

# E Series

SEAL-LESS INTERNAL GEAR PUMPS | PRODUCT BROCHURE



Where Innovation Flows



Blackmer®, a product brand of PSG®, a Dover company, is a global provider of innovative, high-quality industrial gear pumps for the safe and efficient transfer of high-value and hard-to-seal fluids.

## THE STANDARD IN LEAK-FREE RELIABILITY

### Blackmer® E Series Seal-less Internal Gear Pumps

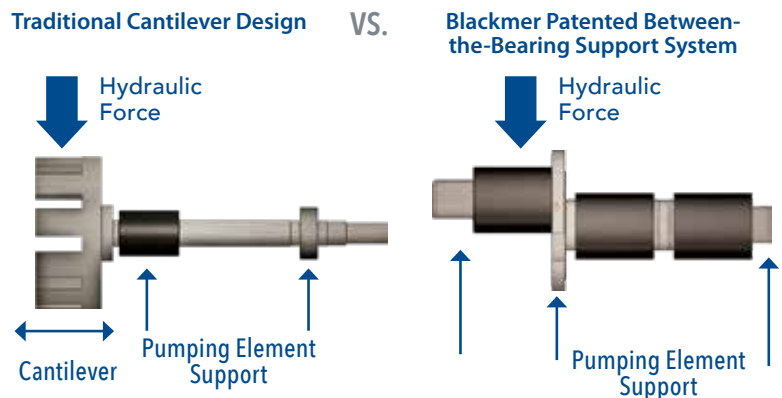
Blackmer E Series Magnetically Coupled Seal-less Internal Gear Pumps feature a revolutionary design with a patented between-the-bearing support system. As an innovative, durable and environmentally-friendly positive displacement pump, the E Series design effectively eliminates leaks and reduces mechanical wear, helping increase the safety of site personnel and the environment.

What separates the E Series from the competition, besides its patented between-the-bearing support system, is its market-leading warranty, high-quality manufacturing and lead times. E Series Pumps also feature a competitive price and are completely interchangeable with competitor pumps. No other mag drive internal gear pump offers a lower upfront cost, lower total cost of ownership or more reliability than the E Series.



### Between-the-Bearing Support System

The E Series' patented between-the-bearing support system protects the rotor and idler gears with an eccentric spindle at three crucial points – the head, the crescent location and the back of the containment canister. This design eliminates the damaging effects of cantilevered load that are present in competitor internal gear pumps. Extra-long radial bushings support the entire length of the rotating element, which spreads out the hydraulic forces and maximizes the life of the bushings.





# Blackmer® E Series | Features

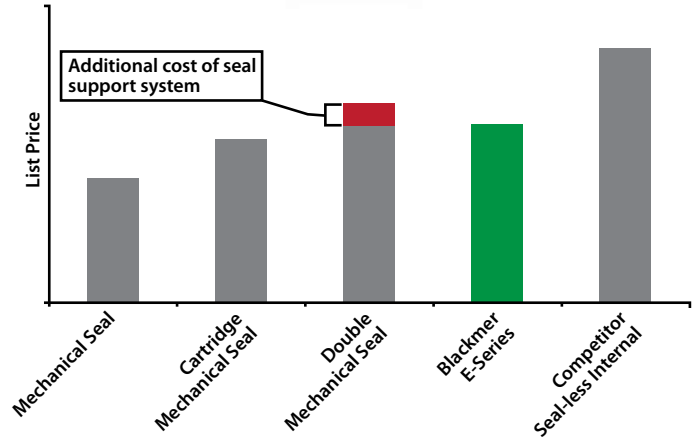
## One Fluid Chamber Seal-less Design

Eliminates the need for a complex multi-chamber design while improving fluid circulation through the magnetic coupling. The result is lower operating temperatures, longer magnet life, and a more effective cleaning and flushing processes with the ability to handle fluids with viscosities up to 50,000 cSt.



