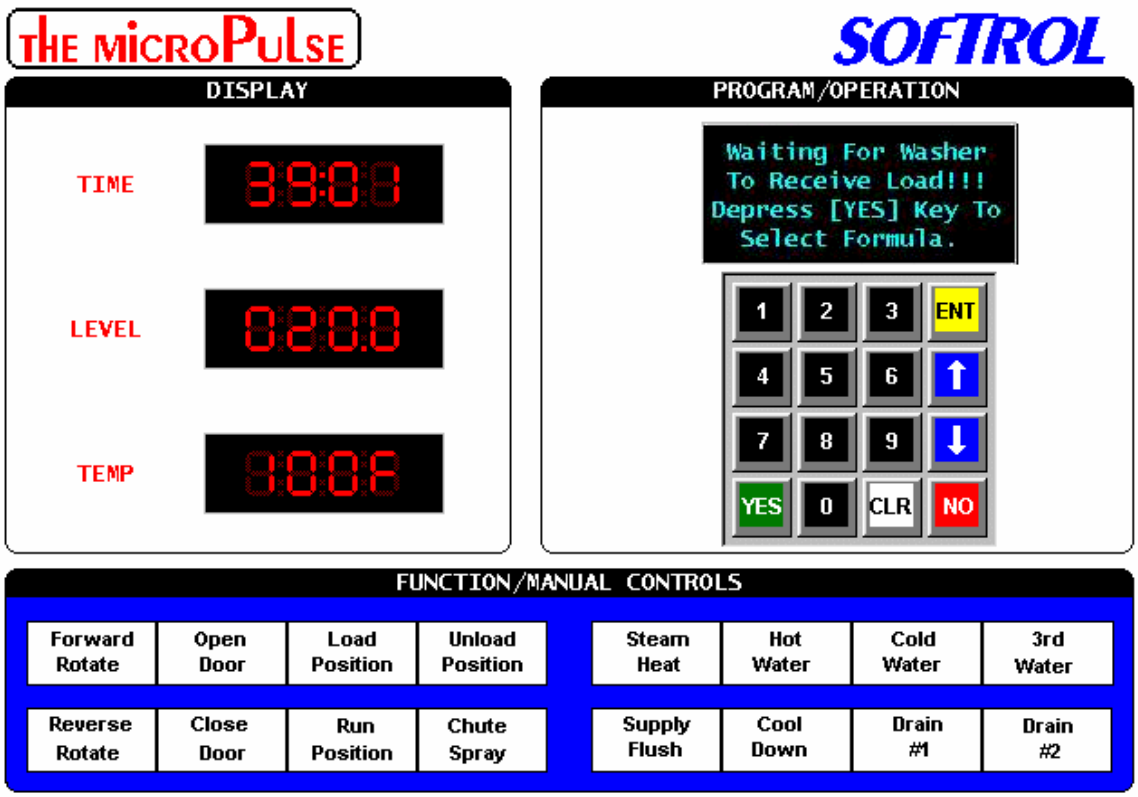
SOFTROL

Software & Control for Automation

MicroPulse Washer



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Introduction to the MicroPulse Controller

The Softrol MicroPulse Washer Controller is the most advanced, state-of-the art washer controller in the industry. Its software, specifically designed, provides safe and efficient control and easy formula programming. The controller automatically gathers production data to give clear indication of washroom efficiency. It is also communications ready, making it possible to transfer production data to a PC workstation via PulseNet, our proprietary plant Floor Networking System. Its modular design allows quick troubleshooting procedures and allows for easy expansion by simply adding modules as needed.

The MicroPulse Controller consists of two units. The main control enclosure houses the microprocessor and provides the points of connection between the controller and the machine(s). It includes all the input and output modules necessary to actuate the machine and to completely control all the machine processes.

The second enclosure is the Front Panel Display (FPD). The FPD is typically mounted on the front of the machine, and the operator uses it to communicate with the controller. Its operation is easy. Once the machine has been loaded, the operator presses the [YES] key and then selects the desired formula. Password protected access allows key personnel to program new formulas and operations.

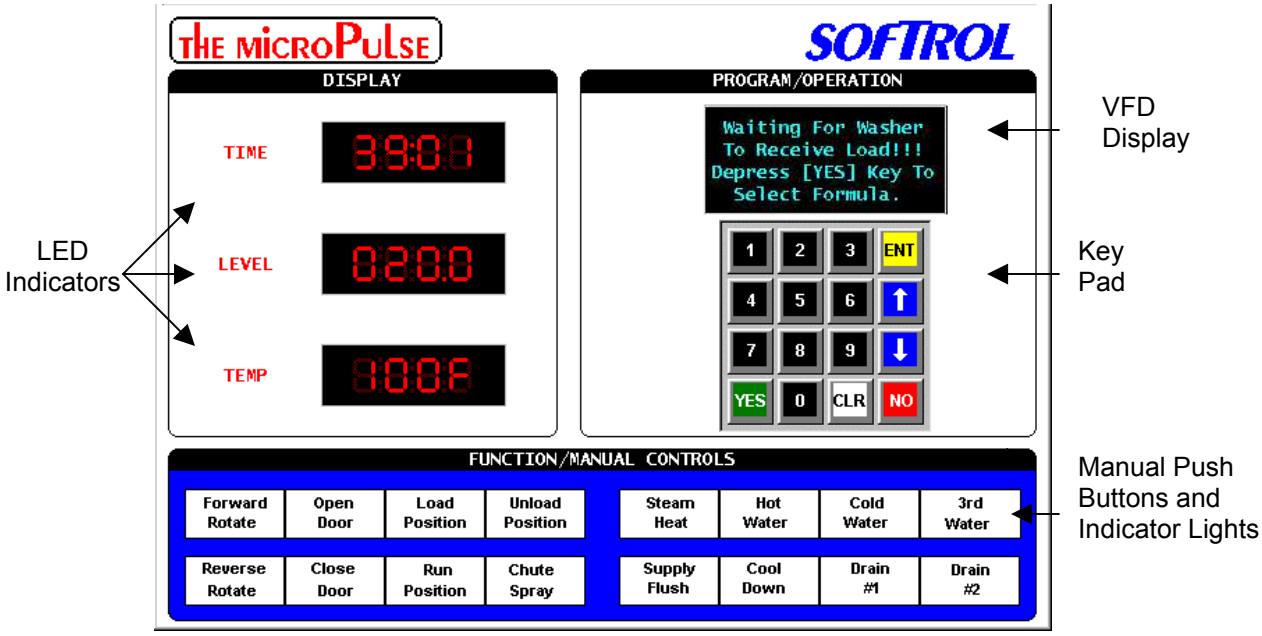
The MicroPulse Controller Front Panel is constructed of corrosion-resistant materials. Its operator-friendly interface reduces the learning curve and speeds up the creation and editing of formulas. The programming mode can only be entered via high-level user passwords for security. There are 128 different formulas and 64 operations that can be programmed and referenced by either name or number. The MicroPulse keeps in its memory information about the loads processed (including date and time stamping of each load), load time, formula executed, formula time, satisfy time (fill, steam, extract unbalance, etc.) and unload time.

The MicroPulse has two basic operating states: Normal Operating Mode and Password Protected Mode.

In the Normal Operating Mode, the MicroPulse Controller will execute programmed formulas, control all aspects of machine operation, monitor and record pertinent machine and process information, and monitor all user-defined operation parameters (i.e., Machine Setups).

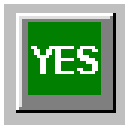
The Password Protected Mode allows personnel access to one of seven levels of protected menus via a password. These different levels allow specific users to perform a variety of tasks including programming the controller, calibrating chemical injection systems, specifying user-defined Machine Setups, as well as many other advanced control functions.

Notes:

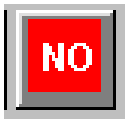


The Front Panel Display (FPD) on the MicroPulse control has a 4 line by 20-character vacuum florescent display (VFD), 3 light emitting diodes (LED) indicators for time, water level and temperature displays. 16 key pad for data entry, and 16 pushbuttons with indicator lights for manual operation.

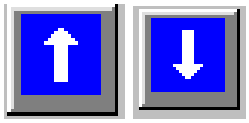
Key Pad Description



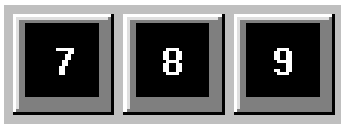
Press the [YES] key to display the formula selection menu. The [YES] key also restarts the formula after it has been paused. In the programming mode, the [YES] key is used to answer setup and programming questions. In the vocabularies mode, the [YES] key moves the cursor left.



The [NO] key pauses the formula. In the vocabularies mode, the [NO] key moves the cursor right.



The [UP] and [DOWN] arrow keys are used to scroll while in programming, formula advancement, and a various list of choices.



The numerical keys are used to program and setup the machine along with formula starting without the use of scrolling.

The [ENT] key is used to accept choices while in programming, machine setup, and formula starting.

The [CLR] key can be used to pause an operator signal or maintenance alarm for the programmed time in the customer Silent Alarm setups. Pressing the [CLR] key will not silence safety alarms. The [CLR] key is also used in setups and programming to clear the value being programmed setting the value to “0”.

Light Emitting Diode (LED) Indicators

The time indicator represents different times depending on the mode of operation.

Formula Execution Mode
During this mode, the time indicator represents in minutes and seconds the time remaining in the formula. This time is the sum of all step times programmed in the formula. This time does not include steams, fills, or other wait times. The time decreases as the formula proceeds. The time is held while the formula is paused or waiting to satisfy.

Unload Mode
The time display shows the time that the machine has waited to be unloaded.

Load Mode
The time display shows the time that the machine has waited to be loaded.

Programming Mode
The time displays show the hexadecimal number corresponding to the current menu location. Please note. The Load/Unload time does not increase while in the password protected programming mode.

The level display shows the actual water level inside the machine in inches or millimeters.

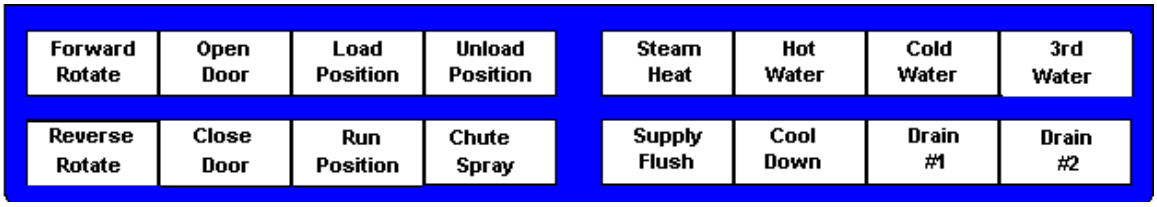
The temperature indicator represents different displays depending on the mode of operation.

Formula Execution Mode
During this mode, the temperature indicator represents the actual temperature inside the machine in either Celsius or Fahrenheit.

Programming Mode
The temperature indicator provides information about previous edits performed on the formula or operation. A “0” in the display indicates that the formula or operation has not been edited since it was created. The editing password level is indicated if the formula or operation has been edited.

Access Totals Mode
The temperature indicator represents the last 101 formula executions. As you scroll through the list, the indicator increases or decreases depending on the scrolling direction. A “1” indicates the last wash.

Manual Pushbuttons and Indicator Lights



The Manual Pushbuttons (PB) can be programmed in the machine setups to operate by using a password only Manual Pushbuttons = No meaning that the pushbuttons will only work after entering a valid password or by answering Yes for the normal mode. The Gentle Action pushbutton will not work in the normal mode.

Forward Rotate PB 1
This PB rotates the cylinder forward (clockwise) during loading and unloading and is only active on tilting machines. The indicator light illuminates when the cylinder is rotating in the forward direction.

Open Door PB 2
This will open the machines doors. Please note that all safeties must be met for the door to unlock i.e. no water in the machine or cylinder not rotating. The indicator light illuminates when the door is fully opened.

Load Position PB 3
On equipped machines, this will raise the front of the machine into the loading position. The indicator light illuminates when the machine is in the load position

Unload Position PB 4
On equipped machines, this will raise the rear of the machine into the unloading position. The indicator light illuminates when the machine is in the unload position.

Reverse Rotate PB 5
This PB rotates the cylinder reverse (counter clockwise) during loading and unloading and is only active on tilting machines. The indicator light illuminates when the cylinder is rotating in the reverse direction.

Close Door PB 6
This will close the machines doors. The indicator light illuminates when the door is fully closed and locked.

Run Position PB 7
On equipped machines, this will lower the front/rear of the machine into the run position. The indicator light illuminates when the machine is in the run position

Chute Spray PB 8
Pressing this PB opens the chute spray water valve. The indicator light illuminates when the load spray is on.

Steam Heat PB 9
Pressing and holding this PB will open the steam valve. The indicator light illuminates when the steam valve is open.

Hot Water PB 10
Pressing and holding this PB will open the hot water valve. The indicator light illuminates when the hot water valve is open.

Cold Water PB 11
Pressing and holding this PB will open the cold water valve. The indicator light illuminates when the cold-water valve is open.

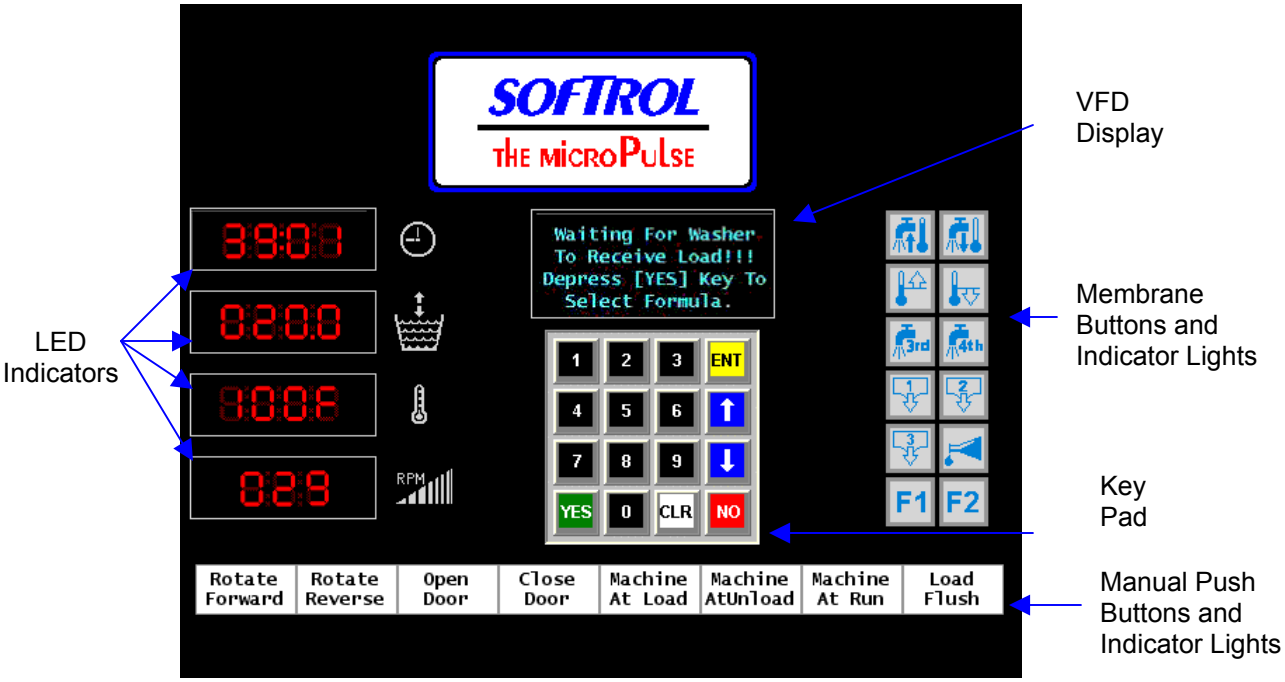
3rd Water PB 12
Pressing and holding this PB will open the 3rd water valve. The indicator light illuminates when the 3rd water valve is open.

Supply Flush PB 13
Pressing and holding this PB will open the supply flush water valve. The indicator light illuminates when the supply flush water valve is open.

Cooldown PB 14
Pressing and holding this PB will open the cooldown water valve. The indicator light illuminates when the cooldown water valve is open.

Drain #1 Open PB 15
Pressing and holding this PB will open drain 1. The indicator light illuminates when the drain 1 is open.

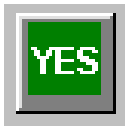
Drain #2 Open PB 16
Pressing and holding this PB will open drain 2. The indicator light illuminates when the drain 2 is open.



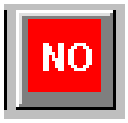
The MicroPulse Plus FPD is very similar than that of the standard MicroPulse.

The Front Panel Display (FPD) on the MicroPulse Plus control has a 4 line by 20-character vacuum florescent display (VFD), 4 light emitting diodes (LED) indicators for time, water level, temperature, and RPM displays. 16 key pad for data entry, and 8 pushbuttons with indicator lights and 12 Membrane buttons with indicator lights for manual operation.

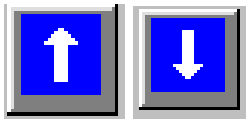
Key Pad Description



Press the [YES] key to display the formula selection menu. The [YES] key also restarts the formula after it has been paused. In the programming mode, the [YES] key is used to answer setup and programming questions. In the vocabularies mode, the [YES] key moves the cursor left.



The [NO] key pauses the formula. In the vocabularies mode, the [NO] key moves the cursor right.



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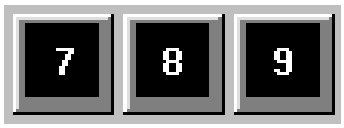


The numerical keys are used to program and setup the machine along with formula starting without the use of scrolling.

The [ENT] key is used to accept choices while in programming, machine setup, and formula starting.

The [CLR] key can be used to pause an operator signal or maintenance alarm for the programmed time in the customer Silent Alarm setups. Pressing the [CLR] key will not silence safety alarms. The [CLR] key is also used in setups and programming to clear the value being programmed setting the value to “0”.

Light Emitting Diode (LED) Indicators

The time indicator represents different times depending on the mode of operation.

Formula Execution Mode
During this mode, the time indicator represents in minutes and seconds the time remaining in the formula. This time is the sum of all step times programmed in the formula. This time does not include steams, fills, or other wait times. The time decreases as the formula proceeds. The time is held while the formula is paused or waiting to satisfy.

Unload Mode
The time display shows the time that the machine has waited to be unloaded.

Load Mode
The time display shows the time that the machine has waited to be loaded.

Programming Mode
The time displays show the hexadecimal number corresponding to the current menu location. Please note. The Load/Unload time does not increase while in the password protected programming mode.

The level display shows the actual water level inside the machine in inches or millimeters.

The temperature indicator represents different displays depending on the mode of operation.

Formula Execution Mode
During this mode, the temperature indicator represents the actual temperature inside the machine in either Celsius or Fahrenheit.

Programming Mode
The temperature indicator provides information about previous edits performed on the formula or operation. A “0” in the display indicates that the formula or operation has not been edited since it was created. The editing password level is indicated if the formula or operation has been edited.

Access Totals Mode
The temperature indicator represents the last 101 formula executions. As you scroll through the list, the indicator increases or decreases depending on the scrolling direction. A “1” indicates the last wash.

The level RPM shows the actual RPM’s of the machine while in the loading, unloading and formula processing modes.

Manual Pushbuttons and Indicator Lights

Rotate Forward	Rotate Reverse	Open Door	Close Door	Machine At Load	Machine AtUnload	Machine At Run	Load Flush

The Manual Pushbuttons (PB) can be programmed in the machine setups to operate by using a password only Manual Pushbuttons = No meaning that the pushbuttons will only work after entering a valid password or by answering Yes for the normal mode.

Rotate Forward PB 1
This PB rotates the cylinder forward (clockwise) during loading and unloading and is only active on tilting machines. The indicator light illuminates when the cylinder is rotating in the forward direction.

Rotate Reverse PB 2
This PB rotates the cylinder reverse (counter clockwise) during loading and unloading and is only active on tilting machines. The indicator light illuminates when the cylinder is rotating in the reverse direction.

Open Door PB 3
This will open the machines doors. Please note that all safeties must be met for the door to unlock i.e. no water in the machine or cylinder not rotating. The indicator light illuminates when the door is fully opened.

Close Door PB 4
This will close the machines doors. The indicator light illuminates when the door is fully closed and locked.

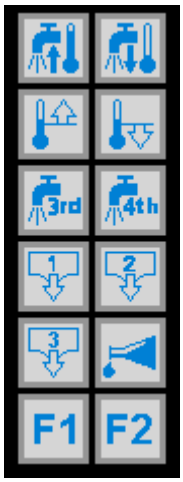
Machine at Load PB 5
On equipped machines, this will raise the front of the machine into the loading position. The indicator light illuminates when the machine is in the load position

Machine at Unload PB 6
On equipped machines, this will raise the rear of the machine into the unloading position. The indicator light illuminates when the machine is in the unload position.

Machine at Run PB 7
On equipped machines, this will lower the front/rear of the machine into the run position. The indicator light illuminates when the machine is in the run position

Load Flush PB 8
Pressing this PB opens the load spray water valve. The indicator light illuminates when the load spray is on.

Manual Membrane Buttons and Indicator Lights



Hot Water PB 1
Pressing and holding this PB will open the hot water valve. The indicator light illuminates when the hot water valve is open.

Cold Water MB 2
Pressing and holding this MB will open the cold water valve. The indicator light illuminates when the cold-water valve is open.

Steam Heat MB 3
Pressing and holding this MB will open the steam valve. The indicator light illuminates when the steam valve is open.

Cooldown PB 4
Pressing and holding this MB will open the cooldown water valve. The indicator light illuminates when the cooldown water valve is open.

3rd Water MB 5
Pressing and holding this MB will open the 3rd water valve. The indicator light illuminates when the 3rd water valve is open.

4th Water MB 6
Pressing and holding this MB will open the 4th water valve. The indicator light illuminates when the 4th water valve is open.

Drain #1 Open MB 7
Pressing and holding this MB will open drain 1. The indicator light illuminates when the drain 1 is open.

Drain #2 Open MB 8
Pressing and holding this MB will open drain 2. The indicator light illuminates when the drain 2 is open.

Drain #3 Open MB 9
Pressing and holding this MB will open drain 2. The indicator light illuminates when the drain 2 is open.

Supply Flush PB 10
Pressing and holding this PB will open the supply flush water valve. The indicator light illuminates when the supply flush water valve is open.

F1 MB 11
Pressing and holding this MB will open the inner door on washers equipped with a hopper loading system. The indicator light illuminates when the inner door is open.

F2 MB 12
Pressing and holding this MB will close the inner door on washers equipped with a hopper loading system. The indicator light illuminates when the inner door is closed.

Notes:

Starting a Formula

To execute a formula you must start from the Waiting to Load screen.

Waiting for Washer
to Receive Load!!
Depress [YES] Key to
Select Formula

Press the [YES] key.

Formula Number 0
Use arrow key to select

ENTER=accept 0=exit

Enter the desired formula number or using the arrow keys, scroll to the desired formula number to be executed. For example to execute formula number 100 press [1][0][0].

Formula # 100
Sheets
Use arrow key to select
ENTER=accept 0=exit

Press [ENT].

If the chemicals are added using ratio metric and in the user setups Prompt Weight = YES, the following will be displayed on the LCD. If Prompt Weight = NO, skip to next screen.

Sheets

Key in Pounds (kilograms) 0
ENT=Run N=Cancel

Enter the weight of the load. For example if the load size is 987 pounds (448 kilograms) press [9][8][7] ([4][4][8]) then press [ENT]. If there are no faults, the audible and visual alarms will start alerting the operator the machine is preparing to start.

Sheets
Step # 1 Line # 2
Paused [YES] Starts
T=0:21 S=10:00

Press [YES] to start formula execution.

Sheets
HOT SUDS
Step # 1 Line # 2
T=0:26 S=9:56

After the formula execution, the MicroPulse controller will start timing how long it takes to unload the machine. The display will read.

Sheets
Waiting for Washer
To Unload!!
Press [YES] Key Continue

Press the [YES] key.

Sheets
Waiting For Washer
To Unload!!!
T=35:46 Step =0:00

The display shows the last formula to be executed. Formula number 100: Sheets. The display shows how long the formula ran during that execution. T=35:46.

Resetting the MicroPulse
To be able to execute another formula, the control must be reset to the Waiting to Load display. There are two ways to do this. The first way being opening the door and tilting to the unload position then returning to the run position. The second way to reset the display to the Waiting to Load screen, enter a valid level 1 to 7 password. Now press the [ENT] + [NO] simultaneously to reset the display.

MicroPulse Tilting Machines
To unload a tilting machine, press and hold the [Open Door] button. After the door is fully opened, the [Open Door] button will remain illuminated.

To tilt the machine for unloading, press and hold the [Unload Position] button. When the machine stops, it is at full tilt. The [Unload Position] button will remain illuminated.

To rotate the load from the basket depending on the user defined setups, the [Forward Rotate] and the [Reverse Rotate] buttons work differently. In the user defined setups if Reversing Unload= Yes, pressing and holding the [Forward Rotate] button rotates the machine forward for 8 seconds then reverse for 8

seconds or to the unload sequence that is programmable in each formula. If at any time during this process the operator releases the [Forward Rotate] button, the timers reset. If Reversing Unload= No, the operator can press and hold either the [Forward Rotate] button or the [Reverse Rotate] button depending on the direction preferred.

After the unloading is complete, press the [Run Position] button until the machine to returns to the run position. When the machine stops tilting, the [Run Position] button to remain illuminated. This resets the display to the Waiting to Load screen.

To tilt the machine for loading, press and hold the [Load Position] button until machine stops tilting. The [Load Position] button will illuminate.

MicroPulse Non-tilting Non-pass Through Machine
To unload a non-tilting side loading machine, press and release the [JOG] button. This will automatically rotate the machine to unload side 1.

After the machine stops rotating, if equipped with a powered door, open the door by pressing the [Door Actuate or FUNCTION] + [Door Open]. The machine will open the door automatically. Open the inner door and unload the pocket.

After the pocket is unloaded, close and lock the inner door.

To close the powered door, press and holding the [Door Actuate] + [Door Close]. The machine will close the door. If the [Door Actuate] or the [Door Close] button is released or if the door photo-eye circuit is broken, the door will stop closing until all safeties are again met.

After closing the powered door, press and release the [JOG] button. This will automatically rotate the machine to unload side 2. Repeat the above for unloading side 2.

MicroPulse End Loading Non-tilting Non-pass Through Machine
Press and hold the [Open Door] button. After the door latch is released, open the door and unload the goods.

To reset the display to the Waiting to Load screen, press the [ENT] + [NO] simultaneously. On non-tilting non-pass through machines, the user is required to press the [ENT] + [NO] simultaneously to reset the display.

Waiting for Washer
to Receive Load!!
Depress [YES] Key to
Select Formula

Notes:

Setup Procedure

The machine setups tailor the operation to suit individual preferences and applications. These parameters are global meaning they affect all formulas. Some of these parameters (maximum temperature, for example) can also be set locally to override the global parameters and only effect the current formula. Local parameters are normally used in special circumstances and are controlled through the Advanced Functions. Please refer to the Advanced Functions for information. Use the following sequence to set up the user programmable features.

From the “Waiting to Receive Load” display, enter a valid level 7 password (please refer to Passwords).

1=Setups 2=Program
3=Maint. 4=Calibrate
5=Totals 6=Clock
Selection? 0=exit

Select 1=Setups

1=Watchdogs/Setups
2=Chemical Setups

Select 1=Watchdogs/Setups

1=Machine Setup
2=Maintenance Setup
3=Clear Ram Vocabs
4=Passwords 0=exit

Select 1=Machine Setup

The current setting is shown on the display. The Programmable Functions section describes all of the questions in detail.

Note
Use the [YES] or [NO] keys and the numbers on the keypad to change the answer to the setup questions. Some questions require the operator to enter a value.

Press the [ENT] key to accept the answer.

Press only the [ENT] key to accept the default or keep the previously programmed value.

You cannot go backwards through the questions. If you need to change the answer to a previous question, press the [ENT] key to accept the current values to the remaining questions then restart the procedure.

Press the [CLR] key to cleat the numeric value of the current question.

After all setups are complete pressing the [CLR] key will accept the changes. The MicroPulse does not store any of the changes in memory until the last setup question is answered and the [CLR] key is pressed. If the power is lost during the setup procedure, the changes will not take effect.

Metric System
This indicates whether the user desires the Level and Temperature prompts to be in Inches/Deg F or Millimeters/Deg C. If Metric Selected, prompts in the Setup routine will change to MM and Deg. C where appropriate. Answer YES for Metric or NO for English.

Manual Buttons
This indicates whether the user desires the Hot, Cold, 3rd Water, and Steam push buttons for actuation during the formula without password. If answered YES, then operators will be able to use push buttons.

Momentary Load
Y/N Yes allows the user to select whether an operator is to hold down a rotation button while loading. No allows the machine to be locked into rotation by pressing the Rotate Forward button. This must be answered NO in automatic loading and unloading systems.

All Chems Manual
If answered YES, then the setup will skip to the One Way W/Chems question. No allows the user to define if the machine will process with automatic chemicals 1 thru 8 or manual chemicals. Answering Yes will prompt the user for automatic chemicals 9 through 12 and 13 through 16. Please note, chemical outputs for chemicals 13 through 16 are not standard and must be ordered separately.

One Way W/Chems
This indicates whether the cylinder should rotate in one direction when chemicals are being added. Answer YES or NO. If answered NO, then the setup will skip to the Drain Delay question.

Chems Forward
If One Way W/Chems is selected, Chems Forward selects Forward direction with Chems. If not selected, Reverse direction is selected. Answer YES or NO.

Drain Delay
This is the delay time in MM:SS to be spent in Balance Speed before the drain is allowed to open. The drain delay may be set at 00:00 to 00:15 seconds.

Extract Retry
This indicates whether Extract Retry should be automatic after an extract unbalance. If selected, Extract will be attempted three times. Answer YES or NO. If answered NO, then the setup will skip to the Reversing Unload question.

Extract Retry Level
If Extract Retry is selected, the Retry Level is entered. This is the water level for the machine to fill back up to during an Extract Retry. The MicroPulse Control will automatically try to adjust water temperature to the temperature at the beginning of the extract process.

Reversing Unload
If answered Yes pressing the rotate forward button rotates the machine forward for 8 seconds then reverse for 8 seconds. If at any time during this process the operator lifts up on the rotate forward, the timers reset. If Reversing Unload= No, the operator can press either the rotate forward button or the rotate reverse button depending on the direction preferred.

3rd Water Valve
This indicates whether this machine is equipped with a 3rd water valve. Answer YES or NO. If answered NO, then the setup will skip to the Second Drain question. If answered YES, the Output rack for 3rd water valve is enabled.

