

synflow®

User's Guide



Elevate your process

SVC-17-0044_EN-Rev01 (EN) 03 / 2018



Introduction

Dear Customers,

Thank you for purchasing a Synventive synflow® System. Our objective is to provide you with a product that is a good fit for the application, trouble free in performance, and support it with the best service in the industry. If problems occur during the use of this product please contact us at one of the locations provided.

This manual is designed as a reference document for the proper installation, operation and maintenance of Synventive synflow® Systems as well as a guideline for securing occupational health and safety in connection with the use of this system. Synventive does not warrant that the information is complete or accurate for every application. Synventive reserves the right to make changes to this document from time to time as new products are developed and new information identified.

This manual contains essential information, to ensure its general applicability to Synventive synflow® Systems. The customer is exclusively responsible for the protection of their equipment and personnel. Synventive is not liable for any personal injury or damage caused by improper use, installation or handling of the product. This product should only be installed and used by fully trained and qualified personnel. The customer is required to provide the necessary personal protective equipment, such as protective gloves, hearing protection, protective shields etc. In no case does this document provided by Synventive release the customer from its obligations.

This manual is intended for tooling and molding personnel who install and maintain the synflow® System. It should be forwarded with the synflow® System when shipped to the molder or between molding locations.

This document is copyright protected and it is intended exclusively for the users of Synventive synflow® Systems. It may not be copied and distributed without the written consent of Synventive Molding Solutions.

Yours faithfully,

Synventive Molding Solutions

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Symbols of Danger Categorisation

**Danger**

indicates an imminent hazardous situation which may result in death or serious injury.

**Warning**

indicates a dangerous situation that may lead to irreversible injury.

**Caution**

indicates a dangerous situation that may lead to reversible injury.

NOTICE**Notice**

indicates a situation that may lead to material damage and provides additional information on proper procedures and trouble-free labor without the possibility of personal injury.

Mandatory Safety Signs of the Personal Protective Equipment

	Read the user instruction		Wear safety shoes		Wear close-fitting working cloth
	Wear headgear		Wear protective goggles		Wear face protection
	Wear work gloves		Wear apron against high temperature		Wear hearing protection

Warning Symbols

	General warning		Warning of electrical danger		Warning of hot surface
	Warning of overhead load		Warning of fork lift trucks operating		Warning of falling objects
	Warning of oxidizing materials		Warning of explosive atmosphere		



System Power UP

1 System Power UP



Read the user instruction

! DANGER**Danger to Life by Electric Shock**

Electrical work must be carried out by qualified persons.

For any work on the controllers, check that the system is properly grounded.

For first aid contact your medical / safety representing.

! WARNING**Danger of Unexpected Discharge****Danger when opening the safety gates.**

Make sure to use protective gear when opening the safety gates. DO NOT rely on status indicators and walk into the open tool.

The danger of hot polymer and/or clamp injury remains.

Use personal protective equipment, such as work gloves, apron, sleeves and face protection, to guard against burns.

For first aid contact your medical / safety representing.

**NOTICE**

None of the synflow® components have user-serviceable components. If service is required, the unit must not be opened; rather it should be returned to Synventive for service.



System Power UP

NOTICE

To install the hardware components of a synflow® system, refer to the Installation Instructions SVC-16 0017_EN-Rev##

Acronyms

IMM: Injection Molding Machine
eFRV: electric Flow Restrict Valve

- 1) Reference the synflow® Field Installation Guide prior to turning on the system for the first time. Turn on the main power switch located on the bottom of the controller. The front light will illuminate.
- 2) Press and hold the power button on the top left edge of the tablet for three seconds.
- 3) Allow the system to boot up; the synflow® software will start automatically. This should take less than two minutes.

NOTICE

DO NOT Touch the screen while the software is loading.

