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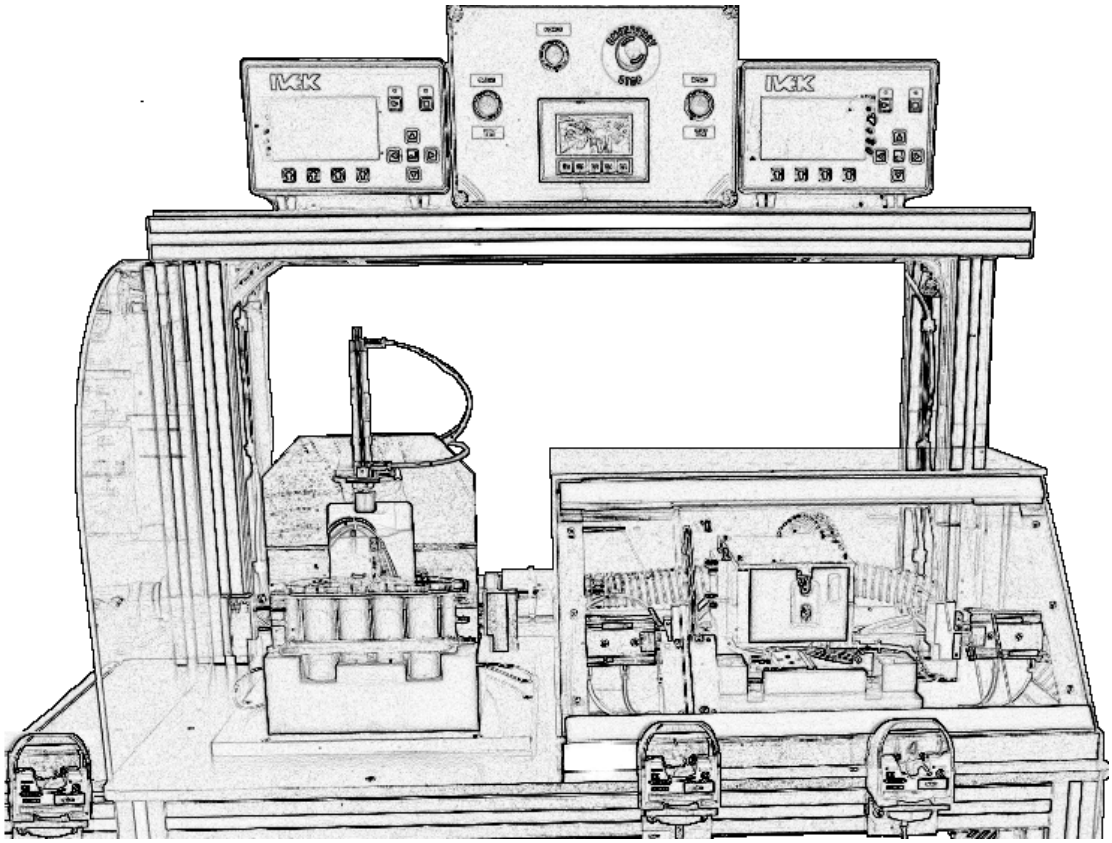


CFDSS Clean and Spray Machine

USER'S MANUAL

Introduction

This Manual provides information to setup and operate the Semi- Automated CFDSS Clean and Spray Machine referred to as CFDSS in this manual. This manual consists of a series of sections that describe in detail each machine component and its operation.

About The Machine

CFDSS is plc controlled and pneumatic actuated. Its design allows for the semi-automated cleaning and silicone spraying of continuous feed dispensing pump barrels.

Theory of Operation

The CFDSS is a two station machine. Each station operates independent of the other. Parts are manually loaded and offloaded to each station. The Clean Station uses filtered air, filtered ionized air and vacuum to clean the inside of the CFDSS pump barrels. The Spray Station utilizes four *IVEK* controlled spray nozzles and three *NORDSON* EFD spray valves to spray silicone into the CFDSS pump barrels.

Table of Contents

SAFETY REQUIREMENTS

To avoid possible injury, and to operate the equipment in a safe and efficient manner, please observe the following safety measures.

Do not operate any of the system components before they are installed.

Verify the proper setup, tooling and nests are installed.

Any unauthorized modifications to the control circuitry or other parts of the system could cause damage to the equipment and / or injury to the operator. Unauthorized modifications may also void the equipment's warranty.

Do not operate this equipment with its cover(s)/ guards off. If it becomes necessary to remove the equipment cover(s)/guards, first turn off power at disconnect and follow company lock-out procedures.

Do not operate this equipment without an equipment grounding connection.

Other safety requirements are included in the manual where they apply.

Description

CFDSS Machine Layout, the left side of the machine is the Clean Station and the right side is the Spray Station.

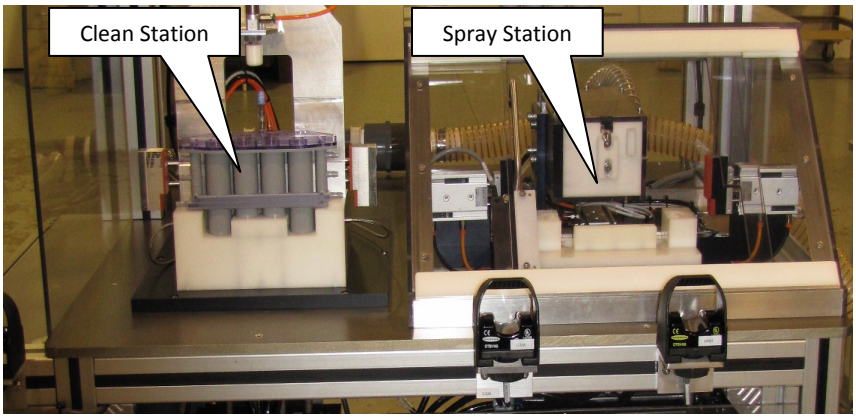
System

Line Voltage	120 vac, 1Phase, 60 Hertz, 20Amp
System Air Supply Air Pressure	>100psi, regulator at machine set at 80 psi.

