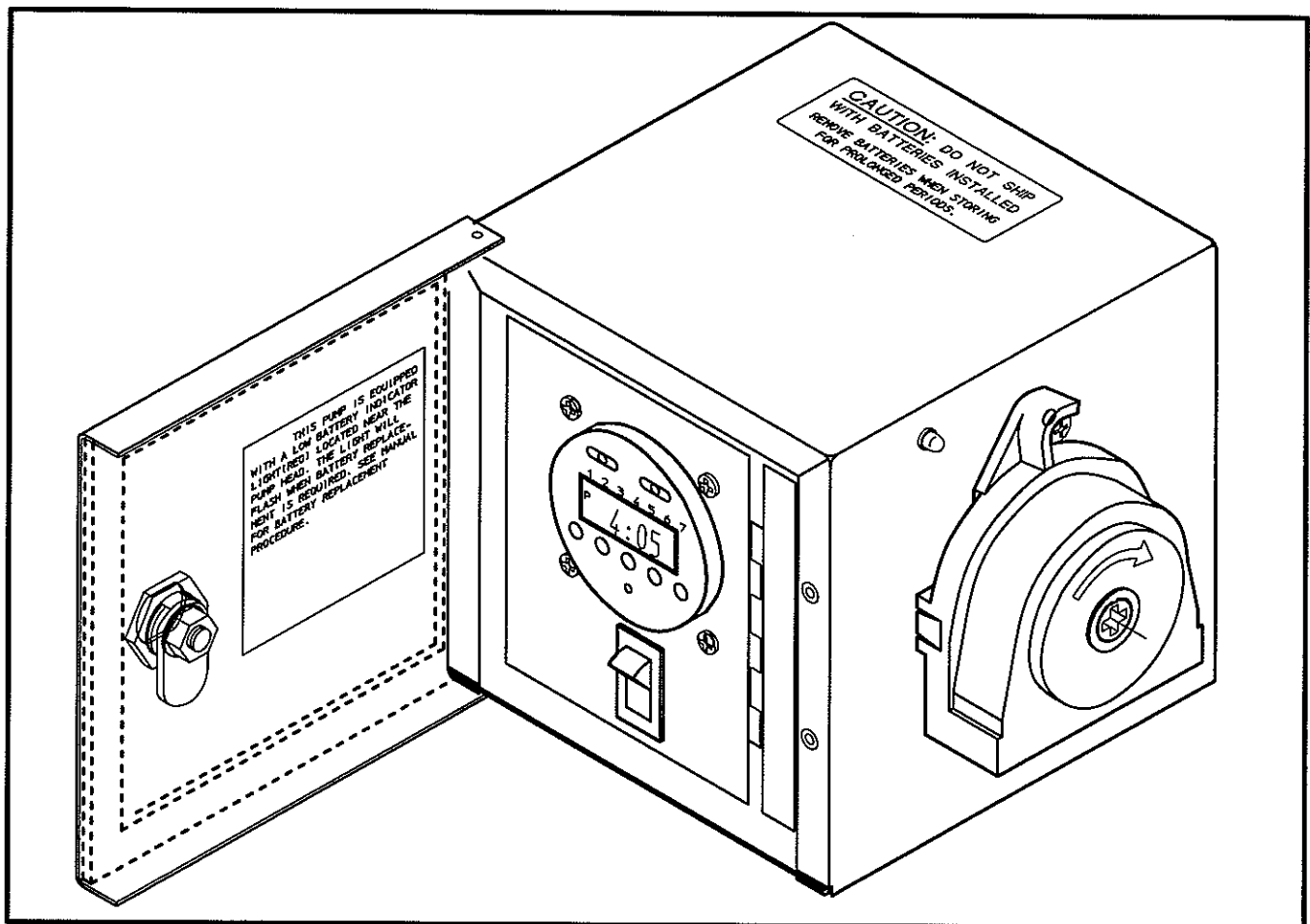


Installation, Operation and Maintenance Manual



2400T-DC BATTERY POWERED PERISTALTIC CHEMICAL SOLUTION DESPENSER

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IMPORTANT SAFETY INSTRUCTIONS

BEFORE USING YOUR 2400T-DC, BASIC SAFETY PRECAUTIONS SHOULD ALWAYS BE FOLLOWED TO REDUCE THE RISK OF INJURY TO PERSONS, INCLUDING THE FOLLOWING:

1. Read & understand all instructions.
2. Follow all warnings & instructions prior to using this product.
3. This product should be operated only from the type of power source indicated on the data plate.
4. Always wear protective clothing & eye protection when filling or emptying equipment, changing tubes, working with chemicals or just working in the area.
5. Use CAUTION when operating or maintaining your equipment.
6. Always keep equipment & area clean for proper operation & safety.
6. Keep safety & operation in mind when locating pump & routing tubing during installation or repair. Check all components to insure they are properly latched, screwed or tightened & not loose, pinched or kinked.
7. Follow all safety & handling instructions of the chemical manufacturer. Use chemicals or cleaners in accordance with the manufacturer's instructions.
8. Always be aware of discharge direction or destination, keep away from other persons & yourself.

