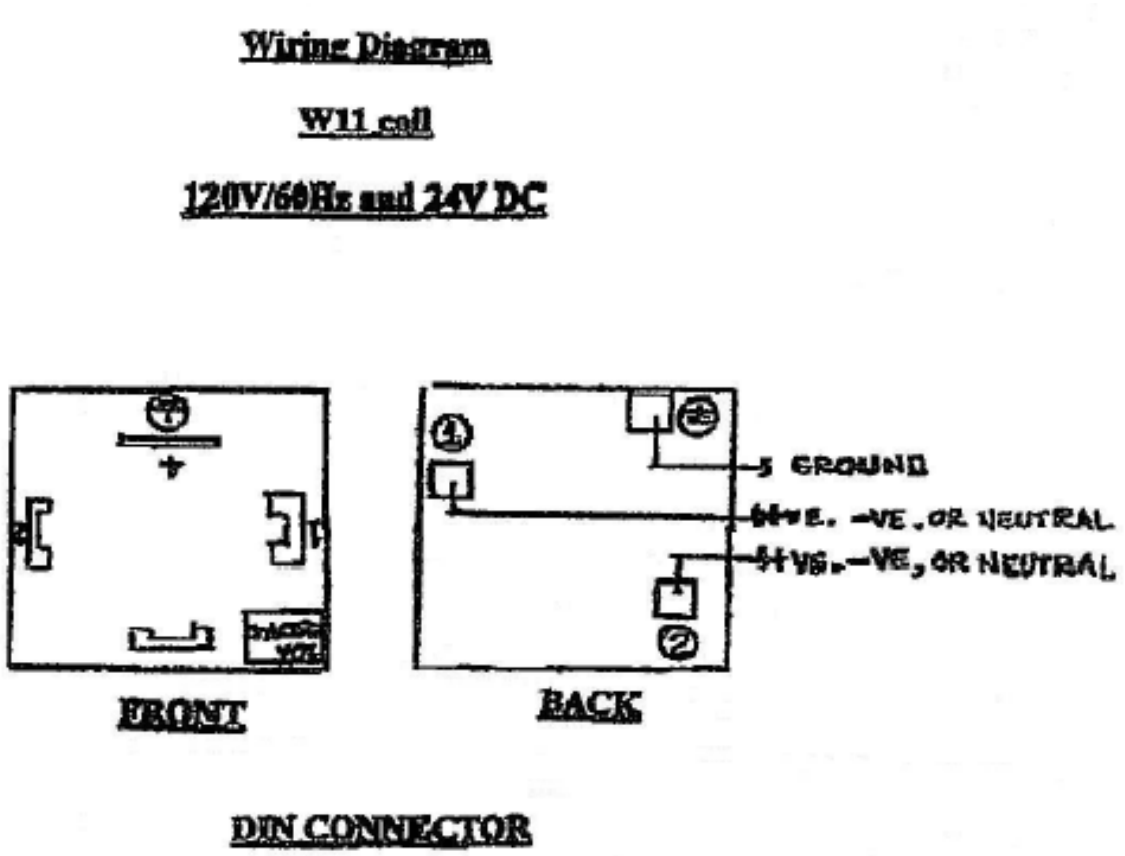
When using unit as a **chlorine feeder**, unit should be electrically connected to the controllers **ORP**, **HRR**, or **Cl2** output terminals.

When using unit as an **acid feeder**, unit should be electrically connected to the controllers' **pH** control output terminal.

The unit comes with a 125 volt, 16 gauge, 13 amp, 3-wire grounded power cord with plug 5 ½" long already connected. Normally, unit is plugged into an electrical outlet, which is controlled by the electronic chemical controller.

For wiring installation instructions, or information regarding power consumption please refer to **TYPE W11 MOLDED SOLENOID COIL & ENCLOSED INFORMATION**, provided with unit.

(a) Wiring Diagram



TYPE W11 MOLDED SOLENOID COIL & ENCLOSURE INFORMATION

INSTALLATION - Refer to drawing on reverse side

PLAST-O-MATIC solenoid coils are molded with corrosion resistant polyester and are designed to meet NEMA 4 standards. These coils are water and dust tight and are supplied standard with a ½" NPT female nylon connector assembly. A connector assembly with an optional indicator light and other choices can be found in the PLAST-O-MATIC catalog. The coil is intended for indoor or outdoor use in general purpose applications as well as those where conditions such as dust, blowing dirt or splashing water are likely to be found. They should never be submerged in water.

These coils are equipped with a DIN standard connector assembly (DIN 43650 and ISO 4400). The standard external connection is ½" NPT. This type of connector allows internal electrical connections to be made easily while disconnected from the coil. The external cable connection to the housing may be arranged at any one of 4 angles (90° increments) to facilitate valve installation.

The coil can be rotated to any position in relation to the valve by loosening the cap nut on top of the coil. Rotate the coil to the desired positon. Retighten the cap nut snuggly to be sure the O-rings and gasket seal properly. Hand tight is sufficient.

