KNIGHT

IDEX CORPORATION

Chem-Trak Jr. (EDP)
Instruction Manual

TABLE OF CONTENTS

CAUTION: Wear protective clothing and eyewear when dispensing chemicals or other materials. Observe safety handling instructions (MSDS) of chemical mfrs.

CAUTION: To avoid severe or fatal shock, always disconnect main power when servicing the unit.

CAUTION: When installing any equipment, ensure that all national and local safety, electrical, and plumbing codes are met.

SPECIFICATIONS

Max Number of Washers	4
Max Number of Chemicals	6
Pump Cabinet	46” W x 13” H x 11.5” D (1.17m x .33m x .29m)
Controller	15” W x 15” H x 7.5” D (.38m x .38m x .19m)
Power Supply	8” W x 10” H x 5” D (.203m x .254m x .127m)
Diverter Valve	15” W x 8” H x 4” D (.381m x .203m x .102m)
Manifold	36” W x 6” H x 7” D (.91m x .15m x .18m)
Total Weight	100 lbs (45 kg)
Voltage	115 or 230V
Frequency	50 or 60 Hz
Current	10A (typical)
Water Pressure	30 - 70 PSI / 2 - 5 bar
Water Temperature	32 - 120°F / 0 - 50°C
Max Distance to Washer (see note 1)	250 feet / 75M
EDP Pump Duty Cycle	Continuous Duty
Chemical Compatibility	(see note 2)
Humidity (max)	95%
Working Temperature	41 - 104°F / 5 - 40°C
Storage Temperature	-40 - 185°F / -40 - 85°C
Life (normal operation)	5 years
Case Rating	IP55

NOTES

(1) Far distance to washers requires longer transfer times.

(2) EDP pump wetted components are constructed of various chemical resistant materials. Consult Knight for chemical compatibility information.

SAFETY SYMBOL EXPLANATIONS

Listed below are explanations of the safety symbols that appear either on the unit, in the instruction manual, or both. Please familiarize yourself with the meaning of each symbol.

GENERAL CAUTION: This symbol indicates a general safety caution.

SHOCK HAZARD: This symbol indicates that hazardous voltages are inside the enclosure.

READ MANUAL: This symbol indicates to read the manual for important instructions and procedures related to safety.

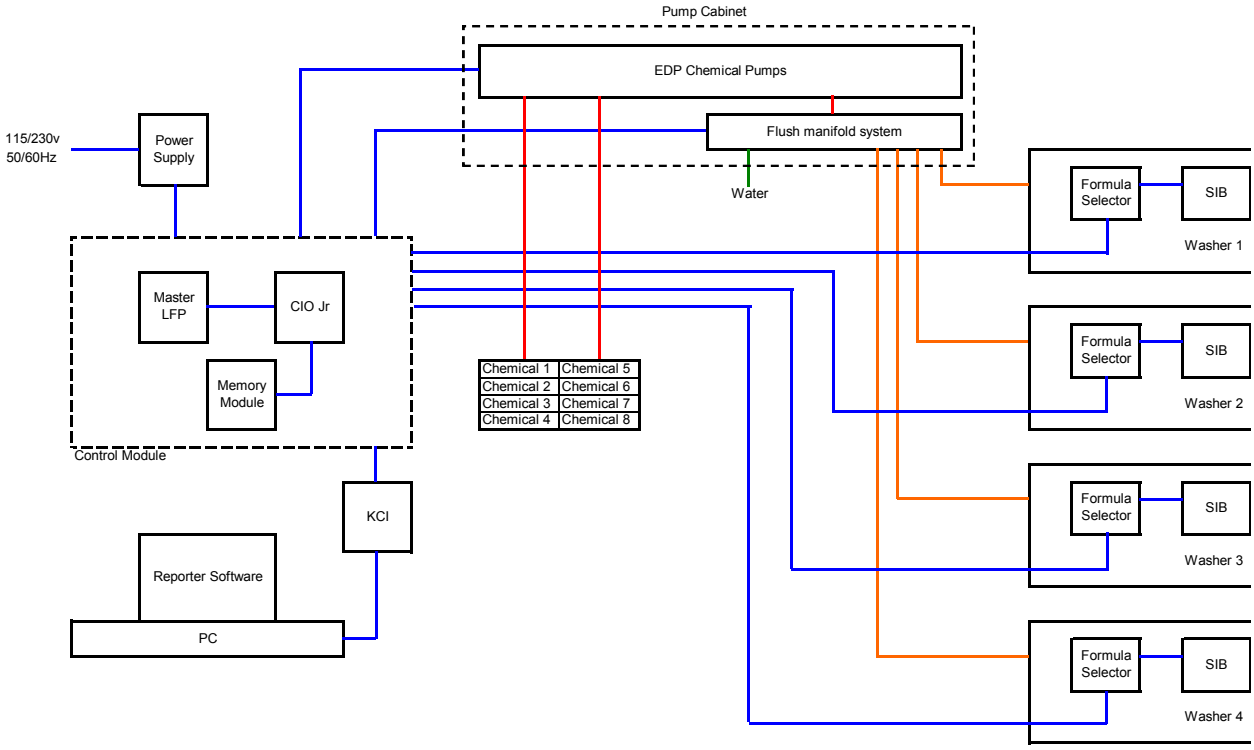
SYSTEM OVERVIEW

Chem-Trak Jr. (EDP) is a modular system with the Master LFP, CIO Jr and Memory Module in one cabinet, and a separate power supply. Up to six electric diaphragm pumps (EDP's) are located in a third cabinet with a separate flush manifold which includes the manifold block , check valves, one water solenoid, flow switch, and regulator. A fourth, and separate cabinet, houses the four diverter valves which are used to control delivery to each respective washer.

A Formula Selector/SIB combination are mounted remotely at each washer. The system can service a maximum of four washer-extractors. The system can be programmed locally at the Master LFP or globally via a link to Reporter software using the KCI module. The system stores all programmed features in battery-backed RAM. The battery has a minimum life of 10 years.

SYSTEM COMPONENTS

- **Control Module:** The Chem-Trak Jr. control module monitors chemical feed requests for up to 4 washers. When a washer requests a chemical dosage, the control module dispenses the correct amount, then handles the operation of the flush and transfer to deliver the chemical to the appropriate washer.
- **Flush Manifold:** This area of the system houses the flush manifold and checkvalves. The manifold is where all of the pumps inject chemical into. The checkvalves prevent cross-contamination of chemicals.
- **Formula Selector & SIB:** Remote formula selector integrates with washer signal inputs and sends chemical requests to the control module. Each washer has its own formula selector that is used by operators for choosing wash formulas. When a chemical trigger signal is sent by the washer, the SIB transmits the dosage request to the control module.
- **Strobe Alarm(s):** The strobe alarm is an audio-visual warning device to alert operators when there is a problem with the system. When the alarm is activated, there will be various system errors shown on the display of the control module. The errors are also tracked into memory for later printing a report.
- **Pump Cabinet:** Chem-Trak Jr. uses reliable Knight EDP pumps to deliver up to eight chemicals ranging from .4 GPM to 1.5 GPM.



OPERATION

► Normal Chemical Transfer

When the system receives a request for chemical, the following sequence occurs. The diverter valve associated with the washer requesting chemical is activated and the water flush solenoid valve is also activated. After the flush error delay time (setup in the programming menus) the system will check the flow switch input. If the switch contact is closed the system will start the pump and run it for the programmed volume. If the switch contact is open the system will stop, activate the strobe alarm, and display “FE” (indicating flush error) on the formula selector for each washer.

At the end of the pump run time the water flush solenoid will continue to operate for the flush time and transfer time programmed in the setup. This time should be set long enough to ensure all chemical is flushed through the system and to the washer. If the flow switch contacts open (for longer than the flush error delay) at any time during the flush cycle, the system will shut down with a flush error as described above.

If a specific flush time is programmed for the pump that is running, the system will add this additional time to the normal flush time. If the Halt with Injection feature is used, the Chem-Trak Jr. SIB will hold the washer during the entire process described above.

► Multiple Chemical Requests (one machine)

If multiple chemicals have been requested by one machine, then the following sequence occurs. If the Flush Between feature is used, then the system will activate the programmed flush time between each pump activation to provide a barrier of water between non-compatible chemicals. This sequence continues until all requested products have been dispensed. The system then follows the transfer sequence described in the section above to push all chemical and water to the washer. The maximum number of pumps that can run simultaneously is three total.

► Multiple Chemical Requests (multiple machines)

If a washer calls for product while the system is active servicing another washer then the system puts the request in a queue. The washer interface puts the washer into halt mode (if the Chem-Trak Jr. SIB is interfaced with the washer’s controls) to ensure the chemical does not miss injection to the correct wash cycle step. When the system is ready to process the request, washer halt is de-activated and a normal transfer sequence will begin.

► Multiple Injection Levels

Using multiple volume levels allows a pump to dispense 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 volume levels (max) are available per pump.

Multiple volume levels can be used for any pump on any formula, except the load count pump. Only level 1 can be programmed on the load count pump (or any other pumps that are signaled at the same time as the load count pump).

After the load count pump has been triggered (to end the previous formula) 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. To “use up” a level and NOT dispense product, simply program a “0" volume and a ”1" second delay time for that level.

PRE-INSTALLATION

Before installing Chem-Trak Jr., you should survey the installation site thoroughly to determine materials and tools that will be needed. You may wish to use the specifications in the front section of this manual as reference. At the very least, your site survey should included the following.

- Locate a 115 or 230 VAC power source.
- Locate a water source and nearby drain.
- Plan to place the unit in view of the washer line so the operators can see alarms, and also where there is enough room for chemical containers.
- Plan your delivery lines and the easiest route to each machine for tubing and wiring of the formula selectors.
- Check to make sure that all functions of the laundry machine are operating properly (i.e. drain valve, hot/cold water solenoids, flush down valves, water level switch, card reader or timer, and machine motor).
- Familiarize yourself with all applicable safety, electrical, and plumbing codes.
- Measure the distance from the chemical supply containers to where the chemical pumps will be mounted.
- Measure the distance from where the system will be mounted to each respective washmachine.
- Make a list of all parts, electrical and plumbing, so you will have everything you need to complete the install.

