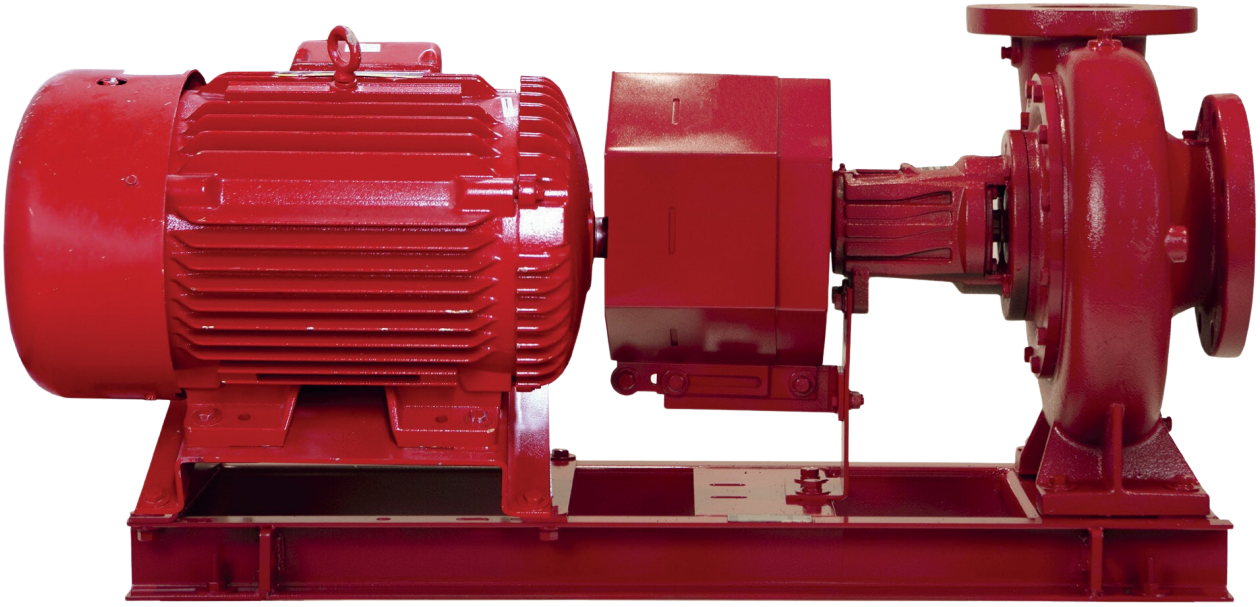
xylem
Let's Solve Water



Series e-1510
Centrifugal Pumps
TECHNICAL BROCHURE

Bell & Gossett
a xylem brand

B-313F-IN

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Useful Pump Formulas

$$\text{Pressure (PSI)} = \frac{\text{Head (Feet)} \times \text{Specific Gravity}}{2.31}$$

$$\text{Head (Feet)} = \frac{\text{Pressure (PSI)} \times 2.31}{\text{Specific Gravity}}$$

$$\text{Vacuum (Inches of Mercury)} = \text{Dynamic Suction Lift (Feet)} \times .883 \times \text{Specific Gravity}$$

$$\text{Horsepower (Brake)} = \frac{\text{GPM} \times \text{Head (Feet)} \times \text{Specific Gravity}}{3960 \times \text{Pump Efficiency}}$$

$$\text{Horsepower (Water)} = \frac{\text{GPM} \times \text{Head (Feet)} \times \text{Specific Gravity}}{3960}$$

$$\text{Efficiency (Pump)} = \frac{\text{Horsepower (Water)}}{\text{Horsepower (Brake)}} \times 100 \text{ Per Cent}$$

$$\text{NPSH (Available)} = \text{Positive Factors} - \text{Negative Factors}$$

Affinity Laws: Effect of change of speed or impeller diameter on centrifugal pumps.

