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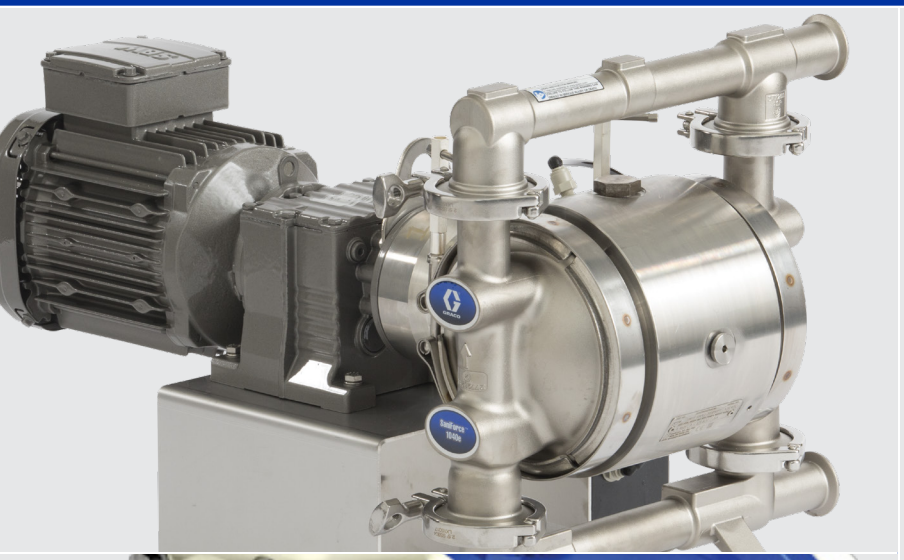
Lower energy consumption by using Electric Operated Diaphragm Pumps vs. Air operated designs

Graco Inc. Process Technology Division has developed an Electric Operated Diaphragm Pump system. This system can lower power consumption by 4-5x over compressed air diaphragm designs as well as eliminate noise and dirty/wet exhaust air throughout the facility created by air operated diaphragm pumps

Additional submitted attachment is included below.

Electric Diaphragm Pumps

Electric Operated Double Diaphragm Pump



- Only electric diaphragm pump on the market that will stall under pressure
- Up to 80% more efficient than air operated diaphragm pumps
- Reduce pulsation without the addition of pulsation dampeners

www.graco.com/e-series

PROVEN QUALITY. LEADING TECHNOLOGY.

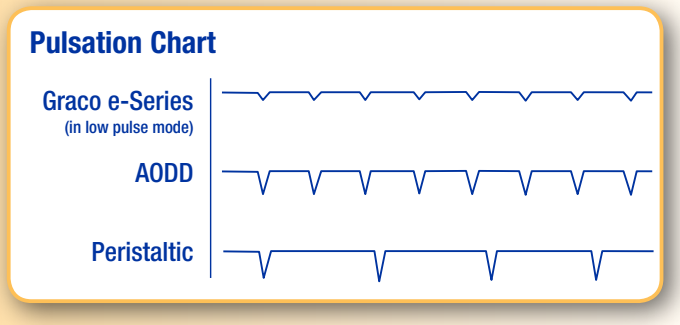
Electric Double Diaphragm Pumps

Would you like to eliminate unnecessary pump failures for your application? Would you like to improve your facilities energy efficiency and create a quieter and cleaner work environment for your employees? Graco's Husky e-Series pumps will help you achieve all of those items!

- ✓ Patent pending technology allows pump to **stall under pressure** preventing pump failures from clogged lines or closed valves
- ✓ **Energy efficient** electric drive reduces energy consumption up to 80% compared to traditional air operated diaphragm pumps
- ✓ Seal-less diaphragm pump design **eliminates leaking** and failures due to run-dry pump conditions
- ✓ **Request a demo** and see interactive information at www.graco.com/e-series

Need Low Pulsation? No Problem!

