



PCF™ Metering System

Precision Continuous Flow Metering and Dispense System
for Sealants and Adhesives



PROVEN QUALITY. LEADING TECHNOLOGY.

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.



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.

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 204 C° (400°F)
- Low to high-viscosity materials
- Unlimited volume

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 parameter for up to 16 different applicators
- Superior flow control saves material – less material waste

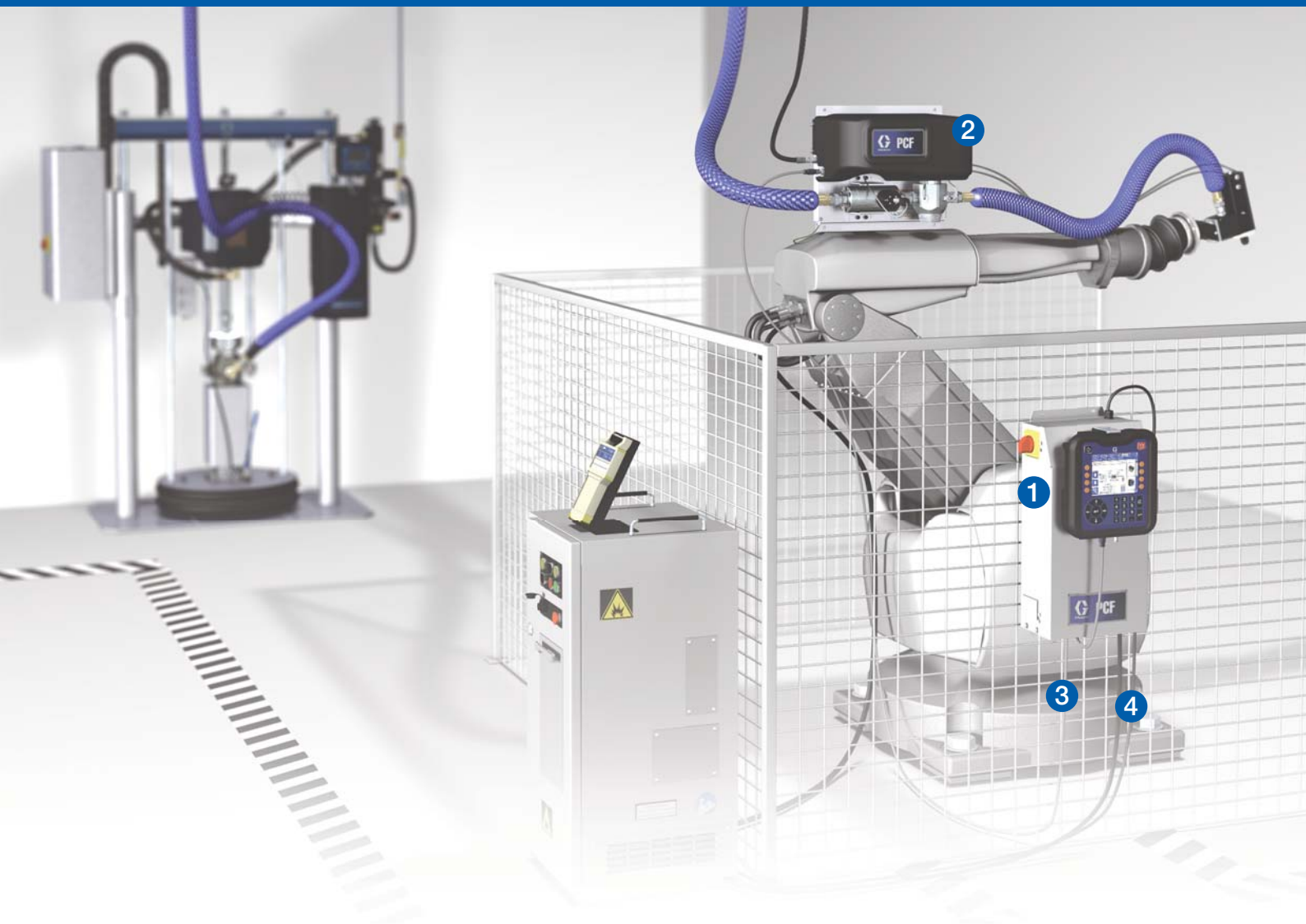
Get consistent, repeatable results

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





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.

