

# SUNDYNE®

Single Stage Integrally Geared API Pumps



# Applications

## Petrochemicals and Petroleum Refining

Charging transfer • Reactor feed • Recycle • Make-up • Bottoming • Pipelines

## Power Generation

Oil fired boilers in primary feed and constant differential services • Boiler feed, desuperheating and condensate services • Fuel feed pumps

## Inorganic Chemicals

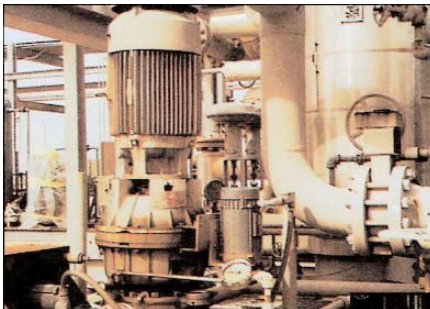
Inorganic acids • High pressure wash • Boiler feed, condensate

## Paper Processing

Washdown and cleaning services • High pressure shower operations • Boiler feed and desuperheating services • Mechanical atomization of spent sulfite liquor

## Food Processing, Mining, Steel, Spray, Drying Petroleum Production

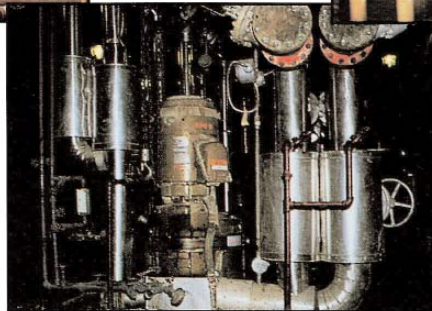
Seal water, boiler feed, condensate • High pressure systems • Vegetable oils • Reverse Osmosis • Cryogenic services • Steel mill descaling • Offshore platform services • Oil field well injection



LMV-311 on 1000 lb. suction pressure hydrocarbon service with auxiliary lube oil pump and air cooled heat exchanger



40 HP LMV-322 reactor feed pumps in southwestern refinery



High temperature LMV-311 installation (temperatures to 650°F)



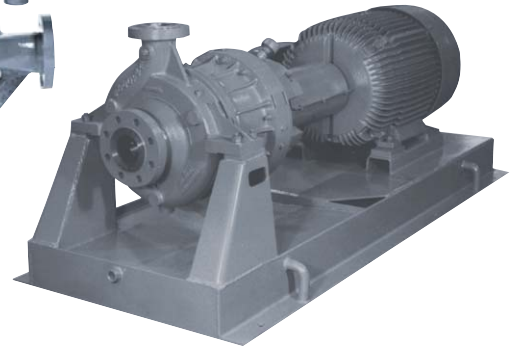
Full emission BMP-338 (500 gpm at 1000 feet) hydrocarbon bottoms pump

# Sundyne Customer Support

- Expedite Program      Four day delivery on most standard units
- Repair Kits              Customized o-ring seal overhaul and seal replacement kits
- Spare Parts                Emergency spares available from the factory or authorized overhaul and repair centers
- Conversion Program      Unit performance changes via unique part interchangeability
- Gearbox Exchanges        Full warranty rebuilt gearbox available in exchange for used one
- Video Tape Training        Video tapes are available for in-house training
- Service Schools            Free factory maintenance and operation training. On-site training also available
- On-Site Service            Professional service engineers available for start-up and consultations
- Overhaul and Repair        Full warranty units at a fraction of new cost

# Innovators in Pump Technology

The Sundyne direct drive pumps feature a single-stage centrifugal design for reliable service in API-610 and general industrial applications. These pumps are computer optimized to fit your exact design requirements.



The Sundyne diffuser design allows for continuous duty at the design flow and at low flows, and permits full curve protection using minimum driver sizes. Open impeller design eliminates efficiency degradation and frequent adjustments. Installation and maintenance is simple and straightforward. Standard 8-12 week deliveries can often be expedited to 4 or 5 days. Let us show you more!

- Multi-stage performance from a single-stage unit
- Small footprint
- Simple design
- Standard or engineered options
- World-wide support

Sundyne Corporation, a subsidiary of Hamilton Sundstrand Corporation, is a leading high technology corporation having a reputation for excellence in both the aerospace and commercial industries.

Sundyne Corporation traces its origin to Sundstrand's Aviation Division, when this aerospace group was contracted by Boeing Aircraft to build a high pressure water injection pump to increase jet engine thrust during take-off. It was from this unique high speed, single-stage centrifugal pump that Sundstrand Fluid Handling (now Sundyne Corporation) got its start. In 1962, while working in cooperation with a major Gulf Coast Chemical Company, a derivative of this design was introduced to the hydrocarbon processing industry.

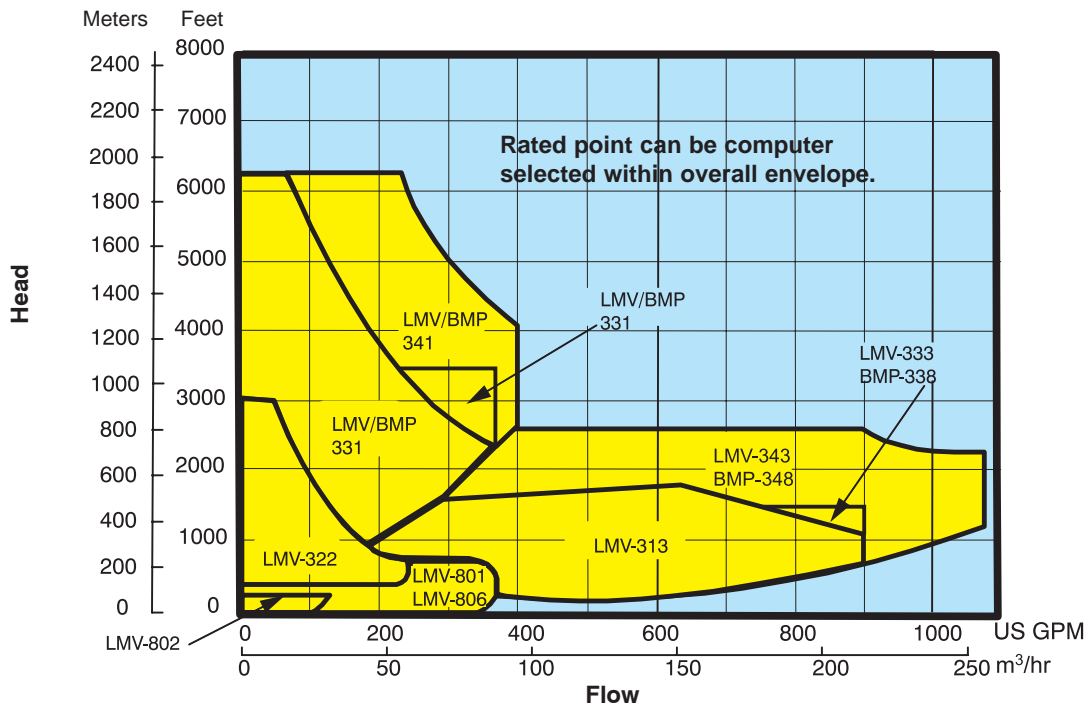
A full range of tests are available, including vibration analysis, metallurgical checks, casing radiography and more. Complete sound pressure level evaluation is also possible in a semi-anechoic chamber. Each pump and compressor is given a complete hydrostatic and performance test to assure quality and reliability.

We remain committed to maintaining our technological leadership as a supplier of pumps and compressors. We are dedicated to providing reliable, economical units delivered on time, as well as after-service support to keep you on line.

