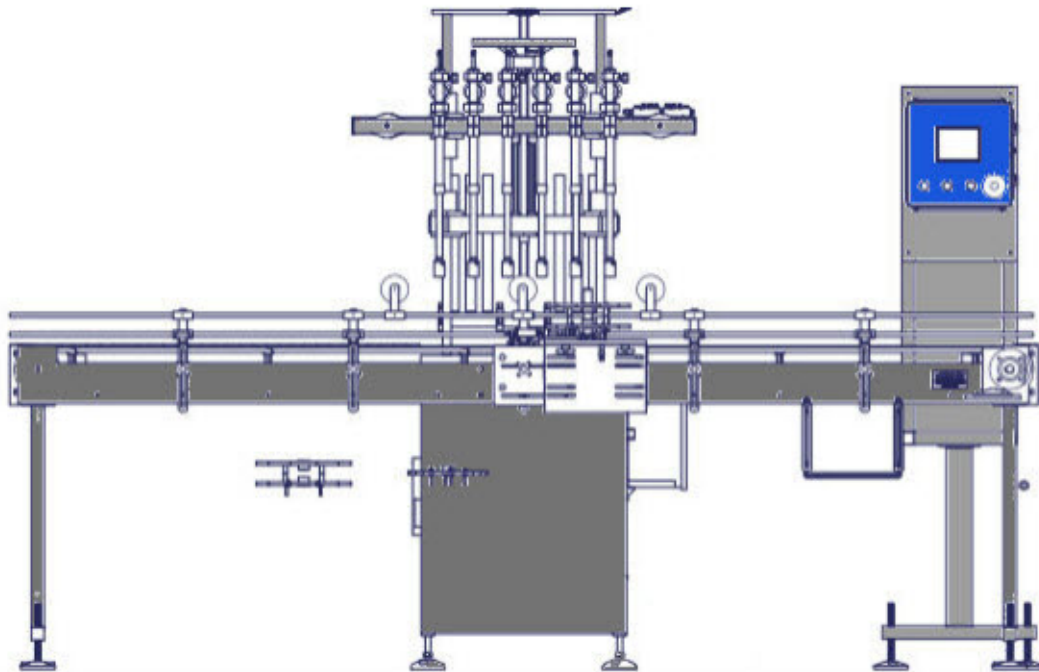


**INLINE FILLING SYSTEMS**

***IONIC AIR RINSER  
OPERATIONS MANUAL***



**FOOD SCIENCE CORP  
SN: 43202**

# IONIC AIR RINSER OPERATIONS MANUAL

<b>GENERAL INFORMATION – SECTION ONE</b> .....	<b>4</b>
<b>SAFETY REQUIREMENTS</b> .....	<b>5</b>
<b>WARNING</b> .....	<b>6</b>
<i>MACHINE CLASSIFICATIONS</i> .....	6
<i>AIR RINSER UTILITIES</i> .....	7
<b>AIR RINSER PLOT</b> .....	7
<i>FRONT VIEW</i> .....	8
<i>OVERHEAD VIEW</i> .....	9
<b>AIR RINSER OPERATIONS – SECTION TWO</b> .....	<b>12</b>
<i>OVERFLOW AIR RINSER STANDARD FEATURES LIST</i> .....	12
<i>MANUAL FORMAT</i> .....	13
<b>CONTROL PANEL OVERVIEW</b> .....	<b>14</b>
<i>EMERGENCY STOP</i> .....	14
<i>RUN/RESET/SETUP</i> .....	14
<i>POWER ON BUTTON</i> .....	15
<i>OPERATOR TOUCH-SCREEN</i> .....	15
<i>OPERATOR INTERFACE CONTROL (OIC)</i> .....	15
<i>RUN STARUP – USING GATES:</i> .....	16
<i>RUN STARTUP – USING A STAR-WHEEL</i> .....	18
<i>OPERATOR INTERFACE SCREENS</i> .....	19
<i>THE RESET SCREEN</i> .....	20
<i>RUN SCREEN</i> .....	21
<i>FUNCTIONS AVAILABLE ON THE MAIN RUN SCREEN</i> .....	21
<i>THE SETUP SCREEN - CHANGE SCREEN BUTTONS:</i> .....	22
<i>FILL SETTINGS SCREEN</i> .....	23
<i>GATE / STAR-WHEEL ROUTINES SCREEN – GATES SELECTED</i> .....	23
<i>STANDARD GATE FUNCTIONS</i> .....	24
<i>STAR-WHEEL AND GATE FUNCTIONS:</i> .....	25
<i>GATE / STAR-WHEEL ROUTINES SCREEN – STAR-WHEEL SELECTED</i> .....	26
<i>SAVE / LOAD DATA</i> .....	27
<i>SAVE LOAD WITH STAR-WHEEL</i> .....	27
<i>SAVE LOAD WITH GATES</i> .....	27
<i>VERIFY PRESET SAVE SCREEN</i> .....	28
<i>VERIFY LOAD SCREEN</i> .....	28
<i>CLEAN ROUTINES SCREEN</i> .....	30
<i>SPECIAL FUNCTIONS SCREEN 1</i> .....	31
<i>CONTACT INFORMATION</i> .....	31
<i>SPECIAL FUNCTIONS SCREEN 2</i> .....	32
<i>SUPPORT EQUIPMENT OVERVIEW</i> .....	33
<i>MECHANICAL ASSEMBLIES</i> .....	33
<i>AUTOMATION CONTROL:</i> .....	33
<i>ADJUSTING THE NOZZLE SUPPORT ASSEMBLY</i> .....	34
<i>IFS AIR RINSER DESCRIPTION</i> .....	35
<i>THE CLEANING PROCESS</i> .....	35
<i>THREE CLEANING VARIABLES</i> .....	36
<i>THE AIR RINSER NOZZLE</i> .....	37
<b>CONTAINER MANAGEMENT</b> .....	<b>38</b>
<i>OPTION – STAR-WHEEL INDEXING</i> .....	38
<i>STAR-WHEEL ASSEMBLY</i> .....	38
<i>STAR-WHEEL CONTROL AND BOTTLE DETECT SENSORS</i> .....	39
<i>STAR-WHEEL INFEEED PHOTO EYE</i> .....	39
<i>STAR-WHEEL PROXIMITY DETECTOR</i> .....	40

# IONIC AIR RINSER OPERATIONS MANUAL

<i>SEQUENCE OF OPERATIONS</i> .....	40
<i>INFEED TIMER</i> .....	40
<i>STAR-WHEEL CHANGE PARTS</i> .....	41
<i>OPTION - CONTAINER CONTROL SYSTEMS – GATE INDEXING</i> .....	42
<i>GATE (PIN) INDEXING</i> .....	42
<i>THE GATING SYSTEM ASSEMBLIES</i> .....	43
<i>GATE PIN INDEX TIMERS CONTROL</i> .....	44
<i>OUTGATE (INDEX) TIMER</i> .....	44
<i>INGATE (INFEED) TIME</i> .....	44
<i>GATE GAP TIMER</i> .....	45
<i>CONVEYOR RESTART DELAY</i> .....	46
<i>AUTOMATIC GATE SETUP</i> .....	46
<i>RUN MODE GATE TIMER SEQUENCE</i> .....	46
<i>PERFORMING AN AUTOGATE ROUTINE</i> .....	47
<i>PHOTO EYE SENSORS</i> .....	48
<i>PHOTO EYES: RETRO-REFLECTIVE</i> .....	48
<i>PHOTO EYES: THROUGH BEAM</i> .....	48
<i>EXAMPLE OF THROUGH BEAM SENSOR</i> .....	49
<i>PHOTO EYES: DIFFUSE REFLECTIVE</i> .....	49
<i>RETRO-REFLECTIVE OPTIC INSTALLED</i> .....	50
<i>FIBER OPTIC PHOTO EYES</i> .....	50
<i>FIBER-OPTIC COMPONENTS</i> .....	51
<i>OTHER PHOTO-EYE SELECTIONS</i> .....	51
<i>LINE LOCATIONS OF SENSORS</i> .....	52
<i>SEQUENCE OF SENSOR EVENTS</i> .....	52
<b>SMALL BOTTLE INDEX – X-GATE</b> .....	53
<i>SMALL BOTTLE INDEX – SEQUENCE OF OPERATION</i> .....	54
<b>PRIOR TO OPERATIONS – MACHINE AND LINE INSPECTION</b> .....	55
<b>SETTING UP FOR A NEW PRODUCT</b> .....	56
<i>SEQUENCE OF SETUP – CONTAINER MANAGEMENT</i> .....	57
<i>TEST YOUR MECHANICAL SETUP</i> .....	57
<i>SEQUENCE OF SETUP – PROGRAMMING PRODUCT DATA</i> .....	58
<b>PROCESS AND PRODUCT ANALYSIS</b> .....	59
<i>LINE SPEED</i> .....	60
<b>TROUBLESHOOTING GUIDE</b> .....	61
<i>NOZZLE IS MISSING THE BOTTLE OPENING</i> .....	61
<i>SYSTEM IS PAUSED AND NOT DISCHARGING THE CLEANED CONTAINERS</i> .....	61
<i>INGATE IS CLOSING TOO SOON</i> .....	61
<i>PHOTO EYES (PART 2)</i> .....	61
<i>AUTOGATE ROUTINE ERRORS</i> .....	62
<i>PHOTO EYES (PART 3)</i> .....	62
<i>PHOTO EYES (PART 4)</i> .....	62
<i>OUTGATE IS CATCHING BOTTLES</i> .....	62
<i>PUMP NOT RUNNING</i> .....	63
<i>PUMP NOT TURNING OFF</i> .....	63
<i>CONNECTING THE PNEUMATIC AIRLINES</i> .....	64
<i>QUICK RELEASE AIR FITTINGS</i> .....	64
<i>AIR RINSER HAS REDUCED VACUUM</i> .....	64
<b>AIR RINSER MAINTENANCE – SECTION THREE</b> .....	65
<i>CLEANING AND MACHINE LUBRICATION</i> .....	66
<i>COMMON MOVING ASSEMBLIES</i> .....	66
<i>IMPORTANT NOTE: HARSH ENVIRONMENTS WILL REQUIRE MORE FREQUENT INSPECTIONS AND CLEANING!</i> .....	66
<i>CARE AND CLEANING PNEUMATIC ACTUATORS</i> .....	67
<i>ACME ADJUSTING SCREWS</i> .....	67
<i>AIR FILTRATION AND PNEUMATICS</i> .....	68
<i>PREVENTIVE MAINTENANCE</i> .....	69
<i>PREVENTIVE MAINTENANCE EXAMPLE WORKSHEET</i> .....	70

# IONIC AIR RINSER OPERATIONS MANUAL

<i>REPLACEMENT PARTS</i> .....	71
<i>ELECTRICAL DIAGRAMS, MACHINE PARTS ASSEMBLIES, SETUP SHEETS AND PREVENTIVE MAINTENANCE DOCUMENTS:</i> .....	73

## IONIC AIR RINSER OPERATIONS MANUAL

### GENERAL INFORMATION – SECTION ONE

This manual contains descriptions and operational information on the following systems:

#### **AIR RINSER (IONIC RINSER)**

This manual has been designed for both experienced and new users. It is divided into three sections.

**SECTION ONE** discusses safety issues, has frame dimensional data and machine utility requirements.

**SECTION TWO** is a step by step guide to programming and operating this filling machine. This section will include setup checklists and product data sheets that you should use to document your product ‘runtime’ parameters. We also include our most current troubleshooting guide, describing some of the troublesome products we have encountered in the past, and the ‘real world’ solutions we have used to overcome particularly obnoxious product habits (unstable containers, missing container opening, etc.)

**SECTION THREE** is dedicated to maintenance, and service issues. This section will have parts list, exploded mechanical views, and electrical diagrams specific to your equipment. **NOTE:** IFS uses top of the line, field tested components to ensure our machines give you years of service. 90% of our machine components have no MTBF (mean time between failures) data, as we have no reported failures of the majority of the components. Wear components items include fluidic and mechanical seals, drive components, belts, and hoses. Suggested Spare Parts for your machine are included at the back of the manual. We will also include Preventive Maintenance and Product Setup Sheets that you should copy and distribute to your maintenance personnel.

To get the most out of your equipment, we recommend reading this entire manual before starting your installation.

## IONIC AIR RINSER OPERATIONS MANUAL

### SAFETY REQUIREMENTS

**NEVER** operate equipment prior to complete installation.

Electrical panels should only be serviced by qualified service technicians. All AC power cords should be unplugged, or service disconnected prior to opening system panels.

Unauthorized modifications to any component of the system could cause injury to personnel, and/or damage to the equipment. (This will usually void your warranty.)

**DO NOT** operate equipment without an adequate electrical ground. The next portion of this section contains proper grounding procedures.

**NOTE** location of system Emergency Stops and Run Switches. Advise all personnel as to these switch locations.

**DO NOT** reach hands into any moving machinery. Automated machinery should be switched to RESET when not in use or during operator 'breaks'.

Observe the normal safety precautions to ensure long hair or loose-fitting clothing will not be pulled into the moving components of any machine.

Ensure machine is unplugged prior to adjusting or servicing. IFS recommend having your electrician installing a lock out on the main power feed to the machine to avoid any chance of accidental switch activation.

Accessories or additional guarding may be required to comply with local or state OSHA regulations.

Other safety recommendations are included in the manual section where they apply.

All Programmable Logic Units (PLC) used in IFS equipment meet or exceed FCC requirements.

All primary control systems in PLC controlled machines produced by IFS are low current, 24 VDC. In spite of the inherent safety factor gained by using low voltage DC systems, it is still mandatory for all service to be performed by a qualified service technician.

## IONIC AIR RINSER OPERATIONS MANUAL

### **WARNING**

It is the responsibility of the user to determine the safety requirements of a new product. Please ensure all safety shrouds and panels are in place prior to putting any machine into service. IFS will not knowingly sell any machine working with flammable, hot or intrinsically dangerous fluids, without complete fill machine shrouding, an electrical interlock system, and all electrical components in compliance with applicable National Electric Codes and manufacturing standards.

### ***MACHINE CLASSIFICATIONS***

The following section is dedicated to machine descriptions. For the engineer planning a line installation, or for the installer of line processing equipment, this section will be a primary reference. It lists drive types, utility requirements, connector specifications, and dimensional data for all of the standard Inline Filling Systems product line.

### **EQUIPMENT CLASSIFICATIONS**

Packaging machines can be divided into several basic classes.

#### **Container Handling Equipment**

Conveyors, Turntable style Bottle Un-scramblers, Accumulating tables and Bottle Transfer systems.

#### **Liquid Filling Equipment**

IFS has a wide range of liquid filling machines. We recognize there is no single filling platform that works for all possible products. This is why IFS produces Gravity Fillers, Positive Displacement Multiple Pump Fillers, Piston Fillers, Overflow and Peristaltic Filling Machines.

#### **Container Post Processing Equipment**

These include Air Rinser systems, Labeling systems, Banding equipment and inkjet encoders.

#### **Capping and Sorting Equipment**

IFS manufacture a full range of Capping and Cap-tightening machines. Due to the wide range of cap types and shapes, we also offer several cap feeding and sorting systems.

### **MACHINE PHYSICAL DETAILS**

Machine descriptions include details of their utilities requirements, Utility Connections required by each machine class, machine specific physical dimensions (footprint), and Drive Information.

## IONIC AIR RINSER OPERATIONS MANUAL

### ***AIR RINSER UTILITIES***

**POWER:** Both 110VAC and 220VAC single phase units are manufactured by IFS. Your line plot will have the correct machine AC requirements and current load for filling machine.

**AIR:** IFS has standardized 80 PSI as the operating air pressure used by all of our automated machinery. For the specific CFM (Cubic feet / minute) figures of your machine, please reference your line plot. Typical usage is 13 CFM @ 80 PSI

### **PROGRAMMABLE LOGIC CONTROLLER**

IFS use Koyo and Allen Bradley PLC controllers in all capitol packaging equipment. Due to the low power consumption of these processors, and the low wattage characteristics of our control peripherals, total control functions consume less than 5A.

