



Knight-Trak II System Programming Manual

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START-UP PROCEDURES

Check each of the following before connecting power:

- (1) Check the voltage-select switch on the POB circuit board located inside the dispenser. Make sure that the voltage to be applied to the dispenser matches the voltage of the POB circuit board. Also make sure the voltage of the pump motors matches voltage to the dispensers. 120 VAC motors have black wires, 240 VAC motors have red wires.
- (2) Connect the voltage wires to the input terminals on the POB board. Make sure that no strands of wire are showing.
- (3) If you are going to MULTI-LINK several POB boards, make sure that you assign a different ID number to each board PRIOR to connecting the Multi-Link wires.
- (4) Make sure that the SIB (Signal Input Board) is properly connected to the LFP. Black, red, and brown wire from the SIB wires marked "SIB" connect to the black, red, and brown terminals inside the LFP. An uninsulated "drain" wire is connected to the BLACK wire. Use a shielded cable APPROVED BY KNIGHT INC.
- (5) Connect the LFP to the POB.
- (6) If you are using an LMIB (Laundry Management Input Board) to track hot and cold water data and door interlock signals, connect the black, red, and brown wires from the LMIB wires marked LMIB to the black, red, and brown wires on the SIB marked LMIB. If you aren't using an LMIB, individually tape off the wires on the SIB marked LMIB.
- (7) Apply power to the POB.
- (8) Always clear dispenser memory before entering new setup program.
- (9) If the LFP displays "PTM-6000 not responding/check connections" while connected to an RM-6000, unplug the RM-6000 from the LFP for 10 seconds, then re-connect.

MENU MAP

1 *** DISPENSER *** MEMORY FUNCTIONS

- Clear pump volumes and delay times
- Clear sum/cycle report memory
- Clear load counter
- Clear setup information
- Load setup file

2 *** DISPENSER *** SETUP ROUTINES

- Change ID and main access code
- Set date and time
- Select unit of measure
- Setup auto formula select and auto formula reset
- Select load count pump and door signal
- Set bleach defeat
- Set delay time units/set signal lockout
- Setup flush mode

3 *** DISPENSER *** REPORT SETUP ROUTINES

- Change user access code
- Setup report name and display features
- Change chemical names and costs
- Change formula names and weights
- Set shift times and operating zone
- Set washer capacity and water flow rates
- Setup cycle time information
- Set signal qualifying time

4 *** DISPENSER *** MAINTENANCE SCHEDULE

- Date dispenser installed
- Date tubes last changed
- Date tubes last lubed

5 *** DISPENSER *** PROGRAMMING ROUTINES

- Calibrate pumps
- Prime pumps
- Set pump flow rates
- Program pumps
- Set delay times

6 *** DISPENSER *** PRINTING FUNCTIONS

- Print reports on-site
- Save files to RM-6000

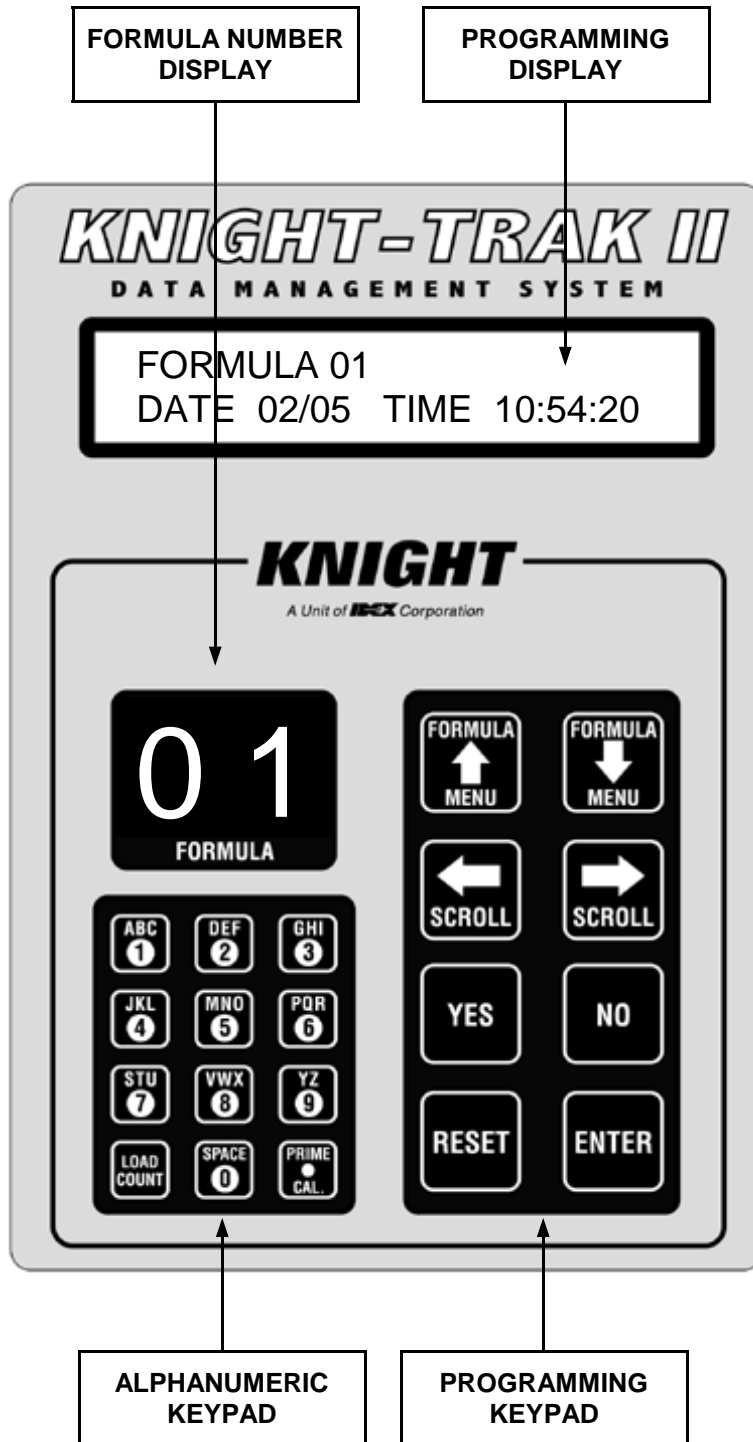
7 *** DISPENSER *** PUMP TEST ROUTINES

- Simulate signals to pumps
- Prime pumps

8 *** DISPENSER *** DIAGNOSTIC ROUTINES

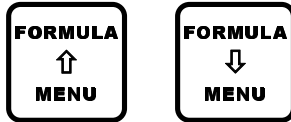
- Test SIB/LMIB signal inputs
- Perform SIB noise test

LFP-6000 KEYPAD DIAGRAM



LFP-6000 KEYPAD DESCRIPTIONS

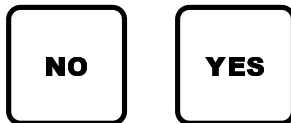
The LFP has been designed “USER FRIENDLY”. The only two (2) keys you need to know are the MENU ↓ and ENTER. Pressing either key will advance you through the screens. Read the screens and respond with one of the buttons below.



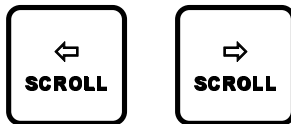
The MENU (DOWN) and MENU (UP) buttons allows you to move down and up through the menu selections and pick what you want to do. Operators can use them to select formulas as well.



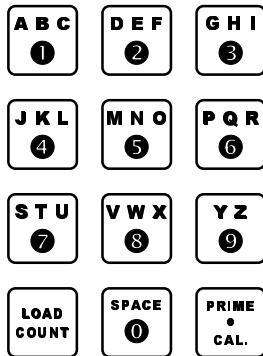
The ENTER key acknowledges input data and logs it into memory. It also takes you into a menu for programming.



The YES and NO keys allow you to pick whether you want to do something or not. Additionally, the YES key doubles as a BLEACH DEFEAT key, defeating the bleach pump by keeping it from operating when the “next” bleach signal is received. The NO key doubles as a ALARM MUTE key, which will temporarily shut alarms off (due to flush errors, low levels, etc.).



The SCROLL keys allow you to move through a particular menu screen, and pick one of several items to change (like characters on a screen, etc).



The alphanumeric keys allow you to input numbers and letters. By repeatedly pressing any key, any of the letter characters (as well as the numeric character) can be entered into the menu selection you are working on. The PRIME/CAL key (lower right corner) can be used to switch units of measure between ounces and gallons when in U.S. units, or between milliliters and liters when in metric units, when auto-calibrating or manually setting flow rate (only). Its also used for priming/calibrating functions. The LOAD COUNT key (lower left corner) shows how many times the load count pump was signaled.



The RESET key performs a number of functions. From any main menu selection, pressing the RESET key LOCKS YOU OUT and returns the screen to the main display. From any screen *within* a main menu that allows you to adjust something (i.e. setting a flow rate), pressing the RESET key takes you back to *that* main menu selection. **Subsequently, RESET can be used to halt pump operation; as desired or in an emergency situation.**

USER DISPLAY DESCRIPTIONS

**KNIGHT-TRAK II
DATA MANAGEMENT SYSTEM**

When the LFP is powered up, the display will initially show the image at the left. After a few seconds, the display will change to one of the example formats shown below.

**FORMULA 01
DATE 02/05 TIME 10:54:20**

The “main display” screen shows the current formula selected (by name). The date and time are also shown unless load weight display has been selected...

**FORMULA 01
ENTER LOAD WEIGHT 000 LB**

..if load weight display has been selected, the programmed load weight for the current formula will be shown. Operators can override the displayed weight and input the *actual* weight using the number keys, then pressing ENTER (before the formula begins).

Once the formula begins, the load weight is “locked in” and will be used for data-tracking purposes. See menu #3 for more details on programming load weights and choosing the load weight display.

**FORMULA 01
\ PUMP-01 L1 000.0 OZS**

When there is pump activity, the display will show a count-down of the pump run time, or the pump volume. The letter “L” (with number following) represents the formula “level” being injected.

