



PERISTALTIC METERING PUMP
RC-0021-0001
RC-0021-0002
RC-0021-0120
OPERATING INSTRUCTIONS

 **CAUTION**
RISK OF INJURY!

READ MANUAL *BEFORE* OPERATING!

**This manual is an important part of the peristaltic metering pump
and must remain with this unit!**

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⚠ WARNING

⚠ WARNING: This product can expose you to chemicals including Lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov

⚠ WARNING

⚠ WARNING: This product can expose you to chemicals including carbon monoxide, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov

INTRODUCTION

Congratulations on the purchase of your peristaltic metering pump! You can be assured your peristaltic metering pump was constructed and designed with quality and performance in mind. Each component has been rigorously tested to ensure the highest level of acceptance.

This operator's manual was compiled for your benefit. The contents of this manual are based on the latest product information available at the time of publication. The manufacturer reserves the right to make changes in price, color, materials, equipment, specifications or models at any time without notice.

! IMPORTANT !

These paragraphs are surrounded by Safety Warnings that must be followed when operating this metering pump.

Accompanying the Safety Warnings are "signal words" which designate the degree or level of hazard seriousness. The "signal words" used in this manual are as follows:



DANGER:

Indicates an imminently hazardous situation which, not avoided, **WILL** result in death or serious injury.



WARNING:

Indicates a potentially hazardous situation which, if not avoided, **COULD** result in death or serious injury.



CAUTION:

Indicates a potentially hazardous situation which, if not avoided **MAY** result in minor or moderate injury.

The symbols set above of this paragraph are "Safety Alert Symbols". These symbols are used to call attention to items or procedures that could be dangerous to you or other persons using this equipment.

ALWAYS PROVIDE A COPY OF THIS MANUAL TO ANYONE USING THIS EQUIPMENT. READ ALL INSTRUCTIONS BEFORE OPERATING THIS METERING PUMP AND ESPECIALLY POINT OUT THE "SAFETY WARNINGS" TO PREVENT THE POSSIBILITY OF PERSONAL INJURY TO THE OPERATOR.

Inspect for signs of obvious or concealed freight damage. If damage does exist, file a claim with the transportation company immediately. Be sure that all damaged parts are replaced and that the mechanical problems are corrected prior to operation of the unit. If you require service, contact Customer Service at 800-553-9053.

Please have the following information available for all service calls:

1. Model Number
2. Date and Place of Purchase

Mi-T-M Corporation
50 Mi-T-M Drive
Peosta, IA 52068

PUMP SPECIFICATIONS

PUMPS	
Flow Rate	2.2 Oz/Min (65 MI/Min)
DC Power Electric	12 Volt DC
Drive Speed	45 Rpm
Inlet Vacuum	20+ in Hg
Outlet Pressure	25 Psi
SYSTEM ENCLOSURE	
Material	ABS with UL Flammability 5VA
Dimensions - Excluding Pump	5.1" W x 8.4" H x 3.1" D
Dimensions - Including Pump	5.1" W x 8.4" H x 4.5" D
Weight	2.1 lbs
PROGRAMMABLE CONTROLLER	
Program Duration	Daily, Weekend, All, Week days
Maximum Number Of Events	99 programmable events
Dispense Amount Per Event	Unlimited

Note: The information within this chart is solely intended for use as a guide. The output data is an approximation based on pumping water at zero psi under controlled testing environment. Many variables can affect the output of the pump.

INSTALLATION

Note:

- *Read all safety hazards before installing or servicing the pump.*
- *Use all required personal protective equipment when working on or near pump.*
- *Inspect tube frequently for leakage, deterioration, or wear. Schedule a regular pump tube maintenance change to prevent damage to pump and/or spillage.*
- *Pump is not recommended for installation in areas where leakage can cause personal injury or property damage.*



CAUTION: MOTOR LIFE WILL BE DRASTICALLY REDUCED IF LEFT IN THE STALLED POSITION FOR EXTENDED PERIODS.

