



# EFR Metering System

Meter, Mix and Dispense System



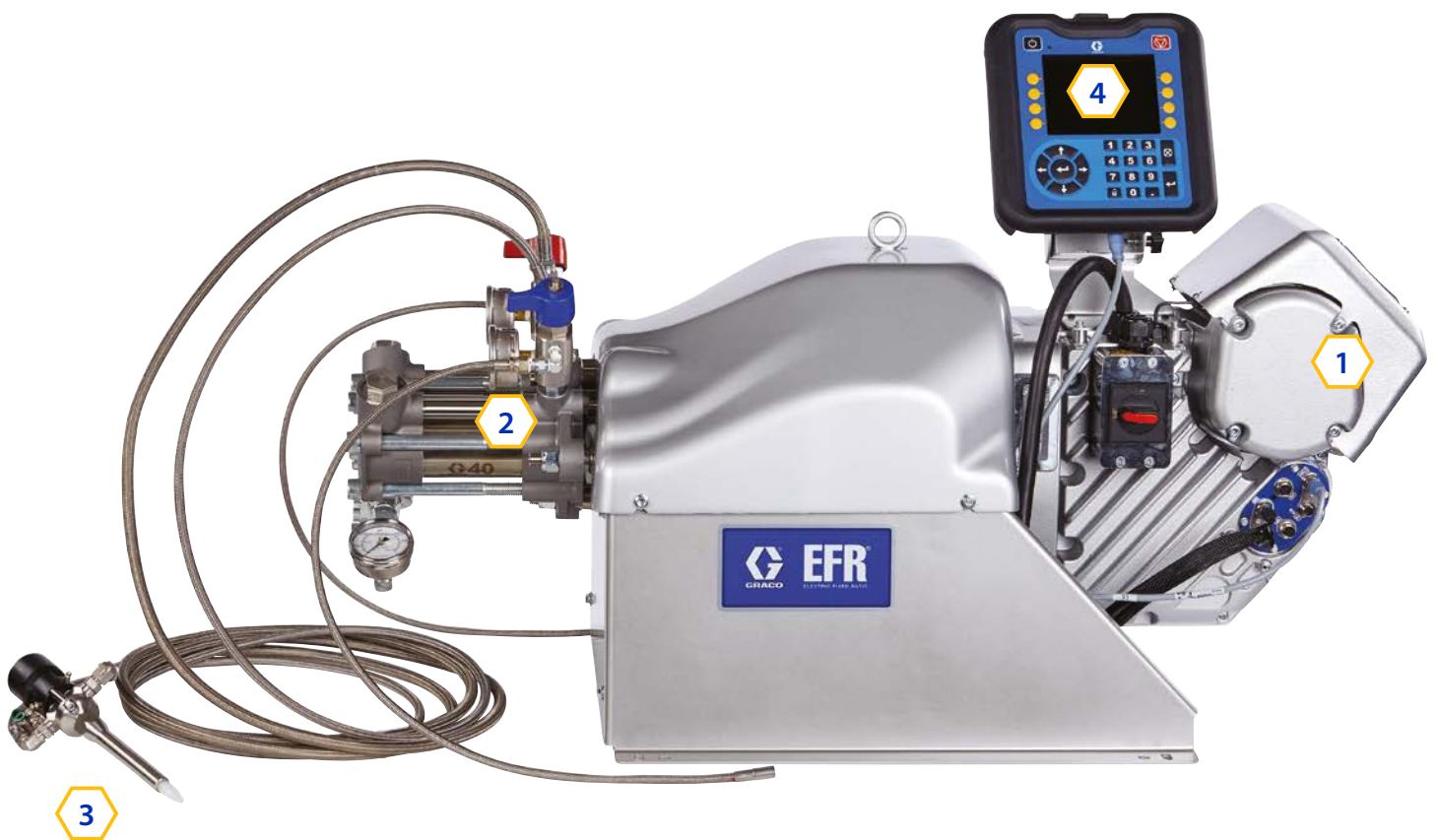
PROVEN QUALITY. LEADING TECHNOLOGY.

# Accurate - Versatile - Easy to use

The Graco Electric Fixed Ratio (EFR) system is a meter, mix and dispense system for two component sealant and adhesive delivery.

Ideal for applications requiring a precision dispense, the EFR provides superior control over material and dispensing of gaskets, beads, shots and for potting applications.

Trust in the EFR, which is accurate, versatile and easy to use.