TECHNICAL INFORMATION

FEED RATE:

WITH STANDARD NORPRENE TUBING

7/16" OD x 1/4" ID = 3.0 oz/minute nominal
3/8" OD x 3/16" ID = 2.0 oz/minute nominal

Viton tubing option available,

Dimensions:

Height = 6.5", Width = 7.5", Depth = 6.5".

LIST OF STANDARD ACCESSORIES PROVIDED

Head Tubing	Hose Clamps(2)
Injection Fitting	Self-Adhesive Bumpers(4)
Polyethylene Tubing (1/4" O.D. x 20')	Manual

ELECTRICAL RATING.....12vDC
[(8)D-Cell Batteries not Included]

MATERIALS:

Pump Head Assembly.....Polycarbonate
Pump Head Tubing.....Special Norprene Tubing

Injection Point Fitting.....PVC
Suction/Discharge Tubing...1/4" x 20' Polyethylene

MAXIMUM SYSTEM PRESSURE.....25 psi
(maximum allowable at injection fitting)

INSTALLATION

1. **MOUNTING**-Use key holes on back for wall mounting or set the feeder on its 4-rubber pads on a suitable horizontal surface. Pads are not mounted, to mount turn feeder upside down with door closed & stick pads on bottom of pump in four corners(not on door).

2. ELECTRICAL-



WARNING READ & FOLLOW ALL INSTRUCTIONS BELOW. SERIOUS INJURY OR FIRE COULD RESULT FROM IMPROPER HANDLING, SEE BATTERIES PAGE 4.

Use 8-alkaline 'D' size batteries to provide 12 vDC power to the pump. Install 4-batteries in each holder as shown in figure #1.

PUMP HEAD TUBING INSTALLATION-

3. Rotate the pump head counterclockwise(see arrows in figure #5,page 10) to disengage from the latch studs on the feeder cover. DO NOT REMOVE THE LATCH LOCK SCREWS.

4. Grasp the tabs on the back cover of the pump head & pull straight out to remove.



CAUTION DO NOT LOSE THE BEARING FROM THE CENTER HOLE IN THE BACK COVER. It's not necessary to remove the spider & bearings from the housing.

5. Remove the old tubing & tube collars from the pump head.

6. Position the spider as shown in figure #2. Put tube collars in pump head with open end of collars facing outward. Locate tubing into right collar so ends will be approximately the same length.

7. While rotating the spider counterclockwise(↺), push the tubing into the housing & center over the rollers as shown in figure #2.

8. Replace the back cover on the pump head. BE SURE IT FITS TIGHTLY AGAINST & FLUSH WITH THE HOUSING.

9. Slide the pump head onto the motor drive shaft & turn it clockwise to lock onto the 2-latch studs. DO NOT REMOVE THE LATCH LOCK SCREWS.

10. Push the suction tubing & discharge tubing into the pump head tubing(figure #5,page 10). NOTE: DO NOT PUSH SUCTION OR DISCHARGE TUBING PAST TUBE COLLARS IN HEAD. Install hose clamps to hold the tubing together, keep suction clamp within .25' of head. Use pliers to squeeze clamps tightly.