TUBING

Note: Inspect all tubing regularly and replace if any sign of deterioration occurs. Always wear safety glasses. Pump can run dry without damage.



WARNING: MI-T-M CORPORATION ASSUMES NO RESPONSIBILITY OF LIABILITY FOR CHEMICAL COMPATIBILITY OF OUR TUBING IN SPECIFIC APPLICATIONS. ALWAYS PRETEST TUBING IN ACCORDANCE WITH TUBING MANUFACTURER'S SPECIFICATIONS. TUBING THAT SHOWS SIGNS OF SWELLING, EMBRITTLEMENT, OR OTHER DETERIORATION SHOULD NOT BE USED.

1. **Mounting:** The metering pump will come mounted to the water treatment unit unless it is ordered as the stand alone model (RC-0021-0120) or as a replacement. Use the hanger brackets to mount to tank, tank stand or wall as close to the chemical container and power supply as possible while following other safety guidelines in manual.
2. **Power Supply:**



WARNING: ENSURE POWER IS DISCONNECTED FROM WATER TREATMENT UNIT BEFORE MAKING ANY WIRING CHANGES.

The metering pump requires 12VDC to operate. The metering pump will be wired into the biological units' control box unless it is the stand-alone version (RC-0021-0120). New biological units will come with a 12VDC power supply in the box and pre-wired to the metering pump on new units (see Bio unit wiring diagram in control box). The peristaltic switch must be on to program and operate pump. The stand-alone version will come with a power supply on the plug to be placed in a 120V outlet. Skip to Operations section if pump has power. Follow the guidelines

INSTALLATION

on the following pages when retrofitting a new metering pump onto an older biological unit with no power supply.

3. Retrofitting water treatment unit for new metering pump (This covers Bio units, consult factory for WTA units):



WARNING: ENSURE POWER IS DISCONNECTED FROM WATER TREATMENT UNIT BEFORE MAKING ANY WIRING CHANGES.

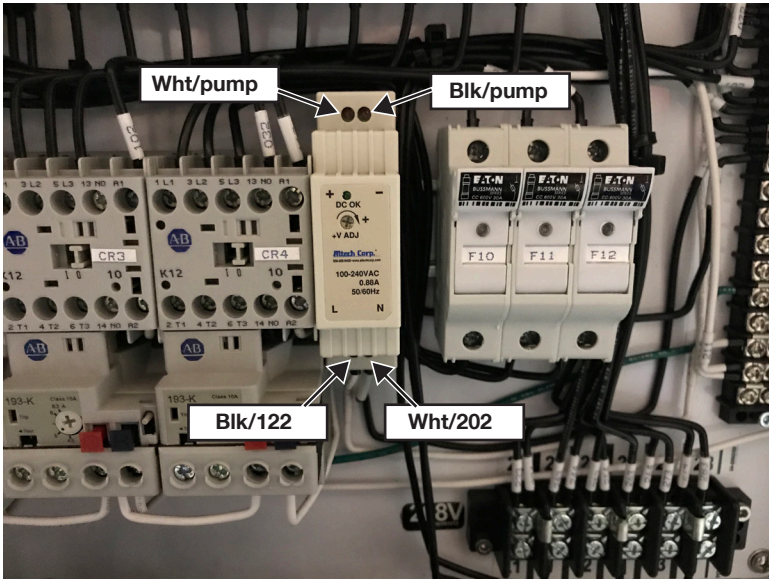
a. Removing old metering pump components:

- i. Unwire old metering pump from control panel.
- ii. Remove old metering pump from tank or tank stand, disconnect tubing from tank and remove pick-up tube from chemical. Leave tank fittings.
- iii. Unwire and remove existing single fuse holder from control panel, labeled F13. Leave black wire that was attached to top of fuse hold loose for now. (Some units may not have a fuse holder, consult factory with questions.)

