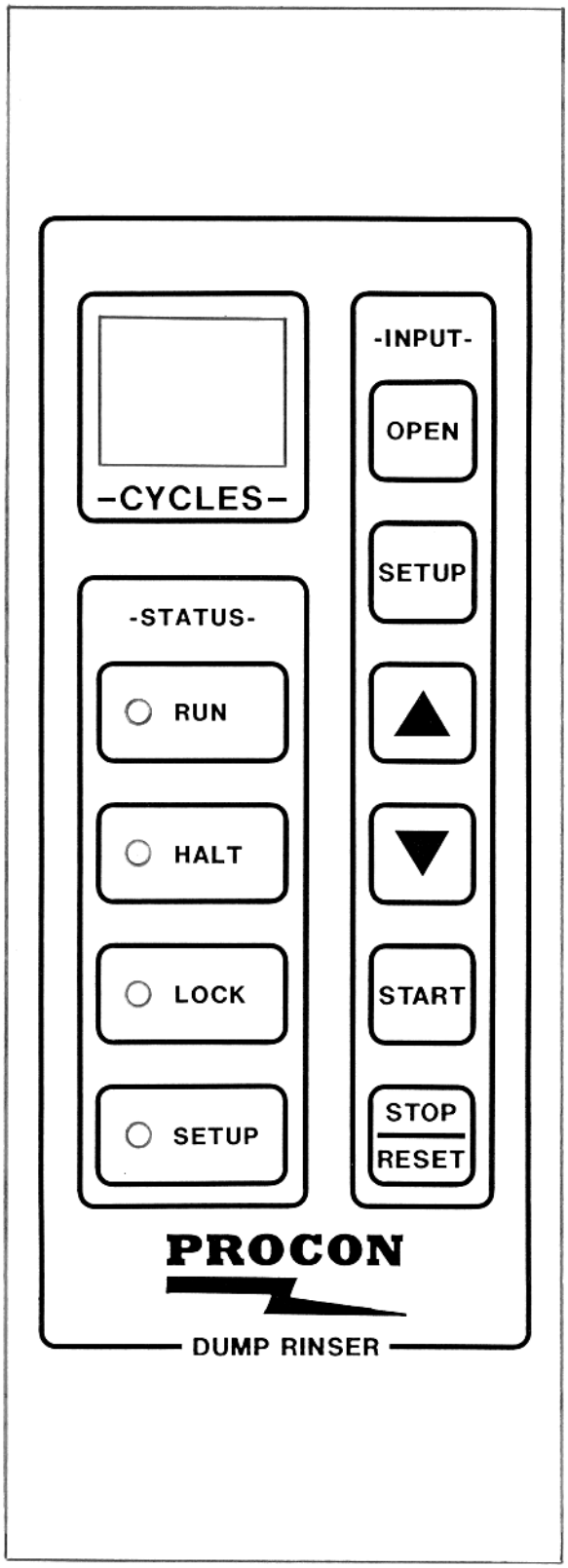
PROCON

MODEL 900D
DUMP RINSER

7/29/02
Rev 3


-CYCLES-
-STATUS-
RUN
HALT
LOCK
SETUP
-INPUT-
OPEN
SETUP
START
STOP
RESET
PROCON
DUMP RINSER

PROCON
MODEL 900D
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*** **N O T I C E** ***

JPC CONTROLS RESERVES THE RIGHT TO MAKE CHANGES TO ITS PRODUCTS OR SPECIFICATIONS AT ANY TIME, WITHOUT NOTICE, IN ORDER TO IMPROVE THE DESIGN OR PERFORMANCE AND TO SUPPLY THE BEST POSSIBLE PRODUCT. THE INFORMATION IN THIS MANUAL HAS BEEN CAREFULLY CHECKED AND IS BELIEVED TO BE ACCURATE. HOWEVER, NO RESPONSIBILITY IS ASSUMED FOR INACCURACIES.

PROCON
MODEL 900D
DUMP RINSER

The Model 900D is a Microprocessor based Stand Alone Quick Dump Rinse Controller. The following are highlights of some of the main features of the controller:

*BUILT IN PNEUMATIC VALVES
*SINGLE AND DOUBLE DOOR MODELS
*SIMPLE YET VERY FLEXIBLE CONFIGURATION
*COLOR CODED PNEUMATIC HOOK-UP TUBING
*ACCESS CODE PARAMETER PROTECTION
*EEPROM PARAMETER MEMORY (MINIMUM 10 YEAR LIFE)
*AUDIO ANNUNCIATOR
*ALL PARAMETERS SET IN SOFTWARE
*AUTO CLEAN CYCLE
*RESISTIVITY INTERFACE
*WET STATION ENCLOSURE
*BRIGHT TWO DIGIT LED DISPLAY
*SMOOTH FACE CONSTRUCTION
*RS232 COMMUNICATIONS AVAILABLE

The following table lists the models that are available:

MODEL	VOLTAGE	NUMBER OF DOORS	WITH RS232
900DSA	24 VAC	1	NO
900DSB	120 VAC	1	NO
900DSC	24 VAC	1	YES
900DSD	120 VAC	1	YES
900DDA	24 VAC	2	NO
900DDB	120 VAC	2	NO
900DDC	24 VAC	2	YES
900DDD	120 VAC	2	YES

The controller contains all of the logic and pneumatics required to interface to a dump rinse tank. Many different operational sequences may be structured using the numerous setup parameters including operation under time, liquid level, resistivity, or a combination thereof. The bright two digit LED display keeps the user informed on an ongoing basis.

LED INDICATORS

Four discrete LEDs are provided to indicate the current system status. They are labeled RUN, HALT, LOCK 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 that the system has been temporarily stopped.

LOCK - Indicates that a switch closure has occurred on the interlock circuit. This will terminate the Dump Rinser cycle prematurely and stop the system regardless of the current conditions. (only active if R2=0, see SETUP)

SETUP - Indicates that the system is in the SETUP mode. In this mode, the system parameters are selected. (see SETUP)

KEYS

The six keys marked: OPEN, SETUP, UP, DOWN, START, and STOP/RESET are used to program and operate the controller. The following is a listing of each key and its function:

OPEN - This key is used to manually dump the tank. When it is depressed, the appropriate solenoid is activated and the tank is dumped. The door is closed by depressing the STOP/RESET key. If the door is opened while in the RUN mode, all remaining cycles will be terminated and the system will enter the READY mode.

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.

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 cancelled by the 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 save all system parameters and return the system to the RESET state in preparation for a new cycle run.

SETUP

The SETUP mode is entered by depressing the SETUP key. While in this mode, the SETUP key is used to step through the parameters. The following is a listing of the Parameter prompts that will appear in the display when in the SETUP mode. The prompt will alternately flash with the selected value to indicate to the user the parameter that is currently being viewed or set.