**Sundyne Technology Does Make A Difference!**

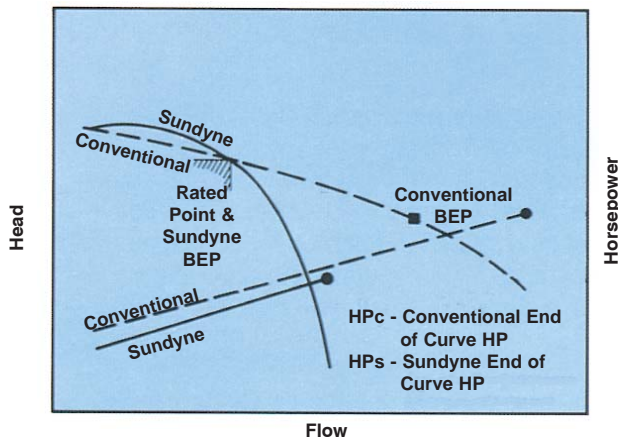
# Performance

## Performance Envelope LMV/BMP Series



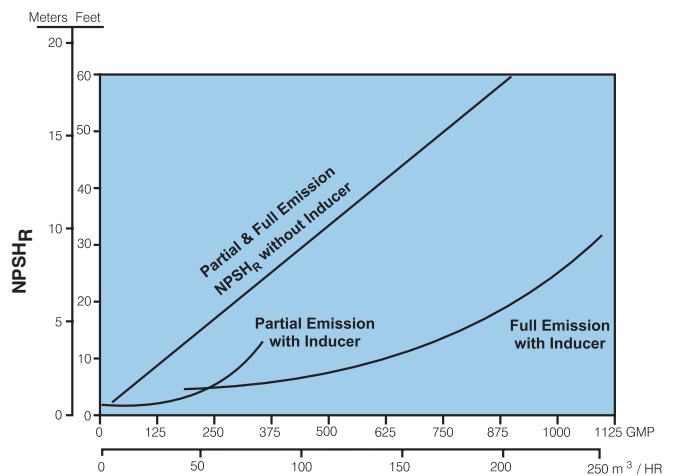
Based on Specific Gravity of 0.5

### Computer Optimized Hydraulics Sundyne Custom Tailored Hydraulics



Unlike conventional multi-stage pumps, Sundyne computer tailored hydraulics puts the B.E.P. (best efficiency point) at the rated point, where you want it. This results in optimum efficiency, minimum recirculation and minimum vibration. An added benefit is reduced end-of-curve horsepower, allowing reduced driver sizing.

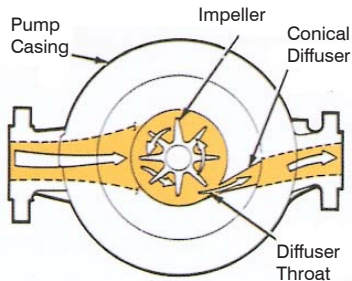
### NPSH Characteristics



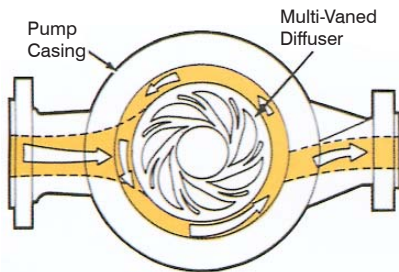
Demanding NPSH characteristics can result in the need for costly design requirements, such as elevated suction vessels and boost pump. Sundyne inducer option reduces considerably, and often eliminates these expenses.

# Hydraulic Optimization

Sundyne's unique design offers the ability to optimize efficiency, curve shape, NPSH, runout horsepower and radial loading to provide economical, reliable operation for your conditions of service through various combinations of impeller, diffuser, and inducer geometry.



**Partial Emission...**delivers optimum efficiency at high head, low flow. For a given speed and diameter, the open radial vane impeller generates a higher head than a backward swept impeller. A single divergent conical diffuser is sized to control the maximum flow rate and efficiently recover velocity head developed by the impeller. Pump efficiency is not affected by impeller axial clearances.



**Full Emission...**Traditionally designed pump hydraulics combined with Sundyne's reliable high speed gearbox maintains single-stage simplicity beyond the region of partial emission. Hydraulics are optimized with a double volute diffuser. An end suction, top discharge flange orientation is available to meet customer API desires.



## Diffuser Optimization

- Concentric bowl or single emission for low flow high head
- Double log spiral for balanced radial loads at higher horsepower
- Full volute single emission for higher efficiency at higher specific speeds ( $N_s$ )
- Dual volute, full emission for higher flows and minimum radial loads



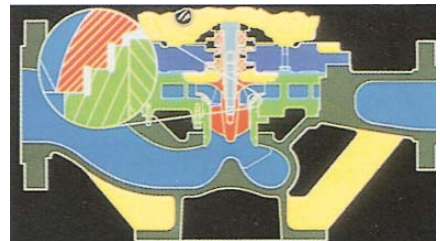
## Tailored Inducers

- Cylindrical for low suction specific speeds
- Tapered for higher suction specific speeds



## Impeller Configurations

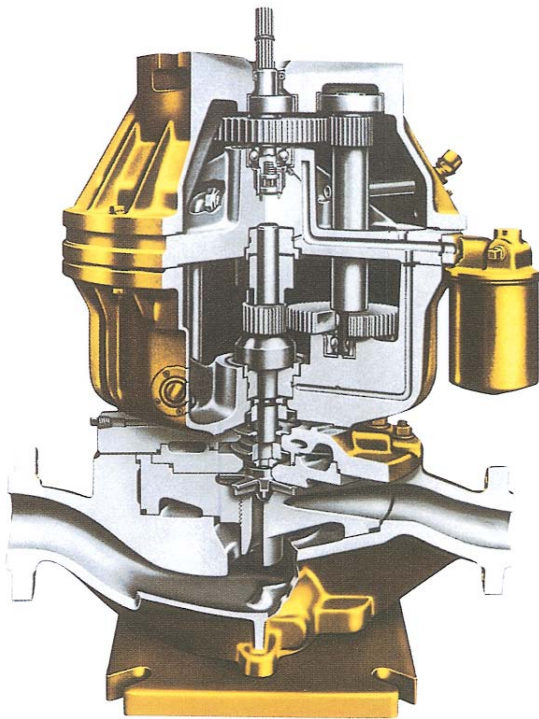
- 8 bladed open radial impeller for low specific speed ( $N_s$ )
- 24 blade high solidity impeller for rising to shut off curves
- Closed impeller for optimum efficiency at higher flow rates



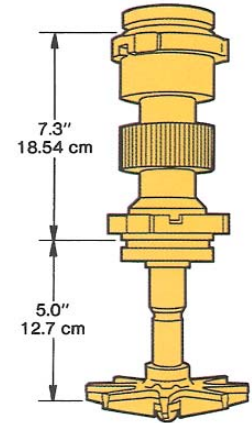
## Full Emission Sealing Ring

- Axial sealing of closed impellers via a patented axial sealing ring, rather than conventional wear rings
- Pump does not suffer performance change due to "wear ring" wear because no parts are in contact with each other
- Small axial clearances are set at assembly
- Large radial clearances are machined in the impeller and inducer housing

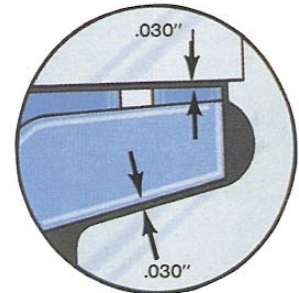
# Sundyne LMV-Series Pump Advantages



High-speed shaft assembly is designed for minimum bearing span to overhang ratio for reduced radial loading and low vibration.



Optional inducer added at the impeller eye reduces NPSH requirements up to 70%.



Generous Clearances

Mechanical seals standard. Seal housing machined to accept all seal configurations and auxiliary seal systems.

Advanced design high-speed thrust bearings capable of suction pressures to 1000 psig.

Casing available in all machinable alloys. Separate diffuser insert allows maximum interchangeability.

Gearbox features internal pressurized lubrication system.

