

VIKING PUMP CMD

COMPOSITE MAG DRIVE PUMPS

Series CMD Models E02, E05, E12, E25, E75 and E125

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PRODUCT DESCRIPTION

The CMD Composite Mag Drive Series is a line of innovative non-metallic industrial gear pumps designed for optimal performance and simplicity of operation and maintenance. With absolutely no wetted metallic parts, the CMD Series is an ideal fit for many highly corrosive clean liquids used in the chemical processing, chemical dosing, pulp and paper and industrial water treatment industries.

APPLICATIONS

Corrosive Chemicals

PVDF fluoropolymer and ceramic wetted materials used in this series are compatible with many corrosive liquids.

Typical Applications:

- Acids
- Bases
- Coagulants
- Solvents
- Refrigerants
- Refined Fuels
- Adhesives
- Odorants
- Organics

Volatile Organic Chemicals and Organic Liquids

The use of a magnetic drive eliminates shaft sealing, the most common source of pump leakage, helping to protect employees and the environment from vapor emissions and the liquids that react to air infiltration.

Typical Applications:

- Solvents
- Refrigerants
- Refined Fuels
- Adhesives
- Odorants
- Organics



Models E02, E05, E12, E25, E75 and E125

SERIES OPERATING RANGE

Nominal Capacity	0.4 to 33 GPM	1.5 to 125 LPM
Maximum Differential Pressure	to 150 PSI	to 10 Bar
Maximum Hydrostatic Pressure	to 200 PSI	to 14 Bar
Viscosity Range	to 25,000 SSU	to 5,000 cSt
Temperature Range	-40° to 150°F	-40° to 65°C

NOMINAL FLOW RATES

Pump Model	Speed	Capacity	
	RPM	GPM	LPM
E02	1750 (1450)	0.4 (0.34)	1.5 (1.3)
E05		1.5 (1.3)	5.8 (4.9)
E12		3.2 (2.6)	12.1 (10)
E25		6.5 (5.5)	24.6 (21)
E75		20.0 (16.5)	75.0 (62.5)
E125		33.0 (26.5)	125.0 (100)



ATEX Certification available.

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FEATURES AND BENEFITS

SIMPLIFIED OPERATION AND REDUCED MAINTENANCE

- Only 16 total fabricated parts in the CMD series pump, reducing inventory requirements.
- Front pull out design allow the pump to be easily serviced in place. Unique repair kits allows quick replacement of normal wear components without removing from the system, minimizing downtime.
- Self-aligning parts and piloted fits ensure proper assembly every time.
- Compression o-ring design adjusts internal clearances for thermal expansion or axial parts wear for longer service life.
- All wetted components are completely non-metallic for corrosion resistance in harsh environments.
- Liner provides wear protection to the casing.
- Self lubricating materials and geometry in the heavy duty bearings provide large wear areas.
- Single piece non-metallic gear/shaft assemblies.

