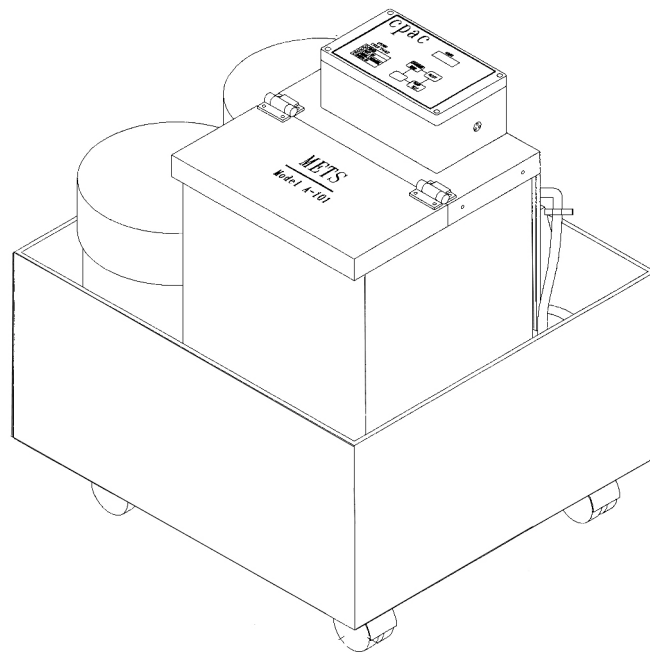


# **METS A-101™**

(115 VAC, 50/60 Hz)

## **User's Manual**

- **Installation**
- **Operation**
- **Maintenance**



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## RECOMMENDATIONS

Read the entire instruction manual *before* installation or operation of the METS A-101 silver recovery system. It will help you to understand the operation of the system, how various sub-assemblies work together and the operating sequence of the controls.

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**WARNING: NEVER ATTEMPT TO PERFORM ANY ELECTRICAL TROUBLESHOOTING ADJUSTMENT(S) OR SERVICE(S) UNLESS YOU ARE A QUALIFIED ELECTRICIAN, ELECTRONICS TECHNICIAN OR FACTORY TRAINED SERVICE TECHNICIAN.**

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## IMPORTANT SAFEGUARDS

When using your METS A-101 silver recovery system, these basic safety precautions should be followed:

1. Read and understand all instructions.
2. Care must be taken to avoid burns from touching hot parts.
3. Do not operate this appliance with a damaged cord or if the appliance has been dropped or damaged until it has been examined by a qualified service technician.
4. Do not let power cord hang over edge of table or counter or touch hot surfaces.
5. An extension cord should not be used with this unit. The unit should be plugged directly into a power outlet.
6. To protect against electrical shock hazard, do not immerse this appliance in water or other liquids.
7. To avoid electrical shock hazard, do not disassemble this appliance. Call a qualified service technician when service or repair work is required. Incorrect reassembly can cause electric shock hazard when the appliance is switched ON.

**SAVE THESE INSTRUCTIONS**

## INTRODUCTION

The METS A-101 is designed to pump silver bearing liquid through two metallic replacement cartridges. The METS A-101 metering pump controls the flowrate (factory set at 100 mls/minute) to ensure the maximum amount of silver recovered.

The METS A-101 unit is ideal for minilabs, allowing them to meet tough environmental regulations for silver discharge of 1mg/L (1PPM) or less when used with RePAC 250 steel wool cartridges. Capacity performance will depend on silver concentration, flow rate, solutions composition and pH, which must be below 7.8. This simple to operate unit is easy to install and monitor.

## INSTALLATION

The METS A-101 unit can be installed “ON-LINE” with processor overflows directly plumbed to the METS unit or “OFF-LINE” where the operator must manually transfer overflow solutions.

### “ON-LINE” Installation

1. Place the METS A-101 unit in a central location, near both the C-1 and RA-4 processor, with access to a floor drain and electrical outlet.
2. Using plastic (PVC) “Y” or “Tee” fittings, connect the RA-4 bleach-fix and stabilizer to the C-41 fixer and stabilizer. (Refer to the PLUMBING DIAGRAM.)  
**NOTE: DO NOT RUN DEVELOPER THROUGH THE METS UNIT!**
3. Connect the combined C-41 and RA-4 overflows to the inlet of the METS A-101 unit.
4. Connect the pump outlet to cartridge #1 inlet.
5. Connect the cartridge #1 outlet to cartridge #2 inlet.
6. Connect the cartridge #2 outlet to the drain. Make a gentle loop in drain tube line after quick disconnect. (Creates an air barrier to decrease build-up.)
7. Connect the safety overflow from the METS A-101 unit to the drain. If a drain is not available, place a bottle or small tank (not supplied) inside the tray with the safety overflow hose inside this bottle or tank. If this container fills with liquid, immediately check the unit for clogging or malfunctioning.
8. Check all hose fittings to ensure proper connections were made.
9. **FILL HOLDING TANK WITH WATER PRIOR TO USE.**
10. The unit is ready for “ON-LINE” operation.