3rd H2O Hot - Y/N allows the user to define if the 3rd water source is unavailable, to use hot water instead.

3rd H2O Cold - Y/N allows the user to define if the 3rd water source is unavailable, to use cold water instead.

3rd H2O 4th H2O - Y/N allows the user to define if the 3rd water source is unavailable, to use 4th water instead.

4th Water Valve - This indicates whether this machine is equipped with a 4th water valve. Answer YES or NO. If answered NO, then the setup will skip to the Second Drain question. If answered YES, the Output rack for 4th water valve is enabled.

4th H2O Hot - Y/N allows the user to define if the 3rd water source is unavailable, to use hot water instead.

4th H2O Cold - Y/N allows the user to define if the 3rd water source is unavailable, to use cold water instead.

4th H2O 3rd H2O - Y/N allows the user to define if the 3rd water source is unavailable, to use 4th water instead.

Second Drain
This indicates whether this machine is equipped with a 2nd drain valve. Answer YES or NO. If answered NO, then the setup will skip to the Chemical Watchdog question. If answered YES, the Output rack for second drain is enabled.

> **Third Drain** - This indicates whether this machine is equipped with a 3rd drain valve. Answer YES or NO. If answered YES, the Output rack for third drain is enabled.

Chemical Watchdog
This is the time the user defines is sufficient for a machine to hold itself while waiting for automatic chemicals either time based systems or flow metered systems.

Drain/Fill Watchdog
This is the maximum allowable time in MM:SS allowed for any individual water inlet to be on during a formula step. If a water inlet is on longer than the programmed water fill watchdog, a fill watchdog error is generated. A water fill watchdog usually indicates that the drain is leaking and frequent "refills" are being experienced or that the water inlet is experiencing problems.

Steam Inj. Watchdog
This is the maximum allowable time in MM:SS allowed for the steam inlet to be on during a formula step. If the steam inlet is on longer than the programmed steam watchdog, a steam watchdog error is generated. A steam watchdog usually indicates that the drain is leaking and frequent "refills" and frequent "re-steams" are being experienced or that the steam valve and/or steam distribution system is experiencing problems.

Cooldown Watchdog
This is the maximum allowable time in MM:SS allowed for the cooldown valve to be on during a cooldown operation in a formula step. If the valve is on longer than the programmed cooldown watchdog, a cooldown watchdog error is generated. This usually indicates a faulty cooldown valve.

Level Halt High
This is the maximum allowable inches of water allowed in the cylinder in ##.# inches. If the water level exceeds the Level Halt High, a Level Halt High error is generated. A Level Halt High usually indicates a water inlet that is not closing or a programming error in the formula. (i.e. Fill Hot 45.0 " with Level Halt High programmed at 30.0 ")

Temp. Halt Low Limit
This is the minimum allowable temperature in degrees allowed in the cylinder. If the water temperature falls below the Temp. Halt Low Limit, a Temp. Halt Low error is generated. This usually indicates a temperature probe fault.

Temp Halt High Limit
This is the maximum allowable temperature in degrees allowed in the cylinder. If the water temperature exceeds the Temp Halt High Limit, a Temp Halt High error is generated. This usually indicates a temperature probe fault or a sticking steam valve.

Level Deadband
The level deadband is programmed in ##.# inches to compensate for the closure of the water valves. If the Level Deadband is 1.0 " then water inlets will be turned off at desired water level - 1.0 ". Refills will also begin at desired water level - 1.0". Maximum Level Deadband is 3.0".

Refills Watchdog
The refills watchdog is programmed to alarm the operator if the number of refills to maintain a water level exceeds the programmed value. If the refills exceed Refills Watchdog, a Water Fill Watchdog, Refills Watchdog is generated. This usually indicates a leaky drain valve.

Flow Meter Y/N
This indicates whether the machine is equipped with a Water Flow Sensor to meter in water to the machine. Answer YES or NO. If answered NO, then the setup will skip to the Prompt Weight question. If answered yes you can choose up to three (3) meter types as follows:

> **Type 1**- This is one (1) water meter that meters both load spray and fill but utilizes separate K-factors.
>
> **Type 2**- This is two (2) water meters installed fill and load spray and utilizes separate K-factors
>
> **Type 3**- This is one (1) meter installed, and the load spray is not metered but is calculated by using the Load Spray K-factor simulating each .5 seconds of flush. For example:
>
> If Load Spray K-Factor = 100.0 and Flush = 30 gpm (measured) then 30/120= .25 gal * 100=25.0 Load Spray K- Factor)

Hot K-Factor
If a Hot Water Flow Meter installed, enter the K-Factor (pulses per gallon) of the installed flow meter.

Cold K-Factor
If a Cold Water Flow Meter installed, enter the K-Factor (pulses per gallon) of the installed flow meter.

3rd K-Factor
If a 3rd Water Flow Meter installed, enter the K-Factor (pulses per gallon) of the installed flow meter.

4th K-Factor
If a 4th Water Flow Meter installed, enter the K-Factor (pulses per gallon) of the installed flow meter.

Machine K-Equivalent
This setup is used in “Mass Thermo Volume Water” fills as described in the Instruction Defined section. This setup is intended to provide the control with the retained heat of the washer wheel.

Fabric K-Sp. Heat
This setup is used in conjunction with the Machine K-Equivalent setup. This setup is intended to provide the control with the retained heat of the fabric that is in the washer wheel.

Load Spray K-Factor
If Load Spray Flow Meter installed, enter the K-Factor (pulses per gallon) of the installed flow meter.

Hot Deadband
If Hot Water Flow Meter installed, enter the number of gallons to subtract from the desired gallons to compensate for the closure of the water valves.

Cold Deadband
If Cold Water Flow Meter installed, enter the number of gallons to subtract from the desired gallons to compensate for the closure of the water valves.

3rd Deadband
If 3rd Water Flow Meter installed, enter the number of gallons to subtract from the desired gallons to compensate for the closure of the water valves.

4th Deadband
If 4th Water Flow Meter installed, enter the number of gallons to subtract from the desired gallons to compensate for the closure of the water valves.

Volume Deadband
If Water Flow Meter installed, enter the number of gallons to subtract from the desired gallons to compensate for the closure of the water valves. This is also the default setting for a “Mass Thermo Volume Water” fills as described in the Instruction Defined section.

Prompt Weight
This indicates whether the operator wishes to prompt the weight of the load before the start of each formula. This allows the operator to use ratio metric fill if flow meter installed and also ratio metric chemical additions. Answer Once, Many or No. If answered NO, then the setup will skip to the Filter Pump question.

Once- Operator enters the load weight.

Many- Operator enters the weight of each sling or container and the control calculates the load weight.

Low Weight Allowed - If Prompt Weight is answered “Once” or “Many”, enter the Low Weight Value of valid weight range for the machine.

High Weight Allowed - If Prompt Weight is answered “Once” or “Many”, enter the High Weight Value of valid weight range for the machine.

Filter Pump
This indicates whether the machine is equipped with a Filter (Recirc) pump. Answer YES or NO.

Supply Dispensers
The user defines this when the machine is supplied with more than one manual chemical dispenser.

KVA Lockout
This is used for electrical motor synchronization on machines equipped with high current motors. If answered YES, the output for KVA Lockout is enabled. Answer YES or NO.

Slow Drain
This allows the user to define if the machine is to drain fully when the drain is opened or if the drain opens and closes during the draining step to reduce the amount of water going to the draining system.

pH System
This allows the user to define if there is a pH system integrated into the machines controls.

ArcNet Node
This allows the user to define if the machine is in an automated system or a manual system. This must be answered Yes in all automatic systems.

Maximum Volume
This is the maximum allowable gallons of water allowed on machines with a flow meter in the cylinder in 000 gallons. If the water level exceeds this setting a Level Halt High error is generated. A Level Halt High usually indicates a water inlet that is not closing or a programming error in the formula. (i.e. Fill Hot 500 Gallons with Maximum Volume programmed at 475 gallons)

Min. Steam Gradient
This allows the user to define how fast the machine will attempt to reach the desired temperature. A setting of 00.0" allows the steam valve to remain on until the desired temperature. A setting of 6.0" allows the steam valve to remain on for a 6 degree per minute rate.

Signal Mute Time
This allows the user to define how long a signal will be ignored when pressing the CLR key.

Ozone Option
This allows the user to define if the machine is an ozone-equipped machine. This is a special order machine.

Full Baud Rate
Y/N this is used only when a RS 232 port network is active on the REMK4A card.

Multidrop Net
Y/N this is used only when a RS 232 port network is active on the REMK4A card.

Serial ID #
This is used only when a RS 232 port network is active on the REMK4A card.

Catalyst Inject
This allows the user to define if the automatic chemical system is a metered system operating over an ArcNet type network.

Database ID# (Only on Machine Class Type 91-99 Systems)
This setup only displays if the Machine Class Type (listed below) is a type 91-99. Valid settings are 210-255. This is for semi-automatic or manually loaded machines that are automatically unloaded that include a PPMM database. This setting allows for multiple dryer classifications to be utilized. A setting of 0-209 will utilize the traditional machine class 91-99 listed below.

NOTE: THESE SETUPS ARE ONLY IF ARCNET NODE= YES.

Loading Position
This is the position for a shuttle to load the washer extractor. Positions are numbered in a system from 0 to 32. Position 0 is always to the far left of the wash aisle facing the wash aisle from the washer's aspect. The rightmost position is determined for each system and is the last needed position to the far right of the wash aisle facing the wash aisle from the washer's aspect. For bag-loaded machines, the loading position is determined by the machine's position in the bag-loading queue. For instance, if three machines were to be accessed by one rail queue, then the loading positions would be 1, 2 and 3 respectively.

Unloading Position
This is the position for a shuttle to unload the washer extractor. The unloading position setup follows the same rules as the loading position for shuttle loaded machines.

Machine Class Type
This is the class type of the machine. The valid range is 0 to 99. Certain machines may be equipped differently than other machines. In addition, certain processes may be preferred in particular machines. This is accomplished through using the Class Type. When items to be processed are entered into the AutoPulse system, they are assigned a Class Type Number for the Wash Classification. The corresponding items will be processed in a machine with a matching Class Number. ***ASSIGNING MACHINE CLASS TYPE 99 WILL PREVENT THE MACHINE FROM AUTOMATIC OPERATION AND IS USEFUL WHEN MAINTENANCE OR TESTING IS PERFORMED ON A MACHINE.***

On bag-loaded systems, the Machine Class Type corresponds to the Queue number of the rail system that will load the machine. In this case, if there are four different rail queues loading machines, then the machines will have either a Machine Class Type 1, 2, 3, or 4 respectively. All machines serviced by a rail queue must be capable of processing the same items.

On systems that do not have a database (PPMM or BLMI), or that it is or manually loaded and automatically unloaded, this will need to be set to 91. Machine Class 91 means that the washer formula and the dryer formula correspond.

For example, if the washer processes “Shop Towels” formula 45, the dryer must also be set up for Dry Class 91 and be programmed for “Shop Towels” at formula 45.

PLEASE NOTE: On manually loaded/automatically unloaded systems without a PPMM database (machine class type 91); formulas 1 to 99 will go to Dryer Class 91 and will unload onto an AutoPulse dryer unload conveyor to the destination number that matches the formula number.

For example, if the dryer processes “Shop Towels” formula 45, the dryer will unload to the AutoPulse Dryer Unload Conveyor and the conveyor will store the load at a destination of 45. Please see the AutoPulse Manual for setting up Post Process Destinations.

Formulas 100 to 128 automatically go to Dryer Class 95 which is usually a dryer By-Pass location. The shuttle setup for No-Dry Station 1 will need to be set to 95. This setup will also correspond with the calibrated shuttle position for No-Dry Sta. 1/Pos.

On systems that have a database (PPMM), that are semi-automatically loaded and automatically unloaded, this will need to be set to 91. In this instance, the Database ID listed above should match the PPMM PC ID. The formula number that is transferred from the loading device will have to match the item number and washer formula number in the PPMM database. For setting up the PPMM database, please refer to the PPMM manual.

Sequence Priority #
The sequence priority establishes the manner in which machines are selected for loading and unloading. Machines with a sequence priority of zero will rotate priority according to how long the machines have been waiting to load or unload. Machines with a sequence priority greater than zero attain a higher priority of selection than those units with a sequence priority of zero. A sequence Priority of 1 is the highest priority. The available machine with the smallest non-zero priority will be selected preferentially. Machines with the same priority will be handled in a shortest path algorithm, meaning that the machine closest to the current position of the shuttle or the first machine in a rail queue will be handled first.

Minimum Weight
This establishes the minimum weight that a machine will accept for a load.

Maximum Weight
This establishes the maximum weight that a machine will accept for a load.

Lo Formula Range 1
This establishes the minimum formula number for a formula range 1 that a machine will accept for a load. Three acceptable ranges can be established.

Hi Formula Range 1
This establishes the maximum formula number for formula range 1 that a machine will accept for a load.

Lo Formula Range 2
This establishes the minimum formula number for formula range 2 that a machine will accept for a load.

Hi Formula Range 2
This establishes the maximum formula number for formula range 2 that a machine will accept for a load.

Lo Formula Range 3
This establishes the minimum formula number for formula range 3 that a machine will accept for a load.

Hi Formula Range 3
This establishes the maximum formula number for formula range 3 that a machine will accept for a load.

Interference Pos. Lo
This establishes the first position for a machine where the automatic movements of the machine's door and/or chutes have a mechanical interference potential with shuttles. If the system has been designed without mechanical interference's, this setup may be programmed to 0.

Interference Pos. Hi
This establishes the last position for a machine where the automatic movements of the machine's door and/or chutes have a mechanical interference potential with shuttles. If the system has been designed without mechanical interference's, this setup may be programmed to 0.

Loading Height
This establishes the height that a scissors shuttle should be positioned at to load the machine. A height of 0 is the lowest height and a height of 99 is the highest height. If the system does not utilize a scissors shuttle , this setup may be programmed to 0.

Loading Depth
This establishes the depth that a scissors shuttle should be positioned at to load the machine. A depth of 0 is the depth of the shuttle when positioned at the shuttle's southern limit. Depth may increase to a maximum of 99. Depth's greater than the shuttle's middle limit establish positioning towards the shuttle's northern limit. If the system does not utilize a scissors shuttle, this setup may be programmed to 0.

Unloading Height
This establishes the height that a scissors shuttle should be positioned at to load the machine. A height of 0 is the lowest height and a height of 99 is the highest height. If the system does not utilize a scissors shuttle, this setup may be programmed to 0.

On machines with a chute door loading system there are four (4) settings that will change the pattern when unloading onto a shuttle.

Unload Height = 0
Machine, when unloading and at the run position, will start opening the door and then tilt to the unload position.

Unload Height = 97
Machine, when unloading and at run position, will open the door until the door open sensor is on then tilt to the unload position.

Unload Height = 98
Machine, when unloading will not begin to open the door until at the unload position.

Unload Height = 99
Machine, when unloading will begin to open the door once the run position sensor turns off.

Unloading Depth
This establishes the depth that a scissors shuttle should be positioned at to unload the machine. A depth of 0 is the depth of the shuttle when positioned at the shuttle's southern limit. Depth may increase to maximum of 98. Depth's greater than the shuttle's middle limit (98) establish positioning towards the shuttle's northern limit (mirrored washer).

If a washer is located to the northern limit (dryer side) of the wash isle, this setting must be set at 99. If the system does not utilize a scissors shuttle, this setup may be programmed to 0.

Loading the Defaults

Default Operations
From the Waiting to Load screen, enter a valid level 6 or 7 password.

1=Setups 2=Program
3=Maint. 4=Calibrate
5=Totals 6=Clock
Selection? 0=exit

Select 2=Program

1=Ops 2=Formulas
3=Clr Ops 4=Clr Forms
5=Copy 6=Vocabs
Selection? 0=exit

Select 3=Clr Ops

Load Defaults
Use YES/NO Keys
ENTER=accept 0=exit

Select YES then press [ENT]. This loads all default operations for quick reference.

Default Formulas
1=Ops2=Formulas
3=Clr Ops 4=Clr Forms
5=Copy 6=Vocabs
Selection? 0=exit

Select 4=Clr Forms

Load Defaults
Use YES/NO Keys
ENTER=accept 0=exit

Select YES then press [ENT]. This loads all default formulas for quick reference.

Exit out of the control. From the Waiting to Load screen, enter a valid level 7 password.

Default Vocabs

1=Setups 2=Program
3=Maint. 4=Calibrate
5=Totals 6=Clock
Selection? 0=exit

Select 1=Setups

1=Watch Dogs / Setups
2=Chemical Setups
3=Setup pH System (only if pH System = Yes in user defined setups)
Selection? 0=exit

Select 1=Watch Dogs / Setups

1=Machine Setup
2=Maintenance Setup
3=Clear Ram Vocabs
4=Passwords 0=exit

Select 3=Clear Ram Vocabs

Clear All Ram Vocabs

Key in Password!!!!
NO=exit

Enter a valid level 7 password and all Ram Vocabs are cleared loading all default vocabs. Exit out of the control.

Chemical Setup

User defined setups must be performed before continuing with the chemical setups. Automatic chemicals must be assigned to numbers 1-16 depending on machine equipment. This is accomplished in the user setups.

Chemical Number	Setup A	B	C	D
1	Manual	Auto	Auto	Auto
2	Manual	Auto	Auto	Auto
3	Manual	Auto	Auto	Auto
4	Manual	Auto	Auto	Auto
5	Manual	Auto	Auto	Auto
6	Manual	Auto	Auto	Auto
7	Manual	Auto	Auto	Auto
8	Manual	Auto	Auto	Auto
9	Manual	Manual	Auto*	Auto
10	Manual	Manual	Auto*	Auto
11	Manual	Manual	Auto*	Auto
12	Manual	Manual	Auto*	Auto
13	Manual	Manual	Manual	Auto
14	Manual	Manual	Manual	Auto
15	Manual	Manual	Manual	Auto
16	Manual	Manual	Manual	Auto
17-50	Manual	Manual	Manual	Manual

A= All Chemicals Manual = Yes in user defined setups.

B= All Chemicals Manual = No, Chems 9-12 Auto = No in user defined setups.

C= All Chemicals Manual = No, Chems 9-12 Auto = Yes, Chems 13-16 Auto = No in user defined setups.

D= All Chemicals Manual = No, Chems 9-12 Auto = Yes, Chems 13-16 Auto = Yes in user defined setups.

Assigning Units

After performing the user defined setups and has defined automatic chemicals, the user is now ready to assign units, chemical numbers, and steam valve usage while receiving chemicals. The MicroPulse series controller has 25 default prompts that the user may use or edit.

001 Pt	002 Qt
003 Gl	004 Oz
005 Lb	006 Drams
007 Gr	008 Kg
009 Lt	010 Cups
011 Packs	012 Scoops
013 Decl.	014 Pwts.
015 Gills	016 1/2 Pt
017 ml	018 cc
019 Pails	020 Bucket
021 Spoons	022 Ladels
023 Charge	024 Bags
025 Boxes	

Editing Default Units

To edit the default units, from the Waiting to Load screen enter a valid level 6 or 7 password.

1=Setups 2=Program
3=Maint. 4=Calibrate
5=Totals 6=Clock
Selection? 0=exit

Select 2=Program

1=Ops2=Formulas
3=Clr Ops 4=Clr Forms
5=Copy 6=Vocabs
Selection? 0=exit

Select 6=Vocabs.

1=Edit Units Vocab
2=Edit Prompts Vocab
Selection? 0=exit

Select 1=Edit Units Vocab.

Unit # 0

Use arrows to scroll
ENTER=accept NO=exit

Using the arrow keys, scroll to the unit desired.

Unit # 1
Pt
Use arrows to scroll
ENTER=accept NO=exit
Press [ENT]

The cursor (appears as a flashing line) the character position to be edited. With the cursor in position, key in the numerical code (see the ASCII reference) for the desired character. For example if you are programming Barrels. Press [6][6] then press [ENT]. The B will be shown now press the [NO] key to move the cursor right.

Bt
ENT= Character # 66
YES = Left NO = Right
YES + NO = Accept

Continue with this sequence until you have programmed the desired operation name.

B=[6][8] [ENT] [NO]
a=[9][7] [ENT] [NO]
r=[1][1][4] [ENT] [NO]
r=[1][1][4] [ENT] [NO]
e=[1][0][1] [ENT] [NO]
l=[1][0][8] [ENT] [NO]
s=[1][1][5] [ENT] [NO]
[YES]+[NO]

1=Edit Units Vocab
2=Edit Prompts Vocab

Selection? 0=exit

If required repeat procedure or exit out of the control.

Assigning Chemicals

After assigning all of your units, you may proceed with the chemical assignments. From the Waiting to Load screen enter a valid level 6 or 7 password.

1=Setups 2=Program
3=Maint. 4=Calibrate
5=Totals 6=Clock
Selection? 0=exit

Select 1=Setups.

1=Watch Dogs / Setups
2=Chemical Setups
3=Setup pH System (only if pH System = Yes in user defined setups)
Selection? 0=exit

Select 2=Chemical Setups

Chemical # 0

ENTER=accept NO=exit

Key in the chemical number or using the arrow keys, scroll to the desired chemical number. Press the [ENT] key. Note: If the chemical has been previously assigned, the name will be displayed on the second line on the LCD.

Chemical # 1
Sour
Enter=accept 0=exit

The cursor (appears as a flashing line) the character position to be edited. With the cursor in position, key in the numerical code (see the ASCII reference) for the desired character. For example if you are programming Detergent. Press [6][8] then press [ENT]. The D will be shown now press the [NO] key to move the cursor right.

D_
ENT= Character # 68
YES = Left NO = Right
YES + NO = Accept

Continue with this sequence until you have programmed the desired operation name.

D=[6][8] [ENT] [NO]
e=[1][0][1] [ENT] [NO]
t=[1][1][6] [ENT] [NO]
e=[1][0][1] [ENT] [NO]
r=[1][1][4] [ENT] [NO]
g=[1][0][3] [ENT] [NO]
e=[1][0][1] [ENT] [NO]
n=[1][1][0] [ENT] [NO]
t=[1][1][6] [ENT] [NO]
[YES]+[NO]

Detergent
Auto Calibrate Secs.
Use arrows to scroll
ENTER=accept 0=exit
If the chemical is to be added by using timed injection, press [ENT]. If the chemical is to be added by using a metered system, using the arrow keys, scroll to the desired unit and press [ENT].

(This display only if in user setups Prompt Weight= YES. If not, skip to Use with steam= Y/N setup.)

Detergent Oz
Units/pound (kilograms) 00.00
Conversion Constant
ENTER=accept 0=exit

Enter the number of units per pound (kilograms). For example, if it takes 15.38 liquid ounces to make 1 pound of detergent, enter [1][5][3][8] then press [ENT]. This conversion factor is used to calculate chemical cost and inventory reports using the PulseNet Module.

Detergent
Use with steam = N
Use Yes/No keys
ENTER=accept 0=exit

This response sets the steam flag for use with this chemical instruction. If the flag is set to NO, steam will not be added while this chemical is being added. If the flag is set to YES, steam will be allowed during a chemical addition. Press [YES] or [NO] then press
[ENT].

1=Watch Dogs / Setups
2=Chemical Setups
3=Setup pH System (only if pH System = Yes in user defined setups)
Selection? 0=exit

Repeat procedure from to assign remaining chemicals.

Notes:

Calibration

Calibrating Water Levels

Both water and chemical calibrations should be performed periodically. To perform the water calibration, with the cylinder empty and the door open for measurement, from the “Waiting to Receive” menu enter a valid level 3 through 7 password.

1=Setups 2=Program
3=Maint. 4=Calibrate
5=Totals 6=Clock
Selection? 0=exit

Select 4=Calibrate

1=Calibrate Levels
2=Calibrate Chems

Selection? 0=exit

Select 1=Calibrate Levels

Calibrate 0" Level
1=Hot 2=Cold 3=3rd
4=Drain Washer
ENTER=accept 0=exit

Calibrate 0" Level. Press either or both 1=Hot or 2=Cold to begin filling the machine. When the water is just visible with the bottom of the basket, Press [ENT] to accept that this is a 0" level.

Calibrate 10" Level
1=Hot 2=Cold 3=3rd
4=Drain Washer
ENTER=accept 0=exit

Calibrate 10" Level. Press either or both 1=Hot or 2=Cold to begin filling the machine. Fill the machine to a 10" level placing a ruler or tape measure on the center band of the basket. When you have achieved a 10" level, Press [ENT] to accept. The level on the FPD will display 9.9 to 10.1 inches. At this time, you have calibrated the machine for water level formulas and may drain the machine. Press [0] to exit.

1=Calibrate Levels
2=Calibrate Chems

Selection? 0=exit

Calibrating Chemicals (Time Based)
From the "Waiting to Receive" menu enter a valid level 3 through 7 password.

1=Setups 2=Program
3=Maint. 4=Calibrate
5=Totals 6=Clock
Selection? 0=exit

Select 4=Calibrate

1=Calibrate Levels
2=Calibrate Chems

Selection? 0=exit

Select 2=Calibrate Chems

1=Flow Sensor Calib.
2=Time Based Calib.

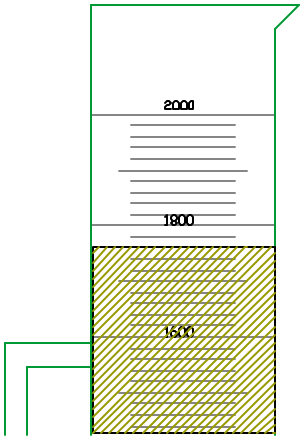
Selection? 0=exit

Select 2=Time Based Calib.

Chemical #0
Press YES to turn ON
Use arrows to scroll
ENTER=accept 0=exit

Open the valve at the end of the calibration line and place the graduated cylinder underneath it.

Press and ***hold*** the [YES] key to dispense chemical. For chemicals with large injections (Alkali, Detergent, Bleach…etc), fill the cylinder to 1800 ml. For chemicals with small injections (<6oz ex. Sour, A/C, etc) fill the cylinder to about 800 ml.



The screen will display the counts for the amount of time measured. Accurately read the amount of chemical in the graduated cylinder.

The cylinder has graduations in 20 ml increments. To convert ml to Oz., divide by 29.57.

Be sure to measure the chemical only and not foam. This will result in more accurate injections.

Example 1760 ml / 29.57= 59.5 Oz.
Press [ENT] to accept the counts. The controller will display a suggested amount based on the previous calibration.

Press [CLR] and enter in the new amount. Enter the amount to the tenths place.

Example - 58 Oz. = 58.0

Press [ENT]. The controller will display:

1=Calibrate Levels
2=Calibrate Chems

Selection? 0=exit

Flush the system by pressing [CLR] & [ENT]

Continue calibrating or exit out of the control.

Calibration (Flow Metered)
To calibrate chemicals, please do the following:

From the “Waiting to Receive” menu enter a valid level 3 through 7 password.

1=Setups 2=Program
3=Maint. 4=Calibrate
5=Totals 6=Clock
Selection? 0=exit

Select 4=Calibrate

1=Calibrate Levels
2=Calibrate Chems

Selection? 0=exit

Select 2=Calibrate Chems

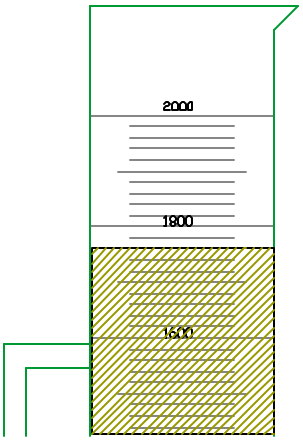
1=Flow Sensor Calib.
2=Time Based Calib.

Selection? 0=exit

Select 1=Flow Sensor Calib.

Chemical #0
Press YES to turn ON
Use arrows to scroll
ENTER=accept 0=exit

Open the valve at the end of the calibration line and place the graduated cylinder underneath it. Press and ***hold*** the [YES] key to dispense chemical. For chemicals with large injections (Alkali, Detergent, Bleach..etc), fill the cylinder to 1800 ml. For chemicals with small injections (<6oz ex. Sour, A/C, etc) fill the cylinder to about 800 ml. The screen will display the counts from the flow meter. These should be about 18-30 counts per oz. Accurately read the amount of chemical in the graduated cylinder.



The cylinder has graduations in 20 ml increments. To convert ml to Oz., divide by 29.57. Be sure to measure the chemical only and not foam. This will result in more accurate injections.
Example 1760 ml / 29.57= 59.5 Oz.
Press [ENT] to accept the counts. The controller will display a suggested amount based on the previous calibration.

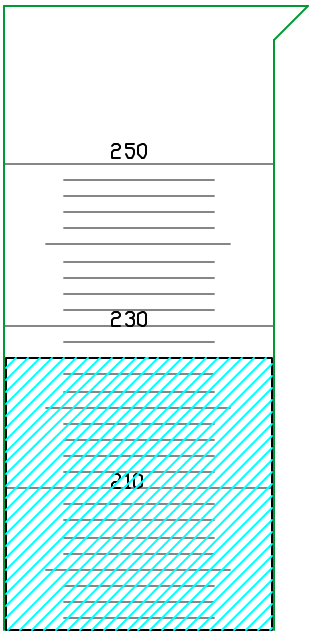
Press [CLR] and enter in the new amount. Enter the amount to the tenths place.
Example - 58 Oz. = 58.0
Press [ENT]. The controller will display:

1=New Calibration
2=Adjust H-Factor
3=Calibration w/H-Factor
4=V-Factor NO=Exit

Select [1] to store the calibration as a new calibration. This is very important, if it is not done, the calibration will be lost. The controller will then return to the calibration menu. Press and hold [CLR] & [ENT] to flush the system.
Select [1] for calibrate chemicals. Select the same chemical as previously calibrated. Select 1=Flow Sensor Calibration.

Place the 250 ml graduated cylinder under the calibration port.

Press and hold [YES] to dispense 200-220 ml. (it will contain mostly water)



The small graduated cylinder is marked in 2 ml graduations. Accurately read the amount and divide by 29.57 to convert to Oz.
Example 226 ml / 29.57 = 7.6 Oz.

Press [ENT] to accept the counts.
Enter in the amount dispensed. It should be slightly more than the suggested amount. If the amounts differ by more than 1 oz. then it might be necessary to recalibrate.

Select #2 Adjust H-Factor.

The controller will display:

1=Calibrate Levels
2=Calibrate Chems

Selection? 0=exit

Flush the system by pressing [CLR] & [ENT]

Continue calibrating or exit out of the control.

Notes:

RAM Based Vocabularies

RAM based vocabularies are user-programmable “words” that are used on the MicroPulse Controller to display information and operator prompts. The user may edit the following vocabularies.