Sensors, pushbuttons, lamps, emergency stops, and actuator solenoids are 24vdc.

Primary Air solenoid is 24vdc.

Stations



Stations are briefly detailed in this section.

- **Clean Station** – This station consists of four blow nozzles, two ionized air ports, two port plug cylinders, one hold down cylinder and a vertical slide. First Ionized air is blown through the CFDSS pump check valves then clean air is blown into the CFDSS pump barrels while the air and any particles are evacuated into the vacuum ports. The parts are manually loaded and unloaded to this station.

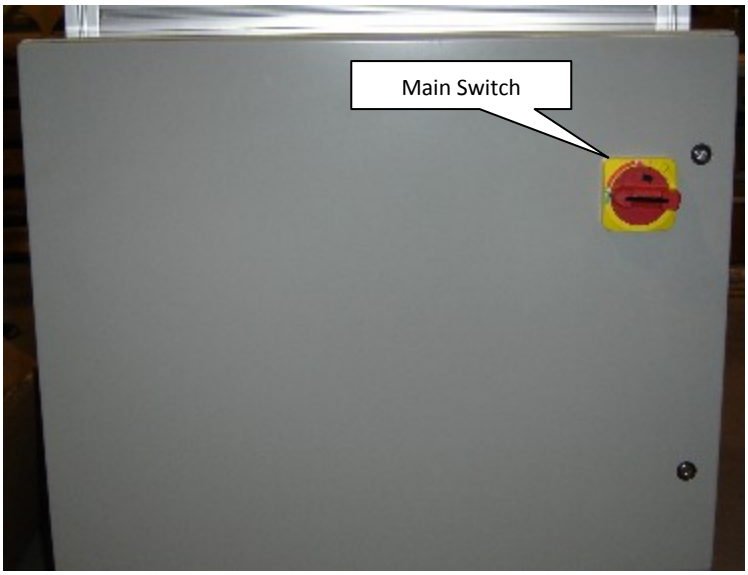
- **Spray Station** – This station sprays silicone into the CFDSS pump barrels and valve housings. In this station there are a total of seven spray nozzles. The four barrels are sprayed individually by four spray nozzles. These four nozzles are controlled by two IVEK controllers. The three valve housings are sprayed individually by three EFD spray valves. The parts are manually loaded and unloaded to this station.

MCP Enclosure

Controls are located in the MCP enclosure. The MCP enclosure is located on the left hand side of the CFDSS machine. Mounted in this enclosure include the following.

- *Allen Bradley* Micrologix 1500 plc
- *Allen Bradley* Safety Relay
- *Sprecher+Schuh* / Load Switch
- *Automation Direct* 24vdc power supplies
- *Sprecher+Schuh* contactors
- Misc. *Automation Direct* terminals
- *Bussmann* midget fuse holders
- *Automation Direct* 5X20mm fuse holders

On the front right side of the enclosure is the main switch. Turn off power with the main switch and unplug whenever it is necessary to open the enclosure door.



Main Switch

An operator handle connected to the main switch provides the ability to lock out power in the off (counter-clockwise) position. When turned on, power is supplied to the system.

Enclosure should not be opened before turning off.

Operator Interface

Mounted on a shelf above the Clean and Spray Stations is the operator interface enclosure with the following controls/buttons/switches/indicators:

POWER ON – White illuminated momentary push button used to apply power to the system. With supply power connected to this unit, operation of this push button energizes the E-stop relay.

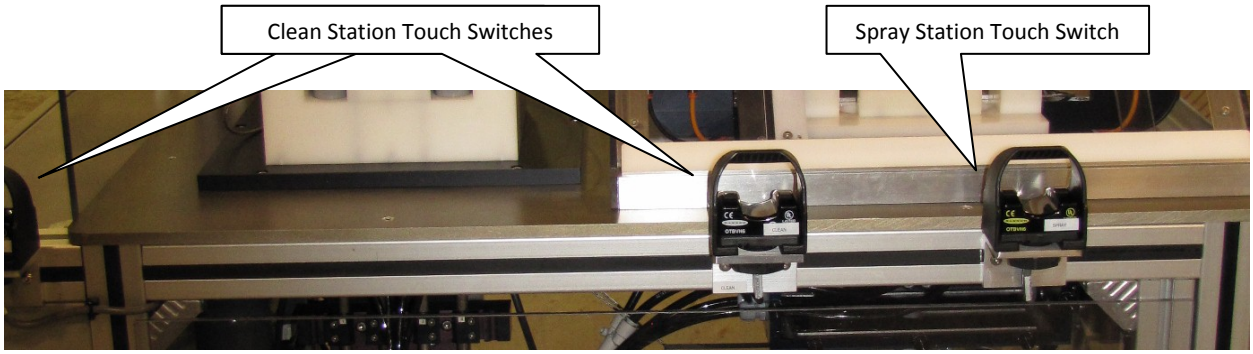
EMERGENCY STOP – Red maintained non-illuminated mushroom button. When this button is depressed the E-stop relay is de-energized, output power and air is removed from the machine. Button must be twisted clockwise to release.

RESET/DONE Clean Station - Blue illuminated momentary push button used to reset Clean Station alarms. The push button indicator flashes if a Clean Station alarm is active and requires the operator to press it. The push button indicator is on steady after the Clean Station has completed a cycle "DONE". To turn off the steady indicator the part must be removed (part present sensor must toggle off). Another part must be in position before a new Clean Station cycle is permitted to start.

RESET/DONE Spray Station - Blue illuminated momentary push button used to reset Spray Station and System alarms. The push button indicator flashes if a Spray Station or System alarm is active and requires the operator to press it. The push button indicator is on steady after the Spray Station has completed a cycle "DONE". To turn off the steady indicator the safety door must be opened and the part must be removed (part present sensor must toggle off). Another part must be in position and the safety door must be closed before a new Spray Station cycle is permitted to start.