	GPM Capacity	Ft. Head	BHP
Impeller Diameter Change	$Q_2 = \frac{D_2}{D_1} Q_1$	$H_2 = \left(\frac{D_2}{D_1}\right)^2 H_1$	$P_2 = \left(\frac{D_2}{D_1}\right)^3 P_1$
Speed Change	$Q_2 = \frac{RPM_2}{RPM_1} Q_1$	$H_2 = \left(\frac{RPM_2}{RPM_1}\right)^2 H_1$	$P_2 = \left(\frac{RPM_2}{RPM_1}\right)^3 P_1$

Where Q = Flow H = Head, P = BHP, D = Impeller Dia., RPM = Pump Speed

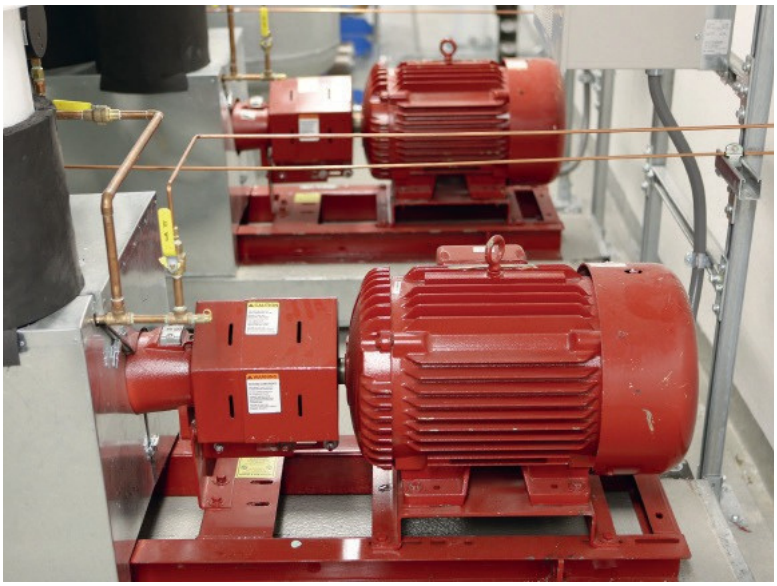
Series e-1510
End Suction Pump System

The Series e-1510 provides the highest overall efficiency in the end-suction market for HVAC and plumbing applications. With the largest Efficiency Island compared to other similar pumps, the e-1510 reduces electricity consumption, improves overall system performance and lowers life cycle costs.

The extensive efficiency profile enables users to maintain significantly higher levels of efficiency over a much wider range of operating conditions. The Series e-1510's dramatic improvement in efficiency is the result of cutting edge computational fluid dynamics (CFD) design technology, extensive hydraulic engineering expertise, and Xylem's comprehensive knowledge of HVAC and plumbing applications. The Bell & Gossett Series e-1510 is available in 26 sizes and a variety of configuration options that enables customization and flexibility to fit a broad range of operating conditions.

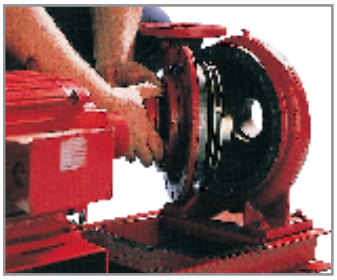
Applications

- Chilled Water
- Commercial HVAC
- Hydronic Heating and Cooling Systems
- Cooling Towers and Industrial Uses



Series e-1510 installation

Take away these seven standard features and you'll have a pump like everyone else's.

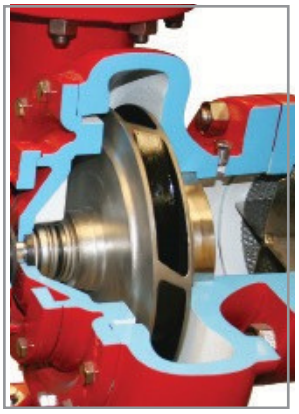


True Back Pullout

A B&G standard in design and construction. Ease in service is assured, while piping and motor remain undisturbed. Extended delays for repairs are virtually eliminated.

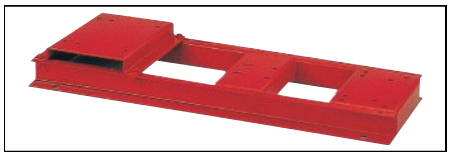
Internally Self-Flushing Mechanical Seal

This design is way ahead of its time. This unique seal design is proven in many years of service. It requires no special external flushing provisions, since the design provides for constant efficient flushing action internally. This standard feature ensures maximum seal face lubrication, heat dissipation and debris removal without vulnerable, external flush tubing. The internal flushing action passes two and a half to three times the flow over the seal faces – compared to a few GPM for conventional, stuffing-box designed pumps.



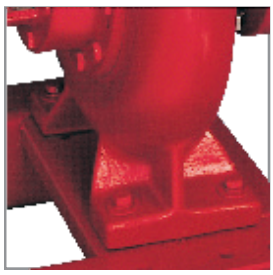
Computer Controlled Impeller Balancing

e-1510 impellers are balanced to ANSI/HI 9.6.4-2022, grade 6.3 standards. This method of computer balancing Impellers provides for quiet, efficient, vibration free performance. Diameters are computer selected at the factory to furnish assurance that your capacity requirements will be met.