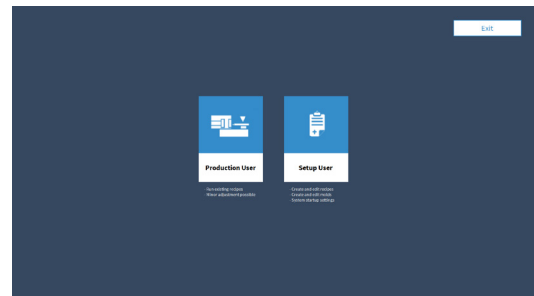
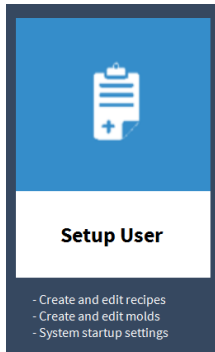




First Time Startup

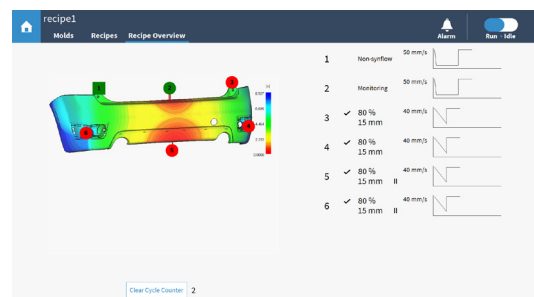
2 First Time Startup

- 1) Touch the “Setup User” icon in “Login page “.



Doc007634.png

- 2) Touch on the “Home” icon at the top left corner.



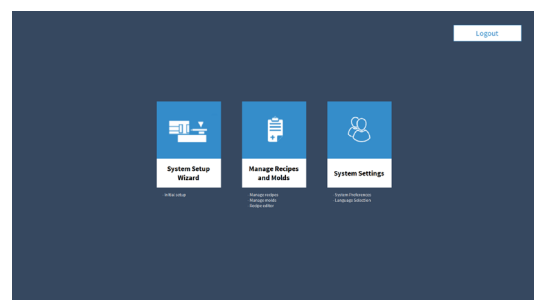
Doc007635.png

- 3) Select “System Setup Wizard” to start the system wizard.

NOTICE

This will further guide you in the initial startup process, as well as familiarize you with your synflow® system.

It is possible to bypass the “System Setup Wizard” by touching the “Manage Recipes and Molds” button.



Doc007636.png



First Time Startup

4) Run through the following 6 steps of the Setup Wizard.

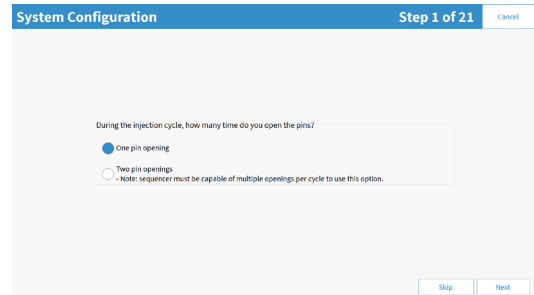
NOTICE

You'll have the option to skip some steps if desired.

System Configuration

Questions regarding the current hardware/software configuration of your system

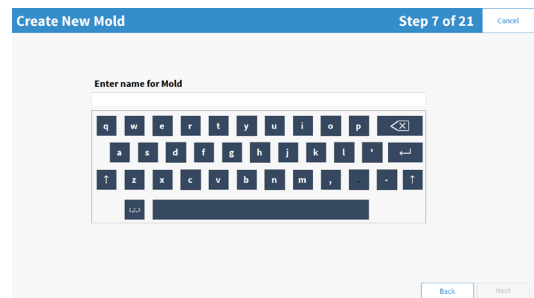
- Number of openings per pin (maximum of two per injection molding cycle) as shown in figure Doc007637.png
- Identify Nozzles without flow restrictor valve installed
- Stroke
- Startup screen (Login, Setup user, Production user)
- Password requirements
- User permissions



Doc007637.png

5) Create a new mold.

- Supply Mold name
- Mold picture "using camera, or load existing image from Tablet or USB"



Doc007638.png

6) Make the entries for position sensor calibration, and verification of input (position sensor) and output (drive).

NOTICE

This step is very useful to confirm that the Position Sensors (inputs) have been correctly installed to correlate to its specific actuator, and Drives (outputs) have been correctly installed to correlate to its specific eFRV.