### **VACUUM**

The type and size of the vacuum is application specific. The primary power requirements are determined by the motors sized for the selected vacuum. The Line Voltages of your machine is listed on your Line Plot. Typical vacuum line load is 120VAC @ 12 A

### **AIR CONSUMPTION**

The Pneumatic control system on all of our fillers is generally set to 80PSI. Air consumption is very low with a typical requirement of 7 to 13CFM. This depends on the pressures set for the rinser system.

### **AIR RINSER PLOT**

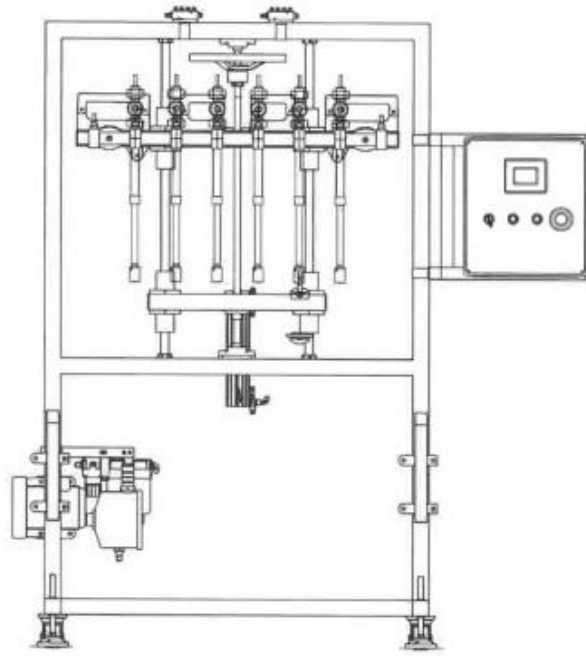
The IFS Econo Air Rinser has kept its same general dimensions since its initial design in 1996. The cabinet is 24" wide by 24" long. Cabinet height is 32" and the upper nozzle support structure is 40" tall.

# IONIC AIR RINSER OPERATIONS MANUAL

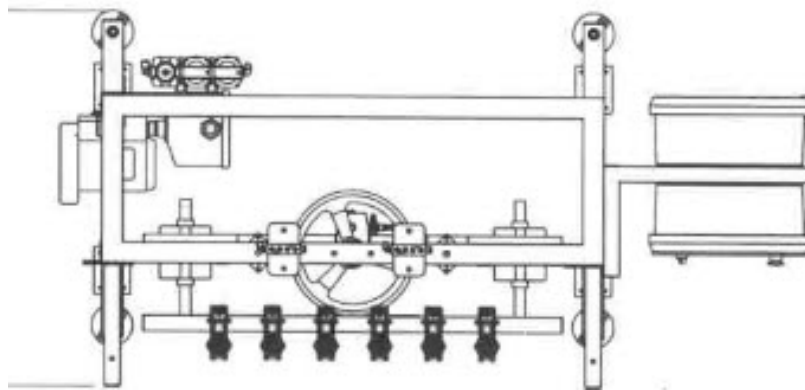
## *FRONT VIEW*



# IONIC AIR RINSER OPERATIONS MANUAL



## *OVERHEAD VIEW*



## IONIC AIR RINSER OPERATIONS MANUAL

### MACHINE INSTALLATION OVERVIEW

#### NOTE ON LINE CHANGES AND FUTURE ADDITIONS

Once your machines are in production, it is time consuming and costly to make drastic changes to your line. When analyzing your plant, always consider your future needs. **EXAMPLE:** You anticipate adding a labeling system in two quarters. The additional conveyor needed is a small incremental cost, compared to taking your line out of production to extend your existing conveyor.

#### SEQUENCE OF LINE SETUP

Line setup has a simple logical format.

#### PRIOR TO RECEIVING THE DELIVERY

Ensure your pallet jacks or fork truck is in good working order  
Assign adequate personnel to assist in removing machines from crate.  
Allocate a 'staging area' for the crates close to the line setup area.

#### UPON RECEIPT OF THE LINE

1. Inspect equipment for shipping damage
2. Check delivery against bill of lading.
3. Please immediately advise both the shipping company and Inline Filling Systems if equipment arrives damaged, or if parts are missing.

#### SETUP SEQUENCE

1. Setup the conveyor system. Assemble modules. Set height, level, and line to line transfer points.
2. Setup Unscrambler. Set height, levels and transfers.
3. Setup the Filler. Align to conveyor, set height, and level machine.
4. Setup Accumulating table. Align to conveyor, set height and level machine.

#### SUMMARY

There are three (3) 'legs' that a perfect installation is built upon.

## IONIC AIR RINSER OPERATIONS MANUAL

### **Planning**

Completely define your packaging needs prior to ordering. Have your line marked out, support personnel assigned, and utilities in place prior to installation.

### **Communication**

During the entire planning, design, and setup process, our knowledgeable sales and application engineering staff are here to assist you in creating a powerful and flexible system specifically tailored to your production needs.

### **Training**

IFS offers in-depth FREE training of your production personnel at our lab and packaging facility. **NOTE: Even if our trained personnel are installing your line, please have your production and maintenance personnel read this material and be involved with the setup. Many of the production problems we have encountered at customer facilities are due to such simple things as loose bolts or out of level conveyors.**

## IONIC AIR RINSER OPERATIONS MANUAL

### AIR RINSER OPERATIONS – SECTION TWO

This section will guide your operators step by step through the application setup procedures and operation of your air Rinser. The picture below shows the components of a typical Rinser.

**NOTE: Components such as Vacuum type and nozzles may differ from machine to machine. This is due to product specific requirements of the container dimensions and opening.**



#### ***OVERFLOW AIR RINSER STANDARD FEATURES LIST***

1. Box Open-frame architecture.
2. Pneumatic actuating nozzle support system.
3. Multiple nozzle sizes easily integrated.
4. Control of multiple pump types from same platform.
5. Nozzle height adjustment.
6. Integrated color touch screen Visual display unit (VDU) for operator / machine communications.
7. Option for: Multiple sensors to control the automation process.
8. Option for: Pneumatic 'gating' or Star-wheel system to control containers under the nozzles.

## IONIC AIR RINSER OPERATIONS MANUAL

### ***MANUAL FORMAT***

The remainder of this manual is laid out in the following order.

### **OPERATOR CONTROL PANEL**

Function of all switches and Operator Panel Controls of the VDU.

Menu system of the user interface (VDU) with detailed description of the various machine control routines (programs) available

'Flow' chart of the VDU menu system.

### **AUTOMATION SUPPORT**

Function and description of the sensors used to control the machine automation

Function and description of the Container Gating System used to control container flow.

Container control setup

Adjusting the nozzle assembly

Air Rinser ionizer settings

### **APPLICATION SETUP**

Line/Machine inspection

Application Procedure check list

Setting product 'parameters' (Vacuum timer, gate timing, etc.)

Product Data Sheets

'Run' operation checklist.

### **APPLICATION TROUBLESHOOTING GUIDE**

This will have solutions to the most common problems we have encountered both in the field, and at our own processing and packaging facility.

### **SUMMARY**

The quickest way to 'Master' setup and operation of any processing machine is to consistently use a systematic approach to each application. After setting up and running a couple of applications, you will be pleasantly surprised at how easy it is to setup for a new product.

## AIR RINSER OPERATIONS MANUAL

### CONTROL PANEL OVERVIEW

The control panel is a NEMA 4 Enclosure with installed Touch-Screen. The available controls are the Emergency Stop Switch, the Run/Reset/Setup switch, and the touch screen operators. See below:



#### ***EMERGENCY STOP***

Push for off, mushroom head switch. The E-stop is used to turn off all electrical to the rinsing machine.

#### ***RUN/RESET/SETUP***

Three (3) position, maintained contact switch.

- **RUN** - 'Working' mode of Air Rinser.
- **SETUP**- Enable the menu-based user interface. When switched to MENU, most of the programming functions become active. This is where run time parameters are set for your containers. The menu also contains a user product memory to store various system control times, and utilities for bottle counter, and to assist in machine setup. The menu system will be explained in detail later in this section.
- **RESET**- Default 'wait' state of the machine when not in Run or Setup. This position resets the vacuum, gating or star-wheel systems, ionizer, etc.

# AIR RINSER OPERATIONS MANUAL

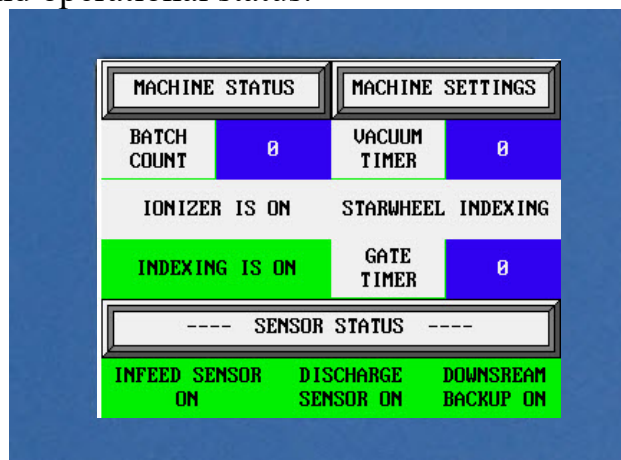
## ***POWER ON BUTTON***

Located on the side of the control box to power up the Air Rinser.



## ***OPERATOR TOUCH-SCREEN***

Used for operator / machine communications. All the various user modifiable parameters are displayed in the user interface menu system. This color graphic panel is used to program the rinsing machine. It also displays machine functions such as sensor status, run time parameters, and reports machine errors and operational status.



## ***OPERATOR INTERFACE CONTROL (OIC)***

The operator interface has different functions available depending on the current operating mode of the rinsing machine.

## AIR RINSER OPERATIONS MANUAL

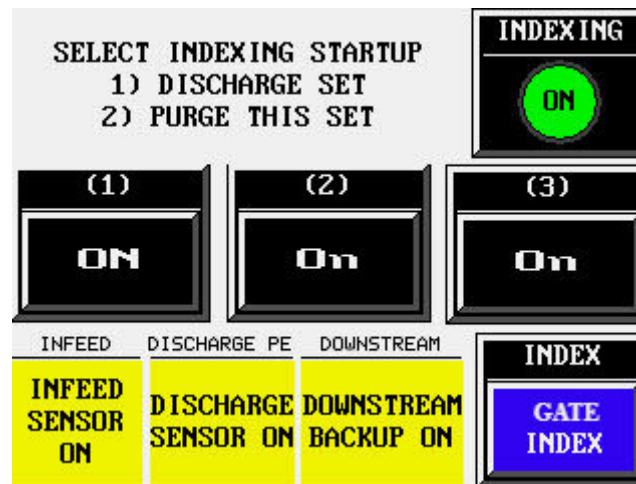
**RESET:** This mode pauses the machine. Reset turns off pump, and switches pneumatics to their 'off' settings. For rinsing Machines, this will mean the nozzles are retracted (Nozzle support system will be UP). Also, any bottle indexing system such as pin gating systems will be CLOSED. Timing screws and star-wheel indexing systems will also be turned off.

**SETUP:** By switching to Setup, you are telling the machine you will be programming functions, running diagnostics or setup routine, or performing special operations such as CLEANING.

**RUN:** After all run time parameters are set, switching the machine to RUN will start the run cycle. When first switched to RUN, a screen opens that request the operator select the initial run operation. Depending on the bottle management system selected, a startup screen is first displayed.

### ***RUN STARUP – USING GATES:***

Containers on the conveyor are managed by either a pair of pneumatic gates or a Star-wheel system. These are explained in detail later in this section. Both the control strategy and the programming are different for these two systems. The startup screen for Gates is shown below.



1. If the bottles are full, the operator can choose to let the bottles exit, then fill the next group of containers.

**NOTE:** If there are no containers under the fill nozzles, the **NO BOTTLE/NO FILL** routines will not allow the machine to start a fill cycle. Accidental covering of both photo eyes in the fill area will

## AIR RINSER OPERATIONS MANUAL

**result in the fill heads coming down. If there are no fill operations needed, do not leave the Air Rinser in RUN.**

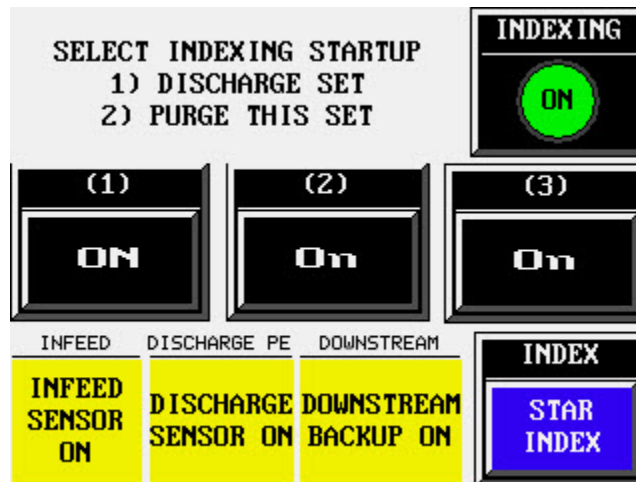
2. If the bottles under the nozzle are empty, the operator will choose to fill the containers.
3. If there are no containers in the rinsing area, the operator can start a new rinsing cycle.

After the initial run is selected, the RUN screen has multiple machine status indicators displaying nozzle operations, and status of the float systems and sensors.

## AIR RINSER OPERATIONS MANUAL

### ***RUN STARTUP – USING A STAR-WHEEL***

If a star-wheel is used for bottle management, there is no installed INFEED GATE. This startup screen is shown below.



1. If the bottles are full, the operator can choose to let the bottles exit, then fill the next group of containers.

**NOTE: If there are no containers under the fill nozzles, the NO BOTTLE/NO FILL routines will not allow the machine to start a fill cycle. Accidental covering of both photo eyes in the fill area will result in the fill heads coming down. If there are no fill operations needed, do not leave the Air Rinser in RUN.**

2. If the bottles under the nozzle are empty, the operator will choose to fill the containers.

After the initial run is selected, the RUN screen has multiple machine status indicators displaying nozzle operations, and status of the float systems and sensors.

## AIR RINSER OPERATIONS MANUAL

### ***OPERATOR INTERFACE SCREENS***

The touch screen operator interface is used to setup and run the machine. It allows the operator to quickly view and change operating values and settings. The screen below shows the typical layout of the touch screens on this machine. At the top of the screen is the Screen Title. Buttons on the touch screen are operated by simply pressing them like a mechanical push button operator. There are two types of push button operators.

**SCREEN CHANGE FUNCTIONS:** These buttons will open a screen with common grouped functions.

**PUSH BUTTON (MANUAL) OPERATORS:** These buttons are generally used to activate or disable a specific device or machine function.



**INDICATORS:** There are two (2) kinds of Display indicators. The **SENSOR STATUS** indicator shows the current condition of a sensor or device. The second kind is used to **DISPLAY INFORMATION**.

1. **SENSOR OR DEVICE STATUS:** Automated machines are controlled by various sensors. Sensor (or device) status can report events such as 'the transfer pump is on', or a photo-eye has a container in front of it.
2. **DISPLAY INFORMATION:** Typically, the numeric settings of programmed functions are displayed by these indicators.

## AIR RINSER OPERATIONS MANUAL

### *THE RESET SCREEN*

When switched to RESET, the following screen is displayed. This mode will halt any currently running operation. In reset, the drives and pneumatics are disabled, and various controls functions are reset to their default settings.



This screen has no programming operators. The other available options are to switch the Air Rinsers to RUN or SETUP.

## AIR RINSER OPERATIONS MANUAL

### ***RUN SCREEN***

RUN mode is the operating mode of the machine. The machine should be in Run mode only during production and should not be left in Run when events on the line require the Air Rinsler to be idle. As a safety measure, when the Air Rinsler is not in production, always switch the Air Rinsler to RESET.

