The Gema OptiColor™ system is a simple, low cost quick color change solution for manual gun users that have multiple hoppers set up to spray various colors. The OptiColor Manifold allows the user to conduct all normal spraying operations as well as do fast, simple spray gun color changes from a single location. And the gun color change only takes approximately 30 seconds. Besides the spray gun color change, the hopper color change and powder hose cleaning can be done independently of the gun color change while the spray gun operator is coating parts in a different color. This unique color selection system offers the user a contamination risk free color change in a quick, operator friendly package.
Theory of Operation

The system consists of two independent but linked operations;
- spray operation
- hopper center operation

The spray operation is the same for each operator in the booth and consists of the OptiStar gun control unit, OptiSelect manual gun, and OptiColor Manifold. The OptiStar gun control unit and OptiSelect gun operation is no different when using the OptiColor Manifold. For further explanation of these devices refer to the appropriate device operating manual. When using the OptiColor Manifold, the conveying air and supplementary air from the OptiStar are connected to the OptiColor Manifold. During operation, selector switches on the OptiColor Manifold direct the conveying air and supplementary air to the corresponding color hopper OptiFlow pump. The hose connected to the OptiFlow pump in turn goes back to the operator and is connected to the OptiSelect gun in order to spray the selected color. The powder hoses of the other hopper colors not being sprayed are connected to the OptiColor Manifold next to the corresponding selector switch. Because the switch and powder hose connections are next to one another on the OptiColor Manifold, it is very easy for the user to identify which color is selected by which hose is connected to the OptiSelect gun.

The hopper center operation manages multiple hoppers in order for various colors to be ready to spray at any time. Each color hopper has an OptiFlow pump for each OptiFlex manual gun user. The conveying and supplementary air connections to the OptiFlow pump are always connected regardless of which color is being sprayed. The hoppers can be set up prior to production in order to spray the different colors needed during production. Should a hopper color need to be changed during production, this can easily be done without interrupting the operator spraying a different color. The hopper color can be changed and the powder hoses from this color hopper can be cleaned all while the spray operator continues to coat parts in production with a different color. In addition, the Hopper Center has a fluidization regulator and shut off valve for each hopper to give the user the flexibility to set different fluidization levels or shut off hoppers individually if needed.
**Color Change Equipment Explanation**

- **OptiColor Manifold (1 required for each operator / gun)**
  - Located at the operator opening of the booth where the operator has easy access to it.
  - Includes the connections for each color powder hose.
    - When a powder hose is being used for spraying, it is connected directly from the pump to the gun.
    - When a powder hose is not being used, it is connected to the OptiColor Manifold to:
      - Keeps the hoses organized
      - Less chance of the hoses getting contaminated from other colors
    - Allows the powder hoses not being used to be cleaned from the hopper. The hose connection on the OptiColor Manifold is connected to a vent hose directed towards the booth recovery. This allows hoppers to be changed and the powder hoses to be cleaned while running production.
  - Includes a switch to select the color to spray.
    - The switch is located next to the powder hose connection on the OptiColor Manifold to easily recognize which color is being used.
    - Only one switch can be OPEN at a time.
    - When the switch is OPEN, the conveying and supplementary air from the OptiStar gun control unit flows to the corresponding color hopper OptiFlow pump.

- **Hopper Center (1 required for up to 20 hopper colors)**
  - Located at a central place for all operator to keep the powder hose lengths as short as possible
  - Includes a compressed air distribution manifold
    - Compressed air filtration to insure clean, dry air in the powder coat system
    - Compressed air solenoid valve to be interlocked with the booth exhauster
    - Compressed air supply for the hopper fluidization
    - Compressed air supply to the OptiFlex manual gun control unit
    - Compressed air supply to the OptiColor Manifold air mover
    - Compressed air supply for a cleaning blow-off gun
- Includes a hopper fluidization control panel
  - Shut-off valves to each hopper for individual on/off capability
  - Fluidization regulator and gauge to each hopper for individual hopper control

- Includes a OptiColor Manifold air mover control
  - A manifold with a shut off valve supplies compressed air to all the OptiColor Manifold air movers when a hopper color change is in process. The shut off valve is closed when the powder hoses are not being cleaned to conserve compressed air.

### Installation

- **Mechanical Installation**

  - For the most user friendly installation, the OptiColor Manifold should be attached to the OptiStar control unit mounting bracket as shown below. Mount the controls vertically at a location near the user opening on the booth.