1.	Formula Names	128 Words	16 Characters
2.	Operation Names	32 Words	16 Characters
3.	Formula Prompts	32 Words	16 Characters
4.	Maintenance Items	32 Words	16 Characters
5.	Chemical Names	50 Words	10 Characters
6.	Unit Names	25 Words	6 Characters

To enter the RAM based vocabularies on the MicroPulse Controller; you use a universal word editor. This word editor uses the same commands to enter and edit all vocabulary words. The desired word is entered from the keypad and then it must be saved. Each individual character in the word is entered using its ASCII code number. For example, an “A” is entered by entering [065] on the FPD, which is the ASCII code number for “A”.

The ASCII Character Codes

The ASCII Character Codes are used to enter text into the programmable text (RAM Vocab). The RAM Vocab is used to enter chemical units, maintenance prompts, text prompts, operation names, and formula names. Refer to the appropriate section in the MicroPulse manual for detailed instructions on entering the character codes.

032 = (space)	052 = 4	071 = G	090 = Z	109 = m
033 = !	053 = 5	072 = H	091 = [	110 = n
034 = "	054 = 6	073 = I	092 = ¥	111 = o
035 = #	055 = 7	074 = J	093 =]	112 = p
036 = $	056 = 8	075 = K	094 = ^	113 = q
037 = %	057 = 9	076 = L	095 = _	114 = r
038 = &	058 = :	077 = M	096 = `	115 = s
039 = '	059 = ;	078 = N	097 = a	116 = t
040 = (	060 = <	079 = O	098 = b	117 = u
041 =)	061 = =	080 = P	099 = c	118 = v
042 = *	062 = >	081 = Q	100 = d	119 = w
043 = +	063 = ?	082 = R	101 = e	120 = x
044 = ,	064 = @	083 = S	102 = f	121 = y
045 = -	065 = A	084 = T	103 = g	122 = z
046 = .	066 = B	085 = U	104 = h	123 = {
047 = /	067 = C	086 = V	105 = I	124 = |
048 = 0	068 = D	087 = W	106 = j	125 = }
049 = 1	069 = E	088 = X	107 = k	126 =
050 = 2	070 = F	089 = Y	108 = l	127 =
051 = 3				

Programming The Prompts

The Prompt instruction is a very useful instruction that can be found in the Advanced Functions in the instruction list of the MicroPulse control. It allows the user to supply information the operator. Up to three prompts may be displayed at once. One or Two prompt instructions may be combined with a chemical prompt to provide additional information to the operator. Following is an example of how this set of Advanced Function and Chemical Additions instructions are used.

005: Signal Until Operator Cancels
006: Prompt: Adjust pH
007: Prompt: ADD CHEMICAL
008: add 32 Oz of Alkali

Default Prompts

To display several prompts on separate screens, separate the prompts with a Wait to Satisfy or program them in separate steps. For multiple prompt displays, the prompts are shown on the LCD in numerical order NOT in the order programmed. There are 32 user defined prompts. Prompts number 1-26 are default prompts that our factory and startup personnel use to test the machine before shipping. The user may edit these prompts.

001 CHECK SHADE!!!
002 Is shade O.K.?
003 Load Stones!!!
004 WATER METER ??
005 3RD WATER ??
006 4TH WATER ??
007 2ND DRAIN ??
008 3RD DRAIN ??
009 TDX MACHINE ??
010 SALT INJECTOR ??
011 HIGHWATER LEVEL?
012 SINGLE MOTOR ??
013 SUPPLY DISP. #5?
014 SUPPLY DISP 6&7?
015 AUTO CHEM 1-8??
016 AUTO CHEM 9-12?
017 AUTO CHEM 13-16?
018 Prompt # 18
019 Prompt # 19
020 Prompt # 20
021 Prompt # 21
022 Prompt # 22
023 Prompt # 23
024 Prompt # 24
025 Prompt # 25
026 Prompt # 26
027 Prompt # 27
028 Prompt # 28
029 Prompt # 29
030 Prompt # 30
031 Prompt # 31
032 Prompt # 32

Editing User Defined Prompts

To program the user defined prompts, from the Waiting to Load screen, enter a valid level 6 or 7 password.

1=Setups 2=Program
3=Maint. 4=Calibrate
5=Totals 6=Clock
Selection? 0=exit
Select 2=Program

1=Ops 2=Formulas
3=Clr Ops 4=Clr Forms
5=Copy 6=Vocabs
Selection? 0=exit

Select 6=Vocabs.

1=Edit Units Vocab
2=Edit Prompts Vocab

Selection? 0=exit

Select 2=Edit Prompts Vocab. Line 2 on the LCD will display the current text.

Prompt # 1
CHECK SHADE!!!
Use arrows to scroll
ENTER=accept NO=exit

Scroll to the desired prompt and press [ENT]
Prompt # 27
ENT= Character # 10
YES = Left NO = Right
YES + NO = Accept

The cursor (appears as a flashing line) the character position to be edited. With the cursor in position, key in the numerical code (see the ASCII reference) for the desired character. For example if you are programming Check pH. Press [6][7] then press [ENT]. The C will be shown now press the [NO] key to move the cursor right.

Crompt # 27
ENT= Character # 67
YES = Left NO = Right
YES + NO = Accept

Continue with this sequence until you have programmed the desired operation name.

C=[6][7] [ENT] [NO]
h=[1][0][4] [ENT] [NO]
e=[1][0][1] [ENT] [NO]
c=[9][9] [ENT] [NO]
k=[1][0][7] [ENT] [NO]
space=[3][2] [ENT] [NO]
p=[1][1][2] [ENT] [NO]
H=[7][2] [ENT] [NO]
space=[3][2] [ENT] [NO]
space=[3][2] [ENT] [NO]
space=[3][2] [ENT] [NO]
[YES]+[NO]

1=Edit Units Vocab
2=Edit Prompts Vocab

Selection? 0=exit

If required, repeat the procedure or exit.

Notes:

Learning to Program the MicroPulse

The normal programming sequence is:

- Load default operations, formulas, and vocabs into the control.
- Program your User Defined Setups.
- Assign chemicals.
- Calibrate water systems and chemical systems.
- Program user defined prompts.
- Program operations.
- Program formulas.
- Setup passwords.
- Edit preventative maintenance prompts and next service intervals.

Formula Planning
Inserting lines of instructions and operations create formulas. To aid in this, with the MicroPulse controller you can build operations and inset them into formulas. Inserting lines of instructions creates operations. In planning for programming operations, it is necessary to view your formulas and see which instructions are most used. After determining this, build a set of operations that most fit your washing needs. The MicroPulse controller has default operations ranging from operation numbers 33 to 64. These are for the user to use to learn to program by or even to use in their formulations. The MicroPulse controller also has default formulas ranging from formulas 100 to 128. These are a good for referencing.

Formula Name
Formula Name is always the first instruction of any formula. The formula name may not be deleted. Editing the formula name enables the corresponding formula for selection by the operator. Setting the Formula Name to Unused prevents selection of the formula by the operators.

Formula End
Formula End is always the last instruction of any formula. Inserting instructions and operations between the Formula Name and the Formula End instructions creates formulas. Memory usage is dynamic so that formulas take up only the required amount of memory.

Operation Name
Operations are programmed just like formulas. An operation is usually a commonly used set of instructions to carry out a desire sequence like AUTO CHEMICAL ADD. Operations may be inserted into formulas like MACROS, and then edited to suit the exact need of the formula. When editing operations, the OPERATION NAME is always the first instruction of any operation. Editing the OPERATION NAME enables the corresponding operation for insertion in formulas.

Operation End
Operation End is always the last instruction of and operation. Inserting instructions between the OPERATION NAME and the OPERATION END instructions creates operations. Memory usage is dynamic so that operations take up only the required amount of memory. OPERATION END is not copied into a formula when an operation is inserted.

Programming Operations
Since formulas are easier to program with operations, operations need to be programmed first. Setting up operations will save substantial time later when formulas are programmed.

Name the Operation
From the Waiting to Load screen, enter a valid level 6 or 7 password.

1=Setups 2=Program
3=Maint. 4=Calibrate
5=Copy 6=Clock
Selection? 0=exit

Select 2=Program

1=Ops2=Formulas
3=Clr Ops 4=Clr Forms
5=Copy 6=Vocabs
Selection? 0=exit

Select 1=Ops

Key in Oper. # 0

ENTER= Accept NO = Exit

Scroll or enter the number that you wish to program and press [ENT].

1:001 ?OPERATION?
002 END OPERATION

3-e 5-s 0-exit

The first line is the active line and all editing operates on the contents of that line. Line 4 on the LCD lists the editing options that are possible. 3-e is for editing the top line. 5-s scrolls the LCD screen left and right. Only 20 characters may display on a line and this option allows more of the line to be viewed. Press [3] to edit.

Operation # 1
CLR= Set to Unused
ENT= Edit Name
0 = exit

Press the [CLR] key to set too unused. Press the [ENT] key to edit the operation name.

_
ENT= Character # 00
YES = Left NO = Right
YES + NO = Accept

The cursor (appears as a flashing line) the character position to be edited. With the cursor in position, key in the numerical code (see the ASCII reference) for the desired character. For example if you are programming WARM WATER RINSE. Press [8][7] then press [ENT]. The W will be shown now press the [NO] key to move the cursor right.

W_
ENT= Character # 87
YES = Left NO = Right
YES + NO = Accept

Continue with this sequence until you have programmed the desired operation name.

W=[8][7] [ENT] [NO]
A=[6][5] [ENT] [NO]
R=[8][2] [ENT] [NO]
M=[7][7] [ENT] [NO]
space=[3][2] [ENT] [NO]
W=[8][7] [ENT] [NO]
A=[6][5] [ENT] [NO]
T=[8][4] [ENT] [NO]

E=[6][9] [ENT] [NO]
R=[8][2] [ENT] [NO]
space=[3][2] [ENT] [NO]
F=[7][0] [ENT] [NO]
L=[7][6] [ENT] [NO]
U=[8][5] [ENT] [NO]
S=[8][3] [ENT] [NO]
H=[7][2] [ENT] [NO]

[YES]+[NO]

1:001 WARM WATER FLUSH
002 END OPERATION

3-e 5-s 0-exit

Now using the arrow keys, place the active line to the top line.

002 END OPERATION

1-i 2-d 3-e 5-s 0-exit

Line 4 on the LCD list the editing options that are possible. 1-i insert. 2-d delete. 3-e edit. 5-s shift. 0-exit. Press 1-i to insert an instruction. You will see "Wait to Satisfy". Scroll through the operation list using the arrow keys to the Water Fill Options and press [ENT]. Now scroll through the Water Fill Options list using the arrow keys to Fill Cold <level>. Press [ENT].

Fill Cold
Key in Level 0.0

To fill to 10" of cold water, press [1][0][0]

002: Fill Cold 10.0 inc.
003: END OF OPERATION

1-i 2-d 3-e 5-s 0-exit

Press 1-i to insert an instruction. You will see "Wait to Satisfy". Scroll through the operation list using the arrow keys to the Water Fill Options and press [ENT]. Now scroll through the Water Fill Options list using the arrow keys to Fill Hot <level>. Press [ENT].

Fill Hot
Key in Level 0.0

To fill to 10" of hot water, press [1][0][0]

003: Fill Hot 10.0 inc.
004: END OF OPERATION

1-i 2-d 3-e 5-s 0-exit

**PLEASE NOTE THAT WHEN CALLING FOR MULTIPLE WATER FILL OPTIONS IN AN OPERATION, THE CONTROL WILL FILL TO THE GREATEST LEVEL DESIRED. FOR EXAMPLE IF 10" OF COLD WATER WAS PROGRAMMED AND 11' OF HOT WATER WAS PROGRAMMED THE CONTROL WOULD TURN OFF THE COLD WATER VALVE AT THE 10" LEVEL (PLEASE REFER TO THE USER DEFINED SETUPS LEVEL DEADBAND) AND TURN THE HOT WATER VALVE AT THE 11" LEVEL. THE CONTROL WILL ONLY FILL TO AN 11" LEVEL NOT A 21" LEVEL. **

Now we will enter a Wait to Satisfy meaning that we want the machine to fill to a 10" water level using both hot and cold water valves before advancing on in the operation.

Press 1-i to insert an instruction. Scroll to the Wait to Satisfy option, press [ENT].

004: Wait to Satisfy
005: END OF OPERATION

1-i 2-d 3-e 5-s 0-exit

Now we will enter a run time. Press 1-i to insert an instruction. Scroll through the operation list using the arrow keys to the Run Time option and press [ENT].

Run Time
Key in time 00:00

To enter a 2-minute run time, press [2][0][0] then press [ENT].

005: Run Time 2:00
006: END OF OPERATION

1-i 2-d 3-e 5-s 0-exit
After our run time is entered we will need to drain the machine. To perform this instruction Press 1-i to insert an instruction. Scroll through the operation list using the arrow keys to the Drains / Extract option and press [ENT]. Scroll to the Drain 1 <time> option and press [ENT].

Drain 1 Time
Key in time 00:00

To enter a 1-minute drain time, press [1][0][0] then press [ENT]. Following will be an example of the operation we just programmed into the control.

001: WARM WATER FLUSH
002: Fill Cold When Level < 10.0" Until Next Step
003: Fill Hot When Level < 10.0" Until Next Step
004: Wait to Satisfy
005: Run Time 2:00
006: Drain 1 Time for 1:00
007: END OF OPERATION

After you have programmed the operation, press 0-exit then press 1=Ops to enter another operation and follow this guideline.

Programming Formulas

Name the Formula
From the Waiting to Load screen, enter a valid level 6 or 7 password. Select 2=Program. Select 2=Formulas

Key in Formula # 0

ENTER= Accept NO = Exit

Scroll or enter the number that you wish to program and press [ENT].

1:001 ?formula?
002 END FORMULA
3-e 5-s 0-exit

The first line is the active line and all editing operates on the contents of that line. Line 4 on the LCD list the editing options that are possible. 3-e is for editing the top line. 5-s scrolls the LCD screen left and right. Only 20 characters may display on a line and this option allows more of the line to be viewed. Press [3] to edit.

Formula # 1
CLR= Set to Unused
ENT= Edit Name
0 = exit

Press the [CLR] key to set too unused. Press the [ENT] key to edit the formula name.

_
ENT= Character # 00
YES = Left NO = Right
YES + NO = Accept
The cursor (appears as a flashing line) the character position to be edited. With the cursor in position, key in the numerical code (see the ASCII reference) for the desired character. For example if you are programming Sheets. Press [8][3] then press [ENT]. The S will be shown now press the [NO] key to move the cursor right.

S_
ENT= Character # 83
YES = Left NO = Right
YES + NO = Accept

Continue with this sequence until you have programmed the desired formula name.

S=[8][3] [ENT] [NO]
h=[1][0][4] [ENT] [NO]
e=[1][0][1] [ENT] [NO]
e=[1][0][1] [ENT] [NO]
t=[1][1][6] [ENT] [NO]
s=[1][1][5] [ENT] [NO]

[YES]+[NO]

1:001 Sheets
002 END FORMULA

3-e 5-s 0-exit

Now using the arrow keys, place the active line to the top line. Line 4 on the LCD lists the editing options that are possible. 1-i insert. 2-d delete. 3-e edit. 4-m macro shows only Operation Names no instructions. 4-n returns display to normal viewing Operation Names and instructions. 5-s shift display. 0-ex exit.

002 END FORMULA
1-i 2-d 3-e 4-m 5-s 0-ex

Press 1-i. This gives us another list of options. From here we can insert an operation from our operations that was programmed, insert an instruction from the same list that was available in programming operations list, or insert an entire formula. Here we will choose 1= Ins. Operation.

1 = Ins. Operation
2 = Ins. Instruction
3 = Ins. Formula
0=exit

Using the arrow keys, scroll through the operations list until you reach the desired operation to be inserted. We will use an operation that we have programmed named HOT SUDS. Following will be an example of what is entered into the control.

001: Sheets
002: HOT SUDS
003: Fill Hot When Level < 10.0" Until Next Step
004: Wait to Satisfy
005: Signal Until Operator Cancels
006: Prompt: ADD CHEMICAL
007: Wait to Satisfy
008: Supply Dispenser 1 for 1:00
009: Wait to Satisfy
010: Run Time 10:00
011: Drain 1 Time for 1:00

Using the arrow keys, scroll until the active line is on top.

012: END OF FORMULA

1-i 2-d 3-e 4-m 5-s 0-ex

Press 1-i. Scroll though the operations list until you reach the desired operation to be inserted. We will use an operation we programmed named HOT CARRYOVER. Following will be an example of what is entered into the control.

012: HOT CARRYOVER
013: Fill Hot When Level < 10.0" Until Next Step
014: Wait to Satisfy
015: Run Time 4:00
016: Drain 1 Time for 1:00
017: END OF FORMULA

In our HOT CARRYOVER operation that we have placed into the formula, we have decided that we want to steam to 160df while filling and that the Run Time is 4:00 minutes and we have decided to make our run time 6:00 minutes. Using the arrow keys, scroll until the active line (014 Wait to Satisfy) is on top.

014: Wait to Satisfy
015: Run Time 4:00
016: Drain 1 Time for 1:00
1-i 2-d 3-e 4-m 5-s 0-ex

Now press 1-i then press 2= Ins. Instruction. Scroll though the instruction list until you reach Water Temp. Options. Press [ENT]. Scroll through the Water Temp. Options until you reach Steam <temp> and press [ENT]. Now enter the desired temperature for the operation in this formula. [1][6][0] then press [ENT].

Steam <temp>
Key in Temp 000 F
The HOT CARRYOVER operation in this formula will now be entered into the control as follows.

012: HOT CARRYOVER
013: Fill Hot When Level < 10.0" Until Next Step
014: Steam when Temperature < 160 F Until Next Step
015: Wait to Satisfy
016: Run Time 4:00
017: Drain 1 Time for 1:00
018: END OF FORMULA

Using the arrow keys, scroll until the active line (016 Run Time 4:00) is on top. Now press 3-e and enter the desired run time [6][0][0].

Run Time
Key in time 04:00

The HOT CARRYOVER operation in this formula will now be entered into the control as follows.

012: HOT CARRYOVER
013: Fill Hot When Level < 10.0" Until Next Step
014: Steam when Temperature < 160 F Until Next Step
015: Wait to Satisfy
016: Run Time 6:00
017: Drain 1 Time for 1:00
018: END OF FORMULA

Using this same procedure, you can edit any of the operations for any of the formula. This does not change the operation in your list of operations, only in the formula that you are programming. After we have entered operations into our formula we can press 4-m to see what operations that we have in our formula.
HOT SUDS
HOT CARRYOVER
END OF FORMULA
1-i 2-d 3-e 4-n 5-s 0-ex

To return to the normal viewing press 4-n.

Extracts
At the end of each formula there is usually an Extract programmed. Following are three examples of how an extract should be programmed. The first is an example of a High Speed Extract. The second is a G-force Extract, and the third is a Non-Stick Extract used for goods that tend to stick to the sides of a washer after an extract.

001: FINAL EXTRACT HI
002: Extract High Until Next Step
003: Drain 1 Time for 6:00
004: END OF OPERATION

FINAL EXTRACT HI
This extract tells the control to extract at the highest possible RPM for a total time not to exceed 6 minutes.

001: EXTRACT w/G's
002: Extract High Until Next Step
003: Extract at 285 G's for 1:00
004: Drain 1 Time for 6:00
005: END OF OPERATION

EXTRACT w/G's
This extract tells the control to extract at a G-force of 285 for 1 minute or run a total time not to exceed 6 minutes. For example if the 285 G-force is met for 1 minute and there is 2 minutes remaining in line 004 Drain 1 Time for 6:00, the control will proceed to the end of the operation or formula saving that additional 2 minutes.

001: NON STICK EXT
002: Extract High Until Next Step
003: Extract at 100 G's for 1:30
004: Drain 1 Time for 6:00
005: Forward Timer 6 Seconds
006: Reverse Timer 5 Seconds
007: Run Time 1:30
008: Set Retry Level = 0.0"
009: Extract High Until Next Step
010: Extract at 285 G's for 1:30
011: Drain 1 Time for 8:00
012: Forward Timer 6 Seconds
013: Reverse Timer 5 Seconds
014: Run Time 1:30
015: END OF OPERATION

NON-STICK EXT

The non-stick extract is a little more complicated to program but after you have it programmed it can save you substantial time in unloading and drying times. Since water passing through the goods causes them to stick to ribs during an extract here we only ask the control to extract at only 100 G's for 1:30 minutes. This is to force most of the water from the basket without causing the goods to stick to the sides. We then have asked the control to run Forward for 6 seconds then run Reverse for 5 seconds for 1:30 minutes. Using different forward and reversing run commands assures us that the basket will be in a different position at each dwell causing any goods that may have stuck to the basket to hopefully break loose. We have then told the control that if we have to attempt an extract retry (for an unbalance) not to use any water. This assures us that we will not be placing the water back into the goods that we have just removed. We then continue on with a high speed G-force removing any left over water. We again reverse the basket using different intervals hoping to break any goods from sticking to the sides of the basket.

Incompatible Step

When programming a formula, no error message will occur. However, when you attempt to execute the formula, the MicroPulse controller will display a message indicating the incompatible instructions were encountered in the same step. The line number will also be displayed so the formula can be corrected.

Incompatible Step!
Error at Line 4

Enter=accept.

Pressing [ENT] takes you to the end of the formula.

Waiting for Washer
to Unload!!

Press the [YES] Key Continue

Press [YES] key to display the following screen:

100: Sheets
Waiting For Washer
To Unload!!!
T=00:26 Step =0:00

Press the [ENT] + [NO] simultaneously to reset the display.

Waiting for Washer
to Receive Load!!
Depress [YES] Key to
Select Formula

Now you may enter the programming mode to fix the problem. Following are examples of incompatible steps.

Incompatible	Compatible
001:Sheets	001:Sheets
002: Fill Hot 10:0	002: Fill Hot 10:0
003: Steam When Temp < 140 F	003: Steam When Temp < 140 F
004: Drain 1 1:00	004: Run Time 1:00
	005: Drain 1 1:00

After correcting the error, the formula is ready to execute.

Defining Instructions

Wait To Satisfy
Wait for conditions above Wait To Satisfy to be simultaneously satisfied before continuing to next Wait To Satisfy or run time.

Run Time
Time programmed in MM:SS (MM:SS > 0 Constitutes a step. MM:SS = 0 does not constitute a step, but does not continue to next Wash instruction until all operations above wash = 0:00 are satisfied.) Conditions above a wash must be satisfied before next step begins.

Signal
Turns on an audible and a visible alarm to notify the wash operator of a wash condition.

Cylinder Rotations

Cyl. Still
Cylinder will not turn until activities (i.e. water level, steam, chemical add) are satisfied within the step.

Reg. Sp. Drain
Drain in wash speed, not balance speed.

Gentle On
Gentle Action directs the MicroPulse Control to rotated forward 4 seconds, dwell 16 seconds then rotate reverse 4 seconds. This will remain on until another rotation parameter is programmed, i.e. <Normal Rotation>.

Normal Rotation
Turns Gentle Action off, Super Penetration off, and sets Dwell = 4, Forward = 29, and Reverse = 29.

Cyl. RPM Speed
Describes the RPM in ### to rotate the cylinder using the variable speed drive unit during washing.

Forward Timer
Describes the forward rotation time in ### seconds (0 to 998) for the reversing action of the wash motor. If this is set to 999, the washer will turn forward only.

Reverse Timer
Describes the reverse rotation time in ### seconds (0 to 998) for the reversing action of the wash motor. If this is set to 999, the washer will turn reverse only.

Dwell Timer
Describes the dwell time to occur between forward and reverse rotation time in ### seconds (0 to 998) for the reversing action of the wash motor. If this is set to 999, the washer will not rotate.

Super Penetration
This causes the machine to rotate at balance speed for the final 10 seconds of a rotation sequence. On a Textile Dye Machine, his causes the cylinder to rotate in balance speed for 10 seconds every 3:00 minutes until a <Normal Rotation> is commanded.

Water Fill Options

Fill Hot Level
Turns on hot water when level < programmed water level until Next Step.

Fill Cold Level
Turns on cold water when level < programmed water level until Next Step.

Fill 3rd Level
Turns on 3rd water when level < programmed water level until Next Step.

Fill 4th Level
Turns on 4th water when level < programmed water level until Next Step.

Fill <level><temp>

Key in High Temp
This is the temperature that the user programs turning off selected water valves while allowing alternative water fill options.

Key in Lo Temp
This is the temperature that the user programs turning off selected water valves while allowing alternative water fill options.

Key in Level
Turns on selected water valves when level < programmed water level until Next Step.

Below Temp. Valves
Turns on selected water valves (i.e. 1=Hot and 3= 3rd) when level < programmed water level and temperature until Next Step.

Within Temp. Valves
Turns on selected water valves (i.e. 1=Hot and 2= Cold) when level < programmed water level and within the temperature range programmed until Next Step.

Above Temp. Valves
Turns on selected water valves (i.e. 1=Hot and 3= 3rd) when level < programmed water level and is > temperature range programmed until Next Step.

Fill Hot Volume
Turns on hot water while total gallons filled < programmed gallons.

Fill Cold Volume
Turns on cold water while total gallons filled < programmed gallons.

Fill 3rd Volume
Turns on 3rd water while total gallons filled < programmed gallons.

Fill 4th Volume
Turns on 4th water while total gallons filled < programmed gallons.

Overflow Rinse
This opens the direct cooldown valve (or load spray) for the duration of the programmed step.

Fill Hot Ratio
Turns on hot water while total ratio of water added < ##.# : weight of linen.

Fill Cold Ratio
Turns on cold water while total ratio of water added < ##.# : weight of linen.

Fill 3rd Ratio
Turns on 3rd water while total ratio of water added < ##.# : weight of linen.

Fill 4th Ratio
Turns on 4th water while total ratio of water added < ##.# : weight of linen.

Fill <volume><temp>

Key in High Temp
This is the temperature that the user programs turning off selected water valves while allowing alternative water fill options.

Key in Lo Temp
This is the temperature that the user programs turning off selected water valves while allowing alternative water fill options.

Key in Gallons
Turns on selected water valves when level < programmed water level until Next Step.

Below Temp. Valves
Turns on selected water valves (i.e. 1=Hot and 3= 3rd) when level < programmed water level and temperature until Next Step.

Within Temp. Valves
Turns on selected water valves (i.e. 1=Hot and 2= Cold) when level < programmed water level and within the temperature range programmed until Next Step.

Above Temp. Valves
Turns on selected water valves (i.e. 1=Hot and 3= 3rd) when level < programmed water level and is > temperature range programmed until Next Step.

Fill <ratio><temp> (Mass Thermo Water Fill)
A Mass Thermo Water Fill is defined as when you use two (2) water valves to achieve a desired temperature of the washer wheel.

Key in High Temp
This is the temperature that the user programs turning off selected water valves while allowing alternative water fill options.

Key in Lo Temp
This is the temperature that the user programs turning off selected water valves while allowing alternative water fill options.

Key in Ratio
Turns on selected water valves when level < ##.# : weight of linen.

Below Temp. Valves
Turns on selected water valves (i.e. 1=Hot and 3= 3rd) when level < programmed water level and temperature until Next Step.

Within Temp. Valves
Turns on selected water valves (i.e. 1=Hot and 2= Cold) when level < programmed water level and within the temperature range programmed until Next Step.

Above Temp. Valves
Turns on selected water valves (i.e. 1=Hot and 3= 3rd) when level < programmed water level and is > temperature range programmed until Next Step.

Water Temp. Options

Steam <temp>
Turns on the steam valve to reach and maintain the programmed temperature until Next Step. (If no steam is desired in a step after reaching temperature, a Run Time= 0:00 must be programmed.)

Gradient <deg/min>
Describes the temperature gradient in ##.# degrees / minute when Steam or Cooldown programmed.

Dir. Cool <temp>
Turns on Load Spray or Cooldown Valve until Temp. < ### Cooldown Temp.

Ind. Cool <temp>
Turns on Indirect Cooldown Valve until Temp. < ### Cooldown Temp.

Drains / Extracts

Extract High
Turns on extract high until Next Step. A drain time must also be programmed to allow this operation.

Extract Low
Turns on extract low until Next Step. A drain time must also be programmed to allow this operation.

Drain 1 Level
Turns on drain 1 when level > programmed level until Next Step.

Drain 2 Level
Turns on drain 2 when level > programmed until Next Step.

Drain 1 Time
Turns on drain 1 for MM:SS (MM:SS > 0 constitutes a step).

Drain 2 Time
Turns on drain 2 for MM:SS (MM:SS > 0 constitutes a step).

Drain 3 Level
Turns on drain 3 when level > programmed until Next Step.

Drain 3 Time
Turns on drain 3 for MM:SS (MM:SS > 0 constitutes a step).

G-Force <G's><time>
Turns on extract high at the programmed G-force rotation desired for the amount of time programmed until Next Step. Extract High and a drain time must be programmed to allow this operation.

Supply Dispensers

Sup. Disp. #1-#7
If a machine is equipped with more than one supply dispenser the time programmed is how long the corresponding dispenser will remain open and flush. If standard one dispenser machine program Sup. Disp. #1 for time to remain open for manually added chemicals.

Chemical Additions

Chemical <units>
Adds or prompts programmed units of chemicals #1-#50. When using automatic chemical injection systems the chemical locations are reserved for chemical numbers 1-16.

Chemical <%OWG>
Adds or prompts programmed percent by weight of goods of chemicals #1-#50. When using automatic chemical injection systems the chemical locations are reserved for chemical numbers 1-16.

pH Monitor On
Turns on the optional pH monitor.

pH Monitor off
Turns off the optional pH monitor.

Adjust pH to >
Allows the user to program a selected range for the control to automatically adjust with the programmed Base.

Adjust pH to <
Allows the user to program a selected range for the control to automatically adjust with the programmed Acid.

Advanced Functions

Advanced Functions are a set of instructions that allow the user to program powerful enhancements and decision-making loops into a formula. Total "Flow Control" of the formula can be based on Operator Input during formula execution. Complete knowledge of these functions is essential if they are to be successfully implemented.

PROMPT
The Prompt instruction is used to give messages to the operator on the LCD display. Up to 32 prompts may be programmed by accessing the Vocab editor in the program menu system of the MicroPulse controller. A prompt may be any message up to 16 characters long. To display a prompt during a formula execution, insert the correct Prompt and combine it with a signal.

FILTER PUMP ON
The Filter Pump On instruction will cause the optional filter pump to be used whenever sufficient water is in dye machine. The Filter Pump will turn on once Steam Level is reached and will remain on for thirty seconds after and during a drain operation. The Filter Pump will always be turned on During Extract Slowdown. The Filter Pump will be utilized until a Filter Pump Off is encountered in the formula.

FILTER PUMP OFF
The Filter Pump Off instruction turns off the use of the Filter Pump during a Formula.

