

**JST MANUFACTURING INC**  
**MODEL DT921DDA**  
**DUMP RINSER**

5/12/95  
Rev 4

The Model DT921D is a Microprocessor based Quick DumpRinser, It is a self-contained unit that is capable of implementing several different dump-rinsing techniques. It contains all of the necessary pneumatics to directly operate a standard system. Both single door and double door configurations are available.

Five standard programs are incorporated in the system. The program to be run is selected by the setup procedure (discussed below) and will operate under time, liquid level, resistivity or combinations thereof. This allows flexibility for mating the device to the system requirements.

The solenoids are internal to the device and are powered by the internal system power supply. The user need only provide 24 volts AC to the power terminals and the pneumatic hookups to the color-coded tubing to allow the system to function. Additional features such as liquid level, resistivity, interlocks and remote Start/Stop may be wired into the terminal block as desired.

There is a two-digit display on the face. During the run mode it displays the remaining cycles. During the setup mode the display will indicate a combination of alpha numeric characters to aid the user in correctly setting up the system.

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Four discrete LEDs are provided to indicate the current system status. They are labeled RUN, HALT, LOCKOUT and SETUP:

**RUN** - Indicates that the system is in the RUN mode and implementing the selected program. The display will indicate the number of cycles remaining.

**HALT** - Indicates the system has been temporarily stopped.

**LOCKOUT** - Indicates that a switch closure has occurred on one of the two interlock circuits. This will terminate the Dump Rinser cycle prematurely and stop the system regardless of the current conditions.

**SETUP** - Indicates that the system is in the SETUP mode. In this mode the system parameters are selected. (See below)

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The six keys marked: START, STOP/RESET, SETUP, OPEN, UP AND DOWN are used to operate and program the unit. The following is a listing of each of the keys and their functions:

**START** - This key is used to activate the Dump Rinser. It will start the system if it is reset, or it will continue if the system has been placed in HALT (see STOP/RESET).

**STOP RESET** - This is a multifunction key. Its function varies with the current system mode.

**RUN/MODE** - If the system is in the RUN mode, but has not completed all of the cycles, depressing STOP/RESET will place the system in the HALT condition. This simply stops the program and holds it until restarted by the START key or RESET key, as described below.

**HALT MODE** - If the system has been placed in the HALT mode by a single depression of the STOP/RESET key, depressing the key again will reset the system.

**SETUP MODE** - If the system is in the SETUP mode, depressing the key will cause the system to return to the RESET state in preparation for a new cycle run.

**SETUP** - This key is used to put the system into the SETUP mode and advance through the parameters.

Depressing the key once will place the unit in the SETUP mode. (Note: If Access Code Protection is selected, an additional step is required, see Access Code). Depressing the key after entering the SETUP mode will allow the user to scroll through the setup parameters. (see SETUP).

**UP** - In the SETUP mode, depressing the UP key will cause the display to advance. Depressing the key once and releasing will allow the accurate setting of the least significant digit. Holding the key down will activate the automatic, rapid incrementing of the display.

**DOWN** - In the SETUP mode, depressing the DOWN key will cause the display to decrease. Depressing the key once and releasing will allow the accurate setting of the least significant digit. Holding the key down will activate the automatic, rapid decrementing of the display.

**OPEN** - This key is used to manually dump the tank. When it is depressed, the appropriate solenoid is activated and the tank is dumped. Depressing the RESET key closes the door.

**SETUP** - The controller may be configured to implement various dump rinsing techniques. The SETUP mode allows the user to both adjust and program the unit. The following is a listing of the Code Prompts that will appear in the display when in the SETUP mode. The code will alternately flash with the selected value to indicate to the user the parameter that is currently being viewed or set.

<u>CODE</u>	<u>DESCRIPTION</u>
CY	Number of Cycles
RC	Number of Reclaimed Cycles (Double door only)
FP	Fill Period (Time Programs Only)
DP	Drain Period
DD	Dump Delay
SC	Start Cascade
AD	Auto Dump Period
SP	Spray
AC	Access Code
PC	Period Count
PN	Program Number
RP	Reclaim Placement (Double Door Only)

<u>CODE</u>	<u>SETTING RANGE</u>
CY	0 TO 99 Cycles
RC	0 TO 99 Cycles
FP	0 TO 99 seconds
DP	0 to 99 seconds
DD	0 to 99 seconds
SC	0 to 99 seconds
AD	0 to 99 seconds
SP	Y-Yes / N-No
AC	0 to 99
PC	L=Long (min) S=Short (sec)
PN	0 to 4
RP	L=Last, F=First

All of the codes do not appear on every unit. If the item does not apply it is automatically removed from the stack. For example, FP is only used with Programs 0 to 1. Thus, when PN is selected as 2 or 3 the FP setting disappears from the stack.

The 'PC' selection will determine whether the Fill Period (FP) and Start Delay (SD) are counted in minutes or seconds. If it is set to 'L' (LONG) it will count in minutes. If it is set to "S" (SHORT) it will count in seconds.

The 'RP' selection will determine the placement of the Reclaim Cycles in a Double Door unit. If the parameter is set to 'F', the Reclaim Door will be open for the first 'RC' cycles. If the parameter is set to last "I", the Reclaim Door will be closed for the first 'CY-RC' cycles and Open for the last 'RC' cycles.