Our Husky e-Series pumps are ideal for applications that require low pulsation and a smooth flow. The air charged drive allows for the elimination or reduction of pulsation **WITHOUT** expensive pulsation dampeners or surge tanks.



Pick the pump that works for you!

We've listened to what you want out of a pump and designed the Graco e-Series to meet your needs!

Feature	Graco Electric Diaphragm Pumps	Other Electric Diaphragm Pumps	Air-Operated Diaphragm Pumps	Peristaltic Pumps	Progressive Cavity Pumps	Rotary Lobe Pumps
Stalls under pressure	X		X			
Runs dry	X	X	X	X		
Self priming	X	X	X	X	X	
Metering capabilities	X	X		X	X	
Energy efficient electric drive	X	X		X	X	X
No rotational shaft seal	X	X	X	X		
Low pulsation operation mode	X				X	X

2 Inch Models

1 Inch Models

Industrial Strength

Durable Pump Technology

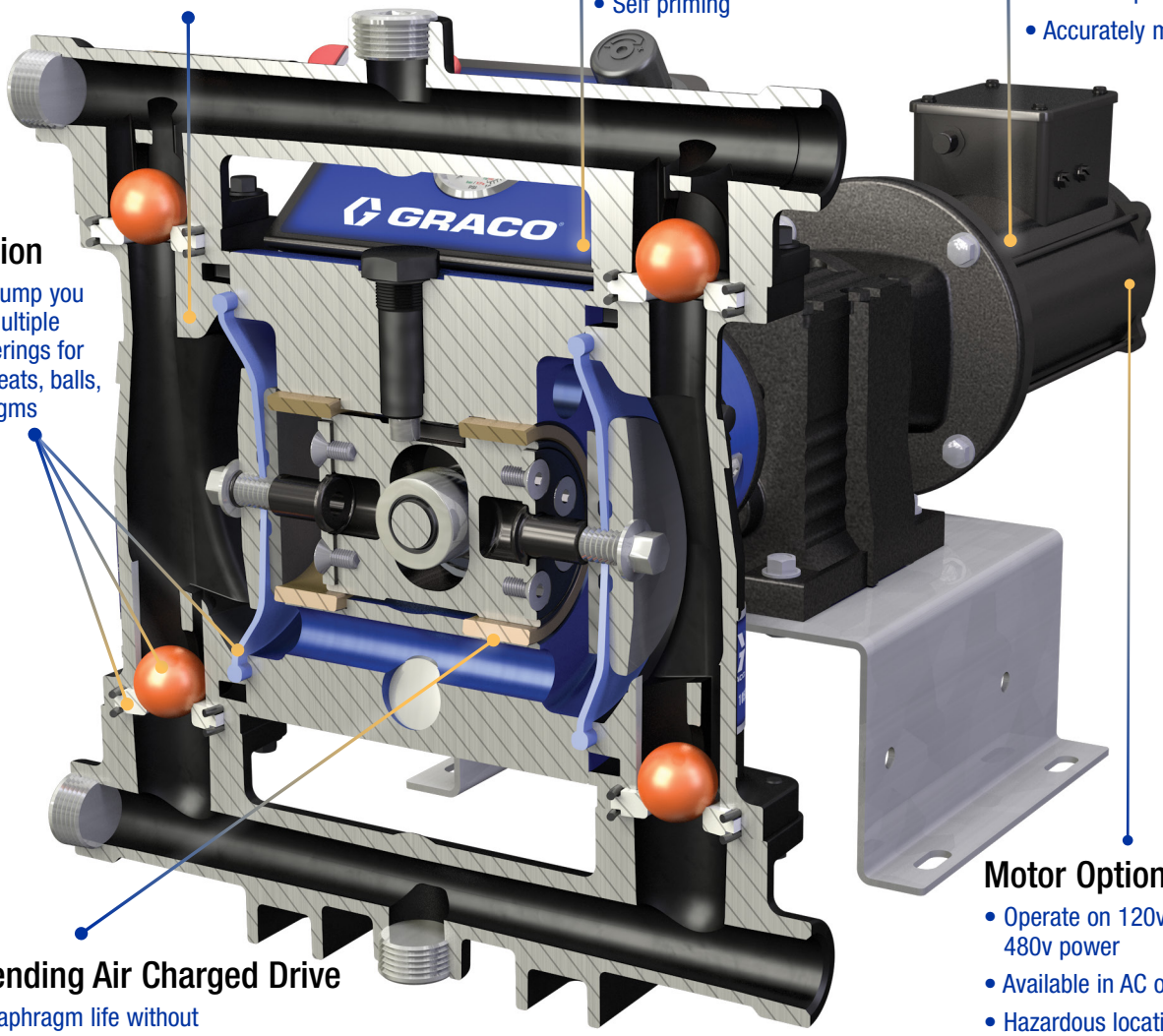
- Handles slurries and abrasives all without damage to the pump
- Gentle on shear sensitive material

