STERLING SIHI

LEH Series - Liquid Ring Vacuum Pump

SIHI Pumps
www.sterlingamericas.com

ISO9001

LEH SERIES
Liquid Ring Vacuum Pumps

SIHI
PERFORMANCE AND RELIABILITY

Orifice Ball Assembly

- Interior variable port design increases efficiency throughout the operating range.
- Wear-resistant ball check design increases reliability and lowers maintenance cost.

Additional Features

- Single stage design capable of operating to 29" Hg. Vacuum.
- No metal-to-metal contact offers quiet and virtually vibration-free performance.
- Fewer parts means lower cost and reduced maintenance.
- One drain connection provides safety for repairs and for maintenance.*
- Available in standard materials and special alloys.
- Continuous purge connections provided to aid in removal of abrasives and excess liquid draining.

*T-Shaped Manifold**

Offers increased liquid carryover handling capabilities, surge protection, and maximum flexibility for piping installations.

Mechanical Seals

Are standard on all models, variety of types and materials available.

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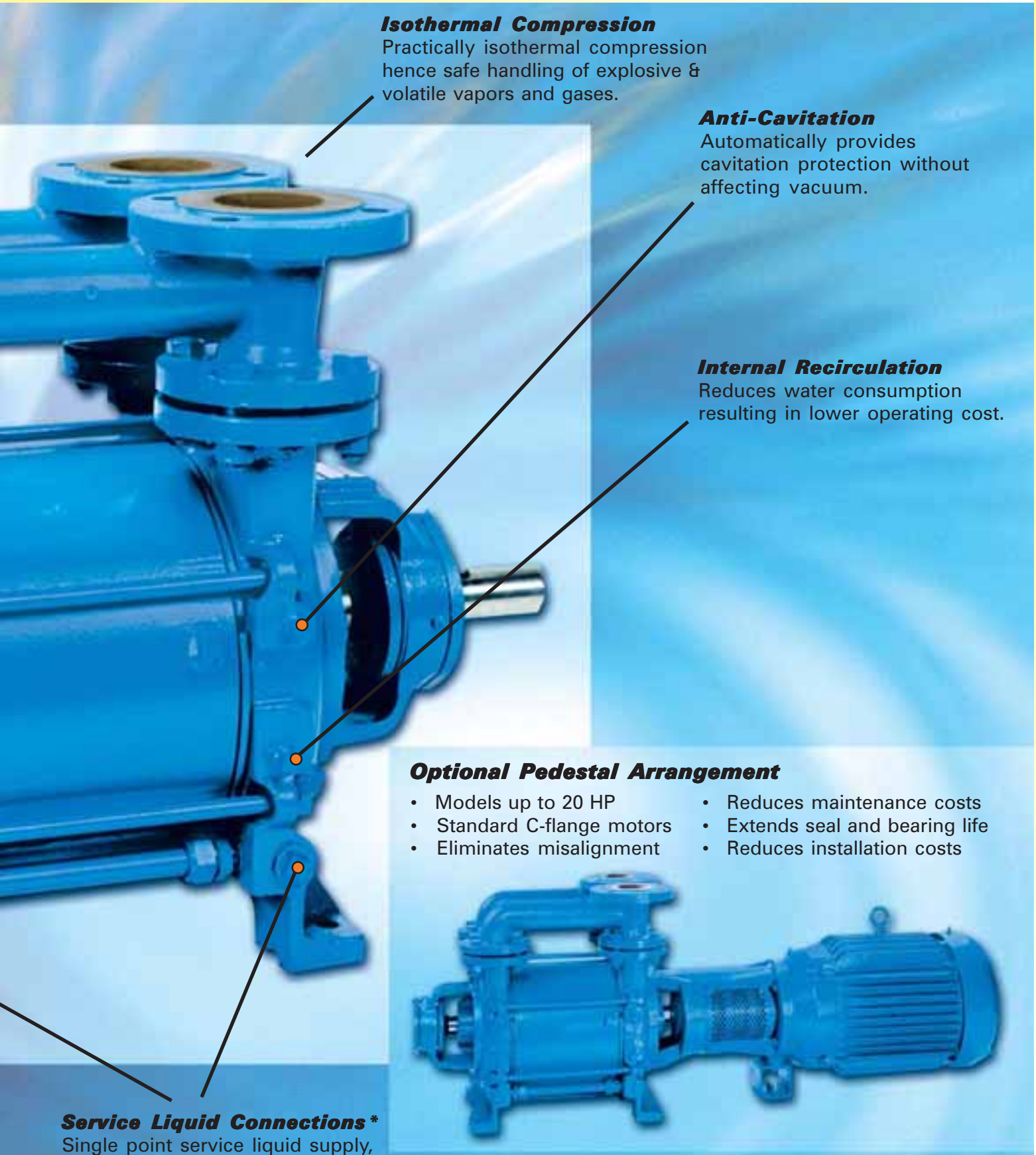