INSTALLATION

(1) Choose a location as close as possible to the chemical supply and no more than 10 ft above chemical containers. Mount the joggle bracket to the wall using appropriate hardware.

(2) Hang the system on the joggle bracket. There is a 1/4” hole on the lower back wall of the control module cabinet to allow the unit to be secured to the wall using appropriate hardware.

(3) Install braided tubing between the discharge (left) side of the pump and the corresponding port on the flush manifold. Use stainless steel hose clamps and barb fittings to secure braided tubing to pump.

(4) Install braided tubing between the suction (right) side of the pump and the barb fitting on the PVC pickup tube. Use stainless steel hose clamps and barb fittings to secure braided tubing to the pickup tube.

(5) Insert pickup line into appropriate chemical container.

(6) Run a drain line from the top port on the 3-way valve to floor drain or nearest trough. The drain line is used to divert water flow away from manifold (by using the 3-way valve) to relieve pressure from the manifold for maintenance.

(7) Mount the power supply box and connect to the terminals on the lower right corner of the CIO board in the control module cabinet (see wiring diagram).

(8) Connect each pump signal input on the SSI circuit board to corresponding terminals on the CIO circuit board (see wiring diagram).

(9) Connect power to the SSI circuit board from the Power Supply Unit (see wiring diagram). Follow local wiring codes — this will typically require the use of conduit.

(10) Connect main power input to the power supply box using suitable conduit.

(11) Run water supply ensuring adequate pressure. Warm water is recommended for best results.

(12) If using SA-12 strobe alarms, mount and wire to the appropriate terminals on the CIO.

(13) Connect multi-link wires for each system if more than one system will be used.

(14) Route the delivery lines from the diverter control to each respective washer.

► Formula Selector's and SIB's

One formula selector and one SIB are required for each washer that the Chem-Trak Jr. will feed. Be sure to connect the formula selector to the appropriate remote terminals on the CIO board (the "remote" numbers shown on the CIO board correspond to the washer number). Perform the steps below for each washer.

(1) Ensure that main power to the Chem-Trak Jr. is off.

(2) Mount the formula selector to the washer using a mounting bracket or dual-lock fastening strips.

(3) Route the formula selector cable to the unit and connect to the CIO board in the control box (avoid running the cable near any source of electrical noise such as high voltage AC lines, motor contactors, etc).

(4) Mount the SIB near the washer's signal source using dual-lock fastening strips. If desired, the SIB can be mounted right inside the washer's control box.

(5) Connect the SIB to the formula selector using 3 conductor cable.

(6) Check the signal voltage output from the laundry machine. Measure the voltage between control signal and signal common, NOT control signal and case ground.

(7) Ensure that power to the washer is off.

(8) Connect signal wires to SIB per wire colors on the label of the SIB. If split commons are required, a resistor can be removed inside the SIB to allow use of 2 different signal commons (see page 8 for details).

(9) If Auto Formula Select will be used, be sure to choose the correct input on the SIB for the application (see page 21 for details).

(10) If the washer hold feature will be used, the Chem-Trak Jr. SIB must be properly interfaced with the washer to permit the SIB to pause the washer if other washers are requesting chemical. See the Washer Hold section (on page 10) for more details.

► Remaining Steps

(1) Power the system up.

(2) Program the system either at the main keypad, or by uploading a setup (HEX) file using WinReporter.

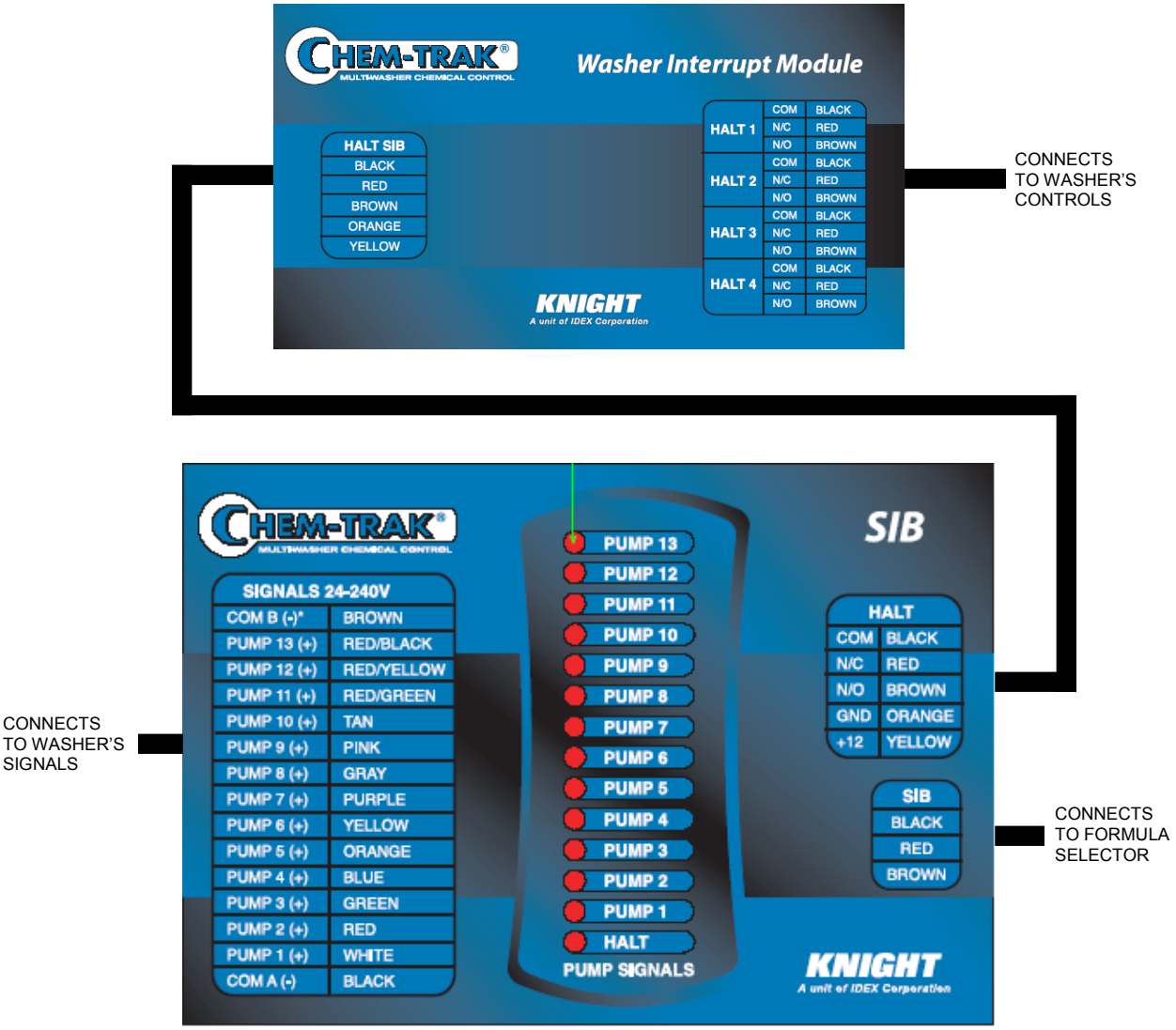
(3) Prime and calibrate each chemical pump at the main keypad according to the instructions in the programming section of this manual.

(4) After the system is programmed, observe the operation to ensure all washers are getting chemical and operating properly. The washer hold feature can be used to ensure proper delivery to each washer.

(5) Check for any water leaks and verify that water pressure is adequate to flush chemical to each washer. Check to ensure that the flush time and transfer time settings are adequate.

(6) Fully train the staff to service and recognize alarms and how to satisfy them. As well as how to maintain the system (i.e. pump inspection, check valves, etc).

SIB & INTERRUPT MODULES



► Splitting Signal Commons

If you have one signal common (typical) connect it to "COM A" only. If you have two signal commons, you will need to remove a resistor inside the SIB before connecting common wires! Once the resistor is removed, you can then use COM A and COM B for different groups of signals shown in the table. Shut off all power sources before continuing.

(1) Remove screws from the bottom of the SIB to open it.