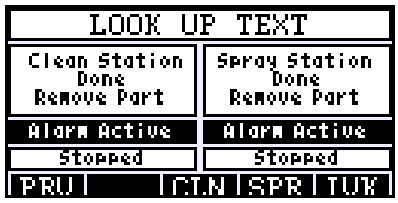
Station Control

Mounted in front of each station are OPTO touch switches.



OPTO TOUCH SWITCHES – There are three OPTO touch switches on the CFDSS. For safety the Clean Station has two OPTO touch switches which utilize anti-tiedown logic the switches when activated are used to start the Clean Station cycle. The Spray Station has one OPTO touch switch this switch when activated is used to start Spray Station cycle. The switches must be deactivated before the station cycle is permitted to start again.

Automation Direct C-more micro TOUCH SCREEN



MAIN SCREEN – Contains system and station status information.

LOOK UP TEXT – Indicates system status, System OK, E-Stop Active or Vacuum Pump Tripped Overload.

STATION STATUS INDICATORS – Indicates whether either station is Done, in Alarm or Stopped.

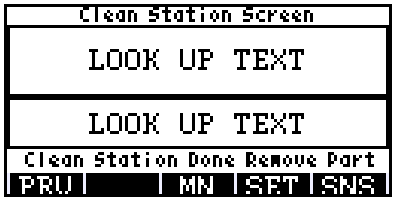
Four functions keys are used to navigate to other screens.

F1 PRV Go To previous screen

F3 CLN Go To Clean Station Status Screen

F4 SPR Go To Spray Station Status Screen

F5 IVK Go To IVEK Status Screen



CLEAN STATION SCREEN – Contains station status information.

TOP LOOK UP TEXT – Message box indicates current station step sequence of operation.

BOTTOM LOOK UP TEXT – Message box indicates any active station alarm.

STATION DONE INDICATOR – Visible when station is Done and part needs removed.

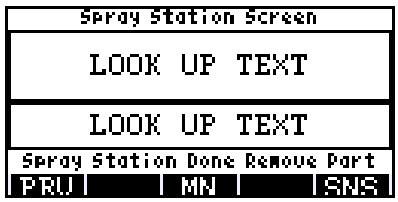
Four function keys are used to navigate to other screens.

F1 PRV Go To previous screen

F3 MN Go To Main Screen

F4 SET Go To Clean Station Setup Screen

F5 SNS Go To Clean Station Sensors Status Screen



SPRAY STATION SCREEN – Contains station status information.

TOP LOOK UP TEXT – Message box indicates current station step sequence of operation.

BOTTOM LOOK UP TEXT – Message box indicates any active station alarm.

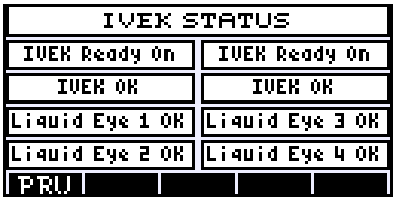
STATION DONE INDICATOR – Visible when station is Done and part needs removed.

Three function keys are used to navigate to other screens.

F1 PRV Go To previous screen

F3 MN Go To Main Screen

F5 SNS Go To Spray Station Sensors Status Screen

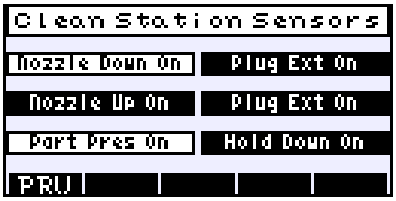


IVEK STATUS SCREEN – Contains IVEK controller and LIQUID EYE status.

STATUS INDICATORS – Display status of the IVEK controller signals and the Liquid Eye monitors.

One function key is used to return to the previous screen.

F1 PRV Go To previous screen

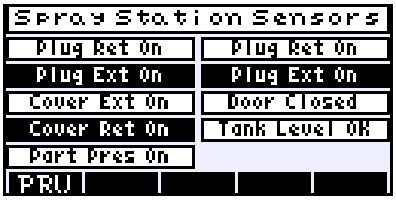


CLEAN STATION SENSOR STATUS SCREEN – Contains Clean Station sensor status.

STATUS INDICATORS – Display sensor status.

One function key is used to return to the previous screen.

F1 PRV Go To previous screen

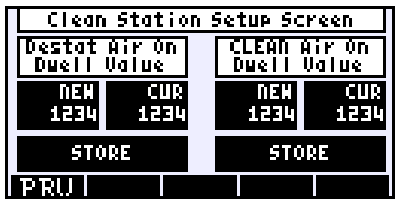


SPRAY STATION SENSOR STATUS SCREEN – Contains Spray Station sensor status.

STATUS INDICATORS – Display sensor status.

One function key is used to return to the previous screen.

F1 PRV Go To previous screen



CLEAN STATION SETUP SCREEN – Contains Clean Station Air On Dwell Values for DESTAT Air (Ionized) and Clean Air.

New Dwell Value – Numeric Entry Touch Cell used to enter new dwell value.

CUR Dwell Value – Numeric Display or the current dwell value for the Clean Station.

STORE – Momentary touch cell used to store the new value that was entered.

One function key is used to return to the previous screen.