## **“OFF-LINE” Installation**

1. For an “OFF-LINE” installation, the METS A-101 unit is not directly plumbed to the processor. Choose a location with access to a floor drain and electrical outlet. The operator will be responsible for transferring processor overflows to the METS A-101.

### **NOTE: DO NOT RUN DEVELOPER THROUGH THE METS UNIT!**

2. Connect the pump outlet to cartridge #1 inlet.
3. Connect the cartridge #1 outlet to cartridge #2 inlet.
4. Connect the cartridge #2 outlet to the drain. Make a gentle loop in drain tube line after quick disconnect. (Creates an air barrier to decrease build-up.)
5. Connect the safety overflow from the METS A-101 unit to the drain.
6. Check all hose fittings to ensure proper connections were made. If a drain is not available, place a bottle or small tank (not supplied) inside the tray with the safety overflow hose inside this bottle or tank. If this container fills with liquid, immediately check the unit for clogging or malfunctioning.
7. **FILL HOLDING TANK WITH WATER PRIOR TO USE.**
8. The unit is ready for “OFF-LINE” operation.

## **OPERATION**

The RePAC 250 cartridges, which are recommended for use with your METS A-101, are available from CPAC at (800) 828-6011. When using these cartridges, a flow rate of 100 ml/minute is used. The first cartridge should be changed after treating 900 gallons based upon a starting silver concentration of 1.8 gm/L. This is equivalent to 600 hours of operation.

If your silver discharge limit is 5 mg/L (PPM), the cartridges may be changed after a longer operating period. (See ADJUSTING CHANGE CARTRIDGE TIME procedure.)

Pump flow rate is factory set at 100 ml/minute. If an adjustment is necessary, refer to BELLOWS PUMP FLOW ADJUSTING instructions.

For best performance and efficiency, the paper bleach-fix (and washless stabilizer) and film fixer (and washless stabilizer) should be drained into the METS collection tank together. This allows a uniform solution to be treated. METS units plumbed directly to the processor will automatically receive this mixture.

## **Weekly Maintenance Procedure – Extremely Important!**

Run two to three gallons of warm to hot water through the unit once a week by pouring the water into the holding tank. This reduces residue build-up in the cartridges and lines.

## **CONTROLS**

### **METS A-101 Controls**

The digital display, LED's, and keypad for the METS A-101 are diagramed in the appendix.

#### **Control Box**

- *Digital display* – A LED display which shows the current pump run timer, unless programming or alarm condition exists. The pump run timer displays the hours that the metering pump has operated since the cartridges were changed and the timer reset to 0.0. The display also shows other information discussed in subsequent sections.
- *Power* – A green LED illuminates when the METS A-101 unit is plugged in.
- *Pump ON* – A green LED illuminates when the metering pump is operating.
- *Change cartridge* – An audible alarm and a red LED blinks when the pump run timer equals the change cartridge timer signaling it is time to change the cartridges. The current pump run timer must be reset to 0.0 to turn the alarm off. The change cartridge timer is factory set at 600 hours. The timer may be changed from 1 to 3000 hours by using the keypad to reprogram the microprocessor. See the description of the keypad for instructions on resetting the pump run timer and changing the cartridge timer setting.
- *Overflow (Optional Feature)* – An audible alarm and a red LED are constantly on when an overflow condition exists. There are 2 overflow conditions, one or both of which could be an optional feature depending on the setup of your system. The first one is an overflow in the METS collection tank and is indicated by an "01" flashing on the digital display. The second conditional is an overflow in an external waste collection tank and is indicated by an "02" flashing on the display.
- *Circuit Breaker* – A circuit breaker located on the back of the control box protects against electrical overloads.

## Keypad

- *PUMP TEST* – Pressing this key will cause the pump to run. It should only be used when the pump is not running automatically, in order to test for a faulty liquid level switch.
- *BLANK* – This key serves two functions. First, pressing this key and the RESET key at the same time for 5 seconds will reset the current pump run timer. See the description of the RESET key for more details. The second function of this key is to allow the operator to change the cartridge timer. Pressing the BLANK key for 5 seconds will cause a blue LED to light behind the key and either a “U” or a “d” to be shown on the LED display for 2 seconds followed by the cartridge timer setting. If a “U” (up) was displayed, the cartridge timer setting can be increased. When the cartridge timer is flashing, release the BLANK key and press the CARTRIDGE TIMER key to increase the timer. If you would like to decrease the timer, press and release the BLANK key and then hold this key down for 5 seconds again, or until the blue LED is lit and a “d” (down) is shown on the LED display. When the cartridge timer is flashing, release the BLANK key and press the CARTRIDGE TIMER key to decrease the timer. Press and release the BLANK key to exit the change timer mode and update new settings. At this time, the blue LED will go off and the display will go back to showing the pump run time. Repeating the steps described above will allow you to toggle between increasing and decreasing the cartridge timer. See also CARTRIDGE key.
- *CARTRIDGE TIMER* – This key has multiple functions. First, while changing the cartridge timer setting described under the BLANK key sections, this key increases or decreases the timer. Holding the key down will change the time quickly after a short delay. When the desired timer setting approaches, continue to press and then release the key to change the timer 1 hour at a time, until the new setting is reached. When pressing this key by itself, the display will show the change cartridge timer setting. If you continue to hold down the key for more than 5 seconds, the permanent pump run timer will be displayed. This timer shows the hours the pump has run for the life of the machine. The permanent pump run timer is similar to an odometer on a car, and cannot be changed or reset.
- *RESET* – This key has two functions. First, by pressing this key while turning on the METS A-101 will cause the microprocessor to “master reset” the unit to the factory settings. The changes to the times are listed below”
  - Current pump run timer – Reset to 0.0
  - Change cartridge timer – Reset to 600
  - Permanent pump run timer – No effect, cannot be reset