When the pump is finished, the display will return to its previous appearance. See menu #3 for details on choosing time or volume display for pump activity.

**OUT OF OPERATING ZONE
DATE 02/05 TIME 10:54:20**

This display indicates that the system is unavailable for dispensing chemical. See menu #3 for more details, and setting the operating zone.

GETTING STARTED

Knight Track II programming is done through the use of menu selections. Any menu can be entered by pressing the ENTER button, or exited by pressing RESET (or in some cases MENU ↓ or ↑). Its that simple! Each of the main menu headings give an idea of what information can be found, entered, or changed. Within each main menu selection are several screen “prompts” that walk you through the complete programming process step-by-step.

Below is an example of the main display when you are not in the programming menus. The main display is more commonly referred to as the *default display*, and appears when the system is in normal operating mode.

FORMULA 01 DATE 05/11 TIME 14:32:54	<p>The default display shows the present formula name on the top line. The bottom line of the display will alternate between date/time and the message ENTER USER PASSWORD.</p> <p>The “user password” should not be confused with systems access codes. User passwords allow multiple persons to operate the system for dispensing chemicals, whereas the access codes allow entry into the menus for programming, or report printing.</p> <p>From the default display, you must enter the main access code (following) to begin programming.</p>
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ACCESS CODES

The Knight Track II system has two access codes for protection:

- The "main" access code, allows entry into ALL of the menus and functions of the system.
- The "user" access code allows entry into the printing functions menu ONLY, without the ability of changing programmed information.

Systems are shipped from the factory with both access codes set to zero. Only a person with the "main" access code can change the "user" access code. (changing codes is explained later in this manual). If desired the two access codes can be the same, however the user will then have access to ALL of the functions of the system, including the ability of changing programmed information.

TO PROGRAM DISPENSER PRESS “ENTER” ...

ENTER ACCESS CODE THEN PRESS ENTER	<p>From the default display shown above, press the ENTER button. The screen at left should appear. If the screen at left does not appear, wait 2 seconds, press RESET, then press ENTER.</p> <p>When you see the screen at left, type in the access code and press ENTER. Remember, for a new system, the access code will be zero (until you change it later).</p> <p>Follow the programming steps for each section, starting on the next page.</p>
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IMPORTANT NOTES:

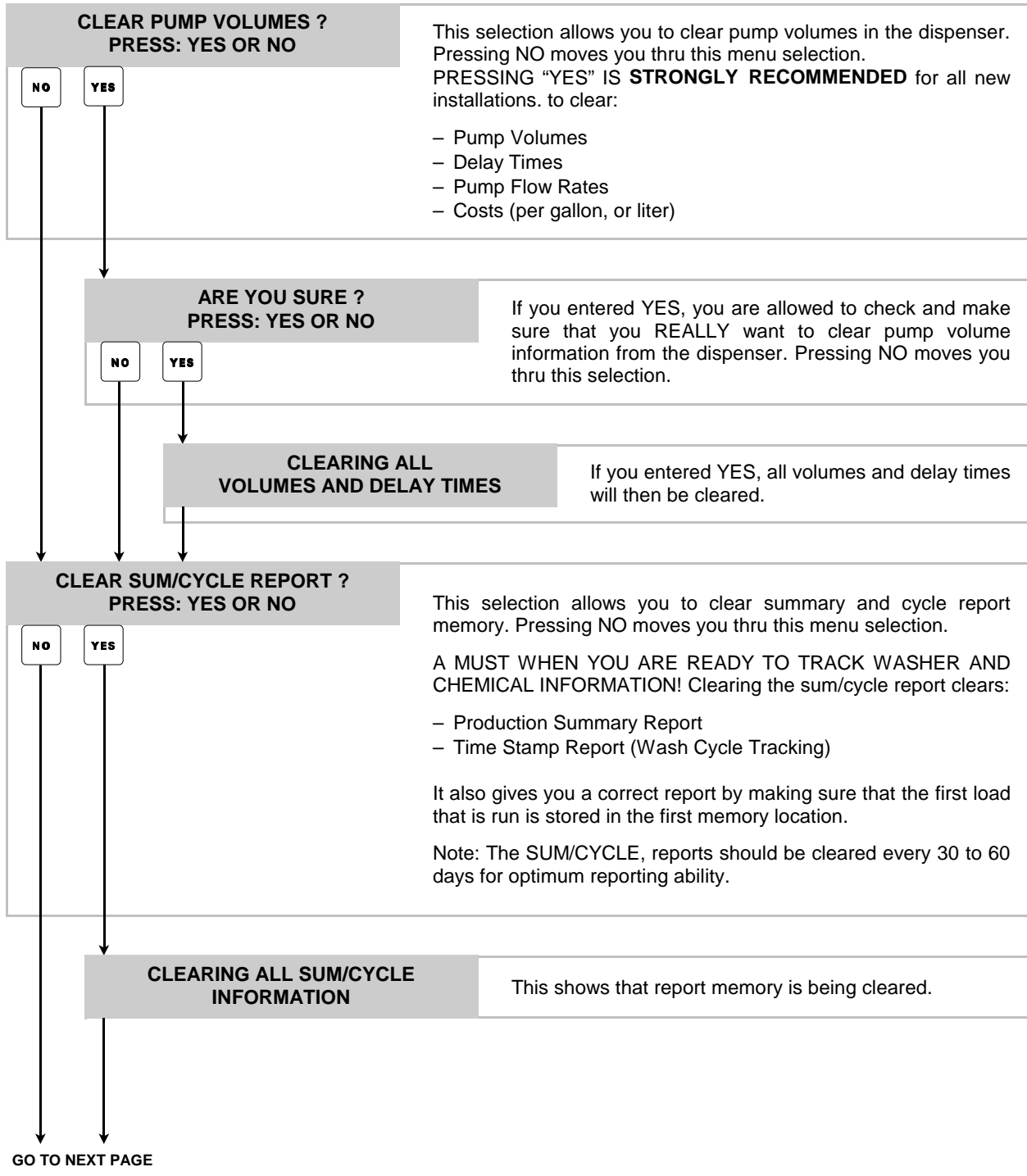
- Leading zeroes on main access code, user access code, and user passwords, are not required to be entered. For example, a user password of “010” can be typed in as “10”, then press ENTER.
- Its **strongly recommended** to clear pump volumes, sum/cycle report, and batch count, then loading factory defaults prior to initial programming of formulas. See MEMORY FUNCTIONS [menu 1] for details.
- Its recommended to print the setup report and access report each time they’re changed. See PRINTING FUNCTIONS [menu 6] for details.
- If at any time you get lost in the programming and are not sure what to do, press the RESET button until the section menu heading appears, then proceed.

1

*** DISPENSER MEMORY FUNCTIONS ***

- Clear pump volumes and delay times
- Clear sum/cycle report memory
- Clear load counter
- Clear setup information
- Load setup file

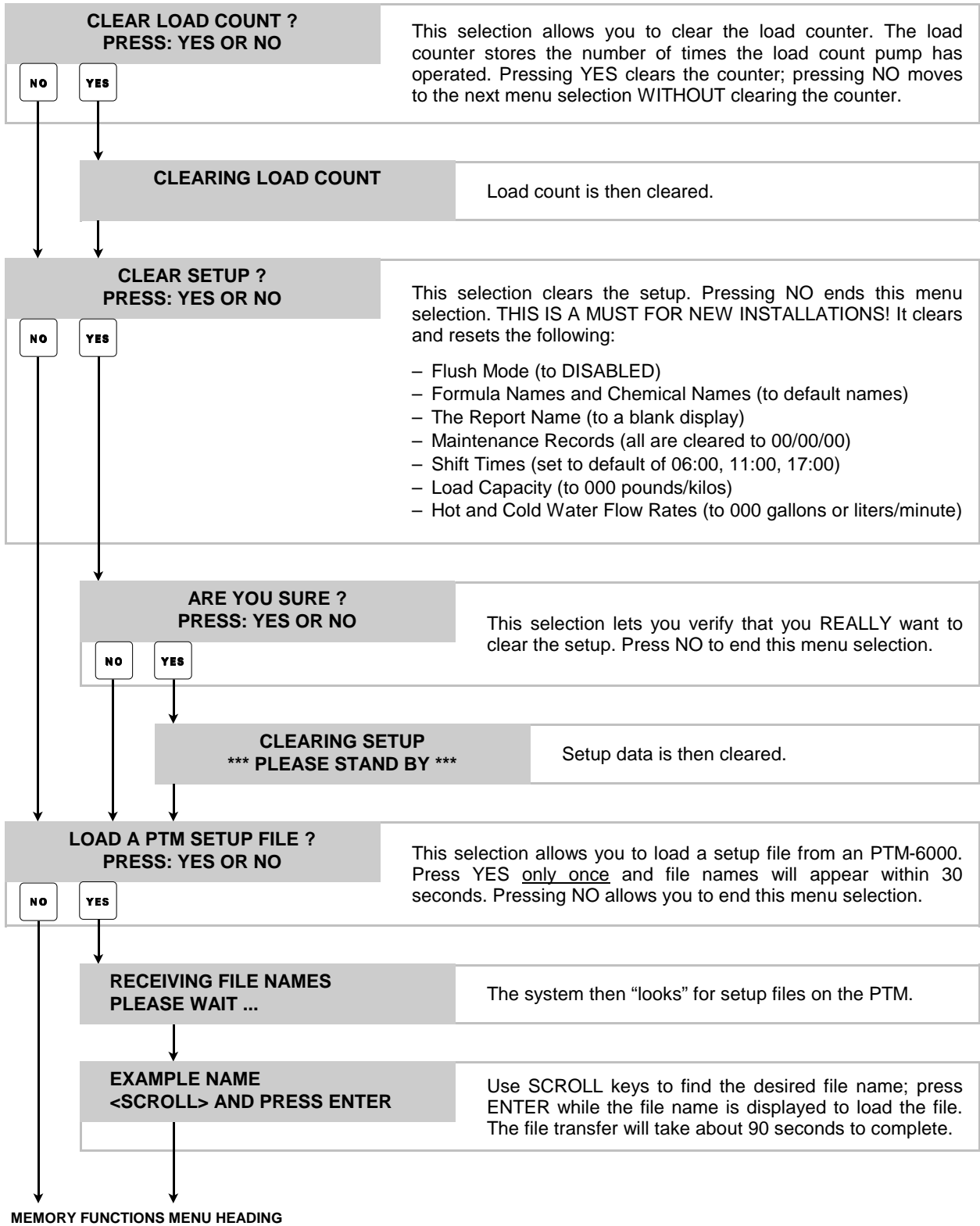
IMPORTANT: Dispenser memory must be cleared when programming a new dispenser. Press ENTER to enter the menu or MENU ↓ to skip to the next main menu.