## Gearbox

### Feature

1. Reliable proven gearbox
2. Excellence in design, manufacturing, and quality
3. Output shaft supported by plain or tilt pad journal bearings
4. High speed shaft assembly designed for minimum bearing span to overhang ratio (L/D)
5. Self-contained lube system
6. Gearbox Exchange Program

### Benefit

1. • Over 15,000 units installed since 1962 with outstanding service
2. • AGMA Class 11 Gears
  - Wide range of ratios enabling impeller speed to be matched to process requirements
3. • Stable rotordynamics
4. • Reduced radial loading
  - Low vibration
5. • Reliable, trouble-free operation is obtained from the integral lubrication system which provides controlled pressurized oil flow to the bearings and gears. The lubrication system includes a wet sump, internal positive displacement pump, which is driven by the low speed shaft and an integral oil filter. Additional items such as auxiliary pre-lube oil pump (required on some configurations), heat exchanger (water or air), pressure/temperature switches, vibration detection system, etc. are also available.
6. • Simplifies maintenance
  - Minimizes downtime
  - Allows purchasing and maintenance to be used more productively

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# Pump

FEATURE	BENEFIT
1. Single Stage	1. • Multi-stage performance with single-stage simplicity • Compact size • Easily maintained
2. Custom Hydraulics	2. • Computer optimized hardware to fit the exact design requirements • Lower end of curve horsepower requirements • Maximizes efficiency • Minimizes radial loading
3. Fewer Wetted Parts	3. • Minimizes costly special metallurgy
4. Simple Seal Housing	4. • One seal housing accepts single, double, or tandem seal arrangements • Easily converted in the field
5. Generous Clearances	5. • 0.030" (0.76mm) nominal clearances eliminates need for impeller casing wear rings • Fewer wearing parts • No performance degradation, maintains as-built efficiency • Dry running capability, can handle process upsets with double seals • No mechanical adjustment required
6. Stable Performance	6. • Z-series hardware provides rising curve to shut-off • Minimum flows to 35% of B.E.P.
7. State of Art Inducers	7. • Superior NPSH <sub>R</sub> Performance • Suction tuned design for cavitation free operation • High suction specific speed capability
8. Replaceable Diffusers (Except LMV-322)	8. • Allows simple field conversions for process changes
9. Heavy Duty Casing	9. • 600# flanges standard (900# flanges available on LMV-311 and 331) • Suction pressures to 1000 psig
10 Axial Seal (LMV-313/333 and BMP-338 only)	10. • Patented non-contact axial seal minimizes leakage while providing large radial clearances • Withstands temporary loss of suction without seizing
11. Internal Centrifugal Separator	11. • Available on most models • Integral to pump case for simplicity • Eliminates external piping • Provides clean flush to process seal for longer life
12. Installation Economy	12. • Most models available either vertical or horizontal mounted to fit plant construction requirements

# Materials of Construction \*

Item No.	Part	All Carbon Steel (CS) (S-5)**	Carbon Steel 316 SS Fitted <sup>1</sup> (S-6+)**	All 316 Stainless (A-8)**	Titanium or Sunmet C <sup>2</sup>	410SS LMV-322 Only (C-6)**
1	Pump Casing	CS	CS	316 SS	T/Sun C	410 SS
2	Impeller	316 SS	316 SS	316 SS	T/Sun C	316 SS
3	Impeller Bolt	316 SS	316 SS	316 SS	T/Sun C	316 SS
5	Impeller Tab Washer	316 SS	316 SS	316 SS	T/Sun C	316 SS
6	Inducer Housing <sup>3</sup>	CS	316 SS	316 SS	T/Sun C	N/A
8	Back Flow Control (Optional) <sup>6</sup>	CS	CS	316 SS	T/Sun C	N/A
9	Inducer	316 SS	316 SS	316 SS	T/Sun C	316 SS
13A	Diffuser (Partial Emission)	CS	316 SS	316 SS	T/Sun C	N/A
13B	Diffuser (Double Volute)	CS	316 SS	316 SS	T/Sun C	N/A
15	Diffuser Cover	CS	316 SS	316 SS	T/Sun C	N/A
19A	Seal Retainer Spacer	CS	N/A	316 SS	T/Sun C	410 SS
21B	Throttle Bushing	316/Teflon <sup>4</sup>	316/Teflon <sup>4</sup>	316/Teflon <sup>4</sup>	T/Sun C	316/Teflon <sup>4</sup>
30	Seal Housing	CS	CS	316 SS	T/Sun C	410 SS
50	Shaft Sleeve	316 SS	316 SS	316 SS	T/Sun C	316 SS
51A	Seal Rotating Face (Pump)	Tungsten Carbide <sup>7</sup>	Tungsten Carbide <sup>7</sup>	Tungsten Carbide <sup>7</sup>	Tungsten Carbide <sup>7</sup>	Tungsten Carbide <sup>7</sup>
51D	Seal Rotating Face (Gearbox)	Tungsten Carbide <sup>7</sup>	Tungsten Carbide <sup>7</sup>	Tungsten Carbide <sup>7</sup>	Tungsten Carbide <sup>7</sup>	Tungsten Carbide <sup>7</sup>
52	Seal Spacer <sup>5</sup>	CS	N/A	316 SS	T/Sun C	410 SS
60A	Mechanical Seal (Pump)	Carbon	Carbon	Carbon	Carbon	Carbon
60C	Mechanical Seal (Gearbox)	Carbon	Carbon	Carbon	Carbon	Carbon
90	Separator Orifice	316 SS	316 SS	316 SS	T/Sun C	316 SS
91	Separator Fitting	316 SS	316 SS	316 SS	T/Sun C	316 SS
101A	Gearbox Housing (Output)	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum
101B	Gearbox Housing (Input)	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum
102	Bearing Plate	Aluminum	Aluminum	Aluminum	Aluminum	N/A
110	Interconnecting Shaft	AISI 4140	AISI 4140	AISI 4140	AISI 4140	AISI 4140
115	Shaft Seal	Nitrile	Nitrile	Nitrile	Nitrile	Nitrile
120	Low Speed Shaft	AISI 4140	AISI 4140	AISI 4140	AISI 4140	AISI 4140
122A/C	Spur Gear <sup>8</sup>	Carburized Steel	Carburized Steel	Carburized Steel	Carburized Steel	Carburized Steel
125A/B	Idler Shaft Ball Bearing <sup>9</sup>	Deep Groove/	Deep Groove/	Deep Groove/	Deep Groove/	Deep Groove/
125C/D	Input Shaft Ball Bearing	Angular Contact	Angular Contact	Angular Contact	Angular Contact	Angular Contact
130	High Speed Shaft	AISI 4140	AISI 4140	AISI 4140	AISI 4140	AISI 4140
132C/D	Pinion Gear <sup>8</sup>	Carburized Steel	Carburized Steel	Carburized Steel	Carburized Steel	Carburized Steel
140	Idler Shaft	AISI 4140	AISI 4140	AISI 4140	AISI 4140	AISI 4140
151A	Journal & Thrust Bearings	Solid or Tilt Pad	Solid or Tilt Pad	Solid or Tilt Pad	Solid or Tilt Pad	Solid or Tilt Pad
151B	Journal Bearings	Solid	Solid	Solid	Solid	Solid
151C	Journal Bearings	Solid	Solid	Solid	Solid	Solid
160	Internal Lube Pump	Gear Pump	Gear Pump	Gear Pump	Gear Pump	Gear Pump