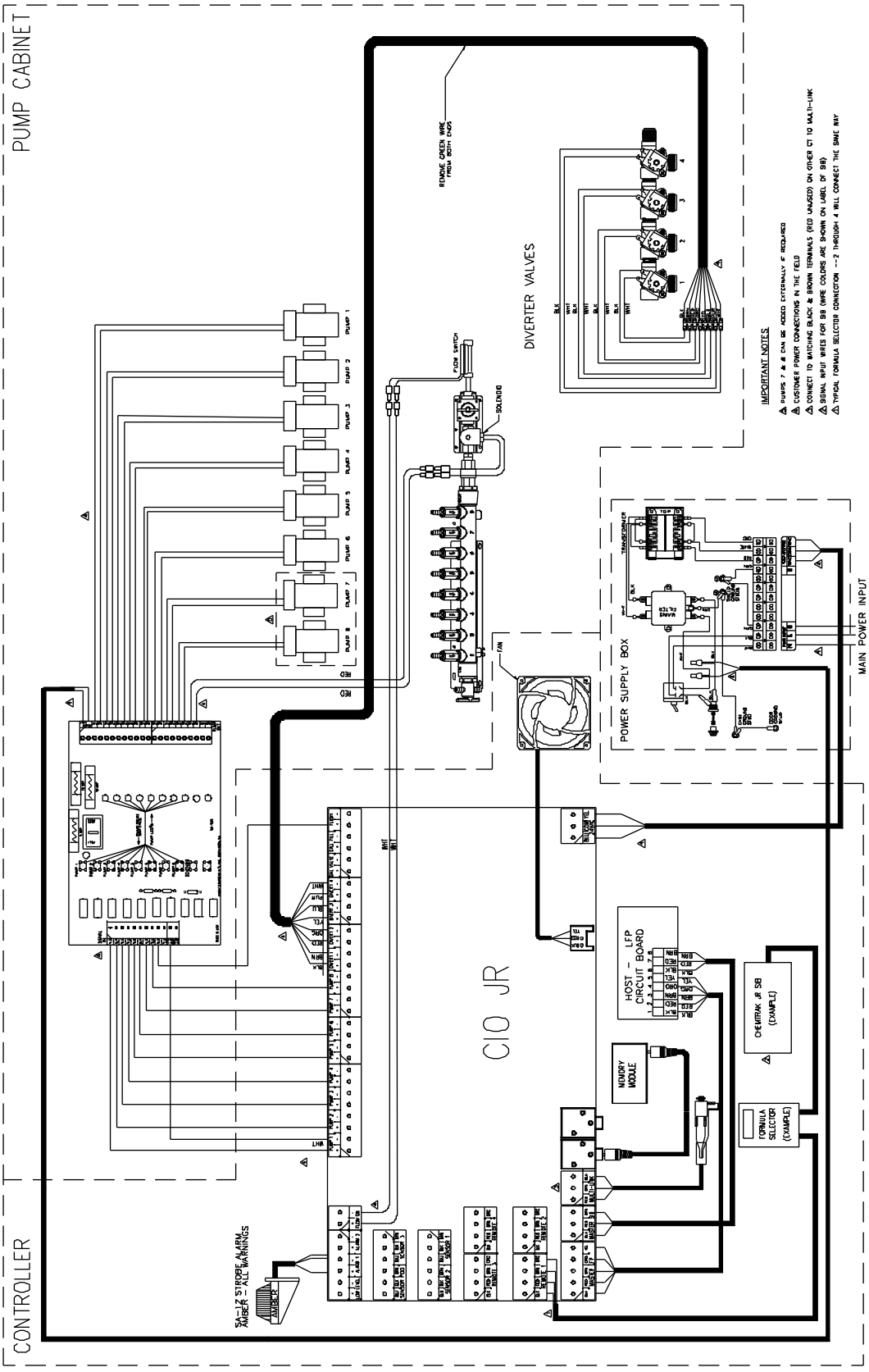
(2) Locate the three resistors marked R15, R14, and R13, on the left side of the module (each resistor has a single black band to identify it).

(3) Cut and remove the resistor that will "split" the commons between the desired pumps. Remove only one resistor.

(4) Close the module and replace screws when finished.

CUT RESISTOR	*TO USE COM A FOR PUMPS*	*AND COM B FOR PUMPS*
R15	1 — 2	3 — 13
R14	1 — 3	4 — 13
R13	1 — 5	6 — 13

WIRING DIAGRAM



WASHER HOLD FUNCTION

The Chem-Trak Jr. System has two halt (washer hold) modes that pause the washer operation to allow sufficient time for chemical injection to reach the machine. There is also a “maintenance hold” function that halts the washer operation and puts the chemical request in the queue for later delivery. Below is a brief overview of the purpose for each halt mode. More information can be found in the Operation section of this manual, and information on maintenance hold can be found in the Programming section of this manual.

- ***Normal Hold:*** The washer is halted if its requesting chemical feed while the system is busy feeding other washers.
- ***Halt With Injection:*** Operates same as above (normal hold) but will additionally halt the washer during its own chemical injection.
- ***Maintenance Hold:*** This function is used while performing maintenance on the system, and must be enabled at the host control panel. While the system is on maintenance hold, any washers that request chemical will be put on hold and the feed request will be added to the queue to be delivered later when finished with maintenance hold.

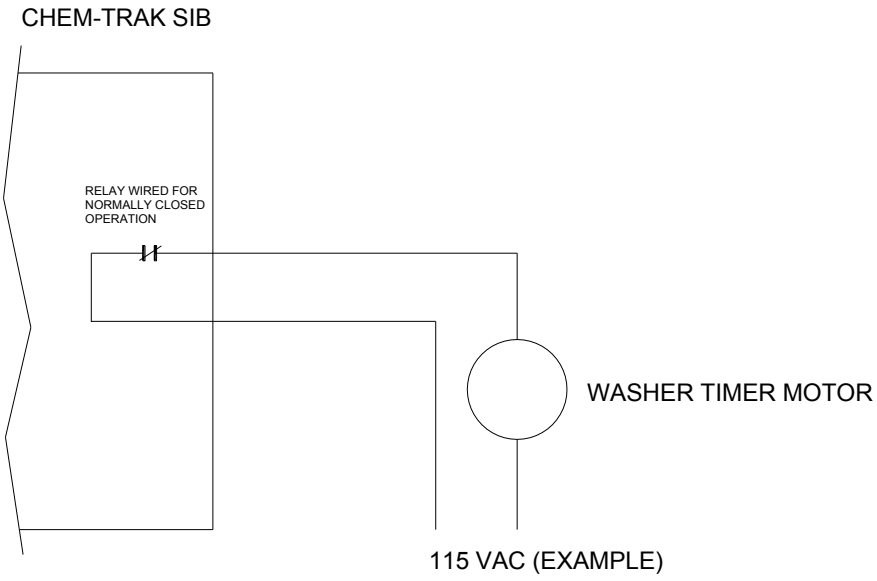
When any of the hold functions are activated, a relay on the Chem-Trak SIB is energized. This relay can be wired normally open or normally closed depending on the type of washer (examples following). The relay causes the washer to halt until the relay is de-energized, then allowing the washer to resume normal operation.

An additional halt module can be wired into the Chem-Trak SIB for applications that require more than one relay (example following). The halt module has four relays that activate simultaneously with the relay on the SIB to expand the washer hold capabilities of the Chem-Trak Jr.

Before attempting to wire the machine for the washer hold function, make sure that you have a wiring diagram of the machine’s controls, and that you fully understand how to perform the necessary electrical changes. Also consider how this feature may affect the wash cycle operation.

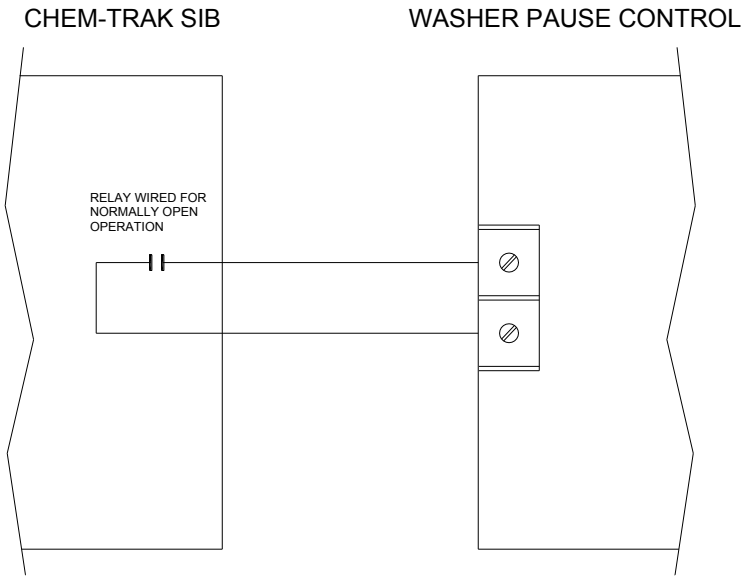
► Fixed Timer or Card Reader Type Washers

The key to halting a fixed timer or card reader machine is to interrupt the motor that controls the timer or card reader mechanism. Wire the timer motor to the Chem-Trak Jr. SIB using the normally closed (N/C) configuration as shown in the diagram below. When the halt feature is active, the relay will open the circuit and thereby pause the washer.



► Microprocessor Washer with Pause Control

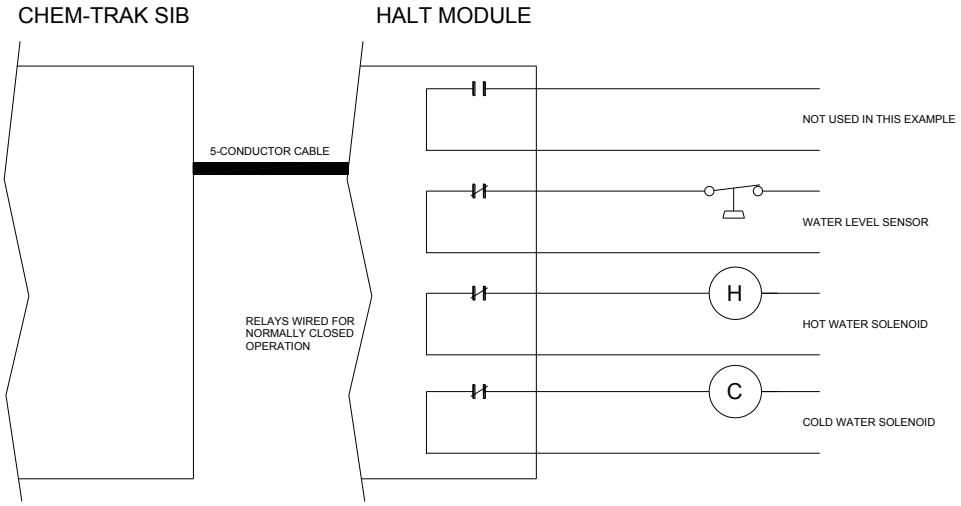
If the washer is microprocessor controlled, check to see if it has a designated input for connecting an external pause device that operates with “dry contacts” (such as a toggle switch). If the machine has such an input, then the relay on the Chem-Trak SIB can be connected using the normally open (N/O) configuration as shown in the diagram below. When the halt feature is active, the relay will close the circuit and thereby pause the washer.