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## ADVANCED PRECISION DRIVE UNIT

- The powerful drive unit reaches up to 26 cycles per minute
- A precise encoder that assures low flows and small shots consistently
- Direct pump control
- Limited maintenance requirements



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## INDUSTRY PROVEN Z PUMPS

- Multiple Ratio options
- Only the seals are wear parts
- An abrasion resistant version
- Mechanically linked pumps ensure ratio assurance



3

## MD2 VALVE

- Adjustable snuff back
- Mixing at the tip of the gun, limiting purge material waste
- A multiple seal combination for material compatibility
- Available in 1:1 to 12:1 for wide ratio applications
- For manual or robotic applications

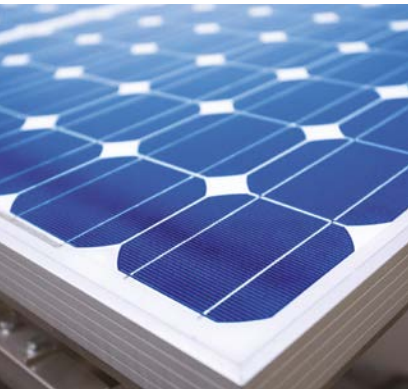


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## ADVANCED DISPLAY MODULE

- An easy to use interface
- Can be completely integrated
- Communication gateway modules: EtherNet/IP, DeviceNet, Profibus, Profinet and Discrete I/O





## ACCURATE

Accurate dispensing is key for quality end products. With the EFR you can be assured to reach accuracy during every dispense.

### Consistent Ratio

The ratio is controlled by our mechanically linked volumetric Z-pumps. These pumps dispense 50% of their nominal volume in each stroke. This allows for accurate ratio control in small shots and in continuous flow.

### Start & Stop

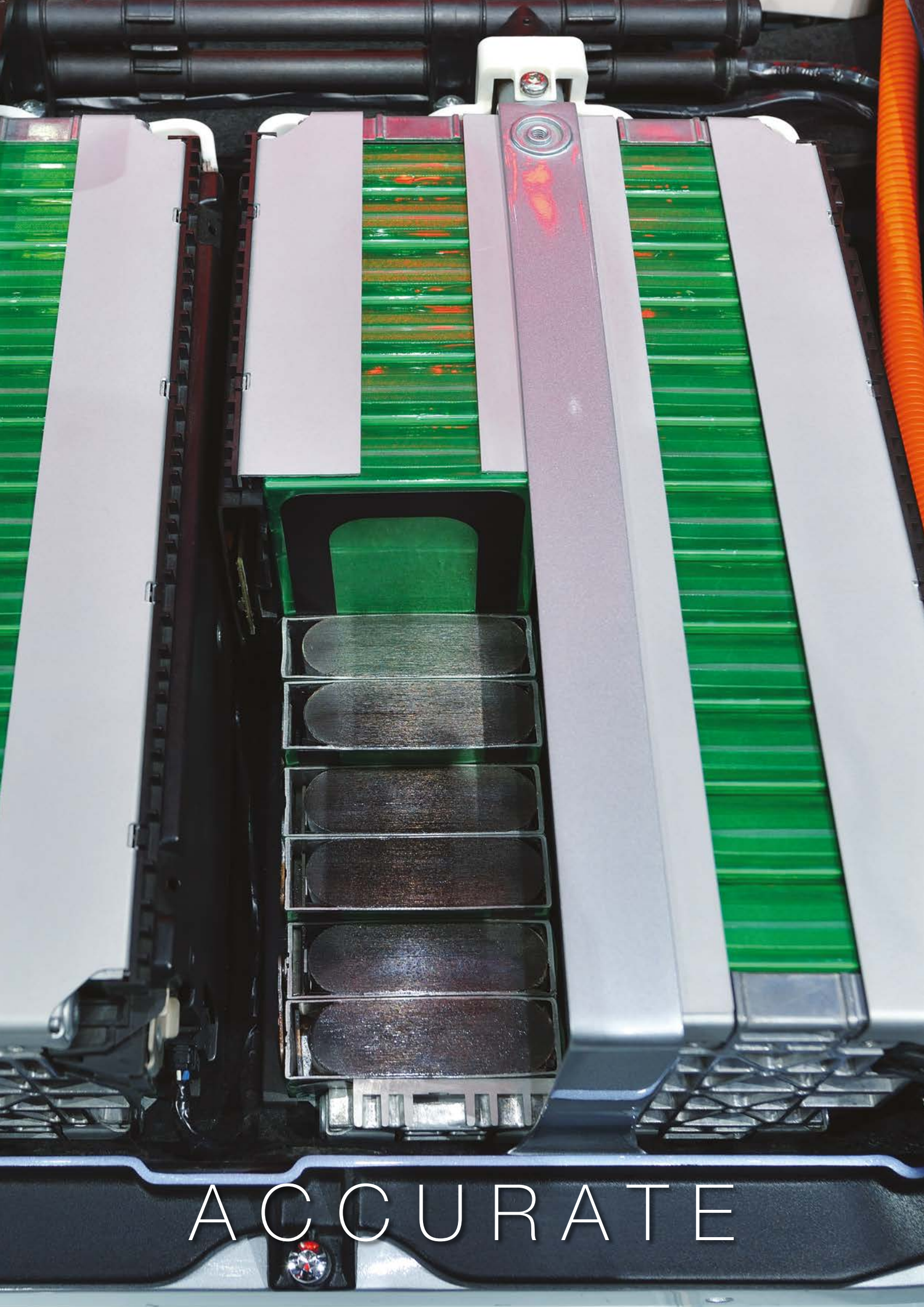
The electric motor directly controls the movement in the pumps so that the requested flow rate is achieved directly from the start. With the additional automatic calibration cycle, snake heads at the start and tails at the end are eliminated.