Isothermal Compression
Practically isothermal compression hence safe handling of explosive & volatile vapors and gases.

Anti-Cavitation
Automatically provides cavitation protection without affecting vacuum.

Internal Recirculation
Reduces water consumption resulting in lower operating cost.

Optional Pedestal Arrangement

- Models up to 20 HP
- Standard C-flange motors
- Eliminates misalignment
- Reduces maintenance costs
- Extends seal and bearing life
- Reduces installation costs

Service Liquid Connections*
Single point service liquid supply, accessible from either end, reduces installation cost.

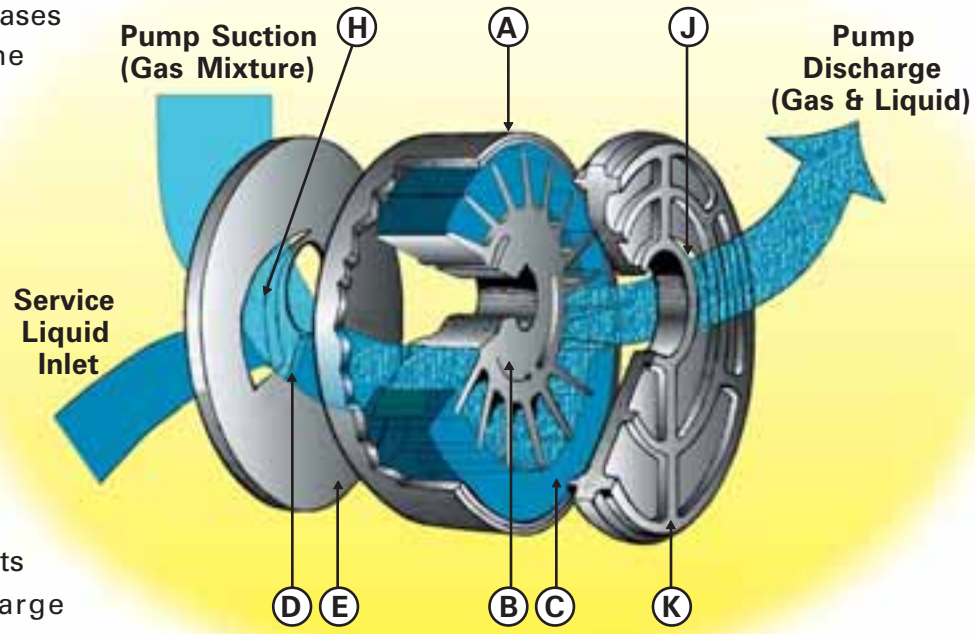
* Not available on LEH 3400.

PRINCIPLE OF OPERATION

PRINCIPLE OF OPERATION SINGLE ACTING LIQUID RING PUMPS

In a round pump body (**A**), a shaft mounted impeller (**B**) is positioned at a point eccentric to the centerline of the pump body. The centrifugal action of the rotating impeller forces the service liquid introduced via channel (**D**) towards the periphery of the pump body forming the liquid ring (**C**).

When pumping action is achieved, the gas mixture being handled is introduced to the impeller through the suction port (**H**), in the intermediate plate (**E**), causing a vacuum at the pump suction. The gas mixture fills the impeller cavity between the inside diameter of the liquid ring and the root of the impeller blade. As the impeller rotates, the impeller blade immersion in the liquid ring increases reducing the volume between the liquid ring and the root of the impeller blade. The result is the compression of the gas mixture until it reaches the discharge port (**J**), located in the intermediate plate (**K**). The gas mixture exits through the discharge port.



