

E Series

SEAL-LESS INTERNAL GEAR PUMPS | PRODUCT BROCHURE



Blackmer

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.



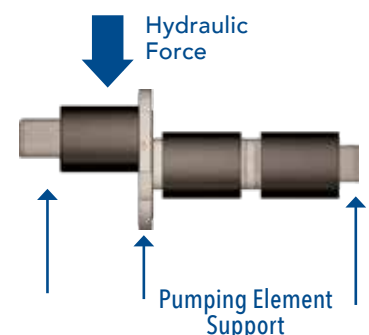
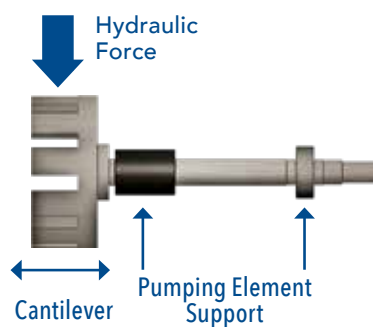
Between-the-Bearing Support System

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.

Traditional Cantilever Design

VS.

Blackmer Patented Between-the-Bearing Support System



Blackmer® E Series | Features

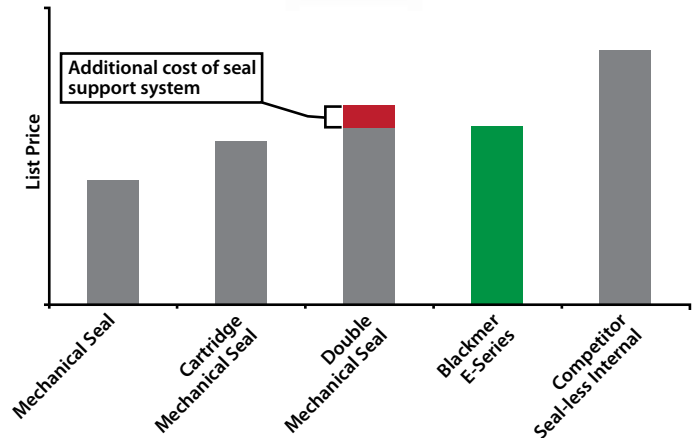
One Fluid Chamber Seal-less Design

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.



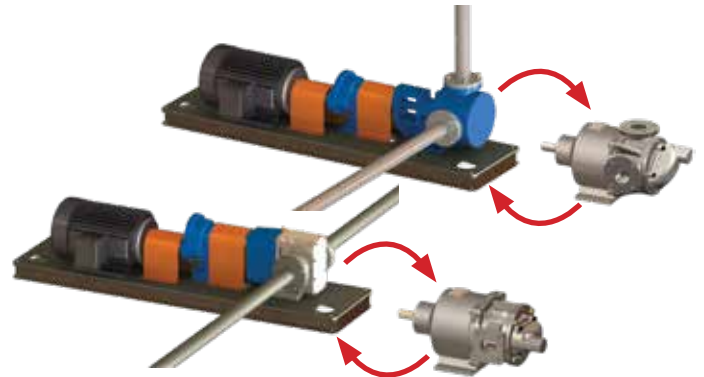
Affordable Upfront Solution

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?