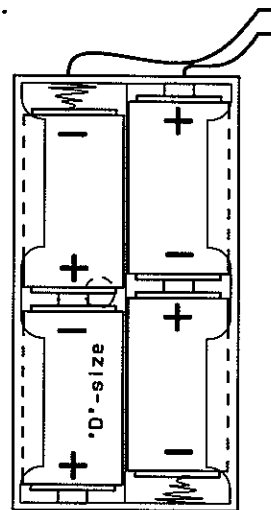


FIGURE #1

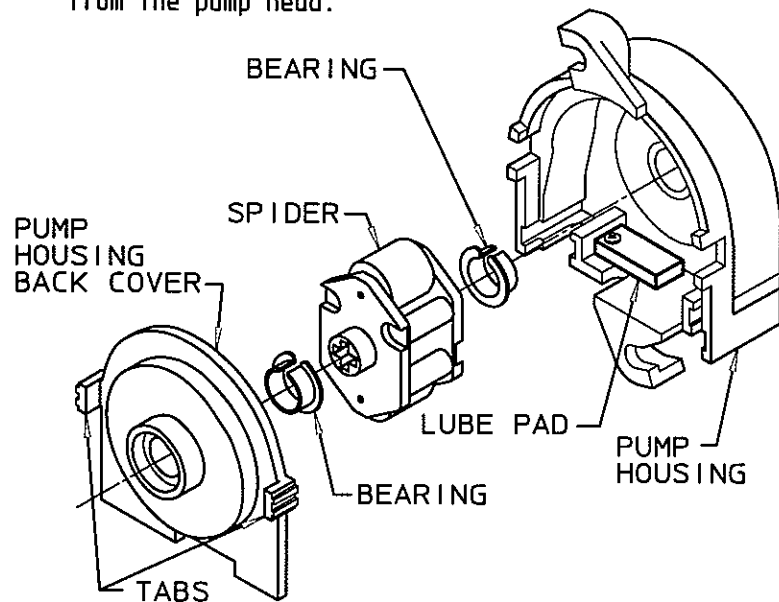


FIGURE #3

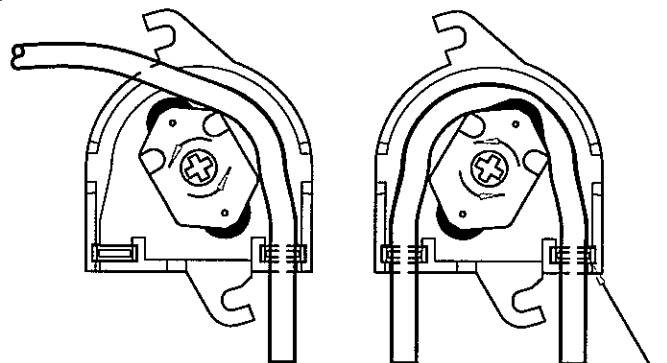


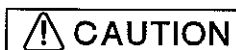
FIGURE #2

TUBE COLLAR

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INSTALLATION (Continued)

11. **INJECTION FITTING**- Install the injection fitting as shown in figure #5, pg. 10. **DO NOT INSTALL IN "DEAD END" PIPES, OR INTO DEEPLY RECESSED TEE'S.** The tip of the injection fitting must not extend beyond the center line of the pipe.
- Take precautions to prevent loss of fluid from the system piping.
 - The injection fitting has 1/4" pipe threads. If needed, drill a 7/16" dia. hole & tap to 1/4"-NPT. Do not tap too deeply so the injection fitting will fit tightly.
 - Apply teflon tape to the injection fitting threads. **DO NOT REMOVE THE PLASTIC SLEEVE ON THE TIP OF THE FITTING.** It is a functional part. Turn the fitting in & tighten.



Inspect the plumbing system & eliminate piping cross-connections to prevent feeding of chemical to pipes or fixtures where it's not wanted or needed.

12. **SUCTION & DISCHARGE TUBING**- Take the 20 ft. length of 1/4" O.D. tubing included, measure & cut the lengths needed to run from pump head to the injection fitting & to the chemical tank (Figure #5, pg. 10). Cut the tubing ends square for proper fitting engagement. Suction tubing end in chemical container should be cut at an angle to allow unobstructed flow. Use the tube wand to hold the suction tubing in place at the bottom of the chemical tank. The tube wands are assembled by inserting together approximately 1'-2' & twisting to lock in place. Telescope the tubes together to vary the height as required.

13. **CONNECT DISCHARGE TUBING TO THE INJECTION FITTING**- Remove the injection fitting nut & slide it over the end of the tubing. Push the end of the tubing onto the injection fitting. Slide the nut on & tighten it firmly, by hand only.

NOTE: To soften the end of the tubing for easier assembly, immerse in hot water.

MAINTENANCE



WARNING READ IMPORTANT SAFETY INSTRUCTIONS ON PAGE 2 BEFORE STARTING ANY MAINTENANCE PROCEDURE.

CHEMICAL TANK- To avoid running out of chemical, follow a maintenance schedule to insure adequate supply.

TUBING INSPECTION- Inspect all tubing regularly & replace it if deteriorating.

REPLACING PUMP HEAD TUBING-

- Relieve all pressure from the discharge tubing & point of injection.
- Remove the hose clamps from the tubing at the pump head (twist clamp to disengage teeth).
- Pull the suction & discharge tubing from the pump head tubing.
- Refer to installation steps 3 thru 10 to install the pump head tubing.

BATTERIES



WARNING SERIOUS INJURY OR FIRE COULD RESULT FROM IMPROPER HANDLING OF BATTERIES. READ & FOLLOW ALL INSTRUCTIONS BELOW.

- Use only the size & type of batteries recommended in this manual.
- Handle batteries with caution so not to short batteries with conductive materials, jewelry, keys, etc., which may cause conductor to overheat & cause burns.
- Install batteries as indicated in manual & as shown on battery holders. Improper polarity may cause leaking & or explosion.
- Replace all batteries at the same time. Using old & new batteries could cause batteries to overheat & explode.
- Remove batteries from product if it will not be used for several months to avoid damage by leaking batteries.
- Do not dispose of batteries in heat or fire, the batteries may explode. Check local codes for special disposal instructions.
- Do not open or mutilate the batteries. Internal electrolyte is corrosive to eyes, skin & may be toxic if swallowed.
- Dispose of "dead" batteries quickly, to avoid leaking & exposure to corrosive.
- If batteries are stored in cold/freezing area to extend shelf life, protect them from condensation during storage & defrosting. Bring batteries to room temperature before using in any product.
- Do not recharge standard batteries recommended for use with this product, also do not attempt to extend battery life by heating, they may leak corrosive electrolyte or explode.

