SMC Pack Demo Operation

Operating Procedure for the SMC Pack Demo			
Important Information Caution: possibility of damage to equipment Warning: possibility of damage to equipment or personnel			
Steps	Activity/Information		
Verify operation state.	Solid green light indicates machine is in a safe state and can be worked on. This is also an indication that is it ready for run verification. Press the “Start Button”		
This is a normal state.	Red light solid Green light Off The system is running and should be in cycle. Press the “Stop Button” This should take you back to the ready state.		
This indicates the machine is safe to work on.	Red light Off Green light Flashing Air Pressure out of range. Correct Pressure issue. Press the “Reset Button” This should take you back to the ready state.		
	Red light Flashing Green light Off Alarm condition. Correct the cause of the alarm. Press the “Reset Button” This should take you back to the ready state.		
	Red light Flashing Green light Flashing Home Required. “Reset Button” This should take you back to the ready state.		

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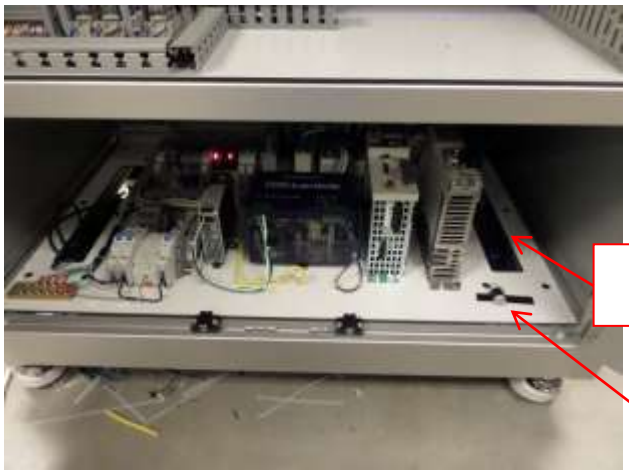
General Notes:

1. When initially setting up the display:
    a. Connect air.

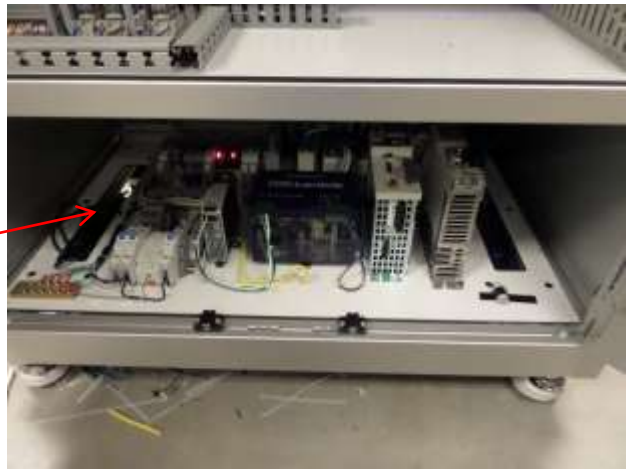


Inlet air can be routed through this slot.

Note, an 8 mm fitting is included for connection at most shows.

    b. Connect electricity.

The 120 VAC electrical plug can be routed through this slot.



    c. The E-stop Button is engaged during shipment so it fits in the recessed area of the Base Unit. Twist and pull out to disengage. If unsure, try pushing it in; it should become engaged, then twist and pull out. If it does not push in, it is already engaged; make sure to twist and pull out.

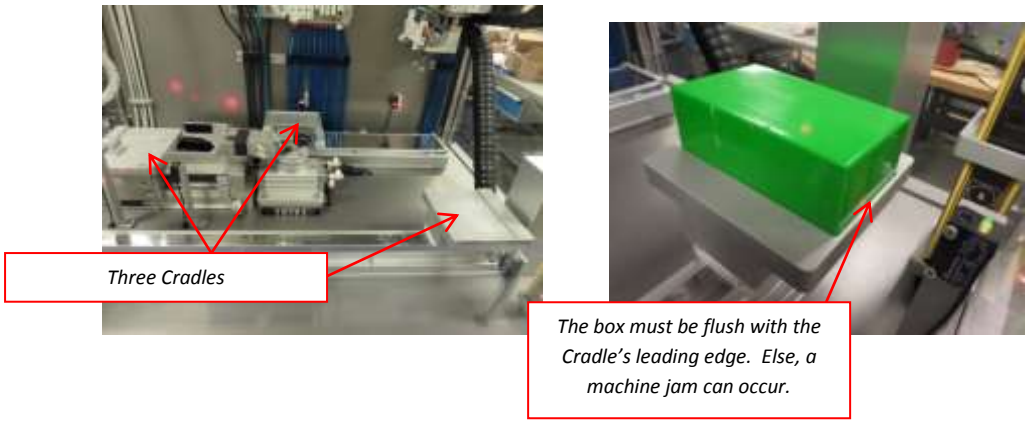
Make sure the E-stop Button is disengaged during initial setup.

   d. Use only one box when initially starting up. After it goes through a complete loop, the system is proved out and two boxes may be used.

2. The regulated air should be set at 80 psi. The machine will alarm if outside of 70 to 90 psi. The regulator is located within the display window door and air is dumped when the door is open; therefore, there are two methods of adjustment:
   a. Open the door and adjust in the blind. Recheck with the door closed and the alarm reset; repeat – trial and error.
   b. See Note 10, which explains how to temporarily bypass the Safety Circuit.