MACHINE STATUS		MACHINE SETTINGS	
BATCH COUNT	0	VACUUM TIMER	0
IONIZER IS ON		STARWHEEL INDEXING	
INDEXING IS ON		GATE TIMER	0
---- SENSOR STATUS ----			
INFEED SENSOR ON	DISCHARGE SENSOR ON	DOWNSREAM BACKUP ON	

### ***FUNCTIONS AVAILABLE ON THE MAIN RUN SCREEN***

**INDICATORS:** The run screen consists mostly of INDICATORS reporting the following conditions:

1. Air Rinsler Vacuum cycle timers.
2. Displays if gate or star-wheel indexing is selected.
3. Current gate or star-wheel index time
4. Sensor status

## AIR RINSER OPERATIONS MANUAL

### ***THE SETUP SCREEN - CHANGE SCREEN BUTTONS:***

When the Air Rinser is switched to SETUP, this is the main screen shown. There are five (5) Screen change buttons available on this screen.



**AIR RINSER SETTINGS:** The fill settings screen has routines to set individual pump run times including after fill Dwell.

**GATES / STAR-WHEEL:** This screen is where the bottle indexing control and parameters are set for both standard Gating and Star-wheel Gating.

**MANUAL OPERATIONS:** This screen allows manual cycling of the pneumatic devices such as the Drip Tray, and Gate cylinders.

**SPECIAL FUNCTIONS:** This Special Functions screen has a group of routines that are not used as frequently in programming such as batch counters. Screen functions will be detailed later in this section.

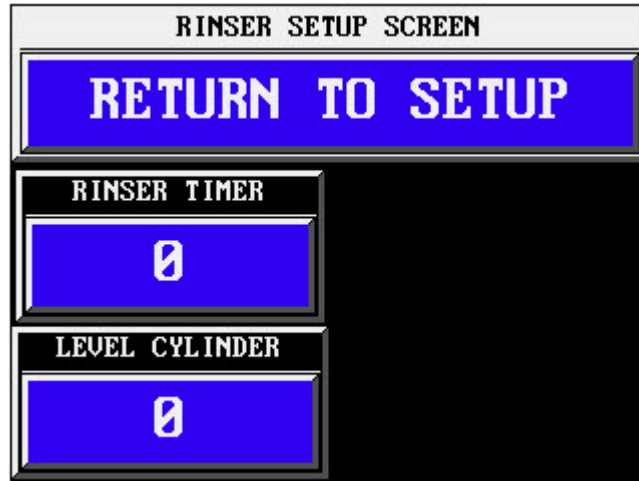
**SAVE/LOAD DATA:** After programming the Air Rinser runtime data, use this screen to SAVE your setup to a product code. After a product has been saved, the programmed data can be LOADED, setting the machine to the saved parameters.

**CLEAN MODE:** Selects functions relevant to various Air Rinser cleaning operations.

## AIR RINSER OPERATIONS MANUAL

### ***FILL SETTINGS SCREEN***

The Filler Setup Screen is where you will set the timers controlling the individual fill portions of the rinsing cycle.



**RINSER TIMER:** Select these functions to set the pump fill cycle timers. These should be sufficient time to completely fill all containers. Staging will be discussed later in this section.

**LEVEL CYLINDER:** The time for the level cylinder to complete its stroke.

### ***GATE / STAR-WHEEL ROUTINES SCREEN – GATES SELECTED***

Setting up bottle your bottle management is the first task in programming for a new container. Gating (also called indexing) refers to the process of controlling the containers under the rinsing nozzles. The Gating screen has a group of programming aids that are used to set the runtime parameters required for both pin and star-wheel indexing. **NOTE:** The special functions screen allows selection of either pin gate indexing or star-wheel indexing. Shown below is the gate timer control screen. The following pages describe these functions.

## AIR RINSER OPERATIONS MANUAL



### ***STANDARD GATE FUNCTIONS***

When the Indexing Mode is toggled to GATE, the following operators are available on the two gate screens.

**RUN AUTOMATIC GATE:** This push button operator runs a routine that helps set the gate index time for a container. This time can also be manually adjusted. The current times are displayed on the screen. Running the Autogate routine will be detailed later in this section.

**INFEED DELAY TIMER:** This function is used to introduce a delay after the bottles discharge from the OUTGATE and the INGATE opening to admit new containers.

**GATE INDEX TIMER:** Displays the current gate index time. Pressing this operator opens a numeric keypad which allows manual entry of the ingate time. (This time is initially set by auto the autogate function.)

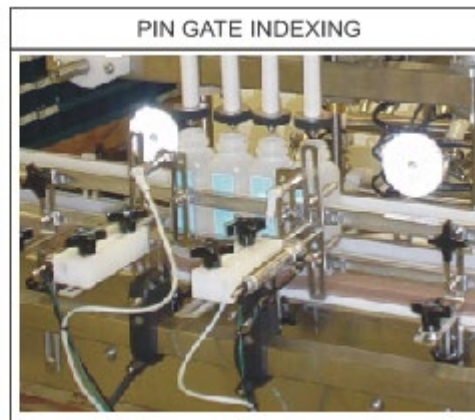
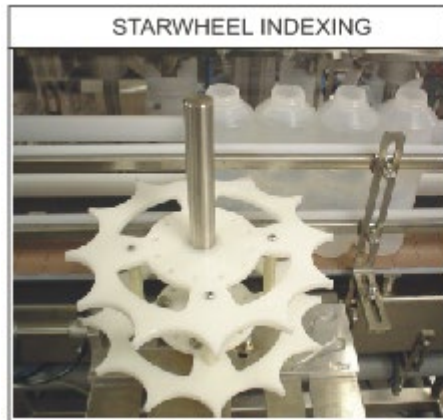
**SET GATE GAP:** Sets the gap time between the outgate opening (discharging containers), and the Ingate opening (Empty containers enter rinsing area.)

**CONVEYOR RESTART DELAY:** The function is used to establish a short delay between the time the outgate opens, and the time the conveyor starts. This is typically used when the conveyor is running at high speeds. Setting a short delay will allow the gate to fully retract prior to discharging the filled containers.

## AIR RINSER OPERATIONS MANUAL

### ***STAR-WHEEL AND GATE FUNCTIONS:***

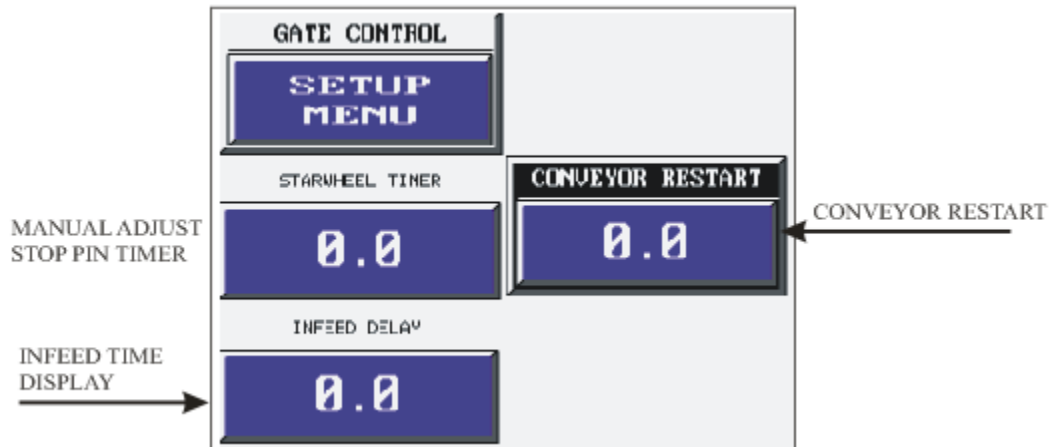
The star-wheel does not typically require an In-gate. When the Air Rinser is using a star-wheel to index containers, the timers are used to manage the star-wheel. The two bottle management systems are shown below. We will be detailing setup and operation of the gating and star-wheel system later in this section.



## AIR RINSER OPERATIONS MANUAL

### ***GATE / STAR-WHEEL ROUTINES SCREEN – STAR-WHEEL SELECTED***

When the Indexing Mode is toggled to STAR-WHEEL, the following operators are available on the two gate screens. The star-wheel programming screen is shown below.



**STAR-WHEEL TIMER:** Displays the current star-wheel time. Pressing this operator opens a numeric keypad which allows manual entry of the star-wheel time. (We will go into more detail on star-wheel bottle management later in this section.)

**INFEEED DELAY TIMER:** This function is used to introduce a delay after bottles are detected by the infeed photo eye and the start of the rinsing cycle.

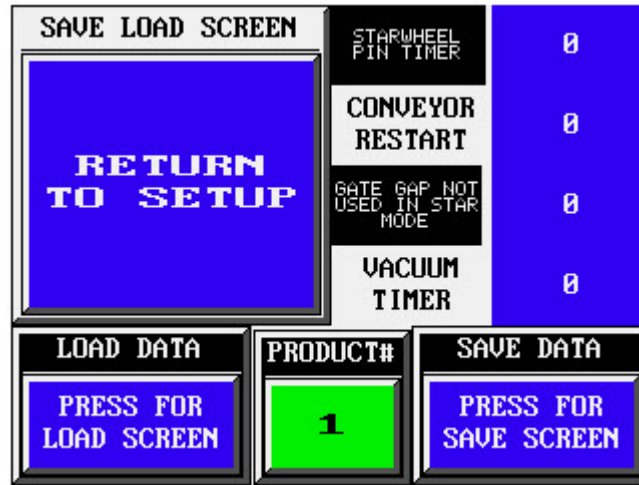
**CONVEYOR RESTART DELAY:** The function is used to establish a short delay between the time the star-wheel stop pin releasing the wheel, and the time the conveyor starts. This is typically used when the conveyor is running at high speeds. Setting a short delay will allow the stop pin to fully retract prior to discharging the filled containers.

# AIR RINSER OPERATIONS MANUAL

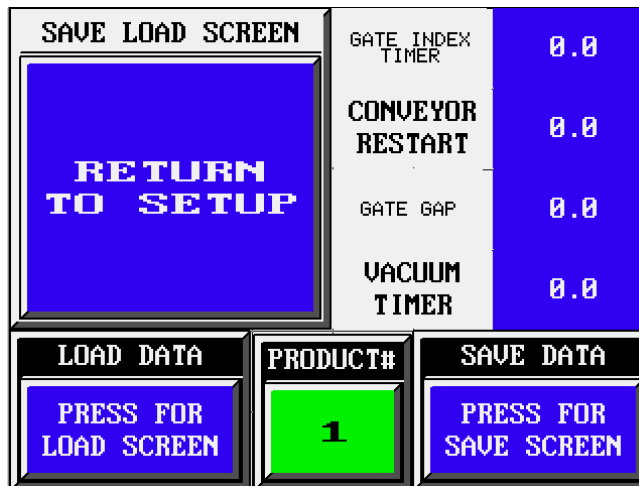
## *SAVE / LOAD DATA*

The operating data for a product is a 'recipe' for running the product correctly. All of this data is saved to a unique product number. **NOTE:** The data displayed is dependent on which mode of bottle control is selected.

## *SAVE LOAD WITH STAR-WHEEL*



## *SAVE LOAD WITH GATES*



## AIR RINSER OPERATIONS MANUAL

### DISPLAYED DATA RECIPE

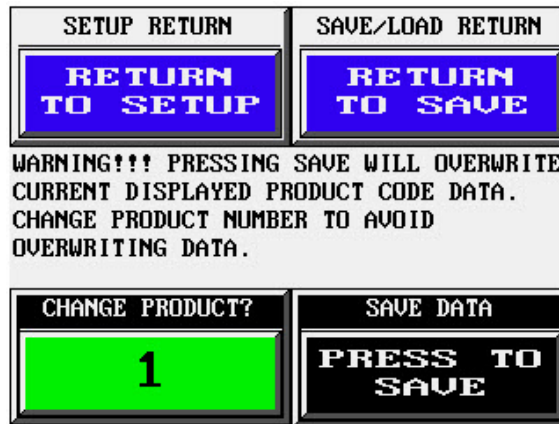
The numbers displayed on this screen are for the current Air Rinser recipe. The displayed information is all of the operating parameters that are saved for a product. To SAVE this recipe information, the operator should first assign a Product number to the program. After a product has been saved, it can be LOADED again, simply by selecting the product number then pressing LOAD DATA.

### SAVE DATA SEQUENCE

1. Press Product# to bring up a numeric entry screen.
2. Type in the new product number and hit enter to accept the number and return to the save data screen.
3. Press SAVE DATA Key.

**NOTE: if a new product code was not selected, the current data can be overwritten. The Air Rinser has a safety screen that verifies if the operator wants to overwrite the current product code.**

### VERIFY PRESET SAVE SCREEN



4. Press CHANGE PRODUCT if you don't want to overwrite the current preset. If you want to overwrite the current settings, press CONTINUE WITH SAVE if you want to overwrite the current selected program.

### VERIFY LOAD SCREEN

The Load screen also warns the current data will be overwritten.

# AIR RINSER OPERATIONS MANUAL



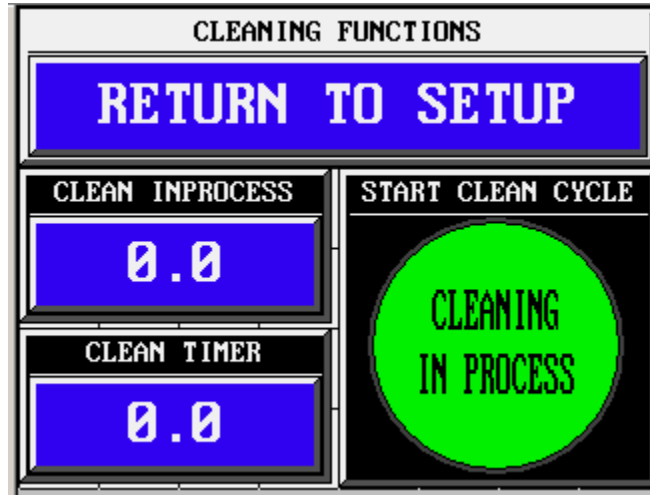
WARNING!!! PRESSING LOAD WILL OVERWRITE  
CURRENT OPERATING PRODUCT CODE DATA. TO  
AVOID LOSING YOUR CURRENT OPERATING DATA  
>SAVE< TO A NEW PRODUCT NUMBER



## AIR RINSER OPERATIONS MANUAL

### ***CLEAN ROUTINES SCREEN***

Selecting the CLEANING ROUTINES button brings up the following screen. This screen also has several Manual Operators for operating the air rinser.



### **CLEAN RINSE TIMER**

The clean timer can be set to 999.9 seconds of operation.

### **CLEAN RINSE IN PROCESS**

This is a countdown timer. While the rinse is in process, this will display the current time.

### **START CLEAN CYCLE**

Press this operator to start the rinse cycle.

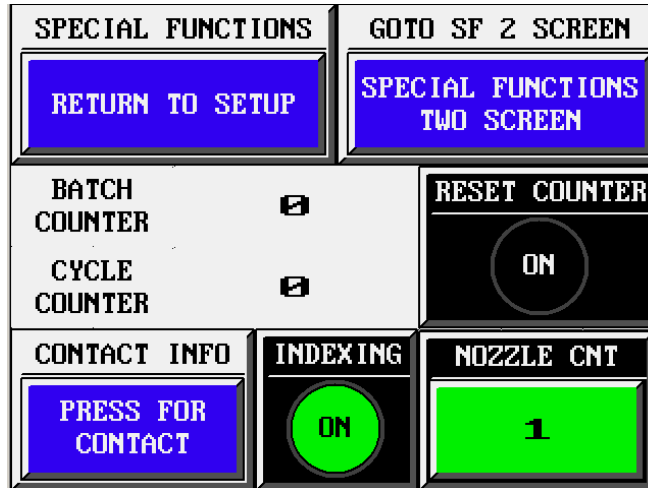
### **CLEAN CYCLE**

1. Set the air rinse pressure gauge to at least 50%
2. Set the clean Timer.
3. Press the start clean cycle.
4. The nozzles lower into the staged empty containers.

## AIR RINSER OPERATIONS MANUAL

### *SPECIAL FUNCTIONS SCREEN 1*

This menu select button takes you to the following screen. The bottle and cycle count is displayed. Pressing RESET COUNTER resets both batch counters



### *CONTACT INFORMATION*

The contact screen has phone and e-mail contact information for our parts department and technical support.