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OPERATION



CAUTION

Remove power batteries before servicing pump or system. The timer may trigger the pump to run unexpectedly during servicing which may cause chemical spill accidents. Always wear appropriate protective equipment when servicing the pump or equipment.




1. Check installation steps for proper completion & chemical tank for adequate supply.
2. Depress the prime button to start the pump. Chemical should begin to fill the suction tubing.
3. When all lines have been filled release the prime button.
4. Set the timer. Refer to the timer instruction on the next three pages. Just follow steps A, B, C for simple timer operation.

PUMP TIMER PROGRAMMING INSTRUCTIONS

1. Read all instructions first.
2. When programming or re-programming, use the program work sheet to set up the desired program before entering the steps into the timer. Seeing the program on paper may avoid errors and will make it easier to put the correct steps into the timer.
3. When re-programming, it is always best to use the reset button and re-program all cycles.
4. Avoid program sequences which overlap another program. Programs which start while another program is in the "ON" sequence will not activate.
5. An "EEE" on the screen indicates an error in program sequence. To correct, push the reset button, reset time of day and day of week, then re-program.



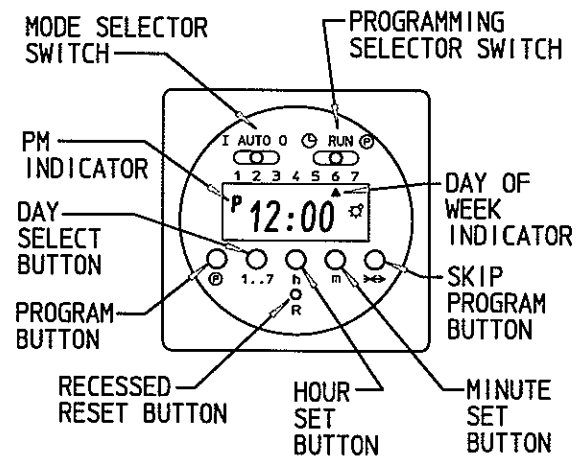
CAUTION

6.  Do not attempt to re-program while the timer is in the "ON" sequence unless the recessed reset button is pressed first and all sequences are reprogrammed.
7.  Do not press the "P" button while in the "time of day" (⌚) set mode. This may cause an error in the time keeping program which will cause hours:minutes to count in seconds. If this condition occurs, slide the programming selector switch to the "⌚" position, press the "P" button & the "h" button at the same time, then use the "h" button to correct the time. When the time of day is corrected slide the programming selector switch back to the "RUN" position.
8.  Do not reset the time of day during an active cycle. Wait to reset during an "OFF" cycle or use reset button and follow the complete instruction from the beginning.
9. All programming errors may be corrected by moving the right side button to the "RUN" position and depressing the reset button "R". This will clear all memory, both time of day and all programs, all desired programs and time of day must be re-entered. Begin again at step #1.

PUMP TIMER PROGRAMMING INSTRUCTIONS

Set Time of Day

1. With the programming selector switch in 'RUN' position, push recessed reset button, 'R' (0:00 will flash on the display).
2. Slide the programming selector switch to the left to the '⌚' time of day position. '12:00' will appear on the display.
- 2A. Use the '1..7' button to set day of week using '1' as Monday. Put the day indicator '▲' under the day of the week
- 2B. Use the 'h' button to set hour, 'P' will appear on the left side of the display to indicate P.M..
- 2C. Use the 'm' button to set minutes.
3. Slide the programming selector switch to center, 'RUN', position to check time setting. The colon ':' will flash. Be certain that minutes do not change with each flash of the colon. If this condition occurs, an error has been made. Begin again at step #1.



- NOTE:**
- 1.) Setting the time in the above sequence will clear all programs, reset the programs as required. (Skip step 1 to correct the time setting without clearing programs).
 - 2.) Check the clock after completion of the time setting procedure. If the clock changes minutes with each flash of the colon, an error has occurred. To correct this condition, slide the programming selector switch to the '⌚' position. Push the 'Ⓟ' button and the 'h' button at the same time, then push the 'h' button to advance the hours to the correct time of day. Slide the programming selector switch back to the 'RUN' position.

Setting Programs

(refer to program worksheet for guidance)

4. Slide programming selector switch right to program 'Ⓟ' position. Screen will show '12:00 1 Ⓟ'. This indicates that you are setting the first event which is the 'ON' time for first cycle.
- 5A. Use the '1..7' button to set the desired day(or days) of the week. Put the day indicator '▲' under the day(or days) you want to run this program. Pressing the '1..7' button once will put the day indicator '▲' under Sunday (7), pressing again will move the day indicator '▲' to Monday (1). Continue pressing the button to advance day by day to Saturday (6). Press again to get multiple day programs.

Once = All weekdays(1 through 5)
 Twice = Weekend only(6 and 7)
 3 Times = Every day except Sunday(1 through 6)
 4 Times = Every day(1 through 7)

- 5B. Use the 'h' button to set hour, remember to set the time in A.M. or P.M. as required.
- 5C. Use the 'm' button to set minutes.