b. Installing New Metering pump:

- i. Mount new pump using the left hanger brackets and one of the old pump holes on the tank with the supplied hardware.
- ii. Level pump, mark spot for second hole through hanger bracket.
- iii. Drill 3/16" hole and insert hardware through hole and hanger bracket. Tighten all bolts.
- iv. Run power cord through open strain relief in control panel.
- v. On inside of the front panel of the control box, run a wire from terminal spade 2 on the peristaltic pump switch to terminal spot 031. (This can be done by moving the Blk/ F13 wire from the bottom of the old fuse holder to terminal 031).
- vi. Place power supply on open din rail location, placing in location of old fuse holder works well.
- vii. Run black wire from terminal strip spot 122 to L on the power supply.
- viii. Run white wire from terminal strip spot 202 to N on the power supply.
- ix. Run white pump wire to the + terminal of power supply and black pump wire to – terminal of power supply. See Photo on following page:
- x. If wiring in 2 pumps, place both white wires in the + terminal and both black wires in the – terminal.

INSTALLATION



Power supply wiring

- xii. Drop suction end of tubing into chemical supply, make sure strainer goes all the way to the bottom of the container.
 - xiii. Attach outlet tubing to existing tank fitting; adjust length of tube as necessary.
 - xiii. Pump is ready for operation. Peristaltic pump switch must be on at all times for pump programming and operation.
4. Inspect all tubing regularly and replace if any sign of deterioration occurs. Always wear safety glasses if handling the tube or the chemicals within the tube. Pump can run dry without damage.
 - a. Make sure suction tubing has black check valve and strainer securely attached. Drop this end into the bucket of liquid microbes or de-foamer.
 - b. Make sure the discharge tubing is firmly attached to the tank fitting. Tubing may need to be reattached or adjusted if knocked loose during shipping.
 - c. Verify no leaks at start-up when pump is primed and calibrated. Adjust tubing if needed to prevent leakage.
 - d. If the black tubing in the pump head needs replaced, the entire pump head is disposable and easily replaced.

OPERATIONS

PROGRAMMING METERING PUMP



CAUTION: THE ON AND OFF BUTTON ON THE METERING PUMP ITSELF WILL TURN THE PUMP ON OR OFF REGARDLESS OF PROGRAMS, THESE BUTTONS DO NOT NEED TO BE PRESSED FOR PUMP TO RUN AUTOMATICALLY AT SET TIMES. PRESSING THE ON BUTTON WILL LEAVE THE PUMP RUNNING CONTINUALLY UNTIL THE MAIN POWER SWITCH IS TURNED OFF OR THE OFF BUTTON IS PRESSED.

The metering pump will have been set and calibrated at the factory. However, after long periods of being unpowered the pump memory can be erased, ALWAYS double check settings and re-calibrate when starting up a new pump. After the pump has been set, it must be powered for a few hours to charge the capacitor that keeps the time, so wait until the system is ready for operation to complete final setting and calibrating of pump so metering pump is ready to remain powered permanently.

Power pump by turning the rocker switch on the control box on, this switch should remain on at all times, except for when conducting maintenance on the pump. After powering for a few hours, the timer and settings will stay saved for several weeks so pump can be shut-off for short periods with no problems. After any long periods of shut-down, the pump will require resetting of programs and re-calibrating. To verify programming and calibration is correct, program a small dose to be activated while a technician is on-site.

SUGGESTED DOSING OF BACTERIA: Dose twice a day at 6oz (177mL) a dose. A 5 gallon bucket of bacteria will last approximately 50 days at this rate.