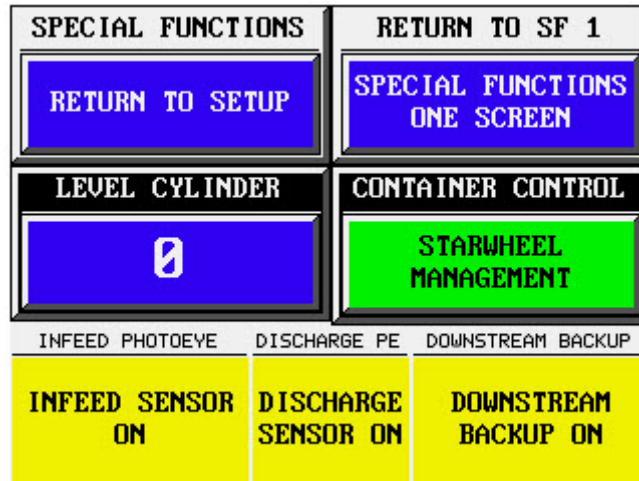


# AIR RINSER OPERATIONS MANUAL

## ***SPECIAL FUNCTIONS SCREEN 2***

Pressing GOTO SF 2 SCREEN takes you to the following screen. These utilities are used to modify count for the numbers of nozzles installed on the Air Rinser. (The Air Rinser has a very simple nozzle expansion capability.)

The LEVEL cylinder timer can also be set here. The bottle management system can be switched between gate indexing and star-wheel indexing. The Air Rinser sensors current status is displayed across the bottom of the screen.



## AIR RINSER OPERATIONS MANUAL

### ***SUPPORT EQUIPMENT OVERVIEW***

Common to all automated processing equipment is the need for both container management and process point detection. The following section will describe the machine accessories and sensors used by IFS for these purposes. These consist of mechanical assemblies controlled by the rinsing machine, or sensors that assist the automation of the machine

### ***MECHANICAL ASSEMBLIES***

The rinsing machine is much more than a pump and nozzles, A powerful rinsing system will control containers, manage drip after the rinsing cycle, and have multiple simple adjustment points to allow operation on a large range of containers.

**STAR-WHEEL – PIN INDEX GATING SYSTEM:** These two indexing systems are used to separate, align, and control groups of containers into and out of the rinsing area.

**NECK GRABBERS:** Neck grabbers are used to control the precise position of the top of the container under the rinsing nozzles.

**NOZZLE HEIGHT:** The nozzle support and level cylinder control mechanisms are used to position the nozzles, and to insert the nozzles into the containers for the rinsing operation.

### ***AUTOMATION CONTROL:***

The rinsing process is controlled by a Programmable Logic Controller (PLC). This industrial computer depends on a sensor suite to control many of its processes. The automation upgrade package includes the sensors listed below

**SENSOR UPGRADE:** Sensors are used to detect the motion, size, speed, and location of containers. The choice of sensors is generally determined by the characteristics of the containers, or to compensate for difficult rinsing environments. **EXAMPLE:** Clear bottles require a very discriminating photo-eye. Small containers may require a Fiber Optic due to the size of the container. Sensors are discussed in detail later in this section.

## AIR RINSER OPERATIONS MANUAL

### ***ADJUSTING THE NOZZLE SUPPORT ASSEMBLY***

IFS Air Rinsers have two (2) methods for adjusting the nozzle support bar. Most rinsing machines have a fixed assembly, which will not adjust horizontally, and has only limited adjustment side to side. On some containers, this would force you to move the Air Rinser or conveyor. Containers with a non-centric opening can be troublesome to set up. It also means that both rail systems must be adjusted for every container change. Even with our 'no tool' rail system, this can be time consuming on medium to large rinsing lines. Our nozzle support can be reset for a new product run as quickly as you can loosen a couple screws. With this system, you only have to adjust one set of conveyor rails to reconfigure for your next containers.

**NOTE: The container does not have to be centered under nozzle rack. Loosen Allen screws on the four set collars (5/32 Allen wrench). Place fingers on back edge of the nozzle support bar (approximately at the support shafts.). Press your thumbs against plastic bearing face using uniform pressure from both hands. Bar will slide easily, as long as care is taken to not 'torque' the bar. (i.e. applying uneven pressures on opposite sides of the bar.) Be sure to tighten Collar set screws when you are finished.**

## AIR RINSER OPERATIONS MANUAL

### ***IFS AIR RINSER DESCRIPTION***

The IFS Ionic Air Rinsers were developed to clean plastic and glass containers. Both plastic and glass have high dielectric constants, which allow them to take on a relatively large static electrical charge. The residue common to molded containers includes: Fine plastic shavings, dust, and particles from the cardboard containers the bottles are typically packaged in. IFS uses a unique Ion Generator developed for the microprocessor industry for cleaning solid state 'chip' substrate. Pressurized ionized air is used to purge the bottles while a dual turbine high efficiency vacuum removes the particulates.

### ***THE CLEANING PROCESS***

The pressurized air is first passed through a dual filter element, reducing any particulates by 99.97% (HEPA rating). (**NOTE:** Plant Air must be free of hydrocarbons for this cleaning application.) The first stage filter has a 5micron element, and the second stage filter has a .3-micron element and a mist coalescer to remove water traces. This high level of filtration is in accordance with the HEPA (High Efficiency Particulate Air-filter) industry guidelines. This ensures the machine is not adding any additional contaminants to the bottles during the cleaning process. The clean filtered air is then passed through the ionizer. The air path is isolated from electrical ground to reduce ion loss through the nozzle. Once discharged into the container, the ionized air creates an identical electrical charge in the both material of the bottle and any particulates. Because the bottle and particles have the same electrical charge, they repel each other. This is similar to the way two magnets repel each other when the same poles are placed in close proximity. As this ionized air stream enters the container, a vortex (cyclone like action) is created. This agitates debris and dust inside the bottles, while lifting the particles in a spiral. This spiral action is needed to assist scrubbing the inner container surface, and to present particles suspended in the air-stream to the vacuum aperture. As the rising column of air and particles passes the nozzle, the vacuum port on the side of the nozzle pulls in a large portion of the air. (**NOTE:** Some of the air/particle stream is purged out the top of the container.)

## AIR RINSER OPERATIONS MANUAL

### *THREE CLEANING VARIABLES*

**Air Pressure:** Sufficient air pressure is required to help break the charged particles loose from the container sides. Container width is a factor in pressure. Wider containers require higher pressures. Typical pressures are from 20 to 45 PSI

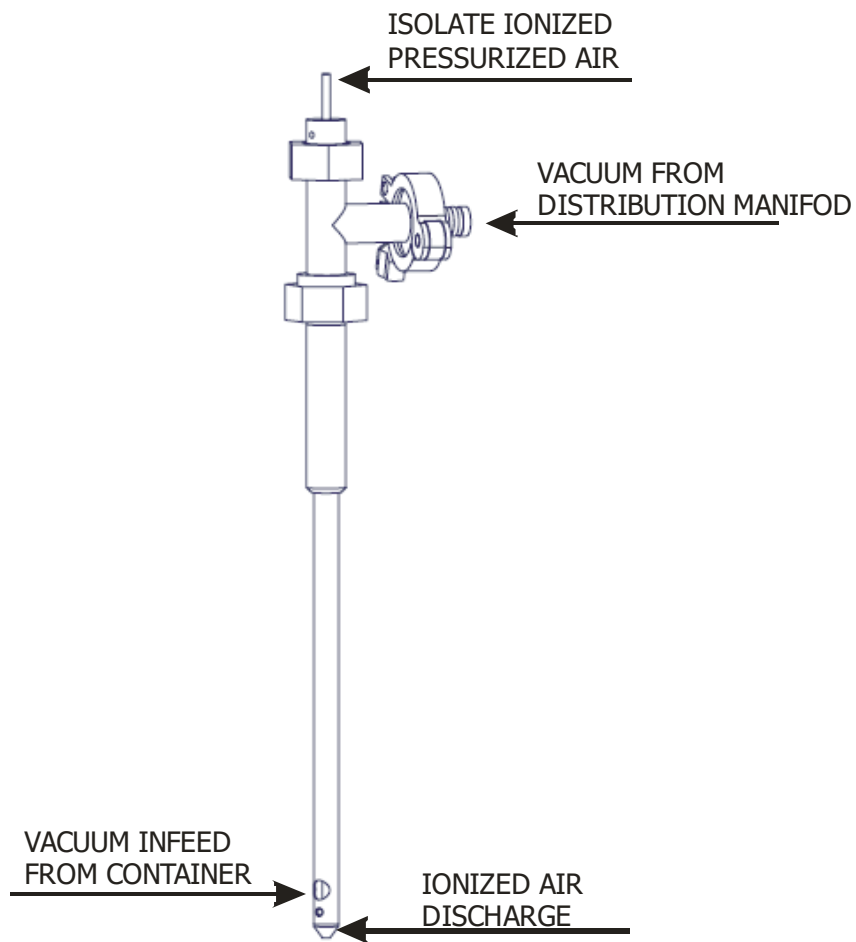
**Nozzle Depth:** The nozzle needs to be at a reasonable depth in the bottle. Correct placement of the nozzle is required to achieve a vortex. This is usually about 1/3 of the way into the bottle. The nozzle depth and air pressure work together to achieve the cleaning 'vortex' mentioned above.

**Nozzle Dwell:** The last element of the cleaning equation is the resident time the nozzle is in the container. There must be sufficient time for the airflow to scrub the container walls and the vacuum to remove the particles. Times of two to three seconds are not uncommon for 500 to 1000 ml bottles.

## AIR RINSER OPERATIONS MANUAL

### *THE AIR RINSER NOZZLE*

The nozzle IFS has developed for the ionic air rinser is shown below.



Ionized air is directed into the container at a user set pressure. The Guide tube is electrically isolated from the common ground of the air rinser. The side ported vacuum infeed is used to pick up any small debris inside the container while suspended in the ionizer air stream.

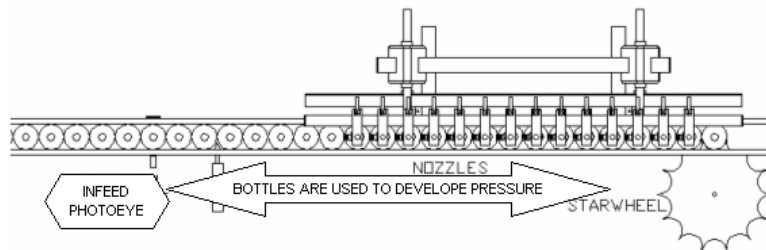
# AIR RINSER OPERATIONS MANUAL

## CONTAINER MANAGEMENT

This section will discuss the automation components used for container management.

### ***OPTION – STAR-WHEEL INDEXING***

Pictured below is a standard setup for a star-wheel indexing system. The primary components are the star-wheel mechanism, and the Infeed photo eye.



Star wheel indexing mode is a high-speed indexing method used to rapidly move the bottles through the Air Rinser. A custom star wheel with slots that precisely fit the container is rotated by the filled exiting bottles, allowing the next set of bottles to enter the rinsing area.

**The primary advantage** to this method is higher throughput due to increased conveyer speed, and the lack of a gate gap required by a pin indexing system as (Gate system discussed previously). The set-up and change-over time is also shortened.

**The primary disadvantage** to this method is the star wheel assembly requires a change part for each bottle size.

### ***STAR-WHEEL ASSEMBLY***

The Star wheel is used to index the bottles as they discharge from the rinsing area. There are typically two pins on the bottom of the wheel, along with a sensor to detect the pins, and a pneumatic stop gate to stop the wheel in the correct position. Once the stop pin is released, the wheel is rotated by the filled containers. Shortly after the second pin passes the pin sensor, the stop gate is closed. This will stop the wheel after a single revolution. The pin sensor then detects the primary pin once the wheel has stopped with the second pin against the stop gate (and the bottles in position under the fill nozzles).

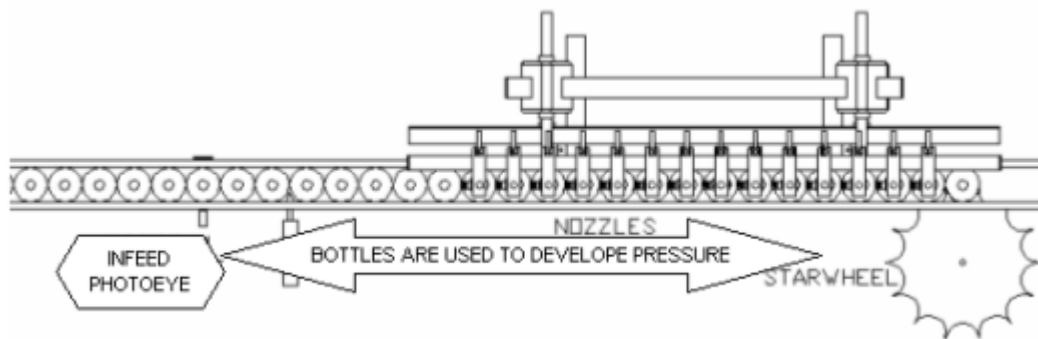
## AIR RINSER OPERATIONS MANUAL

### ***STAR-WHEEL CONTROL AND BOTTLE DETECT SENSORS***

The star wheel uses two sensors to determine the rinsing area is filled and the star wheel is correctly positioned. Star-wheel Pin Sensors is used to ensure the star wheel is positioned against the stop pin. The Infeed photo eye has more than one function

### ***STAR-WHEEL INFEEED PHOTO EYE***

The Infeed photo-eye has two functions. It is used to regulate back pressure against the containers in the rinsing area. The eye is positioned further 'upstream' on the conveyer than when using a conventional pin gating system. The position of the photo-eye is not as critical in star wheel mode, and is typically located up to two indexes from the Star-wheel. It is also used for container detection to ensure the fill area has containers.



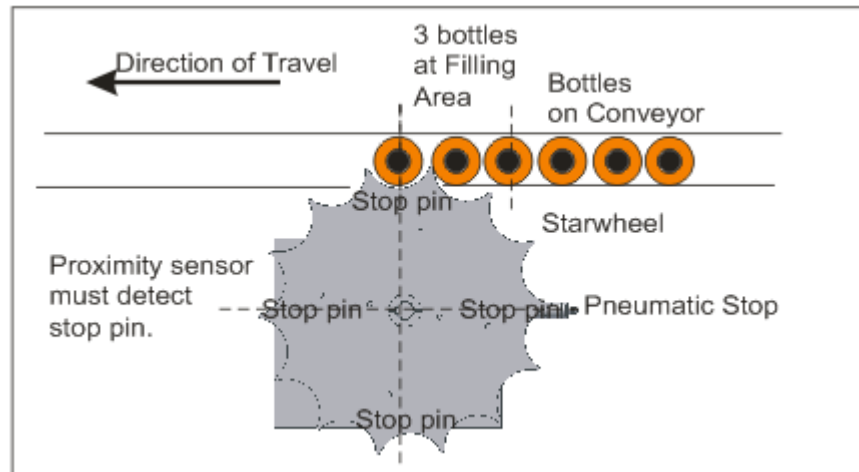
PRE-FEED SENSOR



## AIR RINSER OPERATIONS MANUAL

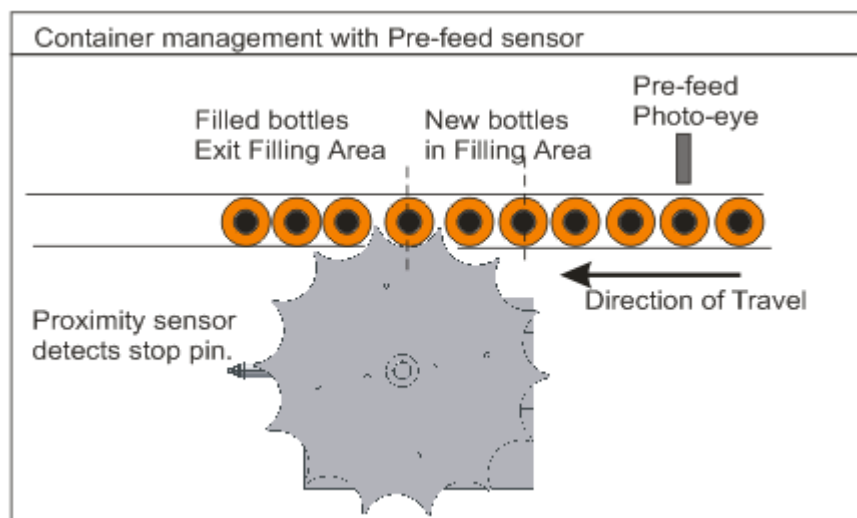
### ***STAR-WHEEL PROXIMITY DETECTOR***

The star wheel has two or more metal pins installed under the star assembly. These are used to position the star-wheel. These Stop Pins are detected by a proximity detector. This ensures the star is in position. On this star, three containers are filled at a time. The star has 12 pockets and four stop pins.