► Microprocessor Washer without Pause Control

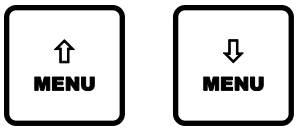
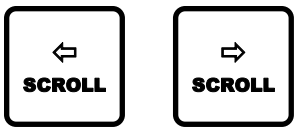
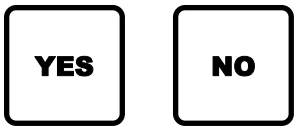
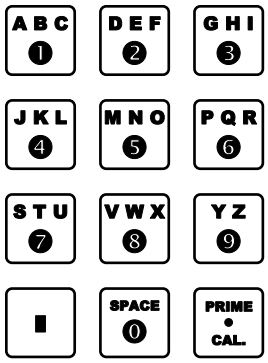
If the washer is microprocessor controlled but does not have a designated input for connecting an external pause device, then other circuits on the machine will have to be interrupted using the halt module. The most common approach is to wire the machine’s water level sensor, hot water fill solenoid, and cold water fill solenoid to the normally closed contacts on the halt module as shown in the diagram below. When the halt feature is active, the relays will open the circuits and thereby pause the washer.

NOTE: When the halt module is inter-connected to the Chem-Trak SIB, then the relay on the SIB can no longer be used. Only use the relays on the halt module for this type of setup.



KEYPAD DIAGRAM

KEYPAD DESCRIPTIONS

	The MENU (UP) and MENU (DOWN) keys allow you to move through the menu selections and pick what you want to do.
	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 YES and NO keys allow you to pick whether you want to do something or not.
	The RESET key performs a number of functions. From any main menu heading, pressing the RESET key allows you to exit the programming mode and returns the screen to the main display. From any selection *within* a main menu, pressing the RESET key takes you back to *that* menu's heading. **NOTE: Reset can be used to silence alarms and to halt pump operation; as desired or in an emergency situation. If pressed, the system will prompt you if you wish to abort the current job. A YES/NO response will direct the system what to do.**
	The ENTER key acknowledges input data and logs it into memory. It also takes you into a menu for programming.
	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) is used during priming and calibrating of the chemical pumps.

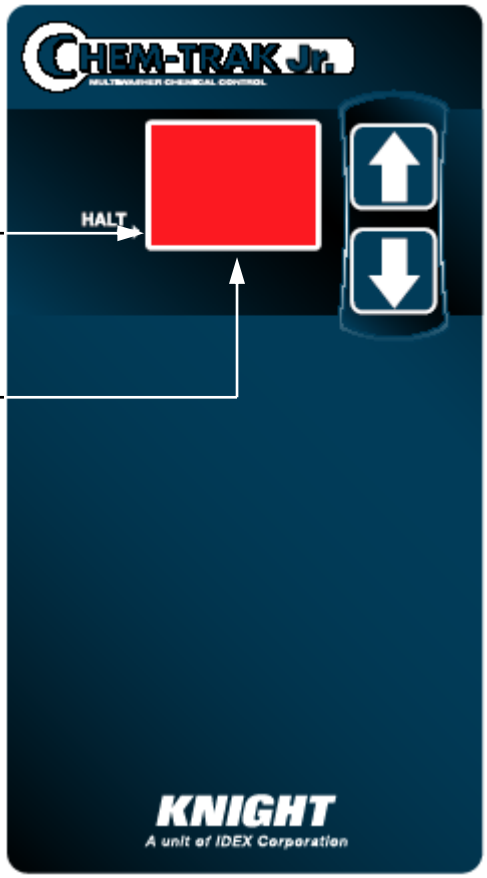
DISPLAY WINDOW

00	CHEM-TRAK JR			00
DATE	09/05	TIME		16:53:50
W3	BLEACH	010.0	OZ	16:51
W1	DETERG	025.0	OZ	16:47

The main display window shows the status of chemical injections, and warns of any system error conditions that could cause potential problems with product delivery. To the left is an example of what the display might look like during typical operation.

- Top line: Left side shows the step number, which is a reference point for what the system is doing (i.e. pumping chemical, flushing, etc). Right side shows the job number, which is a reference to each product request.
- Second line: Shows the date and time when idle, otherwise will show what system activity is taking place, such as the status of a chemical injection in progress.
- Third line: Shows the most recent chemical request history. Number to the left shows the washer that requested chemical, followed by the chemical name and dosage pumped, then the time the job started.
- Bottom line: Same as above. New information is pushed down the list incrementally.

FORMULA SELECTOR(S)



HALT INDICATOR

FORMULA NUMBER DISPLAY

NOTE: FE will display in the formula select window if there is a flush error

FORMULA SELECT BUTTONS

TIP: Hold down on the formula select buttons to rapidly advance the number

PROGRAMMING THE SYSTEM

Chem-Trak Jr. 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.

From the main display screen, you must enter an access code to get into the programming menus. The Chem-Trak Jr. system has two access codes for protection:

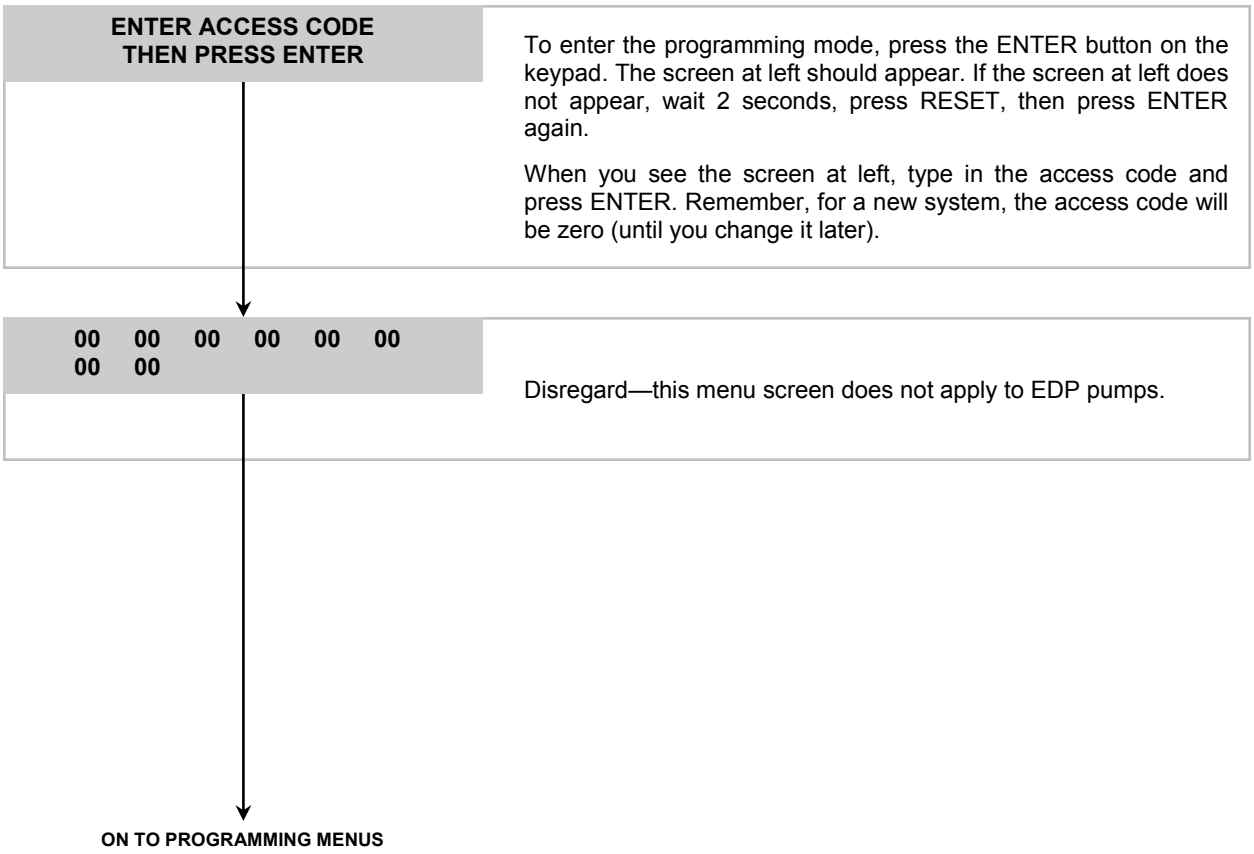
- The "main" access code, allows entry into ALL of the menus and functions of the system.
- The "user" access code restricts access to only the Pump Prime Routines menu without the ability of changing programmed information.

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.

IMPORTANT NOTES

- It is recommended to clear memory prior to initial programming. See the MEMORY FUNCTIONS menu for details.
- Programmed settings apply to all washers unless otherwise specified.

TO ENTER PROGRAMMING MODE...



MENU MAP

1 *** DISPENSER ***
MEMORY FUNCTIONS

- Clear pump volumes and delay times
- Restore default settings
- Clear sum/cycle report memory
- Set external memory module ID
- Clear external memory module

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
- Set delay time units/set signal lockout
- Setup flush parameters
- Set transfer time
- Set flush between status
- Set halt with injection

3 *** DISPENSER ***
REPORT SETUP ROUTINES

- Change user access code
- Change report name
- Change formula names and weights
- Change chemical names and costs
- Set shift times and operating zone
- Set washer capacity
- Set signal qualifying time

4 *** DISPENSER ***
MAINTENANCE SCHEDULE

- Date dispenser installed

5 *** DISPENSER ***
PROGRAMMING ROUTINES

- Enable maintenance hold
- Prime pumps
- Calibrate pumps
- View pump flow rates
- Program formula dosages and delay times

6 *** DISPENSER ***
PUMP PRIME ROUTINES

- Enable maintenance hold
- Prime pumps

1 ***** DISPENSER *****
MEMORY FUNCTIONS

- Clear pump volumes and delay times
- Restore default settings
- Clear sum/cycle report memory
- Set external memory module ID
- Clear external memory module

CLEAR PUMP VOLUMES ?
PRESS: YES OR NO

NO YES

This selection clears all formula pump volumes and delay times back to zero. Press NO if you do not wish to clear pump volumes at this time. Press YES for new installations, or when completely re-programming an existing system.