Diaphragm Pump

- Runs dry
- No rotating or moving fluid seals
- Self priming

Electric Drive

- Reduce energy consumption and operating costs
- Increase pump control
- Accurately meter fluid



Fluid Section

- Create the pump you need with multiple material offerings for manifolds, seats, balls, and diaphragms

Patent Pending Air Charged Drive

- Increase diaphragm life without compromising your fluid
- Ability to minimize pulsation on fluid outlet
- Stalls under pressure without additional switches and controls

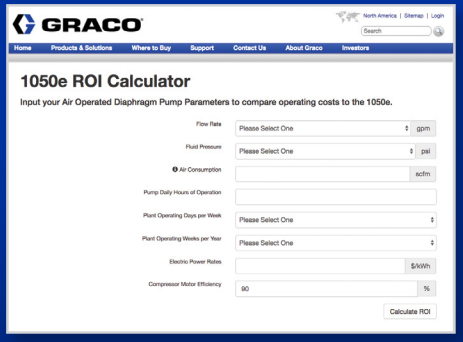
Motor Options

- Operate on 120v, 240v or 480v power
- Available in AC or Brushless DC
- Hazardous location motor options available

How much can you save?

Enter your parameters into the Husky Electric Pump ROI Calculator to compare your costs with a traditional air operated diaphragm pump.

To calculate your ROI, go to www.graco.com/ElectricROI to use the ROI calculator.



Example of ROI Tool

Electric Double Diaphragm Pumps

Are you ready to take your food manufacturing process to the next level? Graco's SaniForce e-series pumps save on energy and extra equipment while hygenically moving fluids over 100 gpm (378 lpm) and 1/4" (6.3 mm) particulates! The low pulsation mode is gentle on shear sensitive materials to maintain the integrity of your highest quality ingredients.

- ✓ All **FDA compliant** fluid sections and tri-clamp connections for accelerated cleaning and minimal down time
- ✓ Ability to **stall under pressure** for dispensing or filling applications without need for a circulation line
- ✓ **Gentle pumping** for shear sensitive materials
- ✓ **Durable pump construction** handles particulates and abrasives in material without damage to pump
- ✓ **Worry free pump design** without rotateable seal prevents leaking and need for flushing