PUMP TIMER PROGRAMMING INSTRUCTIONS SETTING PROGRAMS, CONTINUED

6. Push the program button 'P' to enter this data and set 'ON' time. The display will change to '12:00 2' ready for you to set 'OFF' time for first program.
- 7A. Use the '1..7' button to set the day or days of the week for the 'OFF' cycle (Refer to 5A sequence). Day or days should match the day or days used in previous 'on' cycle setting.
- 7B. Set 'OFF' time for first program using the 'h' and 'm' buttons.
8. After setting time to desired 'OFF' time, press the 'P' button. This completes Program 1. '12:00 3 ⚙' will appear on the display ready to set the 'ON' time for next program.
- 9A. If further programs are desired, continue setting program using Steps 5 through 8.
- 9B. If programming is complete, slide the program selector switch back to the 'RUN' position. All programs are now active.
10. To review program settings slide program selector switch to the 'P' position. The display will show 'xx:xx 1 ⚙' indicating the first 'ON' cycle, day and time. Press the 'P' button again and the display will show 'xx:xx 2', the first 'OFF' cycle, day and time. Continue pressing the 'P' button to step thru the 'ON' and 'OFF' cycles of the rest of the program. After cycle 8 'xx:xx 8' is passed the display will return to the first cycle. The program selector switch may be returned the the run position at anytime during review.

Running the Pump

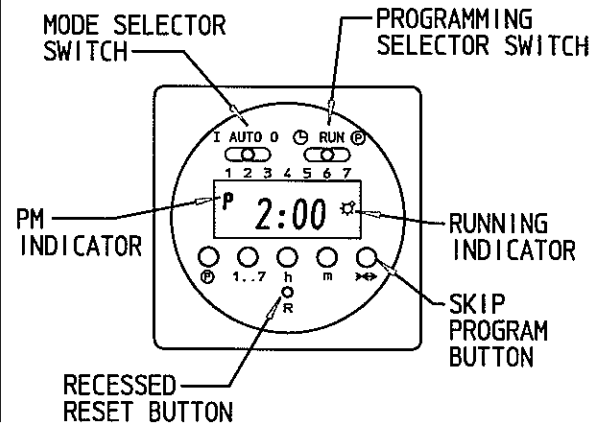
11. Position the mode selector switch('I', 'AUTO', 'O') to the position desired.
 - In position 'I', the pump will run pump continuously, regardless of the program.
 - In position 'Auto', the pump will follow the program sequence.
 - In position 'O', the pump will always remain off, regardless of the program.
12. Skip cycle button '⌘' may be used when you want to skip all program sequences programmed for the next day. Press the '⌘' button once. The symbol '⌘' will appear in the lower right corner of the display. This will stop all program cycles from running the the next calendar day(the day indicator '▲' will flash during the day which is being skipped).

PROGRAM WORKSHEET

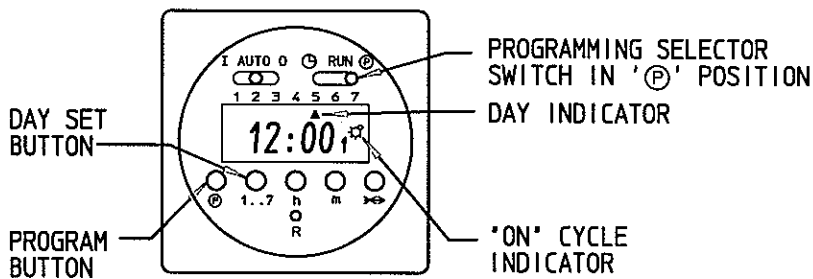
CAUTION: SET TIME OF DAY PRIOR TO PROGRAMMING

PROGRAM	DAY (or DAYS)						
	1	2	3	4	5	6	7
1 ON 1 ☼							
1 OFF 2							
2 ON 3 ☼							
2 OFF 4							
3 ON 5 ☼							
3 OFF 6							
4 ON 7 ☼							
4 OFF 8							
5 ON 9 ☼							
5 OFF 10							
6 ON 11 ☼							
6 OFF 12							
7 ON 13 ☼							
7 OFF 14							
8 ON 15 ☼							
8 OFF 16							