PARAMETER	DESCRIPTION	SETTING RANGE
SC	Start Cascade	0 to 99 (0 to 990 Seconds)
SD	Start Drain	0 to 99 Seconds (DU=1 or 2) 0 to 99 Minutes (DU=0)
SF	Start Fill (if FL=0)	0 to 99 Seconds (FU=1) 0 to 99 Minutes (FU=0)
CY	Number of Cycles	0 to 99 Cycles
RC	Number of Reclaimed Cycles (Double door only)	0 to 99 Cycles
CC	Cycle Cascade	0 to 99 Seconds (FU=1) 0 to 99 Minutes (FU=0)
CD	Cycle Drain	0.0 to 9.9 Seconds (DU=2) 0 to 99 Seconds (DU=1) 0 to 99 Minutes (DU=0)
CF	Cycle Fill (if FL=0)	0 to 99 Seconds (FU=1) 0 to 99 Minutes (FU=0)
EC	End Cascade	0 to 99 (0 to 990 Seconds)
DC	Done Cascade	0 to 99 (0 to 990 Seconds)
SL	Spray Logic	0 - Off 1 - Fill Only 2 - Drain Only 3 - Fill & Drain Only 4 - Always
N2	N2 Bubbler	Y-Yes/N-No
EE	End Empty	Y-Yes/N-No
AS	Auto Stop	0 to 99 beeps
AD	Auto Dump	0 to 99 Minutes
FL	Fill Logic	0 - Timed 1 – Liquid Level
FU	Fill Time Units (if FL=0)	0 - Minutes 1 - Seconds
LT	Liquid Level Top Off Time (if FL=1)	0 to 99 seconds
DU	Drain Time Units	0 - Minutes 1 - Seconds 2 - Tenth Seconds

R1	Resistivity Logic #1	0 - Off 1 - Skip Cycles 2 - Stop Cascade 3 - Change Door
R2	Resistivity Logic #2	0 - Interlock 1 - Skip Cycles 2 - Stop Cascade 3 - Change Door
AC	Access Code	0 to 99
RP	Reclaim Placement (Double door only)	F-First/L-Last
RL	Double Door Logic (Double door only)	0-Double Door 1-Diverter Door

SC - This parameter sets the amount of time that the tank cascades at the start of a run.

SD – This parameter sets the time for the first Drain/Dump.

SF – This parameter sets the time for the first Fill in the run, if Liquid Level Fill is not used.

CY – This parameter sets the number of times the cycle portion of the run (CC/CD/CF) will repeat.

RC - When the system is equipped with a double door, a portion of the drain cycles can be reclaimed. This parameter determines the number of cycles that are reclaimed.

CC – This parameter sets the time for the Cascade that occurs at the start of each cycle.

CD - This parameter sets the time that the dump door is open during each cycle.

CF – This parameter sets the time duration for the cycle fill, if Liquid Level Fill is not used.

EC - This parameter sets the amount of time that the tank cascades at the end of a run.

DC - This parameter sets the amount of time that the tank cascades after the run is Done. It is used to cascade while waiting for the product to be removed.

SL – The spray may do many different things dependent on the process. This parameter allows the selection of the logic that controls the Top Spray:

(0)	Off	- The Spray is off during the entire run.
(1)	Fill	- The Spray is on only during the Fill periods.
(2)	Drain	- The Spray is on only during the Drain periods
(3)	Fill / Drain	- The Spray is on only during the Fill & Drain periods.
(4)	Always	- The Spray is on during the entire run.

N2 – The parameter enables the N2 output. When enabled, the N2 output will be on for the entire run.

EE –This parameter determines whether the dump door is left open at the end of a process run. When this option is enabled, an additional Start Fill cycle is run prior to the Start Cascade at the beginning of a process run.

AS – This parameter may be programmed to automatically reset the Dump Rinser, at the completion of the run, after a specific number of warning 'beeps' have occurred. If this parameter is set to zero, the unit will continue to provide the audio warning until manually reset.

AD - If there is no activity in the system for the duration of time set in the auto dump parameter, a Start Fill and Start Drain cycle will automatically run to keep the system clean. If Start Fill and Start Drain are set to zero, the system will use the Cycle Fill and Cycle Drain settings.

FL – This parameter sets the logic for all fills. They may be either based on time (FL=0) or a liquid level switch (FL=1).

FU – This parameter sets the time units for the Cycle Cascade and Cycle Fill parameters.

LT – This parameter is only used if Liquid Level fill is selected (FL=1). It sets the Liquid Level Top Off Time. This is the time that the Fill remains on after the fluid reaches the liquid level switch.

DU - This parameter sets the time units for the Cycle Drain parameters.

R1 – This parameter controls the logic of the #1 resistivity input. The input is a digital interface with an external resistivity monitor. A closure on the input indicates that a specified resistivity has been met. The action that is then taken is based on the setting of this parameter.

(0) Off	Resistivity not used
(1) Skip Cycles	Will cause the system to monitor the input at the completion of each cycle fill. If there is a closure on the input, the remaining cycles are skipped and the run proceeds to the End Cascade. Note that in Liquid Level applications the point at which the reading is taken may be extended using the Top Off feature (see LT parameter). Thus a delay may be set that allows the water to reach the resistivity sensor if it has not done so when the Liquid Level switch is made.
(2) Stop Cascade	Will cause the system to monitor the input during the entire End Cascade Once a closure is detected, the Cascade is terminated and the run is done.
(3) Change Door	Used in double door application. It will cause the system to monitor the input at the completion of each fill cycle. If there is a closure on the input and the door transfer has not yet been made, it will force that transfer. Note: The transfer is a one way function, once made due to cycle count or resistivity it is fixed for the remainder of the run.

R2 – This input differs from the #1 Resistivity input in that it is a shared function. On the rear panel, it is marked “Int”. The action that is taken is based on the setting of this parameter.

(0) Interlock - Allows an interlock for lids and doors.
(1) Skip Cycles - Will cause the system to monitor the input at the completion of each cycle fill.
(2) Stop Cascade - Will cause the system to monitor the input during the entire End Cascade.
(3) Change Door - Used in double door application. It will cause the system to monitor the input at the completion of each fill cycle.

When used in combination, the two inputs (R1 and R2) allow a wide combination of resistivity functions using two different set points.

AC - In some cases, it may be desirable to restrict access to the SETUP mode. The Access Code is the number that must be matched to allow entry into the Programming mode. This number may be changed at any time, but a note should be kept of its value. If set to “0”, this function is eliminated.

RP - If the user wishes to reclaim any dumps (Double Door Only), this parameter is used to set whether the first or last “RC” cycles are reclaimed.

RL - If the system has two drains to take advantage of the reclaim feature, the type of reclaim logic is selected here. The reclaim may either be done by the use of a second door/drain in the tank or a diverter valve in the tank drain.

All of the parameters do not appear on every unit. Double Door Parameters only appear in units that have that hardware capability.

The STOP/RESET key will exit the SETUP mode. When exiting, all parameters are saved to the EEPROM memory. This is a permanent (10-year minimum life) memory that does not require battery backup.

OPERATION

The Dump Rinser functions are directly controlled by the setup parameters. They allow the user to customize the operation of the system to accomplish many different applications.