### Shot Repeatability

With the built-in encoder, material flow is continuously controlled to assure a consistent flow rate, even during pump changeovers.

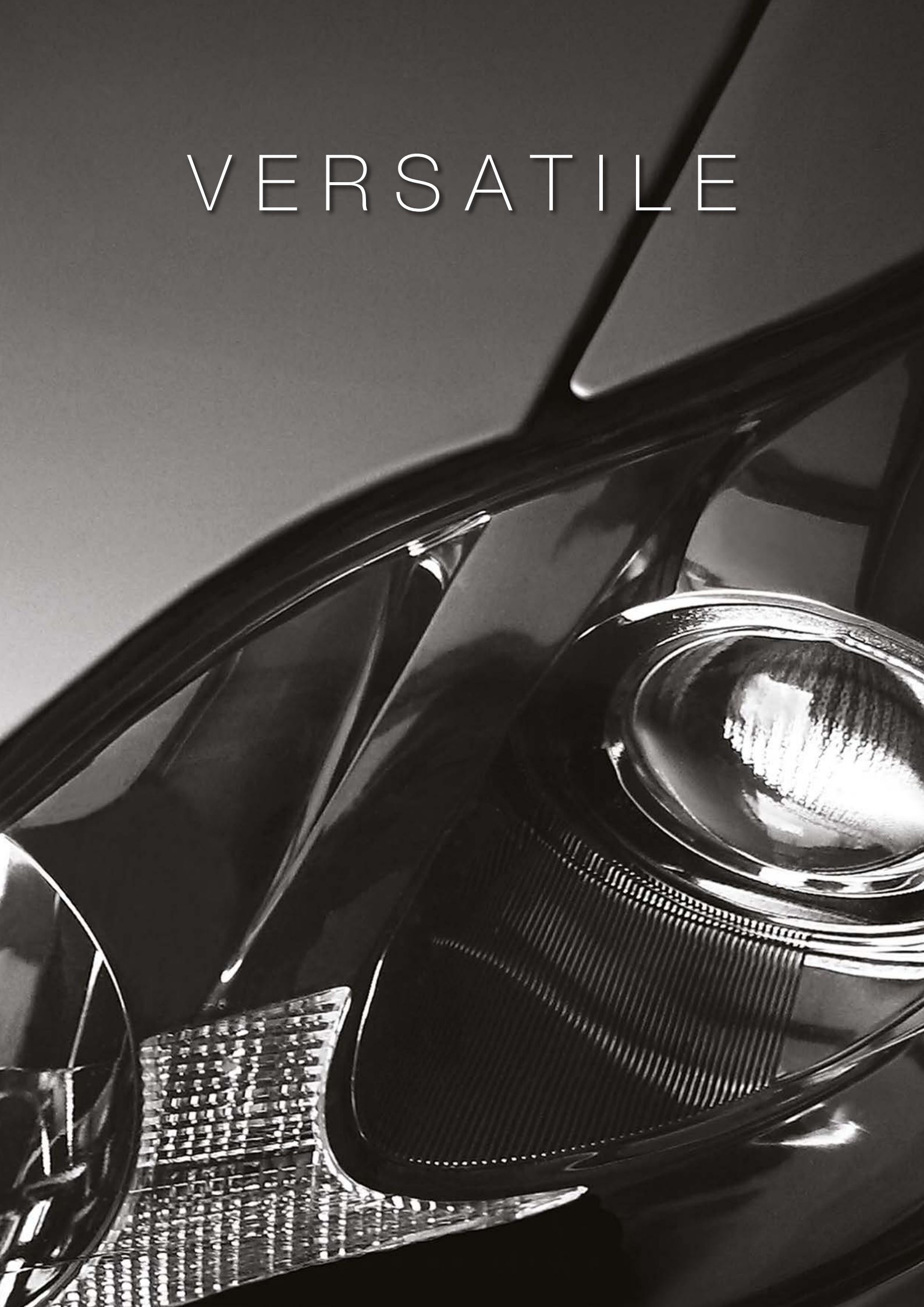
### During Pump Changeovers

In combination with Graco's control architecture, the advanced drive unit can recognize when the pump is close to changeover and is able to accelerate and decelerate to eliminate pulsation in the dispense.