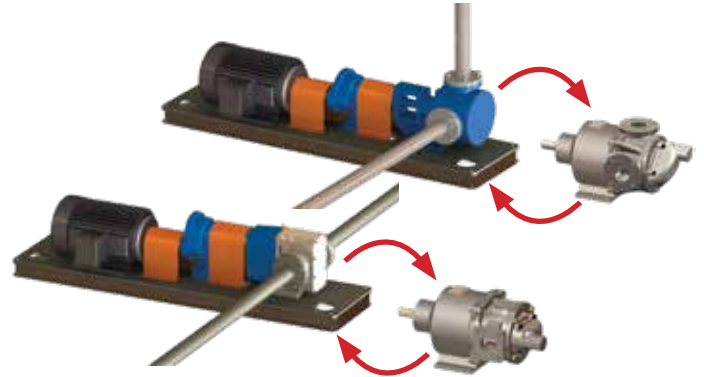
## Affordable Upfront Solution

Due to their simple seven-primary-component part design, E Series Pumps have a much lower investment cost than competitors' pumps. In fact, E Series Pumps are comparable in price to conventional internal gear pumps with double mechanical seals without requiring the added cost for maintenance and auxiliary components that are inherent with complex sealing systems.



## Competitor Pump Interchangeability

E Series Pumps are interchangeable with up to 95% of the packed, mechanically sealed and seal-less internal gear pumps in use today. Replacing an existing pump with an E Series requires no modifications to piping, driver, baseplate or coupling, while keeping flow rates unchanged. Side-ported E Series Pumps can also be interchanged with a number of lobe-pump models.



## World-Class Manufacturing Facility

- **Manufacturing:** All Blackmer pumps are assembled and tested in Grand Rapids, Michigan USA.
- **Supply Chain:** Every component that goes into a Blackmer pump is put through a rigid Production Part Approval Process (PPAP) that ensures quality and reliability.
- **Quality Manufacturing:** 100% of Blackmer Internal Gear Pumps are tested for flow, pressure and power before leaving the factory. The facilities are ISO 9001/14001 compliant, and feature state-of-the-art coordinate-measuring machines and 3D-scanning equipment that ensure the highest level of part quality.
- **Testing Capabilities:** The R&D and testing laboratory is compliant to Hydraulic Institute 3.6 Standards, providing certified performance, NPSH and hydrostatic testing.
- **Global Support:** A full-service global distribution network is ready to serve new or existing Blackmer pump installations and is backed by responsive factory support.

## Warranty Info

All Blackmer Internal Gear products (pumps, accessories and parts) are backed with an industry leading five year warranty. Each and every product manufactured by Blackmer is built to meet the highest standards of quality. Blackmer warrants that pumps, accessories and parts manufactured or supplied by it to be free from defects in material and workmanship. For more details please refer to the Installation Operation Maintenance Manual.