1. Not available with LMV-322

2. ASTM A494 Grade CW7M and is equivalent to Hastelloy C

3. Full emission only

4. Registered Trademark of E. I. de Pont de Nemours

5. LMV-322 only

6. BMP-338 only

7. Other options available

8. Helical upper mesh on 400 hp box

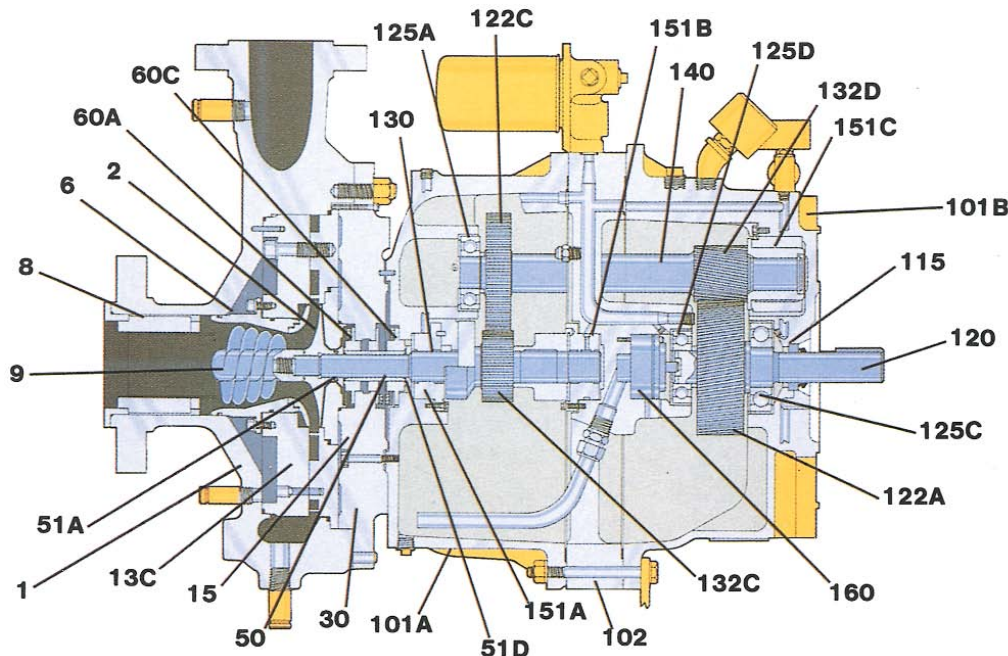
9. Journal upper bearings on 400 hp box

\* Special Metallurgies: All Machineable alloys are available

\*\* API equivalent

+ 316 SS vs 12% chrome

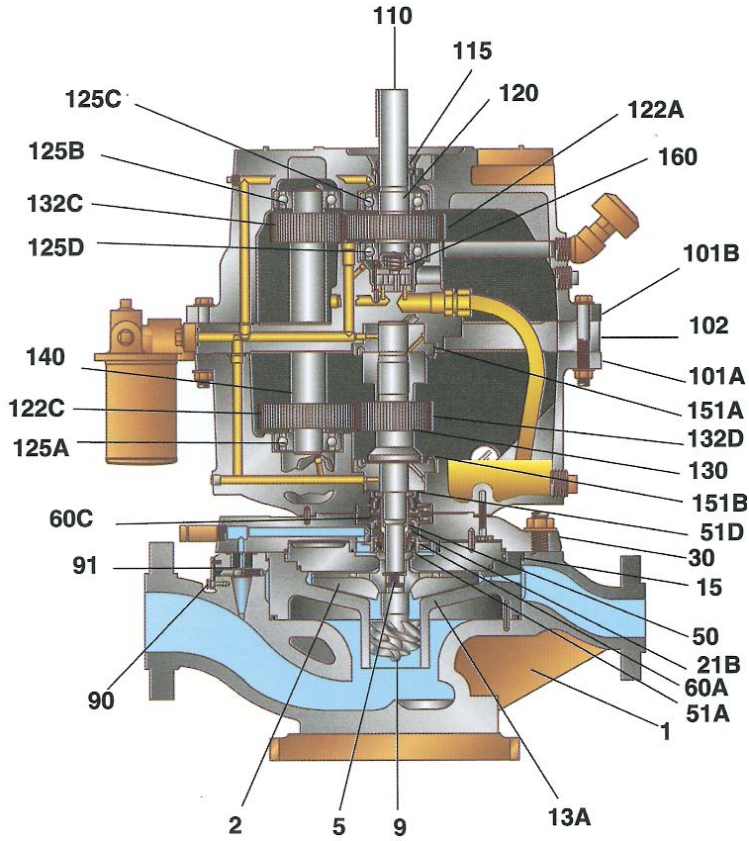
## BMP-338



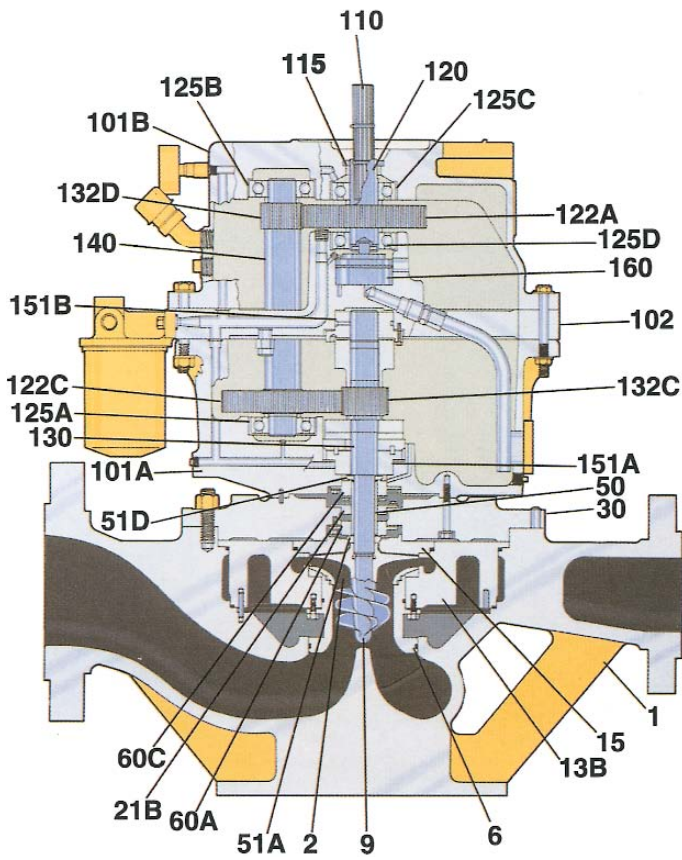
**Pump & Gearbox Cross Section (Single Seal Arrangement)**