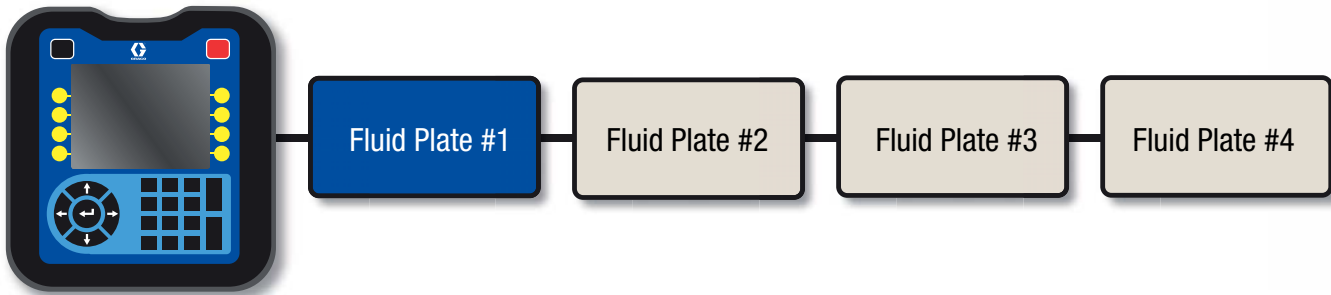
4 Gateway Modules

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

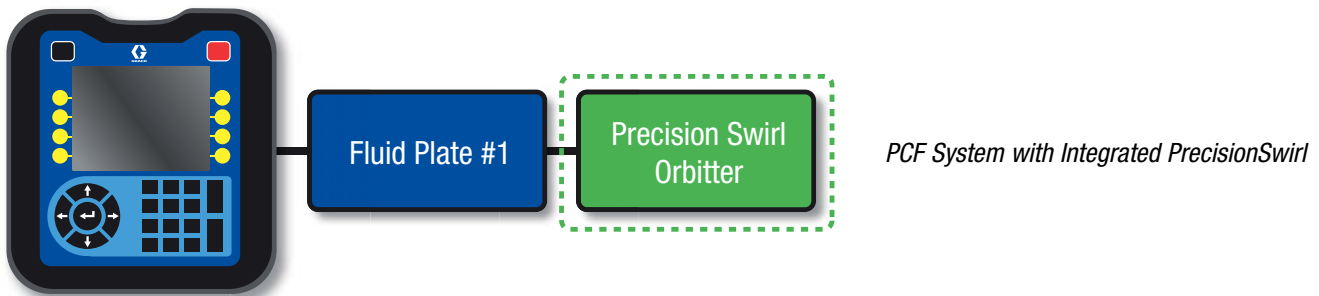
Take total control of your process

Control Center operates multiple fluid plates

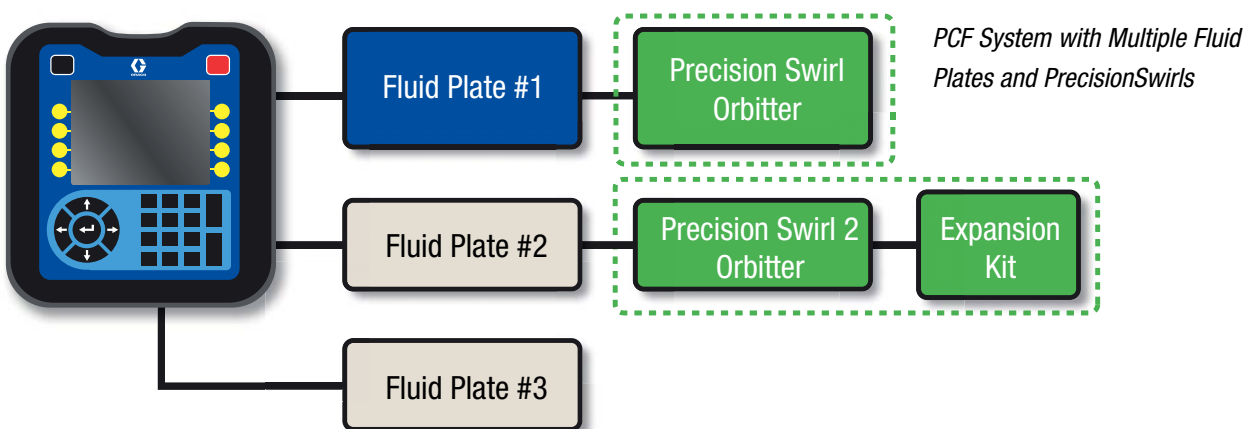


- Controls each fluid plate independently
- Capable of operating multiple fluid plates – up to four with Communication Gateway Modules and up to two with Discrete Gateway Modules
- Controls up to 16 different applicators

Control Center can also control PrecisionSwirl™ Technology



- Integrated PrecisionSwirl allows for full control in a single system



- Operates additional PrecisionSwirl applicators with optional PrecisionSwirl Expansion Kit

 Additional fluid plates are optional and sold separately

 Optional (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.