F1 PRV Go To previous screen

Setup

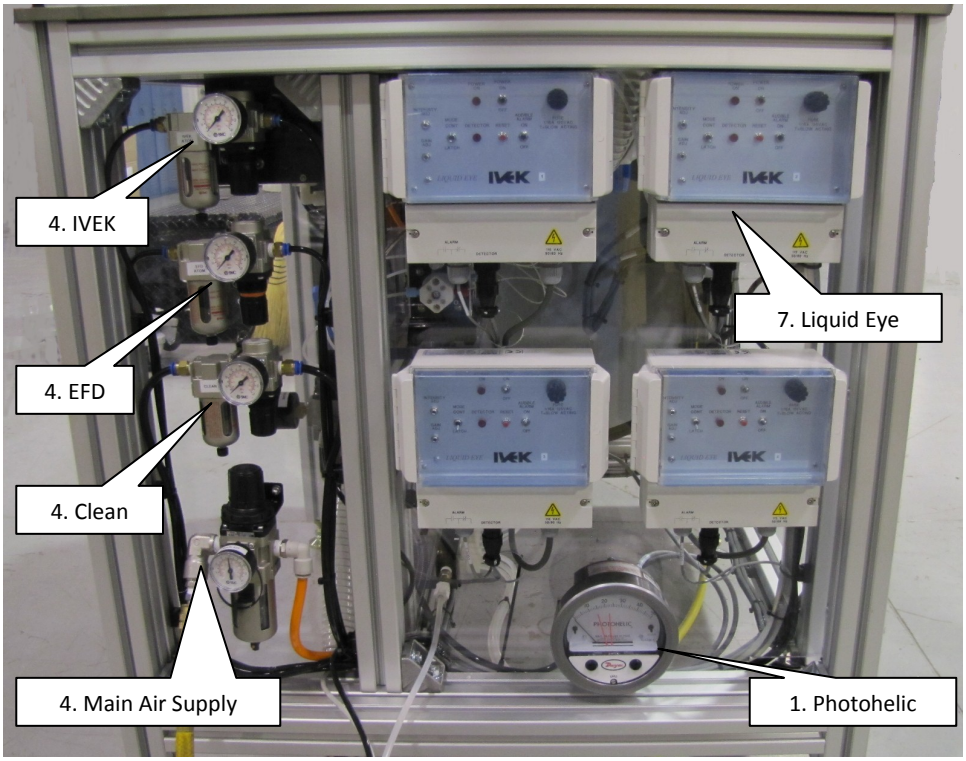
Overview

CFDSS has been designed to minimize setup.

This section will describe general adjustments that can be made.

Caution should be taken when making any adjustments, Machine performance may be directly affected by any changes.

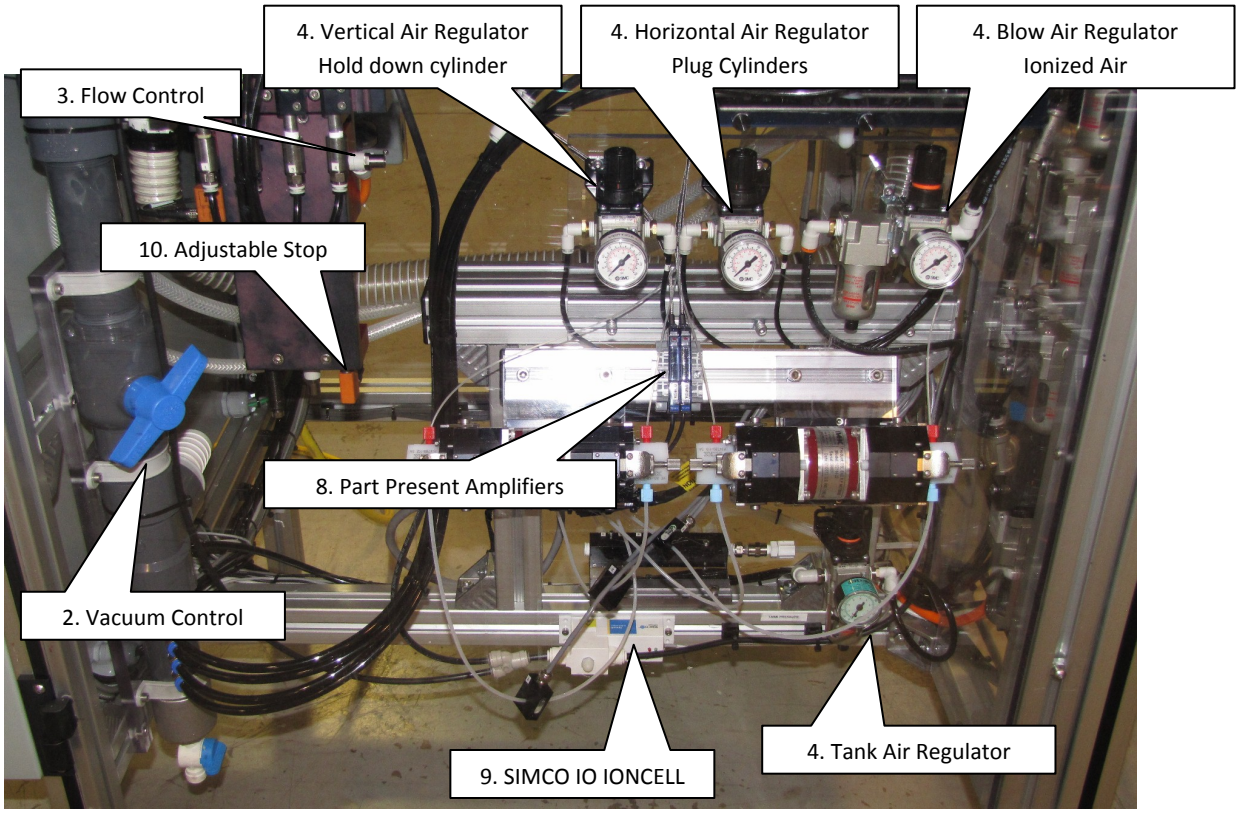
General Adjustments



Bottom Right Side View

1. *Photohelic* Pressure Switches and Gauge (vacuum) are used for to detect a low or high vacuum condition and the actual vacuum at the Spray Station. Refer to manufactures instructions for proper adjustment of switch.

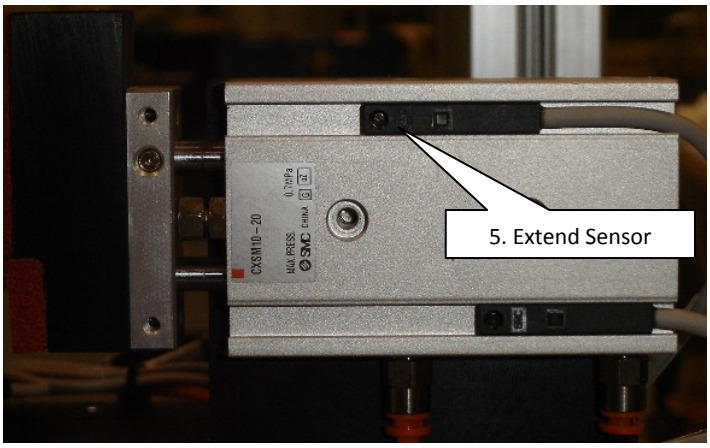
2. Vacuum Control Valve is used to adjust the amount of vacuum at the Spray Station.