Doc007639.png

Doc007640.png



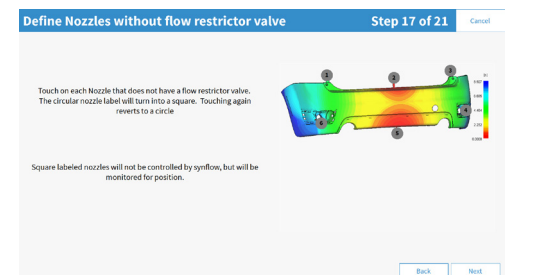
Doc007641.png

Doc007642.png

NOTICE

Any system that being upgraded from VMI to synflow® will also need to be calibrated during this step.

7) Identify Nozzles without flow restrictor valve (eFRV) (if applicable) shown as in figure Doc007643.png

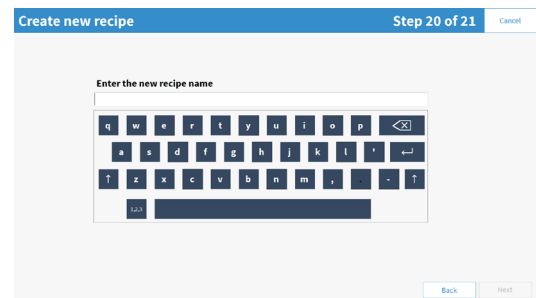


Doc007643.png

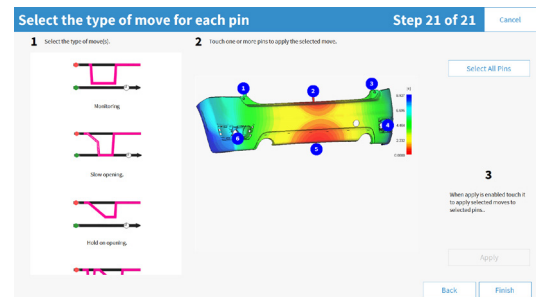


First Time Startup

- 8) Create a new recipe.
- Create a new recipe with some guidance to select the proper control and pin movement.



Doc007644.png



Doc007645.png

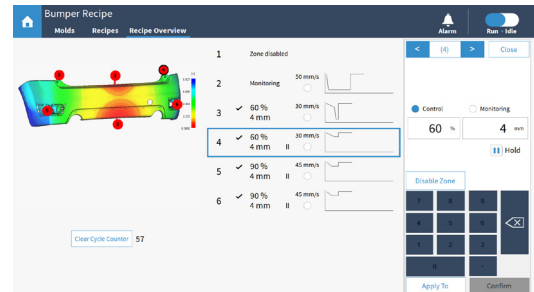


Editing Recipe

3 Editing Recipe

In the “Recipe Overview” it is possible to:

- Change the control value of a selected nozzle
- Clear cycle counter
- Switch from Run to Idle mode
- View the alarm in case of a system error



Doc007646.png

1) When necessary to change the control value:

- Touch the zone in the Mold Map or select the value listed on the right
- Open the panel to change the restriction value and control distance in which synflow® occurs (from closed position)

2) Once a change has been made, touch the confirm button and the change will be implemented in the next cycle.

NOTICE

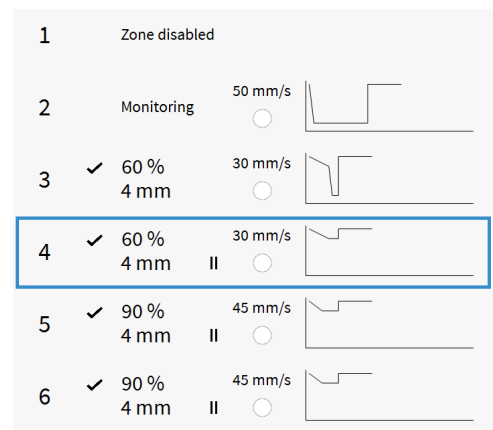
The change can be applied to multiple zones by touching on the “Apply to” button.



Doc007646.png

3) When necessary, select one of the control options:

- 1- Disable a zone to bypass synflow control, which will allow the pin to fully open and close at maximum (uncontrolled). Shown in Nozzle 1.
 - 2- Monitoring will set a zone to maximum speed, and display pin open and close position, speed and plot. Shown in Nozzle 2.
 - 3- Control permits slowing down the pin opening by changing the percentage value (lower value is a slower speed) and distance for which the velocity will be controlled. Shown in Nozzle 3.
- In addition, it is possible to hold an intermediate opening pin position to specified distance. Shown in Nozzle 4.