WIRING INSTALLATION: Three wires (one is ground) are recommended. To connect the wires loosen screw and pull connector assembly away from coil. Use a small screwdriver and carefully pry the inside connector from housing using the visible slot at the corner of the connector. Screw your conduit or cable fitting into the housing. Pass the wires through your fitting and the housing and then connect them to the terminals on the connector. One terminal is marked with a ground symbol (⏚) and the other two are hot leads. Reassemble, paying attention to the desired orientation of the conduit connection. Tighten the conduit fitting to secure the conduit. Make sure the two gaskets are properly seated before tightening the connector assembly to the coil. Do no overtighten. For three-phase power systems the terminals can be connected to any two of the three phases. All local wiring codes should be followed when wiring the coil.

IMPORTANT MOUNTING INFORMATION: Solenoid valves with 11 watt molded coils will operate in any position, however, it is recommended that they be mounted in an up-right position for maximum cycle life.

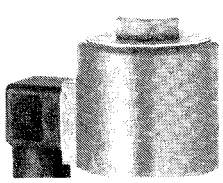
OPERATION

PLAST-O-MATIC molded solenoid coils are rated for continuous duty up to 95 °F (35 °C) ambient. Above this temperature they are rated intermittent duty requiring a cool down period before re-energizing. A general rule of thumb for ambient temperatures between 95 °F (35 °C) and 122 °F (50 °C) is to allow an equal amount of cool-down time as compared to energized time with a maximum on time of ½ hour. At higher temperatures more cool-down time is needed.

Coils can be operated up to 15% below their listed nominal voltages, however, the inlet pressure rating of the valve will be about 30% lower. Also, coils exposed to voltages in excess of their rated nominal voltage will operate hotter than intended which could lead to coil and valve failure. Consult factory for specific information.

PLAST-O-MATIC solenoid valves will operate properly and offer trouble-free service when the valves' pressure ratings are adhered to. Pressure ratings can be found both in the PLAST-O-MATIC solenoid valve catalog (EAST) and on the valves' body labels.

STYLE
W11
11 WATT
CLASS "F"
COILS
Continuous Duty



- **CORROSION RESISTANT**
- **CONTINUOUS DUTY**
- **SAFE OPERATING TEMP.**
- **NEMA 4 WATER AND DUST TIGHT ENCLOSURE**
- **MOISTURE PROOF**
- **FUNGUS PROOF**

INSULATION CLASS	F
COIL SURFACE TEMPERATURE	185 °F 85 °C
MAX. ALLOWABLE AMBIENT TEMP. *	95 °F 35 °C
VA INRUSH	66
VA HOLDING	24

NOTE: For specific information on DC voltages (e.g. 24 Volt DC), contact the factory.

* WITH POWER ON CONTINUOUSLY

POWER CONSUMPTION

The power consumption of PLAST-O-MATIC solenoid valves may be determined from the above coil ratings which list the volt-ampere "inrush" and volt-ampere "holding". The volt-ampere "inrush" is the momentary current surge which occurs the moment the solenoid is energized. The volt-ampere "holding" is the continuous rating after the initial "inrush".

To determine the current rating for either the "inrush" or "holding", divide the voltage into either of the volt ampere ratings.

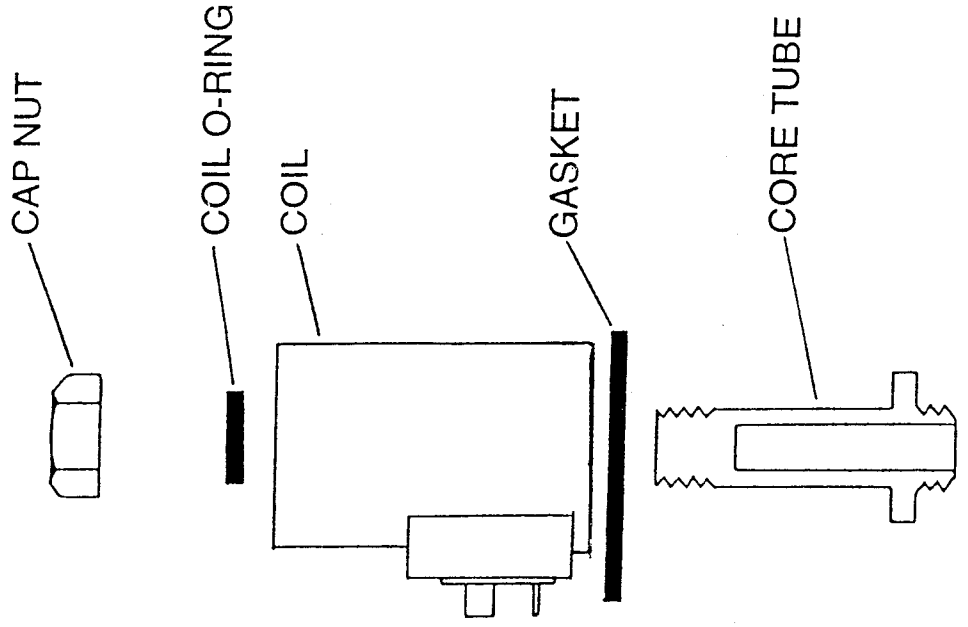
$$**\text{AMPS ("inrush")} = \frac{\text{volt-ampere "inrush"}}{\text{voltage}} \qquad \text{AMPS ("holding")} = \frac{\text{volt-ampere "holding"}}{\text{voltage}}$$