LABEL
The Label instruction is used to mark a spot in a formula. Up to 16 different labels (Labels 1-16) may be inserted into a formula for reference. In addition, Label 17 is always the first instruction of a formula and Label 18 is always the last instruction of a formula. Label 19 is always the Resume label. The Label positions are recorded at formula execution and are used for references of the branching instructions. (See <Signal YES/NO>, <Compare Count>, and <GOTO Label>)

SIGNAL YES/NO

The Signal YES/NO instruction is a flow control instruction, which branches to Labels based on operator input. The Signal YES/NO instruction is usually combined with the Prompt instruction to display a message to the operator. The operator's response to the message must be framed as YES or NO. Depending on the response, formula execution is altered according to the desired action needed. Consider the following pH adjustment loop:

```
1:001 <Formula Name>
 :002 Fill 100 gal 137 - 142 F.
 :003 Wait To Satisfy
 :004 *** Label 1 ***
 :005 Steam 140 F.
 :006 Wait To Satisfy
 :007 pH 6.0 Buf 10 oz.
 :008 Wait To Satisfy
 :009 Run 03:00
 :010 Check pH of Bath
 :011 Is pH Between
 :012 5.8 and 6.2 ?
 :013 Signal YES=19 NO= 1
 :014 Run 00:00
 :015 Enzyme 64 oz.
 :016 Wait To Satisfy
 :017 Run 10:00
```

Label 1 is inserted on line 4 of the formula. This is the pH adjustment and temperature adjustment portion of the formula. The proper pH and temperature is essential for the later action of the Enzyme. After pH and temperature adjustment, a Prompt is programmed for the operator to check the pH (we know at this point that the temperature is OK). The display will show:

```
Display 1: Check pH of Bath
Display 2: Is pH Between
Display 3: 5.8 and 6.2 ?
Display 4: [ENT]+[YES]or[NO]
```

Line 13 of the formula will direct flow of the formula based on the acceptance of the pH range. If the pH range is OK, then GOTO Label 19 (RESUME FORMULA) is executed and the Enzyme is added to the machine. If the pH range is not OK, then GOTO Label 1 (line 4) is executed and the pH and temperature are adjusted again. Note that after each pH adjustment, the operator will be prompted for the measurement. The loop will be repeated as long as the operator continues to answer NO.

RECIRC FLUSH

The Recirc. Flush instruction will cause the Flush system of the supply dispensers to use water from the Filter Pump system for flushing IF THE FILTER PUMP IS ON. If not, regular flush water will be used. The Recirc. Flush instruction is active ONLY for the step it is inserted into. It is NOT retentive.

COUNT# INC/ZERO

The Count# Inc./Zero instruction operates on one of the five available counters. Counters #1 through #5 are initialized to zero at the initial formula execution. Each of the five counters may be independently changed in the formula. These counters may be used to direct flow of the formula based on their values. A counter can be Incremented or set to Zero. The maximum value of a counter is 99.

COMPARE COUNT #

The Compare Count# instructions are used to program formula flow control based on the contents of the counters. Counters may be compared to values from 0 to 99 and counters may be compared to other counters. The compare is always framed as: COUNTER COMPARED TO VALUE - Is Counter X greater than Value (value can be 0 - 99), or COUNTER COMPARED TO COUNTER - Is Counter X greater than Counter Y. If the statement is true, then a branch is executed to the indicated label. In the formula, the instruction appears as: Cnt #1 > 1 GOTO 1 (If counter #1 is greater than 1, then GOTO Label 1), and Cnt #1 > Cnt #2 GOTO 1. The Compare Count# instruction can be used in the above formula (see Signal YES/NO) to limit pH adjustments to 3 adjustments in the following way:

```
1:001 <Formula Name>
 :002 Fill 100 gal 137 - 142 F.
 :003 Wait To Satisfy
 :004 *** Label 1 ***
 :005 Incr. Count #1
 :006 Steam 140 F.
 :007 Wait To Satisfy
 :008 pH 6.0 Buf 10 oz.
 :009 Wait To Satisfy
 :010 Run 03:00
 :011 Cnt #1 > 2 GOTO 2
 :012 Check pH of Bath
 :013 Is pH Between
 :014 5.8 and 6.2?
 :015 Signal YES=19 NO= 1
 :016 Run 00:00
 :017 *** Label 2 ***
 :017 Enzyme 64 oz.
 :018 Wait To Satisfy
 :019 Run 10:00
```

The Operator will be prompted to check the pH a maximum of two times and a maximum of three buffer additions will be made. Counter 1 is incremented (line 5) in the adjustment step each time it is executed. After execution of the step, Counter 1 is checked to see if three adjustments have been made (line 11). The pH check is bypassed by branching to Label 2 (line 17).

GOTO LABEL #

The GOTO Label# instruction causes an unconditional branch to the indicated label. This can be used to make even more powerful flow control formulas. The GOTO Label# can be used to add a new message to the Supervisor indicating that problems with the pH adjustment are occurring. The supervisor can then decide whether to try to adjust the pH again or continue running the formula.

```
1:001 <Formula Name>
 :002 Fill 100 gal 137 - 142 F.
 :003 Wait To Satisfy
 :004 *** Label 1 ***
 :005 Incr. Count #1
 :006 Steam 140 F.
 :007 Wait To Satisfy
 :008 pH 6.0 Buf 10 oz.
 :009 Wait To Satisfy
 :010 Run 03:00
 :011 Check pH of Bath
 :012 Is pH Between
 :013 5.8 and 6.2 ?
 :014 Signal YES= 3 NO=19
 :015 Run 00:00
 :016 Cnt #1 > 2 GOTO 2
 :017 GOTO 1
 :018 *** Label 2 ***
 :019 Zero Cnt. #1
 :020 Call Supervisor!
 :021 pH Not Adjusted.
 :022 Try Again?
 :023 Signal YES= 1 NO=19
 :024 Run 00:00
 :025 ** Label 3 ***
 :026 Enzyme 64 oz.
 :027 Wait To Satisfy
 :028 Run 10:00
```

Line 14 has been changed to direct the program flow to the Enzyme step if the pH is in the correct range. Line 16 checks to see if the operator is answering NO for the third time. If three adjustments have been made, the formula branches to Label 2 (line 18). The counter is set to zero and the supervisor is prompted for a

decision on whether to adjust the pH again or continue without further adjustment. If pH adjustment is tried again, Counter #1 has been set to zero to allow three more adjustments. If no further adjustment is needed, the enzyme is added.

Set Parameters

The Set Instruction allows the setting of formula process watchdogs, setups, and process conditions to be altered from within the formula. These are TOGGLE functions, meaning the programmed value is retained for the remainder of the formula. These instructions allow the user to greatly refine the operation of the machine according to the formula being processed. For example, the unload method can be selected within each formula for more flexibility.

If no SET instructions are programmed in a formula, all functions are reset according to the user defined SETUPS at formula execution. Thorough knowledge of the parameters being SET is needed for maximum utility.

EXT DELAY@
Sets the extract delay from 1:30 to 5:00. May be used to increase the duration of Low Speed Extract before High Speed Extract during a High Speed Extract sequence.

MAX CHEM @
Sets the maximum allowable time for a chemical output to be on. A chemical watchdog is generated if the time is exceeded.

MAX FILL @
Sets the maximum allowable time for a water valve output to be on. A water fill watchdog is generated if the time is exceeded.

MAX STEAM @
Sets the maximum allowable time for the steam output to be on. A steam watchdog is generated if the time is exceeded.

MAX COOL @
Sets the maximum allowable time for the cool-down output to be on. A cool-down watchdog is generated if the time is exceeded.

SIGNAL MUTE
Sets the amount of time to allow the signal to be silenced during a formula execution when the CLR key is pressed.

pH RANGE @
Sets the amount of time that the pH is allowed to be out of range before generating a pH Out Of Range watchdog alarm. (If pH System = YES in user defined setups.)

pH MIN K @
Sets the minimum allowed sample time for the pH system. This sample time is required after an adjustment is made to the bath pH before possible additional adjustments are considered. (If pH System = YES in user defined setups.)

pH MAX K @
Sets the maximum allowed sample time for the pH system. This sample time is the maximum time to wait before possible additional adjustments are considered. (If pH System = YES in user defined setups.)

CHEM FLUSH @
Sets the amount of time to flush after an automatic chemical injection.

DRN. DELAY @
Sets the amount of time to delay the opening of the drain valve after the machine begins rotating at balance speed during a drain sequence.

DRAIN SWAP @
Sets the Drain Swap function to ON after the specified number of seconds. The Drain Swap function swaps the activated drain from either Drain #2 or Drain #3 to Drain #1 (primary drain to sewer) when the water level is below 1.0" after the specified number of seconds.

FWD UNLOAD @
Sets the number of seconds to unload in the forward direction.

REV UNLOAD @
Sets the number of seconds to unload in the reverse direction.

MANUAL P B'S @
Allows or disallows manual push-button use during formula execution. Set to YES or NO.

FLOW SENSORS @
Allows or disallows the use of Flow Sensors on automatic chemical injection during formula execution. Set to YES or NO. This function is used to swap to a time based chemical injection on systems equipped with flow sensors.

ONE WAY CHEMS @
Enables or disables ONE-WAY rotation during chemical additions. Set to YES or NO.

CHEMS FORWARD @
Sets the direction to rotate during One Way Chemical injections to Forward.

CHEMS REVERSE @
Sets the direction to rotate during One Way Chemical injections to Reverse.

EXTRACT RETRY @
Enables or disables automatic Extract Retry. Set to YES or NO.

UNLOAD NORMAL @
Sets the method of unloading to Normal or Reversing Unload.

UNLOAD REV @
Sets the method of unloading to Reverse rotation only.

UNLOAD FWD @
Sets the method of unloading to Forward rotation only.

SLOW DRAIN @
Causes the drain to discharge water at a 50 % duty cycle (3 seconds on, 3 seconds off) during a drain sequence.

HOLD STEP @
Enables or disables the condition hold sequence at the end of each step. Hold Step @ YES is the default condition that causes all conditions to be satisfied before continuing to the next step. (i.e. Steam temperature satisfied.)

ALT HEAT @
Enables or disables the alternate heat output. Some machines may have more than one source of energy to heat the machine during a steam instruction.

LEVEL SAFETIES @
Enables or disables the Chemical Safeties function of the MicroPulse controller. Default operation is Chemical Safeties @ YES, which only allows chemical addition when 3.0" or more of water is in the machine. When disabled, chemicals are allowed to be added at a zero water level and during drains.

OZONE MODE @
When Ozone Mode is set to YES, the MicroPulse controller sequences a set of valves to operate the Ozone Mode of the machine. Setting Ozone Mode to NO resets the machine to normal operating mode.

OZONE WASTE @
When Ozone Waste is set to YES, the MicroPulse controller will divert the exhaust to the ozone destruct unit. When Ozone Waste is set to NO, the MicroPulse controller will send the exhaust to ozone re-use.

RUN @ WATCHDOG @
When Run @ Watchdog is set to YES, the MicroPulse controller continues to rotate the cylinder according to the programmed parameters during watchdog errors. If an error has occurred that interrupts the safeties, the machine is paused regardless of the setting. To reset Run @ Watchdog, reset it to NO.

AUTO CHEMS @
When Auto Chems is set to NO, the MicroPulse controller will add Chemicals 1 - 16 as if they are to be manually added. This will result in the machine prompting for these chemicals if a signal is programmed. Setting Auto Chems back to YES continues normal operation of the automatic chemical system.

SHAKEOUT @ Y/N
If the machine is equipped with a brake, this parameter is used while unloading a machine causing the brake to engage while reversing directions.

MAX LEVEL @
Sets the maximum level allowed in the machine. If the maximum level is exceeded, a Level Halt High watchdog is generated.

RETRY LEV @
Sets the water level to refill to on Extract Retry sequences.

MAX pH ADJ. @
Sets the maximum pH adjustment allowed during each adjustment cycle. This allows a formula to make multiple small adjustments to pH over a broad time base. (If pH System = YES in user defined setups.)

MIN TEMP @
Sets the minimum temperature allowed in the machine. If the minimum temperature is sensed, a Temp. Halt Low watchdog is generated.

MAX TEMP @
Sets the maximum temperature allowed in the machine. If the maximum temperature is exceeded, a Temp. Halt High watchdog is generated.

CUR VOL. @
Sets the current water volume accumulator to the programmed volume.

LOAD WEIGHT @
Sets the load weight for the formula execution to the programmed weight.

LIQ. RATIO @
Sets the current water volume accumulator to the programmed ratio based on the load weight.

REFILLS @
Sets the number of allowable water refills. If the number of refills is exceeded, a Refills Watchdog is generated.

MIN GRAD @
Sets the minimum temperature gradient expected during a steam step. If the minimum gradient is not achieved, a Steam Watchdog is generated.

INIT ACID @
Sets the initial units of acid to be added when adjusting the pH with the pH controller. (If pH System = YES in user defined setups.)

MAX ACID @
Sets the maximum units of acid that can be calculated to be added when adjusting the pH with the pH controller. (If pH System = YES in user defined setups.)

TOTAL ACID @
Sets the total amount of units of acid that can be added when adjusting the pH with the pH controller. When Total Acid is exceeded, a Max Acid Dose watchdog is generated. (If pH System = YES in user defined setups.)

INIT BASE @
Sets the initial units of base to be added when adjusting the pH with the pH controller. (If pH System = YES in user defined setups.)

MAX BASE @
Sets the maximum units of base that can be calculated to be added when adjusting the pH with the pH controller. (If pH System = YES in user defined setups.)

TOTAL BASE @
Sets the total amount of units of base that can be added when adjusting the pH with the pH controller. When Total Base is exceeded, a Max Base Dose watchdog is generated. (If pH System = YES in user defined setups.)

The following is an example using the Signal Yes/No, Count# INC/Zero, Compare Counts, GOTO Label#, and certain Set Parameters.

001: <Formula Name>
002: Set Water Fill Watchdog = 0:45
003: Fill 100 GAL Temp 137 - 142°F Use H-HC-C
004: Wait to Satisfy
005: ********* Label 1 *********
006: Increment Counter 1
007: Set Steam Watchdog = 1:00
008: Steam When Temperature < 140°F Until Next Step
009: Wait to Satisfy
010: Set Chemical Watchdog = 0:30
011: Add 10 Oz. of pH 6.0 Buf
012: Wait to Satisfy
013: Run Time 3:00 001/0003:00
014: Set Signal Mute = 1:00
015: Prompt: Check pH of Bath
016: Prompt: Is pH Between
017: Prompt: 5.8 and 6.2?
018: Signal [Yes] = Label 3 [No] = Resume
019: Run Time 0:00 002/0003:00
020: IF Counter 1 > 2 GOTO Label 2
021: GOTO Label 1
022: ********* Label 2 *********
023: Zero Counter 1
024: Prompt: Call Supervisor!
025: Prompt: pH Not Adjusted
026: Prompt: Try Again?
027: Signal [Yes] = Label 1 [No] = Resume
028: Run Time 0:00 003/0003:00
029: ********* Label 3 *********
030: Set Run @ Watchdog = Enabled
031: Set Min Temperature = 130°F
032: Set Max Temperature = 145°F
033: Add 64 Oz. of Enzyme
034: Wait to Satisfy
035: Run Time 10:00 004/0013:00
036: Set Min Temperature = 32°F
037: Set Max Temperature = 212°F
038: Set Drain Delay = 0 Seconds
039: Drain 1 Time for 1:00 005/0014:00
040: Set Unload Normal = Enabled
041: Set Forward Unload = 8 Seconds
042: Set Reverse Unload = 6 Seconds
043: Run Time 0:00 006/0014:00
044: END OF FORMULA

Line 002 resets our user defined setup Water Fill Watchdog to forty five seconds.
Line 007 resets our user defined setup Steam Watchdog to one minute.
Line 014 resets our user defined setup Signal Mute Time to one minute.
Line 030 enables Run @ Watchdog.
Line 031 resets our user defined setup Min. Temperature to 130^{df}.
Line 032 resets our user defined setup Max. Temperature to 145^{df}.
Line 036 resets our user defined setup Min. Temperature to 32^{df}.
Line 037 resets our user defined setup Max. Temperature to 212^{df}.
Line 038 resets our user defined setup Drain Delay to zero seconds.
Line 040 resets our user defined setup Unload Normal to enable.
Line 041 sets our Forward Unload to rotate eight seconds.
Line 042 sets our Reverse Unload to rotate six seconds.

Please remember the Set Parameters are TOGGLE functions', meaning the programmed value is retained for the remainder of the formula.

Passwords Levels and Access Rights

The MicroPulse controllers are setup with an eight-level password system. Formula programming, manual operations, and maintenance functions are accessible only after entering the appropriate password. The machine is programmed with default passwords at the factory but the user can change them after the machine is entered into service. To change the passwords, a valid level 7 password must be entered. From the Waiting to Load screen enter a valid level 7 password. Select 1=Setup. Select 1=Watchdog/Setups. Select 4=Passwords. Using the arrow keys, scroll to the password that needs to be changed or viewed. A password consists of 1 to 6 numbers. Examples are 1 or 080499. Using a six-digit password is recommended. A password control log is also a recommended practice to keep track of who has each level of password.

Level	Password Code	User	Date	Remarks
1				
2				
3				
4				
5				
6				
7				
8				

Default Password Setups

Level	Default Password
1	111111
2	222222
3	333333
4	444444
5	555555
6	666666
7	777777
8	888888

Function	1	2	3	4	5	6	7	8
Cancel Steps	x	x	x	x	x	x	x	
Access Totals		x	x	x	x	x	x	
Manual Operation			x	x	x	x	x	
Maintenance			x	x	x	x	x	
Calibrate			x	x	x	x	x	
Clock			x	x	x	x	x	
Cancel Watchdogs				x	x	x	x	
Setups						x	x	
Program						x	x	
Watchdogs/Setups							x	
Freeze Timers								x

Cancel Steps
This function is used to skip steps in a formula or to abort a formula that is executing. To cancel a step, press the [NO] key to pause the formula.

Formula # 1
Step # 2 Line 15
PAUSED! [YES] Starts
T = 1:45 S = 5:00

Advancing in a Formula
Enter a valid password level 1 through 7. Press the [UP] arrow key to advance the formula to the desired step. The controller will advance to the next "Wait to Satisfy", Run, or Drain instruction in the formula.

Formula # 1
Step # 4 Line 63
PAUSED! [YES] Starts
T = 1:50 S = 2:00

Press the [YES] key to resume the formula at the new step.

Canceling a Formula
If a formula is cancelled, time accumulated for that formula is added to the totals.

Formula # 1
Step # 4 Line 63
WARM WATER RINSE
T = 1:55 S = 4:57

To abort a formula, enter a valid password level 1 through 7. Press the [ENT] and the [NO] keys simultaneously to clear the current formula.

Waiting for Washer
to Unload!!

Press [YES] Key Continue

Press the [ENT] and the [NO] keys simultaneously to the "Waiting to Load" display.

Waiting for Washer
to Receive Load!!
Depress [YES] Key to
Select Formula

Access Totals
This function allows the user to list various statistics such as formula run times and formula usage. From the "Waiting to Load" display, enter a valid password level 2 through 7.

1=Setups 2=Program
3=Maint. 4=Calibrate
5=Totals 6=Clock
Selection? 0=exit

Select 5=Totals

1=Review Totals
2+Clr= Clr Chem Data
3+Clr= Clr Run Data
Selection? 0 = Exit

Pressing 1=Review Totals the LCD will display the following.

1=View Chemical Data
2=View Run Time Data
3=View Event History
Selection? 0=exit

Pressing 1=View Chemical Data the display will show the number of units of the displayed chemical that has been added by the MicroPulse controller since the last time chemical data was reset. Use the arrow keys to scroll through the data for each chemical supply.

Chemical 1
Sec.= 2568
Use arrow to scroll
0=exit

Press 2=View Run Time Data to display the number of formula run executions of the displayed formula since the last time the last time run time data was reset. The total minutes spent running the displayed formula is also shown.

Formula 1
Total Runs = 14
Tot. MMMMSS= 824
Arrows Scroll 0=exit

Press 3=View Event History to view the last 101 formulas executed. The data for the most recent is displayed. Use the arrow keys to scroll. The start date, start time, formula name, run time, satisfy times (steams, fills etc), loading time and the unloading times are displayed for each formula execution.

D= 08-04-00 (start date) T= 11:45 (start time)
Formula # 1 (formula name)
R= 36:45 (formula run time) S= 5:30 (satisfy time)
L= 2:34 (load time) U= 2:54 (unloading time)

Manual Operation
This function allows the user to operate various machine functions manually. If in the user defined setups the Manual Buttons= NO, from the "Waiting to Load" display the user can enter a valid password level 3 through 7 to activate the manual buttons on the front panel display i.e. steam, drains, and water fills.

Maintenance
This function allows the user to operate various machine functions manually. From the "Waiting to Load" display the user can enter a valid password level 3 through 7.

1=Setups 2=Program
3=Maint. 4=Calibrate
5=Totals 6=Clock
Selection? 0=exit

Select 3=Maint.

1=Manual Outputs
2=Diagnostics
3=Maintenance
Selection? 0=exit

Select 1=Manual Outputs

1=Chemicals/Supplys
2=Water/Heat/Cooldn
3=Drains/Signal
0=exit

Select 1=Chemicals/Supplys

1=Chemical Outputs
2=Supply Dispensers

Selection? 0=exit

Select 1=Chemical Outputs or 2=Supply dispensers. Either selection operates the same so only one will be described.
Chemical # 0

Yes to turn on
0=exit
Use the arrow keys to scroll to the desired chemical. Press and hold the [YES] key. The output will remain on while the [YES] key is pressed. Press [0] to exit.

1=Chemicals/Supplys
2=Water/Heat/Cooldn
3=Drains/Signal
0=exit

Select 2=Water/Heat/Cooldn

1=Hot 2=Cold 3=3rd
4=Heat 5=Cool 6=4th
Hold key down for ON
0=exit

Press and hold the numeric key that matches the output to be tested, i.e. 1=Hot or 2=Cold. The output will remain on while the numeric key is pressed. Press [0] to exit.

1=Chemicals/Supplys
2=Water/Heat/Cooldn
3=Drains/Signal
0=exit

Select 3=Drains/Signal

1=Drain 1 2=Drain 2
3=Drain 3 4=Signal
5=Float
Key Toggles 0=exit

Press and hold the numeric key that matches the output to be tested, i.e. 1=Drain 1 or 2=Drain 2. The drain output will remain on until the numeric key is pressed again. Press [0] to exit.

1=Manual Outputs
2=Diagnostics
3=Maintenance
Selection? 0=exit

Select 2=Diagnostics

1=Test Front Panel
2=Display Inputs
3=Board Responses
Selection? 0=exit

Select 1=Test Front Panel

Press all key and buttons one at a time. The time display will show a number corresponding to the location of the active switch. The LCD will also show the corresponding number to the location of the active switch. If the [up arrow] key is being pressed the time and the LCD will displays will show the following.

Time 00:08
P.B./key 8 is pushed
YES + NO = Exit

If no number is displayed, either the switch is faulty or the corresponding electrical circuit has a bad component. Press [YES] + [NO] to exit.

1=Test Front Panel
2=Display Inputs
3=Board Responses
Selection? 0=exit

Select 2=Display Inputs

701 Control Circuit
Input= Off

Arrows Scroll 0=Exit

By selecting 2=Display Inputs the user can scroll through a list of inputs to check their status. For example, by on certain manufacturers controls, pressing the up arrow seven times the LCD will display the following.

708 Emerg. Stop OK
Input= On

Arrows Scroll 0= exit

This shows that the emergency stop is not pressed on the machine. Press [0] to exit.

1=Test Front Panel
2=Display Inputs
3=Board Responses
Selection? 0=exit

Select 3=Board Responses

I/O Rack #1
No Responses 0

Arrows Scroll 0= exit

By using the arrow keys, the user can determine if there is a possible I/O rack problem. Due to the nature of the electronic timing signals, the I/O racks will fail to respond to the controller. The controller will repeat the request until the board responds. If the controller receives four sequential no-responses, an error message is displayed. An excessive number of repeat requests may indicate a failing I/O rack or a bad connection. Press [0] to exit.

1=Manual Outputs
2=Diagnostics
3=Maintenance
Selection? 0=exit

Select 3=Maintenance

Using the arrow keys, scroll to examine the preventative maintenance watchdog schedule of the machine. If the user presses the up arrow two times the LCD will display (only if default vocabs are loaded) the following.

DRIVE COMPONENTS
Next Service = 26
0= exit

This tells the user that the drive components preventative maintenance schedule will be due in 26 (26 used for example only) machine hours. Please note that machine hours accumulate only while the machine is executing a formula. Exit from the control.

Clock

The clock is used to track when a formula was executed and for reports on the optional PulseNet module. To set the clock, enter a valid level 3 through 7 password from the Waiting to Load screen.

1=Setups 2=Program
3=Maint. 4=Calibrate
5=Totals 6=Clock
Selection? 0=exit

Select 6=Clock

Date= 00:00:00
Enter New Date
Date= 00:00:00
ENTER= Accept No= exit

Enter the day, month, and year. For example the date is July 4, 2000 press [0][8][0][4][0][0].

Date= 00:00:00
Enter New Date
Date= 08:04:00
ENTER= Accept No= exit

Press [ENT].

Time= 00:00:00
Enter New Time
Time= 00:00:00
ENTER= Accept No= exit

The clock is in a 24-hour format also known as European. Enter the hour, minutes, and seconds. For example, if the time is 3:15:33 PM, press [1][5][1][5][3][3].

Time= 00:00:00
Enter New Time
Time= 15:15:33
ENTER= Accept No= exit

Press [ENT].

Cancel Watchdogs
This allows the user to cancel maintenance and preventative maintenance watchdogs. The fault will be displayed on the LCD any time the controller detects an error condition. The error message will indicate the type of fault. Machine operation will be halted until a valid level 4 through 7 password is entered. Refer to troubleshooting for a list of error messages and possible corrective actions.

Call Maintenance!!

Low Air Pressure!

Enter a valid level 4 through 7 password.

Formula # 1
Step # 4 Line 63
PAUSED! [YES] Starts
T = 1:50 S = 2:00

Setups
This allows the user to enter the user-defined setups. Refer to user-defined setups. From the Waiting to Load screen, enter a valid level 6 or 7 password.

1=Setups 2=Program
3=Maint. 4=Calibrate
5=Totals 6=Clock
Selection? 0=exit

Select 1=Setups

Program
This allows the user to enter the 2=Program selection. Refer to Program section. From the Waiting to Load screen, enter a valid level 6 or 7 password.

1=Setups 2=Program
3=Maint. 4=Calibrate
5=Totals 6=Clock
Selection? 0=exit

Select 2=Program

Watchdog/Setups
This allows the user to setup the user defined watchdog setups. From the Waiting to Load screen, only a valid level 7 password will allow access. Refer to Watchdog/Setups section.

1=Setups 2=Program
3=Maint. 4=Calibrate
5=Totals 6=Clock
Selection? 0=exit

Select 1=Setups

1=Watch Dogs / Setups
2=Chemical Setups
3=Setup pH System (only if pH System = Yes in user defined setups)
Selection? 0=exit

Select 1=Watch Dogs / Setups

Freeze Timers
This allows the user to freeze the controls timers while not in operation and to increase and decrease step timers while executing a formula. By entering a valid level 8 password all of the control timers are frozen. If a formula is executing, entering a valid level 8 password will cause the formula to remain frozen in the step it is executing until the [CLR] or any numerical key other than [8] is pressed. When a formula is executing and the timers have been frozen, pressing the up arrow key will add time in one-minute increments to the step timer. Pressing the down arrow key will remove time in one-minute increments to the step timer. After the days production it is good to make sure the formula is finished processing to freeze the timers. This is for the total reports. This is known as sleeping the machine. Pressing any key will wake the machine and resume all timers.

Notes:

Maintenance Prompts

Because the maintenance prompts can be customized to suit the individual needs of the user, responsibility for completing maintenance rests with the user. There is a total of 32 maintenance prompts for the user. The MicroPulse controller has used the first twelve maintenance prompts as defaults. These may be edited or changed at any time. The default prompts are as follows:

001 CLEAN MACHINE
002 ELECTRICAL PANEL
003 DRIVE COMPONENTS
004 BEARINGS
005 SHELL DOOR
006 PNE/AIR/LUB
007 LUBRICATION
008 FLOATAIRE SYSTEM
009 CLUTCH
010 WATER/SYS/CAL
011 BRAKE
012 MOTOR

For the recommended preventative maintenance, please refer to the manufacturer for details.

Setting up the Preventative Maintenance Program

From the Waiting to Load screen, enter a valid level 7 password.

1=Setups 2=Program
3=Maint. 4=Calibrate
5=Totals 6=Clock
Selection? 0=exit

Select 1=Setup.

1=Watch Dogs / Setups
2=Chemical Setups
3=Setup pH System (only if pH System = Yes in user defined setups)
Selection? 0=exit

Select 1=Watch Dogs / Setups

1=Machine Setup
2=Maintenance Setup
3=Clear Ram Vocabs
4=Passwords 0=exit

Select 2=Maintenance Setup

Maintenance # 14
MAINTENANCE # 14
Use arrows to scroll
Enter = Accept No = Exit

Press [ENT]. The cursor (appears as a flashing line) the character position to be edited. With the cursor in position, key in the numerical code (see the ASCII reference) for the desired character.
For example if you are programming TENSION BELTS. Press [8][4] then press [ENT]. The T will be shown now press the [NO] key to move the cursor right.

TAINTENANCE # 14
ENT= Character # 87
YES = Left NO = Right
YES + NO = Accept

Continue with this sequence until you have programmed the desired operation name.

T=[8][4] [ENT] [NO]
E=[6][9] [ENT] [NO]
N=[7][8] [ENT] [NO]
S=[8][3] [ENT] [NO]
I=[7][3] [ENT] [NO]
O=[7][9] [ENT] [NO]
N=[7][8] [ENT] [NO]
space=[3][2] [ENT] [NO]
B=[6][6] [ENT] [NO]
E=[6][9] [ENT] [NO]
L=[7][6] [ENT] [NO]
T=[8][4] [ENT] [NO]
S=[8][3] [ENT] [NO]
space=[3][2] [ENT] [NO]
space=[3][2] [ENT] [NO]
space=[3][2] [ENT] [NO]
[YES]+[NO]

The LCD display will now read as follows:

TENSION BELTS
Interval= 0
Key in Interval Hrs.
ENTER = Accept

The next step is to set up the desired maintenance interval. The screen will show the currently programmed interval in hours. Enter the desired interval

using hours from 1 to 99999. We will enter 80 hours for our example. Press [8][0][ENT]. The LSD display now reads as follows:

TENSION BELTS
Next Service= 80
Password Resets Hrs.
ENTER = Accept

Key in a valid level 7 password to make the interval change take effect. The LCD display will read as follows:

1=Machine Setup
2=Maintenance Setup
3=Clear Ram Vocabs
4=Passwords 0=exit

If required, Press 2=Maintenance Setup and follow this guideline. If not, exit from the controller.