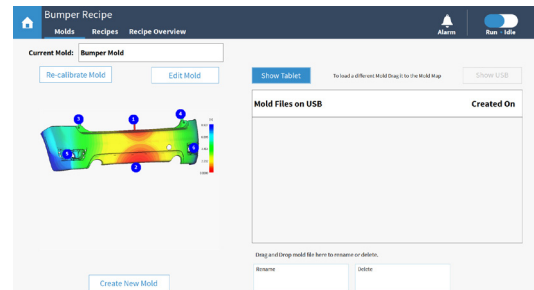
Doc007647.png



Mold Management

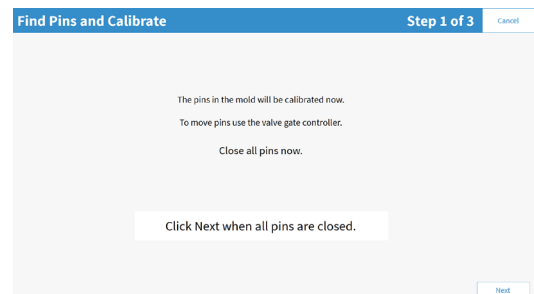
4 Mold Management

- 1) Click "Re-calibrate Mold" to re-calibrate the pins.



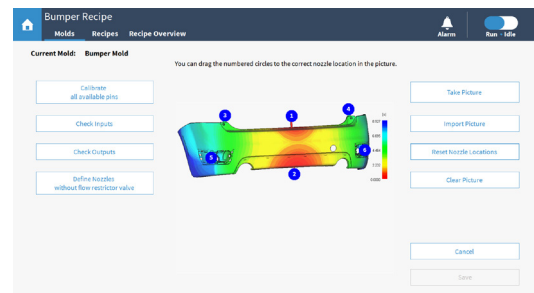
Doc007648.png

- 2) Edit the current Mold.
 - Follow instructions to re-calibrate the pins.



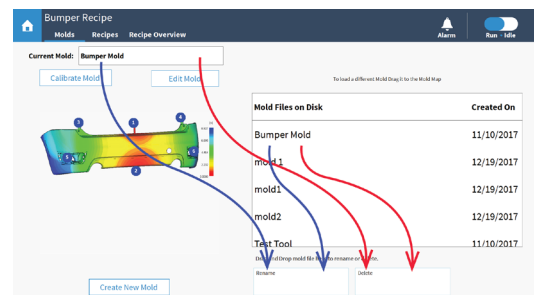
Doc007649.png

- 3) Edit the current Mold
 - Calibrate all available pins
 - Validate the Input or Output
 - Define Nozzle without flow restrictor valve eFRV installed
 - Assign nozzle number by dragging the zone number to each applicable nozzle location via the Mold Map.
 - Change the Mold Map picture (it is possible to disconnect the tablet to take picture of the mold).



Doc007650.png

- 4) Load, rename or delete existing mold from the Tablet or the USB.
 - To Load Mold, simply drag the name from the list to the Mold Map.
 - To rename or delete an existing Mold, simply drag the Mold from the list or from the current mold name text-box to the "Rename" or "Delete" location under the Mold List.



Doc007651.png



Mold Management

5) Create New Mold (by using the Mold Wizard).



Doc007652.png

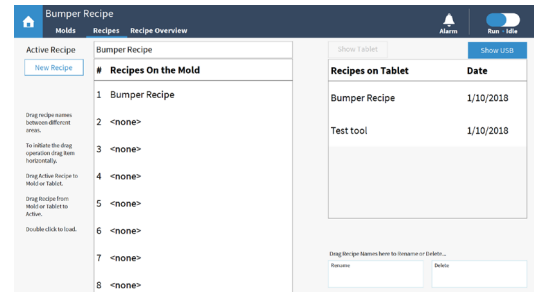


5 Recipe Management

Touch the “Recipes” icon on the Menu Bar.