## Delivery

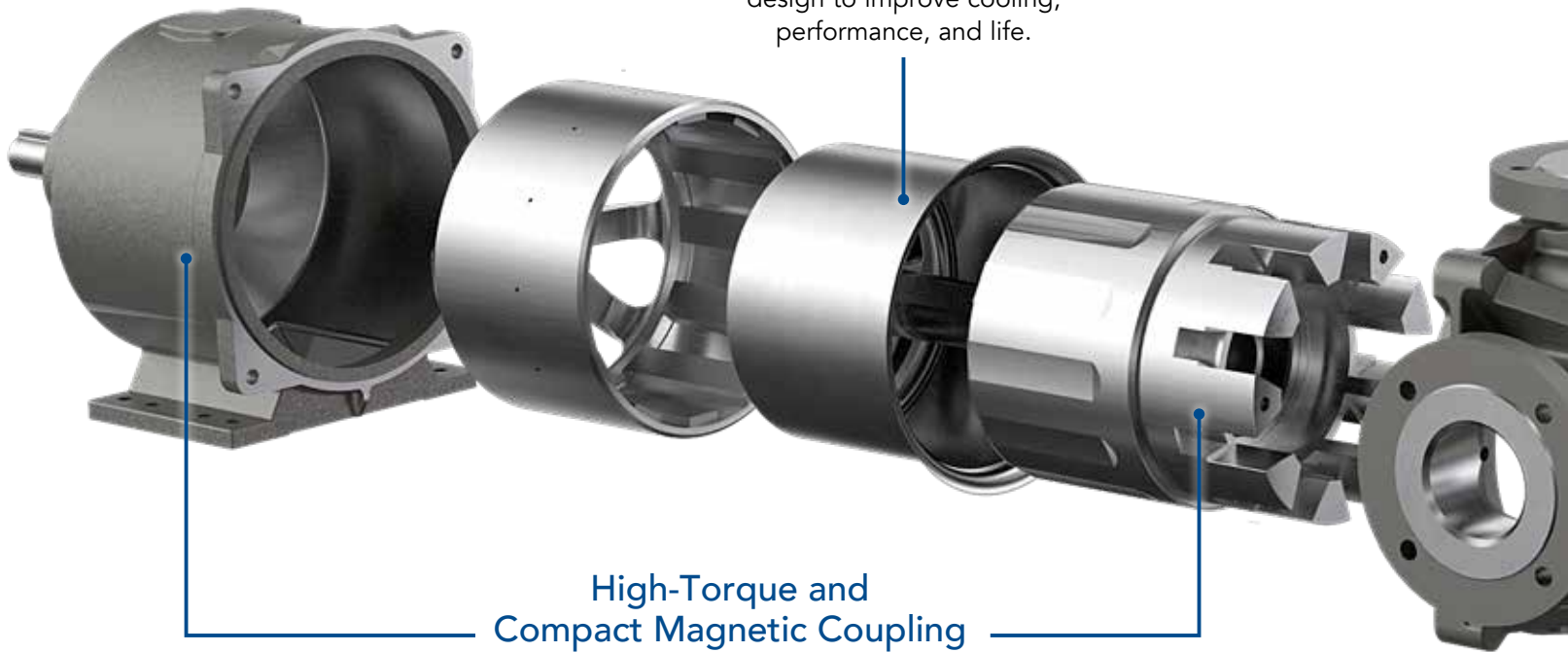
How soon do you want your Blackmer E Series Gear Pump and parts? Blackmer builds and ships out equipment fast. Blackmer Internal Gear Pumps have a 15-day lead time. Our parts have a 5-day lead time, and our base mounted units have a 20-day lead time. Can the other brands do that?

## Simple Design

The need for only seven primary components improves reliability and reduces system complexity while easing maintenance and repair. Critical assemblies can be purchased directly from Blackmer for quick repair or replacement with minimal downtime.

### Patented Containment Canister

Allows for single fluid chamber design to improve cooling, performance, and life.



### High-Torque and Compact Magnetic Coupling

High-strength magnetic couplings come standard to allow more operational flexibility for tough applications and potential system-upset conditions.

The patented rotor magnet assembly mounts directly to the rotor for an extremely compact design. High-temperature, greased-for-life bearings support the outer magnet assembly.



### Casing

Available in ductile iron, carbon steel, and stainless steel

### Patented Eccentric Spindle

Reduces wear and improves performance by eliminating the issues associated with typical overhung load designs.