ACCURATE

VERSATILE



## VERSATILE

The EFR gives you the versatility to choose the material and flow rates you need no matter what your project requirements are.

### Flow Rates

The EFR system consists of a powerful electric motor and a precise encoder. While the motor is powerful enough to give you a high output up to 3.2L per minute, the precise encoder helps you control the flow to reach very low flows or small shots consistently.

- Minimum shot size of 0.3 cc
- Maximum flow rate of 3200 cc/min at 207 bar

### Material

With the EFR system you have the freedom to use the material that best fits your application. The unit can be configured with different versions of Z-pumps to handle a wide range of materials, including difficult to ratio and very abrasive ones.

### Material types:

- Epoxies
- Acrylic
- Urethanes
- Silicones
- Polysulfide
- Thermal Interface Materials

### Markets and Applications

Adaptable for manual or robotic applications, the EFR can be configured for a wide range of manufacturing markets and applications

#### Markets

- Batteries
- Automotive
- Solar power
- General Industry

#### Applications

- Bonding
- Sealing
- Potting
- Gasketing





## EASY

Feel comfortable choosing a unit that is easy to configure and very easy to maintain.

### Configure

The EFR offers a wide range of ratio choices and can be connected to multiple Graco feed systems.

If you still need help, Graco engineers are always available to help you with selecting, configuring and testing the unit.

### Maintenance

The use of an EFR also means a reduction in maintenance time and costs.

- Z Pumps      The seals are the only wear parts of the pumps which can easily be replaced within minutes.





E A S Y



# Technical Information

DRIVE	Precision Controlled ServoDrive Motor
MATERIAL DELIVERY	Shot or Bead
FLOW RATE	1 to 3200 cc/min at 207 bar
SUPPLY TYPE	Bulk supply from 20 L pails to 200 L drums and larger totes.
SHOT RANGE	0,3 cc - any shot size
MIX RATIO RANGE	1:1 to 12:1
MAXIMUM FLUID WORKING PRESSURE	241 bar (3500 psi , 24 MPa)
MAXIMUM FLUID TEMPERATURE	50° C (120° F)
ELECTRICAL POWER	240 V or 480 V (single phase)
WETTED PARTS	Stainless steel, zinc-plated carbon steel, brass, tungsten carbide, chrome, fluoroelastomer, PTFE, ultra-high molecular weight polyethylene, silicon nitride
WEIGHT	145–182 kg (320 – 401 lbs)
DIMENSIONS (H X L X W)	56 x 127 x 57 cm (22 x 50 x x 22.5 in)
GATEWAY	EtherNet/IP, DeviceNet, Profibus, Profinet



# Ordering Information

EFR (First, second, and third digits)	DIGIT 4		DIGIT 5		DIGIT 6		DIGIT 7		DIGIT 8	
System Designator	Voltage Options		Control Options		A Side Pump*		B Side Pump		Material Options	
EFR (Electric Fixed-Ratio Proportioner)	2	240 V	A	ADM	A	5 CC	A	5 CC	C	Carbon and Stainless Steel
	4	480 V			B	10 cc	B	10 cc	S	Stainless Steel
					C	15 cc	C	15 cc		
					D	20 cc	D	20 cc		
					E	25 cc	E	25 cc		
					F	30 cc	F	30 cc		
					G	35 cc	G	35 cc		
					H	40 cc	H	40 cc		
					I	45 cc	I	45 cc		
					J	50 cc	J	50 cc		
					K	60 cc	K	60 cc		
					L	65 cc	L	65 cc		
					M	70 cc	M	70 cc		
					N	75 cc	N	75 cc		
					O	80 cc	O	80 cc		
					P	86 cc	P	86 cc		
					Q	90 cc	Q	90 cc		
					R	100 cc	R	100 cc		
					S	105 cc	S	105 cc		
					T	120 cc	T	120 cc		
				U	140 cc	U	140 cc			
				V	150 cc	V	150 cc			
				W	160 cc	W	160 cc			

PERFORMANCE		
Combined Displacement (A Pump + B Pump)	Max Output Flow (20 cycles/min max)*	Max Average Outlet Pressure**
60 cc	1200 cc/min	241 bar (3500 psi)
80 cc	1600 cc/min	241 bar (3500 psi)
100 cc	2000 cc/min	241 bar (3500 psi)
120 cc	2400 cc/min	241 bar (3500 psi)
140 cc	2800 cc/min	235 bar (3400 psi)
160 cc	3200 cc/min	207 bar (3000 psi)

\* Flow may be limited by metering very viscous materials or where there is strong throttling.

\*\* High inlet pressures reduce this value, subtract 2x inlet pressure.



## 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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Graco is certified ISO 9001.



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