Some of the features are set by the OEM to match the specific Dump Rinser hardware that is being controlled. Features such as Fill Logic that tell the controller if it is to fill the tank based on time or a liquid level switch are setup based on the tank configuration. Other features such as cascade timing, cycle counts, spray logic, etc. are left for the user to customize to the application.

The parameters allow a great deal of flexibility. For example, the variable timing for the drains allow one unit to control everything from a slow draining tank programmable up to 99 minutes down to special partial dump that can be set in tenth second increments.

Start Cycle - Generally, the process run begins with a Start cycle. This is a single cycle that allows for special actions on the first cycle of the run. The three parameters: Start Cascade (SC), Start Fill (SF) and Start Drain (SD) control this cycle. They allow the user to program an initial cascade, a full dump and a complete refill. This is very handy for applications that require a full cycle prior to the activation of rapid partial dumps. It should be noted that if these parameters are set to zero, the Start functions may be eliminated.

Cycles - The CY parameter allows the user to setup a series of repeating cycles. The system will repeat the Cycle Cascade (CC), Cycle Drain (CD) and Cycle Fill (CF) operations the number of times set in the Cycle (CY) parameter.

The Cycle Cascade (CC) is a timed overflow at the beginning of each cycle. The Cycle Drain (CD) parameter selects the time period that the Dump Door will be open during each cycle. The technique used to determine when the tank is full varies based on the setting of the Fill Logic (FL) parameter. If FL=0 the time set in the Cycle Fill (CF) parameter is used. If FL =1 the tank fills until a closure is detected on the Liquid Level input and then Liquid Level Top Off Time (LT) is used to add a specific amount of fill after the level reaches the Liquid Level Switch.

When the Double Door configuration is utilized, the second drain output drives either a Diverter or Reclaim door based on the “DL” setting. Furthermore, the system can reclaim either the first “RC” cycles or the last “RC” cycles based on the “RP” setting. Note that when “RP” is set to First, the Auto Dump Drain and Start Drain will be “Reclaim Drains.”

End Cascade - After the cycles have finished, the system proceeds to the End Cascade. The 'EC' parameter is used to set this independent timed cascade. While in the 'End Cascade' mode, the display will alternately flash the code 'EC' and the remaining time. It should be noted that since the time is programmed in 10 second increments, the display will only change every 10 seconds (e.g. '2' = 20 seconds).

Done Mode - At the completion of the END CASCADE, the unit will sound an audio tone to indicate that the unit has completed the run. This audio tone has a 50/50 duty cycle. The audio tone will remain active until manually terminated, unless Auto Stop is setup (see below).

The 'DC' (Done Cascade) parameter may be programmed to add an independent timed cascade while the system is waiting for the product to be removed. This cascade will end after the period has timed out. While in the 'Done Cascade' mode, the display will alternately flash the code 'DC' and the remaining time. It should be noted that since the time is programmed in 10 second increments, that the display will only change every 10 seconds (e.g. '2' = 20 seconds).

Auto Stop - The 'AS' parameter may be programmed to automatically stop and reset the Dump Rinser after a specific number of warning 'beeps' have occurred. If this parameter is set to zero, the unit will continue to provide the audio warning at the completion of the run until manually reset.

As an example, if 'AS' is set to '5', at the completion of the run, the audio tone will sound 5 times and then automatically reset the system in preparation for another run. It should be noted that the manual STOP/RESET will override the automatic STOP/RESET. Also, the Auto Stop will override the Done Cascade if it is active.

Resistivity - The system may be used with up to two resistivity inputs as controlled by the Resistivity Logic #1 (R1) and Resistivity Logic #2 (R2) parameters. Either input can be set to control the resistivity functions or they may be used together to allow multiple set points to be used. They can terminate cycles, cascades, or force reclaim door switch actions.

Note that ‘R1’ is used in conjunction with the standard resistivity input, while R2 uses the Lockout input. The Lockout function is lost if two resistivity inputs are required.

Lockout – If R2=0 the Lockout feature is enabled. Lockout is an alarm feature normally connected to doors or lids that cancels the current run if a switch closure is detected.

End Empty - The End Empty feature allows the system to finish a process with the tank empty. A drain will follow the end cascade. (Note: if the last cycle drain was a Reclaim, with DL=1, both the Diverter and Waste Door outputs will be on at the end of a process run.) At any time after the process run, the STOP/RESET key can be used to close the drain outputs. It should be noted that if End Empty is enabled, an additional Start Fill period will be run prior to the Start Cascade.

Auto Dump - If a time other than 00 is programmed into the AD (Automatic Dump) parameter, an internal timer will automatically accumulate the time that has elapsed since the last run. If this time accumulates to the programmed number of minutes, the unit will automatically perform one dump cycle. While in this automatic dump cycle, "Ad" will appear in the display to inform the operator that this function is active.

The AUTO DUMP cycle will utilize the Start Fill (SF) and Start Dump (SD) parameters for its timing unless these parameters are set to zero. If Start Fill and Start Drain are set to zero, the system will use the Cycle Fill and Cycle Drain settings.

If the END EMPTY option is set to YES, the AUTO DUMP cycle will first perform a Start Fill and then a Start Dump. Otherwise, the AUTO DUMP cycle will perform a Dump then Fill.

Note: The AUTO DUMP timer may be rezeroed by the operator at any time by simply depressing the STOP/RESET key. This allows the operator to insure that the AUTO DUMP cycle will not initiate at some undesired time.

Access Code - In some cases, it may be desirable to restrict access to the SETUP mode. An Access Code system is incorporated. If the Access Code is set to '00', the function is eliminated and the system operates as previously described. The code is any number from 1 to 99, as programmed into the system by the customer's authorized personnel. Once this code is entered, any attempt to enter the SETUP mode will cause 'CD' to appear in the Timer display. The UP and DOWN keys are then used to enter the Access Code. Once the proper code has been selected, the user simply depresses the SETUP key to gain entry into the SETUP parameters.

Outputs - The following table shows the outputs that are active for each stage of a program run:

	Waste Door	Door 2 (Double Door Units)	N2	Spray (SL=0)	Spray (SL=1)	Spray (SL=2)	Spray (SL=3)	Spray (SL=4)	Fill
Start Cascade			X					X	X
Start Drain (RP=L)	X		X			X	X	X	
Start Drain (RP=F, DL=0) Double Door Units Only		X	X			X	X	X	
Start Drain (RP=F, DL=1) Double Door Units Only	X	X	X			X	X	X	
Start Fill			X		X		X	X	X
Cycle Cascade			X					X	X
Regular Cycle Drain	X		X			X	X	X	
Reclaim Cycle Drain (DL=0) Double Door Units Only		X	X			X	X	X	
Reclaim Cycle Drain (DL=1) Double Door Units Only	X	X	X			X	X	X	
Cycle Fill			X		X		X	X	X
End Cascade			X					X	X
Done Cascade			X					X	X

OPERATIONAL EXAMPLE

This section contains a typical setup for a single door system, as a way of illustrating its basic function. The following is a set of parameters as they would appear in the SETUP STACK:

PARAMETER	SETTING	MEANING
SC	9	90 Sec
SD	10	10 Sec
CY	6	6 cycles
CC	60	60 sec
CD	10	10 sec
EC	12	120 sec
DC	0	0 sec
SL	4	spray always
N2	Y	N2 always
EE	N	end full
AS	5	5 beep auto stop
AD	90	90 minutes
FL	1	LL fill
LT	5	5 sec
DU	1	drain in seconds
R1	0	resistivity#1 inactive
R2	0	Lockout active
AC	57	code = 57

In this example, we have selected a LIQUID LEVEL FILL sequence without Resistivity. There will be a total of six cycles (CY=6). The process will end with the drain door closed (EE=N).