1

*** DISPENSER ***
MEMORY FUNCTIONS

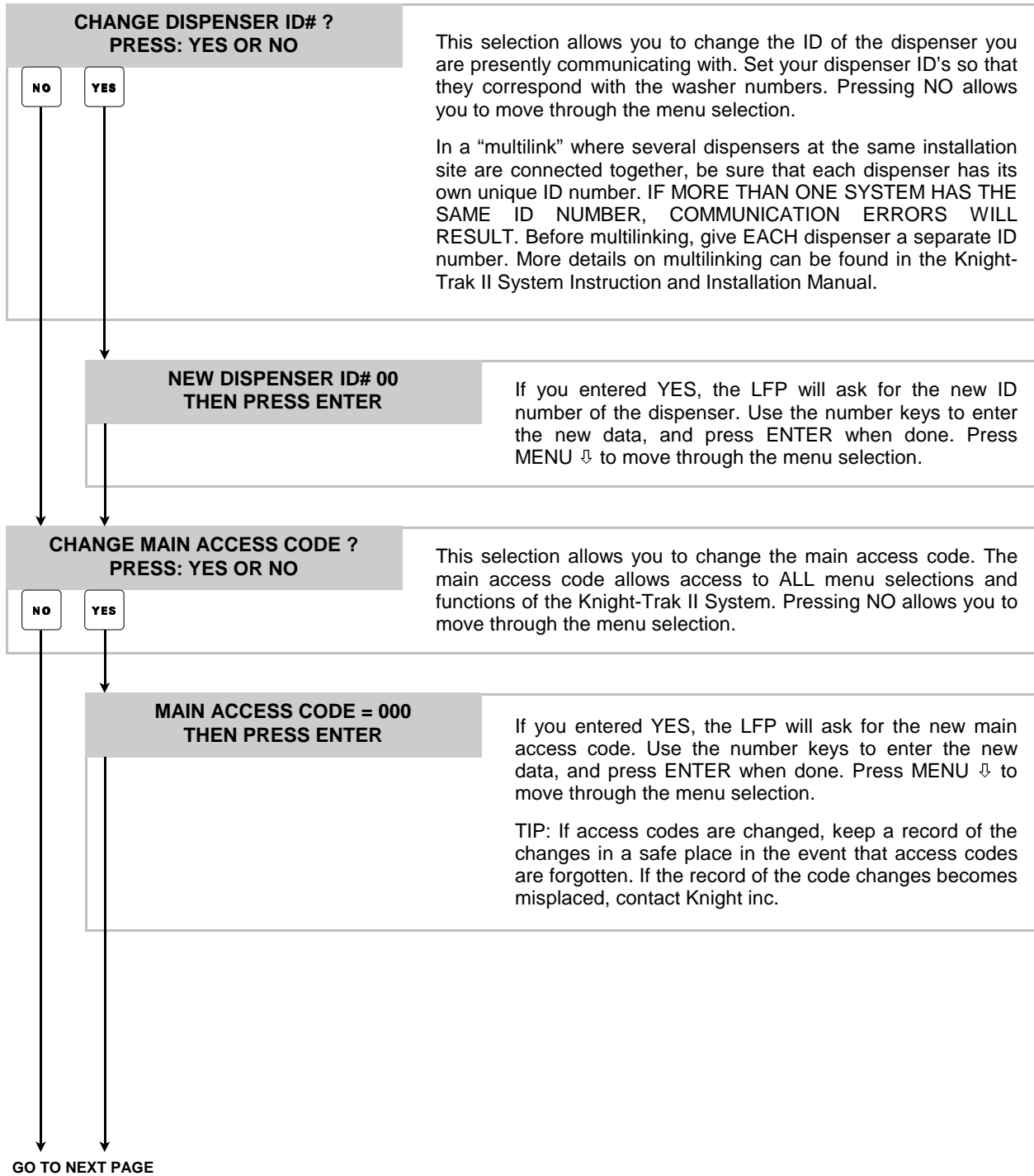
• Continued

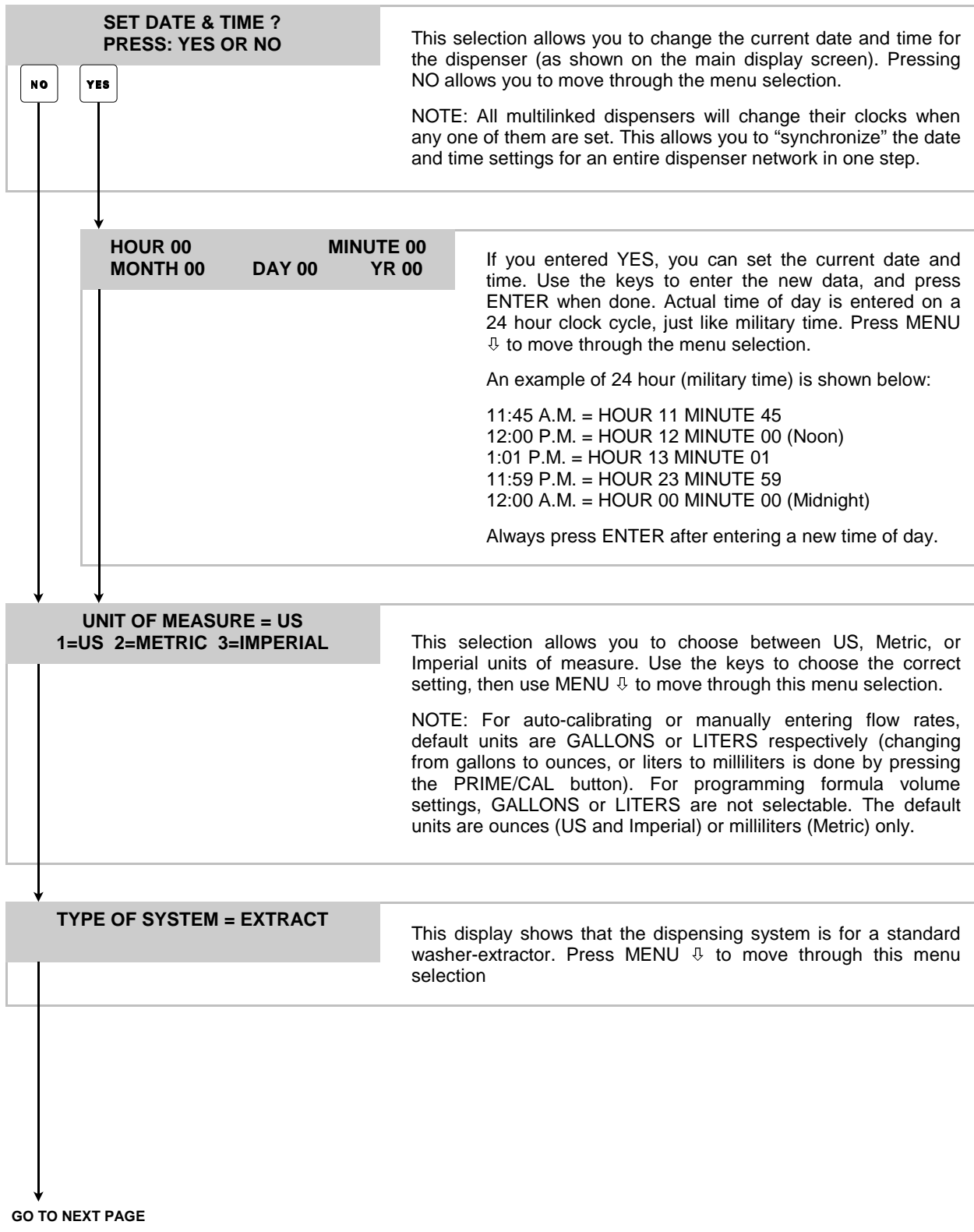


2

*** DISPENSER SETUP ROUTINES ***

- Change ID and main access code
- Set date and time
- Select unit of measure
- Setup auto formula select and auto formula reset
- Select load count pump and door signal
- Set bleach defeat
- Set delay time units/set signal lockout
- Setup flush mode





AUTO FORMULA SELECT OFF
1 = OFF 2 = ON

1 2

This selection enables the Automatic Formula Select feature. This feature allows the washwheel controller to send signals to the Knight-Trak II dispenser and automatically select the correct wash formula. Washroom personnel no longer select formulas, thereby eliminating potential mistakes. Press 1 or 2 for the operation of your choice, then press MENU ↓.

AUTO FORMULA MODE = MICRO
1 = CHART 2 = MICROPROCESSOR

1 2

Press 1 if the machine is controlled by a chart or card reader, or 2 if the machine is controlled by a microprocessor. After the display shows your selection (CHART or MICRO), press MENU ↓.

AFS TIME = 1 SEC
1=1SEC 2=2SEC 5=5 SEC

1 2 5

This selection allows you to select the AFS qualifying time for MICRO mode. For a 1 second qualifying time, a 1 second signal equals formula 1, 2 seconds equals formula 2, 3 seconds equals formula 3, etc. For a 2 second qualifying time, a 2 second signal equals formula 1, 4 seconds equals formula 2, 6 seconds equals formula 3, etc. For a 5 second qualifying time, a 5 second signal equals formula 1, 10 seconds equals formula 2, 15 seconds equals formula 3, etc.

Press 1, 2, or 5, for the qualifying time of your choice, then press MENU ↓.