Bottom Front View

3. Flow Control Valves are used for the vertical cylinder located on the Clean Station. Flow controls should be adjusted to allow smooth and quick movement of the cylinder.

4. Eight Air Pressure Regulators are used to limit the pressure of the supply air, EFD atomizing air, IVEK atomizing air, Silicone tank air, Clean air, Ionized air, Hold down cylinder, and the Clean Station Port Plug cylinders. Settings to be determined by customer.



Spray Station Right Port Plug Cylinder

5. SMC pneumatic cylinders are used on CFDSS. All of the SMC cylinders have sensors mounted to the side of the cylinder. Sensor position adjustments can be made by moving the sensor along the cylinder body.

1 of 2 IVEK Spray Controllers

6. IVEK Spray Controllers – Two controllers (left and right) are used to control four spray nozzles. The controllers control the amount of silicone sprayed into the barrels. Settings to be determined by customer. Refer to manufacturer instructions to adjust parameters.

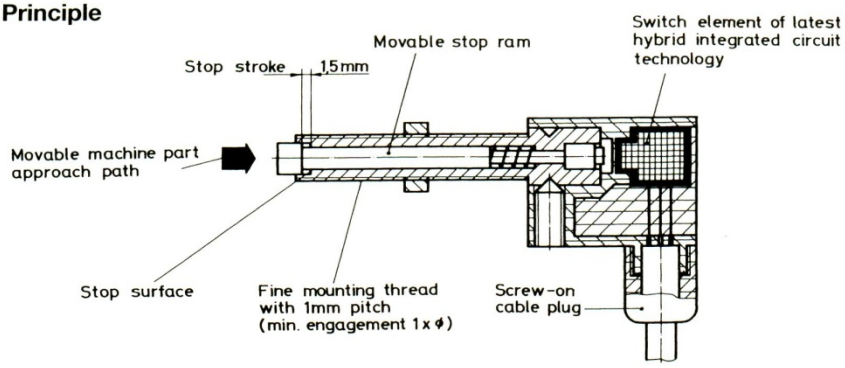
7. IVEK Liquid Eye Monitors – Four units monitor the silicone supply lines to the IVEK spray nozzles for air. If air is detected in a line the Spray Station will alarm until the monitor is reset. Refer to manufacturer instructions to adjust sensitivity.

8. Fiber Optic Thru Beam Sensor and Amplifier – are used to detect a part in the nest of the Clean Station and Spray Station. The amplifiers can be adjusted to optimize sensing capability. Refer to manufacture instructions to adjust parameters.
   (Initial Setting: output mode-Dark-On, power mode-Fine, preset value-50)

9. SIMCO IONCELL – In-Line Ionizer used to supply DESTAT air to the Clean Station only. There is a red and green LED present to indicate status of this device. Power to this device should only be on when air is passing through. Refer to manufacture instructions for cleaning and adjustments.

10. One METO-FER pneumatic ML linear slide is used on CFDSS. All of the ML's have adjustable stop screws to vary the end of stroke stop position. A unique feature of the stop screw is the custom inductive proximity sensor mounted at the end. This eliminates the need of readjusting end of stroke sensors when stop positions are changed. After properly setting the stop screw position, be sure to lock it in place with the lock nut. Also be sure the proximity sensor is completely seated on the end of the stop screw with the set screw snug.

Functional Principle



The socket head cap screw of the plug-in sensing element is used to mount the sensing element on the stop screw.
The socket head cap screw is provided with a conical end and is simultaneously used for the exact positioning of the sensing element on the stop screw.

Operation

Overview

CFDSS has been designed for ease of use by employing software that controls the operation and cycle of the station. This reduces time for setup and the possibility of problems. Once in operation occasional faults may require operator acknowledgement.

This section will cover the sequence of operation of the machine from power up, to total automatic operation, to empty mode cycle then to a complete shutdown.

Startup

Caution: Before proceeding with a machine power up ensure that machine is clear of personnel and that all affected personnel are notified.

Powering On the Machine

Before powering on the machine, verify that all parts are removed from the machine, all air supply valves are open, the emergency stop switch is released and the power cord is securely plugged in. Turn on the main switch located in the upper right hand corner of the MCP. With the MCP enclosure door closed rotate the operator handle clockwise to the ON position. The processor will now have power and the program will start.

This next operation will supply air to the machine and motion will occur!

Press the white power on pushbutton located on the Operator Interface Enclosure. Output power and air will now be supplied to the machine.

Initialization

On power up, the air circuit valve is opened. All components supplied with air from this circuit will move to the position directed by their respective solenoid valves. This does not mean they will go to their "off" or "home" position. A solenoid could possibly be in a manually forced position. The air circuit component's sensors are checked to verify that they are in their "home" position and if any are not, the station will alarm. See individual station sensor status screen.

System Run Mode

There are no modes to select for this machine. All operations are manually initiated.

Activating an OPTO Touch switch may begin machine motion!

Each station is started separately by activating its OPTO Touch switch.

Clean Station - A part must be present in the nest before activating the OPTO Touch switches to start a cycle. The Clean Station has two interlocked OPTO Touch switches with anti-tiedown logic. Only after the part present sensor is on can the OPTO Touch switches be activated. The OPTO Touch switches must be activated simultaneously and held active until the Hold cylinder is down and the Port Plug cylinders are extended before deactivating the OPTO Touch switches. Both OPTO Touch switches must be deactivated and the part removed and replaced before the next cycle is permitted to start.

Spray Station – A part must be present in the nest and the safety door must be closed before activating the OPTO Touch switch to start a cycle. The OPTO Touch switch must be deactivated, and part removed then replaced and the door closed before a new cycle is permitted to start.

Normal Station Cycle

The following is a detail of a normal station cycle. These stations cycle begins with no faults and no parts in the nest.