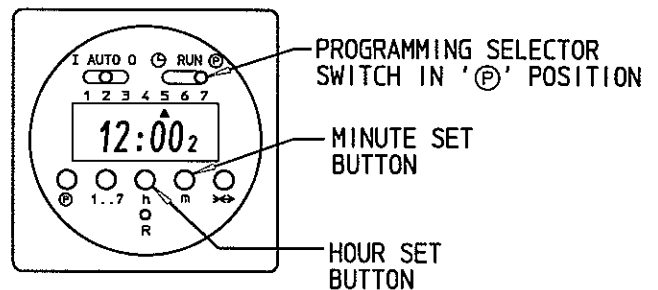
AS SEEN IN AUTOMATIC RUN CONDITION AT 2:00 PM WITH PUMP RUNNING



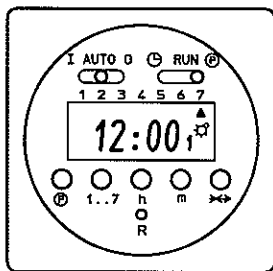
AS SEEN TO SET ON TIME



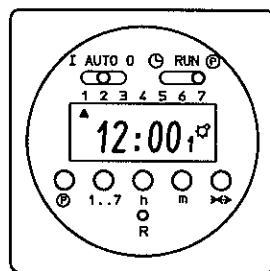
AS SEEN TO SET OFF TIME



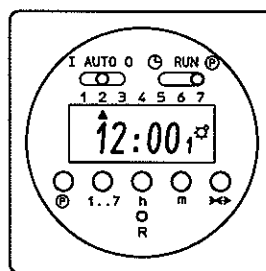
TO SET DAY OF WEEK, PRESS '1...7' BUTTON TO MOVE DAY INDICATOR '▲' TO DAY DESIRED (or DAYS). NOTE: ANY INDIVIDUAL DAY IS AVAILABLE, MULTIPLE DAY PROGRAMS ARE LIMITED TO THOSE SHOWN BELOW. SEE 'SETTING PROGRAM', STEP 5A.