Note: The Safety Display's door interlock switch is for demonstration purposes and not for protection from hazards.

3. The display is designed to run with one or two boxes. When starting up, place the box(es) in one of the three cradles – make sure its edge is flush with the cradles front edge.



4. There are four methods of causing an E-stop Condition:
   a. Pressing the E-stop Button.

b. Stepping on the Safety Mat.

c. Opening the Window Door.

d. Breaking the Light Curtain.

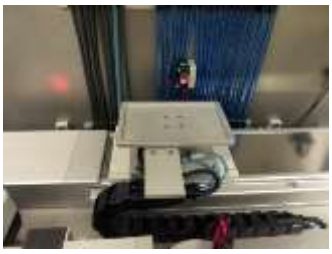
5. When the machine is in an E-stop Condition, the system air is exhausted (dumped).
   a. The air to the Vacuum Pick and Place is separated from the Dump Valve; hence, it does not drop a part in an E-stop Condition.

b. The following actuators have center blocking solenoid valves and have air holding them in place during an E-Stop Condition; hence, having stored mechanical energy. Use caution when troubleshooting these actuators:

i. Center Vertical Pick and Place Lifter.

ii. Center Pick and Place Gripper.

iii. Rear Rotator.



Warning: Actuators having center blocking solenoid valves have stored energy that can cause bodily injury when troubleshooting, even with the system air exhausted or off.

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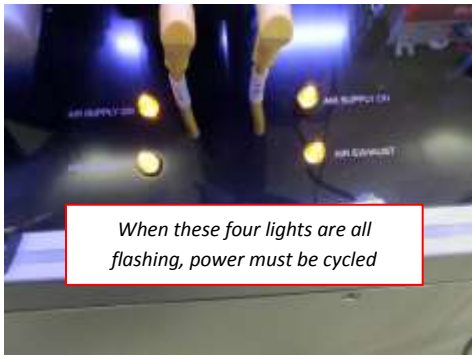
6. When the machine is in an E-stop Condition, remove any boxes being held in a Gripper (when possible – sometimes the box can be trapped between two sensors and cannot be moved – Reset with the box in place). Place these boxes in a Cradle, press Reset, then Start.

7. If a Stepper or Servo Controller error occurs (example, after a jam), the power needs to be cycled off then on to clear. When three unsuccessful resets fail to home the machine, all four amber lights in the window will flash indicating the power needs to be cycled to clear. When cycling the power, leave the power off at least 10 seconds prior to restoring power.



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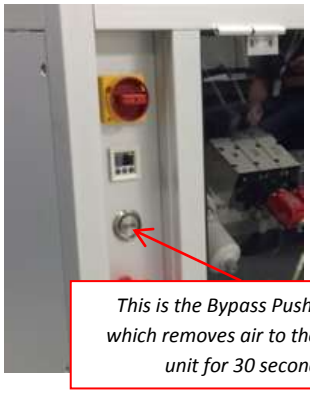
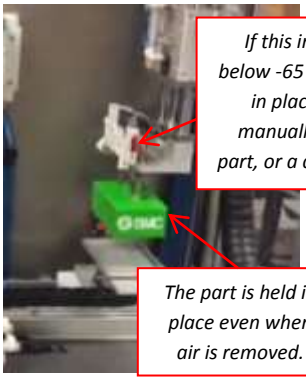
8. The Bypass Push Button on the left side removes the Vacuum Pick & Place air supply for 30 seconds. It shows the part staying in place when supply air is removed, typically in the Stopped position. When pressed multiple times within each 30 second window (with the machine in Stop), the part vacuum will eventually fall below its recycle set point of -65 kPa and soon lose confirmation it has a part (red light will come on in the vacuum unit). Eventually the part will drop.

Caution: <u>Always manually remove the part if the vacuum indication goes less than -65 kPa</u> (for example, -64 kPa). If the part is left in place when the air supply is restored, a major crash could occur – the PLC does not have confirmation of the part in place and will try to pick up the next part.



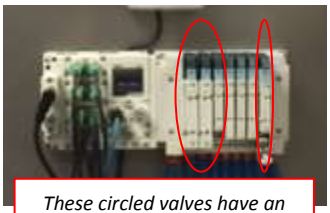
This is the Bypass Push Button, which removes air to the vacuum unit for 30 seconds.



If this indicator falls below -65 kPa with a part in place, you must manually remove the part, or a crash will occur.

The part is held in place even when air is removed.

9. Four of the 3 position SY Valves have an open center (see illustration below). During a catastrophic loss of the main air supplied to the unit, these valves could stop in a floated position where the pilot cannot actuate in either direction. The manifold will sound with a solid hiss. In this situation, you may need to remove the faulting valve from the manifold, and manually move the spool one way or the other.



These circled valves have an open center.

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10. For troubleshooting purposes, the Master Contact Relays (MCR1 and MCR2) for our Safety E-stop Circuit are located on the bottom panel (see illustration below) and have blue override switches. These switches bypass the safety components – you must engage both of them, as they are in series. Bypassing allows you to reach through the light curtain and manually engage the SY solenoid valves without the air being dumped. This feature should only be used by qualified technicians who understand the dangers of engaging overrides. After troubleshooting, re-engage the relays by returning the blue override switches to there off position.

Warning: Bypassing the Master Contact Relays (Safety Circuit) can cause serious injury because you are not protected from the moving pneumatic parts in the display.