During the compression cycle heat is being imparted to the liquid ring. In order to maintain a temperature below the vapor point of the service liquid, cooling must be applied. Cooling is achieved by continuously adding a cool supply of service liquid to the liquid ring. The amount of service liquid added is equal to that discharged through the discharge port (**J**) together with the compressed gas mixture. The gas mixture and service liquid is eventually passed through the pump discharge for separation.

= Gas Mixture
= Service Liquid
= Gas & Liquid

★ *The illustration is intended to depict the operating principle of the SIHI liquid ring pump only and should not be considered for engineering details of construction.*

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SERVICE LIQUID ARRANGEMENTS

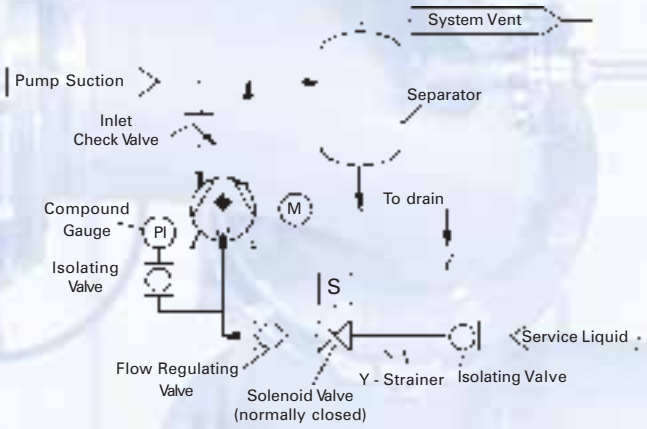
SERVICE LIQUID

ONCE THROUGH

Used where service liquid is plentiful and contamination is not a problem.

Benefits

- Simplicity
- Lowest initial cost

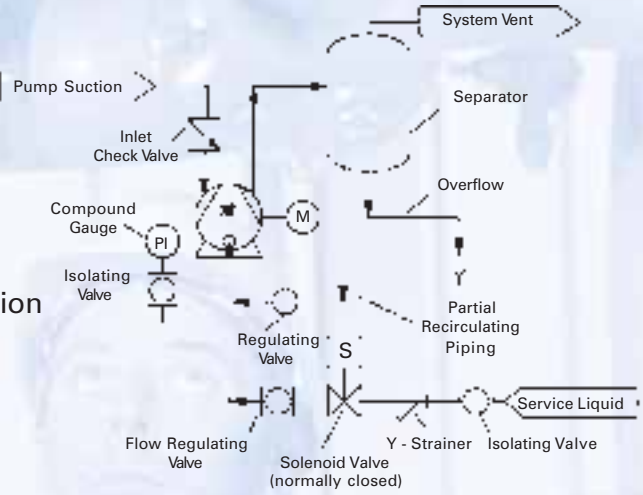


PARTIAL RECIRCULATION

Used where service liquid is available and contamination problems are minimal.

Benefits

- Simplicity
- Low initial cost
- Reduced service liquid consumption

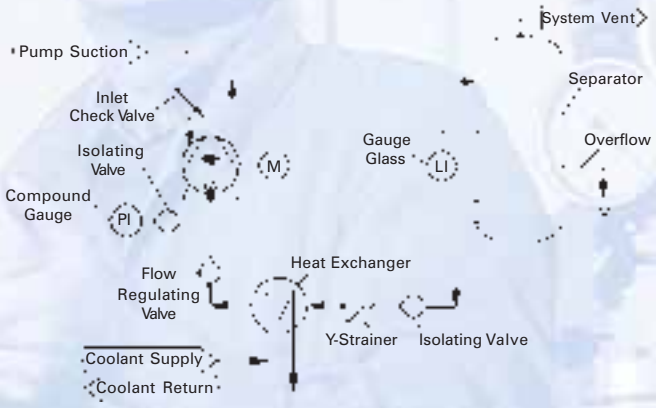


TOTAL RECIRCULATION

Used where gases and liquids are toxic or hazardous, and when environmental contamination is a concern.

Benefits

- Service liquid contained and separated from nonhazardous coolant systems
- Low service liquid usage
- Allows recovery of condensable inlet gases



Accessories for the above service liquid arrangements can be provided by SIHI in completely piped, assembled and tested factory packages.