To exit the SETUP mode, the RESET key is depressed. When exiting, the unit automatically enters a SAVE mode. This caused the parameters to be written into the EEPROM memory. This is a permanent (10-year minimum life) memory that does not require battery backup.

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OPERATION - The Dump Rinser functions are directly controlled by the SETUP parameters and the program selected. All of the programs use a DUMP period. This is the amount of time that the Dump Door is open. The technique used to determine when the tank is full varies between the programs.

Programs 0 to 1 use a Timed Fill. In this case, the FP (FILL PERIOD) parameter is set to a specific number of minutes or seconds. The program will then activate the fill valve for that period of time and then proceed into the DUMP cycle.

When using Programs 2 and 3, a Liquid Level signal is used to terminate the FILL cycle. In these programs, the unit will go into the FILL cycle and remain in FILL until a closure occurs on the Liquid Level input.

A Resistivity override may be used with either the TIME FILL or LIQUID LEVEL FILL Program. Programs 1 and 3 are special versions of the TIME and LIQUID LEVEL routines just described, with the additional feature that the Resistivity input is examined at the end of each FILL period. If there is a closure on the resistivity input at this time, the system stops the cycle and indicates to the operator that rinsing is complete.

Program 4 is a SPRAY RINSE ONLY program. When selected by the 'PN' parameter, the unit will lock the Drain Door open. When a cycle is run, the time that is programmed into the 'FP' parameter will be counted down, while the TOP SPRAY output is active. When the 'FP' time elapses, the DONE AUDIO will sound and the TOP SPRAY output will deactivate. The STOP/RESET key can then be used to reset the unit for another run. When 'PN' is selected as '4', the following parameters will appear in the program stack: FP, AC, PC and PN.

<u>PROGRAM NUMBER</u>	<u>FUNCTION</u>
0	Timed Fill
1	Timed Fill with Resistivity Override
2	Liquid Level Fill
3	Liquid Level Fill with Resistivity Override
4	Spray Only

With any of the programs, except Program #4, the 'SP' option may be selected. When 'SP' is selected, the 'SPRAY' solenoid will activate the START CASCADE and remain active for the entire cycle run.

The Fill solenoid is activated during all CASCADE and FILL periods. However, it is OFF when the doors are open.

There are two programmable delays that may affect the system operation. In the SETUP mode, the DUMP delay may be used to add a fixed amount of time to the above end of the FILL period. The system would operate as described above, except that the dump would not be immediately initiated, but would be delayed by a preset number of seconds.

Additionally, a delay may be inserted via the SC (START CASCADE) function. When the START key is first depressed, the controller will enter the RUN mode, but the RUN LED will flash to indicate that there is a START CASCADE being counted down. The DUMP DOOR(s) will remain closed and the BOTTOM FILL will be active. Once the delay has been completed, the RUN LED will go fully on and the system will proceed to operate as described above.

If a time other than 00 is programmed in the AD (AUTOMATIC DUMP) parameter, an internal Timer will automatically accumulate the time that has elapsed since the last run. If this time accumulated to the programmed number of minutes, the unit will automatically perform one dump cycle.

In some cases, it may be desirable to restrict access to the SETUP mode. Thus, an Access Code System is incorporated. If the AC (Access Code) parameter is set to 00, the function is eliminated and the system operates as previously described.

The Access Code is simply any number from '1 to 99', as programmed into the system by the customer's authorized personnel. Once this code is entered into the EEPROM, any attempt to enter the SET mode will cause 'CD' to appear in the data display. The UP and DOWN keys are then used to enter the Access Code. Once the proper code has been selected, the user simply depressed the SET key once again to gain entry into the SETUP stack. Any other entry, the wrong code number, or no action for 30 seconds will return the unit to the normal mode.

## SPECIFICATIONS

### **JST MANUFACTURING INC MODEL DT921D QUICK DUMP RINSER**

RANGE	0 - 99 Cycles.
RESOLUTION	1 Cycle
DISPLAY	Two, 0.56 Inch High, Seven Segment, LED Uniplanar numerals. Four Discrete LEDs (Red, Green, Amber).
ANNUNCIATOR	Audio Tone, ? 2500 HZ.
SETUP MEMORY	EEPEOM, All Parameters.
MEMORY RETENTION	10 Years w/o Power.
OPERATING RANGE	0 to 50 Degrees C.
STORAGE RANGES	-40 to 60 Degrees C.
CONSTRUCTION	Enclosure - Kydex. Face - Lexan, Back Printed.
SIZE	8.25 x 3 x 5.25 inches (HxWxD) 210 x 76 x 133 mm.
WEIGHT	? 4 Lbs. (1.8 kg).
CONNECTION	Pneumatic - Rear, Tubing, 1/16" ID, PVC, Color Coded with 1/16 - 3/32 Barbed Fitting.  Electrical - Rear, Screw-Type, 3/8 Inch Centers.
OUTPUT	Pneumatic Solenoid, Internal, 100 PS1G Max.  Done- Transistor, Open Collector, 100 MA, 12VDC.
POWER	10 VA, 24 VAC + 10%, 50/60 HZ.