### ***SEQUENCE OF OPERATIONS***

After a set of containers has been filled, the pneumatic stop retracts long enough for the star to rotate past the pin. When the star-wheel rotates to and stops on the next pin, the index of filled containers has been discharged.



### ***INFEED TIMER***

The infeed photo eye will now look for a container. The sensor must remain blocked for the INFEED time set in the user interface. After both the Prox. and the INFEED timer are satisfied, the next fill cycle starts.

## AIR RINSER OPERATIONS MANUAL

### ***STAR-WHEEL CHANGE PARTS***

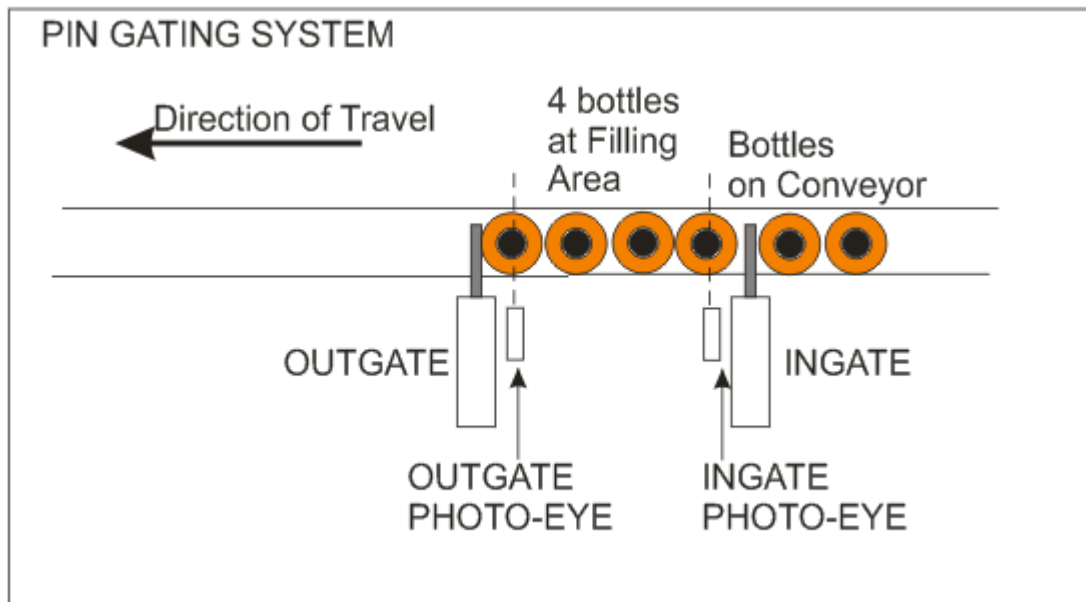
Star-wheels are precisely machined to fit a specific container profile. When a new bottle is introduced, samples should be sent to Inline Rinsing Systems so we can design a new change part. This is also necessary if additional rinsing nozzles are added to the rinsing systems. The number of pockets for the star wheel should match or be a multiple of the number of rinsing heads.



## AIR RINSER OPERATIONS MANUAL

### ***OPTION - CONTAINER CONTROL SYSTEMS – GATE INDEXING***

During the discussion of the operator controls, both Pin indexing (Gating) and Star-wheel bottle control were mentioned. Which system is best for your application? The most versatile system is Gate Pin indexing bottle management. **The primary advantage: This system can work with most shapes and sizes of bottles without requiring change parts.**



### ***GATE (PIN) INDEXING***

Gate indexing uses a pair of pneumatic operated pin style gates to control the containers.

**INGATE:** This gate admits bottles in to the rinsing area. When the rinsing area has the correct number of bottles (determined by the Ingate and Outgate Photo eyes), this gate closes and holds back the remaining bottles.

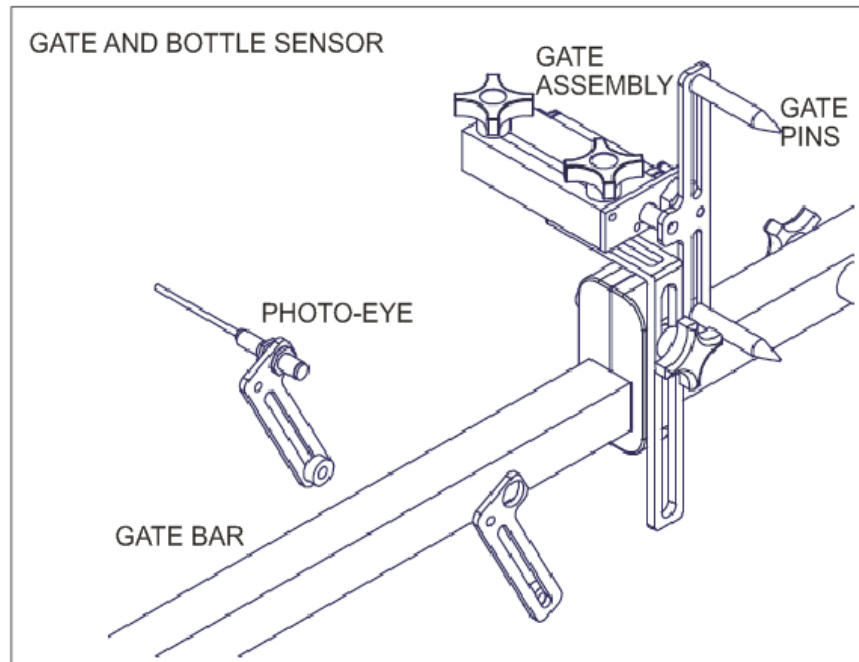
**OUTGATE:** The outgate stops the empty containers at the precise point to line them up with the nozzles. The outgate releases the filled containers at the end of the fill cycle.

**INGATE AND OUTGATE PHOTOEYES:** These sensors are used during rinsing operations to ensure there are sufficient containers in the rinsing area.

## AIR RINSER OPERATIONS MANUAL

### ***THE GATING SYSTEM ASSEMBLIES***

The gate assembly is an adjustable pneumatic pin index system. The gates install on a GATE BAR connected to the conveyor. The pneumatic cylinder is used to open and close Gate Pins. The sensors are typically installed on the conveyor rail.



### GATES SETUP FOR (8) LARGE CONTAINERS



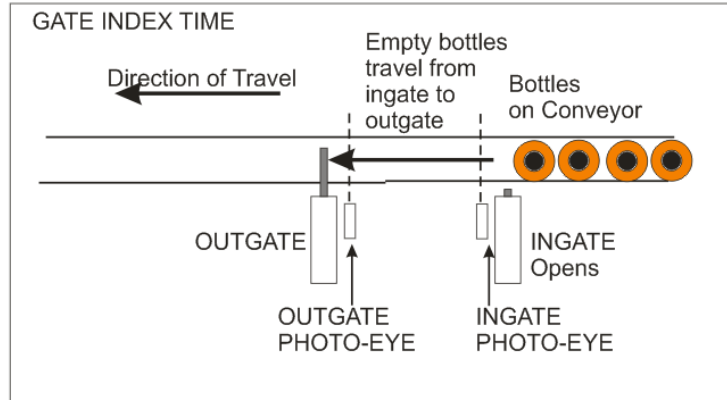
# AIR RINSER OPERATIONS MANUAL

## ***GATE PIN INDEX TIMERS CONTROL***

There are four discrete timers that are utilized by the gating system

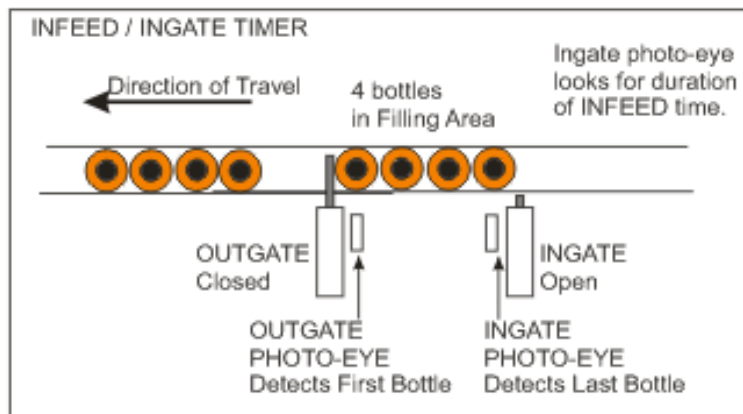
### ***OUTGATE (INDEX) TIMER***

The outgate time is the time it takes for a full set of containers (called an index) to enter the INGATE and completely travel to the OUTGATE. **Note:** The same time is also used when discharging filled containers past the OUTGATE.



### ***INGATE (INFEED) TIME***

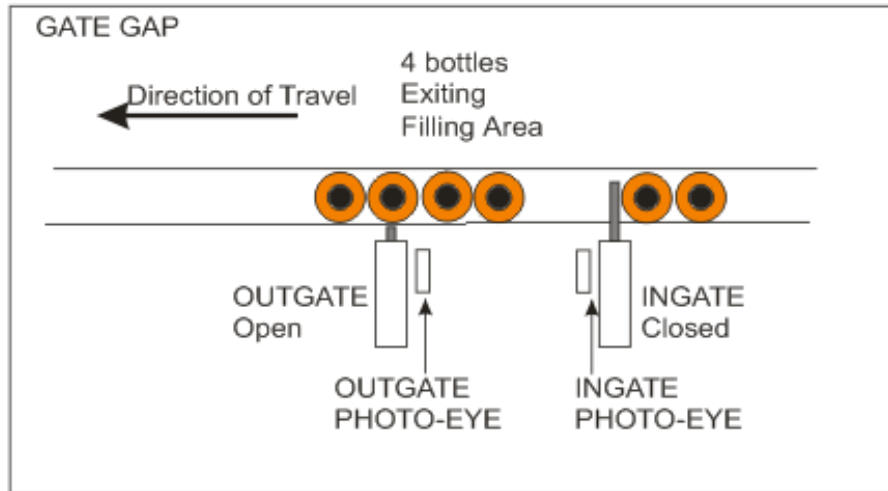
Once the empty containers are in position, they are detected by the OUTGATE PHOTO-EYE. If any bottles are missing from the fill area, and a bottle is in front of the INGATE PHOTO-EYE, the processor can be tricked into thinking the both sensors are blocked and the fill cycle can start. The Ingate time is set long enough for a single container to pass the sensor. The timer resets and the photo-eye resumes inspecting for bottles for this set time. Once the sensor is blocked longer than the programmed INGATE time, the ingate shuts and the fill cycle starts.



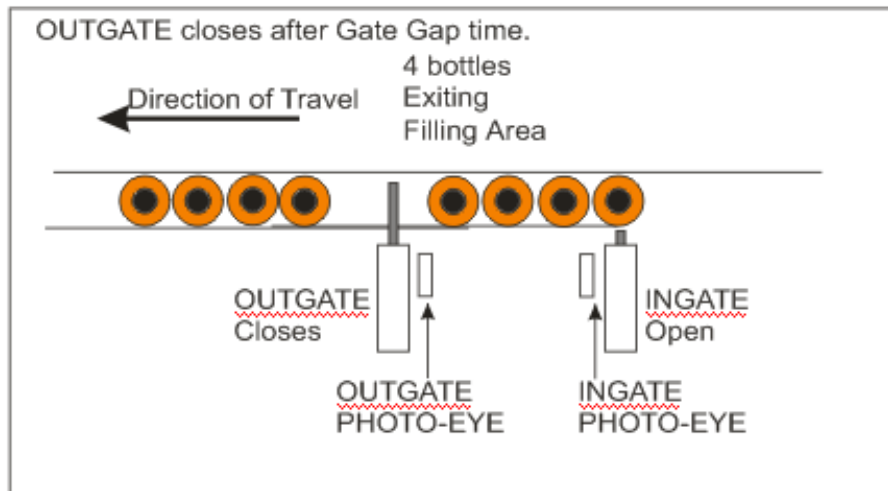
## AIR RINSER OPERATIONS MANUAL

### ***GATE GAP TIMER***

The gate gap timer is used to create spacing between the exiting filled containers, and the entering empty containers. This time is required to allow the OUTGATE to close (into this gap) and not pinch any containers. In the first diagram, the OUTGATE has opened, and the INGATE is still closed. The conveyor turns on and the filled bottles exit.



In this next diagram, the Ingate opens after the OUTGATE timer runs down. The OUTGATE (INDEX) timer runs down then the Outgate closes into the gap between containers. **NOTE** the next index of containers are almost to the OUTGATE.



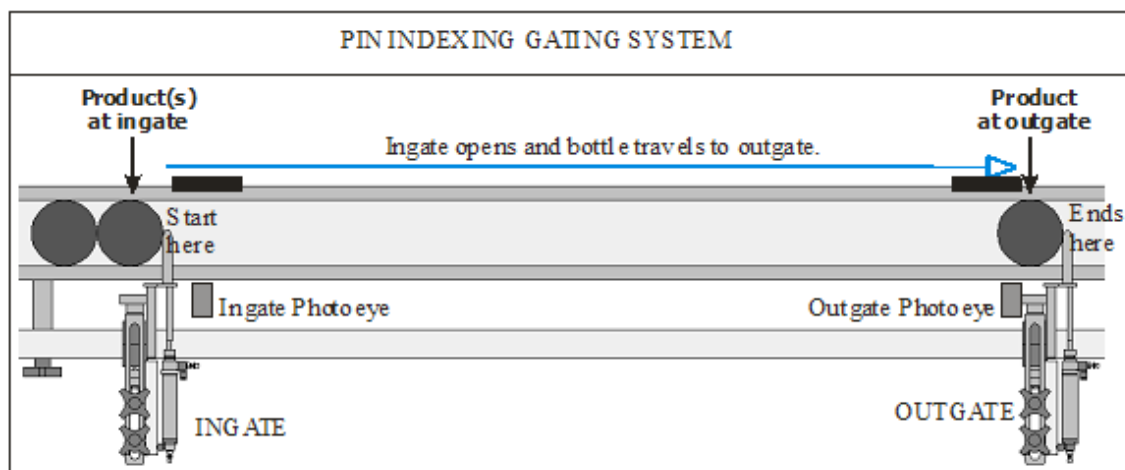
## AIR RINSER OPERATIONS MANUAL

### ***CONVEYOR RESTART DELAY***

This timer is not used very often. If your containers are very heavy, it can be useful to set a short delay between when the OUTGATE opens and the conveyor starts. This is to keep the weight of the containers off of the outgate pins when the filled containers exit.

### ***AUTOMATIC GATE SETUP***

The system will automatically set the outgate (GATE INDEX) time for proper operation of the gating system. During an automatic gate setup, two bottles are used to determine the outgate time setting. The auto-gate system then uses the calculated times to automatically operate the gates. This is a very simple routine. When selected, the conveyor turns on and the Ingate opens. The time it takes for the bottle to reach the OUTGATE photo-eye is recorded and assigned to the OUTGATE timer.