The second function of this key is to reset only the current pump run timer. This can be done by pressing the RESET key and the BLANK key at the same time for 5 seconds. A countdown of the 5 second delay is shown on the LED display at the end of which the display will show the pump run timer reset to 0.0 hours, and the change cartridge alarm will turn off.

## METS A-101 ANALYSIS SERVICE

**Analysis service now available to METS A-101 Users!** Trebla Chemical Company, a subsidiary of CPAC, Inc., will provide an analysis for METS A-101 customers. A set of analysis includes:

- Feed sample tested for silver, iron and pH
- Drain sample tested for silver

The cost is \$35.00 per set.

### **Sampling Instructions**

After approximately 80 hours on the METS A-101 pump run timer, it is recommended that you take the following samples using the bottles provided.

While the unit is in operation, take one sample from the holding tank and one sample after cartridge #2 (exit point – before drain).

Securely tighten the caps on the bottles and place in a bubble envelope.

Ship to:

*Trebla Chemical Company*  
**Attn: METS Lab**  
8417 Chapin Industrial Drive  
St. Louis, MO 63114

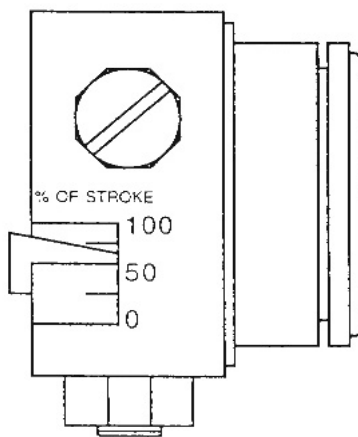
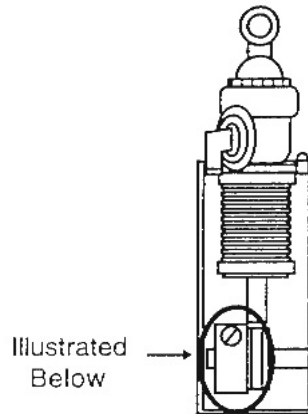
These results will verify the performance of your METS A-101 unit.



## BELLOWS PUMP FLOW ADJUSTING INSTRUCTIONS

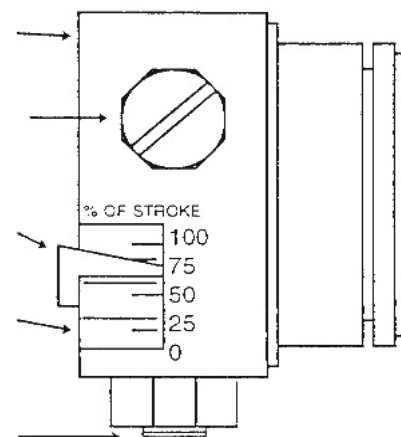
1. Do **not** attempt to adjust flow while pump is running.
2. Clockwise rotation of the adjusting screw increases pump stroke until achieving 100% stroke. Do **not** attempt forced rotation of the adjusting screw after indicator reaches 100% and a "bottoming " resistance is experienced.
3. Counter-clockwise rotation of adjusting screw decreases stroke.
4. Only eight clockwise revolutions adjust stroke from 0% to 100%. One-half inch bellows pump requires only four revolutions.
5. It is not necessary to loosen set screw.