When the START key is depressed, the AUTOMATIC sequence will commence. The RUN LED will blink, the N2, Fill and Spray will come on, and the START CASCADE (SC=9) will begin. This cascade will last for 90 seconds.

When the START CASCADE period has timed out, the DUMP DOOR (SD=10) will open for 10 seconds.

At the completion of the dump, the DUMP DOOR will close and the FILL will begin. This will remain active until the Liquid Level switch is made. Once made the fill will continue for 5 seconds (LT) to ‘top off’ the tank.

The tank will now Cascade for 60 seconds.

The DUMP DOOR will then open for 10 Seconds (CD=10).

At the end of the 10 Second drain period, the DUMP DOOR will close and the FILL will begin. This will remain active until the Liquid Level switch is made. Once made the fill will continue for 5 seconds (LT) to ‘top off’ the tank.

This basic sequence of CASCADE, DUMP, and FILL will continue for the six cycles as programmed into the 'CY' parameter. After the completion of each cycle, the display will count down to show the remaining cycles.

After the cycles are done, the End Cascade will run for 120 seconds (EC=12).

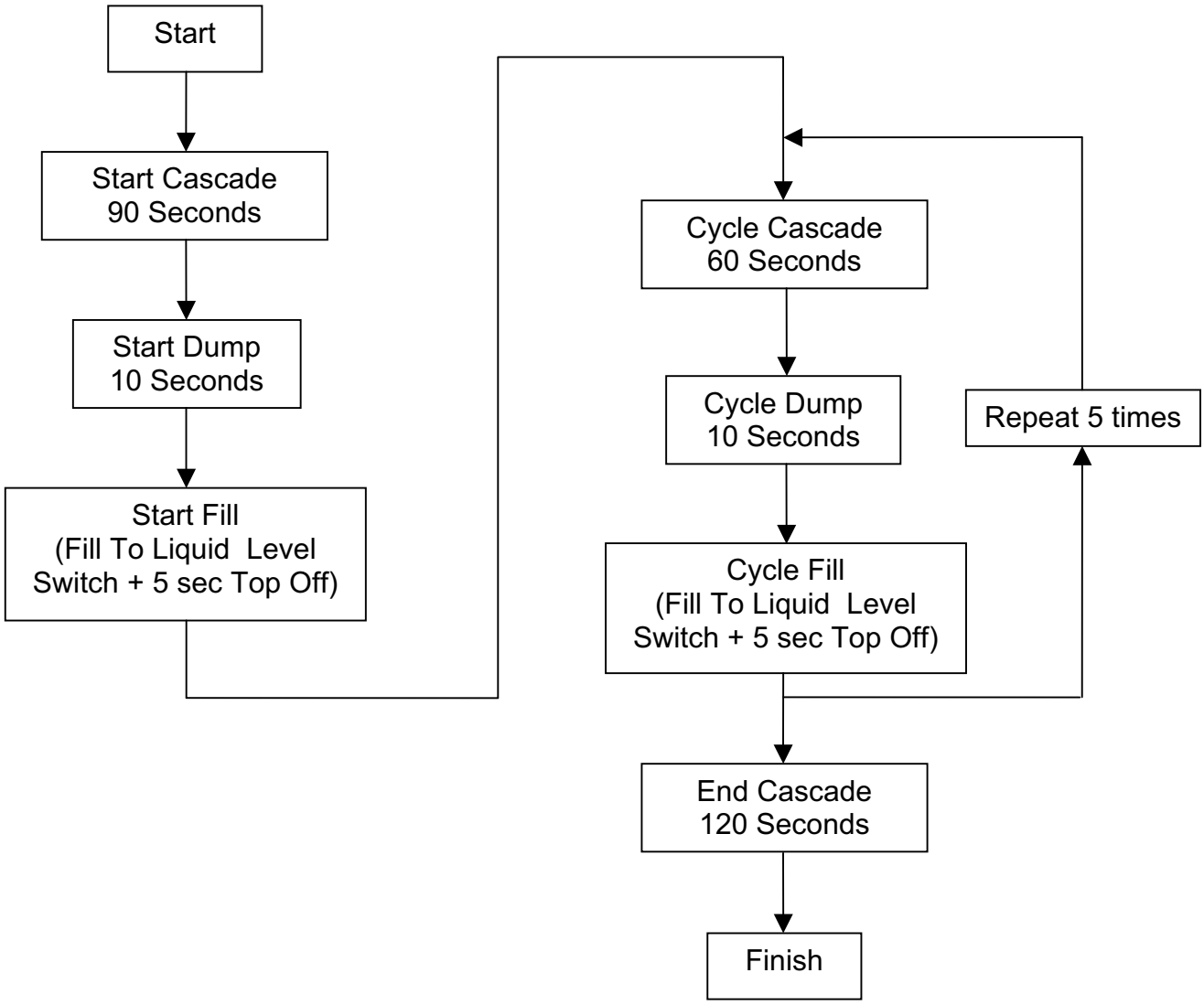
At the completion of the cascade, the buzzer will sound to indicate to the operator that the run is complete. The buzzer will beep five times and then terminate the AUDIO and reset the unit for the next run (AS=5).

If the system has not been run for 90 minutes (AD=90), it will perform one START DUMP and START FILL cycle to clear the lines. The code 'AD' (AUTOMATIC DUMP) will appear in the display. The DUMP DOOR will open for 10 seconds (SD=10). It will then close and the system will FILL until the Liquid Level switch is made. It will then Top Off for an additional 5 seconds.

Since an access code (AC=57) is programmed into the unit, any attempt to enter the programming stack will require an access code of '57'.

NOTE: the 'RC' (RECLAIM CYCLES), 'RP' (RECLAIM PLACEMENT), ‘DL’ (DOOR LOGIC), parameters are unused. ‘RC’, ‘RP’, and ‘DL’ are only used in double door units.

The following chart shows a process run for the rinse controller with the previous configuration:



BACKDOOR CODE

A special code has been incorporated into the software to insure factory access to all functions no matter what the customer has done with the Access Codes. This code is **99**.