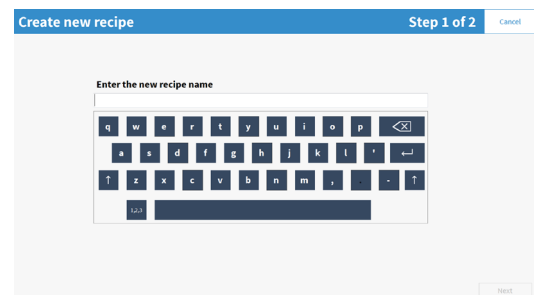
NOTICE

In the recipe management you will be able to perform the following operations:



Doc007653.png

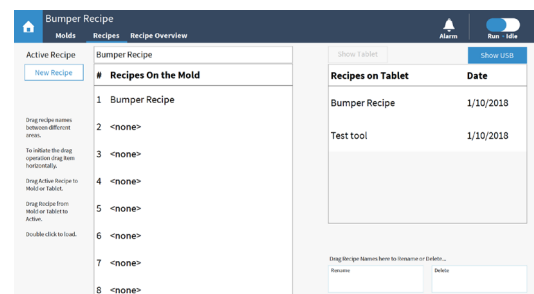
Create a new recipe (using the recipe wizard).



Doc007654.png

Load, Save, Rename or delete existing recipes from the Tablet or the USB.

- To load a Recipe, drag the name from the recipe list on the right to the active recipe text-box on the top left.
- To Save a Recipe, drag the recipe to the desired location (Mold JB, Tablet, USB).
- To rename or delete an existing Recipe, drag the Recipe to the “Rename” or “Delete” location on the bottom right corner.



Doc007653.png



System Alarm

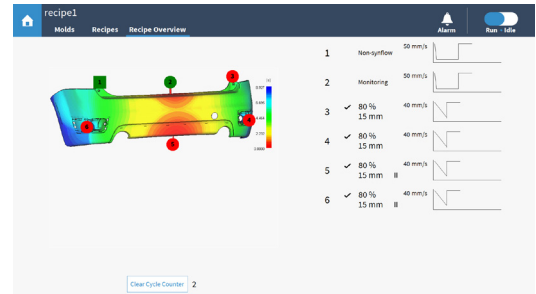
6 System Alarm

1) Touch the "Alarm" icon

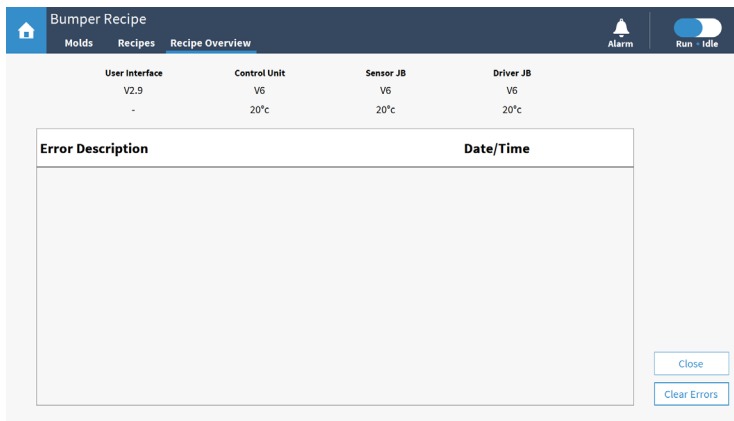


NOTICE

By touching the bell you will access the alarm / version number page.



Doc007635.png



Doc007656.png



Idle Mode

7 Idle Mode

1) Activate with the "Run/Idle" switch the "Idle Mode".

