PCF™ Metering System
Precision Continuous Flow Metering and Dispense System for Sealants and Adhesives
Precision dispensing in a flexible system

Reduce material usage with precise, reliable metering

The Graco PCF Metering System dispenses a precise, continuous flow of single-component sealants or adhesives in automotive and industrial applications. Advanced technology provides ultimate control, resulting in smooth, consistent beads, dots and spray patterns. You minimize material usage, reduce rework, and improve operational efficiencies.

Reduce your cost of ownership

- Low initial capital investment
- Fewer wear parts compared to shot meters simplifies maintenance

Improve your process efficiencies

- Provides consistent, continuous flow – no worry of slow shot meter refill times or the expense of more complicated mechanical solutions
- Intuitive user interface and control options
- Self-diagnostics allow for predictive and preventive maintenance strategies – improving process availability
- Multiple applicator capabilities – lets you program parameters for up to 16 different applicators
- Superior flow control saves material – less material waste

Get consistent, repeatable results

The Graco PCF ensures consistent material flow through closed-loop technology. It takes feedback from the fluid stream, and adjusts for changes in material temperatures, viscosities, dispense rates or robot speeds. Real-time adjustments mean the Graco PCF delivers a highly precise, continuous dispense.

Adapt to changing manufacturing needs

- Modular design for added system flexibility
- Compact, with few moving parts for easy maintenance
- Easy to integrate and install

Applications:
- Bead dispensing
- Gasketing
- Seam sealing
- Hem flange
- Sound deadening
- Anti-flutter
- Body panel reinforcement
- Bonding
- Profile wrapping
- Cable filling
- Automotive underbody coating
- Solar frame sealing

Materials:
- Ambient, warm melt and hot melt materials to 400°F (204°C)
- Low to high-viscosity materials
- Unlimited volume

Control your entire cell with one Advanced Display Module (ADM). Take control of up to four systems with the ADM’s easy-to-read system status and alert messages.
Graco PCF Metering System – System components include:

1 Control Center/Advanced Display Module (ADM)
   Provides easy setup, monitoring and system diagnostics – includes USB interface.

2 Fluid Plate
   Advanced sensors provide feedback to system controls – where real-time adjustments are made for changes in material temperatures, viscosities, dispense rates or robot speeds.

3 Graco CAN Cable
   Provides digital communications between the Advanced Display Module and the fluid plate.

4 Gateway Modules
   Allows the Graco PCF to communicate with other systems within your manufacturing process.
   – Communications Gateway Module for DeviceNet™, EtherNet/IP™, PROFIBUS™, PROFINET™
   – Discrete Gateway Module
Take total control of your process

Control Center operates multiple fluid plates

- Controls each fluid plate independently
- Capable of operating multiple fluid plates – up to four with Communication Gateway Modules and up to two with Discrete Gateway Modules
- Controls up to 16 different applicators

Control Center can also control PrecisionSwirl™ Technology

- Integrated PrecisionSwirl allows for full control in a single system

Options:
- Optional (Sold Separately) PrecisionSwirl™ Orbiter
- Optional (Sold Separately) Expansion Kit

Additional fluid plates are optional and sold separately
Advanced, intuitive user controls

The Control Center contains the electronics that communicate with the fluid plate. Its user interface is easy to use, and is detachable for in-plant mobility and flexibility.

- Monitors amount of material dispensed in each cycle
- Lets you change system values or do simple tests without reprogramming the robot controller
- Provides system diagnostics, helping you isolate problems more easily

Control modes include:

- Bead control – measures flow rate and pressure to ensure a consistent bead size
- Full open – opens regulator to allow for recirculation
- Shot dispense – for controlling specific volumes for cartridge filling or potting applications
- Pressure control – controls regulator outlet pressure for when a flowmeter is not being used

Integrated USB interface for easy data downloads

- Lets you download process data, plus job and error logs onto a flash drive for further analysis
- Allows you to archive valuable setup parameters

Fluid plate provides precision fluid dispensing

The fluid plate metering assembly monitors flow and makes continuous adjustments for changes in pressure and flow rate.

It uses flowmeters and advanced pressure sensors that operate in a closed loop to provide constant and instant adjustments to ensure an accurate dispense.