MANUAL REVISIONS

Revision #	Program #	Engineering #	Revisions Made
Rev 0	DT900DDC	DT900DSA DT900DSB DT900DDA DT900DDB	Origination
Rev 1	DT900DDC	DT900DSA DT900DSB DT900DDA DT900DDB	Added Drawings
Rev 2	DT900DDD	DT900DSA DT900DSB DT900DDA DT900DDB	Upgraded Microprocessor
Rev 3	DT900DA DT900DRA	DT900DSA DT900DSB DT900DDA DT900DDB DT900DSC DT900DSD DT900DDC DT900DDD	Miscellaneous Changes

LIMITED WARRANTY

WARRANTY: JPC CONTROLS WARRANTS ITS NEW PRODUCTS TO BE FREE FROM DEFECTS IN MATERIALS AND WORKMANSHIP UNDER THE SERVICE FOR WHICH THEY ARE INTENDED. THIS WARRANTY IS EFFECTIVE FOR TWELVE MONTHS FROM THE DATE OF SHIPMENT.

EXCLUSIONS: THIS WARRANTY IS **IN LIEU OF** ANY OTHER WARRANTY EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF **MERCHANTABILITY** OR FITNESS FOR A PARTICULAR PURPOSE.

JPC CONTROLS IS NOT LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.

NO PERSON OTHER THAN AN OFFICER IS AUTHORIZED TO GIVE ANY OTHER WARRANTY OR ASSUME ANY LIABILITY.

REMEDIES: THE PURCHASER'S SOLE AND EXCLUSIVE REMEDY SHALL BE: (1) THE REPAIR OR REPLACEMENT OF DEFECTIVE PARTS OR PRODUCTS, WITHOUT CHARGE. (2) AT THE OPTION OF **JPC CONTROLS**, THE REFUND OF THE PURCHASE PRICE.

SPECIFICATIONS

MODEL 900D
RINSE CONTROLLER
NON RS232 MODELS

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, ~ 3200 HZ
SETUP MEMORY	EEPROM, All Parameters
MEMORY RETENTION	10 Years w/o Power
OPERATING RANGE	0 to 50 Degrees C
STORAGE RANGE	-40 to 60 Degrees C
CONSTRUCTION	Enclosure - Kydex, Black Face - Lexan, Back Printed
SIZE	8.25 x 3 x 5.25 inches (HxWxD) 210 x 76 x 133mm
WEIGHT	$\leq$ 4 Lbs. (1.8 kg)
CONNECTION	Pneumatic - Rear, Tubing, 1/16" ID, Polyurethane, Color Coded Electrical - Rear, Screw-Type, 3/8 inch centers
OUTPUT	Pneumatic Solenoid, Internal, 100 PS1G Max. External Audio - Transistor, Open Collector, 100 MA, 12VDC.

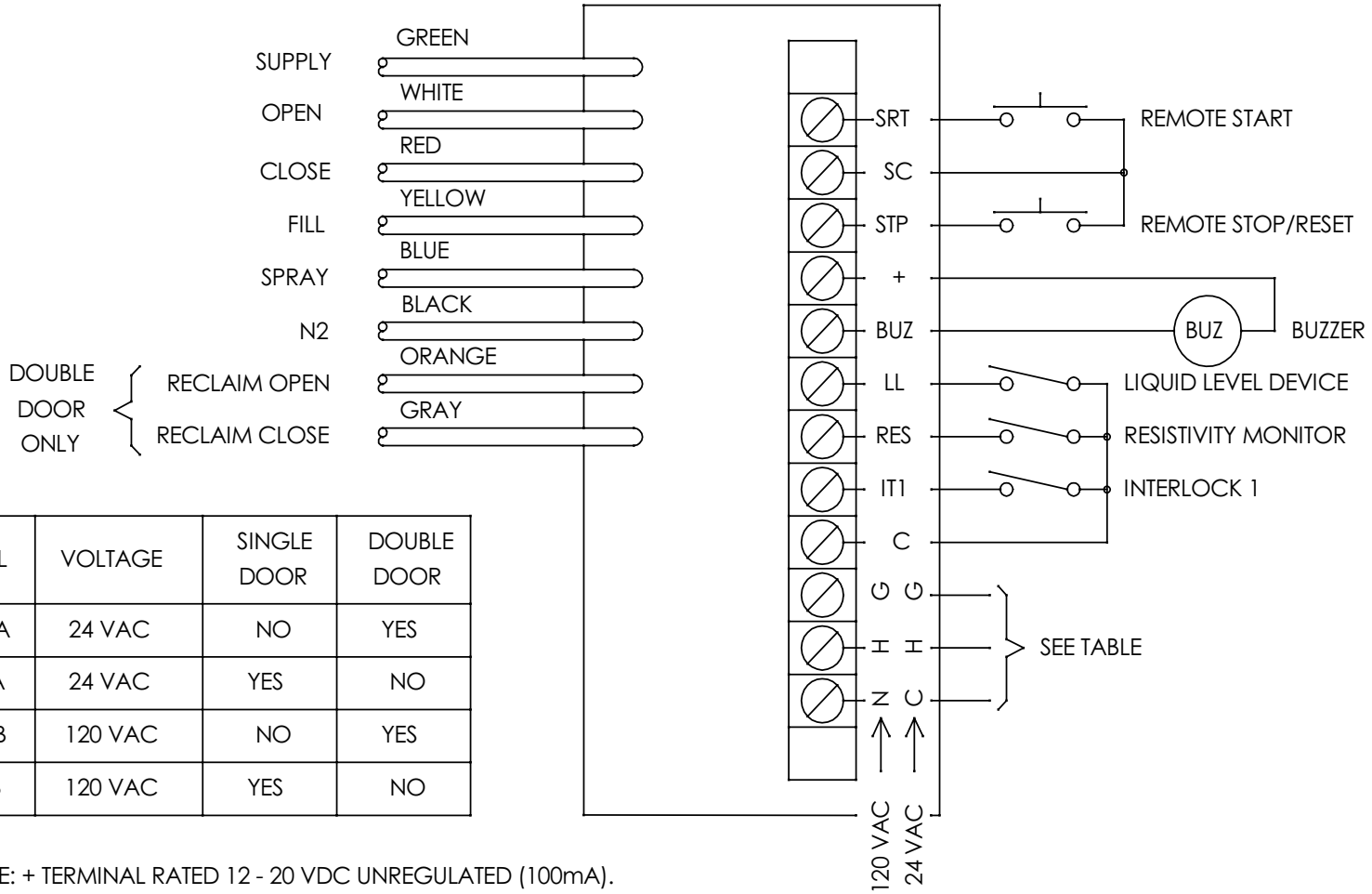
POWER	900DSA - 7 VA, 24 VAC ±10%, 50/60 HZ 900DSB - 7 VA, 120 VAC ±10%, 50/60 HZ 900DDA - 7 VA, 24 VAC ±10%, 50/60 HZ 900DDB - 7 VA, 120 VAC ±10%, 50/60 HZ

SPECIFICATIONS

MODEL 900D
RINSE CONTROLLER
RS232 MODELS

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	EEPROM, All Parameters
MEMORY RETENTION	10 Years w/o Power
OPERATING RANGE	0 to 50 Degrees C
STORAGE RANGE	-40 to 60 Degrees C
CONSTRUCTION	Enclosure - Kydex. Face - Lexan, Back Printed
SIZE	8.25 x 3.75 x 5.25 inches (HxWxD) 210 x 95.25 x 133mm
WEIGHT	$\leq$ 4 Lbs. (1.8 kg)
CONNECTION	Pneumatic - Rear, Tubing, 1/16" ID, PVC, Color Coded, 24" long. Electrical - Rear, Screw-Type, 3/8 inch centers
OUTPUT	Pneumatic Solenoid, Internal, 100 PS1G Max. BUZ - Transistor, Open Collector, 100 MA, 12VDC.