Specifications and ordering information

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

Technical Specifications - PrecisionSwirl

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

PCF Metering System Selection Matrix

PF	2	4	3	1		
Product Identifier PF = Precision Continuous Flow						
Styles/Size					Number of Styles	
1					2 (1 purge and 1 programmed style)	
2					16 (1 purge and 15 programmed styles)	
3					256 (1 purge and 255 programmed styles)	
Fluid Plate					Regulators	Meters
1					Cartridge	None
2					Mastic	None
3					Cartridge	High Resolution
4					Mastic	High Resolution
5					Heated Mastic	Heated Standard Resolution
6					Heated Mastic	None
7					Cartridge	Ultra High Resolution
Interface					Protocol (Interface cable not included)	
0					Discrete gateway	
1					Device/Net	
2					Ethernet/IP	
3					PROFIBUS	
4					PROFINET	
Voltage					Voltage	
0					100-240 VAC gateway	
1					24 VDC	
2					100-240 VAC with Integrated Precision Swirl	
3					240VDC with Integrated Precision Swirl	



PCF Metering System Specifications

Minimum flow rates*

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

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
.....	37,500 cc/minute with separate flowmeter

Maximum fluid working pressure

feed pressure to fluid plate	cartridge regulator: 414 bar (6000 psi, 41.4 MPa)
feed pressure to fluid plate	mastic regulator: 345 bar (5000 psi, 34.5 MPa)
at regulator outlet	310 bar (4500 psi, 31.0 MPa)
at regulator outlet	with electric heat components 241 bar (3500 psi, 24.1 MPa)

Minimum fluid working pressure

at regulator outlet	7 bar (100 psi, 0.68 MPa)
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Air supply pressure range 4.1 to 8.3 bar (60 to 120 psi, 0.4 to 0.8 MPa) 10 micron filtration required

Fluid filtration required 500 micron (30 mesh) minimum

PCF Metering System Specifications - continued

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
Wetted parts meters and fluid panels	
303, 304, 321, 17- 4 stainless steel;.....	tungsten carbide, PTFE, steel, fluoroelastomer
Power requirements	
100-240 VAC	full load 1.4A, fuse rating-2.5A
24 VDC	full load-4A, fuse rating-4A
Power supply voltage range	
100-240 VAC nominal.....	100 - 240 VAC, 50-60 Hz., single phase
Operating temperature range	
Controller	4° to 49°C (40° to 120°F)
Fluid plate.....	heated: 4° to 204°C (40° to 400°F)
	ambient: 4° to 49°C (40° to 120°F)
Operating humidity range	0 to 90% non-condensing
Manuals	3A1935, 3A2098

* 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 Number for multiple fluid pates

REGULATOR	METER	STYLES	PART NUMBER	
Cartridge	None	2	24B959	
		16	24K802	
		256	24K809	
	High Resolution <i>(for flow rates above 22 cc's per minute)</i>	2	24B958	
		15	24K801	
		256	24K808	
		Ultra High Resolution <i>(for flow rates under 25 cc's per minute)</i>	2	24J873
			16	24K807
			256	24K814
Mastic	None	2	24B961	
		16	24K804	
		256	24K811	
	High Resolution	2	24B960	
		16	24K803	
		256	24K810	
Heated Mastic	None	2	24C901	
		16	24K806	
		256	24K813	
	Heated Standard Resolution	2	24B962	
		16	24K805	
		256	24K812	

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

PrecisionSwirl Expansion Kits

PrecisionSwirl Expansion Kits include 6m (20 ft) 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, 6m (20 ft)

121228 Cable, standard flex operation, 15m (50 ft)

123341 Cable, standard flex operation, 40m (130 ft)

123342 Cable, high flex operation, 6m (20 ft)

123343 Cable, high flex operation, 15m (50 ft)

123344 Cable, high flex operation, 40m (130 ft)

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



ABOUT GRACO

Founded in 1926, Graco is a world leader in fluid handling systems and components. Graco products move, measure, control, dispense and apply a wide range of fluids and viscous materials used in vehicle lubrication, commercial and industrial settings.

The company's success is based on its unwavering commitment to technical excellence, world-class manufacturing and unparalleled customer service. Working closely with qualified distributors, Graco offers systems, products and technology that set the quality standard in a wide range of fluid handling solutions. Graco provides equipment for spray finishing, protective coating, paint circulation, lubrication, and dispensing sealants and adhesives, along with power application equipment for the contractor industry. Graco's ongoing investment in fluid management and control will continue to provide innovative solutions to a diverse global market.

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All written and visual data contained in this document are based on the latest product information available at the time of publication. Graco reserves the right to make changes at any time without notice.

Graco is certified ISO 9001.



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