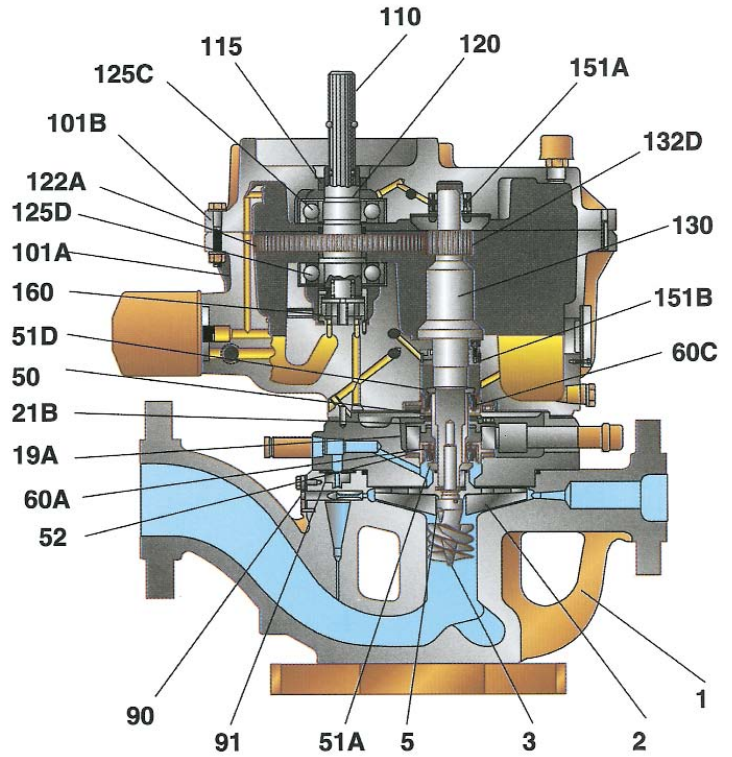
# LMV-311/322/313



**LMV-311**  
PUMP & GEARBOX CROSS SECTION  
(Single Seal Arrangement)

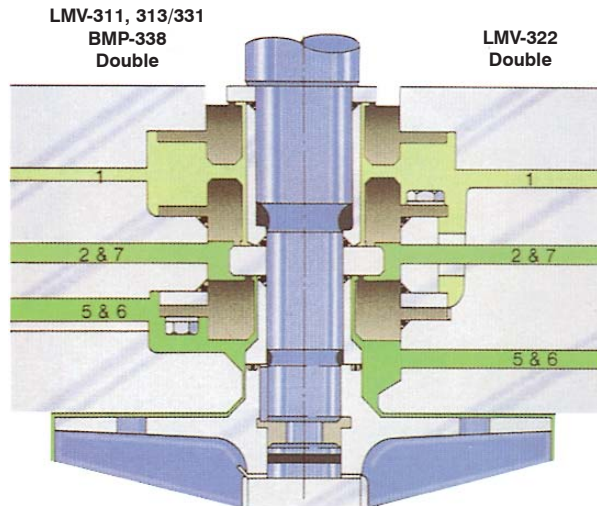
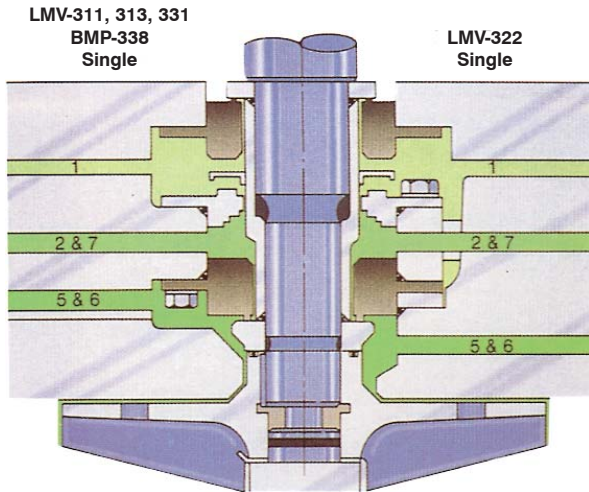


**LMV-313**  
PUMP & GEARBOX CROSS SECTION  
(Single Seal Arrangement)

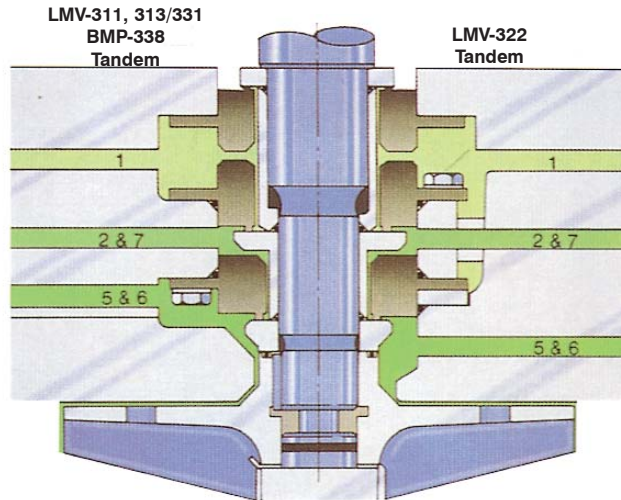


**LMV-322**  
PUMP & GEARBOX CROSS SECTION  
(Single Seal Arrangement)

# Mechanical Seals



**SINGLE SEAL**  
Standard seal used in most applications - for non-abrasive or non-hazardous liquid. Bellows seals are also available for higher temperatures and abrasive liquids

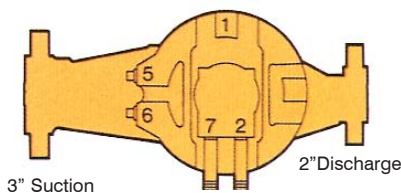


**DOUBLE SEAL**  
Recommended when the pumped liquid contains abrasives, leakage could be hazardous, or when the pump is likely to run dry.

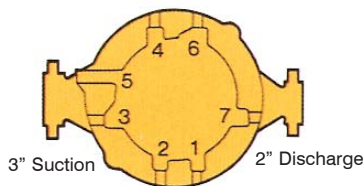
**TANDEM SEAL**  
Used to accommodate quenching, automatic shutdown systems, and high pressure services. With no requirement for a buffer liquid, a film-riding gas seal may be placed in the upper position, thereby providing a secondary seal backup in event of main seal failure.

# Mechanical Seals

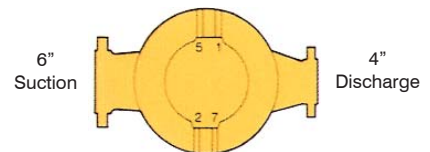
Top View of Pump



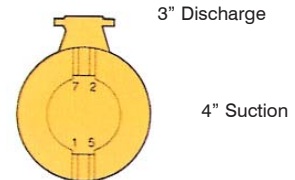
LMV-322



LMV-311/331



LMV-313/333



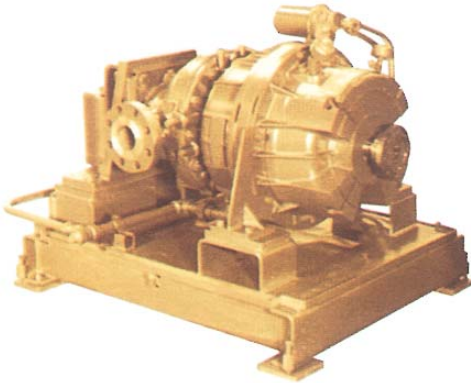
BMP-338

Port	Description
1	Seal Drain, Gearbox Oil and Process Fluid; Always Open to Atmosphere
2	Seal Drain (Single Seal) or Buffer Fluid in (Double or Tandem Seal)
5	Seal Flush or Case Vent
6	Seal Flush or Case Vent
7	Seal Drain (Single Seal) or Buffer Fluid Out (Double or Tandem Seal)

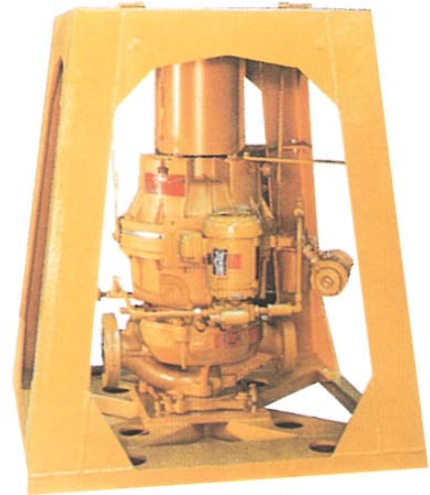
Port	Description
1	Seal Drain (open to atmosphere)
2	Seal Drain (Single Seal) or Buffer Fluid Out (Double or Tandem Seal)
3	Cooling In (Normally Plugged)
4	Cooling Out (Normally Plugged)
5	Seal Flush and/or Vent
6	Seal Flush and/or Vent
7	Seal Drain (Single Seal) or Buffer Fluid In (Double or Tandem Seal)

Port	Description
1	Seal Drain (open to atmosphere)
2	Seal Drain (Single Seal) or Buffer Fluid Out (Double or Tandem Seal)
5	Seal Flush and/or Vent
7	Seal Drain (Single Seal) or Buffer Fluid In (Double or Tandem Seal)

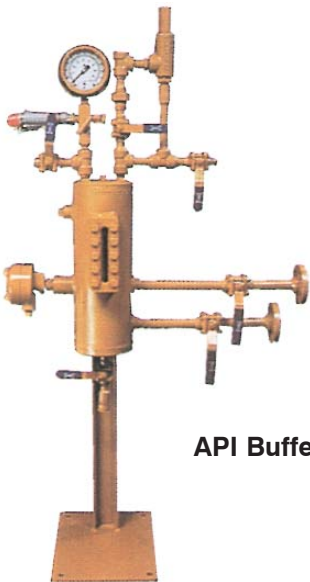
# Optional Features



**Horizontal Mount**  
(Available on 311/331 and 338 models)

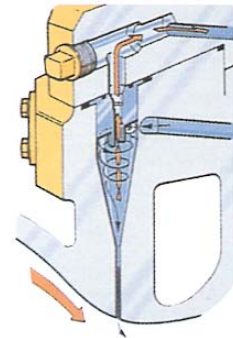


**Vertical Motor Stand**  
(Required above 3500 lb. motor weight)



**API Buffer Plan**

API 610 & 682 specified Plan 52/53 buffer pots are readily available to support double and tandem seal configurations.