OPERATIONS

USER INTERFACE DEFINITION:

Turns pump ON
independent of
controls



Turns pump OFF
independent of
controls



Decreases or moves
backward in menu



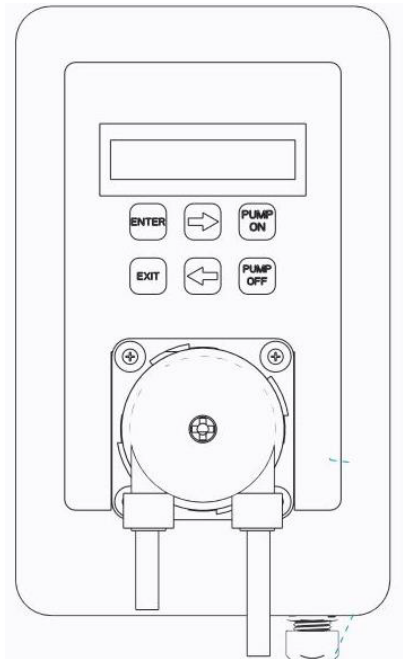
Increases or moves
forward in menu



Actions or accepts &
moves to next field



Moves back up the
menu

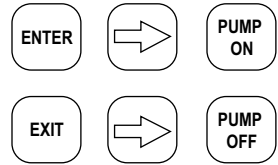


OPERATIONS

PUMP PROGRAMMING AND SETTING

SETTING CURRENT DATE

1. Press "ENTER" to see home Screen.
2. Press "ENTER" to see System Settings Menu.



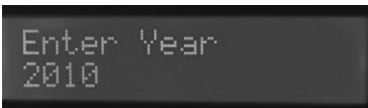
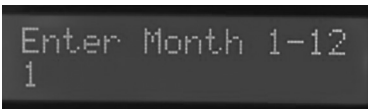
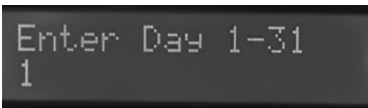
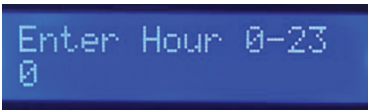
Interface Menu

3. Press "ENTER" again to see Set Time Menu.
4. Press "ENTER" to begin Set Time.
5. Use the left and right arrows to set the time and date then press "ENTER" to move to the next step.



The menu will return to the home screen after the last "ENTER" press.

Example:



OPERATIONS

CALIBRATION

Note: If graduated cylinder is not available, use a timer instead. The pump will pump about 1ml per second, so use a timer to run the calibration for 20 seconds instead of pumping 20 mL of fluid.

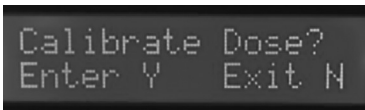
Before the pump is put into service it is important to perform a flow calibration. Calibration allows the device to learn the amount of time it takes to pump 20 ml of fluid. This time will be used by the device to determine how much time is required to pump the amount of fluid you enter in each program step. Be sure the pump is primed (see Priming) before beginning the calibration process.

1. From the home screen press the "RIGHT ARROW" to see the Settings Menu.



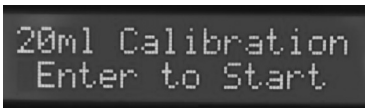
```
System Settings
Enter Y Exit N
```

2. Press "ENTER" to enter the Settings Menu.
 - a. Press the "RIGHT ARROW" twice to reach the Calibration Menu
 - b. Press "ENTER".



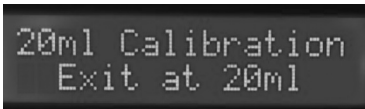
```
Calibrate Dose?
Enter Y Exit N
```

3. Insert the vacuum side tube into a graduated container of fluid.
4. Ensure the Pump is primed and more than 20 ml of fluid remains in the container.
5. Place the exit tube into a graduated container.
6. Press "ENTER" to begin pumping



```
20ml Calibration
Enter to Start
```


7. When the graduated container fills to 20ml press the "EXIT button"



```
20ml Calibration
Exit at 20ml
```

The pump is now calibrated.