Graco offers a combination of fluid pressure regulators and flow meters to create six configurations to support a wide range of ambient or hot melt materials.
PrecisionSwirl Electric Orbital Applicator

**PrecisionSwirl Technology for consistent material delivery**

PrecisionSwirl Technology can now be programmed within the PCF Metering System, in the Advanced Display Module, for easy integration with your automation.

- Applies a uniform, circular loop pattern with clean edges and no mess
- Dispenses open or closed, wide or narrow pattern beads
- Reduces downtime – virtually no tip plugging with PrecisionSwirl applicator’s large tip sizes
- Simplifies robotics programming for directional changes
- An orbiting nozzle allows you to apply material on vertical and horizontal surfaces
- Eliminates manual touch-up, masking and rework

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**Technical Specifications**

**PrecisionSwirl**

<table>
<thead>
<tr>
<th>Input power</th>
<th>Proprietary PWM control of the motor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum motor speed</td>
<td>6,600 rpm</td>
</tr>
<tr>
<td>Maximum motor speed</td>
<td>24,000 rpm</td>
</tr>
<tr>
<td>Maximum operating pressure</td>
<td>3500 psi (24.1 MPa, 241 bar)</td>
</tr>
<tr>
<td>Fluid inlet</td>
<td>3/4-16-in 37° JIC female swivel</td>
</tr>
<tr>
<td>Wetted parts</td>
<td>Stainless steel, nickel alloy, brazing alloy, epoxy, EPDM rubber</td>
</tr>
<tr>
<td>Noise level</td>
<td>Sound pressure level – 67 dBA</td>
</tr>
<tr>
<td>Weight</td>
<td>1.6 lb (0.7 kg)</td>
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### PCF Metering System Selection Matrix

<table>
<thead>
<tr>
<th>Style/Size</th>
<th>Number of Styles</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2 (1 purge and 1 programmed style)</td>
</tr>
<tr>
<td>2</td>
<td>16 (1 purge and 15 programmed styles)</td>
</tr>
<tr>
<td>3</td>
<td>256 (1 purge and 255 programmed styles)</td>
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</table>

<table>
<thead>
<tr>
<th>Regulators</th>
<th>Meters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cartridge</td>
<td>None</td>
</tr>
<tr>
<td>Mastic</td>
<td>None</td>
</tr>
<tr>
<td>Cartridge</td>
<td>High Resolution</td>
</tr>
<tr>
<td>Mastic</td>
<td>High Resolution</td>
</tr>
<tr>
<td>Heated Mastic</td>
<td>Heated Standard Resolution</td>
</tr>
<tr>
<td>Cartridge</td>
<td>Ultra High Resolution</td>
</tr>
<tr>
<td>Mastic</td>
<td>Glass bead</td>
</tr>
<tr>
<td>Cartridge</td>
<td>Glass bead</td>
</tr>
<tr>
<td>Cartridge Abrasive</td>
<td>Coriolis</td>
</tr>
</tbody>
</table>

### Fluid Plate

- Cartridge: 6,000 psi (41.4 bar, 414 MPa)
- Mastic: 5,000 psi (34.5 bar, 345 MPa)
- Heated Mastic: 4,000 psi (28 bar, 280 MPa)

### Interface

- 0
- 1
- 2
- 3
- 4

### Voltage

- 0
- 1
- 2
- 3

### Power requirements

- 100-240 VAC: full load 1.4A, fuse rating 2.5A
- 24 VDC: full load 4A, fuse rating 4A

### Operating temperature range

- 100-240 VAC nominal: 100 - 240 VAC, 50-60 Hz., single phase

### Operating humidity range

- 0 to 90% non-condensing

### Manuals

- 3A1935, 3A2098

### PCF Metering System Specifications

**Minimum flow rates**

- 6 cc/min with ultra-high resolution helical flowmeter
- 25 cc/minute with high-resolution helical flowmeter
- 50 cc/minute with heated helical flowmeter

**Minimum fluid working pressure**

- feed pressure to fluid plate: cartridge regulator: 6000 psi (414 bar, 41.4 MPa)
- feed pressure to fluid plate: mastic regulator: 5000 psi (345 bar, 34.5 MPa)

**Minimum fluid working pressure**

- at regulator outlet: 4500 psi (310 bar, 31.0 MPa)
- at regulator outlet with electric heat components: 3500 psi (241 bar, 24.1 MPa)