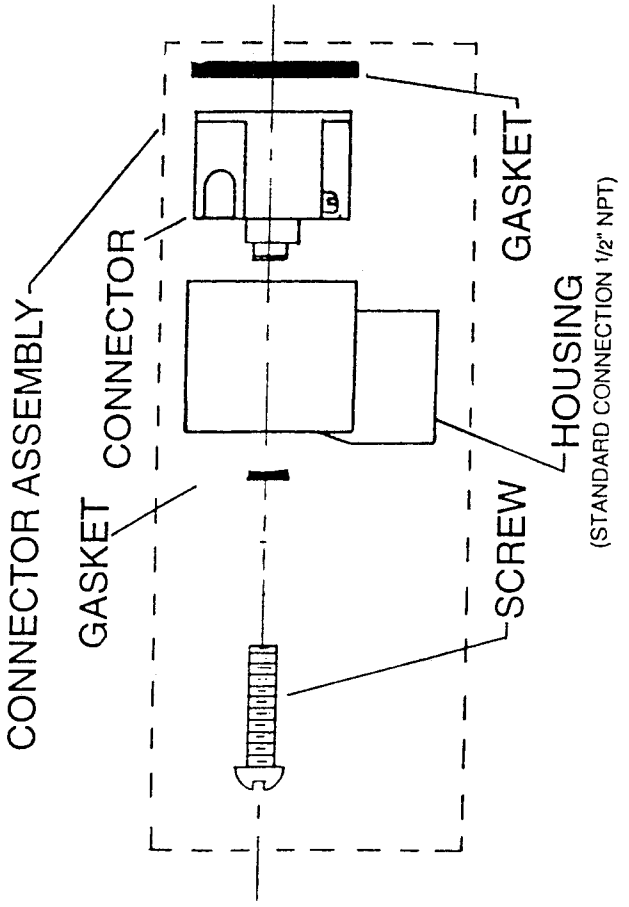
PARTS LIST ON REVERSE SIDE

Plast-O-Matic Valves, Inc. • 1384 Pompton Avenue, Cedar Grove, NJ 07009-1095 • (973) 256-3000 • Fax: (973) 256-4745

TYPE W-11MOLDED SOLENOID COIL & ENCLOSURE PARTS LIST

11 WATT





Plast-O-Matic Valves, Inc. • 1384 Pompton Avenue, Cedar Grove, NJ 07009-1095 • (973) 256-3000 • Fax: (973) 256-4745

2.
Operation Manual

(5) Operating Instructions

a. Output Curve

(5) Operating Instructions

Attention: The Solution X-2 chemical feed system is designed to be used with all of the following chemicals.

	Labels
1. Sodium Hypochlorite (bleach) >	Chlorine Feeder
2. Muriatic Acid (hydrochloric acid) >	Acid Feeder
3. Sulfuric Acid >	Acid Feeder

Important: Label the unit with the **appropriate feeder label**.

Unit is to be used with electronic chemical controller. Controller operates unit (turns on and off).

Unit Feed Rate Range

Unit feed rates are adjustable. Flow rate indicator is calibrated in Gallons Per Hour (located on face of flowmeter).