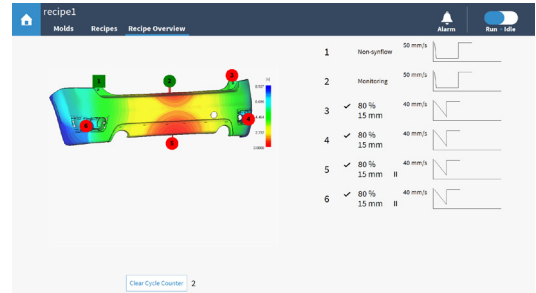


NOTICE

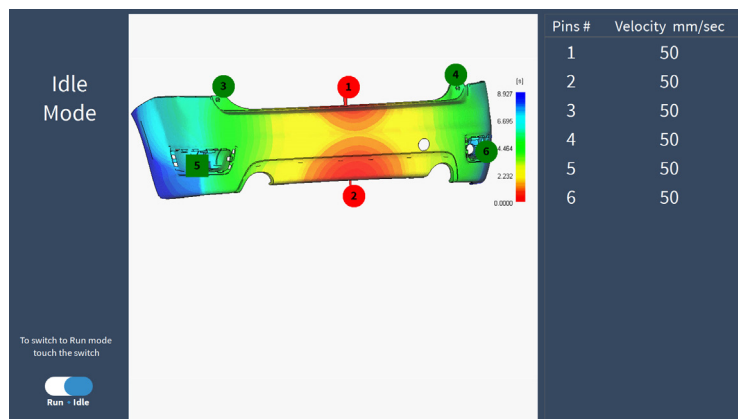
In "Idle Mode" the system will run with no control and show the pin speed and the pin state (open, transition, close).

Pin state

- Open Green
- Transition Yellow
- Close Red



Doc007635.png



Doc007658.png



Enable 2nd Pin Opening Control

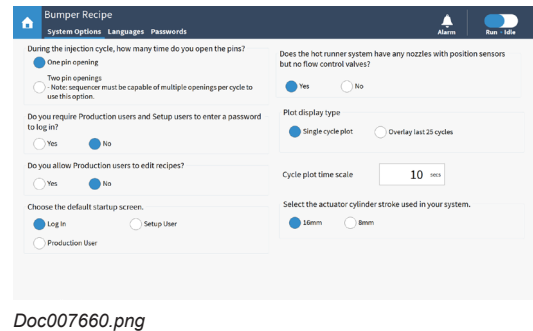
8 Enable 2nd Pin Opening Control

If you have the sequential valve gate controller set for 2 openings for any given valve pin, then you can enable the 2nd pin opening control by following these steps:

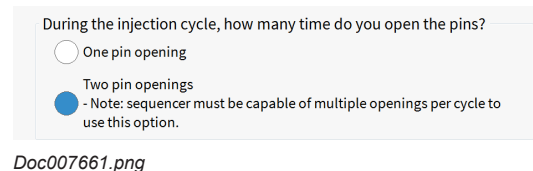
- 1) Touch the symbol "System Settings".



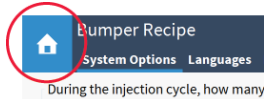
- 2) Make the entries for the "System Options".



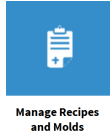
- 3) Select Two pin openings



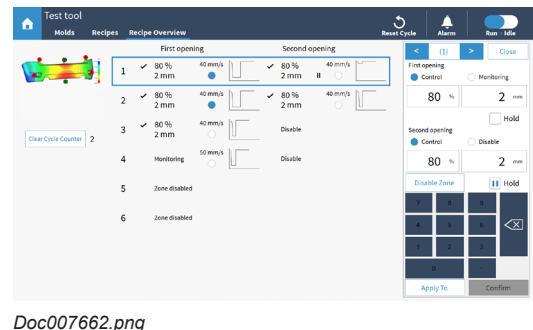
- 4) Touch the "Home" button



- 5) Touch "Manage Recipes and Molds" button



- 6) Touch "Recipe Overview"



NOTICE

You will be able to control the 2nd move as shown in the figure Doc007662.



System Settings

9 System Settings

1) Touch the symbol "System Settings".

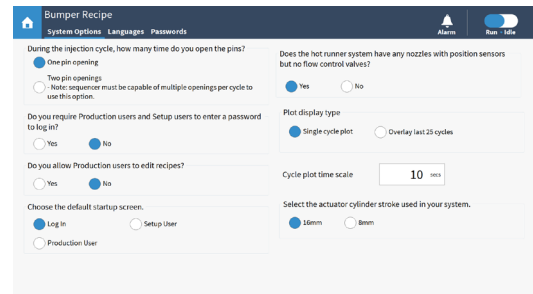


Doc007659.png



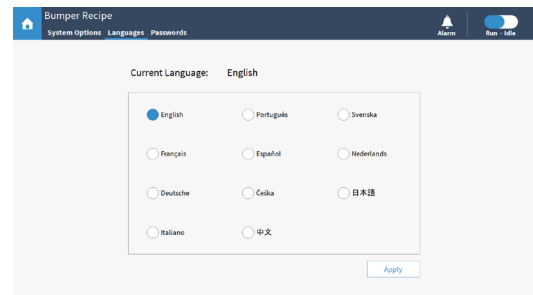
Doc007636.png

2) Make the entries for the "System Options".