BLACKMER® E SERIES SEAL-LESS INTERNAL GEAR PUMPS

Simple Design

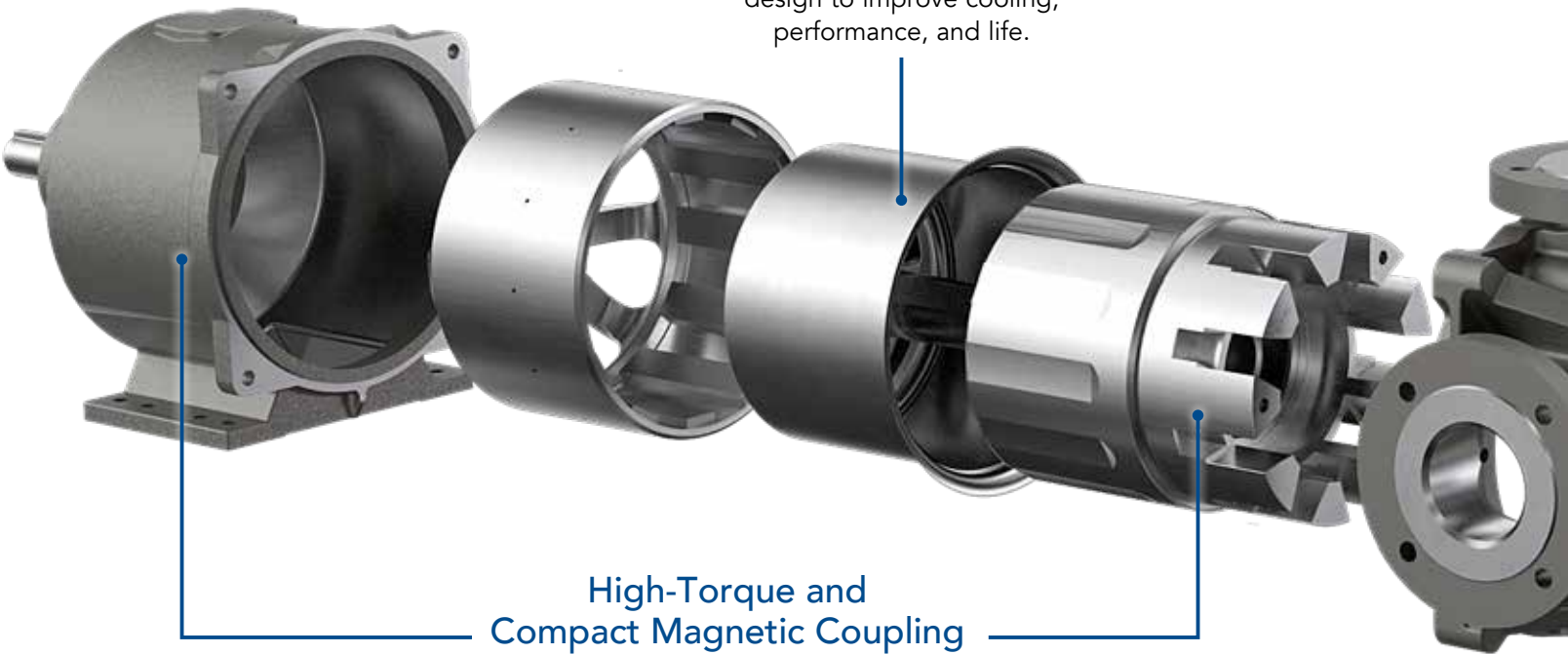
The need for only seven primary components improves reliability and reduces system complexity while easing maintenance and repair. Critical assemblies can be purchased directly from Blackmer for quick repair or replacement with minimal downtime.

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

Porting

- Right Angle (90°)
- Opposite (180° for select models)
- NPT/BST
- ANSI Flanged

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.

Blackmer® E Series | Applications & Product Configurations

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

Port Sizes Available

MODEL	Ductile Iron Gear Pump Port Sizes		Carbon Steel Gear Pump Port Sizes ¹		Stainless Steel Gear Pump Port Sizes ¹	
	THREADED	FLANGED	THREADED	FLANGED	THREADED	FLANGED
E1-2 E1-4	N/A	N/A	1-1/2" NPT 1-1/2" BSPT	1-1/2" ANSI 2" ANSI DN40	1-1/2" NPT 1-1/2" BSPT	1-1/2" ANSI 2" ANSI DN40
E1-24 E1-32	2" NPT 2" BSPT	2" ANSI 2" ANSI 180°	2" NPT 2" BSPT	2" ANSI 2" ANSI 180° 3" ANSI	2" NPT 2" BSPT	2" ANSI 2" ANSI 180° 3" ANSI DN50
E1-55 E1-69 E1-82	N/A	3" ANSI 4" ANSI	N/A	3" ANSI 4" ANSI DN80	N/A	3" ANSI 3" ANSI 180° 4" ANSI DN80
E1-133	N/A	4" ANSI ²	N/A	4" ANSI 4" ANSI 180° * 6" ANSI 180° *	N/A	4" ANSI
E1-222	N/A	6" ANSI ² 180°	N/A	6" ANSI 180°	N/A	6" ANSI 180°

(1) Flanged connections meet Class 150# ANSI

(2) Flanged connections meet Class 125# ANSI

* Flanged connection options to meet Class 150# or 300# ANSI

Note: All port orientations 90° unless specifically noted 180°

Note: All E Series ANSI flanges are "raised-face" (RF), with the exception of E1-133/222 models which are "flat-face" (FF)

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

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

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

Materials of Construction

DESCRIPTION	PART	IRON	CARBON STEEL	STAINLESS STEEL
Pressure Containing	Case	Ductile Iron, ASTM A536 Grade 80-55-06 ¹	Carbon Steel, ASTM A216 Grade WCB	Stainless Steel, ASTM A743 Grade CF8M
	Head	Ductile Iron, ASTM A536 Grade 80-55-06 ¹	Carbon Steel, ASTM A216 Grade WCB	Stainless Steel, ASTM A743 Grade CF8M
	Relief Valve	Carbon Steel, ASTM A216 Grade WCB ¹		Stainless Steel, ASTM A743 Grade CF8M
	Canister	316 Stainless Steel/Hastelloy C (133/222), 316 Stainless Steel (all others)		
Product Contact	Idler Gear ^{1,2}	Carbon Steel, ASTM A311 Grade 1045 Class A ²		Stainless Steel, ASTM A564 Type 630 (17-4PH) ³
	Rotor Gear ^{1,2}	Carbon Steel, ASTM A311 Grade 1045 Class A ²		Stainless Steel, ASTM A564 Type 630 (17-4PH) ³
	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)		
Non-Product Contact	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)		

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

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

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

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

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1901-001 05/25

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