8. Press "EXIT" twice to return to the Main Menu



```
Calibration Set!
```

OPERATIONS

SECURITY

The security function allows you to lock the unit with a passcode. The unit ships with the default passcode of “2001” and unlocked. It is not necessary to lock the unit for it to function. Locking is an optional feature to protect the program settings from alteration by unauthorized individuals.

1. At the Main Menu press “RIGHT ARROW” to reach the Systems Menu.



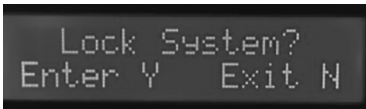
System Settings
Enter Y Exit N

2. Press “ENTER” on the Systems Menu and press the “RIGHT ARROW” 3 times to reach the Security Menu.



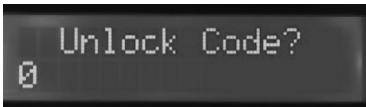
Security Menu
Enter Y Exit N

3. Press “ENTER” on the Security Menu to lock the unit. Press “EXIT” 2 times to return to the Main Menu.



Lock System?
Enter Y Exit N

4. To unlock the unit, follow the same sequence to lock the unit. The “unlock” screen will appear.



Unlock Code?
0

5. Use “LEFT & RIGHT ARROWS” to set code to 2001. Press “ENTER” to unlock the unit.

FACTORY TEST

This is a feature used by the manufacturer for testing the metering pump after assembly. Do not use.

OPERATIONS

PROGRAM MENU

There are three sub-menus to the “Program” menu:

- View Program
- Change Program
- Clear Program

1. From the home screen press the “RIGHT ARROW” to see the Settings Menu.



A screenshot of a terminal window with a blue background. The text is white and reads: "System Settings" on the first line, and "Enter Y Exit N" on the second line.

2. Press “ENTER” to enter the Settings Menu. Press the “RIGHTARROW” once to reach the “Saved Program” Menu. Press “ENTER”.



A screenshot of a terminal window with a black background. The text is white and reads: "Saved Programs" on the first line, and "Enter Y Exit N" on the second line.

3. Press “ENTER” to enter the first Program Menu Sub-menu “View Program”. Press “RIGHTARROW” to see “Change Program” and again for “Clear Program”.

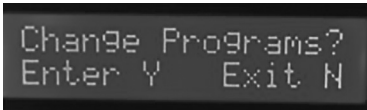


A screenshot of a terminal window with a black background. The text is white and reads: "View Programs" on the first line, and "Enter Y Exit N" on the second line.

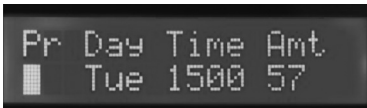
OPERATIONS

CHANGE PROGRAM

1. Press "ENTER" to change program steps



2. Use "RIGHT AND LEFT ARROWS" to change the program step values. Press "ENTER" to set the value and move to the next field



Field 1: Step Number

Field 2: Day to start pump

Field 3: Time to start pump

Field 4: ML to pump

The unit maintains one program with up to 99 steps. Mi-T-M recommends that you dose 6 oz. (177ml) of chemical twice a day.

PRIMING

Always prime the pump before calibration or when the pump has been out of service.

1. From the "Main Menu" press the "RIGHT ARROW" twice to see the "Prime Pump Menu".
2. Press "ENTER" and the pump will turn on.



3. Press "EXIT" when a solid stream of fluid flows from the exit tube.



OPERATIONS

DISPOSABLE PUMP FEATURE (46-1793)

Note: The unit incorporates a DC motor, which has a limited life based on brush wear and is considered perishable - motors with worn out brushes are not considered defective and are not covered under warranty. Continuous operation, particularly at higher speeds, produces quicker brush wear and results in a shorter motor life.

1. Turn Pump Head counterclockwise to release Pump Head from Backing Plate.
2. Dispose of Pump Head.
3. To install new Pump Head, simply align the bayonet feature on back off Pump Head to the slots in the Backing Plate. Turn Pump Head clockwise until secure.