Doc007660.png

3) Make the entries for the "Language"



Doc007665.png



System Settings

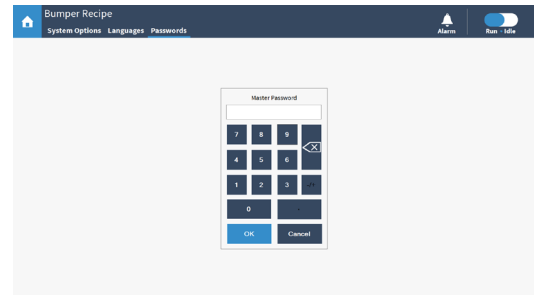
- 4) To change the "Passwords", Enter the master password (159357)

It is possible to change the password for:

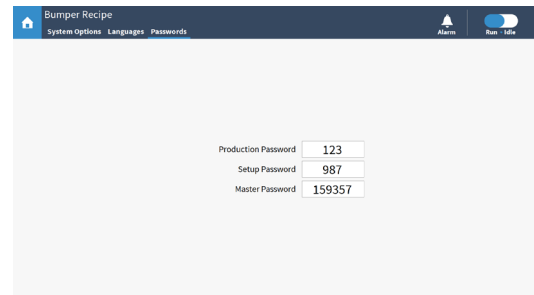
- Production
- Setup
- Master

NOTICE

If the master password has been changed and forgotten, please contact Synventive to have it reset.



Doc007666.png



Doc007667.png



Troubleshooting

10 Troubleshooting

	Problem	Cause	Solution
1	No Power	Power cord not plugged into Controller or outlet.	Check Controller power cable is plugged into qualified wall outlet in the range between 100 VAC and 240 VAC.
		Controller Power Switch not turned "On".	Check to see Controller power switches are "On"
2	No Signal from the Position Sensor	Improperly connected cable between the Position Sensor Junction Box and the Controller.	Verify the cable between the Position Sensor Junction Box and Controller is properly installed and it is secured. Verify connector pins on cable are not damaged.
		Improperly connected cable between the Position Sensor(s) and Position Sensor Junction Box.	Verify that the cable from the Sensor to the Position Sensor Junction Box is properly installed and secured. Verify connector pins on Cable are not damaged.
		Bad Position Sensor	Verify connector pins on Cable are not damaged. Test Position Sensor with Sensor Tester (or Multimeter for QCVG16M06 actuators).
		Disconnected Harness inside Sensor Junction Box	Open Sensor Junction Box to determine if PCB Harness is disconnected, and connect if needed.
		Bad Position Sensor Junction Box	Verify connector pins on Junction Box connectors are not damaged. Return to Synventive for evaluation
3	No current output to eFRV (light on eFRV connector does not light up as expected)	Improperly connected cable between the Drive Junction Box and the Controller	Verify Cable between Drive Junction Box and Controller is properly installed and secured. Verify connector pins on Cable are not damaged.
		Improperly connected cable between the eFRV(s) and Drive Junction Box	Verify that each eFRV is connected to the Drive Junction Box. Verify that the cable from the Sensor to the Position Sensor Junction Box is properly installed and secured. Verify connector pins on Cable are not damaged.
		Improperly calibrated zone(s)	Try the calibration again giving more time at the opened position.