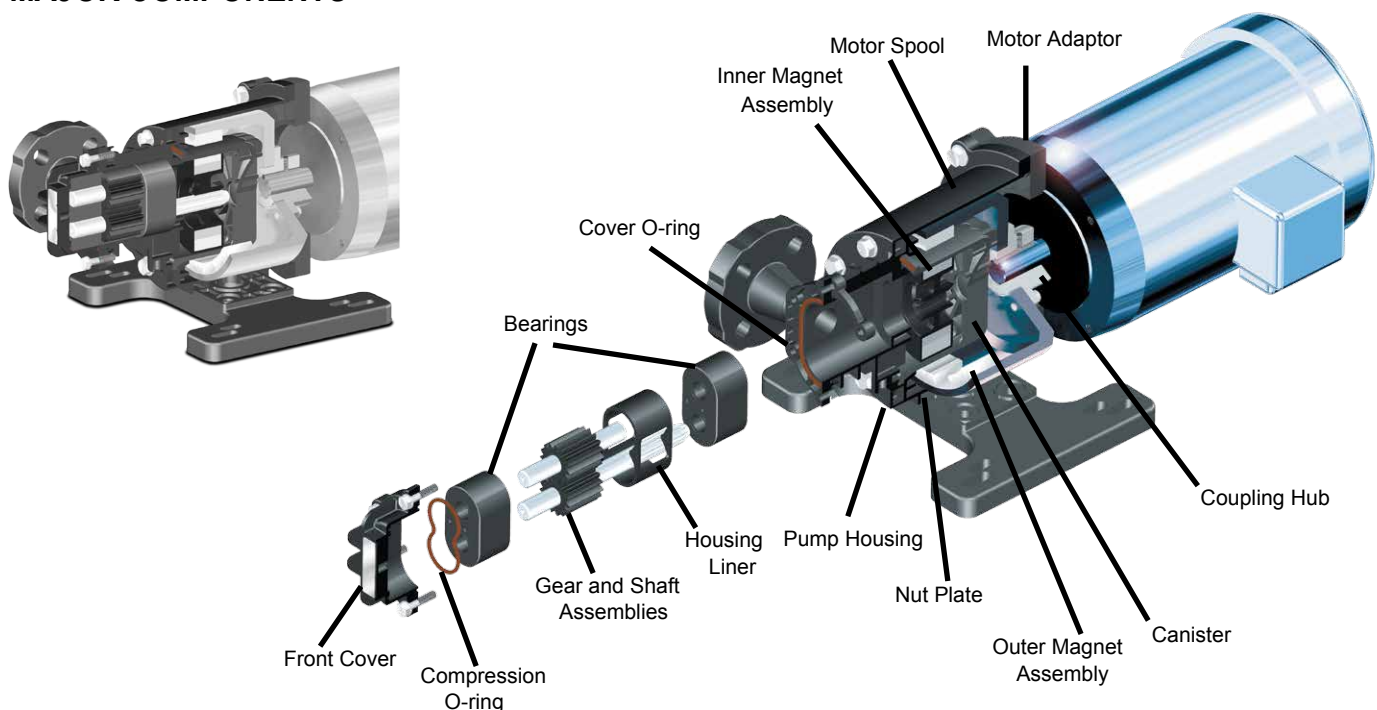
INNOVATIVE MAG DRIVE DESIGN

- Magnet will self-align with no added fasteners or axial loads induced on the drive shaft.
- The modular drive magnet comes with interchangeable magnet adapter-hubs to adapt to either standard NEMA or IEC motors for each pump size, reducing inventory.
- Non-metallic containment canister minimizes heat rise and magnet inefficiencies due to eddy current losses common to metallic pumps.

MOUNTING ADAPTABILITY

- Close-coupled motor to pump mounting eliminates the cost and potential issues associated with pump and motor alignment.
- Universal motor adapter plate mates to multiple NEMA and IEC motors.
- PTFE flange inserts act as a gasket and can be reused or replaced to ensure a proper seal.
- Universal flanges will mate with both ANSI and DIN flange connections.
- Slotted mounting holes permit easy retrofitting in existing installations.

MAJOR COMPONENTS



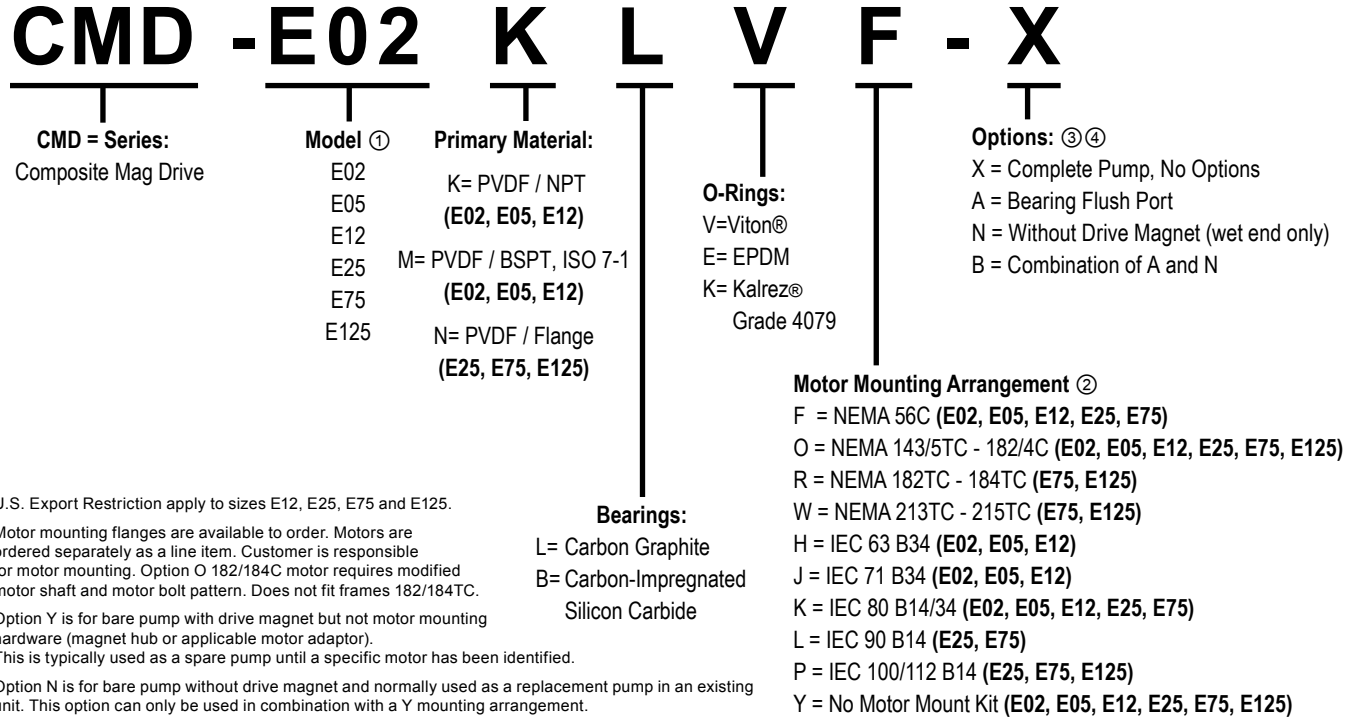
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MODEL NOMENCLATURE