### Idler Gear

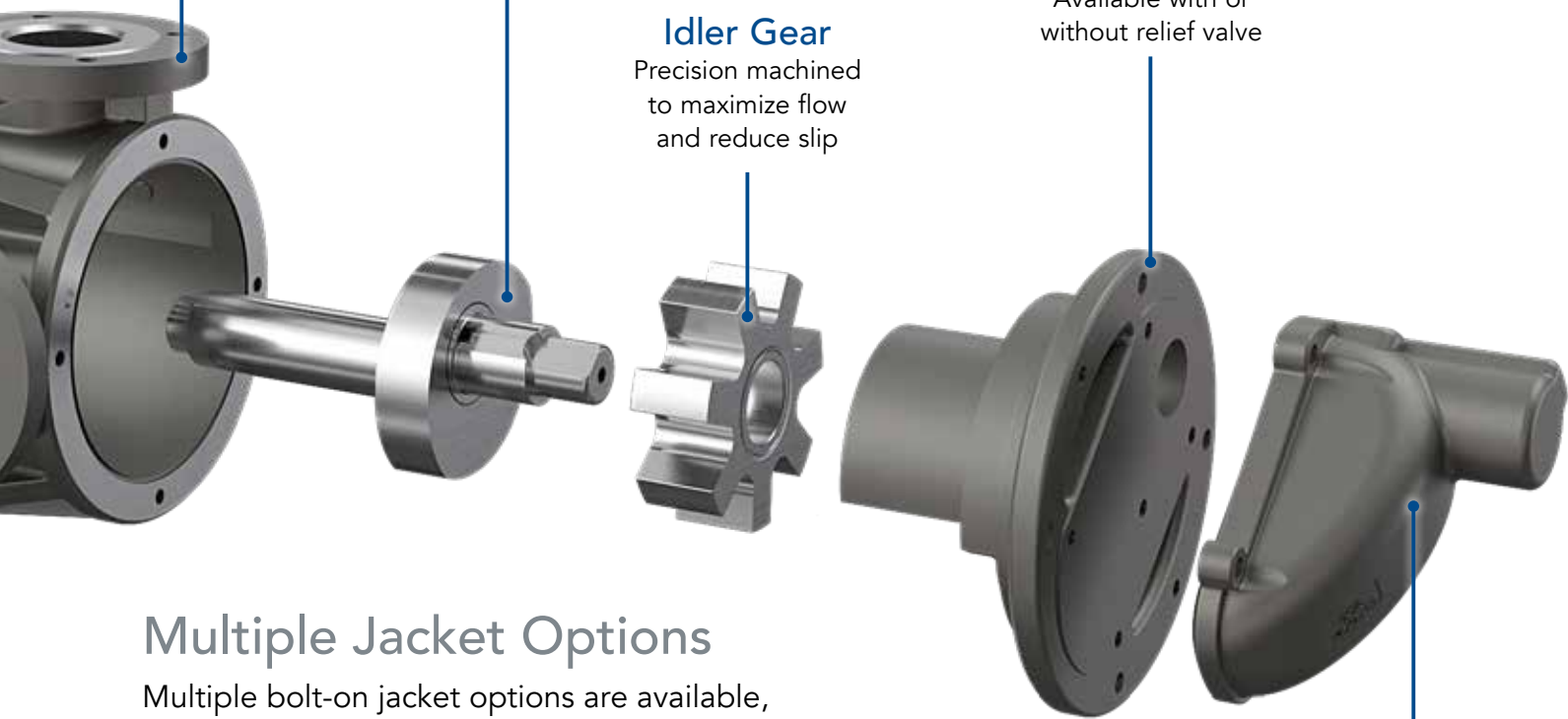
Precision machined to maximize flow and reduce slip

### Pump Head

Available with or without relief valve

### Relief Valve

Available in various cracking pressures to suit your process need



## Multiple Jacket Options

Multiple bolt-on jacket options are available, all of which offer lifelong thermal control with the ability to be removed or reused if the pump requires repair or replacement. Contact the factory to discuss options and delivery.

## Applications

The innovative seal-less and leak-free design of E Series Pumps makes them ideal for handling **hazardous chemicals, expensive fluids,** and **hard-to-seal** crystallizing, thermosetting or viscous fluids in continuous-process applications that may require 24/7 operation.