### ***RUN MODE GATE TIMER SEQUENCE***

1. INGATE opens and conveyor turns on.
2. Empty bottles travel as the OUTGATE (INDEX) timer runs down.
3. INFEED timer runs while ingate photo-eye inspects containers.
4. Infeed Timer runs down and bottles are seen by both photo eyes.
5. Containers fill.
6. Nozzles retract and drip tray extends
7. OUTGATE opens. Conveyor turns on after conveyor delay.
8. When GATE GAP timer runs down ingate opens and Index timer starts.
9. After index timer expires, the outgate closes.

## AIR RINSER OPERATIONS MANUAL

### ***PERFORMING AN AUTOGATE ROUTINE***

The gates and photo eyes should be set up correctly to your container. See the GATING ROUTINES screen below. Press RUN AUTOGATE.



1. Switch the Air Rinsler to SETUP.
2. Press the GATING ROUTINES button.
3. Make sure the ingate and outgates are closed and there are no products between them.
4. Power up the conveyer and set the conveyer speed.
5. Place the containers before the ingate.
6. Press the Run Autogate button.
7. The ingate will open and conveyer will start.
8. Once the containers reach the outgate, the ingate will close and the routine is complete.

For best results, note the value displayed, and then repeat the routine. If the numbers are the same, this indicates the sensors are properly adjusted and the routine has been successful.

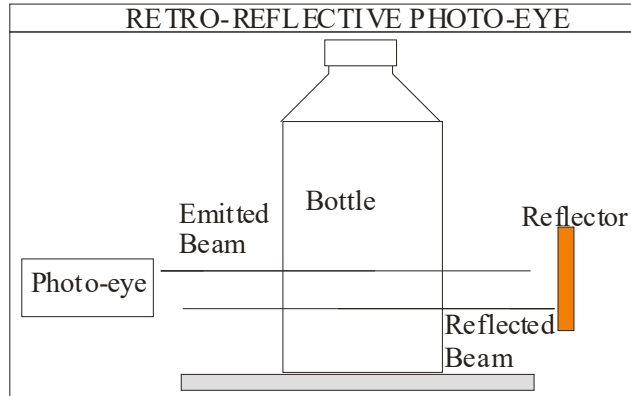
## AIR RINSER OPERATIONS MANUAL

### ***PHOTO EYE SENSORS***

Many machine operations are controlled by photo-eye style sensors. Photo eyes use a light beam to detect an object in front of the sensor. This is called an Emitter. The method the beam is detected (receiver) determines the type of photo-eye. There are three standard classes of photo-eye.

### ***PHOTO EYES: RETRO-REFLECTIVE***

Retro-reflective is perhaps the most popular photo-eye sensors we use. They are generally used to detect containers on a moving conveyor. The retro-reflective sensor houses both the emitter and receiver in one physical body. The light source is sent out to a reflector and returned from the reflector to the receiver in the same housing.



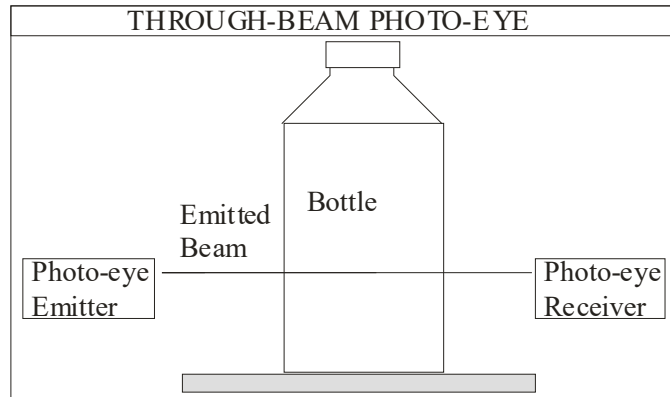
Some retro-reflective sensors are available with a visible beam, to assist with alignment. This beam will show "red" on the reflector when aligned correctly. The retro-reflective sensor has the advantage of reliability through the housing of its own transmitter and receiver in the same enclosure. Retro-reflective sensors are excellent for locating most types of containers. However, because a reflector must be mounted opposite to the sensor head, there is more adjustment

### ***PHOTO EYES: THROUGH BEAM***

A through-beam sensor places an emitter and a receiver in two separate housing. The emitter is the light source and sends the light across the conveyor to the receiver. The receiver houses the electronics to generate a signal that identifies whether or not an object is present. A through-beam has the advantage of being highly dependable because it does not depend on reflectivity in its application. See picture on following page.

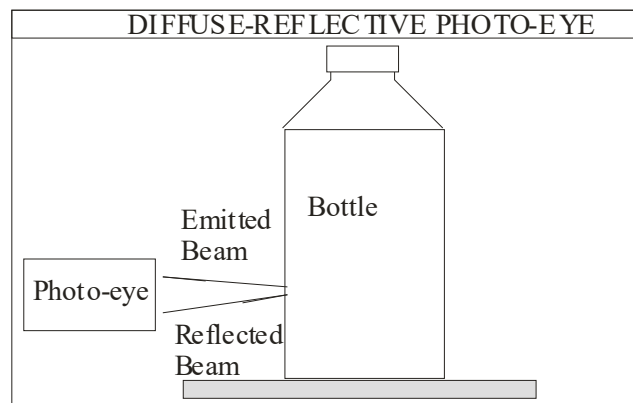
## AIR RINSER OPERATIONS MANUAL

### ***EXAMPLE OF THROUGH BEAM SENSOR***



### ***PHOTO EYES: DIFFUSE REFLECTIVE***

The diffused sensor is the second most popular type of photo eye. Like the retroreflective sensor, the transmitter and receiver are housed in one physical body. In this application, however, the sensor will transmit light to the actual object being sensed and the reflectivity of that object will then return light to that sensor.



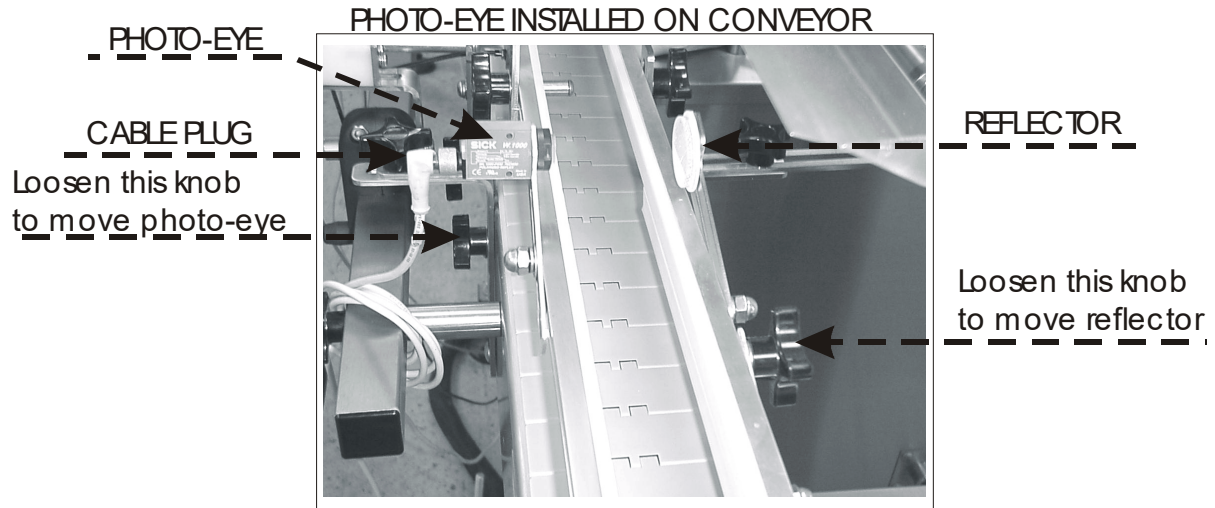
The advantage of this type of sensor is its minimal cost of installation; again, as with the retro-reflective photo sensor, only one device needs to be mounted and wired. The added advantage is that no reflector is necessary.

The disadvantage may be the total dependence on the reflectivity of the object being detected. Should there be a high degree of variance in the reflectivity or color of the objects being sensed, this type of sensor may be unreliable or require frequent adjustments.

## AIR RINSER OPERATIONS MANUAL

### ***RETRO-REFLECTIVE OPTIC INSTALLED***

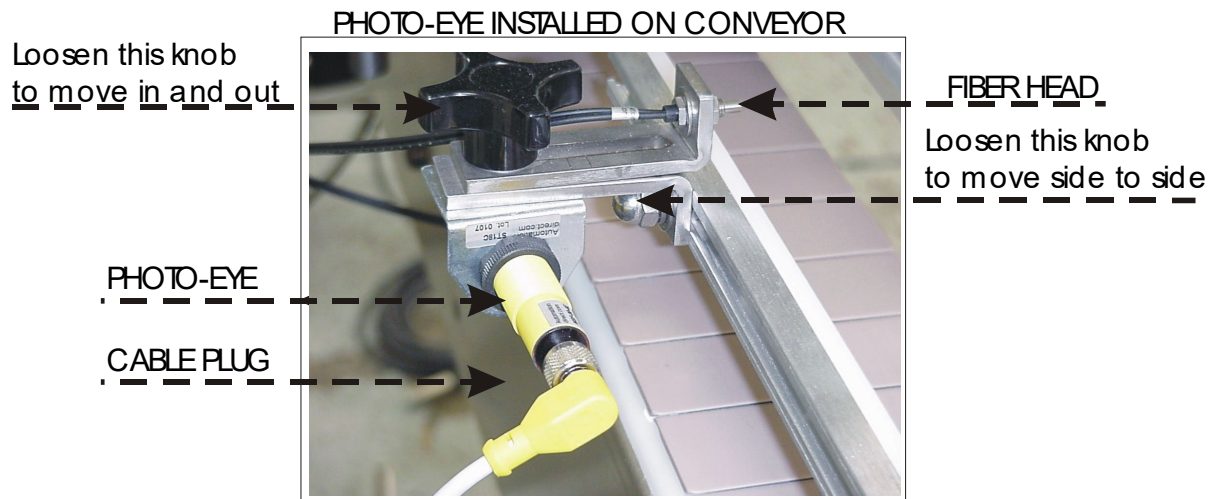
Shown below is a typical installation for a retro-reflective photo-eye installed on an IFS conveyor. The sensor brackets mount to the conveyor rail which greatly simplifies repositioning the optic and reflector.



### ***FIBER OPTIC PHOTO EYES***

IFS use proximity type fiber-optic photo eyes in many of our installations. The primary reason for using fiber optics is: 1) Simplicity of setup due to them not requiring a reflector. 2) Their very small foot-print allows them to be set up to small containers. 3) In explosion-proof, CLASS 1 Div. 1 and 2 applications, they are a legal optic as long as the fiber-head (with its active electronics) is not in the Class 1 Div. 1 or 2 area.

The pictures below show a common fiber optic assembly.



## AIR RINSER OPERATIONS MANUAL

### ***FIBER-OPTIC COMPONENTS***

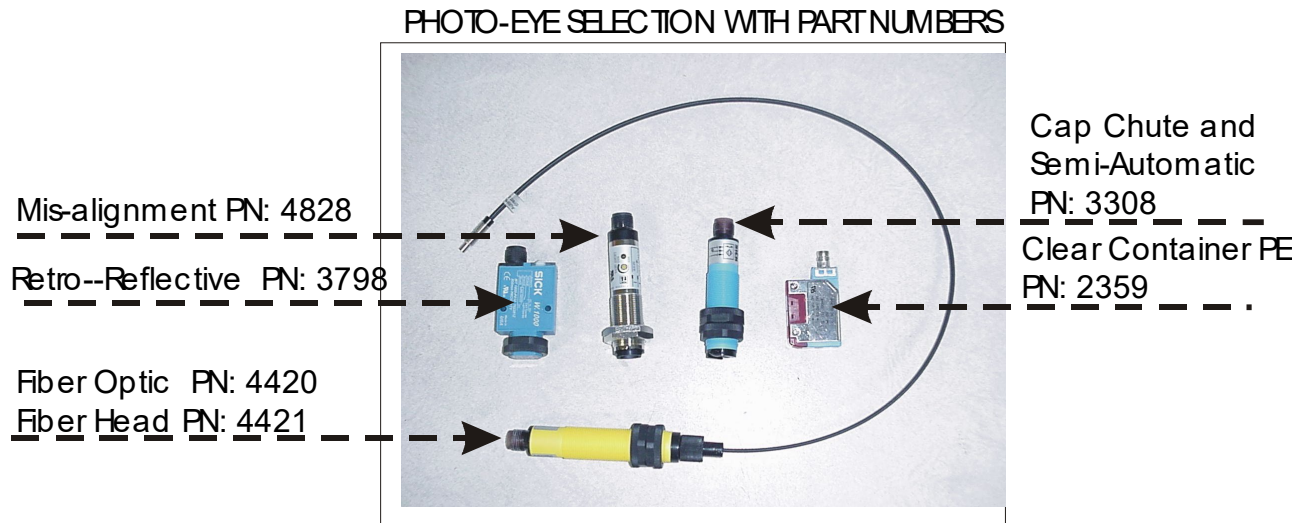
**Photo-eye body:** The photo eye body has the active electronics of the sensor. Typically, they have a socket for the fiber head, a plug connection to allow connecting to the control panel, and a status light which shows if the sensor detects an object.

**Cable Plug:** Typically, a four pin, 12mm quick connect type.

**Fiber Head:** Sensor of the optic. The end of the fiber head should generally be within a ¼” or closer, to the side of your containers

### ***OTHER PHOTO-EYE SELECTIONS***

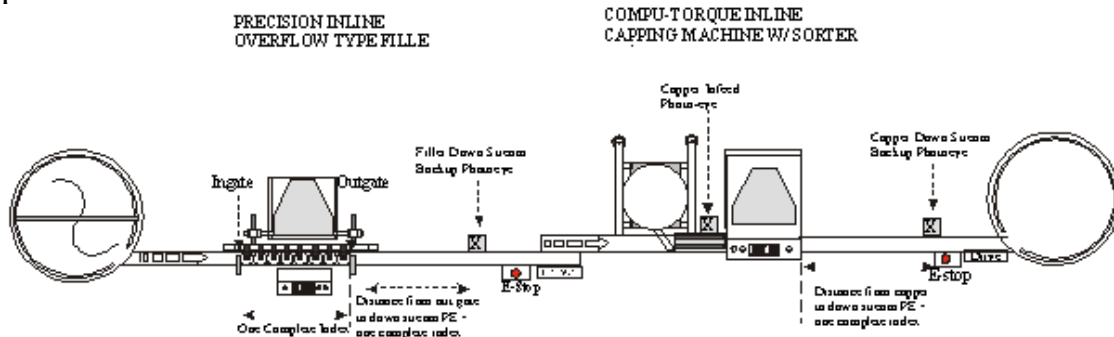
Shown below are several of the more common photo eyes used by IFS. The correct photo-eye is selected for your application by such variables as environment, color of the containers including clear bottles, and container shape (geometry). IFS engineers select photo eyes for your application by analyzing all of the above variables during the application design process.



# AIR RINSER OPERATIONS MANUAL

## ***LINE LOCATIONS OF SENSORS***

Shown below is a typical setup for your rinsing and capping line sensors. As shown, the rinsing machine ingate and outgate photo eyes are installed on the rails directly between (and next to) the gates. The downstream photo-eye is installed at least one and a half indexes past the Air Rinser discharge point.



