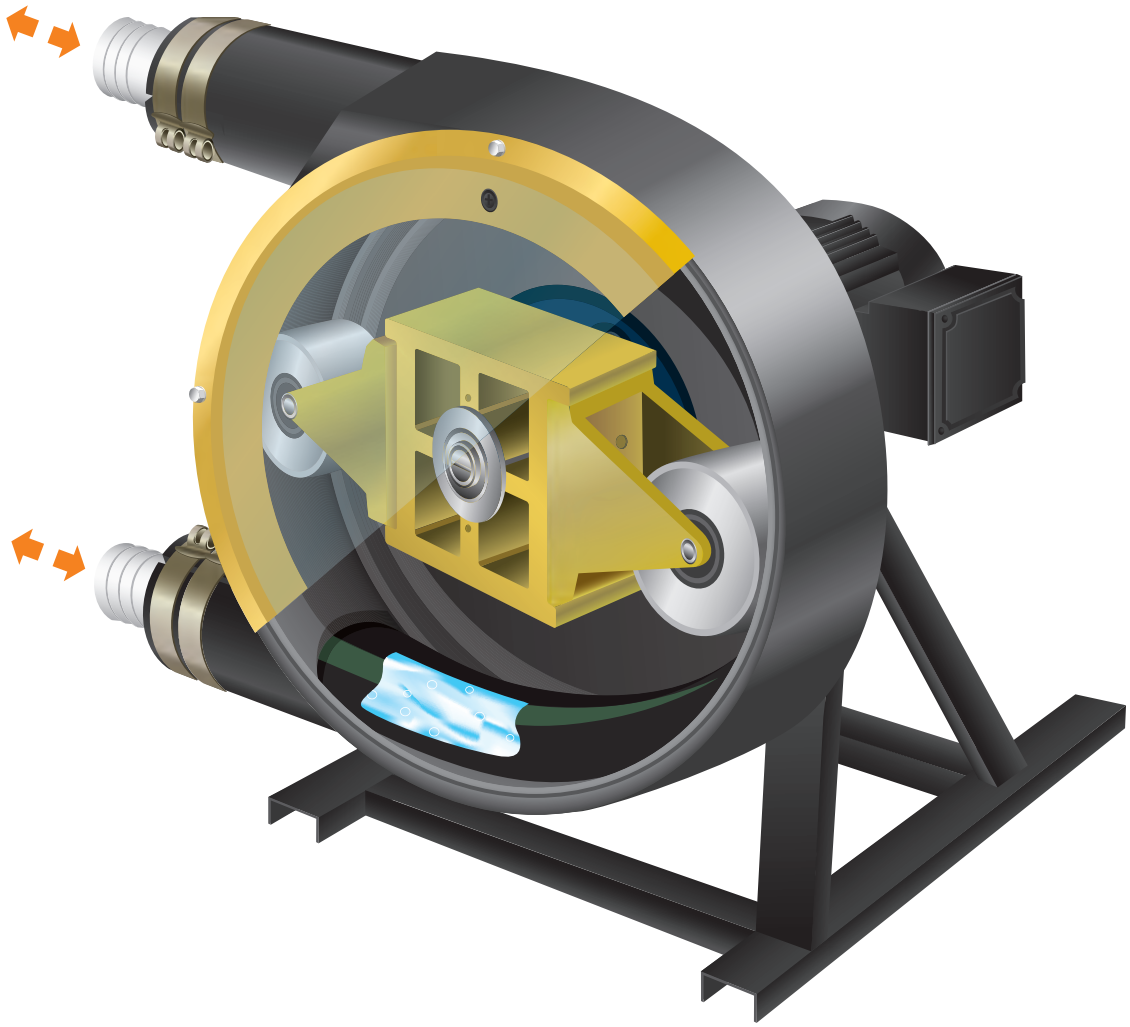
VECTOR
PERISTALTIC PUMPS

Vector Peristaltic Pump Operating Principle

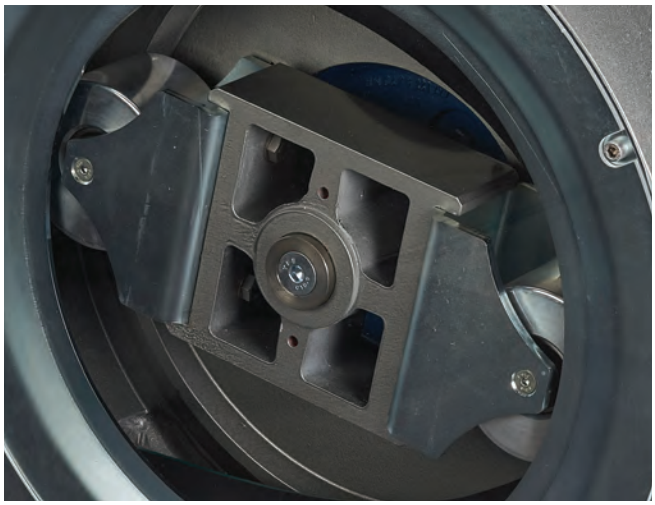


Peristaltic pumps work by compressing and relaxing a hose positioned between a rotating device and a circular pump housing. Vector 2000 Series pumps use rotating rollers that provide the same "push" with far less hose wear.

The peristaltic method employed in Vector pumps can create 100% compression at all times. As a result, there is virtually no slipping. Metering is highly accurate. Up to 29-1/2 feet of suction lift is produced.

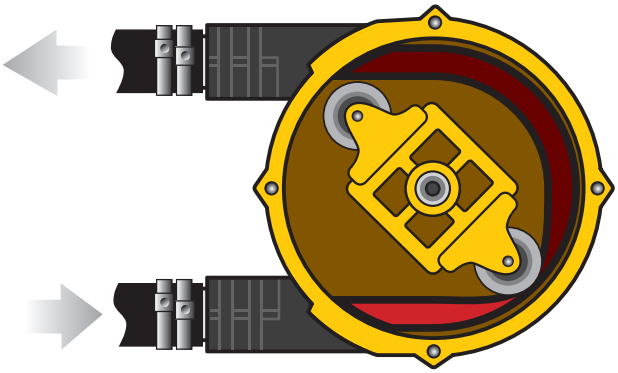