**Integral Centrifugal Separator**  
(Not available on 313/333/338)



**Gearbox Heat Exchanger**  
(Required above 9000 rpm, and/or 350°F process temperature and all full emission models)



**Auxiliary Lube Oil Pump**  
(Required on LMV-331, all full emission units, all horizontal units, or units with gearbox inline heater, air cooled heat exchanger or tilt pad bearings)

# Specifications

PUMP	LMV-322		LMV/BMP-311/331		LMV-313/333		BMP-338	
	English	Metric	English	Metric	English	Metric	English	Metric
Maximum Working Pressure	1440 psig	101.3 kg/cm <sup>2</sup>	2160 psig	150 kg/cm <sup>2</sup>	1440 psig	101.3 kg/cm <sup>2</sup>	1440 psig	101.3 kg/cm <sup>2</sup>
Temperature Range	-200° to 650°F	-130° to 340°C	-200° to 650°F	-130° to 340°C	-200° to 650°F	-130° to 340°C	-200° to 650°F	-130° to 340°C
Hydro Test Pressure	1.5 Times Maximum Working Pressure							
Minimum Casing Thickness	0.625"	15.9 mm	0.625"	15.9 mm	0.75"	19.0 mm	0.75"	19.0 mm
Corrosion Allowance	0.125"	3.2 mm	0.125"	3.2 mm	0.125"	3.2 mm	0.125"	3.2 mm
Impeller Clearance	0.030" to 0.040"	0.76 mm to 1.02 mm	0.030" to 0.040"	0.76 mm to 1.02 mm	0.030" to 0.040"	0.76 mm to 1.02 mm	0.030" to 0.040"	0.76 mm to 1.02mm
Shaft Diameter at Impeller	1"	25.4 mm	1"	25.4mm	1"	25.4 mm	1"	25.4 mm
Mechanical Seal Sizes:								
Lower Seal	1.25"	31.8 mm	1.25"	31.8 mm	1.50"	38.1 mm	1.50"	38.1 mm
Upper Seal (Optional)	1.50"	38.1 mm	1.50"	38.1 mm	1.50"	38.1 mm	1.50"	38.1 mm
Mounting	Vertical	Vertical	Vert./Horz.	Vert./Horz.	Vertical	Vertical	Horizontal	Horizontal
Flanges**	600# ANSI RF	600# ANSI RF	600# ANSI RF	600# ANSI RF	600# ANSI RF	600# ANSI RF	600# ANSI RF	600# ANSI RF
Suction	3"	76.2 mm	3"	76.2 mm	6"	152.4 mm	4"	101.6 mm
Discharge	2"	50.8 mm	2"	50.8 mm	4"	101.6 mm	3"	76.2 mm
<b>GEARBOX</b>	<b>50 hp</b>	<b>37 kw</b>	<b>200/400 hp</b>	<b>148/296 kw</b>	<b>200/400 hp</b>	<b>148/296 kw</b>	<b>400 hp</b>	<b>296 kw</b>
Temperature:								
Minimum Starting...	0°F	-18° C	0°F	-18°C	0°F	-18°C	0°F	-18°C
Operating	140° to 180°F	60° to 82°C	140° to 180°F	60° to 82°C	140° to 180°F	60° to 82°C	140° to 180°F	60° to 82°C
Lubricant	ISO VG 32 Turbine Oil							
Sump Capacity	4.5 quarts	4.3 liters	7 quarts	6.6 liters	7 quarts	6.6 liters	7 quarts	6.6 liters
Lube System	Pressurized	Pressurized	Pressurized	Pressurized	Pressurized	Pressurized	Pressurized	Pressurized
Gearbox Seal Size	1.5"	38.1 mm	1.5"	38.1 mm	1.5"	38.1 mm	1.5"	38.1 mm
Bearings:*	Ball		Ball		Ball		Ball	
Input Idler Shaft			311 - Ball	331 - Sleeve	313 - Ball	333 - Sleeve	Sleeve	
Output Shaft*	Journal	Journal	Journal	Journal	Journal	Journal	Journal	Journal
Gears	Hardened & Precision Ground, Spur on LMV-322/311/313 Helical and Spur on LMV-313/333/& BMP-338							
Coupling	Spline or Standard Flexible						Spacer	Spacer

\* Tilting Pad Thrust and Radial Bearings available as required except for LMV-322.

\*\* 900# ANSI RTJ optional on LMV/BMP 311/331 only.

\*\*\* Lower starting temperatures are possible with optional Lube Oil Heater

## API PLANS - Sundyne can provide most API-610 piping plans.

- Plan 11, 12, 21, & 23
- Plan 13
- Plan 31, 32, and 41
- Plan 52, 53, & 54
- Plan 61 & 62
- Plan J

## METALLURGIES - All machineable alloys are available, for example:

- Carbon Steel
- 316SS
- 410 SS (LMV-322 only)
- Alloy 20
- Sunmet B\*
- Sunmet C\*\*
- Monel
- Titanium

\* Sunmet B - ASTM A494, Grade N-7M and is equivalent to Hastelloy B

\*\* Sunmet C - ASTMA 494, Grade CW2M and is equivalent to Hastelloy C

## HYDRAULIC HARDWARE -

- Z series, 24 blade high solidity impeller for rising curves (LMV-322, 311, 331)
- Concentric Bowl, 8 blade open radial impeller for low specific speed (NS).
- Closed impeller for optimum efficiency at higher flow rates (LMV-313, 333, & BMP-338 only)

**INDUCER** - Reduces NPSHR required, thereby eliminating cavitation.

**900 LB. RF OR RJ FLANGES** - For heavy duty service requirements.

**TESTING** - Sundyne can perform many special tests to meet your needs, for example:

- Performance Test - standard
- Pump Case Hydrostatic Test - standard
- NPSH Suppression Test - optional
- Radiography Inspection - optional
- Liquid Penetrant Inspection - optional
- Mill Test Reports or Material Certificates - optional
- Magnetic Particle Inspection - optional
- Hardness Testing - optional

**STATIC SEALS** - Available in a wide variety of compounds, for example:

- Buna
- Fluorocarbon
- Ethylene Propylene
- Carbon Graphite
- Kalrez®
- Silicone

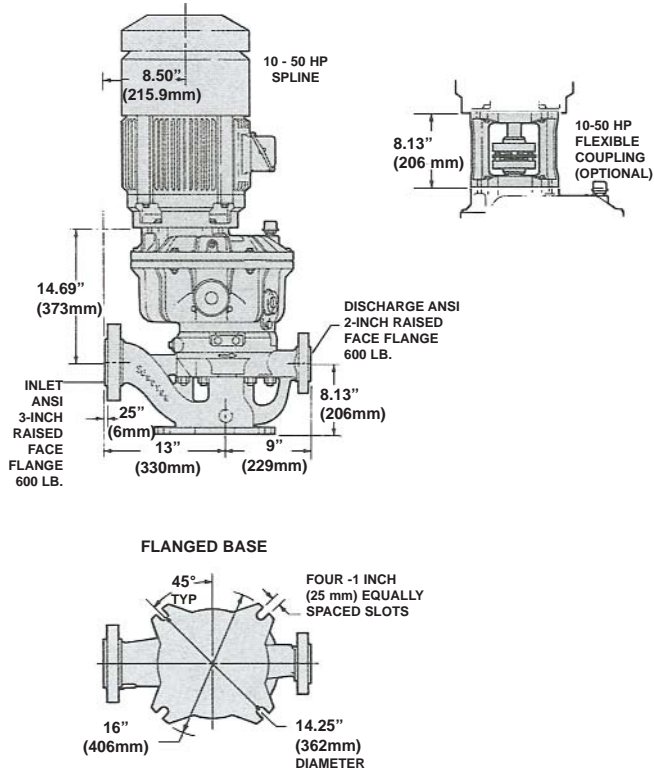
**SEAL ARRANGEMENTS** - Three configurations to meet your needs.