SELECT AUTO FORMULA
INPUT # 00 PRESS ENTER

This selection allows you to select an available signal input that will be used to enable the Automatic Formula Select feature. Enter the input signal number and press ENTER. Press MENU ↓ to move through the menu selection.

Auto formula inputs 1-15 correspond as follows:

- Inputs 1 thru 10 are the pump signal inputs on the SIB
- Input 11 is the door interlock signal on the LMIB
- Input 12 is the steam signal on the LMIB
- Input 13 is the drain signal on the LMIB
- Input 14 is the cold water signal on the LMIB
- Input 15 is to the hot water signal on the LMIB

GO TO NEXT PAGE

AUTO FORMULA SELECT — HOW IT WORKS

CHART MODE: This is used for automatically selecting formulas for washers with cards or charts to control the wash formula.

The Automatic Formula Select signal can be connected to the SIB inputs 6 thru 10, or any of the LMIB inputs. SIB signals 1 - 5 are used for adding up the correct formula number. Inadvertently choosing the auto formula select input as 1 through 5 of the SIB will result in the LFP "defaulting" to input 6.

To operate Chart Mode Automatic Formula Select, choose an available signal track on the chart or card that will be dedicated to selecting formulas. Connect the signal from that track to the Automatic Formula select input you designated using the LFP. The FIRST cut in the chart or card must be on the Automatic Formula Select Signal track. Five seconds after the signal is received, the display on the LFP will show "AUTO FORMULA SELECT". Thirty seconds after this cut begins, the dispenser will "look" at signal inputs 1 through 5 and evaluate the formula number selected (see diagram below). The LFP display will acknowledge the correct formula. Once the formula select signal is finished, pump input signals return to normal operation. All pump signals must turn off for a minimum of five seconds, then retriggered for a pump to operate.

EXAMPLE: THE CHART CUTS BELOW WOULD AUTOMATICALLY SELECT FORMULA #9 AFTER 30 SECONDS.

←← CHART/CARD DIRECTION ←←

■	SIB PUMP #1 SIGNAL INPUT > ADD 1
	SIB PUMP #2 SIGNAL INPUT > ADD 2
	SIB PUMP #3 SIGNAL INPUT > ADD 4
■	SIB PUMP #4 SIGNAL INPUT > ADD 8
	SIB PUMP #5 SIGNAL INPUT > ADD 16
■■■■	AUTO FORMULA SELECT SIGNAL

MICRO MODE: This is used for Automatically Selecting Formulas with washwheels that have microprocessor controllers.

To operate Micro Mode Automatic Formula Select, choose an available signal output from the microprocessor that will be dedicated to selecting formulas. Connect the signal from that output to the Automatic Formula Select input you designated using the LFP. Any unused SIB or LMIB input can be designated for Micro Mode Automatic Formula selection. For a micro processor controlled machine, to change formulas, the FIRST signal to come from the controller must be on the Automatic Formula Select input line. The length of time this signal is applied will determine the selected formula.

↓
GO TO NEXT PAGE

**CHOOSE LOAD COUNT
PUMP # 00 PRESS ENTER**

This selection shows which pump is being used to count loads. ALWAYS enter the last pump in the system that will receive a signal. When a cycle is run, the last pump “stamps” the timing data into memory (for reports and other information). Enter the number of the load count pump (only pumps 1 – 9 can be selected) and press ENTER. Press MENU ↵ to continue.

The load count pump must be signaled on every formula for proper wash cycle tracking info and load counts. When the load count pump is signaled, all volume levels for that formula are reset to level 1.

If an LMIB is used (or DOOR SIGNAL INPUT on the SIB is setup), finished load times are recorded the FIRST time the Door Signal is discontinued after the Load Count pump has been signaled.

**AUTO FORMULA RESET DISABLED
1=ENABLED 2=DISABLED**

1

2

If enabled, this feature resets the formula number to 00 after the load count pump activates. In cases where automatic formula select is OFF (formulas selected manually), this feature ensures that an operator cannot wash a load with the wrong formula. When a washcycle is finished, the next formula must be manually chosen. Enable or disable auto formula reset and press MENU ↵ to continue.

**DELAY TIME UNITS = SEC
1 = MINUTES 2 = SECONDS**

1

2

This selection allows you to choose the delay unit of measure. Some signals only need to be delayed for a few seconds (i.e. to avoid dumping chemical onto dry linen), others may need longer delay times. Select the unit of measure and press MENU ↵ to continue.

**CHOOSE BLEACH DEFEAT
PUMP # 00 PRESS ENTER**

This selection shows which pump will be defeated if the YES key (acting as BLEACH DEFEAT switch) is pressed. Enter the number of the bleach defeat pump (only pumps 0 – 9 can be selected) and press ENTER. Press MENU ↵ to continue.

**CHOOSE DOOR SIGNAL
INPUT # 00 PRESS ENTER**

This selection allows you to define a signal on the SIB that is connected to a door signal. The door signal can be used in conjunction with the load count pump to indicate the end of a wash load (see load count section above). Make the selection and press ENTER when done. Press MENU ↵ to move through the menu selections.

GO TO NEXT PAGE

5 MIN SIGNAL LOCKOUT OFF
1= OFF 2= ON

1 2

This feature helps prevent unwanted injections that are caused by “erroneous” signals from the washer (example: when the water level goes low and a fill valve activates). Make your selection, then press MENU ↓ to continue.

FLUSH MODE ENABLE
1=ENABLED 2=DISABLED

2 1

This selection turns the flush mode on or off. Flush mode operation is used in conjunction with a flush manifold system, which injects diluted chemical into a machine with water. Select flush mode to be enabled or disabled, then press MENU ↓

FLUSHING – AFTER
1=AFTER PUMP 2=WITH PUMP

1 2

If you enabled flush mode, you can choose whether the flush happens during or after pump operation. Select when the flush occurs, and press MENU ↓ to continue.

CHOOSE FLUSH OUTPUT
OUTPUT # 10 PRESS ENTER

Pump 10 is reserved for flush output (where the manifold connects) however any pump output may be selected as the flush output. Select a different pump output if desired, then press ENTER. Press MENU ↓ to continue.

FLUSH ERROR SAMPLING
DELAY = 00 SECONDS

This is for flush applications where a flow switch is used to verify actual water flow. This setting tells the system at what point during the flush cycle to check the flow switch state (open or closed). If set to 00, this feature is turned “off”, and the flow switch input will not be checked (no FLUSH ERROR warnings will be produced). For flush systems with a flow switch, it is recommended that this setting be no less than 03 seconds. Make your selection and press ENTER. Press MENU ↓ to continue.

NOTE: When running the flush with pump, the flush solenoid will start before the pump. After the flush error sampling time, if water flow is good, the pump will start. If water flow is bad, a flush error will occur and the system will stop. In this case, no chemical residue will be left in the flush port. During this “pre-flush” time, the display may show a pump delay time — this is normal.

FLUSH TIME 000 SECONDS

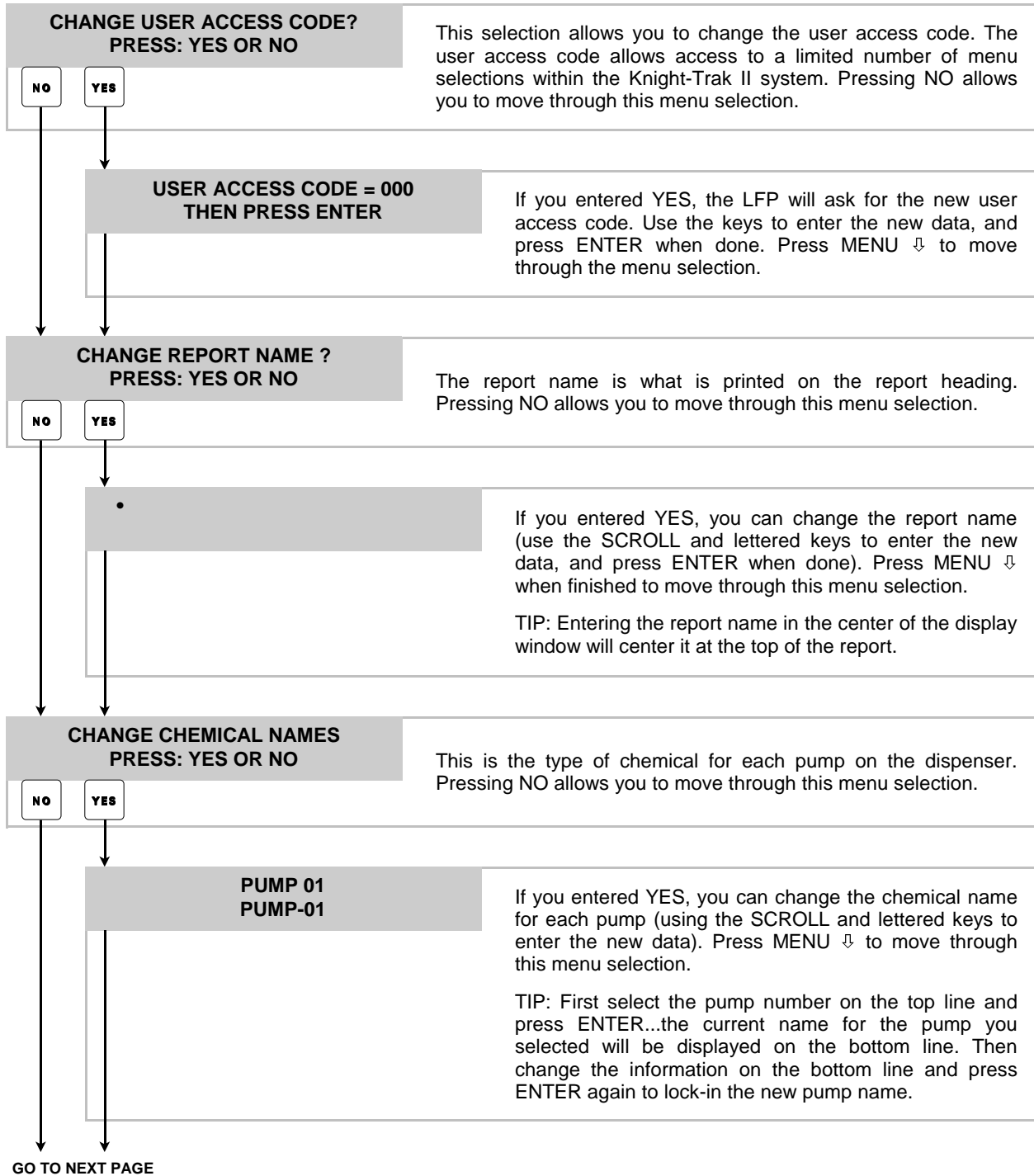
This sets the time the flush solenoid will operate after the pumps have finished. Type in the flush time, then press ENTER. Press MENU ↓ to move on to the next menu.