Despite this powerful pumping action, Vector pumps will not cause frothing or delicate emulsions to break up. Since fluids travel through a single hose, they never come into contact with moving valves, springs, or seals. This makes Vector pumps ideal for handling abrasive, shear-sensitive, or corrosive fluids. Dyes, thick fluids, and solids up to 3-1/2 inches (90 mm) are also readily pumped.

Superior Roller Design

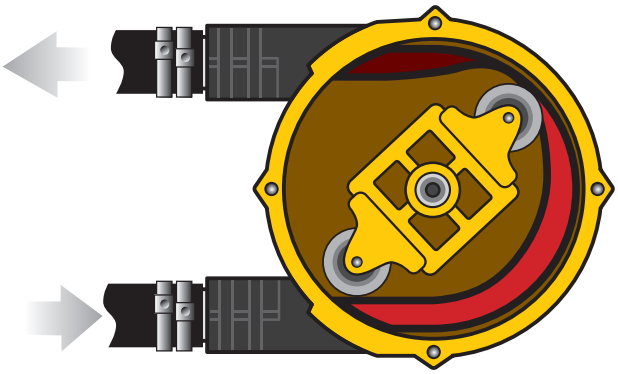


Vector uses an evolutionary roller mechanism instead of a rigid shoe to push fluids through its hose. This ensures longer working life with less downtime for maintenance.

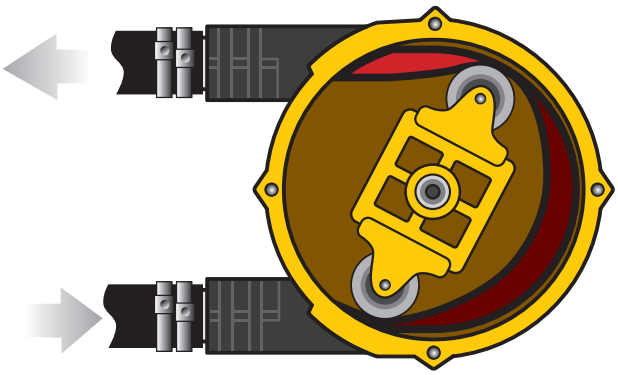
The rollers generate less friction than shoes, extending hose life and reducing downtime.