ARE YOU SURE ?
PRESS: YES OR NO

NO YES

If you entered YES, you are allowed to check and make sure that you really do want to clear pump volume information. Press NO if you are not sure that you want to clear all formula programming.

CLEARING ALL
VOLUMES AND DELAY TIMES

If you pressed YES, all volumes and delay times will then be cleared.

RESTORE DEFAULT SETTINGS
PRESS: YES OR NO

NO YES

This selection clears the setup parameters back to their default values. Press NO if you do not wish to restore default settings at this time. Press YES for new installations, or when completely re-programming an existing system.

CLEARING SETUP
***** PLEASE STAND BY *****

If you chose YES, the setup data is then cleared, and default settings are restored. When the clearing process is finished, you will then see the next menu selection.

CLEAR SUM/CYCLE REPORT ?
PRESS: YES OR NO

NO YES

This selection allows you to clear summary and cycle report memory. Press NO if you do not wish to clear sum/cycle information at this time. Press YES to clear the report memory.

A MUST WHEN YOU ARE READY TO TRACK WASHER AND CHEMICAL INFORMATION! Clearing the sum/cycle report clears:

– Production Summary Report
– Time Stamp Report (Wash Cycle Tracking)

CLEARING ALL SUM/CYCLE
INFORMATION

This shows that report memory is being cleared.

GO TO NEXT PAGE

1 *** DISPENSER *** MEMORY FUNCTIONS

- Continued

SET EXT MEM MODULE ID ?
PRESS: YES OR NO

This menu selection is used to synchronize the ID number of the external memory module to match the system's ID.

Press NO for a new installation, or if the external memory module ID had been set previously. Press YES if you have changed the ID number in menu #2 (be sure the unit is not be multi-linked with other systems while performing this step).

NOTE: You will typically need to first set the ID number of the host, then come back to this menu later to set the ID number for the external memory module.

NO / YES

ARE YOU SURE ?
PRESS: YES OR NO

You are then asked if you really do want to use this command. Press YES if you are sure, or press NO to continue on to the next menu selection without setting the external memory module ID number.

NO / YES

SETTING EXT MEM MODULE
***** ID TO CURRENT ID *****

When the process is complete, you will be returned back to the menu heading.

CLEAR MEMORY MODULE ?
PRESS: YES OR NO

This menu selection allows you to clear all time stamp data from the external memory module.

Press YES for a new installation, or if you wish to clear old data from the memory module that is no longer needed. Press NO if you do not wish to clear the memory module (or if you're not sure) and you will return to the menu heading.

NOTE: While the memory module can hold a very large amount of data, it is recommended to periodically clear the module. Be sure that the old data is no longer needed before proceeding.

NO / YES

ARE YOU SURE ?
PRESS: YES OR NO

You are then asked if you really do want to use this command. Press YES if you are sure, or press NO to return back to the menu heading without clearing the external memory module.

NO / YES

CLEARING MEMORY MODULE
****

When the process is complete, you will be returned back to the menu heading.

MEMORY FUNCTIONS MENU HEADING

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
- Set delay time units/set signal lockout
- Setup flush parameters
- Set transfer time
- Set flush between status
- Set halt with injection

CHANGE ID# ?
PRESS: YES OR NO

NO YES

This selection allows you to change the ID number of the system. The ID number is used for communication with a PC to print reports. It also identifies which host that a report was generated from when multiple systems are connected together in a daisy-chain format known as “multi-linking”.

Press NO if you do not wish to change the ID number at this time. Press YES to change the ID number (remember to go back to menu 1 and set the ID number of the external memory module).

NOTE: If two or more systems will be multi-linked together, they must have separate ID numbers. ID numbers should be set in increments of ten. For example, set the ID of the first unit to be 10, the second unit to be 20, the third to be 30, and so on.

NEW CHEM-TRAK JR ID# 00
THEN PRESS ENTER

If you pressed YES, you can now change the system’s ID number. Use the number keys to enter the new ID, then press ENTER. Press MENU ⇩ to continue.

CHANGE MAIN ACCESS CODE ?
PRESS: YES OR NO

NO YES

This selection allows you to change the “main” access code. The main access code allows entry into to ALL menus and functions of the Chem-Trak Jr. Press NO if you do not wish to change the main access code at this time. Press YES to change the code.

MAIN ACCESS CODE = 000
THEN PRESS ENTER

If you pressed YES, you can now change the system’s main access code. Pick a number that will be easy to remember. Use the number keys to enter the new code, then press ENTER. Press MENU ⇩ to continue.

TIP: If the main access code is changed, keep a record of the change in a safe place (in the event that the code is forgotten). If the record of the code change becomes misplaced, contact Knight for help.

GO TO NEXT PAGE

2 *** DISPENSER *** SETUP ROUTINES

- Continued

SET DATE & TIME ?
PRESS: YES OR NO

NO YES

This selection allows you to change the current date and time (as shown on the main display screen). Press NO if you do not wish to change the date and time. Otherwise press YES.

HOUR 00 MINUTE 00
MONTH 00 DAY 00 YR 00

Use number buttons to set date and time (military format, 13:00 = 1:00 PM) then press ENTER. Press the MENU ⇩ button to move on to the next menu selection.

UNIT OF MEASURE = US
1=US 2=METRIC 3=IMPERIAL

This selection allows you to choose between US, Metric, or Imperial units of measure. Use the keys to choose the correct setting, then use MENU ⇩ to move through this menu selection.

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 slave 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=5SEC

1 2 5

This selection allows you to select the AFS qualifying time for MICRO mode (only). 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 ⇩.

GO TO NEXT PAGE

AUTO FORMULA SELECT — HOW IT WORKS

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

Only SIB inputs 11 - 13 can be used for micro mode AFS. Input 11 does not add any numbers to the formula selected. Input 12 adds the number 30, and input 13 adds the number 60 to the formula, regardless of the AFS qualifying time. For example a 20 second signal using input 11 would result in formula 20 being selected, whereas a 20 second signal to input 12 would result in formula 50 being selected, and so on.

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 wish to use (11, 12, or 13). 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 (based on the AFS time setting) will determine the selected formula.

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 input will be pump 11 (only) on the SIB. Signal inputs 1 - 7 are used for adding up the correct formula number.

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.

The FIRST cut in the chart or card must be on the Automatic Formula Select Signal track. Thirty seconds after this cut begins, the dispenser will “look” at signal inputs 1 through 7 and evaluate the formula number selected (any signal combination higher than 90 will revert the system to formula 90).

The formula selector display will acknowledge the correct formula. Once the formula select process 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
	SIB PUMP #6 SIGNAL INPUT > ADD 32
	SIB PUMP #7 SIGNAL INPUT > ADD 64
■■■■■	**SIB INPUT #11 AUTO FORMULA SELECT SIGNAL**

GO TO NEXT PAGE

2 *** DISPENSER *** SETUP ROUTINES

- Continued

CHOOSE LOAD COUNT PUMP # 00 PRESS ENTER

This sets 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 purposes). Enter the number of the load count pump and press ENTER. Press MENU ⇩ to continue.

NOTE: The load count pump must be signaled on every formula for proper wash cycle tracking data. When the load count pump is signaled, all volume levels for that formula are reset to level 1. This setting applies to all washers using the Chem-Trak Jr.

AUTO FORM RESET DISABLE 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. Make your selection, then 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 delay time unit of measure, then press MENU ⇩ to continue.

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.

WATER FLUSH TIME = 40 SECONDS

This sets the time the flush solenoid will activate after the pumps have finished. Type in the flush time (range is 10 - 99 seconds) required to clear the chemical from the tube, then press ENTER. Press MENU ⇩ to move on to the next menu.

TIP: Flush time should be set long enough to completely clear chemical from the delivery tube. Determine this setting based on the thickest product that will be used. This setting is particularly important if using the "flush between pumps" option.

GO TO NEXT PAGE

2 ***** DISPENSER *****
SETUP ROUTINES

- Continued

TRANSFER TIME
WASHER 1 25 SECONDS

This selection sets the amount of time that the diverter solenoid will activate, after the flush time expires, to deliver product to the washer. Type in the washer number and transfer time (range is 0 - 99 seconds) then press ENTER. Repeat for each washer in use. Press MENU ⇩ to continue.

TIP: The transfer time should be set long enough to deliver all chemicals to each respective washer (based on washer distance and product viscosity). Determine this setting based on the thickest product that will be used.

PUMP FLUSH TIME
PUMP 01 00 SECONDS

This selection sets an additional amount of time that will be added to the normal flush time during transfer. Each pump can have its own flush time if desired (range is 0 - 99 seconds). The purpose of this setting is to add extra flush time for pumps that have very viscous products. This helps to ensure that no chemical residue is left in the flush line.

NOTE: If two (or more) pumps run together and each one has a flush time, then the longest flush time will be used during transfer.

FLUSH ERROR DELAY
= 05 SECONDS

The system has a flow switch that 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). It is recommended that this setting be no less than 05 seconds. Make your selection and press ENTER. Press MENU ⇩ to continue.

If deemed necessary by the customer, the delay can be set to 00 which will turn this feature “off”, and the flow switch input will not be checked (and therefore no FLUSH ERROR warnings will be produced). The customer accepts liability in such cases, as the system will not be able to detect flush errors.

NOTE: The flush solenoid will start before the pump. After the flush error delay 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 manifold.

FLUSH BETWEEN PUMPS = OFF
1 = OFF 2 = ON

1 **2**

This selection allows you to choose if the system will add flush water between chemical injections before transferring all chemicals to the washer. This provides a barrier of water between non-compatible chemicals in situations where the washer calls for multiple chemicals at the same time.

Make your choice, then press MENU ⇩ to continue.

GO TO NEXT PAGE

2 ***** DISPENSER *****
SETUP ROUTINES

- Continued

HALT W/INJECTION = OFF
1= ON 2= OFF

1 **2**

This feature allows the SIB to pause the washer's operation (halt) while <u>its own</u> chemical injection is taking place. This can be helpful in the following applications:

– Excessive pump run time (due to product viscosity, pump size).
– Far distance to the washer (longer flush and transfer times).
– Low water pressure.