SETUP ROUTINES MENU HEADING

3

*** DISPENSER *** REPORT SETUP ROUTINES

- Change user access code
- Setup report name and display features
- Change chemical names and costs
- Change formula names and weights
- Set shift times and operating zone
- Set washer capacity and water flow rates
- Setup cycle time information
- Set signal qualifying time



**CHANGE PRODUCT COSTS ?
PRESS: YES OR NO**

NO

YES

This menu selection allows you to change costs for each product. Pressing NO allows you to move through this menu selection.

PUMP 01 \$00.00 /GALS

If you entered YES, you can change the cost for each chemical (using the SCROLL and lettered keys to enter the new data). Press MENU ↓ to move through this menu selection.

TIP: First select the pump number on the left side of the display and press ENTER...the product cost for the pump you selected will be displayed on the right side. Then change the information on the right side and press ENTER again to lock-in the new product cost.

**CHANGE FORMULA NAME AND
WEIGHT? PRESS: YES OR NO**

NO

YES

This menu selection allows you to change the formula names and load weight for each formula. Giving each formula a descriptive name makes the system more user-friendly. Load weights are used for data-tracking purposes to generate reports. Pressing NO allows you to move through this menu selection.

FORMULA 01
FORMULA 01

If you entered YES, you will first change the formula names. When finished changing all formula names, press MENU ↓ to move on to the next display for changing load weights.

TIP: First select the formula number on the top line and press ENTER...the current formula name will be displayed on the bottom line. Then change the information on the bottom line and press ENTER again to lock-in the new formula name.

FORMULA 01
LOAD WEIGHT 000 LBS

Now enter the load weight for each formula used. When finished changing load weights, press MENU ↓ to move on to the next menu selection.

TIP: First select the formula number on the top line and press ENTER...the current load weight will be displayed on the bottom line. Then change the information on the bottom line and press ENTER again to lock-in the new load weight.

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**WANT TO SET SHIFT TIMES ?
PRESS: YES OR NO**

NO **YES**

This selection allows you to enter the shift times (the start time for each work shift in the washroom) for the report. Pressing NO allows you to move through this menu selection.

START TIMES #1 06:00
 #2 11:00 #3 17:00

If you entered YES, you can change the start time for each washroom work shift. Use SCROLL and the numbered keys to enter the new data, then press ENTER. Shift times are entered on a 24 hour clock cycle (like military time). Press MENU ↓ to continue.

**SET OPERATING ZONE ?
PRESS: YES OR NO**

NO **YES**

This selection allows you to select whether or not you wish to establish "on" and "off" times of operation for the dispenser. The default start and end times (shown below) allow the system to dispense chemical at any time, day or night.

When the system is out of the operating zone the main display screen will show "OUT OF OPERATING ZONE". Any trigger signals that are received outside of the operating zone will be ignored, and chemicals will not be dispensed . Pressing NO allows you to move through this menu selection.

START TIME 00:00
END TIME 24:00

If you selected YES, you will be prompted to establish the "on" and "off" times of operation for the dispenser. Use the keys to enter the new data, then press ENTER. Actual time of day is entered on a 24-hour clock cycle, like military time. Press MENU ↓ to continue.

WASHWHEEL LOAD CAPACITY
000 LBS

This selection allows you to enter the load capacity for the wash wheel that the dispenser is presently connected to. Use the keys to enter the new data, and press ENTER when done. Press MENU ↓ to continue.

COLD WATER 000 GALS/MIN
HOT WATER 000 GALS/MIN

This selection allows you to enter flow rates for the cold and hot water valves in the wash wheel that the dispenser is presently connected to. Use the keys to enter the new data, and press ENTER when done. Press MENU ↓ to continue.

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ESTIMATED CYCLE TIME
FORMULA 01 TIME 00 MIN

This selection enables you to estimate the cycle time for a specific formula. Use the keys to enter the desired formula, SCROLL (RIGHT) and input the estimated cycle time up to 99 minutes. Press ENTER when done, then MENU ↓ to move through this menu selection.

CYCLE TIME TOLERANCE
PLUS OR MINUS 00 MINUTES

This selection allows you to set error tolerance between the estimated cycle time and actual cycle time. Enter a time error tolerance between 0 and 99, then press ENTER. Press MENU ↓ to continue.

MAXIMUM CYCLE TIME
000 MINUTES

This selection allows you to program the maximum allowable cycle time for ANY programmed formula. When figuring maximum cycle time, you MUST allow for estimated cycle time and cycle time tolerance (maximum programmable cycle time is 255 minutes). Enter the desired cycle time, and press ENTER. Press MENU ↓ to continue.

CYCLE TIME ERRORS

Cycle times are printed on the Cycle Report under the heading "CT". Maximum cycle times of up to 682 minutes (11.37 hours) will be printed normally. Cycle times longer than this will result in the symbols *T? appearing on the cycle report.

If a wash load does not end before the Maximum Cycle Time, the message "LOAD NOT WITHIN CYCLE TIME PARAMETERS" will be printed on the Cycle Report. Cycle times and pump volumes will appear on the Cycle Report but will not be used in Summary Report calculations.

If a washload is shorter than the programmed Cycle Time minus the tolerance, the message "LOAD NOT WITHIN CYCLE PARAMETERS" will be printed on the Cycle Report. Cycle times and pump volumes will also appear but will not be used in Summary Report calculations.

If a washload is longer than the programmed Cycle Time plus the tolerance (but shorter than Maximum Cycle Time), the message "CYCLE TIME NOT WITHIN RANGE" will be printed on the Cycle Report. Cycle times and pump volumes will also appear and will be used in Summary Report calculations.

GO TO NEXT PAGE

3***** DISPENSER ***
REPORT SETUP ROUTINES**

• Continued

**DISPLAY COUNTDOWN – SEC
1=SECONDS 2=VOLUMES****1** **2**

This selection allows you to select whether amounts of chemical are displayed in seconds of pump run time, or calculated amounts of volume. As chemicals are called for by the washer, the amount of time or volume for each pump will be displayed and will “count down” as the pump operates. Make your selection, then press MENU ↓ to continue.

**SIGNAL QUALIFYING TIME
005 SECONDS (1-120)**

This selection allows you to determine the appropriate length of a valid supply signal from the washer. Enter a time in seconds (1 - 120) and press ENTER. Supply signals must be of a duration that matches the minimum setting to activate any pump in the system, or start a pump delay. Press MENU ↓ to continue.

NOTE: The factory default setting is 5 seconds.

**SIB FORMULA SEL DISABLE
1=ENABLED 2=DISABLED****1** **2**

To activate the formula select feature using an RSB-1000 Remote Switch Box, select 1=ENABLED. The RSB-1000 toggle switch will then control the formula select function, not the LFP-6000. Formulas are then limited to formula 1 and formula 2. Select 2=DISABLED for LFP-6000 formula select control. Press MENU ↓ to continue.

**LOAD WEIGHT DISPLAY ON
1 = OFF 2 = ON****1** **2**

If you select ON, the load weight display will replace the time and date on the LFP main display screen (during normal operation). Choosing this option will allow operators to manually input the actual load weight on the LFP keypad to over-ride the programmed load weight for the formula that is selected. Press MENU ↓ to move on to the next menu.

REPORT SETUP ROUTINES MENU HEADING

4***** DISPENSER ***
MAINTENANCE SCHEDULE**

- Date dispenser installed
- Date tubes last changed
- Date tubes last lubed

**DISPENSER INSTALLED
00/00/00**

This selection allows you to enter the date that the dispenser was installed. (Use the SCROLL and number keys to enter the new data, and press ENTER when done). Press MENU ↓ to move thru this menu selection.

**SQUEEZE TUBES CHANGED
PUMP 01 00/00/00**

This selection allows you to enter the date that the squeeze tubes were last changed. (Use the SCROLL and number keys to enter the new data, and press ENTER when done). Press MENU ↓ to move thru this menu selection.

**SQUEEZE TUBES LAST LUBED
PUMP 01 00/00/00**

This selection allows you to enter the date that the squeeze tubes were last lubricated. (Use the SCROLL and number keys to enter the new data, and press ENTER when done). Press MENU ↓ to move on to the next menu.