Fluid positioned ahead of the rollers gets pushed forward as the rollers rotate inside of the case.



Meanwhile, the portion of the hose just behind the rollers rebounds to create a vacuum.



The vacuum draws fluid into the pumping hose, which is then pushed forward by the rollers.

VECTOR
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Selection Guidelines
(2000 & 3000 Series)

1. Collect application information

Fluid: _____

Discharge Press: _____ psig

Suction Condition:

Lift: _____ feet

or Vacuum: _____ inches of Hg

or Flooded: _____ feet of fluid above pump

or Pressurized: _____ psig

Flow or Flow Range: _____ gpm

Temperature (°F): Min: _____ Max: _____ Normal: _____

Solids?, describe: _____

Solid Size: _____

Solid Length: _____

Solids %: _____

Viscosity at Temp: _____

Vapor Pressure at Temp: _____

Specific Gravity: _____

Duty Cycle (hrs/day): _____

Motor Enclosure: _____

Hertz: 50 _____ 60 _____

Volts: _____

Phase: 1 _____ 3 _____

Motor eff: Std _____ High _____ Inverter Duty _____

Variable Frequency Drive: Yes _____ No _____

If yes, what environment will controller be mounted:

Inside another panel _____ Dry, fairly dust free _____

Dusty area _____ Wet area _____

Wash down area _____

Hazardous area _____ If yes, class and group _____

If Yes, input voltage: 120 _____ 230 _____ 460 _____

2. Determine the maximum roller speed

Duty Cycle (hours/day) of operation

- <8 hours/day: the pump can be run out of the gray shaded areas on the pump specification curves (minimum of 1 hour stop after 2 hours use).
- 8-12 hours/day: do not operate out of the gray shaded areas on the pump specification curves.
- >12 hours/day: 25-32 rpm is the maximum recommended speed.

Viscosity of the fluid

- <200 cps: no speed correction needed
- 200-1000 cps: max. speed 40 rpm
- 1,000-5000 cps: max. speed 30 rpm; use flooded/pressurized suction
- 5,000-10,000 cps: max. speed 20 rpm; use flooded/pressurized suction
- 10,000-15,000 cps: max. speed 10 rpm; use flooded/pressurized suction

Note: With viscosities over 200 cps it is very important to oversize the suction line 1-1/2 to 2 times the pump connector size and to keep suction lines as short as possible.

Temperature of the fluid: If the fluid temperature pumped is within 15˚ F (9.4˚C) of the maximum temperature rating of the hose, contact factory and select a pump with a maximum speed of 20 rpm.

3. Pump Selection

- Select pump that can deliver the required flow based on the maximum roller speed and discharge pressure required by the application.

Note: It may be required to select a larger pump if solids are larger than the maximum size the pump can handle.

4. Hose Selection

- Hose selection based on chemical compatibility and temperature.
- For suction vacuum over 4.5" Hg, always use fiber braided hoses (extruded hoses may collapse)
- In general, fiber-braided hoses will last longer and withstand greater discharge pressures than extruded hoses.
- Maximum recommended motor speeds with extruded hoses 40 rpm.

Note: Maximum viscosity for Nitrile hose is 3000 cps.
(The inner white hose will separate from the outer black hose.)