Maintenance Errors and Call Maintenance

One of the major advantages of the technology of the MicroPulse Controller is the ability of the controller to monitor the machine and itself. Should something "out of the ordinary" occur, the controller will sound an alarm and warn the operator of a potential problem.

There are two main types of alarms. The first type warns the operator that something is wrong, and will allow the operator to restart the machine once the situation is corrected. The second and more serious alarm warns the operator that something is wrong and displays a "Call Maintenance" message. This alarm cannot be cleared from the controller until a level 4 or higher password is entered.

NOTE: Watchdog messages are "latched" on occurrence.

Type I Alarms

The condition is enunciated and the program is paused. The LCD displays:

PAUSED! [YES] STARTS.

To clear the error: correct the condition and then press the [YES] key.

Alarms Message	Reason for Alarm
RESET OVERLOADS!	One or more Overloads have tripped.
LOW AIR PRESSURE!	Air pressure has dropped below a safe operating range.
EMERGENCY STOP!	The Emergency Stop has interrupted the control circuit.
RESET 15A CIRCUIT	The 15 Amp circuit breaker has been tripped.
SAMPLE DOOR OPEN!	The Sample Door Closed switch is not made.
FILTER DOOR OPEN!	The Filter Door Closed switch is not made.
FRONT NOT FULL DOWN!	The Front Full Down switch is not made or the Unbalanced Switch is made.
REAR NOT FULL DOWN!	The Rear Full Down switch is not made or the Unbalanced Switch is made.
DOOR NOT CLOSED!	The Cylinder Door Closed switch (automatic doors) or the Door Interlock Input is not made.
BRAKE NEEDS ADJUSTED!	If applicable, the Brake pads have worn to the point that the Brake Needs Adjusted Switch is made.

Type II Alarms

The condition is enunciated in the Watchdog state. The LCD displays:

“Call Maintenance”

To clear the error, correct the condition and key in a level 4 or higher password.

Alarms Message	Reason for Alarm
Chem. Watchdog	The user defined length of time (see Machine Setups) has been exceeded, or the Chemical Flow Sensor is not transmitting counts when a chemical injections is programmed
Chemical #1	The MicroPulse controller will specify which chemical should have injected during the Chemical Watchdog.
Sensor #1 Leak	Pulses wee transmitted by Chemical Flow Sensor #1 when no chemical injection was programmed.
Sensor #2 Leak	Pulses wee transmitted by Chemical Flow Sensor #2 when no chemical injection was programmed.
Sensor #3 Leak	Pulses wee transmitted by Chemical Flow Sensor #3 when no chemical injection was programmed.
Sensor #1 Flush	No pulses were transmitted by Chemical Flow Sensor #1 when water flush was called for.
Sensor #2 Flush	No pulses were transmitted by Chemical Flow Sensor #2 when water flush was called for.
Sensor #3 Flush	No pulses were transmitted by Chemical Flow Sensor #3 when water flush was called for.
Fill Watchdog	The desired water level or water volume was not reached after the user-defined watchdog period of time. (See Machine Setups)

Refills Watchdog	The user-defined number of refills has been exceeded. (See Machine Setups)
Fill Hot	The MicroPulse controller will specify if the water that was programmed and did not meet level or volume was Hot Water.
Fill Cold	The MicroPulse controller will specify if the water that was programmed and did not meet level or volume was Cold Water.
Fill 3rd	The MicroPulse controller will specify if the water that was programmed and did not meet level or volume was 3rd Water.
Fill 4th	The MicroPulse controller will specify if the water that was programmed and did not meet level or volume was 4th Water.
Steam Watchdog	The desired temperature has not been reached after the user-defined watchdog period of time. (See Machine Setups)
Cool Down Watchdog	The desired temperature has not been reached after the user-defined watchdog period of time. (See Machine Setups)
Temp Halt Lo Limit	The Temperature probe is reading a temperature below the user-defined Temperature Halt Low Limit. (See Machine Setups)
Temp Halt Hi Limit	The Temperature probe is reading a temperature above the user-defined Temperature Halt Hi Limit. (See Machine Setups)
Level Halt High	The pressure transducer is reading a level above the user-defined Level Halt High Limit. (See Machine Setups)
I/O Rack #1 Fault	The IIC Chip on I/O Rack #1 did not respond to a request by the MicroPulse controller CPU via the IIC Cable.

I/O Rack #2 Fault	The IIC Chip on I/O Rack #2 did not respond to a request by the MicroPulse controller CPU via the IIC Cable.
I/O Rack #3 Fault	The IIC Chip on I/O Rack #3 did not respond to a request by the MicroPulse controller CPU via the IIC Cable.
I/O Rack #4 Fault	The IIC Chip on I/O Rack #4 did not respond to a request by the MicroPulse controller CPU via the IIC Cable.
I/O Rack #5 Fault	The IIC Chip on I/O Rack #5 did not respond to a request by the MicroPulse controller CPU via the IIC Cable.
I/O Rack #6 Fault	The IIC Chip on I/O Rack #6 did not respond to a request by the MicroPulse controller CPU via the IIC Cable.
I/O Rack #7 Fault	The IIC Chip on I/O Rack #7 did not respond to a request by the MicroPulse controller CPU via the IIC Cable.
I/O Rack #8 Fault	The IIC Chip on I/O Rack #8 did not respond to a request by the MicroPulse controller CPU via the IIC Cable.
Analog Out #1 Fault	The IIC Chip on the Analog Out #1 did not respond to a request by the MicroPulse Controller CPU via the IIC Cable.
Analog Out #2 Fault	The IIC Chip on the Analog Out #2 did not respond to a request by the MicroPulse Controller CPU via the IIC Cable.
Aux Rack #1 Fault	The IIC Chip on the Auxiliary Rack #1 did not respond to a request by the MicroPulse Controller CPU via the IIC Cable.
Aux Rack #2 Fault	The IIC Chip on the Auxiliary Rack #2 did not respond to a request by the MicroPulse Controller CPU via the IIC Cable.

pH OUT OF RANGE!!	If the ChemPulse pH Monitor and Control System are being used to control pH, the user-defined pH Timer Watchdog has been exceeded. (See Machine Setups)
MAX ACID EXCEDDED!!	If the ChemPulse pH Monitor and Control System are being used to control pH, the user-defined pH maximum amount of acid has been added and the programmed pH Range has not been satisfied. (See Machine Setups)
MAX BASE EXCEDDED!!	If the ChemPulse pH Monitor and Control System are being used to control pH, the user-defined pH maximum amount of base has been added and the programmed pH Range has not been satisfied. (See Machine Setups)

Key Pressing During Formula Execution

While a formula is being executed you can get very useful information by pressing any of the numeric keys. Following will be examples of information by pressing these keys.

Pressing the [1] key displays information on chemicals 1- 8. This information includes the chemical number followed by the desired amount and then the actual amount received.

```
1:  0   0   2:  0   0
3:  0   0   4:  0   0
5:  0   0   6:  0   0
7:  0   0   8:  0   0
```

Pressing the [2] key displays information on chemicals 9- 16. This information includes the chemical number followed by the desired amount and then the actual amount received. Due to room restrictions on the LCD, the number 1 in all of the even numbered chemicals must be displayed with a ^ symbol.

```
 9:  0   0   ^0:  0   0
11:  0   0   ^2:  0   0
13:  0   0   ^4:  0   0
15:  0   0   ^6:  0   0
```

Pressing the [3] key displays the desired water level and temperature.

```
Des. Level = 00.0
Des. Temp = 000
Act. Temp = 000
```

Pressing the [4] key displays the cylinder RPM's and G-force.

```
Cylinders RPM's = 000
Cylinders G's = 000.0
Desired RPM's = 000
```

Pressing the [5] key displays the hour meter, operation name of the step of the formula being executed, and the analog out number that is being sent to the VSD to operate at the programmed RPM.

```
Hour Meter = 00000.0
Operation name or number
Analog out = 0000
```

Pressing the [6] key displays the reversing timers.

Fwd = desired seconds	count down of desired seconds
Rev = desired seconds	count down of desired seconds
Dwell = desired seconds	count down of desired seconds

Pressing the [7] key displays the desired and current gallons if equipped with a water meter and is programmed in the formula being executed and totals for the entire formula up to the point of the operation.

Desired Gal. = 000
Current Gal. = 000
Total Gal. = 00000

Pressing the [8] key displays the total hot, cold, 3rd if equipped and 4th water totals for the operation being executed in the formula and totals for the entire formula up to the point of the operation.

Hot C=00000	T=00000
Cold C=00000	T=00000
3rd C=00000	T=00000
4th C=00000	T=00000

Pressing the [9] key displays the total time that a supply dispenser is programmed for during the execution of the operation of the formula.

SD1= 0:00	SD2= 0:00
SD3= 0:00	SD4= 0:00
SD5= 0:00	SD6= 0:00
SD7= 0:00	

Using the Override Displays

Screen 1
To enter into the override displays, the operator will need to press the Up and Down arrows simultaneously. The following will be a review of screen number 1.

Time in MM:SS = 00:00
Level in In. = 00.0
Temp. In Deg. = 000F
Cylinder RPM's = 000

Line 1 shows the time in minutes and seconds. For example, if there were 21 minutes and 14 seconds, the display would read 21:14.

Line 2 shows the water level in inches. For example, if the machine were filled to a 10-inch water level, the display would read 10.0;

Line 3 shows the temperature in degrees either in Fahrenheit or Metric depending on the customer setups. If the temperature were 140 degrees Fahrenheit or 60 degrees Celsius the display would read 140 or 60.

Line 4 shows the cylinder RPM's if equipped. If the cylinder were rotating at 29 RPM's the display would read 029.

Screen 2
Press the Down arrow to advance to screen 2.

Serial Num. = 000000
Hour Meter= 0000.0
Backscans = 000000 (0r Current pH 0.00 if equipped)
Current Gal. = 000 (On flow meter equipped)

Line 1 displays the machines serial number.

Line 2 displays the machines hours ran.

Line 3 displays the controllers Backscans or the current pH if equipped.

Line 4 displays the current gallons or liters if equipped with a flow meter. For example, if the machine has 240 gallons or 908 liters the display would read 240 or 908.

Screen 3

Press the Down arrow to advance to screen 3.

```
  pH 1 - 8       pH 9 - 16
00000000      00000000
00-00-0000  (Software Date) ID#=000 (Arcfiber board setting)
MicroPulse V 3.01 R 1
```

Line 1 displays the pH range if equipped.

Line 2 displays the pH if equipped.

Line 3 displays the Software date and Arcfiber ID. For example, if the software date was July 4, 2000 and the machine ArcNet ID was 4 the display would read 07-04-2000 ID#4.

Line 4 displays the software name, version number, and revision number.

Screen 4

Press the Down arrow to advance to screen 4.

```
S301-S308    S309-S316
 00000000      00000000 (Inputs in Slot 301-316 On=1 Off=0)
S101-S108    S109-S116
 00000000      00000000 (Inputs in Slot 101-116 On=1 Off=0)
```

Line 1 displays the slot 3 card 1-16.

Line 2 displays the slot 3 card 1-16 status. For example, if inputs 307 and 314 were on the display would read 00000010 00000100.

Line 3 displays the slot 1 card 1-16.

Line 4 displays the slot 1 card 1-16 status. For example, if inputs 107 and 114 were on the display would read 00000010 00000100.

Screen 5

Press the Down arrow to advance to screen 5.

R501-R508 R601-R608
00000000 00000000 (Racks 502-508 and 601-608 On=1 Off=0)
R701-R708 R801-R808
00000000 00000000 (Racks 701-708 and 801-808 On=1 Off=0)

Line 1 displays the rack 5, 1-8 and rack 6, 1-8.

Line 2 displays the rack 5, 1-8 and rack 6, 1-8 status. For example, if outputs 507 and 604 were on the display would read 00000010 00010000.

Line 3 displays the rack 7, 1-8 and rack 8, 1-8.

Line 4 displays the rack 7, 1-8 and rack 8, 1-8 status. For example, if outputs 707 and 804 were on the display would read 00000010 00010000.

Screen 6

Press the Down arrow to advance to screen 6.

R101-R108 R201-R208
00000000 00000000 (Racks 102-108 and 201-208 On=1 Off=0)
R301-R308 R401-R408
00000000 00000000 (Racks 301-308 and 401-408 On=1 Off=0)

Line 1 displays the rack 1, 1-8 and rack 2, 1-8.

Line 2 displays the rack 1, 1-8 and rack 2, 1-8 status. For example, if outputs 107 and 204 were on the display would read 00000010 00010000.

Line 3 displays the rack 3, 1-8 and rack 4, 1-8.

Line 4 displays the rack 3, 1-8 and rack 4, 1-8 status. For example, if outputs 307 and 404 were on the display would read 00000010 00010000.

Screen 7
Press the Down arrow to advance to screen 7.

Machine Diagnostic
Machine is OK or Displays a Fault

Line 1 displays that you are in the Machine Diagnostics.

Lines 2, 3, and 4 display the machine status. For example, if the machine was in the load position with the door open the display would read line 2 Machine not at Run. Line 3 would display Door not Closed.

Press the Down arrow to advance to back to screen 1.

Time in MM:SS = 00:00
Level in In. = 00.0
Temp. In Deg. = 000F
Cylinder RPM's = 000

Press the [CLR] key to return to the machine state.

Waiting to Receive Load State
If the machine were in the waiting to receive state, the display would read as follows:

Waiting For Washer
To Receive Load!!
Depress [YES] Key To
Select Formula
Switching to
* The MicroPulse *
Softrol Systems
c. 1988-2002
Softrol Systems, Inc

Formula Execution State
If the machine were executing a formula, the machine would read as follows:

Formula Name
Operation Name
Step # 1 Line # 2
T=0:26 S=9:56

Line 1 displays the formula name. For example, if the formula name was Sheets, the display would read Sheets.

Line 2 displays the operation name. For example if the name of the operation were Hot Suds, the display would read Hot Suds.

Line 3 displays the step number and the line number that the formula is executing.

Line 4 displays the total time the formula has been running and the remaining time in the step.

Reinitializing the Front Panel Display
If there is a power interruption to the FPD, the FPD will need to be reinitialized. To reinitialize the FPD press the [UP] and [Down] arrow keys simultaneously. Then the [UP] and [ENT] keys simultaneously.

Notes:

Copying Memory Contents

All power must be turned off before inserting or removing printed circuit boards. The memory card is very static sensitive device. Always touch the machine before touching the circuit boards. Hold the circuit boards by the edges to minimize contact with the components. This procedure is used to duplicate formulas, operations, setups, calibrations, vocabs, and passwords between machines. This process reduces programming time for multiple machines and achieves standardization among machines. The transfer can be done two different ways. *THIS PROCEDURE IS USED ON NON-AUTOMATED SYSTEMS ONLY* but may be used before any automation is performed. These two procedures copy the Automation Setups causing loading and unloading problems.

1. All power must be turned off before inserting or removing printed circuit boards. Remove the E3-FLOWMEM slot 5 card from the unprogrammed machine and place it into the slot 4 of the programmed machine. To do this the ACI16 slot 4 card must be removed from the programmed machine. Then copy slot 5 to 4.

2. All power must be turned off before inserting or removing printed circuit boards. Remove the E3-FLOWMEM slot 5 card from the programmed machine and place it into the slot 4 of the unprogrammed machine. To do this the ACI16 slot 4 card must be removed from the unprogrammed machine. Then copy slot 4 to 5.

This process replaces whatever is stored on the E3-FLOWMEM card. Be careful not to replace the contents of an unprogrammed E3-FLOWMEM onto the programmed E3-FLOWMEM. Because the procedure is the same for both methods only one method will be explained. Because there may be some difference between machines (water pressure, air pressure, etc.) calibrations may not be as accurate as desired.

The vocabs and the calibrations are stored on the E3-REMK4A card that is connected to the E3-PRO63K4 card in slot 1. If the user wishes to copy the vocabs and the calibrations along with the setups, formulations, operations, and passwords they will have to be copied to the slot 5 E3-FLOWMEM card. After machine 1 (programmed machine) has been programmed and calibrated, copy the vocabs and the calibrations.

At the Waiting for Load screen enter a valid level 7 password.

1=Setups 2=Program
3=Maint. 4=Calibrate
5=Totals 6=Clock
Selection? 0=exit

Select 2=Program.

1=Ops2=Formulas
3=Clr Ops 4=Clr Forms
5=Copy 6=Vocabs
Selection? 0=exit

Select 5=Copy.

1=Copy Slot Cards
2=Copy Vocabs
3=Copy Calibrations
Selection? 0=exit

Select 2=Copy Vocabs.

1=Vocabs to Slot 5
2=Slot 5 to Vocabs
0=exit

Select 1=Vocabs to Slot 5. Be careful not to select 2=Slot 5 to Vocabs. That could potentially change all of your formula, operation, and maintenance names along with all other programmable vocabs.

Copy Vocabs to Slot 5
Key in Password!!!
NO = exit

Enter a valid level 7 password.

Verify

YES to Continue

1=Ops2=Formulas
3=Clr Ops 4=Clr Forms
5=Copy 6=Vocabs
Selection? 0=exit

Select 5=Copy.

1=Copy Slot Cards
2=Copy Vocabs
3=Copy Calibrations
Selection? 0=exit

Select 3=Copy Calibrations

1=Calib. to Slot 5
2=Slot 5 to Calib.
0=exit

Select 1=Calib. to Slot 5. Be careful not to select 2=Slot 5 to Calib. That could potentially change all of your calibrations.

Calib. to Slot 5
Key in Password!!!
NO = exit

Enter a valid level 7 password.

1=Ops2=Formulas
3=Clr Ops 4=Clr Forms
5=Copy 6=Vocabs
Selection? 0=exit

Now that all vocabs and calibrations are backed up on the E3-FLOWMEM card, the user will be ready to continue.

Turn off the main circuit breaker of the machine that has not been programmed (machine 2). Remove the E3-FLOWMEM slot 5 card from the machine.

Turn off the main circuit breaker of the machine that has been programmed (machine 1). Remove the ACI16 slot 4 card from machine 1 and replace it with the E3-FLOWMEM card from machine 2.

Turn on the circuit breaker on machine 1.

At the Waiting for Load screen enter a valid level 7 password.

1=Setups 2=Program
3=Maint. 4=Calibrate
5=Totals 6=Clock
Selection? 0=exit
Select 2=Program.

1=Ops2=Formulas
3=Clr Ops 4=Clr Forms
5=Copy 6=Vocabs
Selection? 0=exit

Select 5=Copy.

1=Copy Slot Cards
2=Copy Vocabs
3=Copy Calibrations
Selection? 0=exit

Select 1=Copy Slot Cards

1=Copy Slot 5 to 4
2=Copy Slot 4 to 5
Selection? 0=exit

Select 1=Copy Slot 5 to 4

Copy Slot 5 to 4
Key in Password!!!
NO = exit

Enter a valid level 7 password and all formulas, operations, setups, password, vocabs, and calibrations are now stored on the E3-FLOWMEM card from machine 2.

Turn off the main circuit breaker of the machine 1. Remove the E3-FLOWMEM card from machine 2 and place the E3-FLOWMEM card from machine 3 and follow the procedure beginning with replacing machine 2 with machine 3. If no other machines are to be copied, place the ACI16 card back into slot 4 on machine 1 and turn on the main circuit breaker.

Return to machine 2. Place the E3_FLOWMEM card back into slot 5. Turn on the main circuit breaker to the machine.

At the Waiting for Load screen enter a valid level 7 password.

1=Setups 2=Program
3=Maint. 4=Calibrate
5=Totals 6=Clock
Selection? 0=exit

Select 2=Program.

1=Ops2=Formulas
3=Clr Ops 4=Clr Forms
5=Copy 6=Vocabs
Selection? 0=exit

Select 5=Copy.

1=Copy Slot Cards
2=Copy Vocabs
3=Copy Calibrations
Selection? 0=exit

Select 2=Copy Vocabs.

1=Vocabs to Slot 5
2=Slot 5 to Vocabs
0=exit

Select 2=Slot 5 to Vocabs. This will copy all of the vocabs to the E3-REMK4A card allowing the user to view them.

Copy Slot 5 to Vocabs
Key in Password!!!
NO = exit

Enter a valid level 7 password.

Verify

YES to Continue

1=Ops2=Formulas
3=Clr Ops 4=Clr Forms
5=Copy 6=Vocabs
Selection? 0=exit

Select 5=Copy.

1=Copy Slot Cards
2=Copy Vocabs
3=Copy Calibrations
Selection? 0=exit

Select 3=Copy Calibrations

1=Calib. to Slot 5
2=Slot 5 to Calib.
0=exit

Select 2=Slot 5 to Calib. Because there may be some difference between machines (water pressure, air pressure, etc.) calibrations may not be as accurate as desired and should be checked for accuracy.

Slot 5 to Calib.
Key in Password!!!
NO = exit

Enter a valid level 7 password.

1=Ops2=Formulas
3=Clr Ops 4=Clr Forms
5=Copy 6=Vocabs
Selection? 0=exit

Exit out of the control and the user is ready to execute formulas.

Machine Rotations Loading and Unloading

Load Position Rotation

The rotation push buttons work differently according to the user defined setups. In the user defined setups if Momentary Load = YES, while in the load position the machine will only rotate forward and only while the rotate forward button is pressed. If Momentary Load = No, while in the load position the machine will only rotate forward. If the rotate forward is pressed and released the machine will rotate distribution speed. If both rotate forward and rotate reverse is pressed at the same time, the machine will rotate at wash speed. If Momentary Load = No, the operator may press the function button along with the machine at run button while the machine is rotating. This will allow the machine to start tilting towards the run position, close the door while rotating until the door shows closed. Momentary Load must be answered No for all automatic systems.

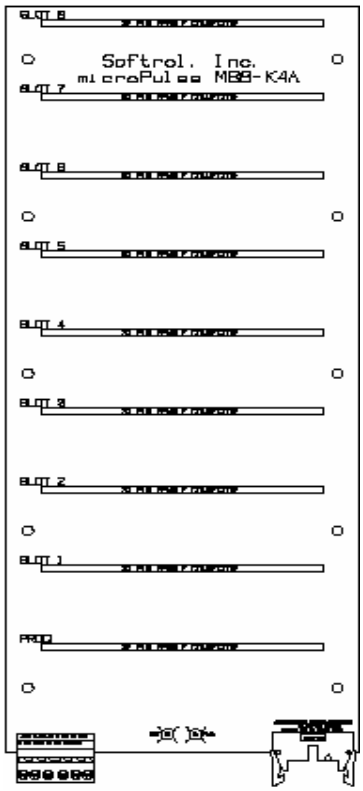
Unload Position Rotation

The rotation push buttons work differently according to the user defined setups. In the user defined setups if Reversing Unload= Yes, pressing the rotate forward button rotates the machine forward for 8 seconds then reverse for 8 seconds. If at any time during this process the operator lifts up on the rotate forward, the timers reset. If Reversing Unload= No, the operator can press either the rotate forward button or the rotate reverse button depending on the direction preferred.

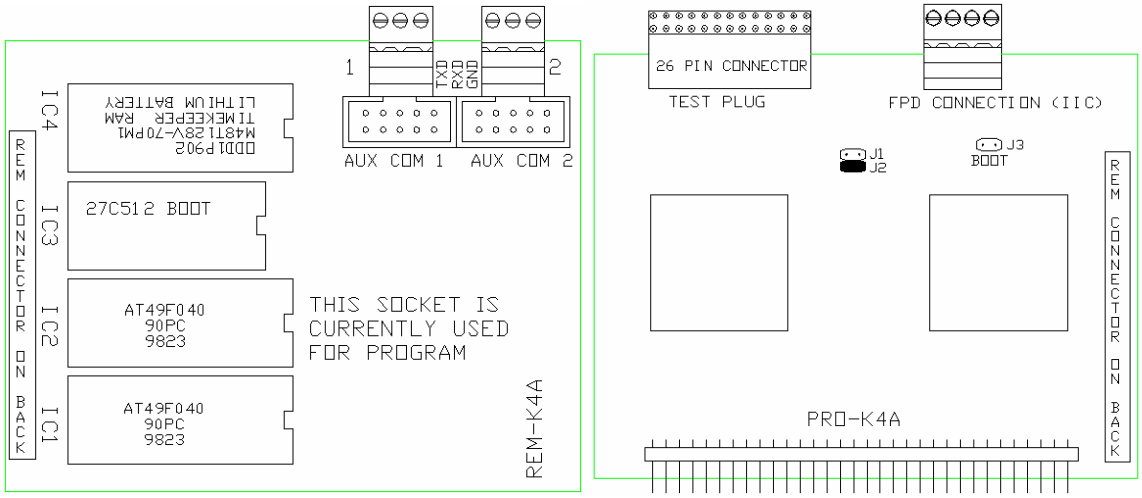
Notes:

Hardware Overview

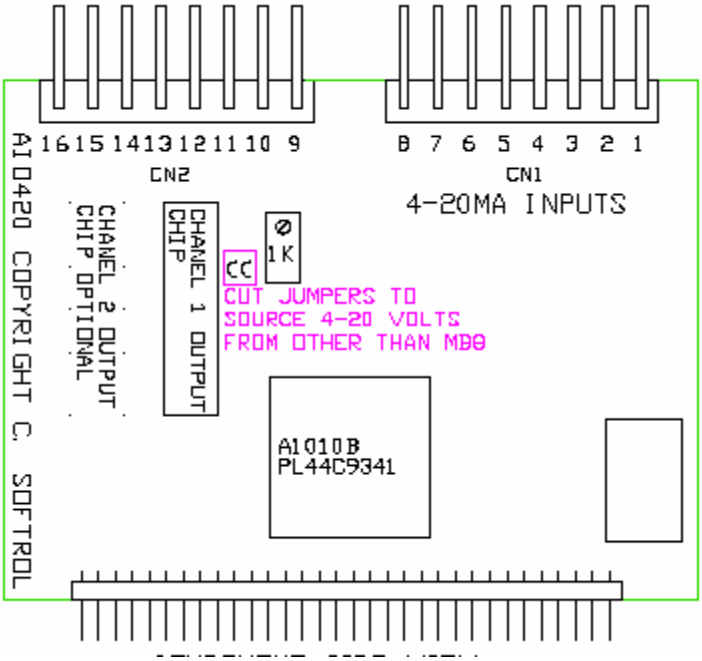
The MicroPulse Controller consists of Slot Cards that reside in an Mb8-K4A (Mother Board). Residing in the processor slot, you will find two cards that attach to each other then plug into the Mb8-K4A. The REM-K4A attaches to the E3-PRO63K4A card. The E3-PRO63K4A then attaches to the Mb8-K4A. In Slot 2 you will find an E3-AIO420 card. In Slot 3 resides an ACI16 card. In Slot 4 you will find the optional 4-Flow card used with multiple water flow meters. In Slot 5 you will find an E3-FLOWMEM128NV card. In Slot 6 you will find the ARCFIBER card. Slot 7 you will find an E3-IO8X8B card. The remaining Slots are empty and used for different machine configurations.



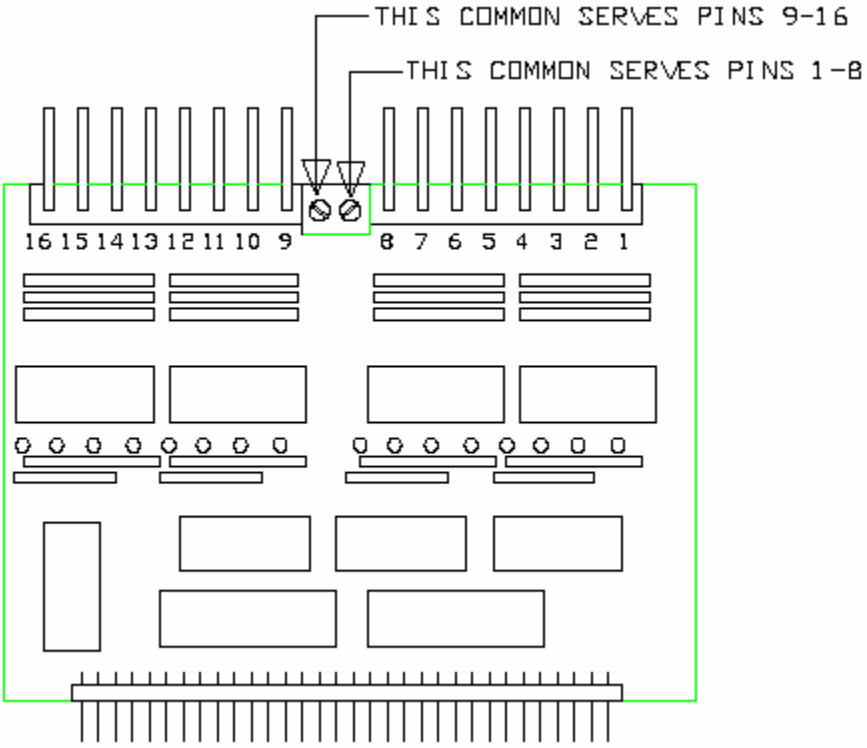
Mb8-K4A (Mother Board) is the board that connects all of the cards in the rack. It houses the EEPROM where the manufacturers setups reside and is also the Processor Board for the MicroPulse Controllers. With the Mb8-K4A card mounted into the machine, starting from left to right, there is a 6 pin 250V 10 AMP connector. In Pin 1 you will find a 299 black wire 0 VDC. In Pin 2 you will find a 200 red wire +24 VDC. In Pin 3 you will find a orange wire +5VDC. In Pin 5 will be a black wire 0VDC. Next to the 6 Pin connector, you will see two Red LED's. The first LED will flash on and off when the control is resetting itself. The second LED is on steady when there is power to the control. Next you will see the Communication Ribbon Connection to the I DR-8G4 Boards with the Ribbon Red attached on the arrow side of the connector. You will then find 9 Slots for the remaining cards.