POWER	900DSC - 10 VA, 24 VAC ±10%, 50/60 HZ 900DSD - 10 VA, 120 VAC ±10%, 50/60 HZ 900DDC - 10 VA, 24 VAC ±10%, 50/60 HZ 900DDD - 10 VA, 120 VAC ±10%, 50/60 HZ



MODEL	VOLTAGE	SINGLE DOOR	DOUBLE DOOR
900DDA	24 VAC	NO	YES
900DSA	24 VAC	YES	NO
900DDB	120 VAC	NO	YES
900DSB	120 VAC	YES	NO

NOTE: + TERMINAL RATED 12 - 20 VDC UNREGULATED (100mA).

TOLERANCES UNLESS OTHERWISE SPECIFIED

ALL DIMENSIONS ARE IN INCHES

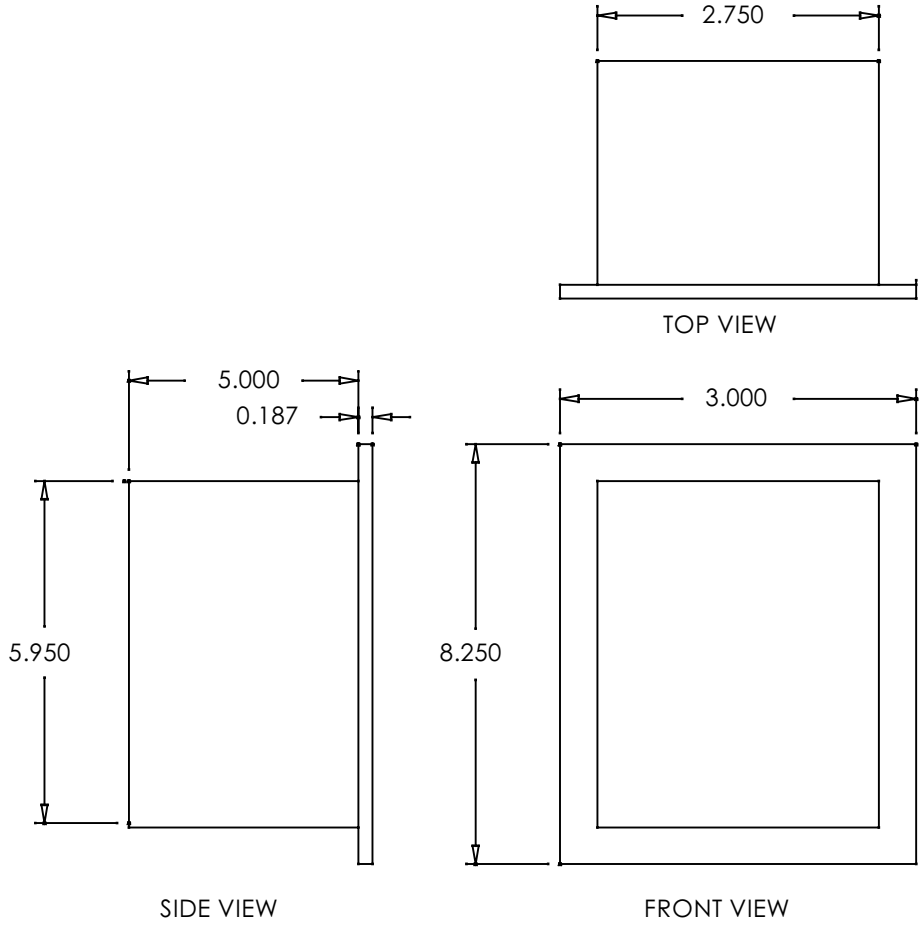
PATH = E:\CC\DT900\900DB12.SLDDRW

JPC CONTROLS

102 COMPASS PT. DR. STE. D, ST. CHARLES, MO 63301
(636) 946-3300 Fax (636) 724-2492 www.jpccontrols.com

PROCON 900DDA/900DSA/900DDB/900DSB
DUMP RINSER REAR PANEL

APPROVAL		DWN BY	MPJ	DATE	08/07/02	SCALE	NONE	CHKD BY	
ENG	DATE	SHEET							
QA	DATE	1 OF 1		13	090052			10	02



TOLERANCES UNLESS OTHERWISE SPECIFIED	JPC CONTROLS 102 COMPASS PT. DR. STE. D, ST. CHARLES, MO 63301 (636) 946-3300 Fax (636) 724-2492 www.jpccontrols.com							
	PROCON 900DDA/900DSA/900DDB/900DSB DUMP RINSER PHYSICAL DIMENSIONS							
	APPROVAL		DWN BY MPJ	DATE 12/9/99	SCALE NONE	CHKD BY		
ALL DIMENSIONS ARE IN INCHES	ENG	DATE	SHEET					
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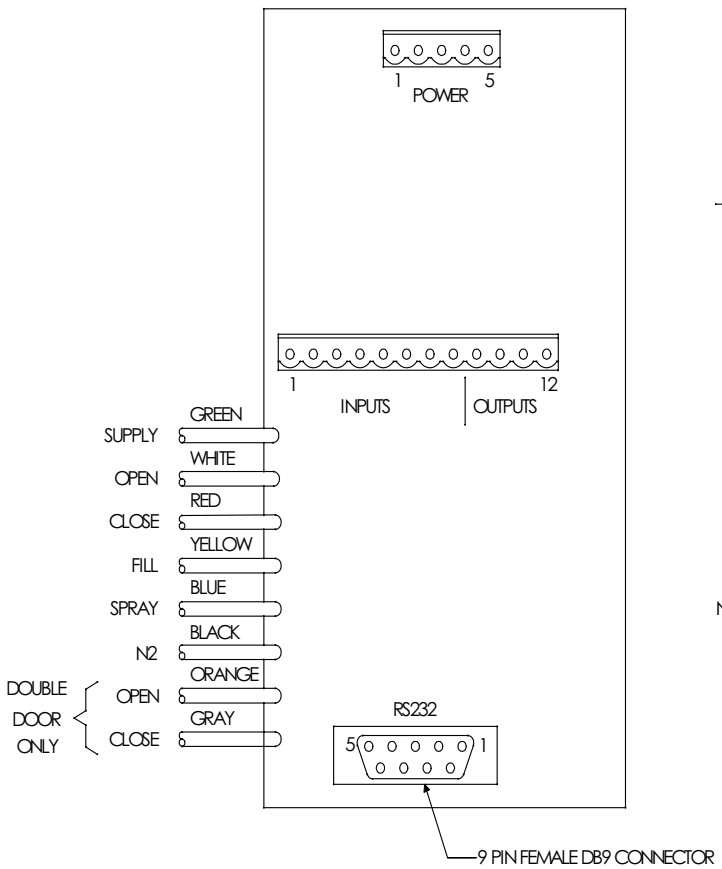
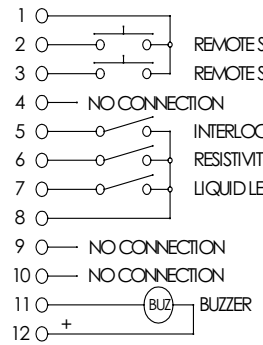