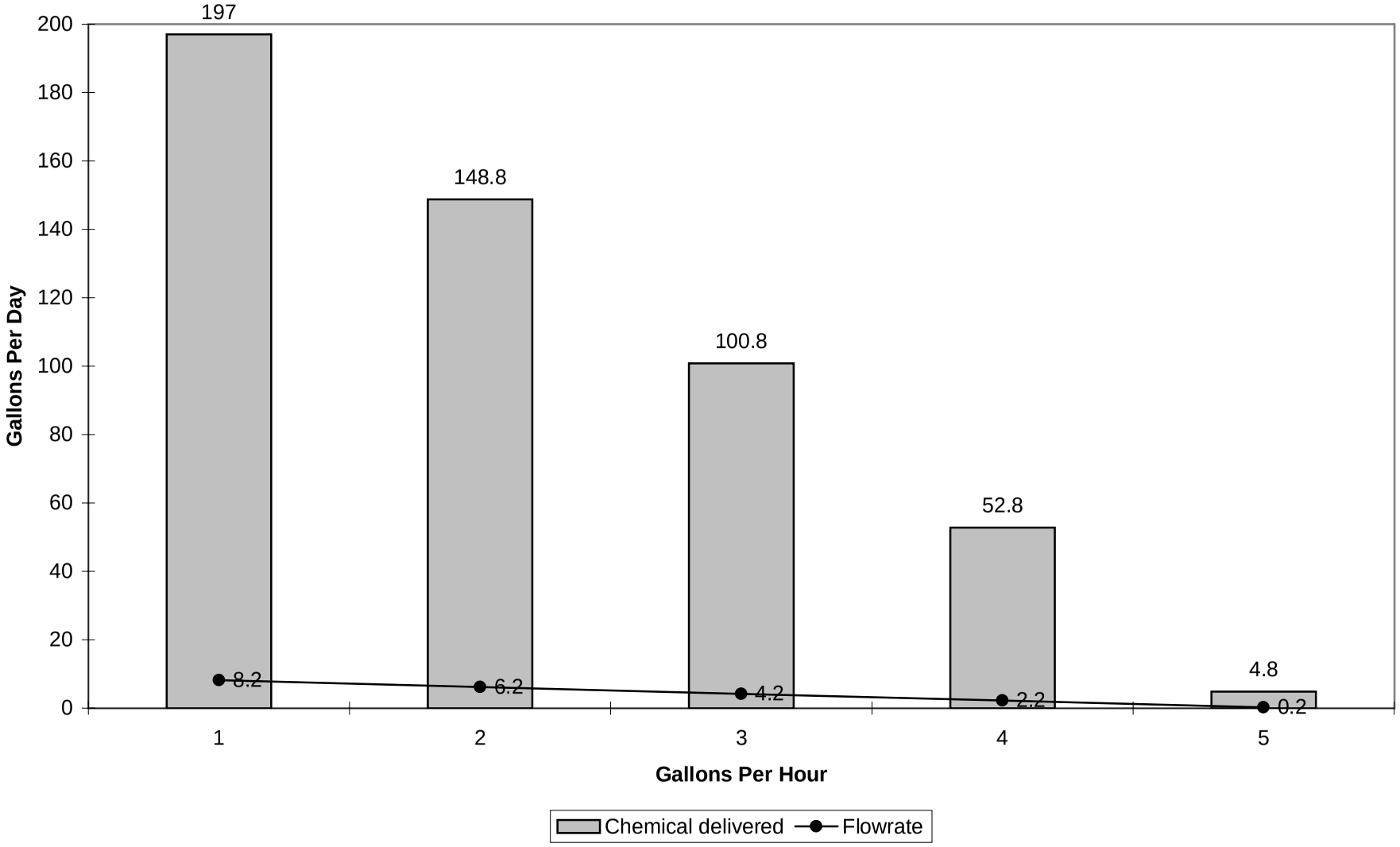
.2 gph minimum to 8.2 gph maximum
x 24 hrs =
4.8 gpd minimum to 197 gpd maximum

Setting Feed Rate

Determine required feed rate and adjust flowmeter to desired rate. (Adjustment knob at base of flowmeter)

Important: Unit is to be cleaned and free of chemical when not in use for extended periods of time. (See Service/Maintenance Manual)

The Solution X-2 Output Graph
Sodium Hypo/ Muriatic or Sulfuric Acid



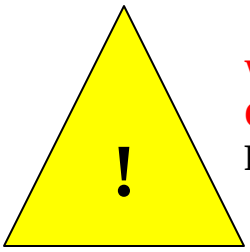
3.
Service / Maintenance Manual

(6) Service / Cleaning Unit

(6) Service / Cleaning Unit

To service **Chlorine Feeder** it is required unit be cleaned every two weeks if using batch sodium hypochlorite (bleach). If using continuous process sodium hypochlorite (bleach) unit should be cleaned once a month.

To service **Acid Feeder** it is required unit be cleaned every three months.



Warning
Chemical Hazard: Always Wear Appropriate Personal Protective Equipment

1. **When Cleaning Unit, or Handling Chemicals**
2. **When Preparing 50% Acid, 50% Water Solution. <u>Always Add Acid To Water - Never Add Water To Acid.</u>**
3. **Never Allow Acid To Mix With Chlorine In Unit.**

Cleaning instructions are located on Unit. Left side for cleaning **Acid Feeder**, right side for cleaning **Chlorine Unit**.

To Clean Chlorine Unit

1. Set controller to FEED MODE.
2. Close chemical shut off valve.
3. Insert clean-out labcock flex tube in one gallon of water and open clean-out labcock valve.
   Allow entire gallon to flow through unit, rinsing unit free of bleach.
4. Insert clean-out labcock flex tube in gallon solution of 50% water, 50% muriatic acid and allow mixture to flow through unit approximately 15 seconds.
5. With clean-out labcock valve still open reinsert labcock flex tube in fresh gallon of water. Allow entire gallon to flow through unit, rinsing unit free of muriatic acid.
6. Clean T-strainer if needed.
7. Close clean-out labcock valve.
8. Re-open chemical shut off valve.
9. Reset controller.
   * Remove and clean foot valve / strainer as needed*

Warning
Chemical Hazard: Always Wear Appropriate Personal Protective Equipment

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2. **When Preparing 50% Acid, 50% Water Solution. <u>Always Add Acid To Water - Never Add Water To Acid.</u>**
3. **Never Allow Acid To Mix With Chlorine In Unit.**

Cleaning instructions are located on Unit. Left side for cleaning **Acid Feeder**, right side for cleaning **Chlorine Unit**.