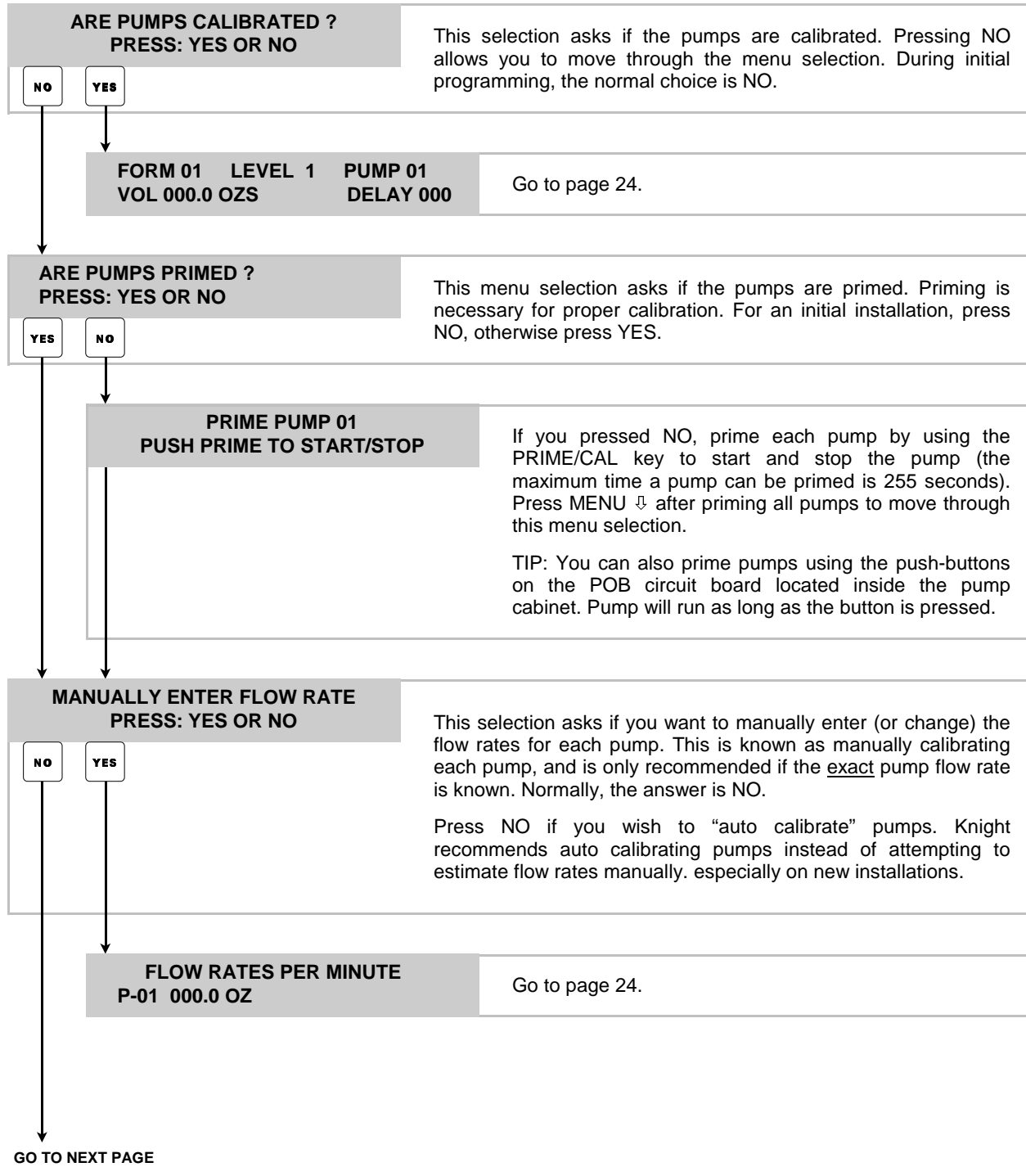
↓
MAINTENANCE SCHEDULE MENU HEADING

5

*** DISPENSER *** PROGRAMMING ROUTINES

- Calibrate pumps
- Prime pumps
- Set pump flow rates
- Program pumps
- Set delay times

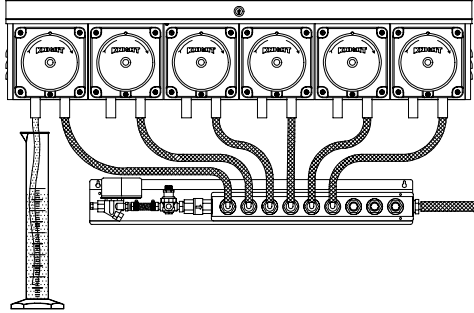
IMPORTANT: Pump 10 cannot be used as a normal pump output. It is reserved for use as the “default” flush output, however any pump output can be used for flush.



5

*** DISPENSER *** PROGRAMMING ROUTINES

• Continued



NOTE: To properly calibrate a peristaltic pump that injects into a flush manifold (through a checkvalve and into dynamic water pressure) measure at the suction side of the pump *instead* of the output side. By drawing chemical out of your measuring container and noting the liquid level before and after the pump runs, you can easily determine the amount of chemical dispensed.

This method increases accuracy. Its also quicker and easier, as you don't need to disconnect the squeeze tube from the manifold to get a calibration.

The diagram to the left is an example of using the suction side of the pump to draw chemical out of a graduated cylinder.

CALIBRATE PUMP 01 PRESS CAL. TO START/STOP

This selection allows you to automatically calibrate each pump. Auto calibrate "teaches" the system the actual flow rate of the pump. Accurate flow rates are important for delivering the correct amount of product that's called for in the formula volume settings.

Follow the steps below to auto calibrate the pumps. Use the **LARGEST** container possible (larger containers result in more accurate pump calibrations).

WITH FLUSH MANIFOLD: Fill your container with product and place under the suction tube of the pump you wish to calibrate (as shown in the example above to the left). Be sure the tube is primed, then note the amount of chemical in the container.

WITHOUT FLUSH MANIFOLD: Place your empty container under the discharge tube of the pump you wish to calibrate.

Next, select the pump number and press the PRIME/CAL button to start the pump. Let the pump run for about 60 seconds, then press the PRIME/CAL button again to stop the pump. You will then see the following display...

ENTER CALIBRATION VOL PUMPED = 000.0 OZS

Check to see how much chemical was actually pumped and enter this amount as the VOL PUMPED (in OZ or ML only depending on the unit of measure selected in setup menu #2) then press ENTER. You will then see the following display...

GO TO NEXT PAGE

5***** DISPENSER ***
PROGRAMMING ROUTINES**

• Continued

**FLOW RATES PER MINUTE
P-01 000.0 OZ**

(*auto calibration continued*) The resulting flow rate from the previous step will be displayed. If you wish to re-calibrate the pump, or to calibrate other pumps, press MENU ↑ and repeat the auto calibration steps. Otherwise, press MENU ↓ to move on to the next menu selection.

NOTE: If you had entered YES to the “*manually enter flow rate*” prompt, use the SCROLL and numbered keys to enter the new data. Make sure the correct unit of measure is displayed; if it is not, use the PRIME/CAL key to change the unit of measure (OZS/GAL or MILS/LTRS). Press ENTER to lock-in the new flow rate. Press MENU ↓ to continue.

**FORM 01 LEVEL 1 PUMP 01
VOL 000.0 OZS DELAY 000**

This menu selection allows you to enter pump volumes and delay times for the formulas you will use. When finished programming, press MENU ↓ to move on to the next menu.

TIP: This selection can be used to *simply review* programmed formula settings. By entering the formula number, volume level, and pump number, and then pressing ENTER, the programmed volume and delay time will be displayed.

TIP: To *change* the programmed information, first select the formula number, volume level, and pump number on the top line and press ENTER (as mentioned above)...the current settings will be displayed on the bottom line. Then change the information on the bottom line and press ENTER again to lock-in the new data.

↓
GO TO NEXT PAGE

PROGRAMMING NOTES

For US and Imperial units of measure, formula volume settings are programmed in ounces only (the maximum permissible amount that can be programmed is 999.9 ounces). For Metric units of measure, formula volume settings are programmed in milliliters only (the maximum permissible amount that can be programmed is 9999 milliliters).

The maximum time any pump can run is 255 seconds. If a formula volume is programmed that will cause a pump to run for longer than 255 seconds (base on that pump's flow rate) the pump will not activate when signaled.

Delay times are provided for those signal sources that do not occur at optimum times for chemical dispensing. Maximum delay times are 120 seconds or 120 minutes. Selection of seconds or minutes is done in the Dispenser Setup Routines menu.

Pumped volumes of up to 4095.9 ounces, or 40959 milliliters will be printed on the cycle report. Pumped volumes over this amount will result in the symbols *VOL? appearing on the cycle report.

MULTI-LEVEL OPERATION — HOW IT WORKS

Entering multiple volume levels allows a pump to pump different amounts of chemical upon subsequent signals. For example, on a particular formula, pump 1 could pump 8 ounces of chemical the first time it is signaled, and pump 1 could pump 12 ounces of chemical the second time it is signaled. Up to three (3) volume levels are available per pump.

These volume levels are for any given pump on any formula, except the LOAD COUNT pump. ONLY 1 LEVEL CAN BE PROGRAMMED on the LOAD COUNT PUMP (or any other pumps that are signaled simultaneously with the load count pump). Multiple volume levels can be used on more than one formula.

After the RESET button has been pushed or the "Load Count" pump has been triggered, the next signal to a pump will dispense Level 1 amounts. The next washer signal to the same pump will be Level 2 if there is a run or delay time programmed. If no time is programmed, it will skip Level 2 and go to Level 3. If there is no time programmed on Level 3, it will disregard Level 3 and dispense Level 1 amounts again.

By using run or delay times on the different levels, you can have a plurality of chemical formulas using multiple signals from the same card or microprocessor. The maximum levels available is (3) three, except for the load count pump which has only (1) one level. To NOT skip a Level and NOT dispense product, simply program a "0" volume and a "1" second delay time.