POWER CONNECTOR

1	EARTH GROUND
2	N/C
3	120 VAC NEUTRAL/24 VAC COMMON
4	N/C
5	120 VAC HOT/24 VAC HOT

INPUT/OUTPUT CONNECTOR



NOTE: + TERMINALS RATED 7-12 VDC UNREGULATED (50mA).

RS232 CONNECTOR

1	N/C
2	TxD
3	RxD
4	N/C
5	COMMON
6	N/C
7	N/C
8	N/C
9	N/C

MODEL	VOLTAGE	SINGLE DOOR	DOUBLE DOOR
900DSC	24 VAC	YES	NO
900DDC	24 VAC	NO	YES
900DSD	120 VAC	YES	NO
900DDD	120 VAC	NO	YES

MATING CONNECTORS ARE WEIDMULLER TERMINAL TYPE BL
BL5 - 5 PIN, CATALOG NO. 12594.6
BL12 - 12 PIN, CATALOG NO. 12601.6
NOTE: WEIDMULLER CONNECTORS ARE SIDE STACKABLE.

TOLERANCES UNLESS OTHERWISE SPECIFIED

ALL DIMENSIONS ARE IN INCHES

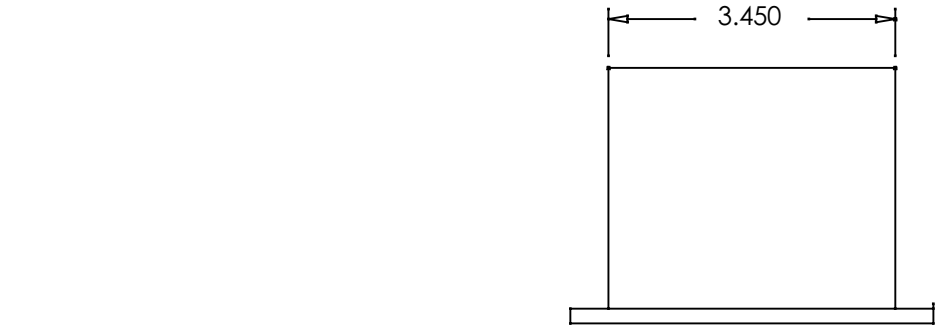
PATH = E:\CC\DT900\900DRS232B11.SLDDRW

JPC CONTROLS 102 COMPASS PT. DR. STE. D, ST. CHARLES, MO 63301 (636) 946-3300 FAX (636) 724-4296 www.jpccontrols.com

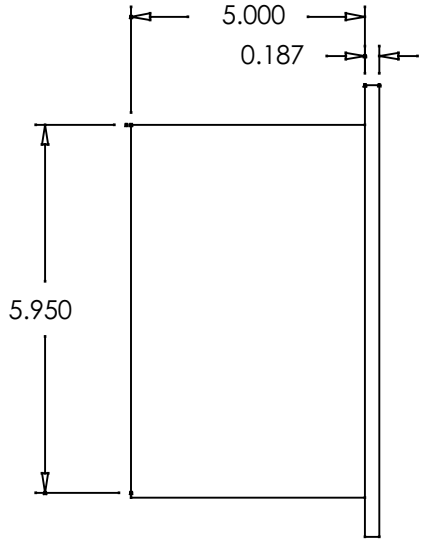
PROCON 900DDC/900DSC/900DDD/900DSD
DUMP RINSER REAR PANEL

APPROVAL		DWN BY	DATE	SCALE	CHKD BY
ENG	DATE	MPJ	08/07/02	NONE	
QA	DATE	SHEET 1 OF 1			

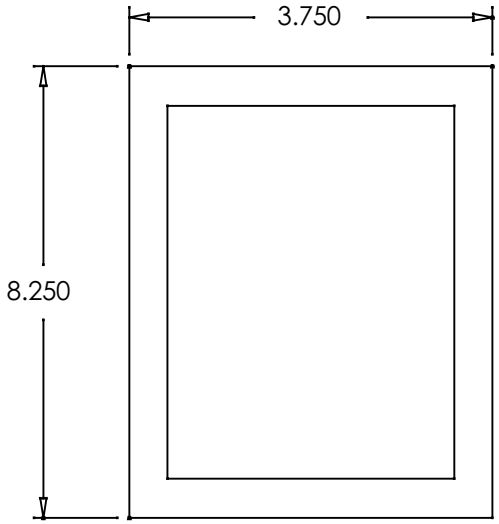
13 090075 20 01



TOP VIEW



SIDE VIEW



FRONT VIEW

TOLERANCES UNLESS OTHERWISE SPECIFIED	JPC CONTROLS 102 COMPASS PT. DR. STE. D, ST. CHARLES, MO 63301 (636) 946-3300 Fax (636) 724-2492 www.jpccontrols.com								
	PROCON 900DDC/900DSC/900DDD/900DSD DUMP RINSER PHYSICAL DIMENSIONS								
	APPROVAL		DWN BY MPJ	DATE 07/05/02	SCALE NONE	CHKD BY			
ALL DIMENSIONS ARE IN INCHES	ENG	DATE	SHEET						
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COMMUNICATIONS SUPPLEMENT

This supplement contains information relating to the RS232 option for the PROCON Model 900D Dump Rinser. This option allows the user to have direct access to the Controller via a standard RS232 link. Through this serial link, all of the standard functions of the Controller may be activated, tested and adjusted.

Since this unit is a Controller, it does not handle a great deal of data. Therefore, the link has been optimized to allow the user, through very simple instructions, to control and interrogate the unit.

Six 'key' commands allow the user to instruct the Controller to perform all of its normal operations. However, only a couple of these are actually required for computer operation. The remainder are provided, but are not often used, since these keys are utilized in programming. The serial link has direct access to the programming stack through the 'READ', 'WRITE', 'UP LOAD' and 'DOWN LOAD' commands without using 'key' commands. Utilizing these commands, the serial link can interrogate or overwrite any or all of the items in the PROGRAM stack.

The basic status conditions for the Controller are accessed through 1 byte. This byte may be read out at any time using the 'STATUS' command.