**NOTE: Do not add lubricants to any pump mechanism.**



1/2" BELLOWS

CRANK  
ADJUSTING SCREW  
(5/16 HEX w/SLOT)  
STROKE INDICATOR  
STROKE SCALE  
SET SCREW

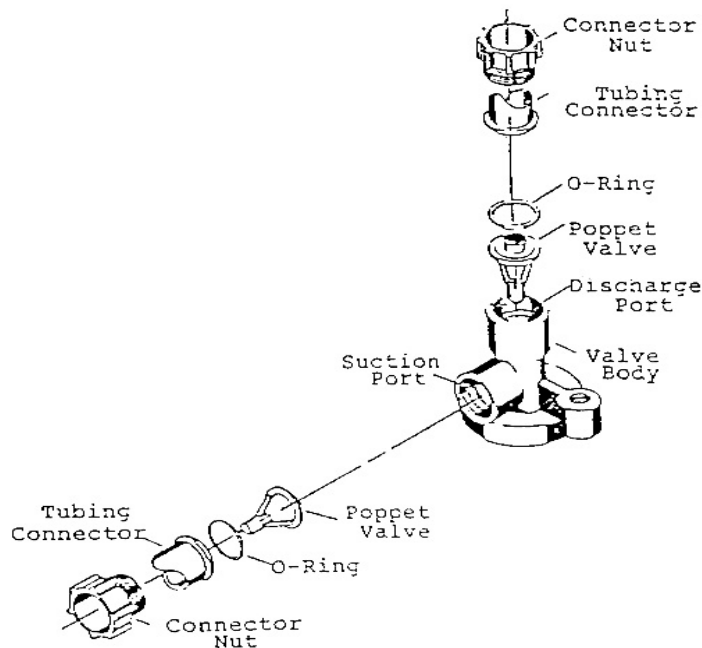


S 1" to 1-1/2" BELLOWS

## POPPET VALVE REMOVAL, CLEANING AND INSTALLATION PROCEDURES

1. Pinch off tubes near the pump's hose connectors.
2. Unscrew connector nuts, pull off tubing and nut connector assemblies.
3. Remove valves form valve body;
  - a) Suction side – Pull valve out by the stem, the o-ring will come out with the valve
  - b) Discharge side – Use a small flat screwdriver to remove the o-ring. With o-ring removed, pull valve out of the valve body with needle nose pliers
4. Wash poppet valve assemblies or discard and replace.
5. Reinstall in reverse order of removal. Suction and discharge valves are interchangeable. Valves are always installed before the o-ring.

### VALVE ASSEMBLY PROCEDURE



# METS-A-101

## CARTRIDGE ROTATION CHART

Rolls per Day	Days Before Rotation*	
	RP 250	RP 500
40 OR LESS	200	use RP250
45	175	use RP250
50	160	use RP250
55	145	use RP250
60	133	use RP250
65	123	use RP250
70	114	use RP250
75	107	use RP250
80	100	180
85	94	170
90	89	160
100	80	150
125	64	120
150	53	100
175	46	85
200	40	75
225	35	65
250	USE RP500	60
275	USE RP500	55
300	USE RP500	50

\*Total Days Column Is in Primary Position

## CARTRIDGE ROTATION INSTRUCTIONS

1. When the alarm sounds, reset the alarm (refer to instruction on page 6).
  2. Pour approximately **2 gallons of water** into the tank located under the control box.
  3. **Allow all of the water to flow through the cartridge**, perhaps overnight.
  4. Turn METS OFF using CIRCUIT BREAKER button on the back of the control box.
  5. Disconnect both cartridges completely using the quick disconnects.
  6. Remove cartridge #1 and set aside for draining.
  7. Move cartridge #2 into the #1 position.
  8. Place new cartridge in the #2 position. DO NOT throw away the carton.
  9. Reconnect cartridges to the METS unit and the drain, making sure the drain hose is looped.
    - METS to bottom fitting of #1 cartridge
    - Top fitting of #1 cartridge to bottom fitting of #2 cartridge
    - Top fitting of #2 cartridge to drain hose.
  10. Turn unit ON.
  11. Pour 4 gallons of water into holding tank. It's not necessary to wait for water to pump through before adding chemistry.
- If, for some reason, both cartridges are being replaced, **FILL** holding tank with water prior to use.
12. Reset the alarm (refer to instructions on page 6).

## **DRAINING METS CARTRIDGE FOR SHIPPING**

The draining procedure does not interfere with the operation of the METS unit. Once a cartridge is drained, it cannot be reused (Refer to Drawing on page 15).

1. Place cartridge just removed on top of installed cartridges. This cartridge will be **HEAVY**.
2. Turn bottom fitting so hose extends into the holding tank of the METS Unit.
3. Turn top so hose points upward.
4. Snap body half of drain kit into this bottom fitting. This allows water to drain into the holding tank.
5. Snap insert half of drain kit (quick disconnect) into top fitting of cartridge to be drained. This allows air into the cartridge.
6. Allow the cartridge to drain completely (approximately one to two hours).
7. Remove drain kit from both fittings before shipping.