To Clean Acid Feeder

1. Set controller to FEED MODE.
2. Close chemical shut off valve.
3. Insert clean-out labcock flex tube in one gallon of water and open clean-out labcock valve.
   Allow entire gallon to flow through unit, rinsing unit free of acid.
4. Remove T-strainer screen / clean and replace.
5. Close clean-out labcock valve.
6. Re-open chemical shut off valve.
7. Reset controller.
   Remove and clean foot valve / strainer as needed

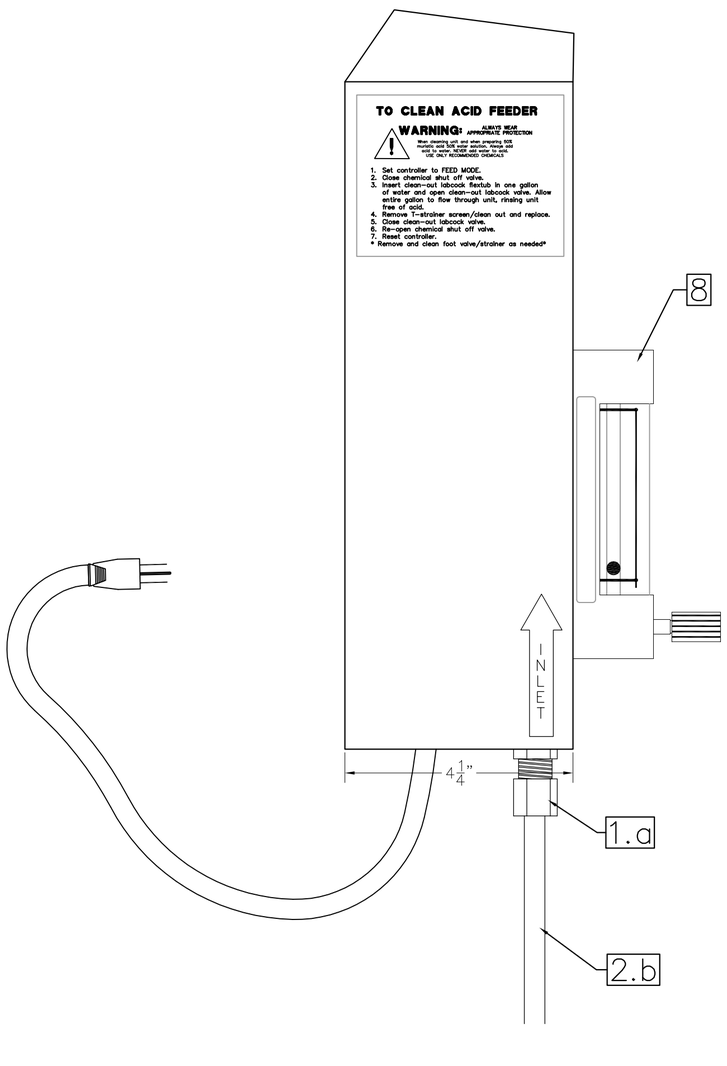
4.
Spare Parts List

(7) Spare Parts Information

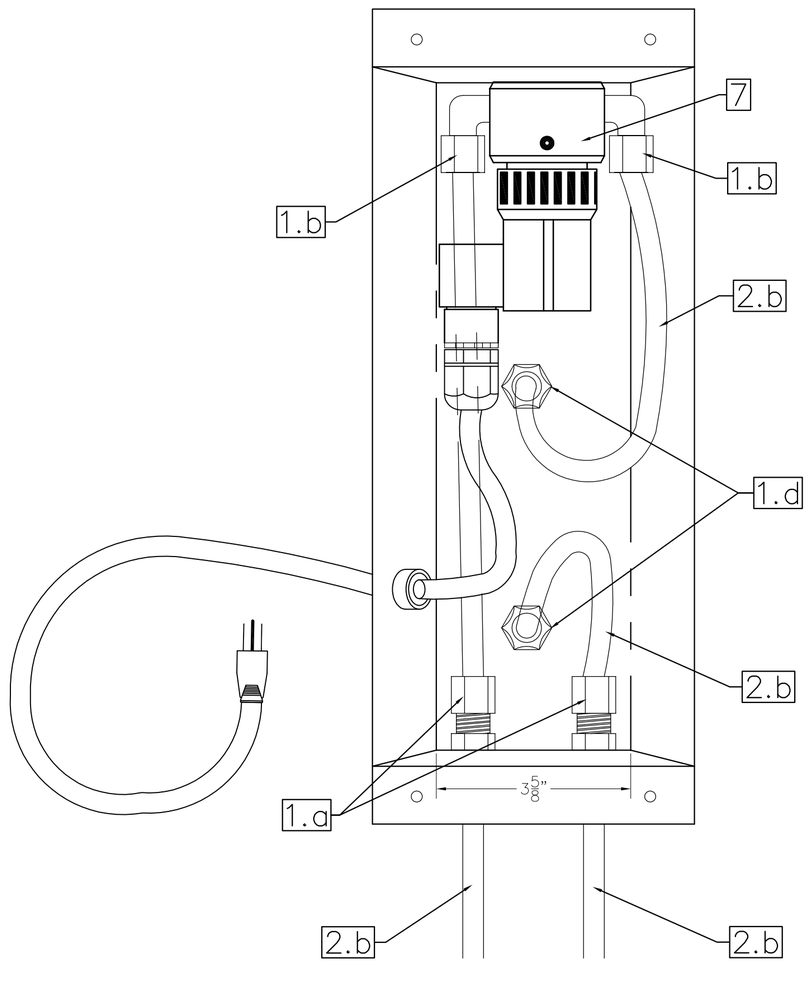
(7) Spare Parts Information

	Part Number
1. Jaco Vibra Pruf Tube Fittings	
a. 3/8” bulk head union	20-6-k-pg
b. 3/8” x ¼” male elbow	40-6-4-k-pg
c. 3/8” x ¼” male connector	10-6-4-k-pg
d. 3/8” x ¼” male connector	10-6-2-k-pg
2. Teflon Tubing	
a. .375” OD x .312” ID	tsfe14-0375-031
b. .375” OD x .250” ID	tsfe14-0375-062
3. PVC Fittings sched 80	
a. ¼” threaded T	
b. ¼” 90 degree threaded street L	
c. ¼” threaded coupling	
d. ¼” x close threaded nipple	
e. ¼” threaded coupling with barb fitting	
4. 18” Clear Flex Tube	
5. ¼” Spears Labcock valve	lvk-3a-0603
6. ¾” True Blue Union Ball Valve	mbv075vst-pv
7. ¼” Plasto-Matic Solenoid Valve Type W11	
8. King Flow Meter, Model # 74234g041133210	
9. Mazzei Injector (venturi), Model # 684	
10. Foot valve check strainer	c-340a
11. T-Strainer Assembly	
12. 1/8” Wika Pressure Gauge	9738240