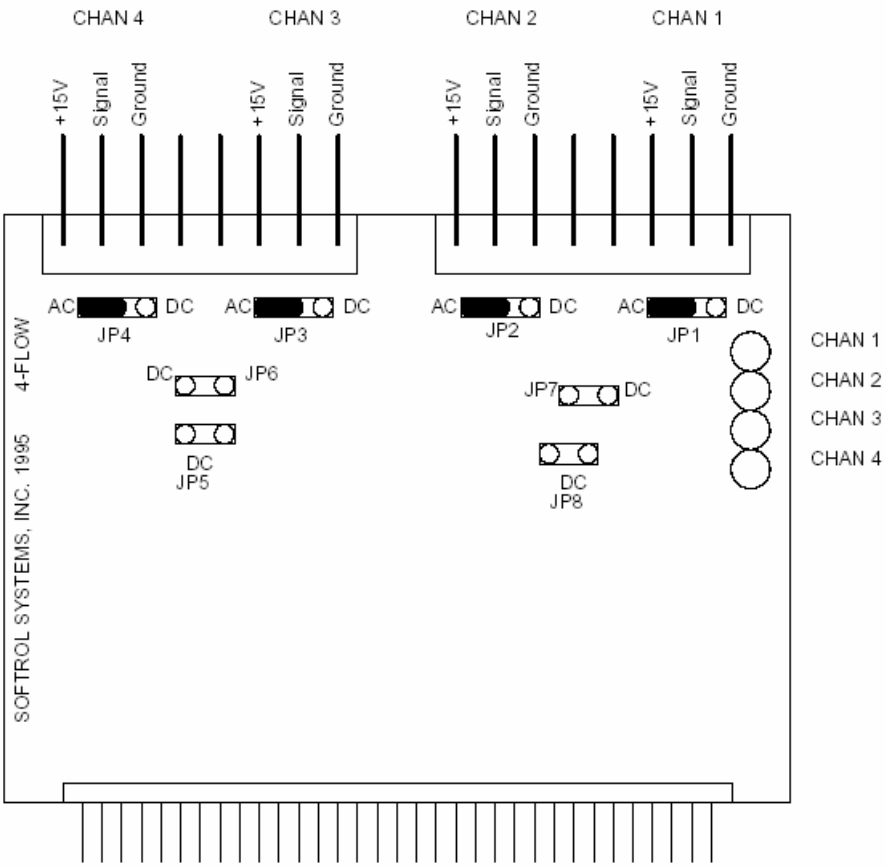
Processor Slot the REM-K4A and the E3-PRO63K4A cards. The REM-K4A card is the memory card. This card houses the Timekeeper RAM and the Lithium Battery in the IC4 socket. The IC3 socket contains the Boot memory. The IC2 socket contains an AT49F040 EPROM. This socket is currently used for the program. The IC1 socket is open for later use of an AT49F040 EPROM. The REM-K4A card also has an Auxiliary COM 1 port and an Auxiliary COM 2 port. The COM 1 is for ModBus communications while COM 2 is for a 232 type communications. The REM-K4A attaches to the E3-PRO63K4A card. The E3-PRO63K4A resides in the Processor Slot of the Mother Board. The E3-PRO63K4A card will have J2 pins jumpered. It will have a four pin IIC or FPD Connection. Pin 1 is for +5VDC. Pin 2 is for the Ground. Pin 3 is for the Clock. Pin 4 is for Data. The Data and Clock is one twisted pair. The Ground and the +5VDC is one twisted pair.



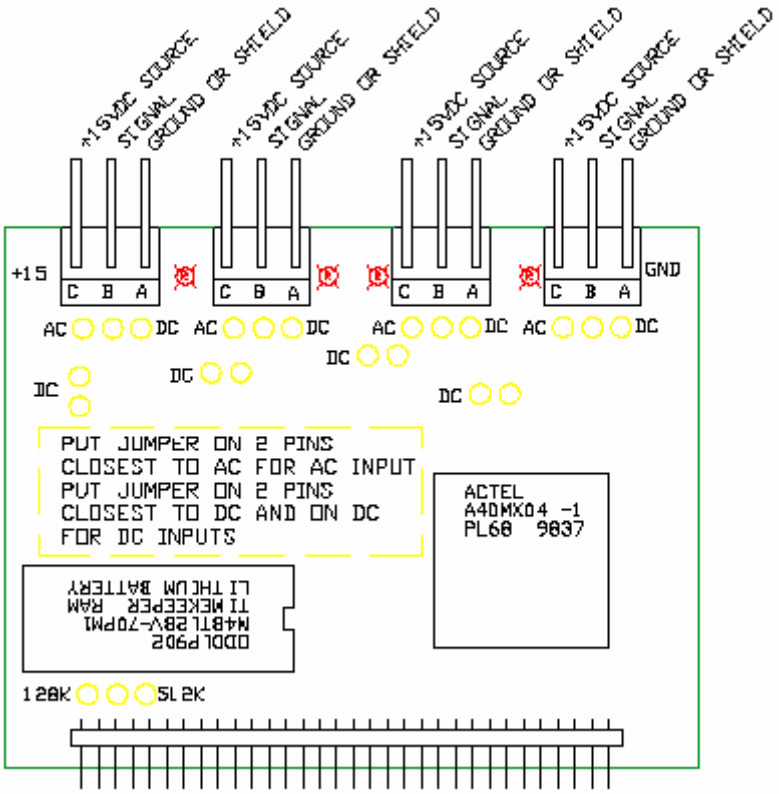
Slot 2 the E3-AIO420 card. The E3-AIO420 is for 4 to 20 mA inputs and outputs. Pin 1 (S2-01) is a 4 to 20 mA Black wire input from the Water Level Sensor. Pin 3 (S2-03) is a 4 to 20 mA Purple wire input from the Temperature Probe. Pin 8 (S2-08) is a 4 to 20 mA Blue wire from the VFD for the Out of Balance setting. Pin 13 (S2-13) is a 4 to 20 mA output 1 plus Red wire to the VFD for Frequency Reference. Pin 14 (S2-14) is a 4 to 20 mA output 1 negative Black wire to the VFD for Frequency Reference.



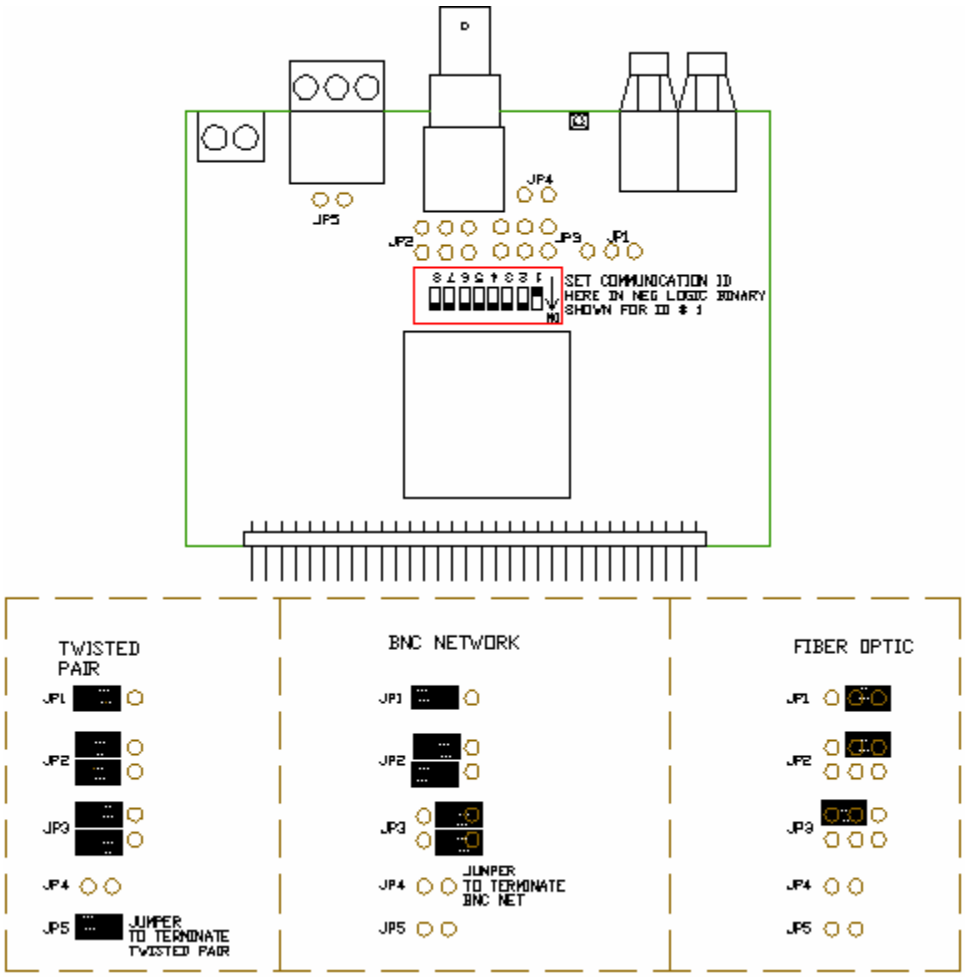
Slot 3 the ACI16 card. This card is usually used for 24 volts AC and has 16 inputs. LED's correspond to inputs and light up when power is applied. When the input is AC, the LED is orange. This card can be used on two circuits with different commons. With the card residing in its proper slot the first common is Red wire 200. The second common is also a Red wire 200 +24 VDC. The remaining wires are inputs s3-01 through s3-16 and are Brown wires.



Slot 4 the 4-FLOW (optional card used with up to 4 water meters). The 4-FLOW card is a four- channel AC or DC card. Channel 1 is used in for a Hot Water Flow meter. Channel 2 is used for a Cold Water Flow Meter. Channel 3 is used for a 3rd Water Flow Meter. Channel 4 is used for a 4th Water Flow Meter. Illustration shown as a AC card.



Slot 5 the E3-FLOWMEM128NV card. The E3-FLOWMEM128 NV card is a four-channel AC or DC memory card. Channel 1 is used for the RPM sensor with the ground in Pin A, the signal in Pin B, and the +15 VDC in Pin C. Channel 2 is a spare. Channel 3 is for the Water Meter with the ground in Pin A, the signal in Pin B, and the +15 VDC in Pin C. Channel 4 is a spare. A Timekeeper RAM and Lithium Battery is also socketed to this card.



Slot 6 the ARCFIBER card. The ARCFIBER card contains an ArcNet Media. The ArcNet Media controller can drive three different types media depending on the jumper configuration. One ArcNet Media is Twisted-pair Communication (TP). To use the TP communications, the card must be jumpered as follows; viewing the ARCFIBER name to your right, JP1 need pins 1 and 2 jumped. JP2 needs both sets of pins 1 and 2 jumped. JP3 needs both sets of pins 1 and 2 jumped. Please note, that if the machine is at the end of the communication loop, JP5 needs to be jumped also.

The second ArcNet Media is COAX Communication. To use the COAX communications, the card must be jumpered as follows: viewing the ARCFIBER name to your right, JP1 need pins 1 and 2 jumped, JP2 needs both sets of pins 1 and 2 jumped, and JP3 needs both sets of pins 2 and 3 jumped. Please note that if the machine is at the end of the communication loop, JP4 needs to be jumped. If a 93-ohm terminator is placed onto the ArcNet connector DO NOT JUMPER JP4.

The final ArcNet Media is Fiber Optic Communication (FO). To use the FO communications, the card must be jumpered as follows: viewing the ARCFIBER

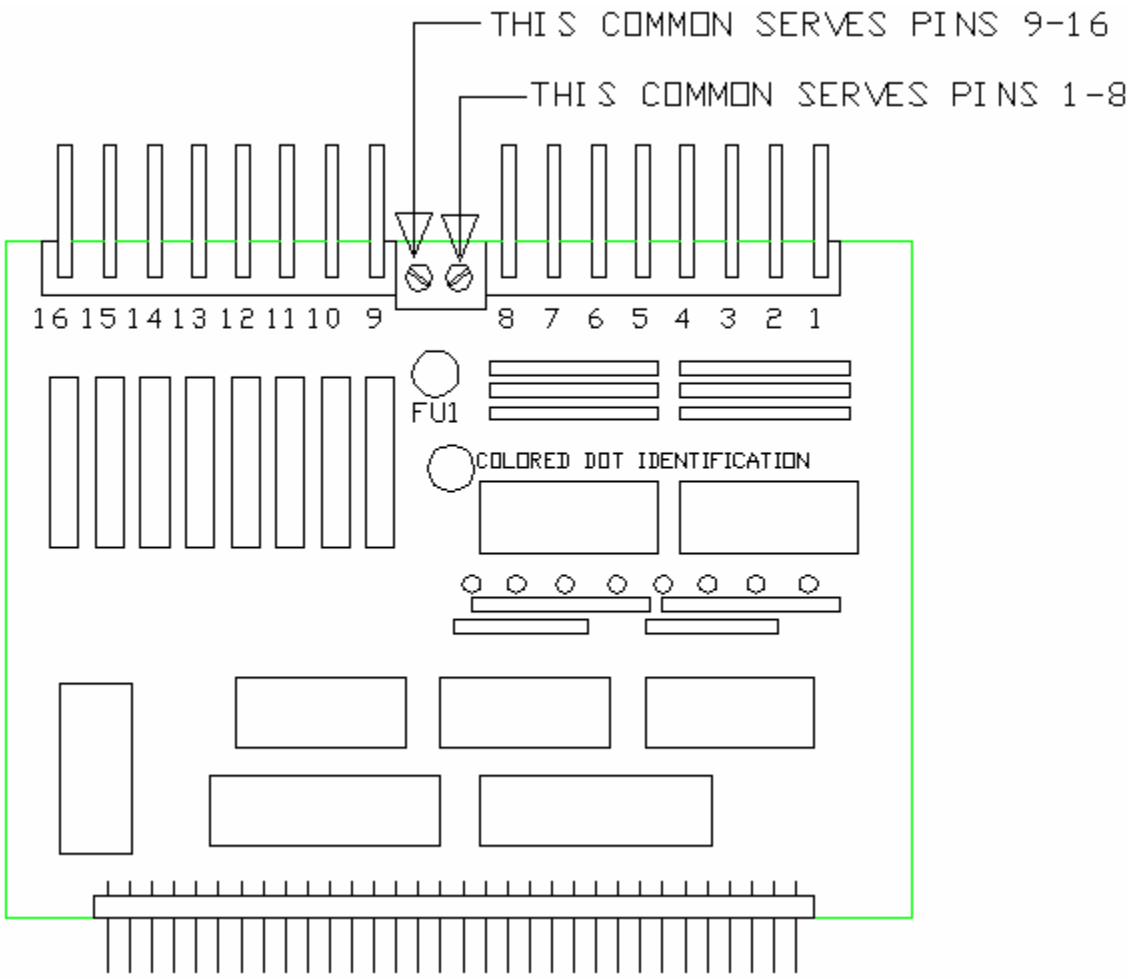
name to your right, JP1 need pins 2 and 3 jumped, JP2 needs the top set of pins 2 and 3 jumped, and JP3 needs the top set of pins 1 and 2 jumped. Software must configure the ArcNet controller for back plane mode to properly transmit and receive.

On systems where the machine is connected to a PulseNet network, this board needs to be set so that each individual machine establishes its own identity that is known as the Node ID. To do this the ARCFIBER card needs to be set up. The Node ID for the board is setup by setting the 8-position DIPswitch to the proper binary code representing the particular node number from 0 to 255. The switches are numbered 1 through 8 with 1 being the least significant bit of the node. The ON position represents a logic 0, the OFF position represents logic 1. For example, to set the node ID as 31 first convert the decimal to binary, then determine the switch positions.

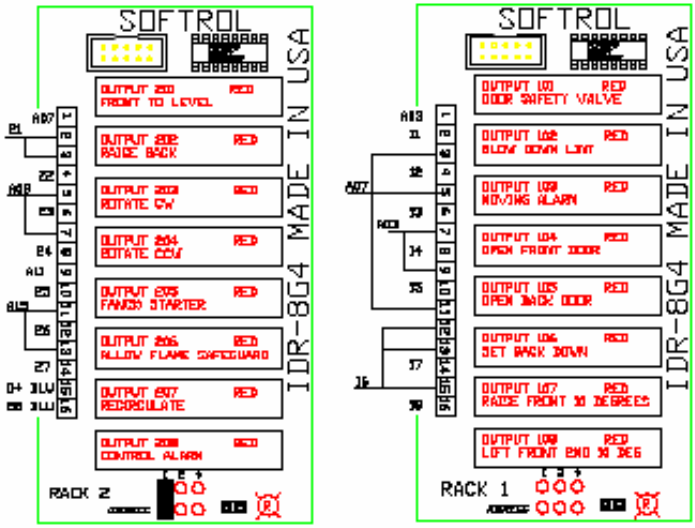
Switch #	1	2	3	4	5	6	7	8
Decimal	1	2	4	8	16	32	64	128
Binary	Off	Off	Off	Off	Off	On	On	On

EXAMPLE: Node ID 31

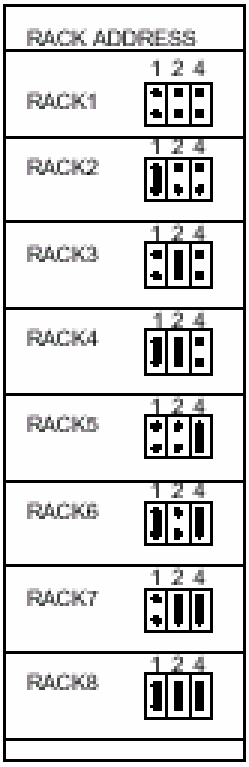
```
        x x x
x x x x x
1 2 3 4 5 6 7 8
```



Slot 7 houses an IO8X8 card. This card has 8 inputs and 8 outputs. The inputs are on Pins S7-01 to S7-08. The outputs are on Pins S7-09 to S7-16. The inputs are the same as an ACI16 card that can be 24 VAC of up to 24 VDC all-sinking or all sourcing. The output configuration can be 24 VAC or 24 VDC sourcing. The output LED's are Red for 24 VAC and Green for 24 VDC.



There are up to eight output/input racks known as IDR-8G4. The number of racks depends on the features of the machine. The IDR-8G4 is an 8 output/input (AC/DC, opto-isolated) interface card called a RACK under 12C control. The card is addressable with eight unique addresses. A fuse tester for the opto modules is built in and located to the right of the red LED. Placing jumpers on the 1, 2, and 4 pins sets the RACK address. Please note that jumper numbers total to one less than the RACK number meaning a RACK address can be setup by subtracting one from the desired RACK number and then installing jumpers to get the desired results. For example if the address for RACK 6 is desired, subtract one from six to get five, then jumper pins 1 and 4. Please review the following example of RACK addresses:



The MicroPulse controller has default operations ranging from operation numbers 33 to 64. These operations may be edited but the operation names may not. These are for the user to use to learn to program by or even to use in their formulations. The MicroPulse controller also has default formulas ranging from formulas 100 to 128. These formulas and formula names may be edited.

Operation #33, COLD FLUSH

0001: COLD FLUSH
0002: Fill Cold When Level < 20.0" Until Next Step
0003: Wait to Satisfy
0004: Run Time 3:00
0005: Drain 1 Time for 1:00
0006: END OF OPERATION

Operation #34, WARM FLUSH

0001: WARM FLUSH
0002: Fill Cold When Level < 20.0" Until Next Step
0003: Fill Hot When Level < 20.0" Until Next Step
0004: Wait to Satisfy
0005: Run Time 2:00
0006: Drain 1 Time for 1:00
0007: END OF OPERATION

Operation #35, HOT FLUSH

0001: HOT FLUSH
0002: Fill Hot When Level < 20.0" Until Next Step
0003: Wait to Satisfy
0004: Run Time 2:00
0005: Drain 1 Time for 1:00
0006: END OF OPERATION

Operation #36, WARM BREAK

0001: WARM BREAK
0002: Fill Cold When Level < 20.0" Until Next Step
0003: Fill Hot When Level < 20.0" Until Next Step
0004: Wait to Satisfy
0005: Supply Dispenser 1 for 0:30
0006: Supply Dispenser 2 for 0:30
0007: Wait to Satisfy
0008: Run Time 8:00
0009: Drain 1 Time for 1:00
0010: END OF OPERATION

Operation #37, HOT BREAK

0001: HOT BREAK
0002: Fill Hot When Level < 10.0" Until Next Step
0003: Wait to Satisfy
0004: Supply Dispenser 1 for 0:30
0005: Supply Dispenser 2 for 0:30
0006: Wait to Satisfy
0007: Run Time 10:00
0008: Drain 1 Time for 1:00
0009: END OF OPERATION

Operation #38, WARM CARRYOVER

0001: WARM CARRYOVER
0002: Fill Cold When Level < 10.0" Until Next Step
0003: Fill Hot When Level < 10.0" Until Next Step
0004: Wait to Satisfy
0005: Supply Dispenser 3 for 0:30
0006: Wait to Satisfy
0007: Run Time 3:00
0008: END OF OPERATION

Operation #39, HOT CARRYOVER

0001: HOT CARRYOVER
0002: Fill Hot When Level < 10.0" Until Next Step
0003: Wait to Satisfy
0004: Supply Dispenser 3 for 0:30
0005: Wait to Satisfy
0006: Run Time 12:00
0007: Drain 1 Time for 1:00
0008: END OF OPERATION

Operation #40, WARM SUDS

0001: WARM SUDS
0002: Fill Cold When Level < 20.0" Until Next Step
0003: Fill Hot When Level < 20.0" Until Next Step
0004: Wait to Satisfy
0005: Supply Dispenser 1 for 0:30
0006: Wait to Satisfy
0007: Run Time 8:00
0008: Drain 1 Time for 1:00
0009: END OF OPERATION

Operation #41, HOT SUDS

0001: HOT SUDS
0002: Fill Hot When Level < 10.0" Until Next Step
0003: Wait to Satisfy
0004: Supply Dispenser 1 for 0:30
0005: Wait to Satisfy
0006: Run Time 7:00
0007: Drain 1 Time for 1:00
0008: END OF OPERATION

Operation #42, COLD RINSE

0001: COLD RINSE
0002: Fill Cold When Level < 20.0" Until Next Step
0003: Wait to Satisfy
0004: Run Time 2:00
0005: Drain 1 Time for 1:00
0006: END OF OPERATION

Operation #43, WARM RINSE

0001: WARM RINSE
0002: Fill Cold When Level < 20.0" Until Next Step
0003: Fill Hot When Level < 20.0" Until Next Step
0004: Wait to Satisfy
0005: Run Time 2:00
0006: Drain 1 Time for 1:00
0007: END OF OPERATION

Operation #44, HOT RINSE

0001: HOT RINSE
0002: Fill Hot When Level < 20.0" Until Next Step
0003: Wait to Satisfy
0004: Run Time 2:00
0005: Drain 1 Time for 1:00
0006: END OF OPERATION

Operation #45, WARM BLEACH

0001: WARM BLEACH
0002: Fill Hot When Level < 10.0" Until Next Step
0003: Wait to Satisfy
0004: Supply Dispenser 2 for 0:30
0005: Wait to Satisfy
0006: Run Time 7:00
0007: Drain 1 Time for 1:00
0008: END OF OPERATION

Operation #46, BLEACH SOAK

0001: BLEACH SOAK
0002: Fill Hot When Level < 10.0" Until Next Step
0003: Wait to Satisfy
0004: Supply Dispenser 2 for 0:30
0005: Wait to Satisfy
0006: Run Time 20:00
0007: Drain 1 Time for 1:00
0008: END OF OPERATION

Operation #47, WARM STARCH

0001: WARM STARCH
0002: Fill Cold When Level < 10.0" Until Next Step
0003: Fill Hot When Level < 10.0" Until Next Step
0004: Wait to Satisfy
0005: Supply Dispenser 5 for 0:30
0006: Wait to Satisfy
0007: Run Time 6:00
0008: END OF OPERATION

Operation #48, FINAL BATH

0001: FINAL BATH
0002: Fill Cold When Level < 10.0" Until Next Step
0003: Fill Hot When Level < 10.0" Until Next Step
0004: Wait to Satisfy
0005: Supply Dispenser 3 for 0:30
0006: Supply Dispenser 4 for 0:30
0007: Wait to Satisfy
0008: Run Time 4:00
0009: END OF OPERATION

Operation #49, SOFTENER BATH

0001: SOFTENER BATH
0002: Fill Cold When Level < 10.0" Until Next Step
0003: Wait to Satisfy
0004: Supply Dispenser 4 for 0:30
0005: Wait to Satisfy
0006: Run Time 4:00
0007: END OF OPERATION

Operation #50, INTER. EXTRACT

0001: INTER. EXTRACT
0002: Extract Low Until Next Step
0003: Drain 1 Time for 2:00
0004: END OF OPERATION

Operation #51, FINAL EXTRACT HI

0001: FINAL EXTRACT HI
0002: Extract High Until Next Step
0003: Drain 1 Time for 6:00
0004: END OF OPERATION

Operation #52, FINAL EXTRACT LO

0001: FINAL EXTRACT LO
0002: Extract Low Until Next Step
0003: Drain 1 Time for 3:00
0004: END OF OPERATION

Operation #53, EXTRACT w/G's

0001: EXTRACT w/G's
0002: Extract at 300 G's for 1:00
0003: Extract High Until Next Step
0004: Drain 1 Time for 6:00
0005: END OF OPERATION

Operation #54, COOLDOWN TO TEMP

0001: COOLDOWN TO TEMP
0002: Cooldown When Temp > 110.F Until Next Step
0003: Wait to Satisfy
0004: Run Time 1:00
0005: END OF OPERATION

Operation #55, TUMBLE LOAD

0001: TUMBLE LOAD
0002: Run Time 1:00
0003: END OF OPERATION

Operation #56, CONTINUOUS RINSE

0001: CONTINUOUS RINSE
0002: Fill Hot When Level < 20.0" Until Next Step
0003: Fill Cold When Level < 20.0" Until Next Step
0004: Wait to Satisfy
0005: Overflow Rinse On
0006: Run Time 5:00
0007: Drain 1 Time for 1:00
0008: END OF OPERATION

Operation #57, DRAIN TO LEVEL

0001: DRAIN TO LEVEL
0002: Drain 1 When Level > 10.0" Until Next Step
0003: Run Time 1:00
0004: END OF OPERATION

Operation #58, LOAD STONES

0001: LOAD STONES
0002: Dwell Timer 999 Seconds
0003: Signal Until Operator Cancels
0004: Prompt: LOAD STONES!!!
0005: Wait to Satisfy
0006: Normal Rotation
0007: Run Time 1:00
0008: END OF OPERATION

Operation #59, DYE BATH

0001: DYE BATH
0002: Cylinder Still Until Initially Satisfied
0003: Fill Hot When Level < 36.0" Until Next Step
0004: Wait to Satisfy
0005: 12 RPM Wash Speed
0006: Supply Dispenser 3 for 0:10
0007: Wait to Satisfy
0008: Supply Dispenser 3 for 0:30
0009: Timed Supply On 0:07 / Off 0:03
0010: Super Penetration On
0011: Run Time 5:00
0012: END OF OPERATION

Operation #60, STEAM TO TEMP

0001: STEAM TO TEMP
0002: Steam When Temperature < 180.F Until Next Step
0003: Wait to Satisfy
0004: Run Time 1:00
0005: END OF OPERATION

Operation #61, PRE-WASH

0001: PRE-WASH
0002: Fill While < 20.0" Temp 120 - 130.F Use H-HC-C
0003: Wait to Satisfy
0004: Run Time 2:00
0005: Drain 1 Time for 1:00
0006: END OF OPERATION

Operation #62, CHECK PROCESS

0001: CHECK PROCESS
0002: Prompt: CHECK SHADE!!!
0003: Prompt: Is shade O.K.?
0004: Signal [Yes] = Resume [No] = Label 1
0005: Wait to Satisfy
0006: Run Time 1:00
0007: END OF OPERATION

Operation #63, MAKE ADJUSTMENT

0001: MAKE ADJUSTMENT
0002: END OF OPERATION

Operation #64, HALF BATH RINSE

0001: HALF BATH RINSE
0002: Drain 1 When Level > 10.0" Until Next Step
0003: Run Time 1:00
0004: Cylinder Still Until Initially Satisfied
0005: Fill Hot When Level < 20.0" Until Next Step
0006: Fill Cold When Level < 20.0" Until Next Step
0007: Wait to Satisfy
0008: Run Time 3:00
0009: Drain 1 Time for 1:00
0010: END OF OPERATION

Formula #100, Sheets

0001: Sheets
0002: HOT SUDS
0003: Fill Hot When Level < 10.0" Until Next Step
0004: Wait to Satisfy
0005: Supply Dispenser 1 for 0:30
0006: Wait to Satisfy
0007: Run Time 7:00
0008: Drain 1 Time for 1:00
0009: WARM BLEACH
0010: Fill Hot When Level < 10.0" Until Next Step
0011: Wait to Satisfy
0012: Supply Dispenser 2 for 0:30
0013: Wait to Satisfy
0014: Run Time 7:00
0015: Drain 1 Time for 1:00
0016: WARM RINSE
0017: Fill Cold When Level < 20.0" Until Next Step
0018: Fill Hot When Level < 20.0" Until Next Step
0019: Wait to Satisfy
0020: Run Time 2:00
0021: Drain 1 Time for 1:00
0022: INTER. EXTRACT
0023: Extract Low Until Next Step
0024: Drain 1 Time for 2:00
0025: WARM RINSE
0026: Fill Cold When Level < 20.0" Until Next Step
0027: Fill Hot When Level < 20.0" Until Next Step
0028: Wait to Satisfy
0029: Run Time 2:00
0030: Drain 1 Time for 1:00
0031: FINAL BATH
0032: Fill Cold When Level < 10.0" Until Next Step
0033: Fill Hot When Level < 10.0" Until Next Step
0034: Wait to Satisfy
0035: Supply Dispenser 3 for 0:30
0036: Supply Dispenser 4 for 0:30
0037: Wait to Satisfy
0038: Run Time 4:00
0039: FINAL EXTRACT HI
0040: Extract High Until Next Step
0041: Drain 1 Time for 6:00
0042: END OF FORMULA

Formula #101, Uniforms & Sheet

0001: Uniforms & Sheet
0002: WARM FLUSH
0003: Fill Cold When Level < 20.0" Until Next Step
0004: Fill Hot When Level < 20.0" Until Next Step
0005: Wait to Satisfy
0006: Run Time 2:00
0007: Drain 1 Time for 1:00
0008: HOT SUDS
0009: Fill Hot When Level < 10.0" Until Next Step
0010: Wait to Satisfy
0011: Supply Dispenser 1 for 0:30
0012: Wait to Satisfy
0013: Run Time 7:00
0014: Drain 1 Time for 1:00
0015: WARM BLEACH
0016: Fill Hot When Level < 10.0" Until Next Step
0017: Wait to Satisfy
0018: Supply Dispenser 2 for 0:30
0019: Wait to Satisfy
0020: Run Time 7:00
0021: Drain 1 Time for 1:00
0022: WARM RINSE
0023: Fill Cold When Level < 20.0" Until Next Step
0024: Fill Hot When Level < 20.0" Until Next Step
0025: Wait to Satisfy
0026: Run Time 2:00
0027: Drain 1 Time for 1:00
0028: INTER. EXTRACT
0029: Extract Low Until Next Step
0030: Drain 1 Time for 2:00
0031: WARM RINSE
0032: Fill Cold When Level < 20.0" Until Next Step
0033: Fill Hot When Level < 20.0" Until Next Step
0034: Wait to Satisfy
0035: Run Time 2:00
0036: Drain 1 Time for 1:00
0037: FINAL BATH
0038: Fill Cold When Level < 10.0" Until Next Step
0039: Fill Hot When Level < 10.0" Until Next Step
0040: Wait to Satisfy
0041: Supply Dispenser 3 for 0:30
0042: Supply Dispenser 4 for 0:30
0043: Wait to Satisfy
0044: Run Time 4:00
0045: FINAL EXTRACT HI
0046: Extract High Until Next Step
0047: Drain 1 Time for 6:00
0048: END OF FORMULA