Clean Station – Begin by loading a part onto the nest in the proper orientation. Verify the part present sensor is blocked. Next activate both OPTO Touch switches simultaneously, hold down cylinder goes down, left and right port plug cylinders extend. (OPTO Touch switches may be deactivated after this step) the DESTAT (ionized) air is turned on and blows through the CFDSS pump check valves for a set duration, after DESTAT air is turned off the vertical nozzle cylinder rises up, once up the clean air turns on and blows out the CFDSS pump barrels for a set duration and stays on until the nozzle cylinder lowers down. A constant vacuum removes air and particulates. When the nozzle cylinder is completely down the clean air turns off, the left and right port plug cylinders retract and the hold down cylinder rises up after motion has completed the blue Reset/Done indicator turns on steady. This is an indication that the cycle has completed successfully. Finish by removing cleaned part from the nest. The blue Reset/Done indicator is turned off after the part is removed. Cycle may now be restarted.

Spray Station – Begin by opening the safety door and loading a part onto the nest in the proper orientation. Verify the part present sensor is blocked and close the safety door. Next activate OPTO Touch switch, the left and right port plug cylinders extend and the spray cover cylinder retracts. Next the sprays are triggered and silicone is sprayed into the CFDSS pump barrels and valve housings. Once spraying has completed the left and right port plug cylinders retract and the cover cylinder extends. A constant vacuum removes any overspray of silicone. The blue Reset/Done indicator turns on steady. This is an indication that the cycle has completed successfully. Finish by opening the safety door and removing sprayed part from the nest. The blue Reset/Done indicator is turned off after the part is removed. Cycle may now be restarted.

STATION STOP

Clean Station – Station stop is active whenever a part is not present in the nest or when an OPTO Touch switch is deactivated before the hold down cylinder or port plug cylinders are completely actuated at the start of a cycle. At Station Stop the station step sequence is reset to zero. Also anytime during a Clean cycle if a part is removed Station Stop is activated. Station Stop is reset when both OPTO Touch switches are deactivated and a part is present in the nest.

Spray Station – Station stop is active whenever a part is not present in the nest or when the safety door is opened. Also the station step sequence is reset to zero if the safety door is opened during a spray cycle. Station Stop is reset when a part is present in the nest and the safety door is closed.

Station stop is not the same as EMERGENCY STOP. It is a software controlled operation pause. Personnel should <u>not</u> work on any part of the machine while it is in station stop.

SHUTDOWN

Emergency Stop push button, push to activate, twist to release.

EMERGENCY

There is one Emergency Stop push button located on the CFDSS machine. This push button is located on the front of the operator interface enclosure. Pressing this emergency stop push button will remove output power and air from the machine immediately.

Any parts being processed by the machine need not be removed after Emergency Stop activation.

NORMAL SHUTDOWN

For normal system shutdown, Allow stations to finish their cycles and remove parts. Next press the Emergency Stop push button to turn off output power and air to the machine. Turn off the main switch located in the upper right hand corner of the MCP. With the MCP enclosure door closed rotate the operator handle counter-clockwise to the OFF position. Close Supply Air valve. Unplug power cord if MCP is to be opened.

Personnel should <u>not</u> work on any part of the machine while power or air is applied.

Allow Silicone Tank Air Pressure to bleed off before disconnecting tank!

DIAGNOSTICS

OVERVIEW

This section identifies various faults and errors that are detected by the system. Error or fault conditions will be indicated with lamps or a message on the operator interface touch screen.

CONDITIONS

GENERAL STATION ACTUATORS

Actuator faults occur during normal operation and are detected with proximity sensors. Any time an actuator is turned on or off, its respective sensor is checked to verify that it is in the proper position.

If an actuator is turned on and the end of stroke sensor is not activated within a fixed amount of time, the actuator is turned off. The Reset/Done blue push button indicator located at the operator interface panel will flash indicating a fault. A corresponding alarm message will be displayed on that stations status screen.

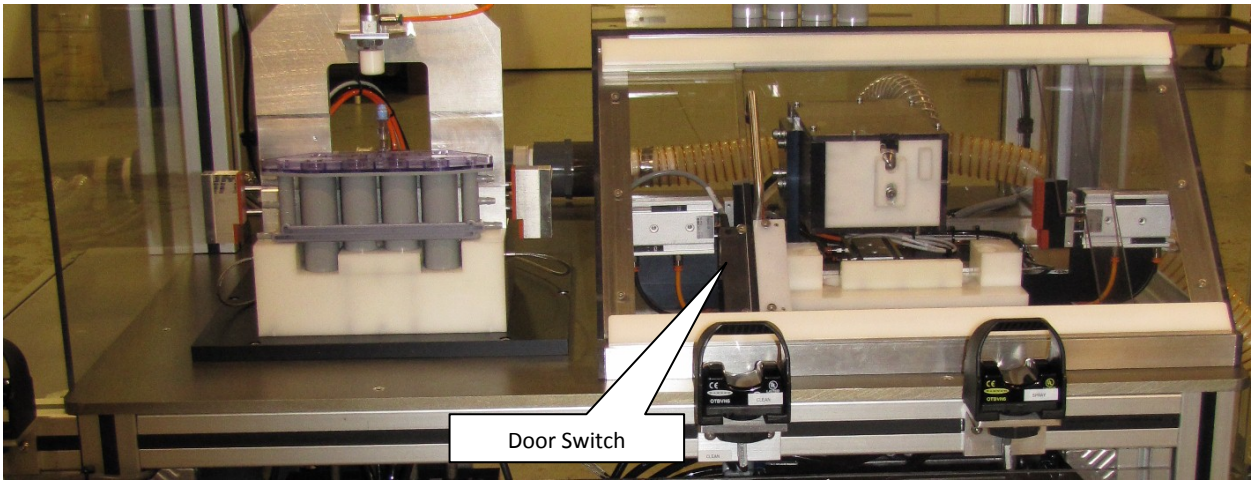
If an actuator is turned off and the end of stroke (home) sensor is not activated within a fixed amount of time, the actuator remains off. The Reset/Done blue push button indicator located at the operator interface panel will flash indicating a fault. A corresponding alarm message will be displayed on that stations status screen.