The Chem-Trak SIB has special relay contacts that can be connected to the washer's controls to halt machine operation. Even if this feature is turned off, the SIB will still halt the washer if requesting chemical while the system is busy feeding <u>other</u> washers. Make your selection, then press MENU ⇩ to continue.

LEVEL SENSORS = DISABLED
1 = ENABLED 2 = DISABLED

1 **2**

Disregard — for future use (leave setting on DISABLED). Press MENU ⇩ to return to the menu heading.

SETUP ROUTINES MENU HEADING

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

- Change user access code
- Change report name
- Change formula names and weights
- Change chemical names and costs
- Set shift times and operating zone
- Set washer capacity
- Set signal qualifying time

CHANGE USER ACCESS CODE?
PRESS: YES OR NO

NO YES

This selection allows you to change the user access code. The user access code allows access to only the pump prime menu of the Chem-Trak Jr. and allows printing-only when using WinReporter PC software. Pressing NO allows you to move through this menu selection.

USER ACCESS CODE = 000
THEN PRESS ENTER

If you entered YES, you will be prompted for a new user access code. Use the keys to enter the new data, and press ENTER when done. Press MENU ⇩ to move through the menu selection.

CHANGE REPORT NAME ?
PRESS: YES OR NO

NO YES

The report name is what is printed on the report heading. Pressing NO allows you to move through this menu selection.

▒

If you entered YES, you can change the report name (use the SCROLL and lettered keys to enter the new data, and press ENTER when done). Press MENU ⇩ when finished to move through this menu selection.

TIP: Entering the report name in the center of the display window will center it at the top of the report.

GO TO NEXT PAGE

3 *** DISPENSER *** REPORT SETUP ROUTINES

- Continued

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 appear on the bottom line. Then change the name on the bottom line and press ENTER again to lock-in the new data.

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 appear on the bottom line. Then change weight on the bottom line and press ENTER again to lock-in the new data.

CHANGE CHEMICAL NAMES PRESS: YES OR NO

NO YES

This is the type of chemical for each pump on the system. Pressing NO allows you to move through this menu selection.

PUMP 01
PUMP-01

If you entered YES, you can change the chemical name for each pump (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 top line and press ENTER...the current name for the pump you selected will be displayed on the bottom line. Then change the information on the bottom line and press ENTER again to lock-in the new pump name.

GO TO NEXT PAGE

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

- Continued

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 number 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.

SQUEEZE TUBE WARNING
= 00 %

Disregard—this menu screen does not apply to EDP pumps.

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.

GO TO NEXT PAGE

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

- Continued

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 system. 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, any trigger signals that are received 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 system. 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
WASHER 1 000 LBS

This selection allows you to enter the load capacity for each washer. Use the SCROLL and number keys to enter the washer number and corresponding machine weight, then press ENTER when done. Press MENU ⇩ to continue.

SIGNAL QUALIFYING TIME
005 SECONDS (1-120)

This selection allows you to set the time required for a supply signal from the washer to be recognized. The supply signal duration must meet or exceed the qualify time setting to activate a pump. Choose a time from 1 - 120 seconds (default setting is 5 seconds) and press ENTER. Then press MENU ⇩ to continue.

NOTE: This feature can be used as a “filter” for stray signals (or ghost signals) that erroneously trigger a pump. Determine the normal signal duration from the washer and set the signal qualify time to be slightly shorter than the washer’s supply signals. For example, if the supply signals are always 30 seconds in duration, set the signal qualify time to be 25 seconds.

REPORT SETUP ROUTINES MENU HEADING

4	***** DISPENSER ***** **MAINTENANCE SCHEDULE**	• Date dispenser installed

DISPENSER INSTALLED **00/00/00**	This selection allows you to enter the date that the system 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**	Disregard—this menu screen does not apply to EDP pumps.
SQUEEZE TUBES LAST LUBED **PUMP 01 00/00/00**	Disregard—this menu screen does not apply to EDP pumps.

MAINTENANCE SCHEDULE MENU HEADING

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

- Enable maintenance hold
- Prime pumps
- Calibrate pumps
- View pump flow rates
- Program formula dosages and delay times

ENABLE MAINTENANCE HOLD ?
PRESS: YES OR NO

NO YES

This feature allows you to halt the washers and chemical feed while performing maintenance. Choose YES or NO to continue (if "SYSTEM BUSY" appears, wait 30 seconds then try again).

MAINTENANCE HOLD ENABLED
HIT RESET KEY TO RESUME

This display shows that the system is on maintenance hold. If a feed request is received, the washer will be halted (by the SIB) and the request will be put in the queue for later delivery. Press RESET to end the hold and resume normal operation. Or press MENU ⇩ to advance to the next step and continue the hold.

PRIME PUMPS ?
PRESS: YES OR NO

NO YES

This allows you to prime chemical pumps (necessary for proper calibration). Choose YES or NO to continue.

SEND PRODUCT TO WASHER
PRESS ENTER 1

Choose the washer that you want product sent to during the priming process, then press ENTER.

PRIME PUMP 01
PUSH PRIME TO START/STOP

Choose the pump you wish to prime, then use the PRIME/CAL button to start and stop the pump.

TRANSFER TO WASHER ?
PRESS: YES OR NO

NO YES

You can choose if you wish to transfer the product to the selected washer at this time. Choose YES or NO.

EMPTYING VESSEL

Disregard — for future use.

TRANSFERRING-WASHER1 060

Chemical will transfer to the washer and the display will count down the remaining time till the process is finished. The count down is a sum of flush time, and transfer time and will be activated in this order.

GO TO NEXT PAGE

5 *** DISPENSER *** PROGRAMMING ROUTINES

- Continued

CALIBRATE PUMPS
PRESS: YES OR NO

NO YES

This selection allows you to automatically calibrate each pump. Calibrating "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.

SEND PRODUCT TO WASHER
PRESS ENTER 1

Choose the washer that you want product sent to during the calibration process, then press ENTER.

CALIBRATE PUMP 01
PRESS CAL. TO START

Use a large container for the most accurate pump calibrations. Fill your container with product and place under the suction tube of the pump you wish to calibrate Be sure the tube is primed, then note the amount of chemical in the container.

Choose the pump number you are calibrating, then press the CAL button to start the pump. After about 30 seconds, press the CAL button again to stop the pump.

ENTER CALIBRATION
VOL PUMPED = 000.0 OZS

Check the amount of chemical left in the container and subtract from the previous step to see how much chemical was actually pumped. Enter this as the "volume pumped" (OZ or ML) then press ENTER to continue.

NEW PUMP SQUEEZE TUBE
PRESS: YES OR NO

NO YES

Disregard—this menu screen does not apply to EDP pumps.

EMPTYING VESSEL

Disregard — for future use.

TRANSFERRING-WASHER1 060

Chemical will then transfer to the washer. The display will show the remaining time till the process is finished. The count down on the display is a combination of flush time, and transfer time and will be activated in this order.

GO TO NEXT PAGE

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

- Continued

FLOW RATES / MIN
P-01 38.6 OZS 0275MLU

The system calculates the flow rate of the pump and then displays the result. To the left is an example of what a flow rate might look like (the MLU number is for reference only by Knight personnel). Press MENU ⇧ to calibrate another pump or press MENU ⇩ to continue.

NOTE: You can manually enter or change the flow rates if necessary. Use the PRIME/CAL button to alternate OZ/ GAL, or ML/L.

VIEW PUMP CALIBRATION
PRESS: YES OR NO

YES NO

This menu selection allows you to view existing pump calibrations. Choose YES or NO 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. The system is capable of 90 total formulas. You can decide how you want to use the formulas. For example, you can program all 90 formulas to be shared by all washers. Or you can program certain "groups" of formulas to be used by only certain washers (such as formulas 1 - 20 for washer 1, formulas 21 - 40 for washer 2, etc). 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.

- For US and Imperial units of measure, formula volume settings are programmed in ounces only (the max allowed is 999.9 ounces). For Metric units of measure, formula volume settings are programmed in milliliters only (the max allowed is 9999 milliliters).
- The maximum run time for any pump is 255 seconds. If a formula volume is programmed that will cause a pump to exceed 255 seconds (base on that pump's flow rate) the pump will not activate when signaled.
- Delay times can be used when washer signals do not occur at optimum times for chemical dispensing. Maximum delay times are 255 seconds or 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.

PROGRAMMING ROUTINES MENU HEADING

6 ***** DISPENSER *****
PUMP PRIME ROUTINES

- Enable maintenance hold
- Prime pumps

ENABLE MAINTENANCE HOLD ?
PRESS: YES OR NO

NO YES

This feature allows you to halt the washers and chemical feed while performing maintenance. Choose YES or NO to continue (if "SYSTEM BUSY" appears, wait 30 seconds then try again).

MAINTENANCE HOLD ENABLED
HIT RESET KEY TO RESUME

This display shows that the system is on maintenance hold. If a feed request is received, its washer will be halted (by the SIB or Interrupt Module) and the request will be put in the queue for later delivery. Press RESET to end the hold and resume normal operation. Or press MENU ⇩ to advance to the next step

SEND PRODUCT TO WASHER
PRESS ENTER 1

Choose the washer that you want product sent to during the priming process and press ENTER.

PRIME PUMPS ?
PRESS: YES OR NO

NO YES

This menu allows you to prime the chemical pumps. Choose YES or NO to continue.

PRIME PUMP 01
PUSH PRIME TO START/STOP

Choose the pump you wish to prime, then use the PRIME/CAL button to start and stop the pump.

TRANSFER TO WASHER ?
PRESS: YES OR NO

NO YES

You can choose if you wish to transfer the product to the selected washer. Choose YES or NO.

EMPTYING VESSEL

Disregard — for future use.