Formula #102, White Towels

0001: White Towels
0002: HOT SUDS
0003: Fill Hot When Level < 10.0" Until Next Step
0004: Wait to Satisfy
0005: Supply Dispenser 1 for 0:30
0006: Wait to Satisfy
0007: Run Time 7:00
0008: Drain 1 Time for 1:00
0009: HOT RINSE
0010: Fill Hot When Level < 20.0" Until Next Step
0011: Wait to Satisfy
0012: Run Time 2:00
0013: Drain 1 Time for 1:00
0014: WARM BLEACH
0015: Fill Hot When Level < 10.0" Until Next Step
0016: Wait to Satisfy
0017: Supply Dispenser 2 for 0:30
0018: Wait to Satisfy
0019: Run Time 7:00
0020: Drain 1 Time for 1:00
0021: WARM RINSE
0022: Fill Cold When Level < 20.0" Until Next Step
0023: Fill Hot When Level < 20.0" Until Next Step
0024: Wait to Satisfy
0025: Run Time 2:00
0026: Drain 1 Time for 1:00
0027: INTER. EXTRACT
0028: Extract Low Until Next Step
0029: Drain 1 Time for 2:00
0030: WARM RINSE
0031: Fill Cold When Level < 20.0" Until Next Step
0032: Fill Hot When Level < 20.0" Until Next Step
0033: Wait to Satisfy
0034: Run Time 2:00
0035: Drain 1 Time for 1:00
0036: FINAL BATH
0037: Fill Cold When Level < 10.0" Until Next Step
0038: Fill Hot When Level < 10.0" Until Next Step
0039: Wait to Satisfy
0040: Supply Dispenser 3 for 0:30
0041: Supply Dispenser 4 for 0:30
0042: Wait to Satisfy
0043: Run Time 4:00
0044: FINAL EXTRACT HI
0045: Extract High Until Next Step
0046: Drain 1 Time for 6:00
0047: END OF FORMULA

Formula #103, Color Towels

0001: Color Towels
0002: HOT SUDS
0003: Fill Hot When Level < 10.0" Until Next Step
0004: Wait to Satisfy
0005: Supply Dispenser 1 for 0:30
0006: Wait to Satisfy
0007: Run Time 7:00
0008: Drain 1 Time for 1:00
0009: WARM RINSE
0010: Fill Cold When Level < 20.0" Until Next Step
0011: Fill Hot When Level < 20.0" Until Next Step
0012: Wait to Satisfy
0013: Run Time 2:00
0014: Drain 1 Time for 1:00
0015: WARM RINSE
0016: Fill Cold When Level < 20.0" Until Next Step
0017: Fill Hot When Level < 20.0" Until Next Step
0018: Wait to Satisfy
0019: Run Time 2:00
0020: Drain 1 Time for 1:00
0021: INTER. EXTRACT
0022: Extract Low Until Next Step
0023: Drain 1 Time for 2:00
0024: WARM RINSE
0025: Fill Cold When Level < 20.0" Until Next Step
0026: Fill Hot When Level < 20.0" Until Next Step
0027: Wait to Satisfy
0028: Run Time 2:00
0029: Drain 1 Time for 1:00
0030: FINAL BATH
0031: Fill Cold When Level < 10.0" Until Next Step
0032: Fill Hot When Level < 10.0" Until Next Step
0033: Wait to Satisfy
0034: Supply Dispenser 3 for 0:30
0035: Supply Dispenser 4 for 0:30
0036: Wait to Satisfy
0037: Run Time 4:00
0038: FINAL EXTRACT HI
0039: Extract High Until Next Step
0040: Drain 1 Time for 6:00
0041: END OF FORMULA

Formula #104, Delicates

0001: Delicates
0002: WARM SUDS
0003: Fill Cold When Level < 20.0" Until Next Step
0004: Fill Hot When Level < 20.0" Until Next Step
0005: Wait to Satisfy
0006: Supply Dispenser 1 for 0:30
0007: Wait to Satisfy
0008: Run Time 8:00
0009: Drain 1 Time for 1:00
0010: COLD RINSE
0011: Fill Cold When Level < 20.0" Until Next Step
0012: Wait to Satisfy
0013: Run Time 2:00
0014: Drain 1 Time for 1:00
0015: COLD RINSE
0016: Fill Cold When Level < 20.0" Until Next Step
0017: Wait to Satisfy
0018: Run Time 2:00
0019: Drain 1 Time for 1:00
0020: COLD RINSE
0021: Fill Cold When Level < 20.0" Until Next Step
0022: Wait to Satisfy
0023: Run Time 2:00
0024: Drain 1 Time for 1:00
0025: SOFTENER BATH
0026: Fill Cold When Level < 10.0" Until Next Step
0027: Wait to Satisfy
0028: Supply Dispenser 4 for 0:30
0029: Wait to Satisfy
0030: Run Time 4:00
0031: FINAL EXTRACT HI
0032: Extract High Until Next Step
0033: Drain 1 Time for 6:00
0034: END OF FORMULA

Formula #105, Chef Coats

0001: Chef Coats
0002: HOT SUDS
0003: Fill Hot When Level < 10.0" Until Next Step
0004: Wait to Satisfy
0005: Supply Dispenser 1 for 0:30
0006: Wait to Satisfy
0007: Run Time 7:00
0008: Drain 1 Time for 1:00
0009: HOT RINSE
0010: Fill Hot When Level < 20.0" Until Next Step
0011: Wait to Satisfy
0012: Run Time 2:00
0013: Drain 1 Time for 1:00
0014: HOT SUDS
0015: Fill Hot When Level < 10.0" Until Next Step
0016: Wait to Satisfy
0017: Supply Dispenser 1 for 0:30
0018: Wait to Satisfy
0019: Run Time 7:00
0020: Drain 1 Time for 1:00
0021: HOT RINSE
0022: Fill Hot When Level < 20.0" Until Next Step
0023: Wait to Satisfy
0024: Run Time 2:00
0025: Drain 1 Time for 1:00
0026: WARM BLEACH
0027: Fill Hot When Level < 10.0" Until Next Step
0028: Wait to Satisfy
0029: Supply Dispenser 2 for 0:30
0030: Wait to Satisfy
0031: Run Time 7:00
0032: Drain 1 Time for 1:00
0033: WARM RINSE
0034: Fill Cold When Level < 20.0" Until Next Step
0035: Fill Hot When Level < 20.0" Until Next Step
0036: Wait to Satisfy
0037: Run Time 2:00
0038: Drain 1 Time for 1:00
0039: INTER. EXTRACT
0040: Extract Low Until Next Step
0041: Drain 1 Time for 2:00
0042: WARM RINSE
0043: Fill Cold When Level < 20.0" Until Next Step
0044: Fill Hot When Level < 20.0" Until Next Step
0045: Wait to Satisfy
0046: Run Time 2:00
0047: Drain 1 Time for 1:00
0048: WARM CARRYOVER
0049: Fill Cold When Level < 10.0" Until Next Step
0050: Fill Hot When Level < 10.0" Until Next Step
0051: Wait to Satisfy
0052: Supply Dispenser 3 for 0:30
0053: Wait to Satisfy
0054: Run Time 3:00
0055: FINAL EXTRACT HI
0056: Extract High Until Next Step
0057: Drain 1 Time for 6:00
0058: END OF FORMULA

Formula #106, Kitchen Rags

0001: Kitchen Rags
0002: WARM FLUSH
0003: Fill Cold When Level < 20.0" Until Next Step
0004: Fill Hot When Level < 20.0" Until Next Step
0005: Wait to Satisfy
0006: Run Time 2:00
0007: Drain 1 Time for 1:00
0008: WARM FLUSH
0009: Fill Cold When Level < 20.0" Until Next Step
0010: Fill Hot When Level < 20.0" Until Next Step
0011: Wait to Satisfy
0012: Run Time 2:00
0013: Drain 1 Time for 1:00
0014: HOT SUDS
0015: Fill Hot When Level < 10.0" Until Next Step
0016: Wait to Satisfy
0017: Supply Dispenser 1 for 0:30
0018: Wait to Satisfy
0019: Run Time 7:00
0020: Drain 1 Time for 1:00
0021: HOT RINSE
0022: Fill Hot When Level < 20.0" Until Next Step
0023: Wait to Satisfy
0024: Run Time 2:00
0025: Drain 1 Time for 1:00
0026: INTER. EXTRACT
0027: Extract Low Until Next Step
0028: Drain 1 Time for 2:00
0029: WARM BLEACH
0030: Fill Hot When Level < 10.0" Until Next Step
0031: Wait to Satisfy
0032: Supply Dispenser 2 for 0:30
0033: Wait to Satisfy
0034: Run Time 7:00
0035: Drain 1 Time for 1:00
0036: WARM RINSE
0037: Fill Cold When Level < 20.0" Until Next Step
0038: Fill Hot When Level < 20.0" Until Next Step
0039: Wait to Satisfy
0040: Run Time 2:00
0041: Drain 1 Time for 1:00
0042: INTER. EXTRACT
0043: Extract Low Until Next Step
0044: Drain 1 Time for 2:00
0045: WARM RINSE
0046: Fill Cold When Level < 20.0" Until Next Step
0047: Fill Hot When Level < 20.0" Until Next Step
0048: Wait to Satisfy
0049: Run Time 2:00
0050: Drain 1 Time for 1:00
0051: FINAL EXTRACT HI
0052: Extract High Until Next Step
0053: Drain 1 Time for 6:00
0054: END OF FORMULA

Formula #107, Mops

0001: Mops
0002: WARM FLUSH
0003: Fill Cold When Level < 20.0" Until Next Step
0004: Fill Hot When Level < 20.0" Until Next Step
0005: Wait to Satisfy
0006: Run Time 2:00
0007: Drain 1 Time for 1:00
0008: WARM FLUSH
0009: Fill Cold When Level < 20.0" Until Next Step
0010: Fill Hot When Level < 20.0" Until Next Step
0011: Wait to Satisfy
0012: Run Time 2:00
0013: Drain 1 Time for 1:00
0014: WARM FLUSH
0015: Fill Cold When Level < 20.0" Until Next Step
0016: Fill Hot When Level < 20.0" Until Next Step
0017: Wait to Satisfy
0018: Run Time 2:00
0019: Drain 1 Time for 1:00
0020: WARM FLUSH
0021: Fill Cold When Level < 20.0" Until Next Step
0022: Fill Hot When Level < 20.0" Until Next Step
0023: Wait to Satisfy
0024: Run Time 2:00
0025: Drain 1 Time for 1:00
0026: HOT SUDS
0027: Fill Hot When Level < 10.0" Until Next Step
0028: Wait to Satisfy
0029: Supply Dispenser 1 for 0:30
0030: Wait to Satisfy
0031: Run Time 7:00
0032: Drain 1 Time for 1:00
0033: HOT RINSE
0034: Fill Hot When Level < 20.0" Until Next Step
0035: Wait to Satisfy
0036: Run Time 2:00
0037: Drain 1 Time for 1:00
0038: WARM BLEACH
0039: Fill Hot When Level < 10.0" Until Next Step
0040: Wait to Satisfy
0041: Supply Dispenser 2 for 0:30
0042: Wait to Satisfy
0043: Run Time 7:00
0044: Drain 1 Time for 1:00
0045: WARM RINSE
0046: Fill Cold When Level < 20.0" Until Next Step
0047: Fill Hot When Level < 20.0" Until Next Step
0048: Wait to Satisfy
0049: Run Time 2:00
0050: Drain 1 Time for 1:00
0051: INTER. EXTRACT
0052: Extract Low Until Next Step
0053: Drain 1 Time for 2:00
0054: WARM RINSE
0055: Fill Cold When Level < 20.0" Until Next Step
0056: Fill Hot When Level < 20.0" Until Next Step
0057: Wait to Satisfy
0058: Run Time 2:00
0059: Drain 1 Time for 1:00
0060: FINAL EXTRACT HI
0061: Extract High Until Next Step
0062: Drain 1 Time for 6:00
0063: END OF FORMULA

Formula #108, WhiteTable Linen

0001: WhiteTable Linen
0002: WARM FLUSH
0003: Fill Cold When Level < 20.0" Until Next Step
0004: Fill Hot When Level < 20.0" Until Next Step
0005: Wait to Satisfy
0006: Run Time 2:00
0007: Drain 1 Time for 1:00
0008: HOT SUDS
0009: Fill Hot When Level < 10.0" Until Next Step
0010: Wait to Satisfy
0011: Supply Dispenser 1 for 0:30
0012: Wait to Satisfy
0013: Run Time 7:00
0014: Drain 1 Time for 1:00
0015: HOT RINSE
0016: Fill Hot When Level < 20.0" Until Next Step
0017: Wait to Satisfy
0018: Run Time 2:00
0019: Drain 1 Time for 1:00
0020: WARM BLEACH
0021: Fill Hot When Level < 10.0" Until Next Step
0022: Wait to Satisfy
0023: Supply Dispenser 2 for 0:30
0024: Wait to Satisfy
0025: Run Time 7:00
0026: Drain 1 Time for 1:00
0027: WARM RINSE
0028: Fill Cold When Level < 20.0" Until Next Step
0029: Fill Hot When Level < 20.0" Until Next Step
0030: Wait to Satisfy
0031: Run Time 2:00
0032: Drain 1 Time for 1:00
0033: INTER. EXTRACT
0034: Extract Low Until Next Step
0035: Drain 1 Time for 2:00
0036: WARM RINSE
0037: Fill Cold When Level < 20.0" Until Next Step
0038: Fill Hot When Level < 20.0" Until Next Step
0039: Wait to Satisfy
0040: Run Time 2:00
0041: Drain 1 Time for 1:00
0042: WARM CARRYOVER
0043: Fill Cold When Level < 10.0" Until Next Step
0044: Fill Hot When Level < 10.0" Until Next Step
0045: Wait to Satisfy
0046: Supply Dispenser 3 for 0:30
0047: Wait to Satisfy
0048: Run Time 3:00
0049: FINAL EXTRACT HI
0050: Extract High Until Next Step
0051: Drain 1 Time for 6:00
0052: END OF FORMULA

Formula #109, ColorTable Linen

0001: ColorTable Linen
0002: WARM FLUSH
0003: Fill Cold When Level < 20.0" Until Next Step
0004: Fill Hot When Level < 20.0" Until Next Step
0005: Wait to Satisfy
0006: Run Time 2:00
0007: Drain 1 Time for 1:00
0008: HOT SUDS
0009: Fill Hot When Level < 10.0" Until Next Step
0010: Wait to Satisfy
0011: Supply Dispenser 1 for 0:30
0012: Wait to Satisfy
0013: Run Time 7:00
0014: Drain 1 Time for 1:00
0015: WARM BLEACH
0016: Fill Hot When Level < 10.0" Until Next Step
0017: Wait to Satisfy
0018: Supply Dispenser 2 for 0:30
0019: Wait to Satisfy
0020: Run Time 7:00
0021: Drain 1 Time for 1:00
0022: WARM RINSE
0023: Fill Cold When Level < 20.0" Until Next Step
0024: Fill Hot When Level < 20.0" Until Next Step
0025: Wait to Satisfy
0026: Run Time 2:00
0027: Drain 1 Time for 1:00
0028: INTER. EXTRACT
0029: Extract Low Until Next Step
0030: Drain 1 Time for 2:00
0031: WARM RINSE
0032: Fill Cold When Level < 20.0" Until Next Step
0033: Fill Hot When Level < 20.0" Until Next Step
0034: Wait to Satisfy
0035: Run Time 2:00
0036: Drain 1 Time for 1:00
0037: WARM CARRYOVER
0038: Fill Cold When Level < 10.0" Until Next Step
0039: Fill Hot When Level < 10.0" Until Next Step
0040: Wait to Satisfy
0041: Supply Dispenser 3 for 0:30
0042: Wait to Satisfy
0043: Run Time 3:00
0044: FINAL EXTRACT HI
0045: Extract High Until Next Step
0046: Drain 1 Time for 6:00
0047: END OF FORMULA

Formula #110, WhitePoly. Linen

0001: WhitePoly. Linen
0002: WARM FLUSH
0003: Fill Cold When Level < 20.0" Until Next Step
0004: Fill Hot When Level < 20.0" Until Next Step
0005: Wait to Satisfy
0006: Run Time 2:00
0007: Drain 1 Time for 1:00
0008: HOT SUDS
0009: Fill Hot When Level < 10.0" Until Next Step
0010: Wait to Satisfy
0011: Supply Dispenser 1 for 0:30
0012: Wait to Satisfy
0013: Run Time 7:00
0014: Drain 1 Time for 1:00
0015: HOT RINSE
0016: Fill Hot When Level < 20.0" Until Next Step
0017: Wait to Satisfy
0018: Run Time 2:00
0019: Drain 1 Time for 1:00
0020: WARM BLEACH
0021: Fill Hot When Level < 10.0" Until Next Step
0022: Wait to Satisfy
0023: Supply Dispenser 2 for 0:30
0024: Wait to Satisfy
0025: Run Time 7:00
0026: Drain 1 Time for 1:00
0027: WARM RINSE
0028: Fill Cold When Level < 20.0" Until Next Step
0029: Fill Hot When Level < 20.0" Until Next Step
0030: Wait to Satisfy
0031: Run Time 2:00
0032: Drain 1 Time for 1:00
0033: WARM RINSE
0034: Fill Cold When Level < 20.0" Until Next Step
0035: Fill Hot When Level < 20.0" Until Next Step
0036: Wait to Satisfy
0037: Run Time 2:00
0038: Drain 1 Time for 1:00
0039: WARM CARRYOVER
0040: Fill Cold When Level < 10.0" Until Next Step
0041: Fill Hot When Level < 10.0" Until Next Step
0042: Wait to Satisfy
0043: Supply Dispenser 3 for 0:30
0044: Wait to Satisfy
0045: Run Time 3:00
0046: FINAL EXTRACT HI
0047: Extract High Until Next Step
0048: Drain 1 Time for 4:00
0049: END OF FORMULA

Formula #111, Pool/Spa Towels

0001: Pool/Spa Towels
0002: WARM FLUSH
0003: Fill Cold When Level < 20.0" Until Next Step
0004: Fill Hot When Level < 20.0" Until Next Step
0005: Wait to Satisfy
0006: Run Time 2:00
0007: Drain 1 Time for 1:00
0008: HOT SUDS
0009: Fill Hot When Level < 10.0" Until Next Step
0010: Wait to Satisfy
0011: Supply Dispenser 1 for 0:30
0012: Wait to Satisfy
0013: Run Time 7:00
0014: Drain 1 Time for 1:00
0015: HOT RINSE
0016: Fill Hot When Level < 20.0" Until Next Step
0017: Wait to Satisfy
0018: Run Time 2:00
0019: Drain 1 Time for 1:00
0020: WARM BLEACH
0021: Fill Hot When Level < 10.0" Until Next Step
0022: Wait to Satisfy
0023: Supply Dispenser 2 for 0:30
0024: Wait to Satisfy
0025: Run Time 7:00
0026: Drain 1 Time for 1:00
0027: HOT RINSE
0028: Fill Hot When Level < 20.0" Until Next Step
0029: Wait to Satisfy
0030: Run Time 2:00
0031: Drain 1 Time for 1:00
0032: INTER. EXTRACT
0033: Extract Low Until Next Step
0034: Drain 1 Time for 2:00
0035: WARM RINSE
0036: Fill Cold When Level < 20.0" Until Next Step
0037: Fill Hot When Level < 20.0" Until Next Step
0038: Wait to Satisfy
0039: Run Time 2:00
0040: Drain 1 Time for 1:00
0041: HOT RINSE
0042: Fill Hot When Level < 20.0" Until Next Step
0043: Wait to Satisfy
0044: Run Time 2:00
0045: Drain 1 Time for 1:00
0046: FINAL BATH
0047: Fill Cold When Level < 10.0" Until Next Step
0048: Fill Hot When Level < 10.0" Until Next Step
0049: Wait to Satisfy
0050: Supply Dispenser 3 for 0:30
0051: Supply Dispenser 4 for 0:30
0052: Wait to Satisfy
0053: Run Time 4:00
0054: FINAL EXTRACT HI
0055: Extract High Until Next Step
0056: Drain 1 Time for 6:00
0057: END OF FORMULA

Formula #112, ColorPoly. Linen

0001: ColorPoly. Linen
0002: WARM FLUSH
0003: Fill Cold When Level < 20.0" Until Next Step
0004: Fill Hot When Level < 20.0" Until Next Step
0005: Wait to Satisfy
0006: Run Time 2:00
0007: Drain 1 Time for 1:00
0008: HOT SUDS
0009: Fill Hot When Level < 10.0" Until Next Step
0010: Wait to Satisfy
0011: Supply Dispenser 1 for 0:30
0012: Wait to Satisfy
0013: Run Time 7:00
0014: Drain 1 Time for 1:00
0015: WARM RINSE
0016: Fill Cold When Level < 20.0" Until Next Step
0017: Fill Hot When Level < 20.0" Until Next Step
0018: Wait to Satisfy
0019: Run Time 2:00
0020: Drain 1 Time for 1:00
0021: WARM RINSE
0022: Fill Cold When Level < 20.0" Until Next Step
0023: Fill Hot When Level < 20.0" Until Next Step
0024: Wait to Satisfy
0025: Run Time 2:00
0026: Drain 1 Time for 1:00
0027: WARM RINSE
0028: Fill Cold When Level < 20.0" Until Next Step
0029: Fill Hot When Level < 20.0" Until Next Step
0030: Wait to Satisfy
0031: Run Time 2:00
0032: Drain 1 Time for 1:00
0033: WARM CARRYOVER
0034: Fill Cold When Level < 10.0" Until Next Step
0035: Fill Hot When Level < 10.0" Until Next Step
0036: Wait to Satisfy
0037: Supply Dispenser 3 for 0:30
0038: Wait to Satisfy
0039: Run Time 3:00
0040: FINAL EXTRACT HI
0041: Extract High Until Next Step
0042: Drain 1 Time for 4:00
0043: END OF FORMULA

Formula #113, Personals

0001: Personals
0002: WARM FLUSH
0003: Fill Cold When Level < 20.0" Until Next Step
0004: Fill Hot When Level < 20.0" Until Next Step
0005: Wait to Satisfy
0006: Run Time 2:00
0007: Drain 1 Time for 1:00
0008: HOT BREAK
0009: Fill Hot When Level < 10.0" Until Next Step
0010: Wait to Satisfy
0011: Supply Dispenser 1 for 0:30
0012: Supply Dispenser 2 for 0:30
0013: Wait to Satisfy
0014: Run Time 10:00
0015: Drain 1 Time for 1:00
0016: WARM RINSE
0017: Fill Cold When Level < 20.0" Until Next Step
0018: Fill Hot When Level < 20.0" Until Next Step
0019: Wait to Satisfy
0020: Run Time 2:00
0021: Drain 1 Time for 1:00
0022: WARM RINSE
0023: Fill Cold When Level < 20.0" Until Next Step
0024: Fill Hot When Level < 20.0" Until Next Step
0025: Wait to Satisfy
0026: Run Time 2:00
0027: Drain 1 Time for 1:00
0028: WARM RINSE
0029: Fill Cold When Level < 20.0" Until Next Step
0030: Fill Hot When Level < 20.0" Until Next Step
0031: Wait to Satisfy
0032: Run Time 2:00
0033: Drain 1 Time for 1:00
0034: FINAL BATH
0035: Fill Cold When Level < 10.0" Until Next Step
0036: Fill Hot When Level < 10.0" Until Next Step
0037: Wait to Satisfy
0038: Supply Dispenser 3 for 0:30
0039: Supply Dispenser 4 for 0:30
0040: Wait to Satisfy
0041: Run Time 4:00
0042: FINAL EXTRACT HI
0043: Extract High Until Next Step
0044: Drain 1 Time for 6:00
0045: END OF FORMULA

Formula #114, Diapers

0001: Diapers
0002: WARM FLUSH
0003: Fill Cold When Level < 20.0" Until Next Step
0004: Fill Hot When Level < 20.0" Until Next Step
0005: Wait to Satisfy
0006: Run Time 2:00
0007: Drain 1 Time for 1:00
0008: WARM FLUSH
0009: Fill Cold When Level < 20.0" Until Next Step
0010: Fill Hot When Level < 20.0" Until Next Step
0011: Wait to Satisfy
0012: Run Time 2:00
0013: Drain 1 Time for 1:00
0014: HOT SUDS
0015: Fill Hot When Level < 10.0" Until Next Step
0016: Wait to Satisfy
0017: Supply Dispenser 1 for 0:30
0018: Wait to Satisfy
0019: Run Time 7:00
0020: Drain 1 Time for 1:00
0021: HOT RINSE
0022: Fill Hot When Level < 20.0" Until Next Step
0023: Wait to Satisfy
0024: Run Time 2:00
0025: Drain 1 Time for 1:00
0026: WARM BLEACH
0027: Fill Hot When Level < 10.0" Until Next Step
0028: Wait to Satisfy
0029: Supply Dispenser 2 for 0:30
0030: Wait to Satisfy
0031: Run Time 7:00
0032: Drain 1 Time for 1:00
0033: WARM RINSE
0034: Fill Cold When Level < 20.0" Until Next Step
0035: Fill Hot When Level < 20.0" Until Next Step
0036: Wait to Satisfy
0037: Run Time 2:00
0038: Drain 1 Time for 1:00
0039: INTER. EXTRACT
0040: Extract Low Until Next Step
0041: Drain 1 Time for 2:00
0042: WARM RINSE
0043: Fill Cold When Level < 20.0" Until Next Step
0044: Fill Hot When Level < 20.0" Until Next Step
0045: Wait to Satisfy
0046: Run Time 2:00
0047: Drain 1 Time for 1:00
0048: FINAL BATH
0049: Fill Cold When Level < 10.0" Until Next Step
0050: Fill Hot When Level < 10.0" Until Next Step
0051: Wait to Satisfy
0052: Supply Dispenser 3 for 0:30
0053: Supply Dispenser 4 for 0:30
0054: Wait to Satisfy
0055: Run Time 4:00
0056: FINAL EXTRACT HI
0057: Extract High Until Next Step
0058: Drain 1 Time for 6:00
0059: END OF FORMULA

Formula #115, Polyester Pads

0001: Polyester Pads
0002: WARM FLUSH
0003: Fill Cold When Level < 20.0" Until Next Step
0004: Fill Hot When Level < 20.0" Until Next Step
0005: Wait to Satisfy
0006: Run Time 2:00
0007: Drain 1 Time for 1:00
0008: WARM FLUSH
0009: Fill Cold When Level < 20.0" Until Next Step
0010: Fill Hot When Level < 20.0" Until Next Step
0011: Wait to Satisfy
0012: Run Time 2:00
0013: Drain 1 Time for 1:00
0014: WARM FLUSH
0015: Fill Cold When Level < 20.0" Until Next Step
0016: Fill Hot When Level < 20.0" Until Next Step
0017: Wait to Satisfy
0018: Run Time 2:00
0019: Drain 1 Time for 1:00
0020: HOT BREAK
0021: Fill Hot When Level < 10.0" Until Next Step
0022: Wait to Satisfy
0023: Supply Dispenser 1 for 0:30
0024: Supply Dispenser 2 for 0:30
0025: Wait to Satisfy
0026: Run Time 10:00
0027: Drain 1 Time for 1:00
0028: WARM RINSE
0029: Fill Cold When Level < 20.0" Until Next Step
0030: Fill Hot When Level < 20.0" Until Next Step
0031: Wait to Satisfy
0032: Run Time 2:00
0033: Drain 1 Time for 1:00
0034: WARM RINSE
0035: Fill Cold When Level < 20.0" Until Next Step
0036: Fill Hot When Level < 20.0" Until Next Step
0037: Wait to Satisfy
0038: Run Time 2:00
0039: Drain 1 Time for 1:00
0040: WARM RINSE
0041: Fill Cold When Level < 20.0" Until Next Step
0042: Fill Hot When Level < 20.0" Until Next Step
0043: Wait to Satisfy
0044: Run Time 2:00
0045: Drain 1 Time for 1:00
0046: WARM CARRYOVER
0047: Fill Cold When Level < 10.0" Until Next Step
0048: Fill Hot When Level < 10.0" Until Next Step
0049: Wait to Satisfy
0050: Supply Dispenser 3 for 0:30
0051: Wait to Satisfy
0052: Run Time 3:00
0053: FINAL EXTRACT HI
0054: Extract High Until Next Step
0055: Drain 1 Time for 6:00
0056: END OF FORMULA

Formula #116, Housekeeping Rag

0001: Housekeeping Rag
0002: WARM FLUSH
0003: Fill Cold When Level < 20.0" Until Next Step
0004: Fill Hot When Level < 20.0" Until Next Step
0005: Wait to Satisfy
0006: Run Time 2:00
0007: Drain 1 Time for 1:00
0008: WARM FLUSH
0009: Fill Cold When Level < 20.0" Until Next Step
0010: Fill Hot When Level < 20.0" Until Next Step
0011: Wait to Satisfy
0012: Run Time 2:00
0013: Drain 1 Time for 1:00
0014: HOT SUDS
0015: Fill Hot When Level < 10.0" Until Next Step
0016: Wait to Satisfy
0017: Supply Dispenser 1 for 0:30
0018: Wait to Satisfy
0019: Run Time 7:00
0020: Drain 1 Time for 1:00
0021: HOT RINSE
0022: Fill Hot When Level < 20.0" Until Next Step
0023: Wait to Satisfy
0024: Run Time 2:00
0025: Drain 1 Time for 1:00
0026: WARM BLEACH
0027: Fill Hot When Level < 10.0" Until Next Step
0028: Wait to Satisfy
0029: Supply Dispenser 2 for 0:30
0030: Wait to Satisfy
0031: Run Time 7:00
0032: Drain 1 Time for 1:00
0033: WARM RINSE
0034: Fill Cold When Level < 20.0" Until Next Step
0035: Fill Hot When Level < 20.0" Until Next Step
0036: Wait to Satisfy
0037: Run Time 2:00
0038: Drain 1 Time for 1:00
0039: INTER. EXTRACT
0040: Extract Low Until Next Step
0041: Drain 1 Time for 2:00
0042: WARM RINSE
0043: Fill Cold When Level < 20.0" Until Next Step
0044: Fill Hot When Level < 20.0" Until Next Step
0045: Wait to Satisfy
0046: Run Time 2:00
0047: Drain 1 Time for 1:00
0048: FINAL EXTRACT HI
0049: Extract High Until Next Step
0050: Drain 1 Time for 6:00
0051: END OF FORMULA