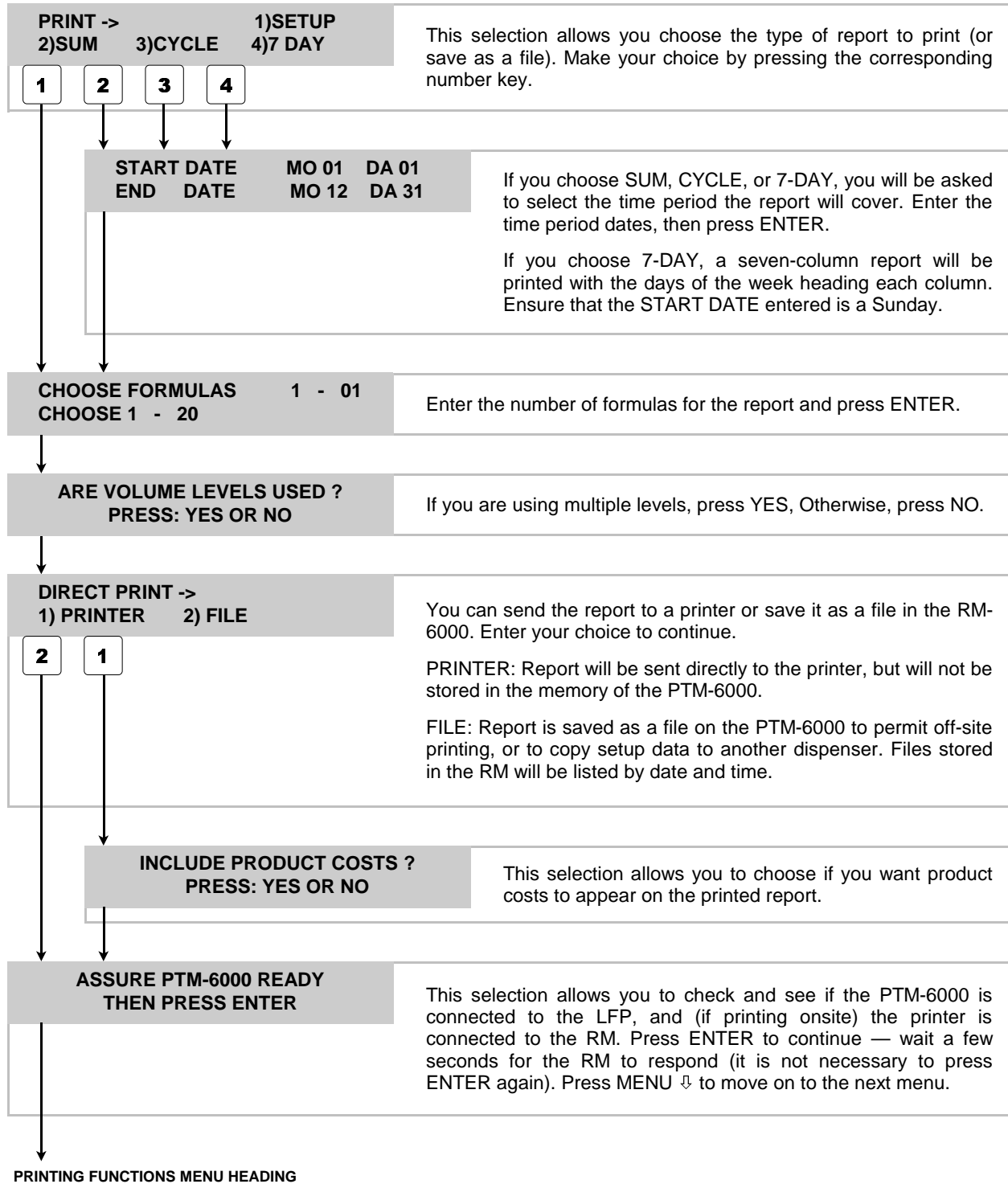
PROGRAMMING ROUTINES MENU HEADING

6

*** DISPENSER *** PRINTING FUNCTIONS

- Print reports on-site
- Save files to RM-6000

IMPORTANT: Before entering this menu, make sure that your RM-6000 module is connected to the LFP. If printing on-site, make sure that your printer is connected to the RM-6000 as well.



7***** DISPENSER ***
PUMP TEST ROUTINES**

- Simulate signals to pumps
- Prime pumps

**TO SIGNAL PUMP # 01
PUSH PRIME TO START PUMP**

This selection allows you to simulate a signal to a pump. Use the numbered keys to select the desired pump, and push the PRIME/CAL key to start the pump. Press MENU ↵ to continue.

NOTES: When the PRIME/CAL key is depressed, the pump will pump the FIRST level volume amount on the formula selected on the LFP.

Pressing the PRIME/CAL key again will run the SECOND level volume amount, and (when finished with the second run time) pressing PRIME/CAL again will run the THIRD volume amount.

If only one volume amount is programmed, the amount will run every time PRIME/CAL is depressed.

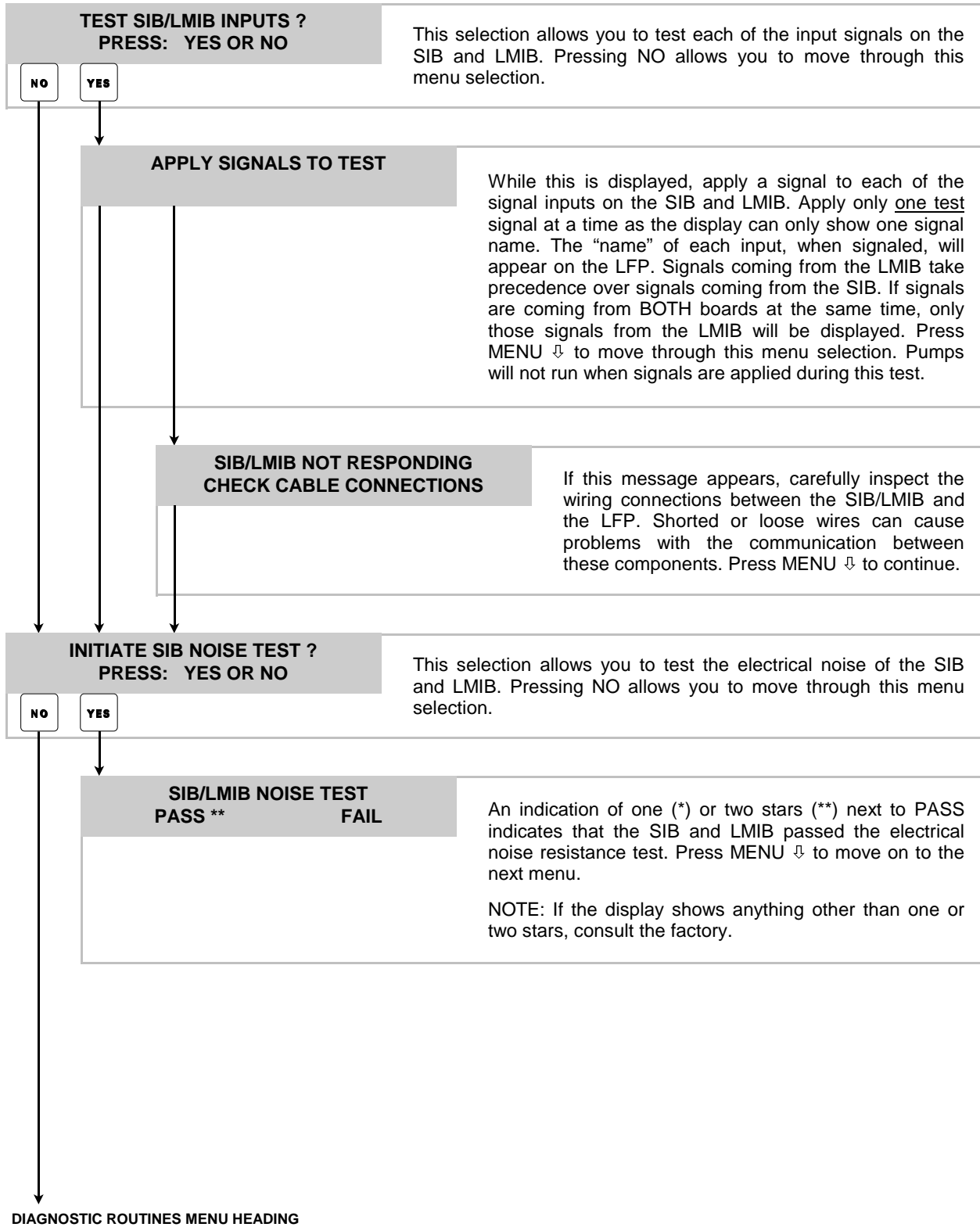
**PRIME PUMP 01
PUSH PRIME TO START/STOP**

This selection allows you to prime a pump. Use the numbered keys to select the desired pump, then push PRIME /CAL to start the pump. Push PRIME/CAL again to stop the pump. Press MENU ↵ to move on to the next menu.

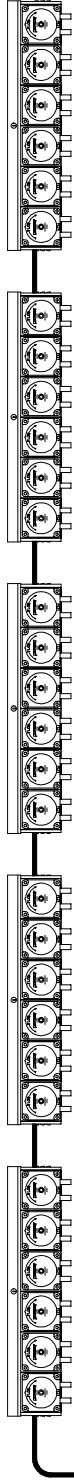
NOTE: The maximum time that a pump can run while priming is 255 seconds. After beginning to prime a pump, if the PRIME/CAL button is not pushed again to stop the pump, it will simply "time-out" after running for 255 seconds.

TEST ROUTINES MENU HEADING

- Test SIB/LMIB signal inputs
- Perform SIB noise test



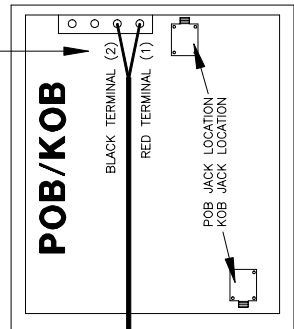
Reporter Network Wiring Diagram



3 CONDUCTOR NETWORK CABLE
KNIGHT P/N 0300058 ONLY

← Data Flow Over Multi-Link

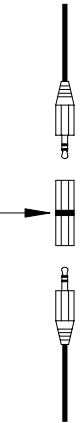
Multi-Link Terminals



CONNECT THE PLUG INTO THE JACK ON THE CIRCUIT BOARD IN ANY ONE OF THE MULTI-LINKED DISPENSERS. NOTE: SOME POB BOARDS DO NOT HAVE A JACK PRESENT. CONTACT KNIGHT EQUIPMENT IF YOU ENCOUNTER THIS.