Heavy Duty, Rugged Baseplate

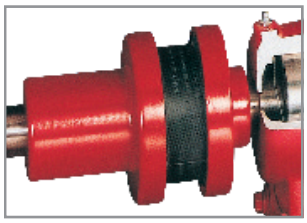
The Bell & Gossett fabricated heavy duty baseplate is supplied as standard on every Series e-1510 pump. Unlike rolled steel and "C" channel baseplates, the Series e-1510 baseplate provides a heavy duty saddle assembly, full seam welds, closed baseplate ends and an open top to provide ease of access for proper equipment grouting.



Solid-Foot Mounted Volute

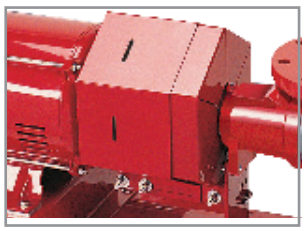
All Series e-1510 pumps are provided as standard with an integrally cast volute foot located directly beneath the pump volute. This integrally cast foot ensures that the alignment between the volute and motor assembly is maintained.

Without solid support beneath the volute, the piping weight alone will cause distortion which can lead to premature failure of the bearings, shaft and mechanical seal. This feature is equally important on hot water applications. The Series e-1510 volute foot provides a solid foundation and eliminates the deflections which would otherwise exist within an unsupported overhung volute during the normal thermal expansion of the system piping against the volute.



Center Drop-Out Spacer Coupling

Unlike conventional jaw type or rigid style couplings, a center drop-out spacer coupling allows removal of the bearing frame and rotating element without disturbing the pump end pipe alignment or motor electrical connections.



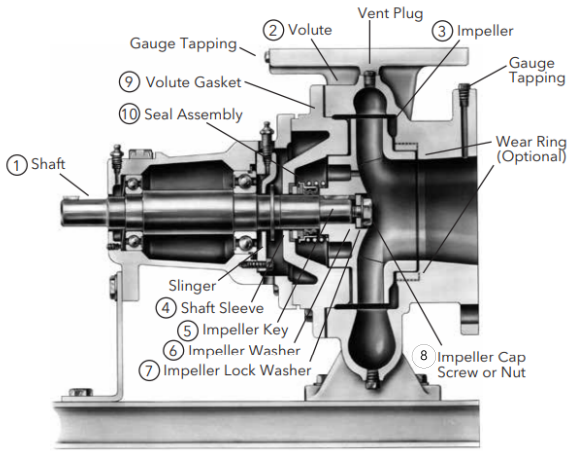
ANSI/OSHA-Compliant Coupling Guard

The coupler guard complies with OSHA 1910.219. The guard offers increased protection against potential injuries and is standard on all e-1510 pumps. The guards include slotted viewing windows for easy inspection.

OptimyzeTM modular condition monitoring solution

Optimyze provides health guidance and predictive maintenance advice or rotating and fixed assets such as pumps, motors, heat exchangers and steam traps. It periodically monitors system vibration and temperature and allows everyday users to access simple-to-use monitoring tools from iOS or Android mobile devices.

Materials of Construction



STANDARD CONFIGURATION

Sl. No.	Description	Stainless Steel Fitted Pump (Standard) Configuration
1	Shaft	SS416
2	Volute	Cast Iron ASTM A159/ Ductile Iron ASTM A536, Grade 65:45:12*
3	Impeller	CF8 ASTM #A351
4	Shaft Sleeve	ASTM A312 SS 304
5	Impeller Key	#304 Stainless Steel
6	Impeller Washer	Steel
7	Impeller Lock Washer	#304 Stainless Steel
8	Impeller Cap Screw	#304 Stainless Steel
9	Volute Gasket	Cellulose Fiber
10	Seal Assembly	
	Bellows	EPDM/ Buna N **
	Faces	Carbon- Silicon Carbide/ Carbon- Ceramic
	Metal Parts	Stainless Steel/ Brass
	Spring	Stainless Steel

** BUNA/ EPDM -PH Limitations 7-9 Temperatures Range -20°F to +250°F

* Check specific model material released chart

The Bell & Gossett End Suction Pump System

Consists of:

B&G Series e-1510 Pump
B&G Triple Duty® Valve
B&G Suction Diffuser

Triple Duty Valve

- Lowest Pressure Drop
- ASHRAE 90.1 Energy Efficient Design
- Three Valves in one!
  1. Nonslam drip-tight check valve
  2. Positive shutoff valve
  3. Calibrated system balance valve
- EPDM Disc Soft Seat Design
- Repack Under Pressure
- Brass Seat & Bronze Disc
- Stainless Steel Stem
- Multi-turn Valve (8-9 turns) vs 1/4 turn range of control
- Available connections – Threaded – Flanged – Grooved
- ESP-Systemwize Selection

Suction Diffuser

- Full length stainless steel straightening vanes
- Oversized cylinder assures minimum strainer pressure drop
- Pressure gauge tap
- Magnetic drain plug to protect pump seals
- Adjustable support foot
- Space saving design reduces the "footprint" size of the unit
- Available connections - Threaded - Flanged - Grooved
- Reducer and elbow provide multiple combinations of inlet and pump suction configurations which eliminates the need for reducer fittings
- ESP Plus System Selection

Typical Specification for Series e-1510
Base Mounted, Flexible Coupled, End-Suction Pumps

Furnish and install pumps with performance characteristics as shown on plans. Pumps shall be base mounted, single stage, end suction design with a foot mounted volute to allow removal and service of the entire rotating assembly without disturbing the pump piping, electrical motor connections or pump to motor alignment.

Pump volute shall be Class 30 CI/ DI with integrally-cast pedestal support feet. The impeller shall be a cast stainless steel enclosed type, balanced to ANSI/HI 9.6.4-2022 balance grade G6.3 and secured to the shaft by a locking capscrew or nut.

The liquid cavity shall be sealed off at the pump shaft by an internally-flushed mechanical seal with Ceramic/ Silicon Carbide seal seat and carbon seal ring, suitable for continuous operation at 225°F (107°C). A replaceable stainless steel shaft sleeve shall completely cover the wetted area under the seal.

Pump shall be rated for minimum of 175 psi (12 bar) working pressure. Volute shall have gauge tappings at the suction and discharge nozzles and vent and drain tappings at the top and bottom.

The pump(s) vibration limits shall conform to Hydraulic Institute ANSI/HI 9.6.4-2022 for recommend acceptable unfiltered field vibration limits (as measured per ANSI/HI 9.6.4-2022) for pumps with rolling contact bearings.

Baseplate shall be of structural steel or fabricated steel channel with fully enclosed sides and ends, and securely welded cross members. Grouting area shall be fully open. The combined pump and motor baseplate shall be sufficiently stiff as to limit the susceptibility of vibration. The minimum baseplate stiffness shall conform to ANSI/HI 14.3-2019 for grouted Horizontal Baseplate Design standards.

A flexible type, center drop-out design coupling, capable of absorbing torsional vibration, shall be employed between the pump and motor. Pumps for variable speed application shall be provided with a suitable coupling sleeve. The coupling shall be shielded by a rated OSHA 1910.219 compliant coupling guard and contain viewing windows for inspection of the coupling.

Motor shall meet IEC specifications and shall be of the size & voltage called for on the plans. Pump and motor shall be factory aligned, and shall be realigned by the contractor per factory recommendations after installation.

The pump(s) selected shall conform to ANSI/HI9.6.3-2017 standards for Preferred Operating Region (POR) unless otherwise approved by the engineer.

Each pump shall be factory hydrostatically tested per Hydraulic Institute standards. It shall then be thoroughly cleaned and painted with at least one coat of high grade paint prior to shipment. The pump(s) shall be manufactured, assembled and tested in an ISO 9001 approved facility.

A pump condition monitoring system should be provided on the pump power end to continuously measure pump vibration and temperature at the outboard bearing. The system shall record the baseline vibration at start-up and have local alarm indication at the pump when the vibration levels are double the baseline values or when alarm limits are reached for vibration and temperature. Vibration modes shall be based on ANSI/ HI 9.6.4-2022 and ISO 101816 recommended levels. The sensors and condition monitors' electronics shall be provided in a stainless steel enclosure potted in epoxy for protection from the environment. A battery powered system is preferred with no external power source required. The acceptable ambient temperature range shall be -40°F to 212°F (-40°C to 100°C). CSA certification is required.

Pumps shall be Series e-1510 as manufactured by Xylem Bell & Gossett or equal.

We value your feedback. Please take our 3 question survey at bellgossett.com/survey to let us know how we are doing.

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Let's Solve Water

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