- Single
- Double
- Tandem

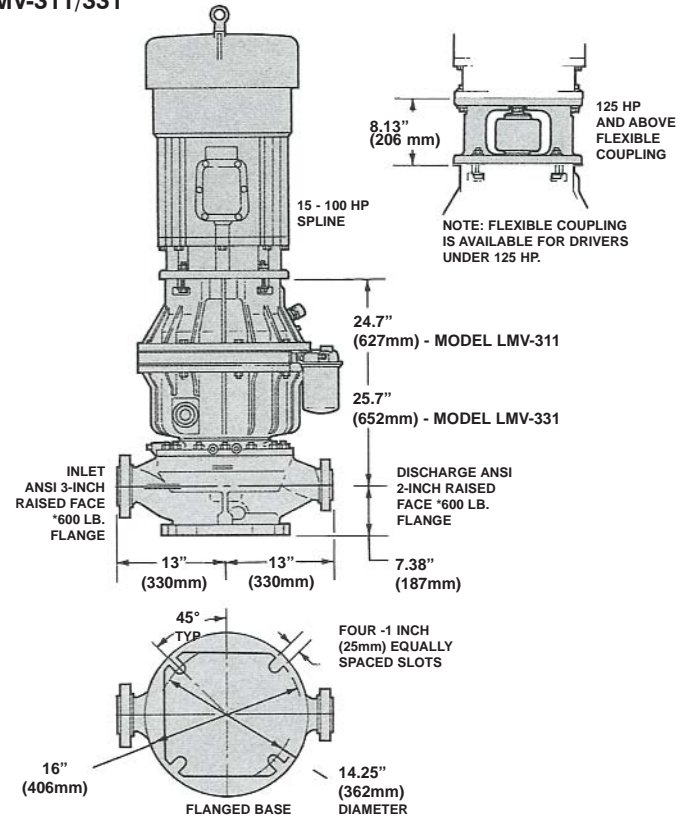
Engineered seals are also available.