The Controller may be hooked to any standard terminal or computer system via the DB9 connector on the back panel. The pin out follows the standard IBM DB9 configuration. Therefore, it may be wired directly to an IBM PC/AT or its equivalent. The link is fixed at 9600 baud, 8 bit, 1 stop and 1 start bit, no parity. This link only requires 3 leads to function. As viewed from the Controller, Pin 5 is the 'Signal Ground', Pin 3 is 'Receive Data' and Pin 2 is 'Transmit Data'.

The internal ACIA utilizes a full duplex interrupt driven transmission scheme. Thus, the unit may receive and transmit simultaneously, as well as continue to perform its normal functions. Therefore, the Controller may be interrogated even though it is performing its program.

The Protocol for the serial link consists of 7 basic commands:

K - KEY
S - STATUS
R - READ
W - WRITE
D - DOWN LOAD
U - UP LOAD
X - CANCEL (CLEAR)

All commands will be prefixed by one of these 7 letters. The data format is standard ASCII and all data, with the exception of the Status Bytes are BCD values. The Status Bytes are transmitted in ASCII as hexadecimal, since they contain bit information.

UP LOAD and DOWN LOAD are the only group commands. They each have a specific format and a specific number of bytes of information. They are structured to DOWN LOAD all of the programming information at one time or READ the complete programming stack. All of the rest of the commands are structured to handle the data one byte at a time.

The following is a breakdown of each of the commands and the way they are accessed. It should be noted that the format allows for the unit to be hooked directly to a dumb computer terminal. This can be very useful in checkout. The unit will echo all characters that are typed to it. When used with a terminal, this will provide the appropriate display. When used with a computer system, this will provide direct feedback of the fact that unit has accepted the data.

All commands are completed with a carriage return from the computer. With the exception on the CANCEL command (X), all commands will be acknowledged by a carriage return, line feed ($0D,$0A).

KEY COMMAND

The KEY COMMAND allows the user to instruct the Controller just as would be done by depressing the Face Panel keys. The exact operation and sequence for these keys is covered in the Controller manual. This description will simply indicate how the link may be used to send these key functions.

The command is entered as a letter followed by 2 numbers, followed by a carriage return:

K01(Return)

The 'K' indicates that this is to be a KEY command. The '01' indicates the KEY number and the 'Return' activates the command.
The following is a listing of the key numbers:

KEY NUMBER	KEY
01	START
02	PROGRAM
03	UP
04	STOP/RESET
05	OPEN
06	DOWN

When a KEY command is sent, the Controller will echo each of the characters and acknowledge with a carriage return line feed, once the command is entered. If an invalid command is detected, it will simply be ignored, although it will acknowledge the fact that the command has been received.

READ COMMAND

The READ command is utilized to read from the Controller any of the program data. The format for the command is essentially the same as the KEY command.

R07(Return)

The 'R' indicates to the Controller that the command is to be a READ command. The next two digits indicate the information that is to be read. The carriage return indicates that the command is to be activated. The following is a listing of the data locations that may be read:

DATA LOCATION	DESCRIPTION
01	SC
02	SD
03	SF
04	CY
05	RC
06	CC
07	CD
08	CF
09	EC
10	DC
11	SL
12	N2
13	EE
14	AS
15	AD
16	FL
17	FU
18	LT
19	DU
20	R1
21	R2
22	AC
23	RP
24	RL
25	REMAINING CYCLES

It should be noted that while most of the values will read out directly as they appear on the unit, the N2 and EE utilizes 0=No and 1=Yes. The RP parameter uses 0=First and 1=Last.

All data is returned in ASCII format with 2 BCD characters. The user should refer to the Controller Manual to determine the exact meaning of each of these readings.

STATUS

The STATUS command is utilized to access information that is utilized by the Controller to indicate its operating status. The same format as the KEY and READ commands is utilized to read the STATUS byte:

S01(Return)

The 'S' indicates the activation of a STATUS command. The number indicates the status byte that is to be read out. The carriage return activates the command. The following is a listing of the available bytes:

NUMBER	DESCRIPTION	
01	MODBYT	SYSTEM MODE

The system mode byte contains the basic operating information for the unit. The control algorithm sets the internal bits. The following is a listing of the meaning of each of the bits in the byte:

MODBYT

7-AUTO DUMP
6-LOCKOUT
5-MANUAL OPEN
4-HALT
3-DONE
2-PROGRAM
1-RUN
0-READY

These bytes require data transmission in a hexadecimal format. The actual data is sent as an ASCII character, but its meaning is translated in hexadecimal to determine the appropriate bit pattern. For example, the ASCII transmission of $31,$30 would translate to a hex reading of 10, which would indicate that the rinse controller has completed its cycle.

After the carriage return, the Controller will acknowledge with a carriage return line feed and then send the two ASCII characters that indicate the hex representation for the appropriate bit pattern requested.

WRITE

The WRITE command allows the user to overwrite all the information in the programming stack. It should be noted that while this information may be over written, it will not be permanently saved in the controller without first accessing the PROGRAM mode and then activating the SAVE command via the keys. If the values written are to be permanently saved in the controller's EEPROM memory, after all changes have been made, a K02 (SETUP) followed by a K04 (RESET) must be transmitted.

If it is not desirable to have these values permanently saved, the user may simply go in and overwrite the current information for temporary use. When the system is repowered, the information that is currently stored in its EEPROM will be reinserted into the Program stack.

The following is the format for this command:

W0107 (Return)

The command essentially follows the same format as all the previous commands. The 'W' indicates that it is a WRITE command, the next two characters indicate the location that is to be written to and the last four characters indicate the data value that is to be entered. Again, the data is in BCD and transmitted in an ASCII format. The example WRITE command would put 7 into the cycle count.

The data locations are the same as those covered in the READ command section. However, location 25 is READ only and may not be written to. It simply provides a Read Out of the running count of the remaining cycles.

UP LOAD

The UP LOAD command is utilized to READ all of the items in the SETUP Stack at one time. The following is the format for this command:

U(Return)

This is a single character command that instructs the controller to do a direct dump of the complete programming stack. The data will be transmitted as described in the READ COMMAND section with a carriage return line feed between each parameter.

DOWN LOAD

The DOWN LOAD command allows the user to overwrite the complete programming stack with one command. The following is the format for this command:

Dxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx(Return)

Where small 'x' is replaced by the data to be DOWN LOADED starting with data location 1 and running through data location 24.

The Controller will echo each of the characters as it is transmitted to confirm that it has been correctly received.

The data locations and the appropriate descriptions are identical to the stack shown under the READ command

CANCEL

The CANCEL command is simply a way to reestablish proper control, should an error occur or an incorrect command be transmitted. For the most part, an incorrect command will simply be ignored and the controller will prepare for an additional command. However, a command may be canceled midstream by transmitting an 'X' (ASCII). This command does not require a carriage return, nor will it acknowledge with a carriage return. However, it will echo an 'X' to indicate that the CANCEL command has been received.

The command may also be utilized as a clear and/or acknowledgment of the Controller being on line.