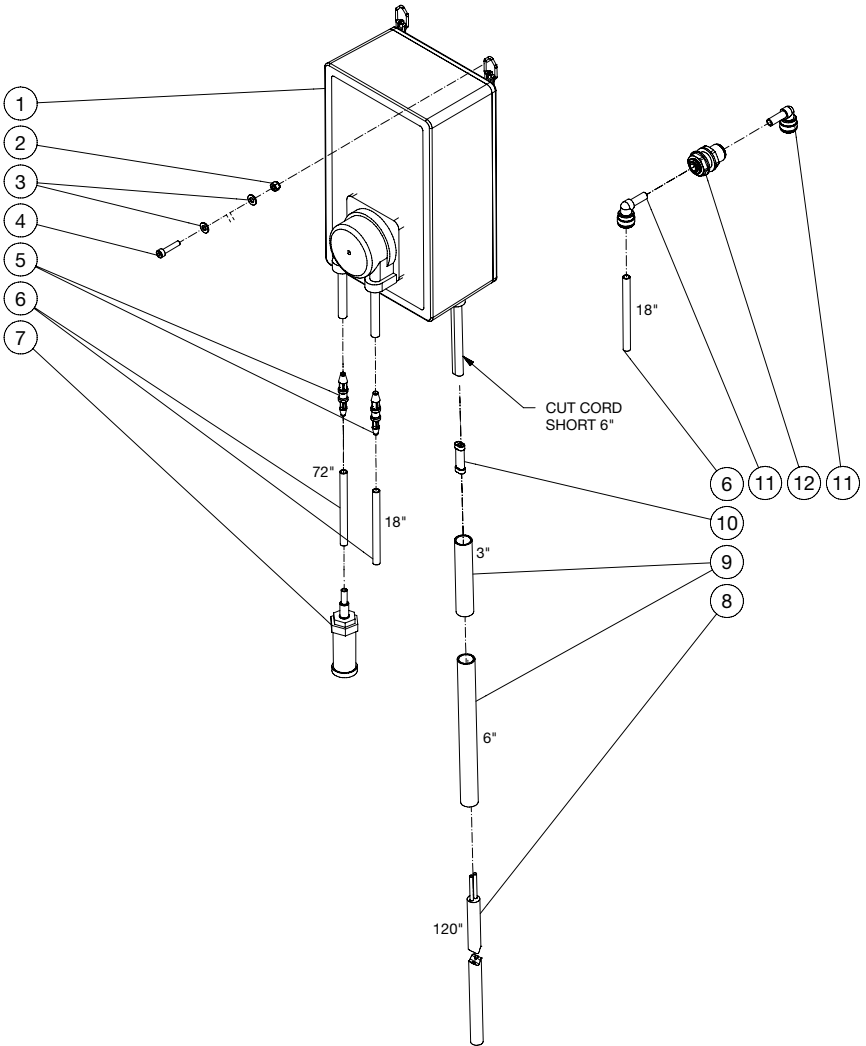


TROUBLESHOOTING

Fluid leaking	Pump tube worn	Replace pump head
	Excessive back pressure	Ensure system pressure does not exceed pressure rating
	Tube connections are not tight	Ensure tubing connections are properly connected
Tube life is shortened	Roller bracket assembly worn out	Replace pump head
	Fluid is not compatible with tubing	Check fluid-to-tube compatibility
Pump will not start	Check for blown fuse	Replace Fuse
	Pump is not connected to specified voltage	Ensure that the pump is connected to rated voltage
	Motor brushes worn	Check brush wear, replace if necessary
	Gearbox assembly worn	Replace unit
Pump runs but does not meet rated flow	Tubing is worn	Replace tubing
	Gearbox assembly worn	Replace unit
	Fluid viscosity is too high	Lower viscosity
	Head height is too high	Lower head height
	Pumping distance is too far	Reduce pumping distance