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LEH SERIES PERFORMANCE DATA

Dry Air Performance Data

Pump Model (inlet & outlet)	Vacuum in inches Hg.		6	12	18	22	24	28	28.9	Average Service Liquid Flow (USGPM) (1)
	Absolute pressure in inches Hg.		23.92	17.92	11.92	7.92	5.92	1.92	1.02	
	Absolute pressure in torr		608	455	303	201	150	49	26	
	Speed (RPM)	Motor HP	ACFM	ACFM	ACFM	ACFM	ACFM	ACFM	ACFM	
LEH 360 (3″ x 3″)	1450 1750	*10 15	172 212	174 220	172 220	168 217	164 215	108 158	67 75.5	10 10
LEH 460 (3″ x 3″)	1450 1750	15 20	258 294	256 300	251 305	245 297	245 290	180 219	130 135	10 10
LEH 560 (4″ x 4″)	1450 1750	20 25	284 353	282 365	276 355	269 340	264 338	221 280	125 155	12 12
LEH 760 (4″ x 4″)	1450 1750	25 30	311 395	324 420	335 432	338 432	336 427	291 360	195 206	12 12
LEH 860 (4″ x 4″)	1450 1750	30 40	423 518	445 542	456 550	434 542	423 524	331 419	178 235	14 14
LEH 3400 (8″ x 8″)	700	125	1860	1920	1960	1945	1890	1650	1080	40

* Motors with 1.0 service factor use next larger size.

(1) Average flow is representative. Actual flows are a function of the actual application.

This data represents average values for pumps in standard materials discharging at sea level barometric pressure (29.92″ Hg. Abs.). Capacity in actual cubic feet per minute at the inlet pressure handling dry air at 68°F (20°C) and using 60°F (16°C) water as the service liquid.

See table on next page for performance when handling 100% saturated air.

Saturated Air Performance Data

Pump Model (inlet & outlet)	Vacuum in inches Hg.		6	12	18	22	24	28	28.9	Average Service Liquid Flow (USGPM) (1)
	Absolute pressure in inches Hg.		23.92	17.92	11.92	7.92	5.92	1.92	1.02	
	Absolute pressure in torr		608	455	303	201	150	49	26	
	Speed (RPM)	Motor HP	ACFM	ACFM	ACFM	ACFM	ACFM	ACFM	ACFM	
LEH 360 (3″ x 3″)	1450 1750	*10 15	175 215	178 224	177 227	176 227	175 229	135 197	114 128	10 10
LEH 460 (3″ x 3″)	1450 1750	15 20	261 298	260 305	258 313	255 309	259 306	219 266	209 217	10 10
LEH 560 (4″ x 4″)	1450 1750	20 25	288 358	288 372	285 366	282 356	281 360	276 349	213 264	12 12
LEH 760 (4″ x 4″)	1450 1750	25 30	315 400	330 428	344 444	353 451	356 452	358 442	320 339	12 12
LEH 860 (4″ x 4″)	1450 1750	30 40	428 525	453 551	468 565	452 564	447 554	403 511	287 379	14 14
LEH 3400 (8″ x 8″)	700	125	1882	1955	2012	2026	1997	1985	1741	40

* Motors with 1.0 service factor use next larger size.

(1) Average flow is representative. Actual flows are a function of the actual application.

This data represents average values for pumps in standard materials discharging at sea level barometric pressure (29.92" Hg. Abs.). Capacity in actual cubic feet per minute at the inlet pressure handling 100% saturated air at 68°F (20°C) and using 60°F (16°C) water as the service liquid.

When handling saturated air at higher temperatures, capacity of vacuum pumps will increase substantially. Details available by application.

MAJOR INDUSTRIES & ADVANTAGES

Typical Applications

- Drying
- Distillation
- Evaporation
- Crystallization
- Vapor Recovery
- Deaeration
- Sterilization
- Filtration
- Evisceration
- Impregnation
- Extrusion
- Condenser Exhaust
- Vacuum Conveyance
- Priming
- Vacuum Packaging
- Central Vacuum Systems

Advantages

- Varying Vacuum Levels
- Hogging and Holding
- Cavitation Protection
- Compact Design
- Batch Processes
- Water Savings
- Liquid Carryover
- Various Port Configurations
- Soft Solids Handling
- Safe Operation
- High Vapor Loads
- Discharge Pressures Above Atmospheric