E Series Pumps excel in the handling of:

- Adhesives
  - Biofuels
  - Chemicals
  - Edible fats and oils
  - Foods
  - Heat-transfer fluids
- Isocyanates
  - Lube oils and grease blending
  - Molten sulfur
  - Paint and coatings
  - Petrochemicals and additives
  - Pigments and dyes
- Polymers
  - Polyurethane
  - Resins
  - Soap and detergents
  - Sugars and sweeteners
  - Surfactants

## Product Configurations

### Sizes Available

MODEL	DUCTILE IRON PORT SIZES <sup>1</sup>	CARBON STEEL PORT SIZES <sup>1</sup>	STAINLESS STEEL PORT SIZES <sup>1</sup>
<b>E1-2</b>	N/A	1-1/2" NPT/ANSI/BSPT	1-1/2" NPT/ANSI/BSPT
<b>E1-4</b>	N/A	1-1/2" NPT/ANSI/BSPT	1-1/2" NPT/ANSI/BSPT
<b>E1-24</b>	2" NPT/ANSI/BSPT	2" NPT/ANSI/BSPT - 3" ANSI	2" NPT/ANSI/BSPT - 3" ANSI
<b>E1-32</b>	2" NPT/ANSI/BSPT	2" NPT/ANSI/BSPT - 3" ANSI	2" NPT/ANSI/BSPT - 3" ANSI
<b>E1-55</b>	3" ANSI - 4" ANSI	3" ANSI - 4" ANSI	3" ANSI - 4" ANSI
<b>E1-69</b>	3" ANSI - 4" ANSI	3" ANSI - 4" ANSI	3" ANSI - 4" ANSI
<b>E1-82</b>	3" ANSI - 4" ANSI	3" ANSI - 4" ANSI	3" ANSI - 4" ANSI
<b>E1-133</b>	4" ANSI	4" ANSI	4" ANSI
<b>E1-222</b>	6" ANSI	6" ANSI	6" ANSI

(1) Flanged connections meet Class 150# ANSI

## Industry-Leading Customer Service and Factory Support



5-Year Limited Warranty



15 Day Factory Lead Time for Pumps



5 Day Factory Lead Time for Parts



Competitive Prices



ATEX, CE, FDA and TR CU Compliant



# Blackmer® E Series | Technical Data

## Pump Selection Performance Criteria

Model	NOMINAL PUMP RATING		MAX. DISCHARGE PRESSURE <sup>1,2</sup>	MAX. TEMPERATURE	NOMINAL PUMP RATING		MAX. DISCHARGE PRESSURE <sup>1,2</sup>	MAX. TEMPERATURE
	Ductile Iron / Carbon Steel				Stainless Steel			
	RPM	GPM (m³/h)	PSIG (bar)	Fahrenheit (Celsius)	RPM	GPM (m³/h)	PSIG (bar)	Fahrenheit (Celsius)
<b>E1-2</b>	1,750	15 (3.4)	200 (13.8)	500° (260°)	1,150	10 (2.3)	150 (10.3)	500° (260°)
<b>E1-4</b>	1,750	30 (6.8)	200 (13.8)	500° (260°)	1,150	20 (4.5)	150 (10.3)	500° (260°)
<b>E1-24</b>	780	75 (17.0)	200 (13.8)	500° (260°)	640	55 (12.5)	150 (10.3)	500° (260°)
<b>E1-32</b>	780	100 (22.7)	200 (13.8)	500° (260°)	640	80 (18.2)	150 (10.3)	500° (260°)
<b>E1-55</b>	640	135 (30.7)	200 (13.8)	500° (260°)	520	110 (25.0)	150 (10.3)	500° (260°)
<b>E1-69</b>	640	170 (38.6)	200 (13.8)	500° (260°)	520	140 (31.8)	150 (10.3)	500° (260°)
<b>E1-82</b>	640	200 (45.4)	200 (13.8)	500° (260°)	520	160 (36.3)	150 (10.3)	500° (260°)
<b>E1-133</b>	520	300 (68.1)	200 (13.8)	500° (260°)	520	300 (68.1)	150 (10.3)	500° (260°)
<b>E1-222</b>	520	500 (113.6)	200 (13.8)	500° (260°)	520	500 (113.6)	150 (10.3)	500° (260°)