## ***SEQUENCE OF SENSOR EVENTS***

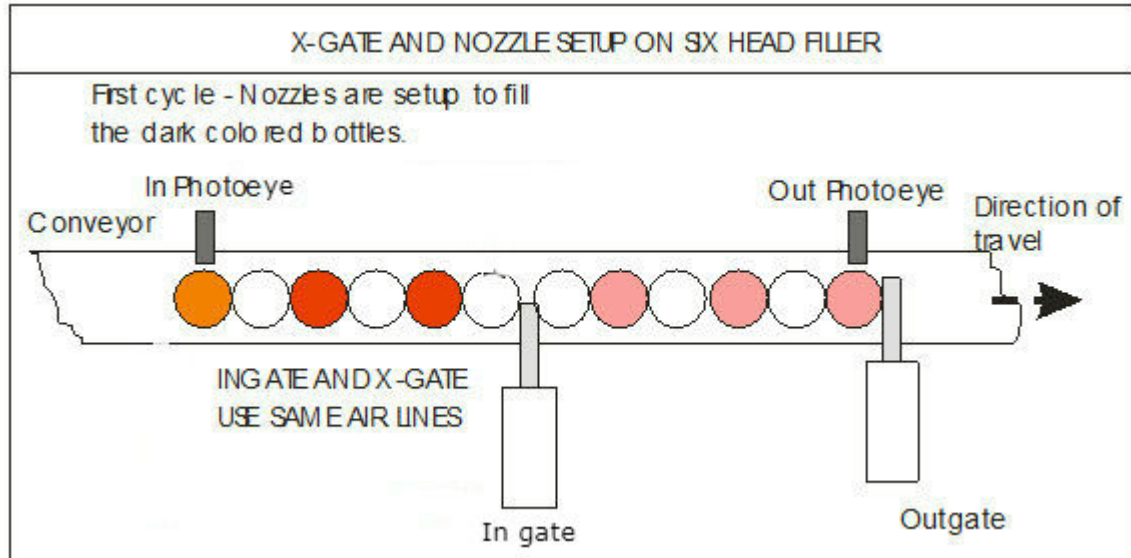
1. The INGATE opens and the conveyor turns on.
2. The bottles move into the rinsing area. They reach and are stopped by the OUTGATE.
3. The INGATE starts to close and the conveyor remains on for the 'de-bounce' time. This time is normally established during the AUTOGATE routine. While the auto-gate is running, the ingate photo-eye measures the time it takes for one container to pass. This is the Automatic 'de-bounce' time. If, at the end of this time. (with the ingate closed, and the conveyor still running) the bottle is still in front of the eye, the conveyor will halt, and the Air Rinser will go into its RUN cycle. If the container moves out from in front of the eye, the Air Rinser knows it needs more containers, and will re-open the gate.
4. At the end of the fill cycle, the Air Rinser checks the DOWNSTREAM BACKUP EYE. If this eye is blocked, the Air Rinser will not discharge the filled containers, and reports on the user interface  

\*\*\*CHECK CONTAINERS\*\*\*  
\*\*DOWNSTREAM BACKUP\*\*
5. After the backup is cleared, the outgate opens, the conveyor turns on, and the bottles exit the rinsing area.

## AIR RINSER OPERATIONS MANUAL

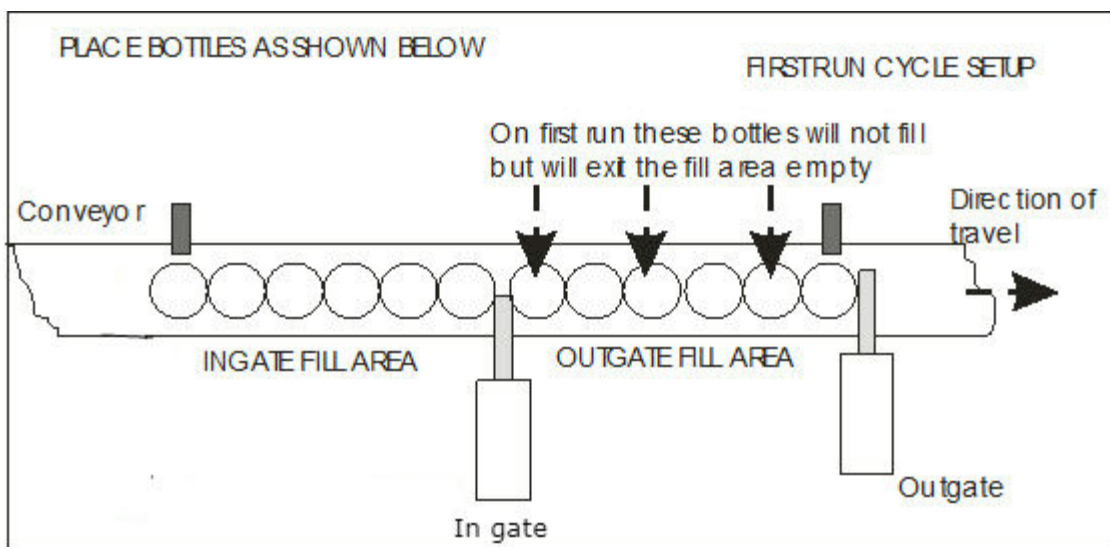
### SMALL BOTTLE INDEX – X-GATE

The x-gate routine is designed to allow simple setup on small bottles that would normally require a timing screw. The drawing below shows the gate and nozzle location.



The picture shows setup of a six head Air Rinser. The in and outgates are setup for 6 bottles as shown above. After the gates are set:

- Set nozzles over containers as shown above.
- To prepare for running the AUTOGATE ROUTINE remove all bottles excepting the one shown above marked gate bottle.
- Run the Autogate routine as described previously.



## AIR RINSER OPERATIONS MANUAL

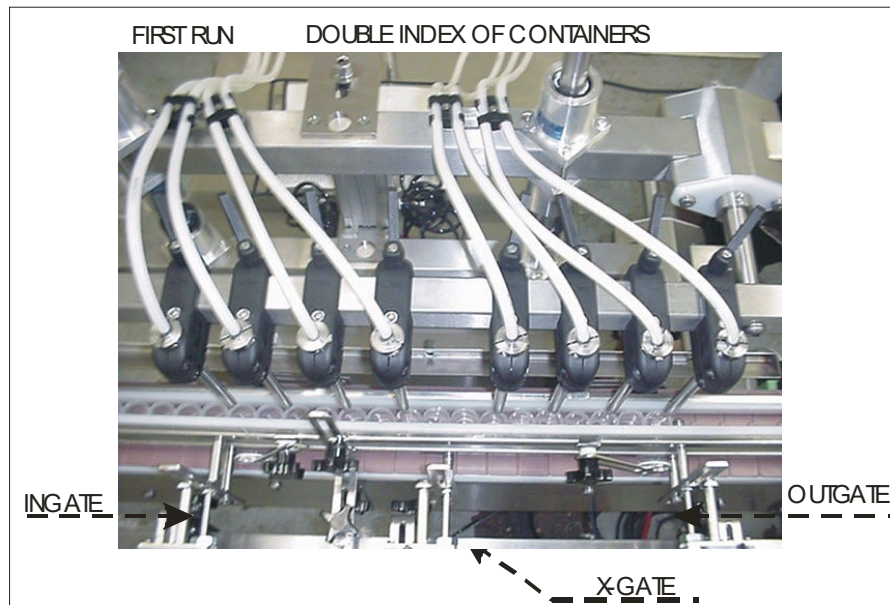
### ***SMALL BOTTLE INDEX – SEQUENCE OF OPERATION***

Set up the INGATE FILL AREA containers as shown on previous page.

**NOTE:** Bottles are always placed next to ingate and outgate, then skip every other bottle.

1. Switch Air Rinser to RUN.
2. Ingate and X-gate open bringing in another set of six containers.
3. The Nozzles lower and fill the shaded containers.
4. The nozzles retract, drip tray throws, and outgate opens.
5. The six containers in the outgate area will exit. The ingate and X-gate will both open, allowing a new set of 6 bottles to move into the outgate fill area. (**NOTE:** After this first run, there will be three containers in the outgate fill area that did not fill. This only occurs on the FIRST RUN CYCLE.) The non-shaded bottles (called the SECOND INDEX) are now positioned under the fill nozzles.
6. The second index of bottles is filled.
7. The Nozzles retract, and the OUTGATE opens and discharges the filled set of containers in the outgate fill area. As these containers start to leave the fill area, the ingate and x-gate open to admit a new set of bottles.

The picture below shows the bottles setup for this double fill cycle: The picture shows two full sets of containers (16 bottles) under eight rinsing nozzles. (**NOTE** the small containers.)



## **AIR RINSER OPERATIONS MANUAL**

### **PRIOR TO OPERATIONS – MACHINE AND LINE INSPECTION**

1. Prior to operating the Air Rinsler, perform the following inspections:
2. Product line installed and secure.
3. Machine level and straight in relation to the conveyor.
4. Inspect air fittings for cracks and leaks.
5. Inspect hoses for ‘pinching’ or wear.
6. Inspect nozzles for damage.
7. Air lines should be in good shape. They should not be ‘leaking’ air.
8. All vacuum process and air lines should be routed away from work areas.
9. Support Devices must be securely fastened to their respective mounting locations.
10. Prior to applying power, Switch machine to RESET
11. When powering up, observe the status of the operator interface.  
Correct Mode (RESET) should be displayed on screen.

## AIR RINSER OPERATIONS MANUAL

### SETTING UP FOR A NEW PRODUCT

What does a 'perfect' setup require? The answer is the same for a small company, and a billion-dollar conglomerate. Knowledge and attention to detail.

1. Understanding the characteristics of your product will give you foresight into how it will react during rinsing.
2. Understanding of the functionality and capabilities of the individual machines on your line, and the way they interact, will help guide you through the setup process.
3. Using a rigorous, step by step process will make application setup highly repeatable.
4. Documenting the document steps will assist in each and every future setup.
5. A comprehensive machine inspection and maintenance program will ensure your machines are ready to work when you are.

**Before operating any complex automated machinery check the following:**

1. Line is setup to specifications outlined in section three.
2. Air, Product, and power lines are installed properly.
3. Operator station locations and corridors of travel are established.
4. A trained operator is available to setup and 'run' the machines. A trained operator is mandatory. From extensive studies performed by PMMI, operator error is the single largest factor in slowing down or halting production. Damage done to equipment due to neglect or improper setup is extremely costly in lost productivity and repair bills.
5. Operators should be familiar with the following:
6. Basic machine components and their purpose.
7. Control Panel layout and function.
8. User interface Menu routines.
9. Support Equipment locations, function, use and adjustments.

**WARNING: Machinery will not function properly, and may be damaged OR HARM PERSONNEL if they are not installed or operated by our guidelines.**

## AIR RINSER OPERATIONS MANUAL

### *SEQUENCE OF SETUP – CONTAINER MANAGEMENT*

1. Power up machine. (Control panel will light up)
2. Connect air to machine. (Ensure 80 PSI shows on system gauge)
3. Adjust conveyor rails of line. Use your container as line spacers, placing one every 2 foot down the length of the conveyor. Rails should support the sides of, but not over grip, bottles.
4. Adjust sweep of unscrambler tables.
5. Adjust turntable and conveyor side transfers. Check for smooth transfer of your containers at these points.
6. Place bottles under nozzles: Nozzles should at least 3” above container ‘mouth’.
7. Adjust in and outgate.
8. Adjust in and outfeed photo eyes.
9. Turn on and set desired conveyor speed.
10. Adjust nozzle assembly over containers. Under AIR RINSER SETUP sub-menu run Level Cylinder routine. Use the nozzle height adjuster to lower nozzle tip into container. Test the Drip tray (Same Function)
11. Under the GATE TIMERS submenu, run the RUN AUTOGATE routine.

### ***TEST YOUR MECHANICAL SETUP***

**Note** and correct performance at the following locations:

1. Turntable transition to conveyor
2. Containers into fill area
3. Nozzles lowering properly into containers and Nozzle height are set correctly.
4. Outgate opens smoothly. Containers should easily transition out of work area.
5. Next index of containers should move into fill area. Gates should close and next run cycle start. If the gap between containers is inadequate, use the GATE INDEX TIMER function to add .1 to .2 seconds to the gate time.
6. All photo eyes should be performing properly. On systems with Downstream backup optic, check that the Downstream Backup photo-eye doesn’t get blocked when the conveyor shuts off for the next fill cycle.

## AIR RINSER OPERATIONS MANUAL

### ***SEQUENCE OF SETUP – PROGRAMMING PRODUCT DATA***

At this point, Nozzle depth of dive, gate times and locations, photo-eye operation and all transitions should be correct. For initial fill setup on a new product, IFS recommends using conservative timer settings initially to program your machine rinsing functions.

12. In the AIR RINSER SETTINGS sub-menu set an initial rinsing time.

It is best to be conservative with these numbers initially. As you become more familiar with the cleaning volume for a given time and ionizer pressure, it will be easier to set this first rinse volume.

13. Run at least 3 full sets of containers before evaluating the rinse.

(Modify as necessary.)

14. FILL OUT A PRODUCT DATA SHEET. Setup sheets give your operators a complete reference for repeating this setup. This will include line speeds, nasty container habits, and physical measurements of several of the key components of your machines. These sheets will help analyze future applications.

To reiterate, train your personnel to use this repetitive task list to perform a new or repeat setup. In our facility, we typically perform complete line change-over in 15 to 20 minutes.

## AIR RINSER OPERATIONS MANUAL

### PROCESS AND PRODUCT ANALYSIS

While it is not within the scope of this manual to teach packaging principles, a brief discussion of some of the analysis tools used by IFS may be useful.

#### Process analysis

This is the study of machine and personnel interaction with the products and containers you are packaging. These evaluations require a systematic and logical step by step process. The goal is to simplify, or expedite both new and everyday production, using your available resources. Every time a new machine, product, or container is introduced, consider how it will affect your physical plant, current production staff, and existing machinery. Your primary production personnel should be involved in this question /answer process. Following are samples of the kind of questions that should arise during this analysis:

- Are machine change parts or additional personnel training needed?
- How well do new containers handle/orient? Will they transfer on my existing conveyors/turntables?

#### Product analysis

Every new product has definable characteristics. Evaluation and rigorously defining a products 'nature' will greatly assist the initial setup. Once again, start with a list of questions:

- Does the product change density or viscosity at different temperatures?
- Does the product require special sanitary or cleaning processes?
- How well is the chemical reactivity understood? (Most seal, tubing, and pump manufacturers have application personnel that can answer these kinds of questions.
- Does the product foam? How fast does foam dissipate?
- Are there dyes or volatile chemicals in the product that will penetrate tubing or plastic tanks? These can contaminate other products run on the same machine.
- Will the product emit harmful or possible flammable vapors?

## AIR RINSER OPERATIONS MANUAL

### ***LINE SPEED***

When analyzing the production speeds or capabilities of your current system, your first task is to identify the slowest machine or process on your line. These slowest process points will determine your actual line speed. If personnel are used in a line processing function (removing filled containers, visual inspection, etc.) they must be examined as a processing point. Under most circumstances, the maximum continuous container handling capability of a person is 8 to 12 bottles per minute.

Once your slowest bottle per minute capability is determined, it is relatively simple to set a conveyor line speed that will keep up with your true line capabilities. A useful formula for computing conveyor speed is shown below.

$$\frac{\text{Bottles per minute}}{1.3} = \text{Conveyor line speed}$$

If your peak BPM is 50 Bottles per minute, your conveyor does not have to exceed 42 Feet per minute. Once your conveyor speed is determined, follow our SEQUENCE OF SET to complete your application analysis.

### **SUMMARY**

IFS have found that the cost of your packaging line is miniscule compared to lost revenue due to misapplied machines, poorly trained personnel, and inadequate setups. A common example: One poorly adjusted set of rails at a transfer point knocks over bottles about once an hour. This is often looked at as the loss of a few bottles of product. Your actual cost per day is 10 to 20% of your total production. It's not the 12 spilled containers that cost you. It is the 10 minutes it takes to clean up, then restart the line after each spill.

## AIR RINSER OPERATIONS MANUAL

### **TROUBLESHOOTING GUIDE**

The following application troubleshooting guide is based on some of the more common problems our customers have related to Air Rinsler operation.

#### ***NOZZLE IS MISSING THE BOTTLE OPENING***

Are the nozzles uniformly spaced over the containers? Look down the centerline of the conveyor. The nozzles should be centered over the conveyor, and the bottle and nozzle lined up. Adjust the nozzle holders, or your conveyor rails to correct this condition. A 'bottle hold-down' or neck guide may be required. IFS manufacture both of these components.

#### ***SYSTEM IS PAUSED AND NOT DISCHARGING THE CLEANED CONTAINERS***

On systems so equipped, check your DOWNSTREAM photo eyes. The photo eyes (particularly, the downstream photo eye) will halt the machine if there is an obstruction. The user interface will always report this condition to the operator.