**FOLLOW THE PROVIDED INSTRUCTIONS FOR SHIPPING. IF YOU HAVE ANY QUESTIONS OR CONCERNS, PLEASE CALL 800-828-6011.**

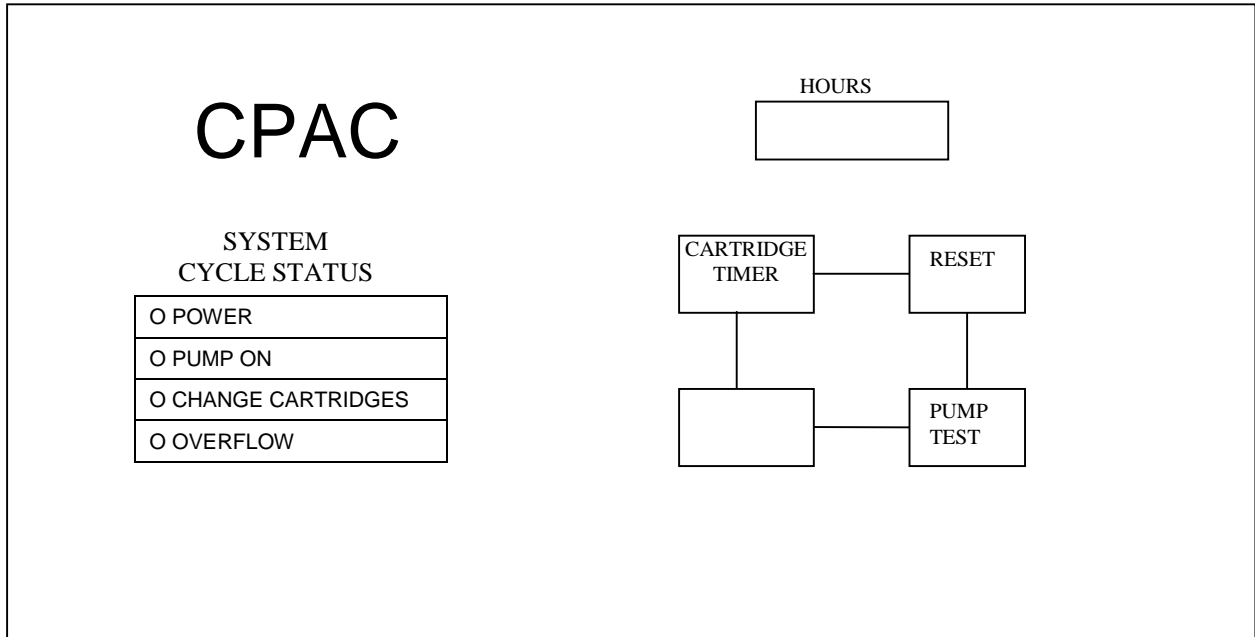
**METS A-101**  
**(115 vac, 60 Hz)**

**SPARE PARTS LIST**

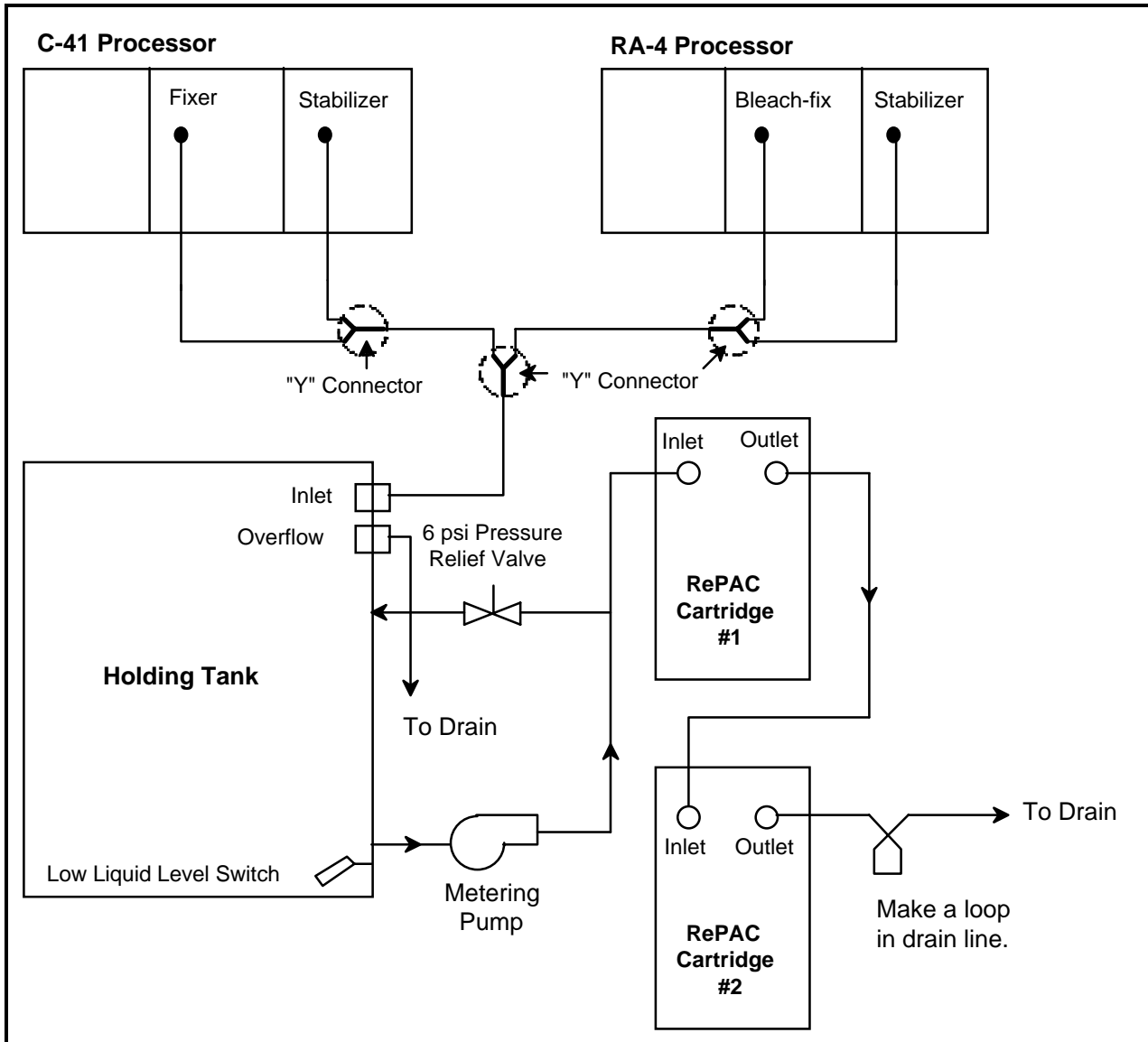
<b>CPAC Part Number</b>	<b>Description</b>
SP-143P2011	Level Switch, LS-7
700814	Circuit Breaker
702479	Metering Pump, 0-125 ml/minute
800248	Quick Disconnect, Body 1/2"
800296	Quick Disconnect, Body 3/4"
800297	Quick Disconnect, Insert 3/4"
100-109P2058	Silver Test Paper
702459	Casters With Lock
702458	Casters Without Lock
24-113P2416	Pump Elbow Kit
24-113P2417	Poppet Valve Kit
602831	PC Board
188865	RePAC Cartridge Rinse Kit
702729	Nylon Filter