Edible Oils

Juices, Concentrates, and Beverages

Condiments and Dressings

Wineries, Breweries, and Distilleries

Personal Care

Pharmaceuticals

2 Inch Models

1 Inch Models

FDA Approved

FDA Approved Fluid Section

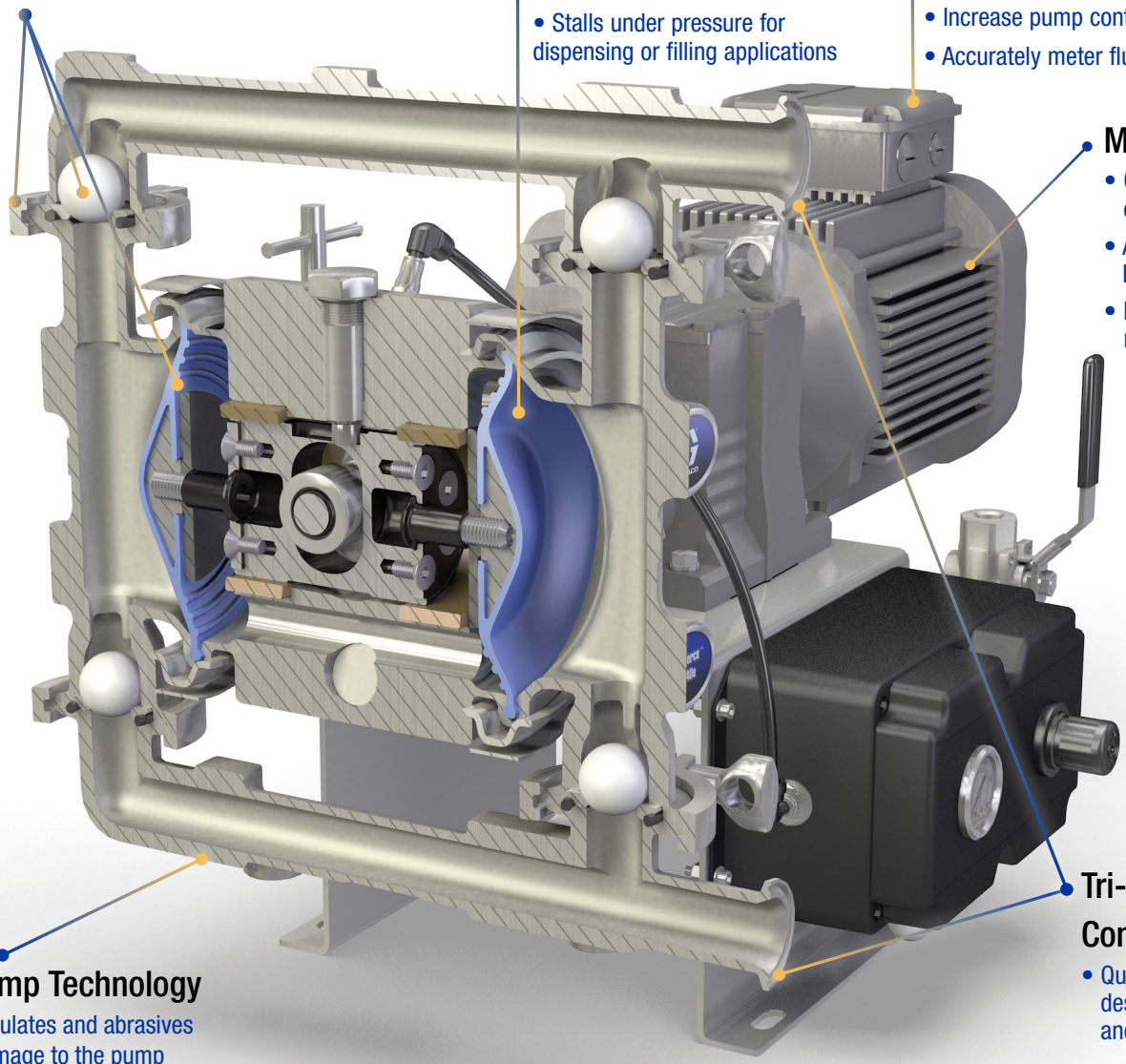
- Manifolds, seats, balls, & diaphragms all FDA compliant material

Diaphragm Pump

- Runs dry
- Self priming
- No rotating seals
- Stalls under pressure for dispensing or filling applications

Electric Drive

- Reduce energy consumption and operating costs
- Increase pump control
- Accurately meter fluid



Motor Options*

- Operate on 120v, 240v or 480v power
- Available in AC or Brushless DC
- Hazardous location motor options available

Durable Pump Technology

- Handles particulates and abrasives all without damage to the pump
- Gentle on shear sensitive material

Tri-Clamp Connections

- Quick knock down design for easy cleaning and service

**Motor options vary based on pump size and configuration.*

Find the Right Pump for your Application

Graco is making it easy to select a pump that's right for you.