- **Electrical Connections**

  - Refer to the OptiStar control unit operating manual for instruction regarding supply power and proper interlocking of the electrical connections. Please note that per NFPA 33 Spray Application of Flammable Liquid and Combustible Powders, the supply power to any powder spray application system must be interlocked to the booth exhauster to only allow spraying while the exhauster is in operation and all fire detection systems (if applicable) are functioning properly.
Hopper Center Solenoid Valve – The solenoid valve located next to the compressed air supply filters on the Hopper Center manifold is included to only allow fluidization air to the hoppers and OptiColor Manifold when the booth exhauster is in operation. Two means of connecting the solenoid valve properly are outlined below;

**SYSTEM INTERLOCKING OPTIONS:**

The compressed air supply to the Hopper Center must be interlocked to the booth exhauster motor starter in order to only allow the hopper fluidization and color change system to operate when the booth exhauster is in operation.

**OPTION 1:**

- Booth Exhauster Motor Starter
- 110 VAC
- N.O.
- AUX. CONTACT
- SOL
- ORG
- ORG
- 110 VAC
- Hopper Center
- Compressed Air Supply
- 110 VAC Solenoid

**OPTION 2:**

- Booth Exhauster Motor Starter
- 110 VAC
- 110 V N
- SOL
- ORG
- ORG
- Hopper Center
- Compressed Air Supply
- 110 VAC Solenoid

- Pneumatic Connections

  - Compressed Air Supply Data
    - 1.25” NPT Connection
    - Clean, dry air required
      - Maximum water content – 1.3 g/m³
      - Maximum oil content – 0.1 mg/m³
    - Pressure - 90 PSI min.
    - Volume
      - 10 CFM per OptiColor Manifold
      - 5 CFM per hopper
  
  - Air Tubing and Powder Hose Connections - Because the OptiColor Manifold is set up to select colors to spray from multiple hoppers, the management of the air tubing and powder hoses is critical for proper operation. It is recommended that the following air tubing and powder hose labeling outline be used to simplify the installation and insure proper connections. As shown in the diagram below, use a two number system for all air tubing and powder hose lines with the first number representing the operator.
number and the second number representing the hopper and OptiColor Manifold selector switch number. Label each end of the air tubing and powder hose lines with this two number system to ensure proper installation. Keep these labels in place after the installation in order to easily identify proper connections during color change.

- **OptiColor Manifold Air mover Vent**
  - The compressed air for the OptiColor Manifold air mover is supplied from the Hopper Center manifold.
  - The air mover hose must be directed towards the booth recovery for proper exhaust of the OptiColor Manifold hose cleaning manifold. A flange is supplied to fasten the air mover hose to the booth or recovery system.
  - Adjust the air mover vacuum capability by opening or closing the locking ring on the air mover body shown in the photo.
  - A setting of 0 indicates the minimum vacuum and a setting of 12 indicates the maximum vacuum. Set the red dot on the air mover to 6 as a starting point during installation.
Color Change Procedures

- **Spray Operator Color Change Procedure**
  1. Operator finishes coating the last part
  2. Disconnect the powder hose from the OptiSelect gun handle
  3. Connect the powder hose to the OptiColor Manifold
  4. Turn the switch to CLOSE the previous color on the OptiColor Manifold
  5. Use the blow off gun at the OptiColor Manifold to clean the inside and outside of the gun
  6. Turn the switch to OPEN for the new color on the OptiColor Manifold
  7. Remove the new color powder hose from the OptiColor Manifold
  8. Trigger the gun to load the new color to the OptiSelect gun
  9. Operator begins coating with the new color

- **Hopper Color Change Procedure**
  1. Close the fluidization shutoff valve for the hopper to be changed
  2. Open the OptiColor Manifold air mover shut off valve to allow powder hose cleaning
  3. Disconnect the hopper fluidization air line on the hopper base
  4. Disconnect the hopper ground connection
  5. Disconnect the pump conveying and supplementary air lines from the OptiFlow pumps
  6. Disconnect the powder hoses from the OptiFlow pumps
  7. Remove the old color hopper
  8. Use the blow off gun to clean the powder hoses
  9. Place the new color hopper
  10. Connect the hopper ground connection
  11. Connect the pump powder hoses
  12. Connect the pump conveying and supplementary air lines
  13. Connect the hopper fluidization air line on the hopper base
  14. Close the OptiColor Manifold air mover shut off valve to disable powder hose cleaning
  15. Open the fluidization shutoff valve for the hopper
  16. Verify the powder is fluidizing correctly in the hopper and adjust if necessary
Maintenance

Replacing the powder hose cleaning check valve.

1. Remove the powder hose

2. Loosen the powder hose connection using a 1-1/16” wrench

3. Remove the powder hose connection

4. Using a small screw driver, pry up around the outside of the check to remove

5. Replace the check valve (part no. 1000089) and reverse the order for assembling