**Air supply pressure range**

- 60 to 120 psi (41.1 to 8.3 bar, 0.4 to 0.8 MPa)

**Fluid filtration required**

- 30 mesh (500 micron) minimum

**Maximum flow rates**

- 4,000 cc/minute with ultra-high resolution helical flowmeter
- 7,500 cc/minute with high-resolution helical flowmeter
- 22,500 cc/minute with heated helical flowmeter

**Maximum fluid working pressure**

- Cartridge: 6000 psi (41.4 bar, 414 MPa)
- Mastic: 5000 psi (345 bar, 345 MPa)

**Wetted parts meters and fluid panels**

- 303, 304, 321, 17-4 stainless steel;
- tungsten carbide, PTFE, steel, fluoroelastomer

**Power supply voltage range**

- 100-240 VAC: 100 - 240 VAC, 50-60 Hz., single phase

**Viscosity range of fluids**

- up to 1,000,000 cps with helical meter

**Minimum dispensed shot size**

- <1 cc ultra-high resolution helical flowmeter
- 6 cc with helical meter
- 3 cc with high-resolution helical meter

**Regulators and Meters**

- Cartridge
- Mastic
- Cartridge: High Resolution
- Mastic: High Resolution
- Heated Mastic: Ultra High Resolution
- Cartridge: Glass bead
- Mastic: Glass bead
- Cartridge Abrasive: Coriolis

*Flow rates and viscosities are general estimates. Flow rates drop as viscosity increases. Fluids are expected to shear under pressure. New applications or fluids should always be tested to determine proper line sizes and equipment selections. See your Graco Authorized distributor for other capabilities.
### Part numbers for multiple fluid plates

<table>
<thead>
<tr>
<th>REGULATOR</th>
<th>METER</th>
<th>STYLES</th>
<th>PART NUMBER</th>
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<td>24K802</td>
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<td>24K809</td>
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<tr>
<td>Cartridge</td>
<td>High Resolution</td>
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<td>24B956</td>
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<tr>
<td></td>
<td>(for flow rates above 25 cc's per minute)</td>
<td>16</td>
<td>24K801</td>
</tr>
<tr>
<td></td>
<td></td>
<td>256</td>
<td>24K808</td>
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<td></td>
<td>Ultra High Resolution</td>
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<td>24J873</td>
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<td>(for flow rates under 25 cc's per minute)</td>
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<td></td>
<td>256</td>
<td>24K814</td>
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<tr>
<td></td>
<td>High Resolution for Glass Beads</td>
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<td>24W203</td>
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</tbody>
</table>

*Note: Independent fluid plate sales include a 50 ft (15 m) CAN cable.*

### PrecisionSwirl Expansion Kits

PrecisionSwirl Expansion Kits include 20 ft (6 m) CAN cable to connect to Control Center. PrecisionSwirl orbiter and motor cable must be ordered separately.

- **16M350** Expansion kit for AC power
- **16M351** Expansion kit for DC power

### CAN Cables

- **121201** Cable, standard flex operation, 20 ft (6 m)
- **121228** Cable, standard flex operation, 50 ft (15 m)
- **123341** Cable, standard flex operation, 130 ft (40 m)
- **123342** Cable, high flex operation, 20 ft (6 m)
- **123343** Cable, high flex operation, 50 ft (15 m)
- **123344** Cable, high flex operation, 130 ft (40 m)

### PCF System Accessories

- **255468** Light tower
- **16M100** Meter enabled, 2 styles token
- **16M101** Meter disabled, 2 styles token
- **16M102** Meter enabled, 16 styles token
- **16M103** Meter disabled, 16 styles token
- **16M104** Meter enabled, 256 styles token
- **16M105** Meter disabled, 256 styles token
- **120010** V/P Regulator
- **121806** Cable, dispense solenoid, 0.5 m
- **123846** Cable, flowmeter, 2 m with flying leads
  - use with **150887**
- **24B693** Four-gun breakout kit
- **24B694** Kit, command cable
- **258334** Dispense solenoid

### Contact us today!

To receive product information or to speak with a Graco representative, call 800-746-1334 or visit us online at [www.graco.com/pcf](http://www.graco.com/pcf).