TRANSFERRING-WASHER1 060

Chemical will transfer to the washer and the display will count down the remaining time till the process is finished. The count down is a sum of flush time and transfer time and will be activated in this order.

FLUSH VESSEL TO DRAIN
PRESS: YES OR NO

Disregard — for future use. Press NO to continue.

PRIME ROUTINES MENU HEADING

MAINTENANCE

Good maintenance habits are key to getting the best performance out of your equipment. The following service items are recommended for normal operation. The intervals may vary depending on chemical affect and actual usage.

NOTE: There is a 3-way valve on the output side of the flush manifold that is provided for servicing. This valve relieves pressure from the manifold for changing checkvalves or any other plumbed manifold part.

Service: Replace manifold checkvalves. ***Interval:*** 3 times a year, or as needed.	(1) Bleed any pressure from discharge line. (2) Disconnect chemical line from barb fitting. (3) Remove checkvalve from manifold by turning it counter-clockwise. (4) Wrap the threads of the new checkvalve with plumbing tape (2 - 3 turns) and install into the manifold being careful not to over-tighten. (5) Re-connect chemical line to barb fitting.

TROUBLESHOOTING

Formula selector does not light up - no power:

- Check fuses — replace if necessary.
- Check for loose wiring connections.
- Check voltage at main connection — refer to wiring diagram.

Pumps do not trigger from signals:

- Check signal voltage and duration.
- Check for flush error — press RESET to clear.
- Check pump volume and delay time settings.
- Pump may be counting down a "lockout" time (if used) from a previous activation.
- Pump may be trying to skip a level.
- Pump flow rate not set, or incorrect

Pumps will not activate when trying to prime, or during a washcycle:

- Check for loose pump motor wires.
- Check for voltage from circuit board to motor.
- Check for mechanical binding of moving parts.

Pumps run but do not dispense product:

- Check product containers.
- Check for air leaks on suction line.
- Check for blockage from pump into the checkvalve on the flush manifold.

Pumps trigger more than once during cycle:

- Check supply signal input for repeat signals from washmachine.
- Check signal lock-out function.

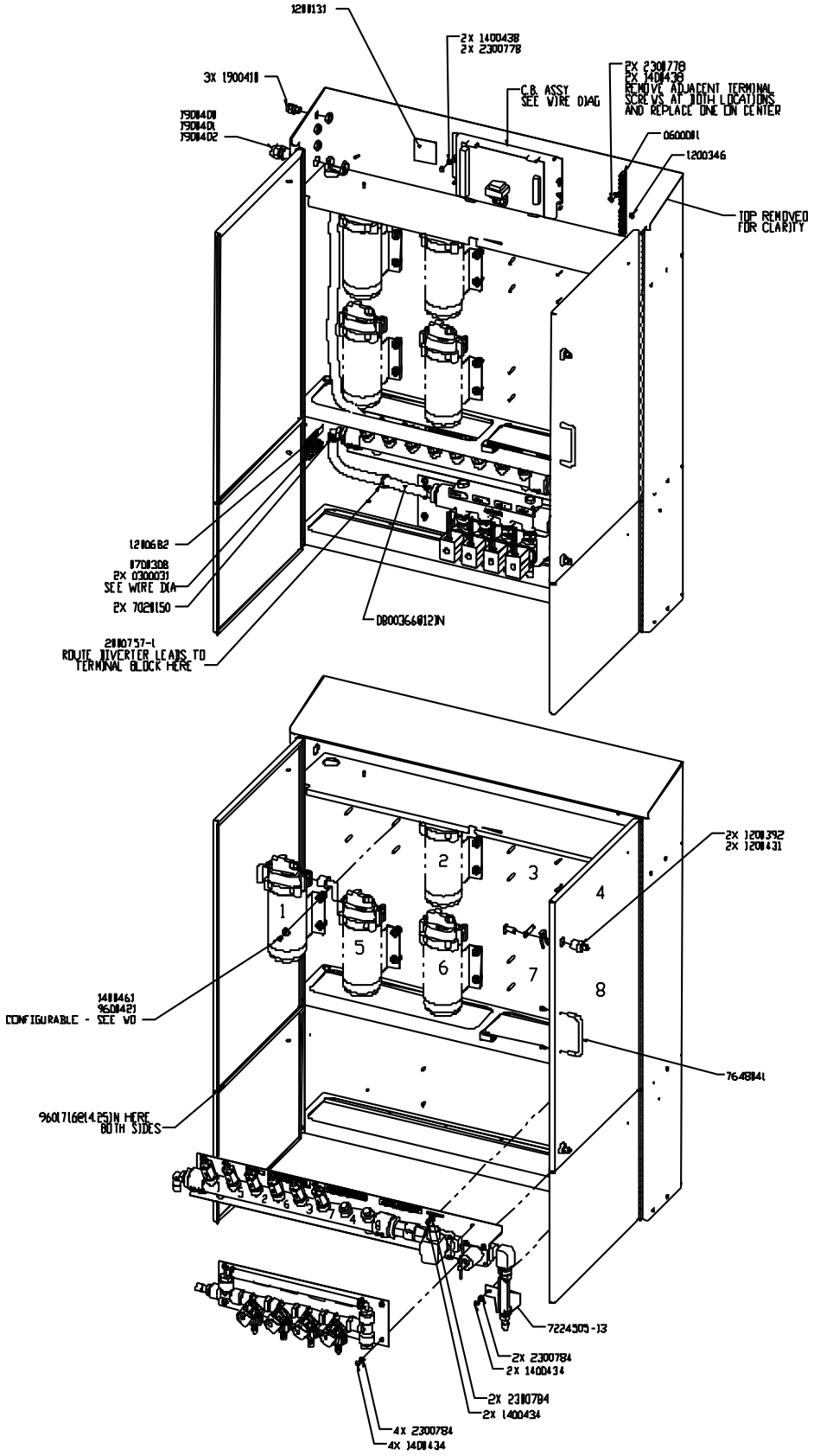
Flush errors keep occurring:

- Check to see if a flush manifold is operating correctly.
- Check flow switch for proper connection to CIO board.
- Check for adequate water flow (clean debris from filter screen at water inlet).
- Check flush error delay setting and adjust if needed.
- Press RESET to clear flush errors — pumps will not run during flush error.

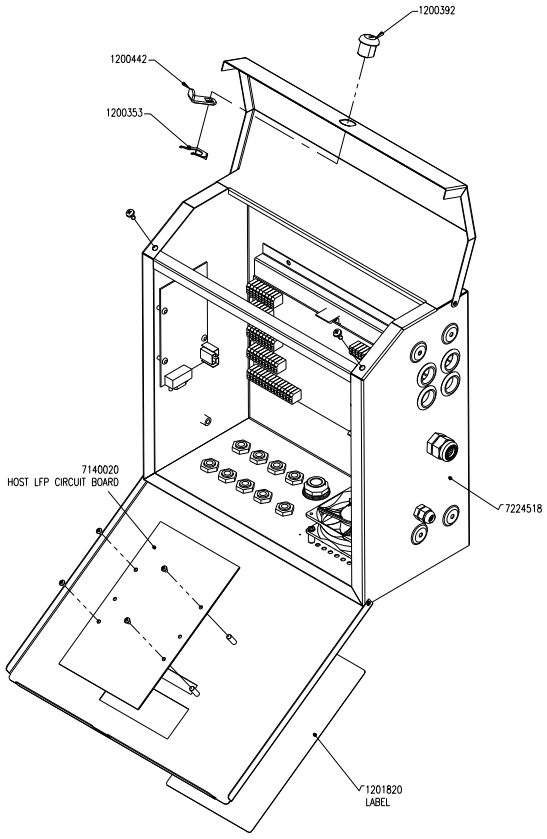
Flush solenoid does not open:

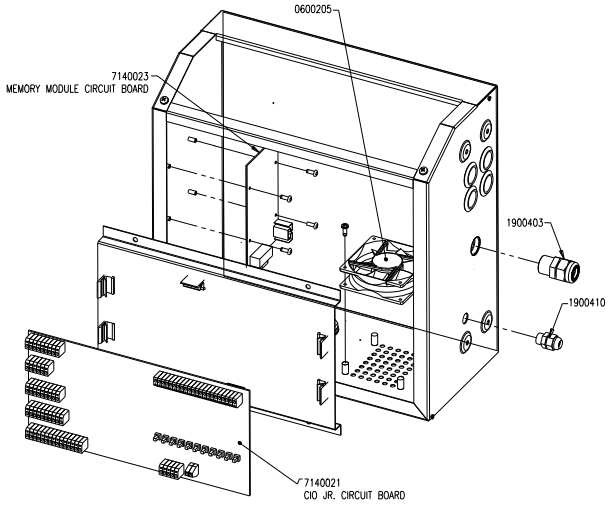
- Check for loose wire connections to CIO board.
- Check for adequate water pressure.
- Check for obstruction inside solenoid.
- Check condition of diaphragm inside solenoid.