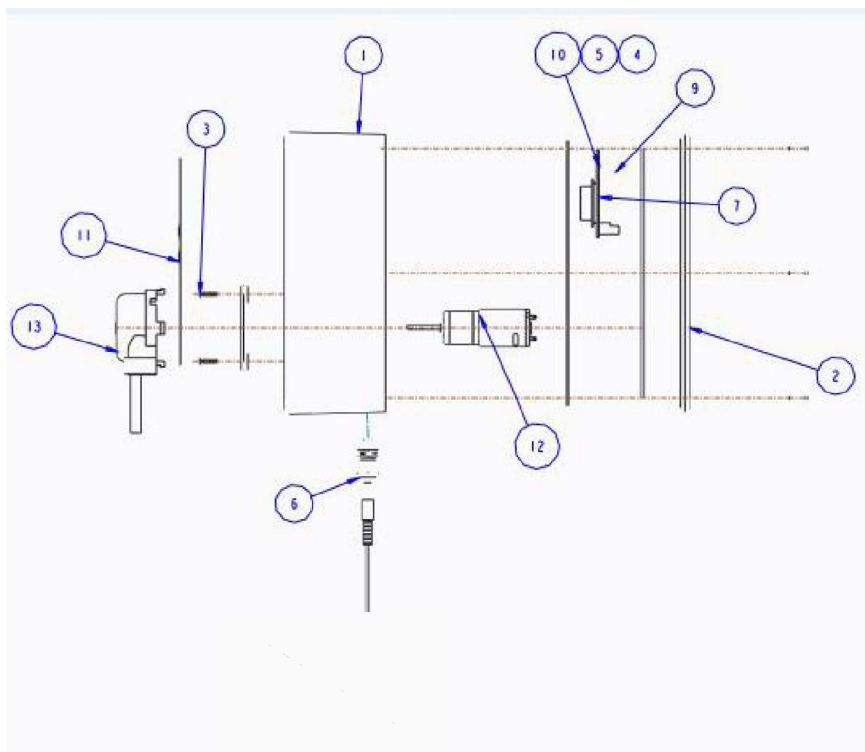
NOTES

SINGLE/DUAL METERING PUMP



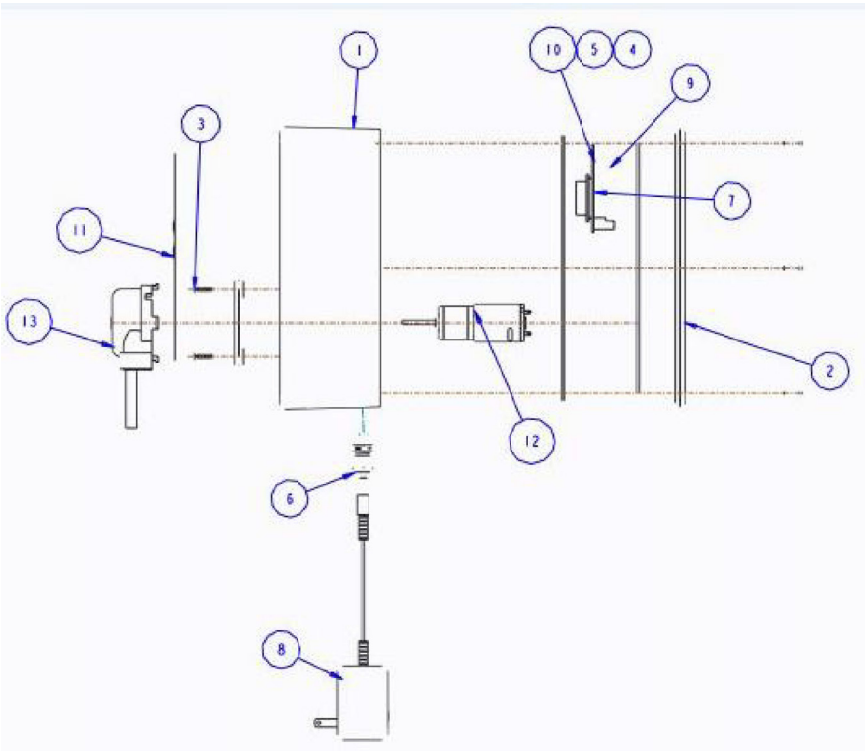
PUMP				
ITEM	DESCRIPTION	PART #	RC/0001 QTY	RC/0002 QTY
1	PERISTALTIC PUMP	3-0443	1	2
2	LOCKNUT	30-8152	2	4
3	WASHER	28-0010	4	8
4	BOLT	27-8930	2	4
5	COUPLING	55-0680	2	4
6	HOSE *(EIGHT FEET REQUIRED)	15-0379	1	2
7	STRAINER	19-0056	1	2
8	CORD *(TEN FEET REQUIRED)	32-0075	1	2
9	HEAT SHRINK *(ONE FOOT REQUIRED)	33-0219	1	2
10	BUTT CONNECTOR	32-0122	2	4
11	ELBOW	55-0114	2	4
12	BULKHEAD	55-0115	1	2
-	SWITCH (NOT SHOWN)	32-0669	1	1
-	POWER SUPPLY (NOT SHOWN)	32-0951	1	1
-	LOCKNUT (NOT SHOWN)	32-0108	1	2
-	STRAIN RELIEF (NOT SHOWN)	32-0437	1	2
-	MANUAL	37-1456	1	1
*MUST ORDER IN ONE FOOT LENGTHS				