Optical SENSORS

Clean Station – Has one through beam sensor to detect the presence of a part in the nest. A part must be present (PARTPRES_C) sensor on for the clean cycle to be permitted to begin, if the part present sensor goes off any time during the cycle that cycle is aborted and has to be restarted after a part is present. At the end of the cycle, station "Done" is active, the part present (PARTPRES_C) sensor must go off and another part (PARTPRES_C) senor on before a new clean cycle can be started.

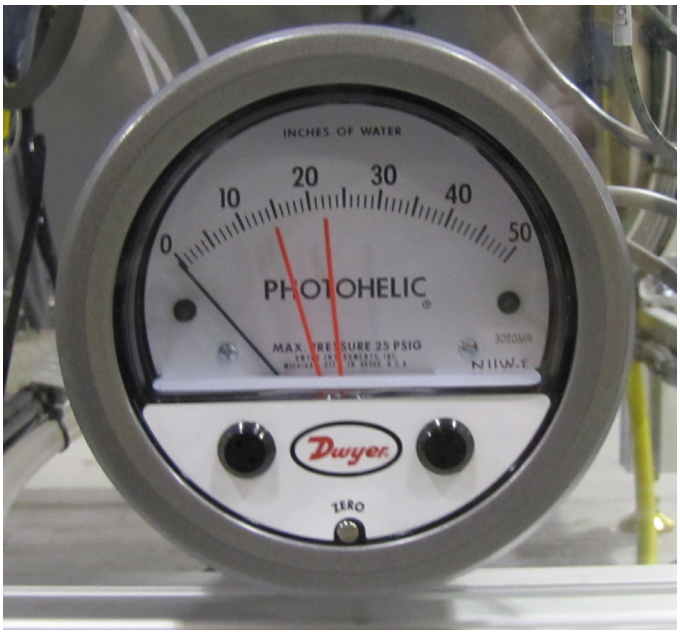
Spray Station – Has one through beam sensor to detect the presence of a part in the nest. A part must be present (PARTPRES_S) sensor on and the safety door closed for the spray cycle to be permitted to begin, if the part present sensor goes off or the safety door is opened any time during the cycle that cycle is aborted and has to be restarted after a part is present and the safety door is closed. At the end of the cycle, station "Done" is active, the part present (PARTPRES_S) sensor must go off and the safety door opened and another part (PARTPRES_S) senor on and safety door closed before a new clean cycle can be started.

SWITCHES



Front View

Spray Station Safety Door Switch – Has one magnetic coded safety door switch covering the spray station. A part must be present and the safety door closed (DOOR_S) on for the spray cycle to be permitted to begin, if the part present sensor goes off or the safety door is opened any time during the cycle that cycle is aborted and has to be restarted after a part is present and the safety door is closed. At the end of the cycle, station "Done" is active, the part present sensor must go off and the safety door opened (DOOR_S) off and another part present and safety door closed (DOOR_S) on before a new spray cycle can be started.



Bottom Right View

Spray Station *Photohelic* Vacuum Pressure Switch - The Spray Station has one *Photohelic* pressure switch which is used to detect a Low vacuum or a High vacuum condition. If either condition is present (PHVACLO) off or (PHVACHI) off the Spray Station will fault. The Reset/Done blue push button indicator located at the operator interface panel will flash indicating a fault. A corresponding alarm message will be displayed on that stations status screen. Operator intervention will be needed to verify the system vacuum is within limits and press the flashing blue reset/done pushbutton to reset the alarm.

Silicone Tank

Spray Station Silicone Tank Low Level Switch - The silicone tank has a low level float switch inside. If a low level condition is detect the Spray Station will fault. The Reset/Done blue push button indicator located at the operator interface panel will flash indicating a fault. A corresponding alarm message will be displayed on that stations status screen. Operator intervention will be needed to replace or fill the silicone tank. Press the flashing blue reset/done pushbutton to reset the alarm.

IVEK Controller

IVEK Controllers and Monitors

Spray Station IVEK Controller – There are two IVEK controllers. The controller signals are monitored by the Spray Station, if the signals are not as expected the Spray Station will fault. The Reset/Done blue push button indicator located at the operator interface panel will flash indicating a fault. A corresponding alarm message will be displayed on that stations status screen. Operator intervention will be needed to verify the state of the IVEK controller and cause of the issue (See IVEK manual for details). Press the flashing blue reset/done pushbutton to reset the alarm.

IVEK Liquid Eye Monitors

Spray Station IVEK Liquid Eye Monitors – Four Liquid Eye monitors are used to detect silicone (air bubbles) in the feed tube of the IVEK pump. If air bubbles are detected the Spray Station will fault. The Reset/Done blue push button indicator located at the operator interface panel will flash indicating a fault. A corresponding alarm message will be displayed on that stations status screen. Operator intervention will be needed to verify presence or not of air in the feed tubing. If air is detected the tubing will need to be purged. (See IVEK manual for details). Press the flashing blue reset/done pushbutton to reset the alarm.

SIMCO Inline Ionizer

DESTAT AIR

Clean Station SIMCO ION Ionizer – This device is used to destat the air used to clean the CFDSS pump check valve ports. The power to this device is turned on and off each clean cycle. Two status indicators are visible on the front of this unit. The status of this device has no effect on the operation of the Clean Station.

APPENDICES

OVERVIEW

This section includes the following documentation:

1. Fuse List
2. Devices / Sensors
3. Inputs and Output, plc address, tag name, and description

FUSE LIST

The following *Edison* AC fuses are used:

MEN7
MEN12
MEN20

The following *Bussman* DC fuses are used.

BK/GMA 2A

I/O DEVICES

The devices are as follows.