#### ***INGATE IS CLOSING TOO SOON***

The no bottle/no fill programming is very versatile. Effectively, it is looking at both the in and out photo eyes. First, the processor waits for a signal from the outfeed photo eye. Upon detecting a signal at the outfeed photo-eye, it then tests the infeed photo-eye. If no container is detected by the ingate photo-eye, the processor continues testing the sensors in approx. 1/2-sec intervals (This is called de-bouncing the signal). When it does see another container, it still looks again in 1/2 second. If the eye still detects a bottle, the PLC goes into an initial run routine. At the start of this routine, it looks one more time just to ensure that a bottle is there. If both optics are blocked (for a time greater than this de-bounce period), the processor assumes the fill lane is full and goes on to lower the nozzle and fill the containers. There are generally only two ways to 'fool' this system.

#### ***PHOTO EYES (PART 2)***

First, if the conveyor speeds are sufficiently slow, it may take too long for a container to pass the ingate photo eye; thereby tricking it into thinking it has a full index of containers.

Second, if several bottles are fed together, after the outfeed photo eye has detected a leading container, it also may be fooled into closing and running the system.

## AIR RINSER OPERATIONS MANUAL

**NOTE: If the light on the sensor is flashing, it needs to be calibrated by pressing and holding the button until the light turns off and then the light comes back on. AS soon as the light comes back on immediately let go of the button.**

### ***AUTOGATE ROUTINE ERRORS***

A surprisingly common problem is operators placing photo eyes in the wrong locations. The Run screen has photo eye status displayed. Block each photo eye to see if they are switched.

### ***PHOTO EYES (PART 3)***

The sensors used on automated equipment keep the machine informed about the status of containers and product during the stages of the process whether it is capping, sorting, rinsing etc. Proper setup of the sensor group is essential for the machine to function properly. A common problem is switching of the control cables after a cleanup operation. The machine may function but it will always exhibit unusual behavior i.e. pausing for no apparent reason, or reporting incorrect errors. The TEST PHOTOEYE function described above will diagnose incorrectly set photo eyes. **Note** the status lights of the sensors. When the photo-eye is not blocked, the light on the top of the optic should be on. If it is not, adjust the eye or its reflector until the light cones on.

### ***PHOTO EYES (PART 4)***

Last but not least, it may be that the photo-eye you are using is not appropriate for your containers' color (including clear.) The section on photo eyes shows some of the different optics we use.

### ***OUTGATE IS CATCHING BOTTLES***

The Autogate routine uses the outgate photo-eye to set its index time. As shown in the section on sensors, this optic should be mounted as close as possible to the outgate. Large (thus heavy when full) containers may slip when the conveyor is started at the end of the fill cycle. In either circumstance, it is a simple matter to use the GATE TIMER routine to add 1/10 of a second to the existing time. We have found adding .1 to .2 seconds is usually all the fix needed. (Don't forget to SAVE the new time to the same product code.)

## AIR RINSER OPERATIONS MANUAL

### ***PUMP NOT RUNNING***

1. Check Counter setting. Make sure the recipe number is loaded.
2. Check Speed setting. If zero "0" is showing the speed setting will not run
3. Check to see if the pump is enabled.
4. Check proper voltage signal from analog module.
5. Check signal on pump drive.
6. Check out voltage from drive.

### ***PUMP NOT TURNING OFF***

1. Check Count setting on screen.
2. Check encoder connection with motor is not loose.
3. Check high speed counter for signal back from encoder.

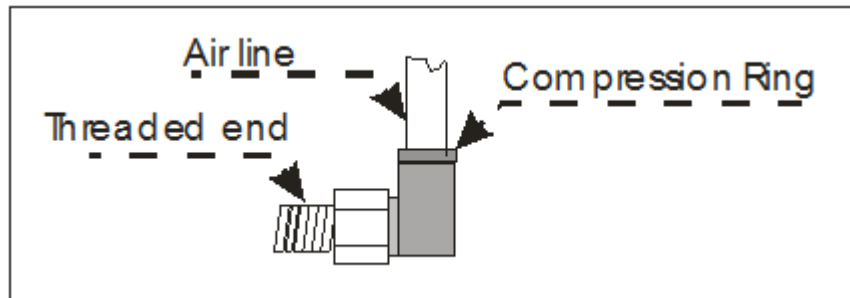
## AIR RINSER OPERATIONS MANUAL

### ***CONNECTING THE PNEUMATIC AIRLINES***

The BLUE air line plugs into the quick connect fitting at the end of the cylinder, and the BLACK air line plugs into the flow control located on the side of the air cylinder. The purpose of a flow control is to slow down the 'throw' of the gate. (Throw means the rate the gate closes.) Turning the front flow control clockwise will slow down the gate.

### ***QUICK RELEASE AIR FITTINGS***

**When inserting air lines** into the quick release fittings, firmly slide the end of the tube into the fitting. You will feel some resistance. Continue pushing line firmly until you feel it 'seat'.



**To remove Air line:** Use two (2) fingers to press the Compression Ring of the fitting (fitting quick disconnect) towards the fitting. Gently push in, and then pull out the air line. IFS uses compression quick connect fittings for most pneumatic applications.

### ***AIR RINSER HAS REDUCED VACUUM***

Check the fittings and seals from the vacuum through the manifold, up to the nozzle connections. Also inspect the vacuum filter.

## AIR RINSER OPERATIONS MANUAL

### AIR RINSER MAINTENANCE – SECTION THREE

The following section will describe and detail the care and general maintenance that must be performed on ALL Inline Filling Systems equipment. Our packaging machinery is constructed to the most rigorous standards, with ‘Top Shelf’ components. This does not mean they are maintenance free. The amount of maintenance they need is directly related to the severity of the environment they are operating in. You are responsible for the maintenance of your equipment. Premature failure or subsequent damage due to negligence or improper operation of any IFS equipment will not be covered by your warranty.

**MACHINE SURFACES** should be wiped off daily. Use clean dry cloths, and a good food grade Stainless Steel Cleaner. **DO NOT WASH DOWN THIS MACHINE.** Surfaces with moving parts or electrical components should be hand cleaned.

**CONTROL ENCLOSURES** are NEMA 4 rated. This means they are water resistant. However, there is no way to prevent condensation inside of a cabinet that is frequently watered down.

**RULE OF THUMB: HAND CLEAN** any panel containing electronic components. If you are uncertain if a panel contains electrical components, please call our Technical Support Group at (941) 486-8800 ext. 111.

**VACUUM AND MECHANICAL MOVING SYSTEMS:** The vacuum filter should be inspected weekly. **WARNING - THE VACUUM IS NOT WASHDOWN!!!** The same wash-down restrictions hold for both Pneumatic Air Cylinders, and Bearings. You will **DRASTICALLY** reduce the life and efficiency of bearings and air cylinders by frequent flooding of these systems. It is a good habit to have a scheduled inspection of all mechanical systems. Use Preventive Maintenance guide included in this section to establish a system that works with your environment and employees.

**MACHINE LUBRICATION:** Establish a lubrication schedule for your equipment. This Section will specify all lubrication points on IFS machines. In a harsh environment, this service may be necessary **DAILY**. Technical Support can help you establish a lubrication schedule appropriate to your operating conditions. The end of this section contains typical maintenance schedules. Properly maintained, your equipment is designed to give you years of excellent service.

## AIR RINSER OPERATIONS MANUAL

### ***CLEANING AND MACHINE LUBRICATION***

The moving components of a machine need periodic cleaning and lubrication. The assembly shown below is the Main Support Shafts and guide bearings for the diving nozzle support. Our filling machines use Thompson Super Smart bearings (One of the toughest bearings in the industry.) We recommend using Teflon based lubricant applied with a grease gun to the standard Zerk type grease fittings (see below). Clean the Nozzle Support Shafts with a good stainless cleaner and dry with a clean cloth. For more serious cleaning from caustic, corrosive, or sticky products, a fine mesh Scotch-Brite pad will restore the finish to these shafts (they are manufactured from 316 Stainless steel). In harsh environments, a daily application of a spray lubricant such as WD-40 will keep the shafts sufficiently lubricated. Any moving assembly should be inspected frequently and cleaned as needed.

### ***COMMON MOVING ASSEMBLIES:***

1. Gate and Star-wheel mechanisms.
2. Nozzle support system.



***IMPORTANT NOTE: HARSH ENVIRONMENTS WILL REQUIRE MORE FREQUENT INSPECTIONS AND CLEANING!***

## AIR RINSER OPERATIONS MANUAL

### ***CARE AND CLEANING PNEUMATIC ACTUATORS***

The pneumatic air cylinders do not require oil applied to the air lines. The activation shafts should be manually cleaned periodically with a good stainless cleaner. Dry with a clean non-abrasive cloth. A heavy-duty gate assembly is shown below.



### ***ACME ADJUSTING SCREWS***

The nozzle height adjustment screw should be cleaned and lubricated frequently. The same Teflon grease used for the support bearings can be manually applied with a cloth to these screws.



## AIR RINSER OPERATIONS MANUAL

### *AIR FILTRATION AND PNEUMATICS*

The Air Regulation/filtration system used by IFS equipment is the finest on the market. Delivering 'instrument' quality air to the pneumatic system is the key to long life and smooth operation. The basic components are shown below. This assembly is installed on the frame of the filling machine. A recommended pressure setting for the regulator is 80 psi.



The regulator should be inspected daily. Drain both mist coalesce and filter using the drain buttons at the bottom of the assemblies.

Air Piston Actuators should be wiped off using a clean dry cloth, at the end of every production run. In particularly wet environments, spraying with a lubricant such as WD-40 will help prevent corrosion.

## AIR RINSER OPERATIONS MANUAL

### ***PREVENTIVE MAINTENANCE***

Studies have shown that a well-planned and implemented Preventive Maintenance Program (PM) can significantly reduce 'down' time of a complex piece of machinery such as a filling machine. The PM worksheet included with this manual is a good general guideline, but cannot consider factors such as harsh operating environment or exposure to caustic or corrosive products. These can add significantly to the amount of care required to keep your equipment in top shape. If designing your own maintenance program IFS recommends using the following process,

**DAILY:** Inspect the machine both before and after production. Operators should note any loose hardware, unusual noises during operations, and any non-standard behavior. The machine should be cleaned every day after production. The personnel cleaning the machine should be familiar with its operations. They will often be the first to identify loose or malfunctioning hardware, long before it becomes a problem.

**WEEKLY:** Along with the standard daily inspection and cleaning routine there should be a more comprehensive cleaning and lubrication of the nozzle support system and drip tray hardware. Check that all exposed hardware is tightened. A good rule of thumb for this inspection: IF IT MOVES, OR IS REMOVABLE ... INSPECT AND SERVICE IT.


**MONTHLY:** Along with the standard daily and weekly service, the product tank and support systems such as transfer pumps should be inspected. Check hoses, clamps, and the integrity of all hardware.

Worksheets are included in the folder with this manual. Please call IFS Technical Services if you require assistance in setting up a procedure in your facility.

# AIR RINSER OPERATIONS MANUAL

## *PREVENTIVE MAINTENANCE EXAMPLE WORKSHEET:*

SERIAL # : \_\_\_\_\_ DATE: \_\_\_\_\_



MACHINE : AIR RINSER SERVICE TECH : \_\_\_\_\_

DAY	TECHNICIAN SIGN OFF		
MONDAY		MONDAY	
TUESDAY		TUESDAY	
WED.		WED.	
THURS.		THURS.	
FRIDAY		FRIDAY	
SAT.		SAT.	
MONDAY		MONDAY	
TUESDAY		TUESDAY	
WED.		WED.	
THURS.		THURS.	
FRIDAY		FRIDAY	
SAT.		SAT.	

ASSEMBLIES TO SERVICE			
INSPECT	R	INITIALS	SERVICE REQUIRED
			<b>If any assemblies require repair, initial, check repair box, and return this form to maintenance for machine servicing</b>
<b>DAILY</b>			
START-UP			Inspect Vacuum Hoses, Air Lines, Nozzles, and test all Photoeyes.
POST RUN			Manually clean control system using a clean damp cloth. Wipe Dry.
VACUUM			Inspect filter
CABINET			Wash cabinet. Dry all surfaces. Wipe support shafts with WD 40.
REGULATOR			Inspect Regulator autodrain and air pressure.
NOZZLES			Inspect Nozzles and hoses for vacuum leaks. Inspect manifolds.
<b>WEEKLY</b>			
GATES			Manually clean Gate assemblies Lubricate shafts - WD40
PHOTO-EYES			Clean Photoeyes with damp cloth. Dry. Inspect cables and plugs.
VACUUM			Inspect vacuum filter. Clean/replace as necessary. Empty canister.
ACTUATOR			Inspect Top Clevis Bolt and wiring to actuator
<b>MONTHLY</b>			
NOZZLES			Dis-assemble and inspect nozzles. Repace selas of necessary.
VACUUM			Remove from cabinet and insspect casing, motor and filter.

## AIR RINSER OPERATIONS MANUAL

### ***REPLACEMENT PARTS***

IFS equipment is designed for easy access, and relatively simple maintenance. We limit the number of moving (wear) parts in all of our designs. All moving parts are mounted to allow for quick removal and replacement. Electrical components, (such as relays and pneumatic valves), typically have manual switches (for testing the individual system) and LED Status lights to show if they are active. This can greatly simplify diagnostics. The following section has CAD drawings of various electrical and pneumatics. It also includes wiring diagrams; parts list for your system, PLC input and output descriptions, and exploded view of your nozzle assemblies. The Replacement parts are either stocked by IFS, or available readily from our vendors. Many of the components can be purchased at your local reps of the following vendors:

VENDOR	PARTS DESCRIPTION
SMC Pneumatics	Air valves, regulators, air cylinders.
Motion Industries	Drive systems, bearings, Belts and pulleys.
SMC	Air cylinders.
KOYO	PLC Processors, User Interfaces, power supplies.
Allen Bradley	PLC Processors, Encoders
Siemens	PLC Processors
Welden	Air Pumps
Jabsco	Electric Pumps
Cole Parmer	Peristaltic Pumps
Sick Optic / Banner	Photo eyes and proximity sensors
Solus	Conveyor Components
Grainger	Fractional HP Drives and Gear motors.
Legris	Pneumatic Fittings and Tubing
IFS	Fluid Components, Enclosures, Frames, Support systems, Brackets and Mounts, etc.

## AIR RINSER OPERATIONS MANUAL

### TECHNICAL SERVICES

IFS maintain a fully staffed service department. We also have a spare/warranty parts person. When contacting technical support, please have the following information ready.

1. Company name
2. Type of machine
3. Serial number of the machine
4. A brief description of the part or problem

### SUPPORT PHONE NUMBERS

#### MAIN NUMBER

(941) 486-8800

Technical Support-Customer Service

Spare Parts

Sales

International Sales

#### EXTENSION

125 *customersvc@fillers.com*

105 *parts@fillers.com*

110

165

**IFS FAX:** (941) 486-0077

**WEBSITE:** [www.fillers.com](http://www.fillers.com)

### Warranty Authorization

IFS must be contacted directly for a warranty part or exchange. You will be issued a return authorization. The warranty part must be returned within 30 days for credit. If a part is not returned, a bill for the part is automatically issued.

### Spare Parts

Non-warranty purchases require a valid Purchase order to process. Verbal purchase orders to \$250 can be assigned to a company representative instead of a process number.

Technicians are available Monday through Friday 8:00 AM to 5:00 PM Eastern standard time.

**IFS Parts department** is available the same hours as our technical staff. At customer request, Next Day shipping is always available. **PLEASE NOTE:** Due to our overnight carrier's pick-up schedule, parts orders received after 3:00 PM EST will not ship until the following day.

## **AIR RINSER OPERATIONS MANUAL**

### ***ELECTRICAL DIAGRAMS, MACHINE PARTS ASSEMBLIES, SETUP SHEETS AND PREVENTIVE MAINTENANCE DOCUMENTS:***

Attachments sent with this manual will contain machine Setup Sheets, 'AS BUILT' bill of materials, CAD Electrical diagrams, mechanical exploded diagrams and Preventive Maintenance (PM) worksheets.