To order an electric pump, go to www.graco.com/pumpselectors to use the selector tool or contact your distributor.

Example of Product Selector Tool

Technical Specifications

Industrial Pumps

	1050e	2150e
Maximum fluid working pressure	70 psi (4.8 bar, 0.48 MPa)	100 psi (0.69 MPa, 6.9 bar)
Air pressure operating range	20 - 80 psi (1.4 to 5.5 bar, 0.14 to 0.55 MPa)	20-100 psi (0.14 to 0.69 MPa, 1.4 to 6.9 bar)
Air inlet size	3/8 in npt(f)	3/8 in npt(f)
Maximum suction lift*	Wet: 29 ft (8.8 m); Dry: 16 ft (4.9 m)	Wet or Dry: 18 ft (5.5 m)
Maximum size pumpable solids	1/8 in (3.2 mm)	1/4 in (6.3 mm)
Ambient air temperature range for operation and storage**	32°F to 104°F (0°C to 40°C)	32°F to 104°F (0°C to 40°C)
Fluid displacement per cycle	0.15 gallons (0.64 L)	0.6 gallons (2.27 L)
Maximum free-flow delivery	42 gpm (158 lpm)	142 gpm (537 lpm)
Fluid inlet and outlet size		
Metal	1 in npt(f) or 1 in bspt	2 in npt (f) or 2 in bspt
Plastic	1 in ANSI/DIN Raised Face Flange	2 in ANSI/DIN Raised Face Flange
AC motor power	2 HP	3, 5, 7.5 HP
BLDC motor power	2.2 HP	N/A
Operation manual	334188	3A4068

*Reduced if balls don't seat well due to damaged balls or seats, lightweight balls, or extreme speed of cycling
**Exposure to extreme low temperatures may result in damage to plastic parts

FDA Approved Pumps

	1040e	2150e
Maximum fluid working pressure	70 psi (4.8 bar, 0.48 MPa)	100 psi (0.69 MPa, 6.9 bar)
Air pressure operating range	20 - 80 psi (1.4 to 5.5 bar, 0.14 to 0.55 MPa)	20-100 psi (0.14 to 0.69 MPa, 1.4 to 6.9 bar)
Air inlet size	3/8 in npt(f)	3/8 in npt(f)
Maximum suction lift*	Wet: 29 ft (8.8 m); Dry: 16 ft (4.9 m)	Wet or Dry: 18 ft (5.5 m)
Maximum size pumpable solids	1/8 in (3.2 mm)	1/4 in (6.3 mm)
Ambient air temperature range for operation and storage**	32°F to 104°F (0°C to 40°C)	32°F to 104°F (0°C to 40°C)
Fluid displacement per cycle	0.10 gallons (0.38 L)	0.6 gallons (2.27 L)
Maximum free-flow delivery	42 gpm (158 lpm)	142 gpm (537 lpm)
Fluid inlet and outlet size		
Aluminum and stainless steel	1.5 in sanitary flange or 40 mm DIN 11851	2.5 in sanitary flange or 65 mm DIN 11851
AC motor power	2 HP	3, 5, 7.5 HP
BLDC motor power	2.2 HP	N/A
Operation manual	3A3167	3A5132

*Reduced if balls don't seat well due to damaged balls or seats, lightweight balls, or extreme speed of cycling
**Exposure to extreme low temperatures may result in damage to plastic parts

Call today for product information or to request a demonstration.

877.84GRACO (1-877-844-7226) or visit us at www.graco.com.

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