Part no.	Manufacturer	Description
FS-V21RSO (2435)	Keyence	npn Fiber Optic Sensor
FU-77G	Keyence	4mm Thru Beam Fiber
OTBVN6	Banner	OPTO Touch Switch
QE-022-NS-11L	METO-FER	npn Stop Screw Sensor
D-Y59A	SMC	CXS, CWS Cylinder Sensor
BNS 33-11z-2063	SCHMERSAL	Magnetic Door Switch
440R-B23020	Allen Bradley	Safety Relay MSR5T
3050MR-TP-20FT	DWYER	Photohelic Pressure Switch
520154-AAC	IVEK	Liquid Eye Monitor
322227	GEMS	Tank Level Float Switch
CA-4-09C	Sprecher +Schuh	Contactor
SQM08D	Automation Direct	Relay Base
QM2X1-D24	Automation Direct	DPDT Relay
NVFS3120-5DZ-03T	SMC	Supply Air Dump Valve
SY5120-5DZE-01T	SMC	24vdc Solenoid Valve
4015281	SIMCO	In-Line Air Ionizer

INPUTS and OUTPUTS

Address	Location	Symbol	Description
I:0.0	Base	ESR1_4	Emergency Stop relay n.c. contact 4
I:0.1	Base	RESETC_PB	Clean Station reset/done momentary pushbutton n.o. contact
I:0.2	Base	RESETS_PB	Spray Station reset/done momentary pushbutton n.o. contact
I:0.3	Base	PARTPRES_S	Spray Station part present sensor
I:0.4	Base	PARTPRES_C	Clean Station part present sensor
I:0.5	Base	OPTOTOUCH_S	Spray Station OPTO Touch switch
I:0.6	Base	OPTOTOUCHL_C	Clean Station Left OPTO Touch switch
I:0.7	Base	DOOR_S	Spray Station door switch
I:0.8	Base	MOLVACPMP	System vacuum pump motor overload n.c. contact
I:0.9	Base	COVEREXT	Spray Station cover cylinder extend sensor
I:0.10	Base	COVERRET	Spray Station cover cylinder retract sensor
I:0.11	Base	IVEKREADY_L	Spray Station left IVEK ready signal
I:0.12	Base	IVEKREADY_R	Spray Station right IVEK ready signal
I:0.13	Base	IVEKFAULT_L	Spray Station left IVEK faulted signal
I:0.14	Base	IVEKFAULT_R	Spray Station right IVEK faulted signal
I:0.15	Base	OPTOTOUCHR_C	Clean Station Right OPTO Touch switch
O:0.0	Base		
O:0.1	Base		
O:0.2	Base		
O:0.3	Base	DONE_LA_S	Spray Station reset/done button indicator lamp
O:0.4	Base	DONE_LA_C	Clean Station reset/done button indicator lamp
O:0.5	Base	COVER	Spray Station cover cylinder solenoid
O:0.6	Base	IVEKTRIG_L	Spray Station left IVEK trigger signal
O:0.7	Base	IVEKTRIG_R	Spray Station right IVEK trigger signal
O:0.8	Base		
O:0.9	Base		
O:0.10	Base		
O:0.11	Base		
I:1.0/0	Slot 1	LIQEYE_1	Spray Station Liquid Eye 1 monitor n.c. contact
I:1.0/1	Slot 1	LIQEYE_2	Spray Station Liquid Eye 2 monitor n.c. contact
I:1.0/2	Slot 1	LIQEYE_3	Spray Station Liquid Eye 3 monitor n.c. contact
I:1.0/3	Slot 1	LIQEYE_4	Spray Station Liquid Eye 4 monitor n.c. contact
I:1.0/4	Slot 1	TANKLOW	Spray Station silicone tank level low n.o. contact
I:1.0/5	Slot 1	PLUGRETL_S	Spray Station left plug cylinder retract sensor
I:1.0/6	Slot 1	PLUGEXTL_S	Spray Station left plug cylinder extend sensor
I:1.0/7	Slot 1	PLUGRETR_S	Spray Station right plug cylinder retract sensor
I:1.0/8	Slot 1	NOZZLEDN_C	Clean Station nozzle cylinder down sensor
I:1.0/9	Slot 1	PLUGEXTR_S	Spray Station right plug cylinder extend sensor

Address	Location	Symbol	Description
I:1.0/10	Slot 1	PHVACLO	Spray Station *Photohelic* low vacuum switch n.o. contact
I:1.0/11	Slot 1	NOZZLEUP_C	Clean Station nozzle cylinder up sensor
I:1.0/12	Slot 1	HOLDDN_C	Clean Station Hold Down Down Sensor
I:1.0/13	Slot 1	PHVACHI	Spray Station *Photohelic* high vacuum switch n.c. contact
I:1.0/14	Slot 1	PLUGEXTL_C	Clean Station Left Plug Cylinder Extend Sensor
I:1.0/15	Slot 1	PLUGEXTR_C	Clean Station Right Plug Cylinder Extend Sensor
O:2.0/0	Slot 2	ATOMAIREFD	Spray Station EFD atomizing air solenoid
O:2.0/1	Slot 2	EFD	Spray Station EFD actuating air solenoid
O:2.0/2	Slot 2	PLUGCYLL	Spray Station left plug cylinder solenoid
O:2.0/3	Slot 2	PLUGCYLR	Spray Station right plug cylinder solenoid
O:2.0/4	Slot 2	NOZZLE	Clean Station nozzle cylinder solenoid
O:2.0/5	Slot 2	CLEANAIR	Clean Station clean air valve solenoid
O:2.0/6	Slot 2	VACPMP	System vacuum pump contactor
O:2.0/7	Slot 2	ATOMAIRIVK	Spray Station IVEK atomizing air solenoid
O:2.0/8	Slot 2	PLUGCYL_C	Clean Station Left and Right Plug Cylinders Solenoid
O:2.0/9	Slot 2		
O:2.0/10	Slot 2	DESTATAIR	Clean Station Destat Air Solenoid
O:2.0/11	Slot 2	DESTAT_CR	Clean Station Destat Control Relay
O:2.0/12	Slot 2	HOLD_C	Clean Station Hold Down Cylinder Solenoid
O:2.0/13	Slot 2		
O:2.0/14	Slot 2		
O:2.0/15	Slot 2		