5. Connector Type and Material Selection

6. Drive Selection

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Hose Data
(2000 & 3000 Series)

Construction

Extruded:

700-1000 hours Typical Life at 30 rpm

Preferred when:

- Pumping foods and pharmaceuticals
- Clean fluids
- Lower pressures required (max. 30 psig)

Fiber Braided:

1500-2000 hours Typical Life at 30 rpm

Preferred when:

- Pumping fluids with abrasives
- The pump is required to create a strong vacuum
- High pressures are required

Operating Duty

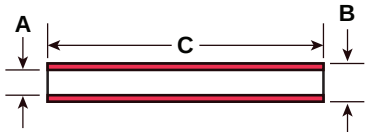
Intermittent: (One hour stop after 2 hours in use)

Higher pressures and higher pump speed

Continuous:

Low pressures and lower speed

Dimensions



(mm)	A	B	C
2002	9	16	330
2003	13	22	390
2004	17	31	590
2005	25	43	860
2006	30	55	1150
2007	45	75	1455
2008	53	88	1850
2009	75	120	2400
2010	100	144	3250
3005	25	44	850

Hose Identification

Extruded	Code	
Hypalon	HE	Black color, shinny smooth surface
Neoprene	PE	Flat black color, rough surface, rubber smell
Varprene	VE	Cream, smooth surface
Silicone	SE	Rust color, smooth surface
Pharmed®	FE	Cream color, Pharmed® name on hose
Fiber Braided		
Hypalon	HF	Black color, yellow or blue stripe, double braided
EPDM	EF	Black color, white stripe, double braided
Natural Rubber	NF	Black color, green stripe, double braided (standard duty)
Natural Rubber	MF	Black color, no stripes, thick double braids (heavy duty)
Nitrile Rubber	BF	Black color with white inner hose.
Nitrile Rubber, Oil-rated	OF	Black color with HBRF-HY-K stamped on hose.

Material	Operating Temperatures	Industry Approvals
EPDM	32˚ to 185˚F (0˚ to 85˚C)	
Hypalon	32˚ to 180˚F (0˚ to 82.2˚C)	
Neoprene	50˚ to 130˚F (10˚ to 54.4˚C)	
Silicone	14˚ to 185˚F (-10˚ to 85˚C)	
Varprene	14˚ to 185˚F (-10˚ to 85˚C)	Meets FDA Criteria
Natural Rubber[1]	14˚ to 185˚F (-10˚ to 85˚C)	Meets FDA Criteria[1]
Nitrile Rubber, Oil-rated	23˚ to 160˚F (-5˚ to 71.1˚C)	
Pharmed®	32˚ to 180˚F (0˚ to 82.2˚C)	Meets USP Class VI, FDA, and NSF Criteria

[1] Natural rubber heavy duty hose meets FDA criteria.

® Pharmed Reg. Saint-Gobain Performance Plastics

ATTENTION!

When operating within 15˚F (9.4˚C) of maximum hose temperature, do not exceed 20 rpm pump speed. In addition, metal inspection plate is required vs. clear plastic material.

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Capabilities Overview

Flow Capacities and Pressure Ratings

Model	Maximum Flow (gpm)	Maximum Discharge Pressure (psig)
2002	0.3	30
2003	0.94	30
2004	2.52	45
2005	5.9	50
3005	9.2	200
2006	14.1	60
2007	40.5	100
2008	50	100
2009	120	100
2010	211	116

Model	Maximum Flow (gpm)	Maximum Discharge Pressure (psig)
4003	0.79	110
4004	2.64	110
4006	12.33	218
4007	23.12	218
4009	41.83	218
4010	69.35	218
4014	154.10	218

Maximum Allowable Solids Guidelines

		Non-Compressible Solids		Sharp Solids	Compressible Solids
Pump Model	Hose I.D. (mm)	Size of solids, when percentage of solids is >50% (mm)	Size of solids, when percentage is <10% (mm)		(mm)
2002	9	1.35	2.25	AVOID	8.1
2003	13	1.95	3.25	AVOID	11.7
2004	17	2.55	4.25	AVOID	15.3
2005	25	3.75	6.25	AVOID	22.5
3005	25	3.75	6.25	AVOID	22.5
2006	30	4.50	7.50	AVOID	27.0
2007	45	6.75	11.25	AVOID	40.5
2008	53	7.95	13.25	AVOID	47.7
2009	75	11.25	18.75	AVOID	67.5
2010	100	15.00	25.00	AVOID	90.0
4003	10	1.35	2.25	AVOID	8.5
4004	15	2.10	3.90	AVOID	14.5
4006	25	3.75	6.25	AVOID	22.5
4007	32	4.50	7.50	AVOID	28.0
4009	40	6.10	10.90	AVOID	39.5
4010	51	7.50	12.90	AVOID	46.5
4014	80	12.10	19.50	AVOID	69.5