<sup>1</sup> Maximum pressure listed reflects maximum differential pressure and maximum allowable working pressure <sup>2</sup> Consult factory for differential pressures below 20 psig (1.4 bar)

## Materials of Construction

DESCRIPTION	PART	IRON	CARBON STEEL	STAINLESS STEEL	
<b>Pressure Containing</b>	Case	Ductile Iron, ASTM A536 Grade 80-55-06 <sup>1</sup>	Carbon Steel, ASTM A216 Grade WCB	Stainless Steel, ASTM A743 Grade CF8M	
	Head	Ductile Iron, ASTM A536 Grade 80-55-06 <sup>1</sup>	Carbon Steel, ASTM A216 Grade WCB	Stainless Steel, ASTM A743 Grade CF8M	
	Relief Valve	Carbon Steel, ASTM A216 Grade WCB <sup>1</sup>		Stainless Steel, ASTM A743 Grade CF8M	
	Canister	316 Stainless Steel/Hastelloy C (133/222), 316 Stainless Steel (all others)			
<b>Product Contact</b>	Idler Gear <sup>1,2</sup>	Carbon Steel, ASTM A311 Grade 1045 Class A <sup>2</sup>		Stainless Steel, ASTM A564 Type 630 (17-4PH) <sup>3</sup>	
	Rotor Gear <sup>1,2</sup>	Carbon Steel, ASTM A311 Grade 1045 Class A <sup>2</sup>		Stainless Steel, ASTM A564 Type 630 (17-4PH) <sup>3</sup>	
	Spindle	Alloy Carbon Steel (4140)		Stainless Steel, ASTM A564 Type 630 (17-4PH)	
	Bushing Carrier (133/222 only)	Alloy Carbon Steel (4140)		Stainless Steel, ASTM A564 Type 630 (17-4PH)	
	Rotor Sleeve	316 Stainless Steel			
	Relief Valve Spring	302 Stainless Steel			
	Rotor/Idler Bushing	Carbon Graphite, Bronze, Tungsten Carbide		Carbon Graphite, Bronze	
	O-Rings	FKM, PTFE-encapsulated FKM, PTFE-encapsulated Silicone, FFKM 7075 (any commercially available material)			
<b>Non-Product Contact</b>	Magnet Housing	Ductile Iron, ASTM A536 Grade 80-55-06			
	Bearing Housing (133/222 Only)	Cast Iron, ASTM A48 Class 30			
	Shaft	Alloy Carbon Steel (4140)			

<sup>1</sup> Iron E1-133/222 comes with cast iron case and head and relief valve ASTM A48 Class 35B

<sup>2</sup> Cast iron and carbon steel E1-133 and E1-222 come standard with ductile iron idler ASTM A536 Grade 80-55-06

<sup>3</sup> Stainless steel E1-133 and E1-222 come standard with Nitronic 60, ASTM A276, UNS21800 rotor and idler

## Model Cross Reference

E SERIES	G SERIES	VIKING®	TUTHILL®	GORMAN-RUPP®
<b>E1-2</b>	G1-2	H	015	GHS 1-1/2
<b>E1-4</b>	G1-4	HL	030	GHS 1-1/2
<b>E1-24</b>	G1-24	K	120	GHS 2
<b>E1-32</b>	G1-32	KK	130	GHS 2
<b>E1-55</b>	G1-55	L & LQ	200	GHS 2-1/2, 3
<b>E1-69</b>	G1-69	LL	210	GHS 3
<b>E1-82</b>	G1-82	LS	250	GHS 3
<b>E1-133</b>	G1-133	Q	N/A	GHS 4
<b>E1-222</b>	G1-222	QS	550	GHS 6

Note: See the Blackmer E Series Competitor Dimensional Comparison Chart for detailed dimensional information

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PSG Grand Rapids  
1809 Century Avenue SW  
Grand Rapids, MI 49503-1530  
USA

P: +1 (616) 241-1611

info@blackmer.com

blackmer.com



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