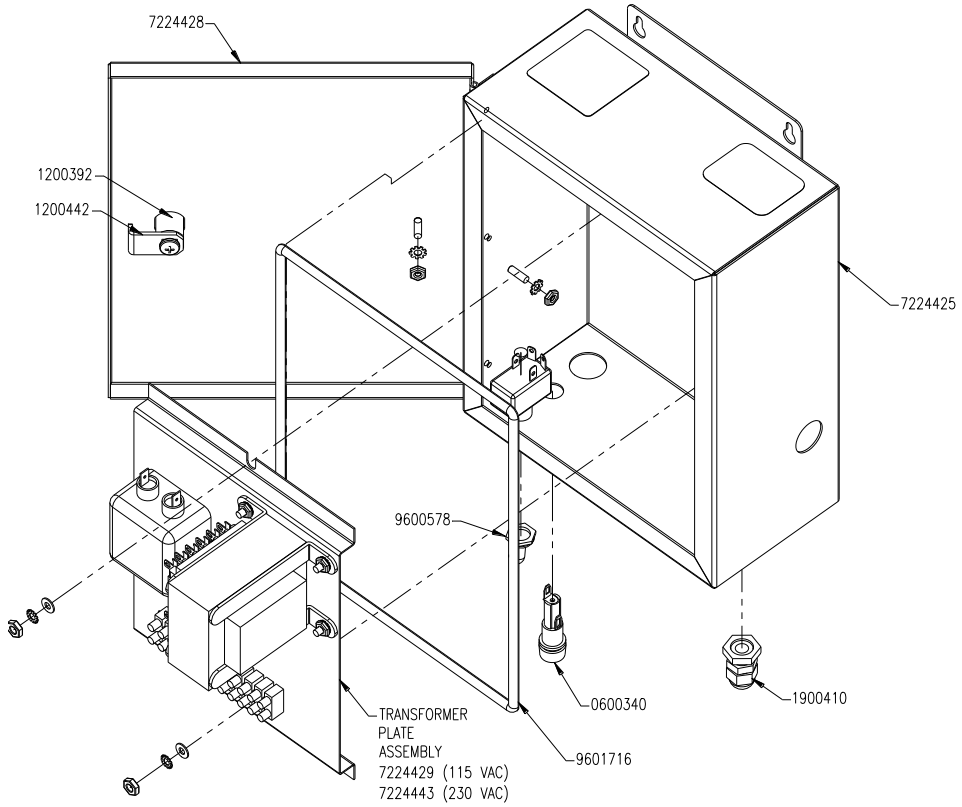
PARTS DIAGRAM — PUMP CABINET



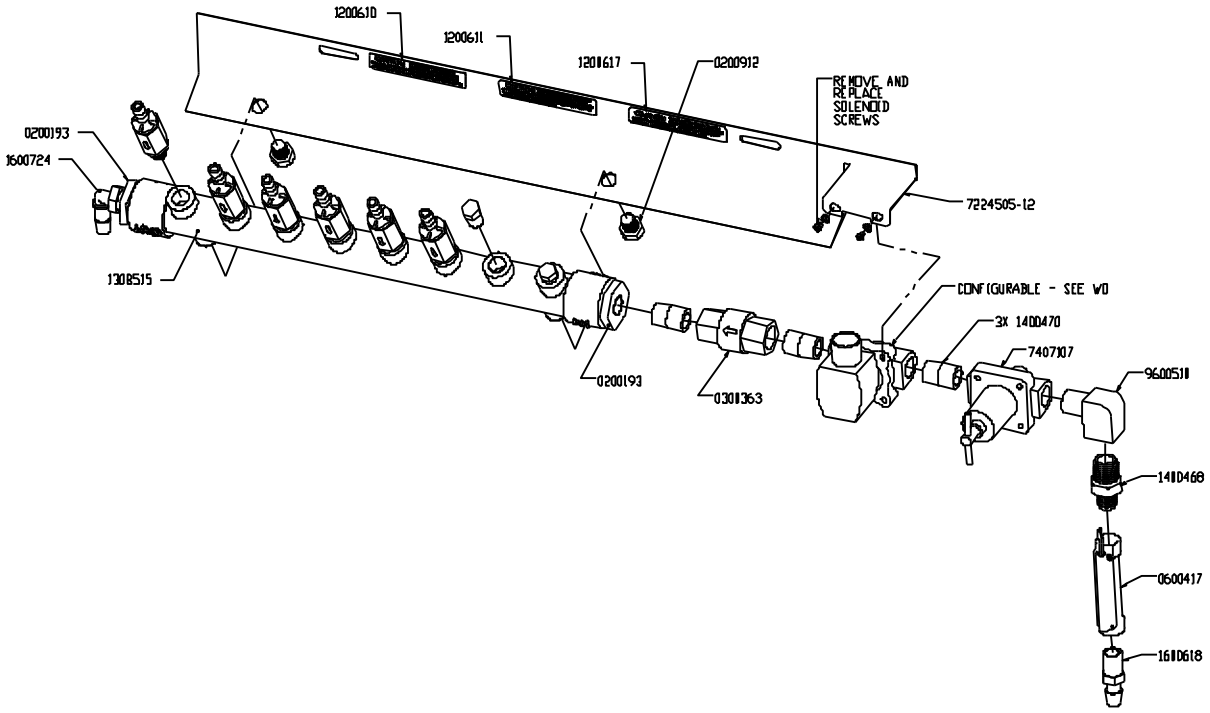
PARTS DIAGRAM — CONTROLLER & POWER SUPPLY

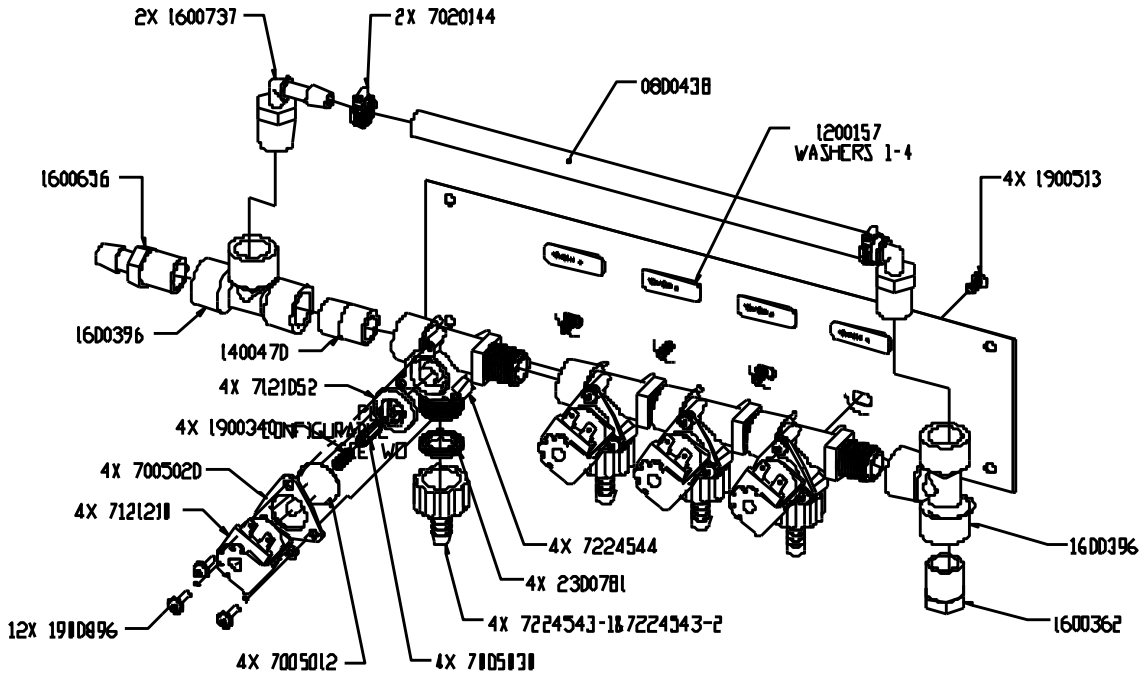




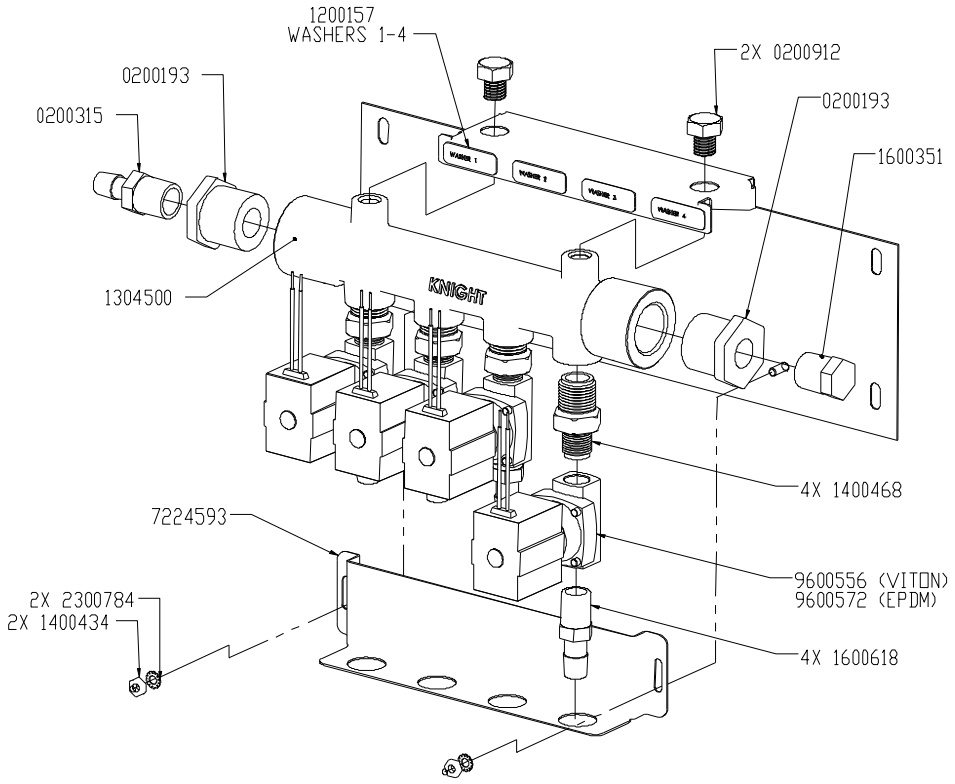


PARTS DIAGRAM — MANIFOLD & STANDARD DIVERTER





PARTS DIAGRAM — OPTIONAL DIVERTER



DISCLAIMER

Knight LLC 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 LLC. Knight products are not for use in potentially explosive environments. Any use of our equipment in such an environment is at the risk of the user, Knight does not accept any liability in such circumstances.

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.

FOOTNOTE

The information and specifications included in this publication were in effect at the time of approval for printing. Knight LLC reserves the right, however, to discontinue or change specifications or design at any time without notice and without incurring any obligation whatsoever.