# APPENDIX

## METS A-101 CONTROL DIAGRAM



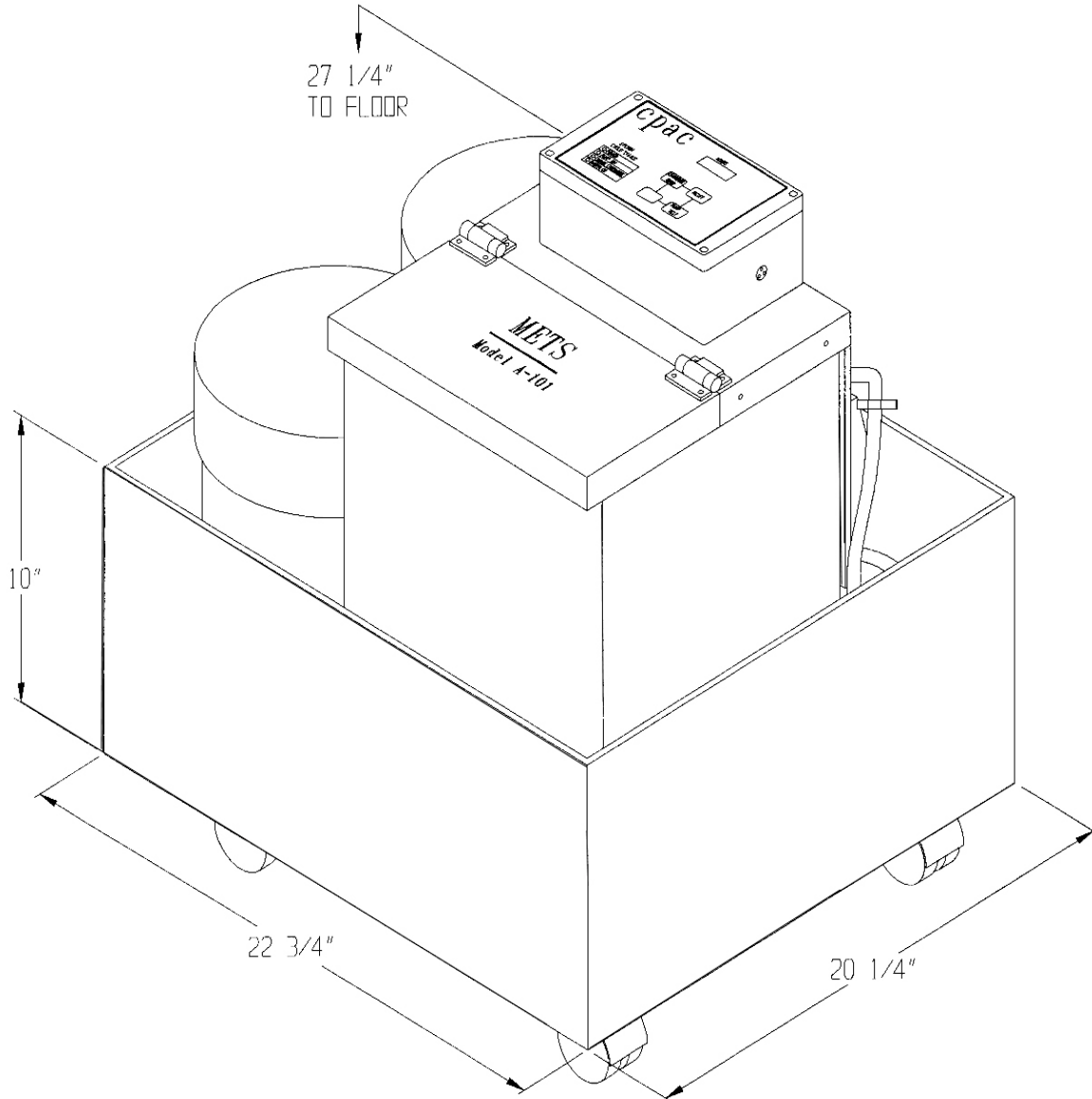
# PLUMBING DIAGRAM





# METS A-101 REFERENCE DRAWING #1

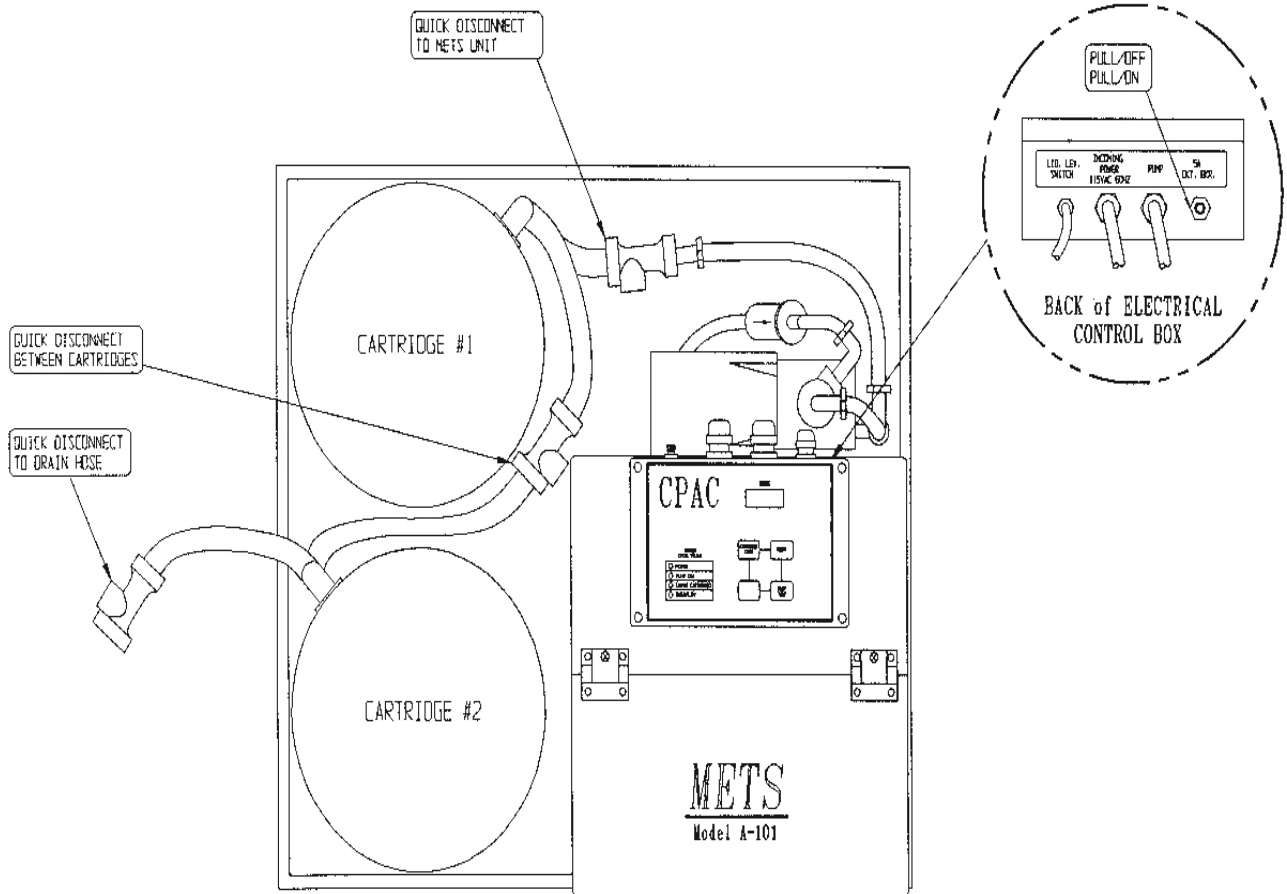
DWG. No: 699606



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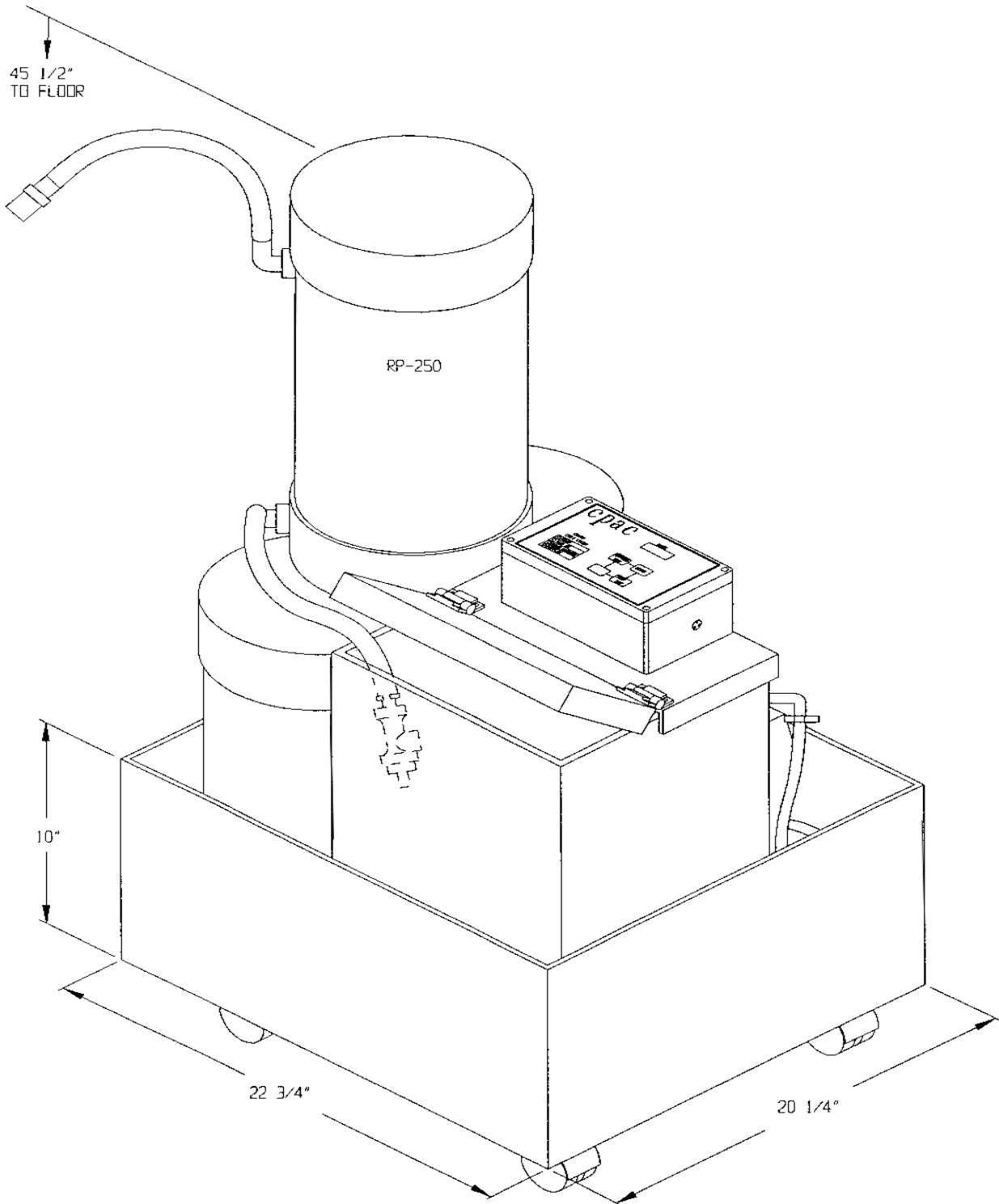
# METS A-101 REFERENCE DRAWING #2

Number: 699607



(Top View)

Mets A101 REFERENCE DRAWING # 3  
Number: 699607



**EVERY EFFORT HAS BEEN MADE TO INSURE THE COMPLETE ACCURACY OF THE CONTENTS OF THIS MANUAL. NO LIABILITY ARISING FROM ITS USE, HOWEVER, CAN BE ACCEPTED BY THE COMPANY, WHO RESERVES THE RIGHT, WHTOUT PRIOR NOTICE, TO ALTER THE SPECIFICATIONS, CONSTRUCTION OR CONTENT OF ITS EQUIPMENT AT THE COMPANY'S OWN DISCRETION.**

## ***Statement of Warranty***

All equipment is manufactured to exacting standards and has been tested and inspected for proper workmanship and performance before shipping.

Any parts which are defective will be repaired or replaced within a one year period after date of shipment, provided the equipment has been used according to the instruction manual and have not been abused or tampered with.

The company will not be responsible for any damage resulting from leakage of water or chemicals caused by improper installation, operator carelessness or defective/loose plumbing fittings associated with installation and operation of the equipment. The company assumes no responsibility for damage in transit and the customer should resent any claim for such damage to the carrier.

This warranty gives you specific legal rights. You may also have additional rights that vary from state to state.

Any unit to be repaired under warranty must be shipped, freight prepaid, or delivered to a facility authorized to render services provided hereunder. Returned unit must be either in its original package or a similar package affording an equal degree of protection. All units must have a Material Return Authorization code (MRA) visible on the returned item. MRA's can be obtained by calling 716-382-3223.