Formula #117, AIDS/Disease

0001: AIDS/Disease
0002: HOT SUDS
0003: Fill Hot When Level < 10.0" Until Next Step
0004: Wait to Satisfy
0005: Supply Dispenser 1 for 0:30
0006: Wait to Satisfy
0007: Run Time 7:00
0008: Drain 1 Time for 1:00
0009: HOT RINSE
0010: Fill Hot When Level < 20.0" Until Next Step
0011: Wait to Satisfy
0012: Run Time 2:00
0013: Drain 1 Time for 1:00
0014: HOT RINSE
0015: Fill Hot When Level < 20.0" Until Next Step
0016: Wait to Satisfy
0017: Run Time 2:00
0018: Drain 1 Time for 1:00
0019: HOT RINSE
0020: Fill Hot When Level < 20.0" Until Next Step
0021: Wait to Satisfy
0022: Run Time 2:00
0023: Drain 1 Time for 1:00
0024: HOT SUDS
0025: Fill Hot When Level < 10.0" Until Next Step
0026: Wait to Satisfy
0027: Supply Dispenser 1 for 0:30
0028: Wait to Satisfy
0029: Run Time 7:00
0030: Drain 1 Time for 1:00
0031: HOT RINSE
0032: Fill Hot When Level < 20.0" Until Next Step
0033: Wait to Satisfy
0034: Run Time 2:00
0035: Drain 1 Time for 1:00
0036: WARM BLEACH
0037: Fill Hot When Level < 10.0" Until Next Step
0038: Wait to Satisfy
0039: Supply Dispenser 2 for 0:30
0040: Wait to Satisfy
0041: Run Time 7:00
0042: Drain 1 Time for 1:00
0043: WARM RINSE
0044: Fill Cold When Level < 20.0" Until Next Step
0045: Fill Hot When Level < 20.0" Until Next Step
0046: Wait to Satisfy
0047: Run Time 2:00
0048: Drain 1 Time for 1:00
0049: WARM RINSE
0050: Fill Cold When Level < 20.0" Until Next Step
0051: Fill Hot When Level < 20.0" Until Next Step
0052: Wait to Satisfy
0053: Run Time 2:00
0054: Drain 1 Time for 1:00
0055: WARM CARRYOVER
0056: Fill Cold When Level < 10.0" Until Next Step
0057: Fill Hot When Level < 10.0" Until Next Step
0058: Wait to Satisfy
0059: Supply Dispenser 3 for 0:30
0060: Wait to Satisfy
0061: Run Time 3:00
0062: FINAL EXTRACT HI
0063: Extract High Until Next Step
0064: Drain 1 Time for 6:00
0065: END OF FORMULA

Formula #118, Shirts

0001: Shirts
0002: WARM FLUSH
0003: Fill Cold When Level < 20.0" Until Next Step
0004: Fill Hot When Level < 20.0" Until Next Step
0005: Wait to Satisfy
0006: Run Time 2:00
0007: Drain 1 Time for 1:00
0008: HOT BREAK
0009: Fill Hot When Level < 10.0" Until Next Step
0010: Wait to Satisfy
0011: Supply Dispenser 1 for 0:30
0012: Supply Dispenser 2 for 0:30
0013: Wait to Satisfy
0014: Run Time 10:00
0015: Drain 1 Time for 1:00
0016: HOT RINSE
0017: Fill Hot When Level < 20.0" Until Next Step
0018: Wait to Satisfy
0019: Run Time 2:00
0020: Drain 1 Time for 1:00
0021: WARM RINSE
0022: Fill Cold When Level < 20.0" Until Next Step
0023: Fill Hot When Level < 20.0" Until Next Step
0024: Wait to Satisfy
0025: Run Time 2:00
0026: Drain 1 Time for 1:00
0027: WARM RINSE
0028: Fill Cold When Level < 20.0" Until Next Step
0029: Fill Hot When Level < 20.0" Until Next Step
0030: Wait to Satisfy
0031: Run Time 2:00
0032: Drain 1 Time for 1:00
0033: WARM RINSE
0034: Fill Cold When Level < 20.0" Until Next Step
0035: Fill Hot When Level < 20.0" Until Next Step
0036: Wait to Satisfy
0037: Run Time 2:00
0038: Drain 1 Time for 1:00
0039: WARM CARRYOVER
0040: Fill Cold When Level < 10.0" Until Next Step
0041: Fill Hot When Level < 10.0" Until Next Step
0042: Wait to Satisfy
0043: Supply Dispenser 3 for 0:30
0044: Wait to Satisfy
0045: Run Time 3:00
0046: FINAL EXTRACT HI
0047: Extract High Until Next Step
0048: Drain 1 Time for 6:00
0049: END OF FORMULA

Formula #119, Lt. Starch/Extr.

0001: Lt. Starch/Extr.
0002: WARM CARRYOVER
0003: Fill Cold When Level < 10.0" Until Next Step
0004: Fill Hot When Level < 10.0" Until Next Step
0005: Wait to Satisfy
0006: Supply Dispenser 3 for 0:30
0007: Wait to Satisfy
0008: Run Time 3:00
0009: Drain 1 Time for 1:00
0010: WARM STARCH
0011: Fill Cold When Level < 10.0" Until Next Step
0012: Fill Hot When Level < 10.0" Until Next Step
0013: Wait to Satisfy
0014: Supply Dispenser 5 for 0:30
0015: Wait to Satisfy
0016: Run Time 6:00
0017: FINAL EXTRACT HI
0018: Extract High Until Next Step
0019: Drain 1 Time for 6:00
0020: END OF FORMULA

Formula #120, Extra Rinse Extr

0001: Extra Rinse Extr
0002: WARM RINSE
0003: Fill Cold When Level < 20.0" Until Next Step
0004: Fill Hot When Level < 20.0" Until Next Step
0005: Wait to Satisfy
0006: Run Time 2:00
0007: Drain 1 Time for 1:00
0008: INTER. EXTRACT
0009: Extract Low Until Next Step
0010: Drain 1 Time for 2:00
0011: WARM RINSE
0012: Fill Cold When Level < 20.0" Until Next Step
0013: Fill Hot When Level < 20.0" Until Next Step
0014: Wait to Satisfy
0015: Run Time 2:00
0016: Drain 1 Time for 1:00
0017: FINAL EXTRACT HI
0018: Extract High Until Next Step
0019: Drain 1 Time for 6:00
0020: END OF FORMULA

Formula #121, General Wash

0001: General Wash
0002: HOT BREAK
0003: Fill Hot When Level < 10.0" Until Next Step
0004: Wait to Satisfy
0005: Supply Dispenser 1 for 0:30
0006: Supply Dispenser 2 for 0:30
0007: Wait to Satisfy
0008: Run Time 10:00
0009: Drain 1 Time for 1:00
0010: WARM RINSE
0011: Fill Cold When Level < 20.0" Until Next Step
0012: Fill Hot When Level < 20.0" Until Next Step
0013: Wait to Satisfy
0014: Run Time 2:00
0015: Drain 1 Time for 1:00
0016: WARM RINSE
0017: Fill Cold When Level < 20.0" Until Next Step
0018: Fill Hot When Level < 20.0" Until Next Step
0019: Wait to Satisfy
0020: Run Time 2:00
0021: Drain 1 Time for 1:00
0022: WARM RINSE
0023: Fill Cold When Level < 20.0" Until Next Step
0024: Fill Hot When Level < 20.0" Until Next Step
0025: Wait to Satisfy
0026: Run Time 2:00
0027: Drain 1 Time for 1:00
0028: FINAL BATH
0029: Fill Cold When Level < 10.0" Until Next Step
0030: Fill Hot When Level < 10.0" Until Next Step
0031: Wait to Satisfy
0032: Supply Dispenser 3 for 0:30
0033: Supply Dispenser 4 for 0:30
0034: Wait to Satisfy
0035: Run Time 4:00
0036: FINAL EXTRACT HI
0037: Extract High Until Next Step
0038: Drain 1 Time for 6:00
0039: END OF FORMULA

Formula #122, Pillow Cases

0001: Pillow Cases
0002: COLD FLUSH
0003: Fill Cold When Level < 20.0" Until Next Step
0004: Wait to Satisfy
0005: Run Time 3:00
0006: Drain 1 Time for 1:00
0007: WARM FLUSH
0008: Fill Cold When Level < 20.0" Until Next Step
0009: Fill Hot When Level < 20.0" Until Next Step
0010: Wait to Satisfy
0011: Run Time 2:00
0012: Drain 1 Time for 1:00
0013: HOT SUDS
0014: Fill Hot When Level < 10.0" Until Next Step
0015: Wait to Satisfy
0016: Supply Dispenser 1 for 0:30
0017: Wait to Satisfy
0018: Run Time 7:00
0019: Drain 1 Time for 1:00
0020: WARM BLEACH
0021: Fill Hot When Level < 10.0" Until Next Step
0022: Wait to Satisfy
0023: Supply Dispenser 2 for 0:30
0024: Wait to Satisfy
0025: Run Time 7:00
0026: Drain 1 Time for 1:00
0027: WARM RINSE
0028: Fill Cold When Level < 20.0" Until Next Step
0029: Fill Hot When Level < 20.0" Until Next Step
0030: Wait to Satisfy
0031: Run Time 2:00
0032: Drain 1 Time for 1:00
0033: INTER. EXTRACT
0034: Extract Low Until Next Step
0035: Drain 1 Time for 2:00
0036: WARM RINSE
0037: Fill Cold When Level < 20.0" Until Next Step
0038: Fill Hot When Level < 20.0" Until Next Step
0039: Wait to Satisfy
0040: Run Time 2:00
0041: Drain 1 Time for 1:00
0042: FINAL BATH
0043: Fill Cold When Level < 10.0" Until Next Step
0044: Fill Hot When Level < 10.0" Until Next Step
0045: Wait to Satisfy
0046: Supply Dispenser 3 for 0:30
0047: Supply Dispenser 4 for 0:30
0048: Wait to Satisfy
0049: Run Time 4:00
0050: FINAL EXTRACT HI
0051: Extract High Until Next Step
0052: Drain 1 Time for 6:00
0053: END OF FORMULA

Formula #123, Extra Heavy Soil

0001: Extra Heavy Soil
0002: HOT SUDS
0003: Fill Hot When Level < 10.0" Until Next Step
0004: Wait to Satisfy
0005: Supply Dispenser 1 for 0:30
0006: Wait to Satisfy
0007: Run Time 7:00
0008: Drain 1 Time for 1:00
0009: HOT RINSE
0010: Fill Hot When Level < 20.0" Until Next Step
0011: Wait to Satisfy
0012: Run Time 2:00
0013: Drain 1 Time for 1:00
0014: HOT SUDS
0015: Fill Hot When Level < 10.0" Until Next Step
0016: Wait to Satisfy
0017: Supply Dispenser 1 for 0:30
0018: Wait to Satisfy
0019: Run Time 7:00
0020: Drain 1 Time for 1:00
0021: HOT RINSE
0022: Fill Hot When Level < 20.0" Until Next Step
0023: Wait to Satisfy
0024: Run Time 2:00
0025: Drain 1 Time for 1:00
0026: HOT RINSE
0027: Fill Hot When Level < 20.0" Until Next Step
0028: Wait to Satisfy
0029: Run Time 2:00
0030: Drain 1 Time for 1:00
0031: HOT BREAK
0032: Fill Hot When Level < 10.0" Until Next Step
0033: Wait to Satisfy
0034: Supply Dispenser 1 for 0:30
0035: Supply Dispenser 2 for 0:30
0036: Wait to Satisfy
0037: Run Time 10:00
0038: Drain 1 Time for 1:00
0039: HOT RINSE
0040: Fill Hot When Level < 20.0" Until Next Step
0041: Wait to Satisfy
0042: Run Time 2:00
0043: Drain 1 Time for 1:00
0044: WARM RINSE
0045: Fill Cold When Level < 20.0" Until Next Step
0046: Fill Hot When Level < 20.0" Until Next Step
0047: Wait to Satisfy
0048: Run Time 2:00
0049: Drain 1 Time for 1:00
0050: INTER. EXTRACT
0051: Extract Low Until Next Step
0052: Drain 1 Time for 2:00
0053: WARM RINSE
0054: Fill Cold When Level < 20.0" Until Next Step
0055: Fill Hot When Level < 20.0" Until Next Step
0056: Wait to Satisfy
0057: Run Time 2:00
0058: Drain 1 Time for 1:00
0059: WARM RINSE
0060: Fill Cold When Level < 20.0" Until Next Step
0061: Fill Hot When Level < 20.0" Until Next Step
0062: Wait to Satisfy
0063: Run Time 2:00
0064: Drain 1 Time for 1:00
0065: WARM CARRYOVER
0066: Fill Cold When Level < 10.0" Until Next Step
0067: Fill Hot When Level < 10.0" Until Next Step
0068: Wait to Satisfy
0069: Supply Dispenser 3 for 0:30
0070: Wait to Satisfy
0071: Run Time 3:00
0072: FINAL EXTRACT HI
0073: Extract High Until Next Step
0074: Drain 1 Time for 6:00
0075: END OF FORMULA

Formula #124, Wool Blankets

0001: Wool Blankets
0002: WARM SUDS
0003: Fill Cold When Level < 20.0" Until Next Step
0004: Fill Hot When Level < 20.0" Until Next Step
0005: Wait to Satisfy
0006: Supply Dispenser 1 for 0:30
0007: Wait to Satisfy
0008: Run Time 8:00
0009: Drain 1 Time for 1:00
0010: WARM RINSE
0011: Fill Cold When Level < 20.0" Until Next Step
0012: Fill Hot When Level < 20.0" Until Next Step
0013: Wait to Satisfy
0014: Run Time 2:00
0015: Drain 1 Time for 1:00
0016: WARM RINSE
0017: Fill Cold When Level < 20.0" Until Next Step
0018: Fill Hot When Level < 20.0" Until Next Step
0019: Wait to Satisfy
0020: Run Time 2:00
0021: Drain 1 Time for 1:00
0022: WARM RINSE
0023: Fill Cold When Level < 20.0" Until Next Step
0024: Fill Hot When Level < 20.0" Until Next Step
0025: Wait to Satisfy
0026: Run Time 2:00
0027: Drain 1 Time for 1:00
0028: FINAL BATH
0029: Fill Cold When Level < 10.0" Until Next Step
0030: Fill Hot When Level < 10.0" Until Next Step
0031: Wait to Satisfy
0032: Supply Dispenser 3 for 0:30
0033: Supply Dispenser 4 for 0:30
0034: Wait to Satisfy
0035: Run Time 4:00
0036: FINAL EXTRACT HI
0037: Extract High Until Next Step
0038: Drain 1 Time for 6:00
0039: END OF FORMULA

Formula #125, Stain Treatment

0001: Stain Treatment
0002: HOT BREAK
0003: Fill Hot When Level < 10.0" Until Next Step
0004: Wait to Satisfy
0005: Supply Dispenser 1 for 0:30
0006: Supply Dispenser 2 for 0:30
0007: Wait to Satisfy
0008: Run Time 10:00
0009: Drain 1 Time for 1:00
0010: BLEACH SOAK
0011: Fill Hot When Level < 10.0" Until Next Step
0012: Wait to Satisfy
0013: Supply Dispenser 2 for 0:30
0014: Wait to Satisfy
0015: Run Time 20:00
0016: Drain 1 Time for 1:00
0017: HOT RINSE
0018: Fill Hot When Level < 20.0" Until Next Step
0019: Wait to Satisfy
0020: Run Time 2:00
0021: Drain 1 Time for 1:00
0022: HOT RINSE
0023: Fill Hot When Level < 20.0" Until Next Step
0024: Wait to Satisfy
0025: Run Time 2:00
0026: Drain 1 Time for 1:00
0027: WARM RINSE
0028: Fill Cold When Level < 20.0" Until Next Step
0029: Fill Hot When Level < 20.0" Until Next Step
0030: Wait to Satisfy
0031: Run Time 2:00
0032: Drain 1 Time for 1:00
0033: INTER. EXTRACT
0034: Extract Low Until Next Step
0035: Drain 1 Time for 2:00
0036: WARM RINSE
0037: Fill Cold When Level < 20.0" Until Next Step
0038: Fill Hot When Level < 20.0" Until Next Step
0039: Wait to Satisfy
0040: Run Time 2:00
0041: Drain 1 Time for 1:00
0042: FINAL EXTRACT HI
0043: Extract High Until Next Step
0044: Drain 1 Time for 6:00
0045: END OF FORMULA

Formula #126, Cotton Blankets

0001: Cotton Blankets
0002: WARM BREAK
0003: Fill Cold When Level < 20.0" Until Next Step
0004: Fill Hot When Level < 20.0" Until Next Step
0005: Wait to Satisfy
0006: Supply Dispenser 1 for 0:30
0007: Supply Dispenser 2 for 0:30
0008: Wait to Satisfy
0009: Run Time 8:00
0010: Drain 1 Time for 1:00
0011: WARM RINSE
0012: Fill Cold When Level < 20.0" Until Next Step
0013: Fill Hot When Level < 20.0" Until Next Step
0014: Wait to Satisfy
0015: Run Time 2:00
0016: Drain 1 Time for 1:00
0017: WARM RINSE
0018: Fill Cold When Level < 20.0" Until Next Step
0019: Fill Hot When Level < 20.0" Until Next Step
0020: Wait to Satisfy
0021: Run Time 2:00
0022: Drain 1 Time for 1:00
0023: WARM RINSE
0024: Fill Cold When Level < 20.0" Until Next Step
0025: Fill Hot When Level < 20.0" Until Next Step
0026: Wait to Satisfy
0027: Run Time 2:00
0028: Drain 1 Time for 1:00
0029: FINAL BATH
0030: Fill Cold When Level < 10.0" Until Next Step
0031: Fill Hot When Level < 10.0" Until Next Step
0032: Wait to Satisfy
0033: Supply Dispenser 3 for 0:30
0034: Supply Dispenser 4 for 0:30
0035: Wait to Satisfy
0036: Run Time 4:00
0037: FINAL EXTRACT HI
0038: Extract High Until Next Step
0039: Drain 1 Time for 6:00
0040: END OF FORMULA

Formula #127, Uniforms

0001: Uniforms
0002: WARM FLUSH
0003: Fill Cold When Level < 20.0" Until Next Step
0004: Fill Hot When Level < 20.0" Until Next Step
0005: Wait to Satisfy
0006: Run Time 2:00
0007: Drain 1 Time for 1:00
0008: HOT SUDS
0009: Fill Hot When Level < 10.0" Until Next Step
0010: Wait to Satisfy
0011: Supply Dispenser 1 for 0:30
0012: Wait to Satisfy
0013: Run Time 7:00
0014: Drain 1 Time for 1:00
0015: WARM BLEACH
0016: Fill Hot When Level < 10.0" Until Next Step
0017: Wait to Satisfy
0018: Supply Dispenser 2 for 0:30
0019: Wait to Satisfy
0020: Run Time 7:00
0021: Drain 1 Time for 1:00
0022: WARM RINSE
0023: Fill Cold When Level < 20.0" Until Next Step
0024: Fill Hot When Level < 20.0" Until Next Step
0025: Wait to Satisfy
0026: Run Time 2:00
0027: Drain 1 Time for 1:00
0028: INTER. EXTRACT
0029: Extract Low Until Next Step
0030: Drain 1 Time for 2:00
0031: WARM RINSE
0032: Fill Cold When Level < 20.0" Until Next Step
0033: Fill Hot When Level < 20.0" Until Next Step
0034: Wait to Satisfy
0035: Run Time 2:00
0036: Drain 1 Time for 1:00
0037: FINAL BATH
0038: Fill Cold When Level < 10.0" Until Next Step
0039: Fill Hot When Level < 10.0" Until Next Step
0040: Wait to Satisfy
0041: Supply Dispenser 3 for 0:30
0042: Supply Dispenser 4 for 0:30
0043: Wait to Satisfy
0044: Run Time 4:00
0045: FINAL EXTRACT HI
0046: Extract High Until Next Step
0047: Drain 1 Time for 6:00
0048: END OF FORMULA

Formula #128, Test Formula

0001: Test Formula
0002: 8 RPM Wash Speed
0003: Speed 2 On
0004: Fill Cold When Level < 10.0" Until Next Step
0005: Wait to Satisfy
0006: Run Time 1:00
0007: Extract Low Until Next Step
0008: Drain 1 Time for 3:00
0009: 12 RPM Wash Speed
0010: Fill Hot When Level < 15.0" Until Next Step
0011: Wait to Satisfy
0012: Run Time 1:00
0013: Speed 2 Off
0014: 28 RPM Wash Speed
0015: Fill Hot When Level < 20.0" Until Next Step
0016: Fill Cold When Level < 20.0" Until Next Step
0017: Wait to Satisfy
0018: Run Time 60:00
0019: Cylinder Still Until Initially Satisfied
0020: Drain 1 Time for 2:00
0021: Prompt: WATER METER ??
0022: Signal [Yes] = Resume [No] = Label 1
0023: Wait to Satisfy
0024: Fill Cold While Total < 100 GAL
0025: Wait to Satisfy
0026: Run Time 1:00
0027: Fill Hot While Total < 150 GAL
0028: Wait to Satisfy
0029: Run Time 1:00
0030: Fill Hot While Total < 200 GAL
0031: Fill Cold While Total < 200 GAL
0032: Wait to Satisfy
0033: Run Time 1:00
0034: Drain 1 Time for 1:00
0035: Fill Cold While Water:Load Ratio < 3.0:1
0036: Wait to Satisfy
0037: Run Time 1:00
0038: Drain 1 Time for 1:00
0039: Fill Hot While Water:Load Ratio < 3.0:1
0040: Fill Cold While Water:Load Ratio < 3.0:1
0041: Wait to Satisfy
0042: Run Time 1:00
0043: Drain 1 Time for 1:00
0044: ********* Label 1 *********
0045: Prompt: 3RD WATER ??
0046: Signal [Yes] = Resume [No] = Label 2
0047: Wait to Satisfy
0048: Fill 3rd When Level < 10.0" Until Next Step
0049: Wait to Satisfy
0050: Run Time 1:00
0051: Drain 1 Time for 1:00
0052: Prompt: 4TH WATER ??
0053: Signal [Yes] = Resume [No] = Label 2
0054: Wait to Satisfy
0055: Fill 4th When Level < 10.0" Until Next Step
0056: Wait to Satisfy
0057: Run Time 1:00
0058: Drain 1 Time for 1:00
0059: ********* Label 2 *********
0060: Prompt: 2ND DRAIN ??
0061: Signal [Yes] = Resume [No] = Label 3
0062: Wait to Satisfy
0063: Fill Cold When Level < 10.0" Until Next Step
0064: Wait to Satisfy
0065: Run Time 1:00
0066: Drain 2 Time for 1:00
0067: Prompt: 3RD DRAIN ??
0068: Signal [Yes] = Resume [No] = Label 3
0069: Wait to Satisfy
0070: Fill Cold When Level < 10.0" Until Next Step
0071: Wait to Satisfy
0072: Run Time 1:00
0073: Drain 3 Time for 1:00
0074: ********* Label 3 *********

0075: Cylinder Still Until Initially Satisfied
0076: Fill Hot When Level < 10.0" Until Next Step
0077: Fill Cold When Level < 10.0" Until Next Step
0078: Wait to Satisfy
0079: Gentle Action On
0080: Run Time 1:00
0081: Forward Timer 30 Seconds
0082: Reverse Timer 30 Seconds
0083: Dwell Timer 10 Seconds
0084: Run Time 3:00
0085: Normal Rotation
0086: Supply Dispenser 1 for 0:30
0087: Wait to Satisfy
0088: Supply Dispenser 2 for 0:30
0089: Wait to Satisfy
0090: Supply Dispenser 3 for 0:30
0091: Wait to Satisfy
0092: Supply Dispenser 4 for 0:30
0093: Wait to Satisfy
0094: Prompt: SUPPLY DISP. #5?
0095: Signal [Yes] = Resume [No] = Label 4
0096: Wait to Satisfy
0097: Supply Dispenser 5 for 0:30
0098: Wait to Satisfy
0099: Prompt: SUPPLY DISP 6&7?
0100: Signal [Yes] = Resume [No] = Label 4
0101: Wait to Satisfy
0102: Supply Dispenser 6 for 0:30
0103: Wait to Satisfy
0104: Supply Dispenser 7 for 0:30
0105: Wait to Satisfy
0106: ********* Label 4 *********
0107: Run Time 1:00
0108: Prompt: TDX MACHINE ??
0109: Signal [Yes] = Resume [No] = Label 5
0110: Wait to Satisfy
0111: Super Penetration On
0112: Run Time 4:00
0113: Supply Dispenser 1 for 0:30
0114: Timed Flush On 0:05 / Off 0:10
0115: Wait to Satisfy
0116: Supply Dispenser 2 for 0:30
0117: Timed Flush On 0:05 / Off 0:10
0118: Wait to Satisfy
0119: Supply Dispenser 3 for 0:30
0120: Timed Flush On 0:05 / Off 0:10
0121: Wait to Satisfy
0122: Recirculation Pump On
0123: Supply Dispenser 4 for 0:30
0124: Timed Flush On 0:05 / Off 0:10
0125: Wait to Satisfy
0126: Prompt: SUPPLY DISP. #5?
0127: Signal [Yes] = Resume [No] = Label 6
0128: Wait to Satisfy
0129: Supply Dispenser 5 for 0:30
0130: Timed Flush On 0:05 / Off 0:10
0131: Wait to Satisfy
0132: Prompt: SUPPLY DISP 6&7?
0133: Signal [Yes] = Resume [No] = Label 6
0134: Wait to Satisfy
0135: Supply Dispenser 6 for 0:30
0136: Timed Flush On 0:05 / Off 0:10
0137: Wait to Satisfy
0138: Supply Dispenser 7 for 0:30
0139: Timed Flush On 0:05 / Off 0:10
0140: Wait to Satisfy
0141: ********* Label 6 *********
0142: Recirculation Pump Off
0143: Run Time 1:00
0144: Prompt: SALT INJECTOR ??
0145: Signal [Yes] = Resume [No] = Label 7
0146: Wait to Satisfy
0147: Chem Pot 5 Cycle(s)
0148: Wait to Satisfy
0149: Run Time 1:00
0150: ********* Label 7 *********
0151: Prompt: HIGHWATER LEVEL?
0152: Signal [Yes] = Resume [No] = Label 8
0153: Wait to Satisfy
0154: Fill Hot When Level < 40.0" Until Next Step
0155: Fill Cold When Level < 40.0" Until Next Step
0156: Steam When Temperature < 160.F Until Next Step
0157: Wait to Satisfy
0158: Run Time 1:00
0159: ********* Label 8 *********
0160: Steam When Temperature < 200.F Until Next Step
0161: Gradient 6.0.F/Min
0162: Wait to Satisfy
0163: Run Time 2:00
0164: Indirect Cooldown Until Temp < 190.F
0165: Wait to Satisfy
0166: Run Time 1:00
0167: Overflow Rinse On
0168: Run Time 3:00
0169: ********* Label 5 *********
0170: Prompt: AUTO CHEM 1-8??
0171: Signal [Yes] = Resume [No] = Label 9
0172: Wait to Satisfy
0173: Add 10 Drams of Chem. # 1
0174: Wait to Satisfy
0175: Add 10 Oz of Chem. # 2
0176: Wait to Satisfy
0177: Add 10 Oz of Chem. # 3
0178: Wait to Satisfy
0179: Add 10 Oz of Chem. # 4
0180: Wait to Satisfy
0181: Add 10 Drams of Chem. # 5
0182: Wait to Satisfy
0183: Add 10 Pt of Chem. # 6
0184: Wait to Satisfy
0185: Add 10 Kg of Chem. # 7
0186: Wait to Satisfy
0187: Add 10 Kg of Chem. # 8
0188: Wait to Satisfy
0189: Prompt: AUTO CHEM 9-12?
0190: Signal [Yes] = Resume [No] = Label 9
0191: Wait to Satisfy
0192: Add 10 Oz of Chem. # 9
0193: Wait to Satisfy
0194: Add 10 Oz of Chem. # 10
0195: Wait to Satisfy
0196: Add 10 Oz of Chem. # 11
0197: Wait to Satisfy
0198: Add 10 Kg of Chem. # 12
0199: Wait to Satisfy
0200: Prompt: AUTO CHEM 13-16?
0201: Signal [Yes] = Resume [No] = Label 9
0202: Wait to Satisfy

0203: Add 10 Bucket of Chem. # 13
0204: Wait to Satisfy
0205: Add 10 Oz of Chem. # 14
0206: Wait to Satisfy
0207: Add 10 Lb of Chem. # 15
0208: Wait to Satisfy
0209: Add 10 Oz of Chem. # 16
0210: Wait to Satisfy
0211: ********* Label 9 *********
0212: Run Time 1:00
0213: Set Alt Heat Source = Enabled
0214: Run Time 1:00
0215: Set Alt Heat Source = Disabled
0216: Steam When Temperature < 160.F Until Next Step
0217: Wait to Satisfy
0218: Run Time 1:00
0219: Cooldown When Temp > 130.F Until Next Step
0220: Wait to Satisfy
0221: Run Time 1:00
0222: Regular Speed Drain
0223: Drain 1 Time for 2:00
0224: Fill While < 10.0" Temp 130 - 140.F Use H-HC-C
0225: Wait to Satisfy
0226: Fill While < 15.0" Temp 50 - 60.F Use H-HC-C
0227: Wait to Satisfy
0228: Run Time 1:00
0229: Drain 1 When Level > 5.0" Until Next Step
0230: Run Time 0:30
0231: Drain 1 Time for 1:00
0232: Prompt: SINGLE MOTOR ??
0233: Signal [Yes] = Resume [No] = Label 10
0234: Wait to Satisfy
0235: Run Time 0:00
0236: Extract at 250 G's for 1:00
0237: Extract High Until Next Step
0238: Drain 1 Time for 6:00
0239: ********* Label 10 *********
0240: Extract High Until Next Step
0241: Drain 1 Time for 30:00
0242: Run Time 1:00
0243: END OF FORMULA

Notes:

SOFTROL

Software & Control for Automation

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Revised 12/19/01: New formatting.
Revised 01/28/02: Added Flow Sensor Calibrations and Maintenance Error Messages.
Revised 10/23/02: Updating scissor shuttle settings.
Revised 05/03/03: Updated setups to include database ID for type 91 systems.
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Revised 06/08/04: Updated Unloading Height description.
Revised 06/11/04: Added new mass energy setups and defined water meter types.
Revised 01/12/05: Added additional formula examples to the Defined Instructions section as well as corrected spelling errors.
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