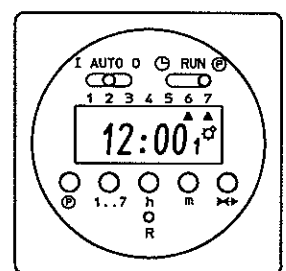
RUN SUNDAY



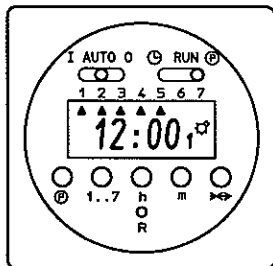
RUN MONDAY



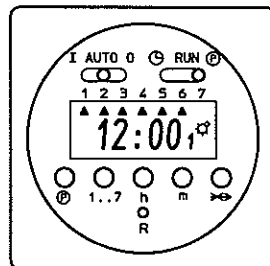
RUN TUESDAY



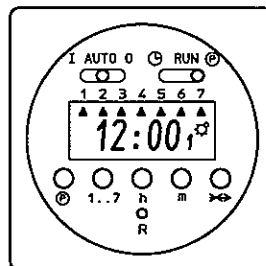
RUN SATURDAY & SUNDAY



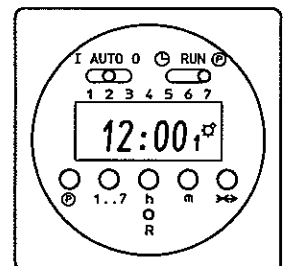
RUN ALL WEEK DAYS



RUN EVERY DAY EXCEPT SUNDAY

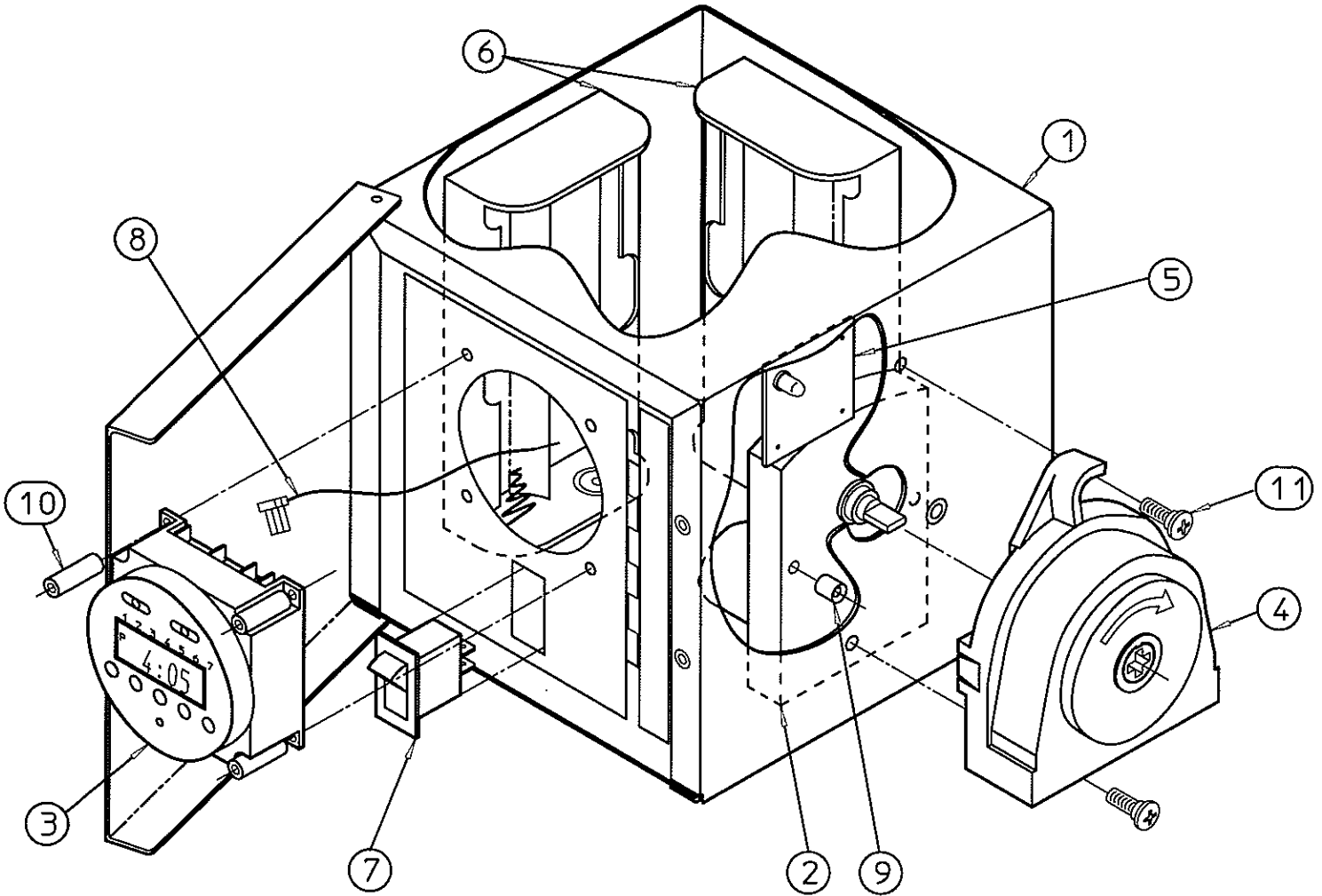


RUN EVERY DAY



NO DAYS! WILL NOT RUN THIS PROGRAM

PARTS LIST & ASSEMBLY



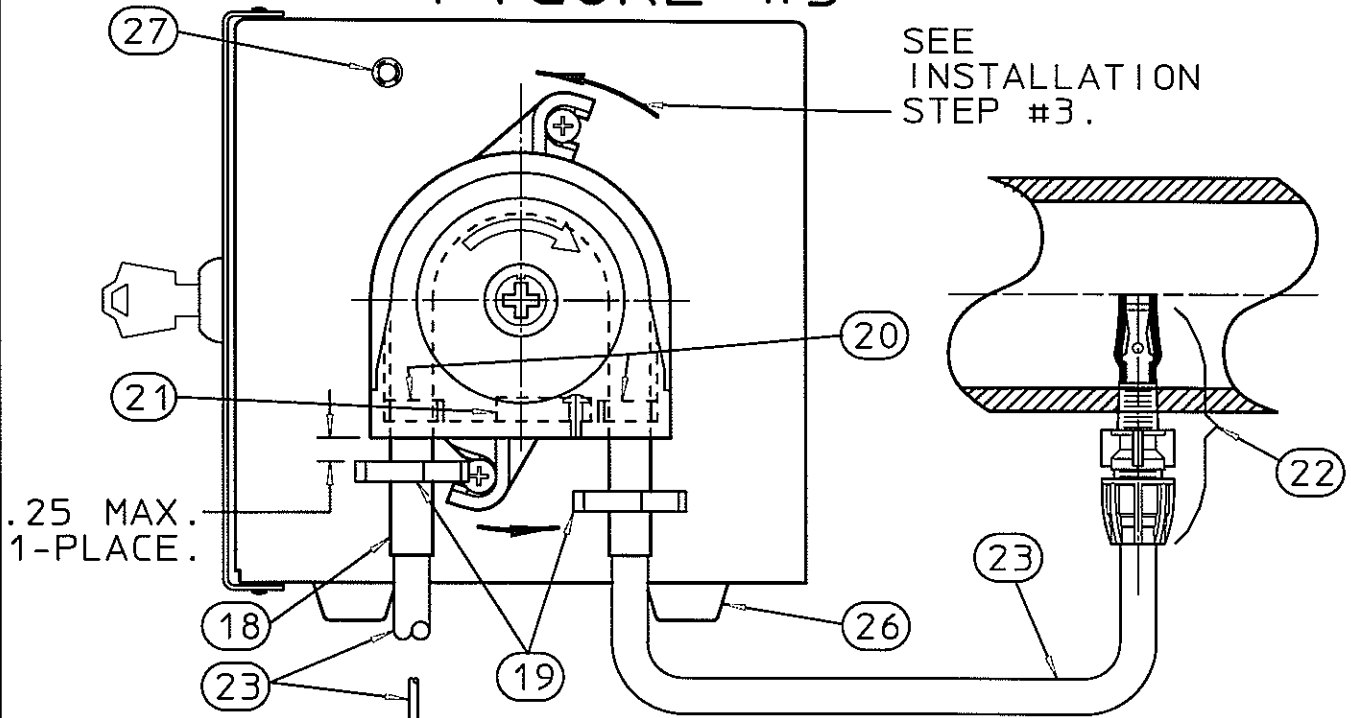
ITEM	PART #	DESCRIPTION	QTY
1	U0818897	HOUSING ASSY w/LOCK	1
2	U0818881	MOTOR 12vDC	1
3	U0818882	DIGITAL TIMER 12vDC	1
4	U8800651	HEAD KIT	1
5	U0818903	LOW BATTERY BOARD ASSY	1
6	U0818902	BATTERY HOLDER ASSY	1
7	U0818061	TOGGLE SWITCH	1
8	U0818904	GROUND WIRE CONN.	1
9	U0818026	SPACER SST(MOTOR)	2
10	U0818888	SPACER PVC(TIMER)	4
11	U0817888	SHOULDER SCREW(PUMP)	2
12*	U0818901	LOCK NUTS(PUMP)	2
13*	U0818666	#8-32 x 1.25' FHP(MOTOR)	2
14*	U0819070	#6-32 x 1.25' PHP(TIMER)	4
15*	U0818208	#6-32 NUT(TIMER)	4
16*	U0812955	#6-32 x .25' PHP(HOLDERS)	8