Troubleshooting

	Problem	Cause	Solution
		Bad Drive Junction Box	Verify connector pins on Junction Box connectors are not damaged. Return to Synventive for evaluation
4	Position Indicator Light status not correct	Improperly calibrated zone(s)	In calibration mode, make sure to wait about 2 seconds while the valve pins are opened. Wait for the zone Zone Indicator in Software to change color from Red to GREEN (about 2 seconds). Make sure sensor-related cables are all connected and secured.
		Zone is disabled	Enable zone, and recalibrate if needed.
5	Tablet screen does not turn on	Did not press "on" button for sufficient amount of time.	Press and hold the Tablet "on" button until the screen backlight is on (approximately for 7 seconds).
		Improperly connected cable between Tablet and Controller.	Verify that the cable from the Tablet to the Controller is properly installed and secured.
		Battery is completely drained.	Plug Tablet into Controller, and turn Controller "on", and wait 30 seconds. Then press and hold the Tablet "on" button until the screen backlight is on (approximately for 7 seconds).
6	Software "freezes"	Unknown	Reboot Tablet by press and hold the Tablet "on" button for approximately for 7 seconds, and then wait for 3 seconds, and then press and hold the Tablet "on" button until the screen backlight is on (approximately for 7 seconds).
7	Tablet unable to connect to controller, or loses communication with controller	Power cord not plugged into Controller or outlet.	Check Controller power cable is plugged into qualified wall outlet in the range between 100 VAC and 240 VAC.
		Controller Power Switch not turned "On".	Check to see Controller power switches are "On"

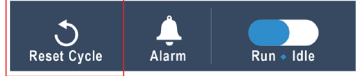


Troubleshooting

	Problem	Cause	Solution
8	Opening velocity or pin position inconsistent from cycle-to-cycle	Hose length going to/from eFRVs too long, and/or hose diameter too small.	Use hose or pipe having a minimum inside diameter of 8 mm (5/16"). For best performance, minimize hose or pipe lengths from Directional Control Valve-to-eFRV and eFRV-to-Multi-Coupling Plate (or Bulkhead) whenever possible. Contact Synventive if hose or pipe lengths greater than 4.5 m (15') are required.
		Hose length going to/from eFRVs, or from bulkhead to actuators are damaged.	Replace hoses.
		eFRVs/Hydraulic Oil contaminated	Check/replace existing filter for main hydraulic supply. Contact Synventive Service for instructions to clean eFRV. Contact Synventive for alternate filtration options.
9	All Pins open and close when actuated simultaneously, but some pins do not open or close when actuated individually	Hydraulic oil supply rate is at a lower rate when actuating pins individually.	Ensure the main hydraulic oil supply rate is sufficient to provide approximately 4.5 Liters/Minute per HB4016 Actuator or 3.5 Liters/minute per QCVG16 Actuator while in "Monitoring Mode"
		Hose length going to/from eFRVs too long, and/or hose diameter too small."	Use hose or pipe having a minimum inside diameter of 8mm (5/16"). For best performance, minimize hose or pipe lengths from Directional Control Valve-to-eFRV and eFRV-to-Multi-Coupling Plate (or Bulkhead) whenever possible. Contact Synventive if hose or pipe lengths greater than 4.5m (15') are required.
		eFRVs/Hydraulic Oil contaminated	Check/replace existing filter for main hydraulic supply. Contact Synventive Service for instructions to clean eFRV. Contact Synventive alternate filtration options.



Troubleshooting

	Problem	Cause	Solution
10	Plots, velocity, or position values not updating in software	Bad Position Sensor	Use Position Sensor Tester to confirm Sensor is ok. Replace if needed.
		Potentiometer Sensor Short	Use multimeter to separately confirm no continuity between either the Potentiometer Housing or anything making contact with the Potentiometer Housing, and each of the following Pins on the Sensor D-Sub Connector: 4, 7, & 8.
11	Software is alarming after a zone has been disabled	Unknown	Press the "Reset Cycle" button in the software.  <i>Doc007595.png</i>



11 Annex

11.1 Disposal

Disposal of synflow® systems should involve the recycling of basic materials. Synventive rejects any responsibility for health and safety risks to personnel or other damages caused by the re-use of individual parts for a purpose other than the originally specified purpose.

- Remove electrical components (heating, temperature sensors) and process through your recycling program.
- Dismantle cables and dispose them in accordance with local environmental regulations.

NOTICE

Metal parts must be separated for recycling (scrapping, collection points).

It is necessary to comply with the instructions from competent firms authorized to dispose of the specific materials.

11.2 Patents

Please note the copyright protection reminder pursuant to DIN ISO 16016. The specified patents are the property of Synventive Molding Solutions. Their distribution and dissemination is permitted only subject to approval.

The products are protected by US, CA, CN, JP and European Community patents published on WEB.

<http://www.synventive.com/AboutUs/Default.aspx?id=488&LangType=1033>

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Annex

11.3 Global Offices / Sales Agencies

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