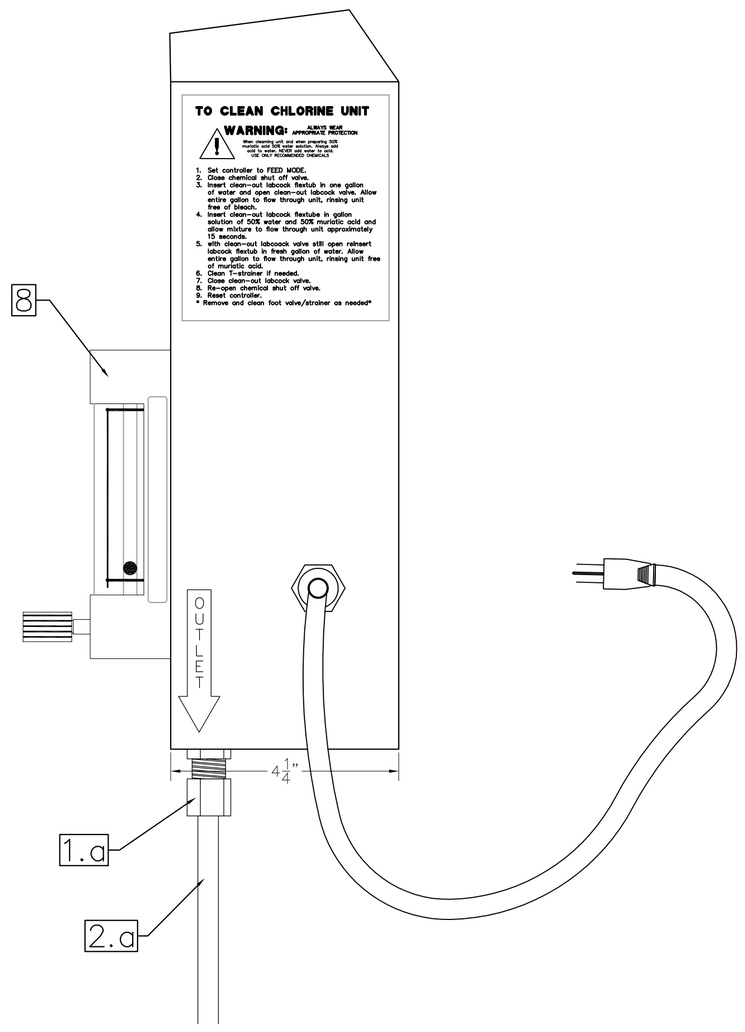
LEFT SIDE VIEW



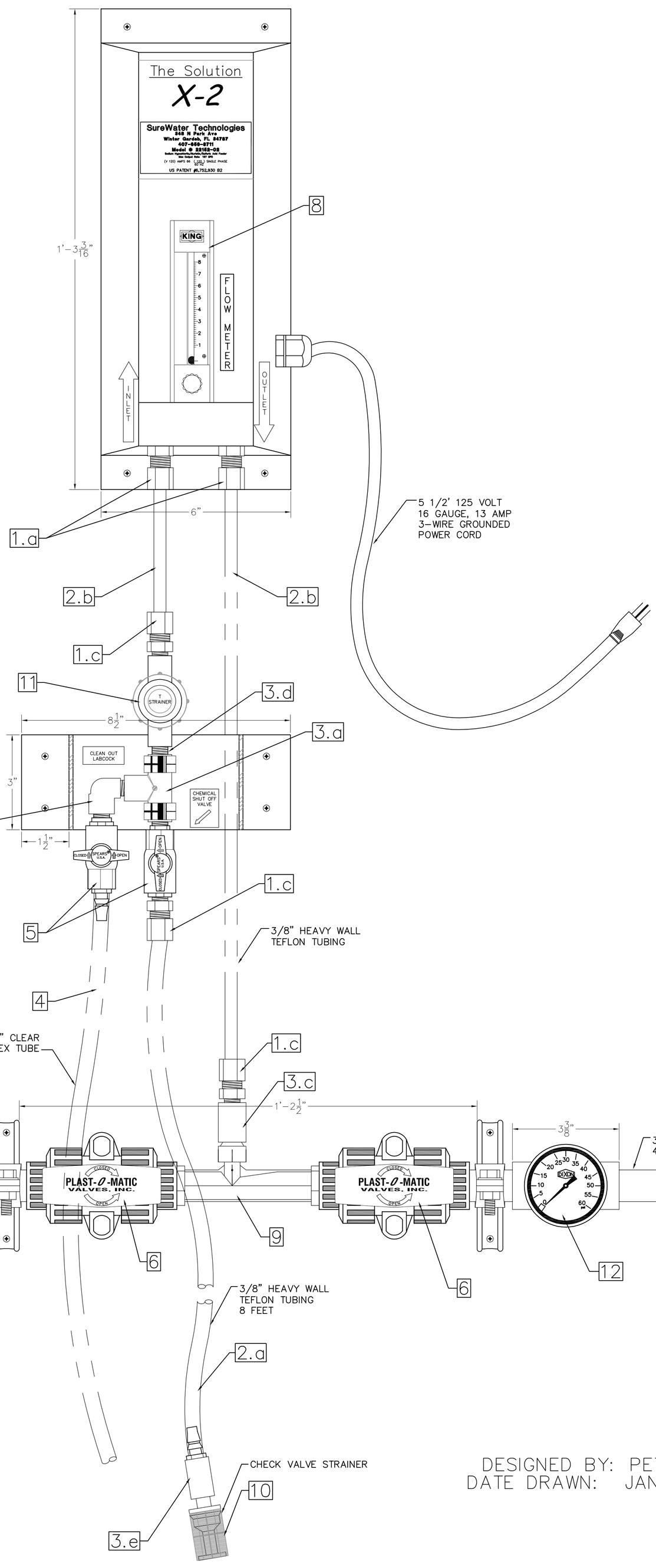
BACK VIEW



RIGHT SIDE VIEW



FRONT VIEW



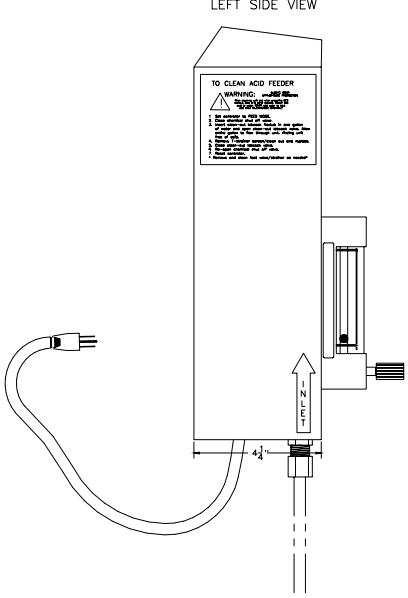
5 1/2' 125 VOLT
16 GAUGE, 13 AMP
3-WIRE GROUNDED
POWER CORD