* = NOT SHOWN

FIGURE #4

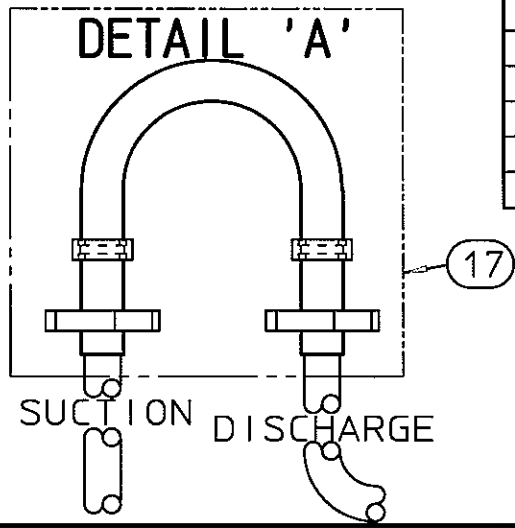
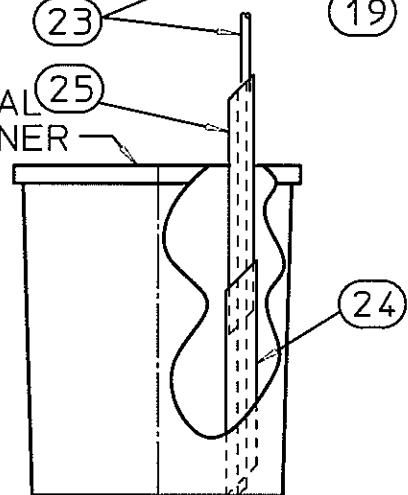
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REV.: B96;
Page 9 of 11.

PARTS LIST & ASSEMBLY (WET END) FIGURE #5



.25 MAX.
1-PLACE.

CHEMICAL
CONTAINER



ITEM	PART #	DESCRIPTION	QTY
17*	U8800637	TUBING KIT (7/16") STD	REF
*	U8800700	TUBING KIT (3/8") STD	REF
18	U0817926	NORPRENE TUBE 7/16"	1
	U0818462	NORPRENE TUBE 3/8"	1
	U0818134	VITON TUBE 7/16"	1
	U0818324	VITON TUBE ASSY 3/8"	1
19	U0817742	HOSE CLAMP	2
20	U0817124	TUBE COLLAR (7/16")	2
	U0817123	TUBE COLLAR (3/8")	2
21	U8800721	FELT LUBE PAD W/ SCREW	1
22	U8800490	INJECTION FITTING	1
23	U0818895	TUBING 1/4" x 20'	1
24	U0818890	TUBE WAND lg ϕ	1
25	U0818924	TUBE WAND sm ϕ	1
26	U0817930	RUBBER FEET	4
27	09-096-00	MOUNT (BLK), LED CLIP	1

* = INCLUDES ITEMS #18-20.

+ = INCLUDES COLLARS.

WARRANTY:

The manufacturer warrants its equipment of its manufacture to be free of defects in material or workmanship. Liability under this policy extends to eighteen(18) months from the date of purchase or one(1) year from date of installation or whichever comes first. The manufacturer's liability is limited to repair or replacement of any device or part, which is returned, prepaid, to the factory and which is proven defective upon examination. This warranty does not include installation or repair costs and in no event shall the manufacturer's liability exceed the selling price of such part.

The manufacturer disclaims all liability for damage to its products through improper installation, maintenance, use or attempts to operate such products beyond their functional capacity, intentionally or otherwise, or any unauthorized repair. Replaceable elastomeric parts are expendable and are not covered by any warranty either expressed or implied. The manufacturer is not responsible for consequential or other damages, injuries or expense incurred through use of its products.

The above warranty is in lieu of any other warranty, either expressed or implied. The manufacturer makes no warranty of fitness or merchantability. No agent of ours is authorized to make any warranty other than the above.