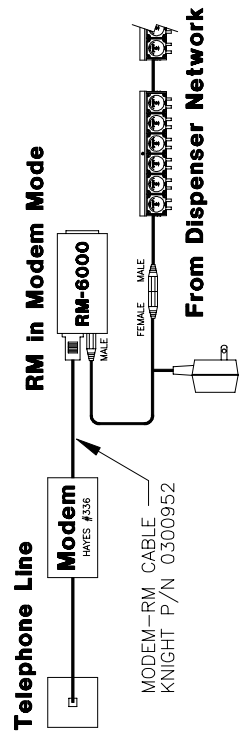
3 CONDUCTOR NETWORK CABLE
MALE JACK x MALE JACK 50'
KNIGHT P/N 0300058-50 ONLY

FEMALE/FEMALE CABLE CONNECTOR
KNIGHT P/N 0300068 ONLY

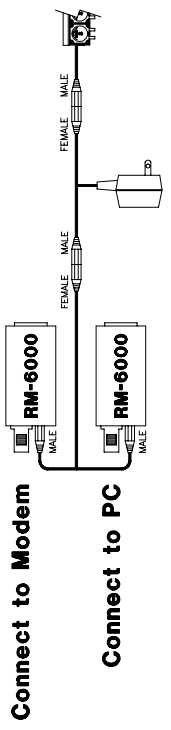


USED FOR JOINING MALE/MALE NETWORK CABLES WHEN RUNNING OVER 50'

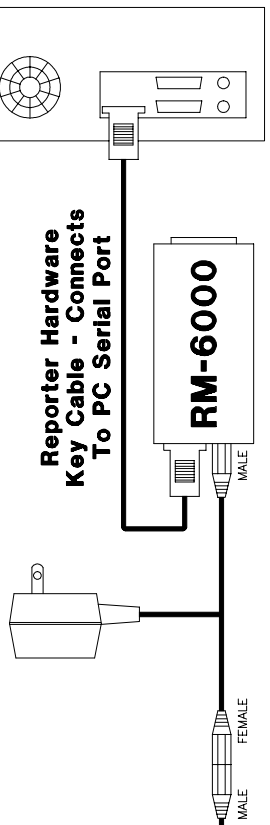
Modem Wiring Diagram



Modem With On-Site PC Diagram



12 VDC Booster Transformer



TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
No voltage at main power terminals	<ul style="list-style-type: none"> • Tripped breakers or blown fuses at power source • Main power wires 	<ul style="list-style-type: none"> • Reset breaker or replace fuses at power source • Inspect wires for damage or loose connection and replace or tighten
Voltage at main power terminals, but power indicator does not glow LFP	<ul style="list-style-type: none"> • Blown fuse(s) on POB board • Incorrect wiring barrier position • Loose wiring barrier 	<ul style="list-style-type: none"> • Replace fuse(s) • Inspect wiring barrier block to be sure its not inadvertently placed on incorrect pin position • Ensure that wiring barrier is seated all the way down on the board
Transformer on POB board gets very hot to the touch	<ul style="list-style-type: none"> • Incorrect voltage select setting 	<ul style="list-style-type: none"> • Select the correct voltage setting. NOTE: While the POB board can be set for 115 VAC or 230 VAC, it is critical that this setting match the pump motors in the dispenser
POB board keeps blowing fuse(s)	<ul style="list-style-type: none"> • Multiple pumps running • Wrong fuse rating • Damaged User Interface 	<ul style="list-style-type: none"> • Try staggering pump injections with delay times • Replace with correct fuse • Replace LFP
LFP has no display, or unusual display	<ul style="list-style-type: none"> • Incorrect voltage select setting • Loose wiring barriers • Incorrect wiring 	<ul style="list-style-type: none"> • Select the correct voltage setting. NOTE: While the POB board can be set for 115 VAC or 230 VAC, it is critical that this setting match the pump motors in the dispenser • Ensure that wiring barriers are seated all the way down on the POB board, and inside the LFP enclosure • Observe wiring connections between LFP and POB and correct as needed
Pumps will not prime from manual switches on POB board	<ul style="list-style-type: none"> • Electrical problem • Mechanical problem • Damaged pump motor • Damaged POB 	<ul style="list-style-type: none"> • Check voltage select jumpers and verify main power voltage. Also see POWER PROBLEMS table. • Check for binding between pump roller block and squeeze tube • Replace pump motor • Replace POB
Pumps will not prime from LFP	<ul style="list-style-type: none"> • Communication problem between User Interface and POB • Damaged User Interface 	<ul style="list-style-type: none"> • Check 5-conductor cable that connects the devices for correct wiring and continuity • Replace LFP

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
SIB signal indicators illuminate but pumps do not run	<ul style="list-style-type: none"> • Signal duration not long enough • Current formula chosen is not programmed • No pump flow rates • Operating range set incorrectly • Signal lockout time active • Electrical or mechanical problem with pumps • SIB not communicating 	<ul style="list-style-type: none"> • Try a shorter setting for signal qualify time if washer signal can't be lengthened • Program the formula, or pick a formula that is programmed • Calibrate pumps, or manually enter flow rates • Set operating range for hours in the day that pumps are needed to run (default is 00:00 to 24:00) • This feature is designed to eliminate unwanted signals. Turn signal lockout off if not needed. • Try priming pumps to verify operation from manual switches on POB board. • See problem column in this table
SIB signal indicators do not illuminate	<ul style="list-style-type: none"> • No signal from washer • Signal voltage too low • SIB not communicating 	<ul style="list-style-type: none"> • Verify signal source at washer and correct as needed • Seek a more reliable signal source that can provide at least 24 volts • See problem column in this table for "SIB not communicating"
SIB not communicating	<ul style="list-style-type: none"> • Loose wiring connection between SIB and LFP • Shorted wiring connection between SIB and LFP • Blown fuse inside SIB • Shorted LMIB leads 	<ul style="list-style-type: none"> • Look for loose connections and repair as needed. Avoid splicing cable whenever possible to help avoid connection problems. • Look for direct shorts or reversed polarity on black/red/brown wires from incorrect wire/color match • Replace fuse • Individually tape off any unused wiring connections
Auto formula select not choosing correct formula number	<ul style="list-style-type: none"> • Auto formula select not turned on • Incorrect signal duration from washer • SIB not communicating 	<ul style="list-style-type: none"> • Turn on auto formula select • Verify signal duration and adjust as needed • See problem column in this table for "SIB not communicating"

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
No voltage at main power terminals	<ul style="list-style-type: none"> • Tripped breakers or blown fuses at power source • Main power wires 	<ul style="list-style-type: none"> • Reset breaker or replace fuses at power source • Inspect wires for damage or loose connection and replace or tighten
Voltage at main power terminals, but power indicator does not glow	<ul style="list-style-type: none"> • Blown fuse(s) on POB board • Incorrect wiring barrier position • Loose wiring barrier 	<ul style="list-style-type: none"> • Replace fuse(s) • Inspect wiring barrier block to be sure its not inadvertently placed on incorrect pin position • Ensure that wiring barrier is seated all the way down on the board
Transformer on POB board gets very hot to the touch	<ul style="list-style-type: none"> • Incorrect voltage select setting • Damaged POB board 	<ul style="list-style-type: none"> • Select the correct voltage setting. NOTE: While the POB board can be set for 115 VAC or 230 VAC, it is critical that this setting match the pump motors in the dispenser • Replace board
POB board keeps blowing fuse(s)	<ul style="list-style-type: none"> • Multiple pumps running • Wrong fuse rating • Damaged User Interface • Damaged POB board 	<ul style="list-style-type: none"> • Try staggering pump injections with delay times • Replace with correct fuse • Replace User Interface • Replace board
LFP has no display, or unusual display	<ul style="list-style-type: none"> • Incorrect voltage select setting • Loose wiring barriers • Incorrect wiring 	<ul style="list-style-type: none"> • Select the correct voltage setting. NOTE: While the POB board can be set for 115 VAC or 230 VAC, it is critical that this setting match the pump motors in the dispenser • Ensure that wiring barriers are seated all the way down on the POB board, and inside the LFP enclosure • Observe wiring connections between LFP and POB and correct as needed

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
Pumps run on an occurrence that is programmed with zero volume	<ul style="list-style-type: none"> No delay time programmed Load count pump has been signaled 	<ul style="list-style-type: none"> An occurrence needs a delay time, even if no volume is programmed" to prevent chemical injection Verify when the load count pump is signaled and correct as needed, since the load count pump resets all occurrences
LOW LEVEL ALARM - showing in display of LFP	<ul style="list-style-type: none"> Low product level has been detected by (optional) Low Level Alarm interfaced with POB Jumper wire across LOW LEVEL terminals on POB Communication problem between LFP and POB 	<ul style="list-style-type: none"> Check product containers Remove jumper wire Check 5-conductor cable that connects the devices for correct wiring and continuity
FLUSH ERROR - showing in display of LFP	<ul style="list-style-type: none"> Flow switch No water flow, or very low flow 	<ul style="list-style-type: none"> Check flow switch for proper operation and correct wiring Check flush water source and correct as needed
Pumps will not prime from manual switches on POB board	<ul style="list-style-type: none"> Electrical problem Mechanical problem Damaged pump motor Damaged POB 	<ul style="list-style-type: none"> Check voltage select jumpers and verify main power voltage. Also see POWER PROBLEMS table. Check for binding between pump roller block and squeeze tube Replace pump motor Replace POB
Pumps will not prime from LFP	<ul style="list-style-type: none"> Communication problem between LFP and POB Damaged LFP 	<ul style="list-style-type: none"> Check 5-conductor cable that connects the devices for correct wiring and continuity Replace LFP

DISCLAIMER

Knight Inc. does not accept responsibility for the mishandling, misuse, or non-performance of the described items when used for purposes other than those specified in the instructions. For hazardous materials information consult label, MSDS, or Knight Inc.

WARRANTY

All Knight controls and pump systems are warranted against defects in material and workmanship for a period of ONE year. All electronic control boards have a TWO year warranty. Warranty applies only to the replacement or repair of such parts when returned to factory with a Knight Return Authorization (KRA) number, freight prepaid, and found to be defective upon factory authorized inspection. Bearings and pump seals or rubber and synthetic rubber parts such as "O" rings, diaphragms, squeeze tubing, and gaskets are considered expendable and are not covered under warranty. Warranty does not cover liability resulting from performance of this equipment nor the labor to replace this equipment. Product abuse or misuse voids warranty.

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