PERISTALTIC METERING PUMP WITH OUT PLUG (3-0443)



PERISTALTIC METERING PUMP WITH OUT PLUG			
ITEM	DESCRIPTION	PART #	QTY
1	ENCLOSURE ASSEMBLY	N/A	1
2	SCREW	N/A	6
3	SCREW	N/A	4
4	HEX NUT	N/A	1
5	SCREW	N/A	1
6	STRAIN RELIEF	N/A	1
7	PWA DS PURCHASED	N/A	1
9	WASHER	N/A	1
10	WASHER	N/A	1
11	OVERLAY	N/A	1
12	PUMP	N/A	1
13	PUMP HEAD ASSEMBLY	46-1793	1
-	REPLACEMENT FUSE	32-1240	1

PERISTALTIC METERING PUMP WITH PLUG (3-0444)



PERISTALIC METERING PUMP WITH PLUG			
ITEM	DESCRIPTION	PART #	QTY
1	ENCLOSURE ASSEMBLY	N/A	1
2	SCREW	N/A	6
3	SCREW	N/A	4
4	HEX NUT	N/A	1
5	SCREW	N/A	1
6	STRAIN RELIEF	N/A	1
7	PWA DS PURCHASED	N/A	1
8	POWER SUPPLY	N/A	1
9	WASHER	N/A	1
10	WASHER	N/A	1
11	OVERLAY	N/A	1
12	PUMP	N/A	1
13	PUMP HEAD ASSEMBLY	46-1793	1
-	REPLACEMENT FUSE	32-1240	1



STATEMENT OF WARRANTY

Mi-T-M Corporation products are warranted against defective material and workmanship under normal use and service for one year from the date of manufacturer. This limited warranty does not apply to any products, which have a normal life shorter than one year or failure and damage caused by chemicals, corrosion, improper voltage supply, physical abuse, or misapplication. Rubber and synthetic rubber parts such as "O" rings, diaphragms, squeeze tubing and gaskets are considered expendable and are not covered under warranty. This warranty is extended only to the original buyer of Mi-T-M Corporation products. If products are altered or repaired without prior approval of Mi-T-M Corporation, this warranty is void.

For Service or Warranty Consideration,
contact Customer Service.
563-556-7484 / 800-553-9053 / Fax 563-556-1235
Monday - Friday 8:00 a.m. - 5:00 p.m. CST