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MODEL 2006

Design Features

- Dry pump cavity
- Self-priming operation
- Runs dry without damage
- Complete isolation of fluid pumped
- Heavy-duty roller bearings
- Variety of pump configurations, flows, and pressure ratings
- No seals, cups or packing to leak or wear
- Reversible flow
- Low maintenance

Materials of Construction

Non-wetted Parts

Casing: Aluminum Alloy
Rotor: Aluminum Alloy
Rollers: Plastic/Alloy

Wetted Parts

Hose:

EXTRUDED – Neoprene, Varprene, Silicone

BRAIDED – EPDM, Hypalon, Nitrile Rubber, Natural Rubber (regular and heavy-duty)

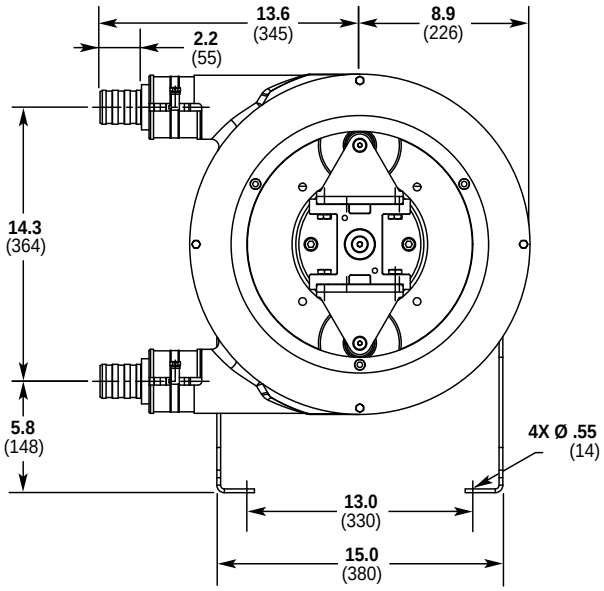
Inlet/Outlet Connections:

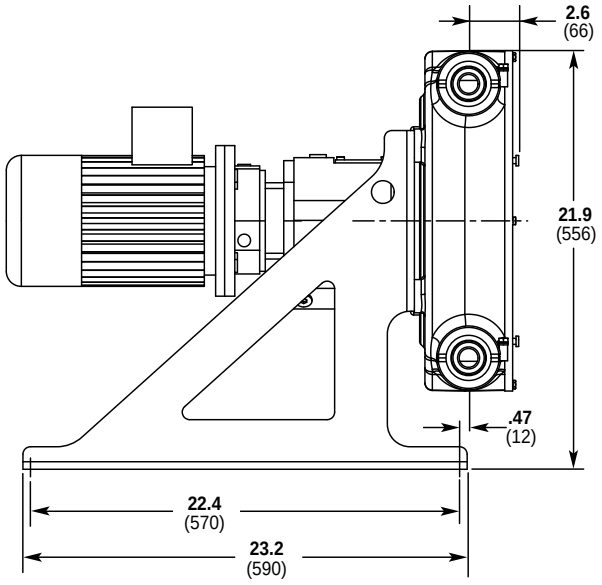
PTFE or Stainless Steel Hose Barb, Stainless Steel or Carbon Steel ANSI Flange, PTFE NPT, and Stainless Steel Sanitary Tri-clamp

Dimensional Drawings

Inches (mm)