DESIGNED BY: PETER ALEXANDER
DATE DRAWN: JANUARY 7TH, 2005

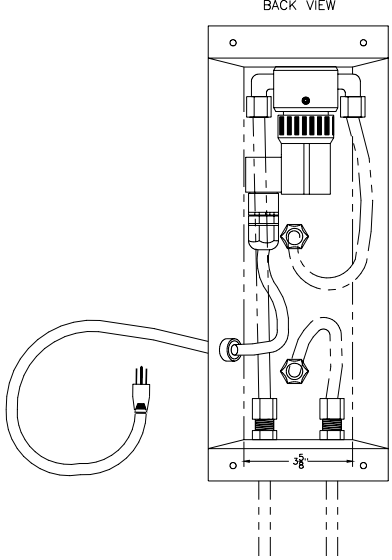
5.
Schematics

(8) Unit Design Diagram

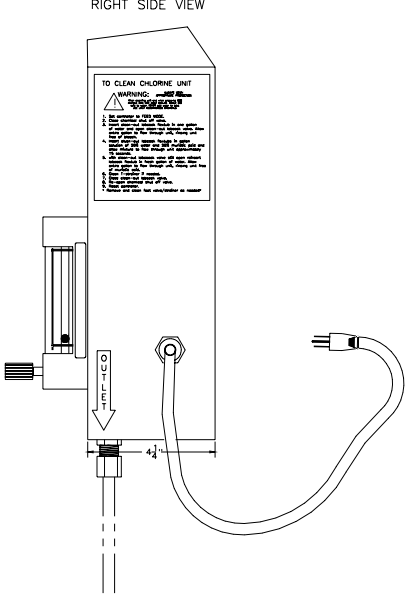
LEFT SIDE VIEW



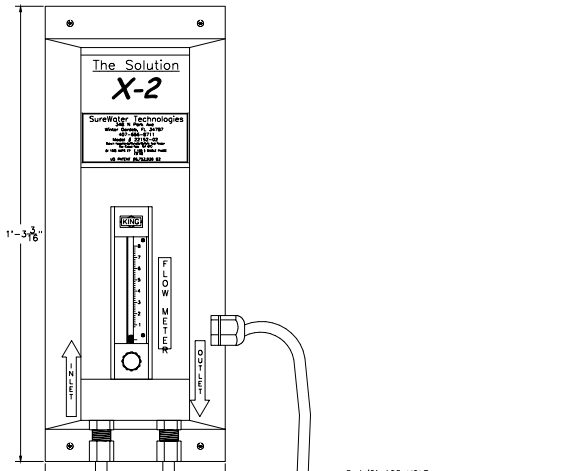
BACK VIEW

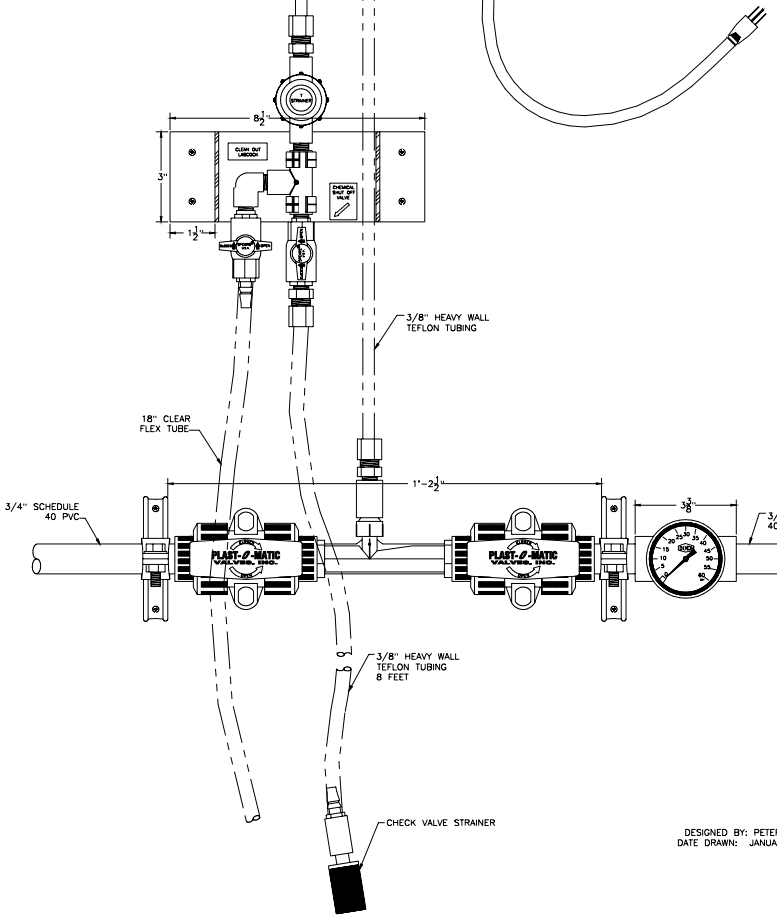


RIGHT SIDE VIEW



FRONT VIEW





DESIGNED BY: PETER ALEXANDER
DATE DRAWN: JANUARY 7TH, 2005

6.
Warranty Statement

(9) Warranty Statement

(9) WARRANTY STATEMENT

SUREWATER TECHNOLOGIES (HEREAFTER SWT) WARRANTS THE SOLUTION X-2 MODEL # 22152-02 TO BE FREE OF DEFECTS IN WORKMANSHIP AND MATERIALS. SWT'S LIABILITY UNDER THIS WARRANTY EXTENDS FOR A PERIOD OF ONE YEAR FROM DATE OF DELIVERY FROM OUR FACTORY OR AUTHORIZED DISTRIBUTOR. IT IS LIMITED TO REPAIRING OR REPLACING ANY DEVICE OR PART WHICH IS RETURNED, TRANSPORTATION PREPAID TO THE FACTORY WITHIN ONE YEAR OF DELIVERY TO THE ORIGINAL PURCHASED, AND WHICH IS PROVEN DEFECTIVE UPON EXAMINATION.

SWT DISCLAIMS ALL LIABILITY FOR DAMAGE DURING TRANSPORTATION, FOR CONSEQUENTIAL DAMAGE OF WHATEVER NATURE FOR DAMAGE DUE TO HANDLING, INSTALLATION OR IMPROPER OPERATION, AND FOR DETERMINING SUITABILITY FOR THE USE INTENDED BY THE PURCHASER.

SWT MAKES NO WARRANTIES EITHER EXPRESSED OR IMPLIED OTHER THAN THOSE STATED ABOVE. NO REPRESENTATIVE HAS AUTHORITY TO CHANGE OR MODIFY THIS WARRANTY IN ANY RESPECT.