# Dimensions

## LMV-322

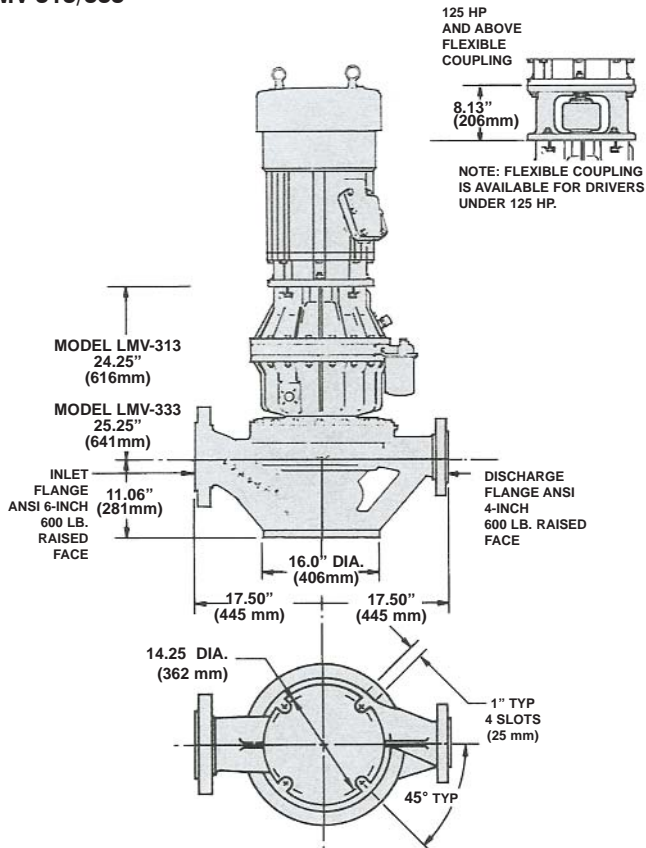


## LMV-311/331

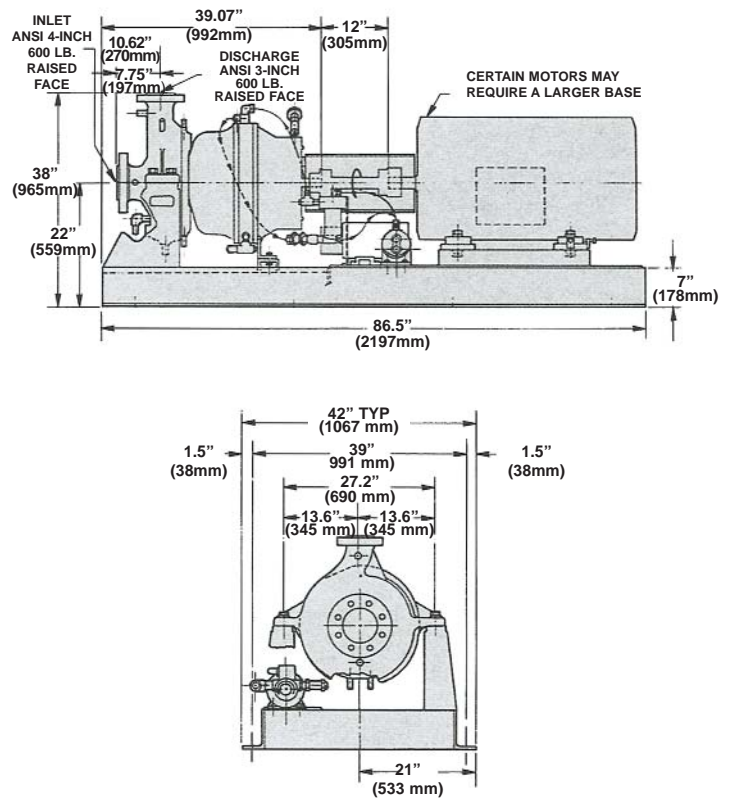


\*900 LB. RING JOINT FLANGES ARE AVAILABLE

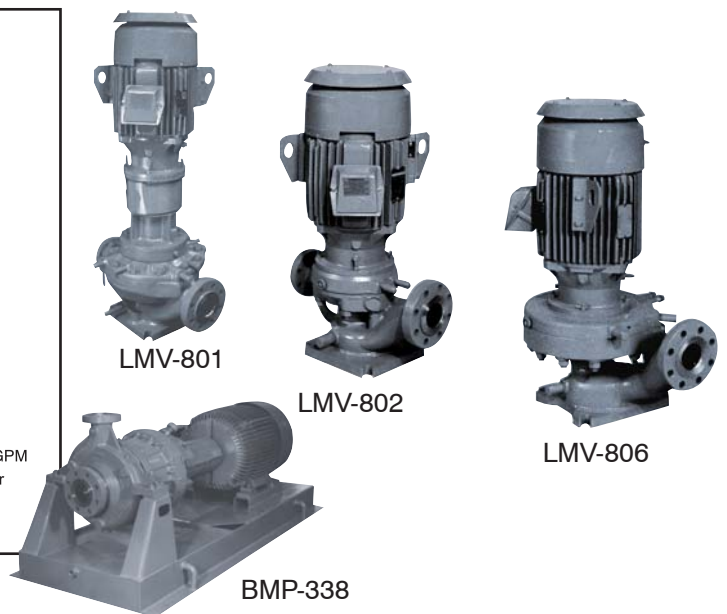
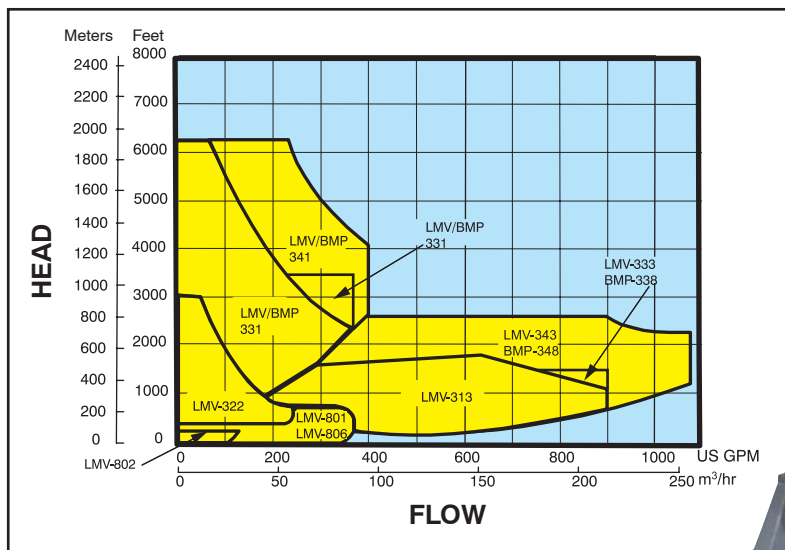
## LMV-313/333



## BMP-338



# Sundyne Pump Family



Pump Series	HZ	Flows To	Heads To	RPM	Max. Motor Power	Max. Case Working Pressure	Max. Suction Pressure	Temperature Range
LMV-802	60	150 gpm	210 feet	1750 and 3550	50 hp	1440 psig	600 psig	-200° to 650°F
	50	34 m³/hr	64 meters	1450 and 2960	37 kW	101 barg	42 barg	-130° to 340°C
LMV-806	60	380 gpm	760 feet	1750 and 3550	75 hp	710 psig	557 psig	-40° to 350°F
	50	86 m³/hr	232 meters	1450 and 2960	55 kW	50 barg	39 barg	-40° to 175°C
LMV-801	60	380 gpm	720 feet	1750 and 3550	75 hp	2160 psig	1000 psig	-200° to 650°F
	50	86 m³/hr	219 meters	1450 and 2960	55 kW	152 barg	70 barg	-130° to 340°C
LMV-322	60	230 gpm	3000 feet	6000 to 17,100	50 hp	1440 psig	450 psig	-200° to 650°F
	50	52 m³/hr	915 meters	5000 to 14,200	37 kW	101 barg	32 barg	-130° to 340°C
LMV/BMP-311	60	400 gpm	6300 feet	5800 to 24,700	200hp	2160 psig	1000 psig	-200° to 650°F
	50	91 m³/hr	1921 meters	4800 to 23,700	150 kW	152 barg	70 barg	-130° to 340°C
LMV/BMP-331	60	400 gpm	6300 feet	10,100 to 24,900	350 hp	2160 psig	1000 psig	-200° to 650°F
	50	91 m³/hr	1921 meters	9400 to 23,800	250 kW	152 barg	70 barg	-130° to 340°C
LMV/BMP-341	60	400 gpm	6300 feet	9916 to 24,700	400 hp	2160 psig	1000 psig	-200° to 650°F
	50	91m³/hr	1921 meters	9853 to 25,000	315 kW	152 barg	70 barg	-130° to 340°C
LMV/313	60	1040 gpm	1790 feet	5800 to 12,200	200 hp	1440 psig	500 psig	-200° to 650°F
	50	236 m³/hr	546 meters	4800 to 12,800	150 kW	101 barg	35 barg	-130° to 340°C
LMV-333	60	1000 gpm	3000 feet	9500 to 14,700	350 hp	1440 psig	500 psig	-200° to 650°F
	50	227 m³/hr	915 meters	8800 to 12,900	250 kW	101 barg	35 barg	-130° to 340°C
LMV-343	60	1000 gpm	3000 feet	8445 to 16,450	400 hp	1440 psig	500 psig	-200° to 650°F
	50	227 m³/hr	915 meters	8347 to 16,236	315 kW	101 barg	35 barg	-130° to 340°C
BMP-338	60	1100 gpm	2800 feet	9500 to 14,700	350 hp	1440 psig	500 psig	-200° to 650°F
	50	250 m³/hr	854 meters	8800 to 12,900	250 kW	101 barg	35 barg	-130° to 340°C
BMP-348	60	1100 gpm	2800 feet	8445 to 16,450	400 hp	1440 psig	500 psig	-200° to 650°F
	50	250 m³/hr	854 meters	8347 to 16,236	315 kW	101 barg	35 barg	-130° to 340°C

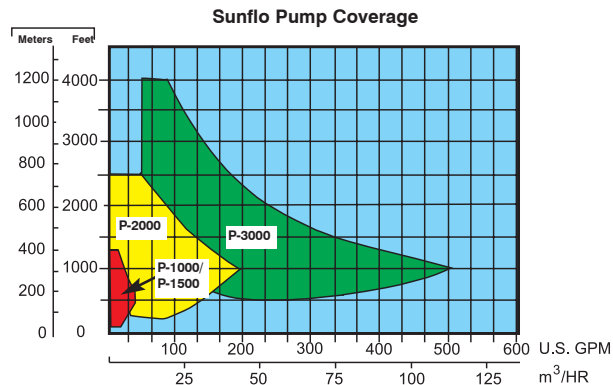
## Sunflo

### High pressure medium duty pumps



P-1000, P-1500, P-2000, P-3000

Non-API  
high performance,  
single stage  
pumps



## Sealless

### The world's most comprehensive sealless pump range



Sundyne  
Canned  
Motor Pump  
(SCMP)

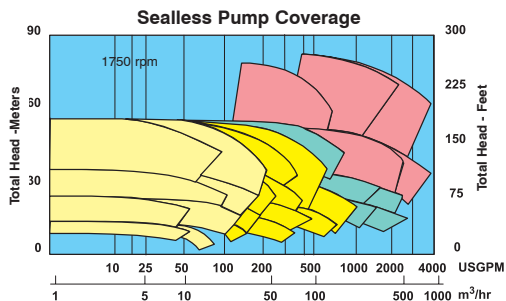
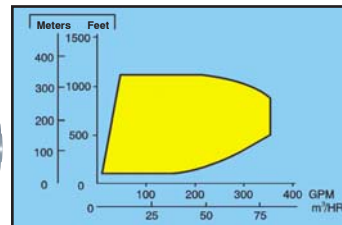


ANSIMAG  
Non-Metallic  
Magnet Drive



VIP-801  
API 610/685  
Canned Motor Pump

**VIP Pump Coverage**



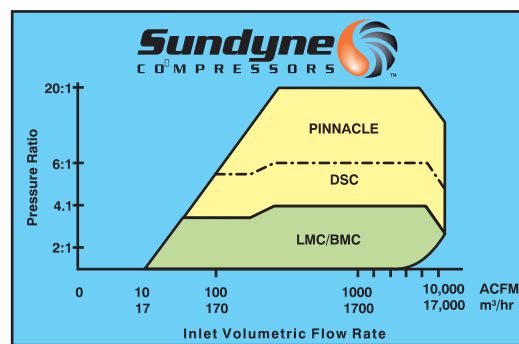
HMD/Kontro  
Metallic Magnet  
Drive

## Compressors

### The low flow centrifugal compressor



Sundyne  
Compressors



## Sanitary-Duty

### An innovative line of sanitary positive displacement pumps

MASO/Sine Pump



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