See Ordering Information for motor and gearbox sizes





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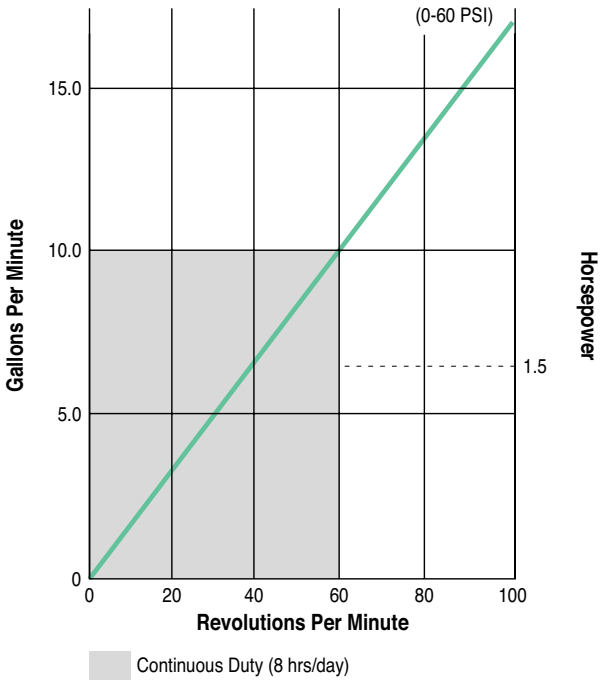
MODEL 2006

Performance



Fluid Characteristics

Viscosity:	15,000 cps max.
Liquid Temperature:	180°F (82°C) max.
Solid Size:	(see page 4)
Fiber Length:	1-7/8 inch (47.6 mm) max.

Specifications

Discharge Pressure:	60 psig (4.1 bar) max.
Suction Lift:	24 ft. (7.3 m)
Suction Pressure:	25 psig (1.7 bar) max.
Horsepower:*	2 max.
Hose Size:	30 x 55 x 1150 mm
Displacement:	0.182 gal/rev
Weight (pump only):	95 lbs. (43 kg)
Weight (with drive):	171 lbs. (78 kg)

* Pumps are shaft driven and require a gearbox and motor. See Ordering Information for details.

Model 2006 Ordering Information

A complete Vector pump order number uses a 9-character order code to identify the desired hose, fittings and drive. Select the appropriate items from the chart below and use the order code from each group to complete the pump assembly order number.

1	2	3	4		5	6		7	8		9	10
2	0	0	6	-			-			-		

Order Digit	Order Code	Description			
1-4		**Pump Designation**			
	2006	Model 2006 Shaft Drive Pump			
5-6		**Hose Material/Type**			
	EF	EPDM, fiber-braided			
	HF	Hypalon, fiber-braided			
	MF	Natural Rubber, fiber-braided, heavy-duty (200 psig max.)			
	NF	Natural Rubber, fiber-braided			
	PE	Neoprene, extruded (30 psig max.)			
	SE	Silicone, extruded (30 psig max.)			
	OF	Nitrile, Oil-rated, fiber-braided, heavy-duty (200 psig max.)			
	VE	Varprene, extruded (30 psig max.)			
7-8		**Connector Material/Style**			
	AA	PTFE, 1-1/4" hose barb			
	BB	316 SST, 1-1/4" ANSI flange			
	CC	316 SST, Sanitary, 1-1/2" tri-clamp			
	DD	Carbon Steel, 1-1/4" ANSI flange			
	EE	Carbon Steel, 1-1/2" male NPT			
	HH	PTFE, 1-1/4" male NPT			
	TT	SST 1-1/2" NPT			
	SS	316 SST, 1-/4" hose barb			
9-10		**Drive**	**Flow GPM**	**Gear Ratio**	**Pump RPM**	**Max Psig**
		3Ø, 1 BHP TEFC, 230-460 VAC, 60 Hz				
		4:1 Constant Torque Speed Range				
	B2		3.5	90:1	19	45(60)[1]
		3Ø, 1-1/2 BHP TEFC, 230-460 VAC, 60 Hz				
		4:1 Constant Torque Speed Range				
	D2		4.8	65:1	27	45(60)[1]
	F2		7.2	43:1	40	45(60)[1]
		3Ø, 2 BHP TEFC, 230-460 VAC, 60 Hz				
		4:1 Constant Torque Speed Range				
	H2		10.3	30:1	57	35(45)[1]
	J2		14.1	22:1	78	35(45)[1]
	A	No Drive				

[1]( ) Heavy-duty, fiber-braided hose

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