Model numbers for the Viking CMD Series Mag Drive pump include the series designator, pump size, housing material and port style, bearing material, O-ring elastomers and mounting arrangement.



CONSTRUCTION

Pump Construction	Casing/Head	Canister	Gears / Shaft Assembly	Bearings	Flange Inserts	O-Rings	Inner Magnet Assembly	Outer Magnet Assembly	Reinforcement Plates
Standard Construction	Carbon-filled PVDF	Carbon-filled PVDF	Carbon filled PTFE/Alumina ceramic	Carbon Graphite	PTFE w/o-ring	Viton®	ETFE Encapsulated Neodymium	Nickel Plated Steel / Neodymium	Epoxy Coated Stainless Steel
Optional Materials	N/A	N/A	N/A	Graphite Impregnated Silicon Carbide	N/A	EPDM, Kalrez® Gr 4079	N/A	N/A	N/A

SPECIFICATIONS — UNMOUNTED PUMPS

Model Number	⑤ Ports			Nominal Pump Rating				Maximum Differential Pressure	Maximum Hydrostatic Pressure	⑥ Maximum Recommended Temperature	Approximate Shipping Weight (less motor)
	TYPE	SIZE in	1750 RPM		1450 RPM						
			GPM (LPM)	(LPM)	GPM (LPM)	(LPM)	PSIG (BAR)	PSIG (BAR)	°F. (°C.)	Pounds (KG)	
E02	NPT	ISO 7-1	1/4	0.4 (1.5)	0.34 (1.3)	150 (10)	200 (14)	150 (65)	4 (2)		
E05	NPT	ISO 7-1	3/8	1.5 (5.8)	1.3 (4.9)	150 (10)	200 (14)	150 (65)	9 (5)		
E12	NPT	ISO 7-1	3/4	3.2 (12.1)	2.6 (10.0)	150 (10) ⑦	200 (14)	150 (65)	10 (6)		
E25	ANSI Flg	DIN Flg.	1	6.5 (24.6)	5.5 (21.0)	150 (10)	200 (14)	150 (65)	26 (12)		
E75	ANSI Flg	DIN Flg.	1.5	20.0 (75.0)	16.5 (62.5)	150 (10)	200 (14)	150 (65)	44 (20)		
E125	ANSI Flg	DIN Flg.	1.5	33.0 (125.0)	26.5 (100.0)	100 (7) ⑧	200 (14)	150 (65)	44 (20)		

⑤ Size 02, 05, 12 available in FNPT or ISO 7-1 port. Sizes E25, E75 and E125 available with 150# ANSI compatible flange and DIN compatible ports.

⑥ Temperature is limited by the composite materials.

⑦ 150 PSI / 10 BAR with Silicon Carbide bearings; 100 PSI / 7 BAR max. pressure with Carbon Graphite bearings.

⑧ 100 PSI / 7 BAR with Silicon Carbide bearings; 80 PSI / 5.5 BAR max. pressure with Carbon Graphite bearings.

Viton® and Kalrez® are Registered Trademarks of DuPont Dow Elastomers
ETFE = Ethylene Tetrafluoroethylene
PVDF = Polyvinylidene Fluoride

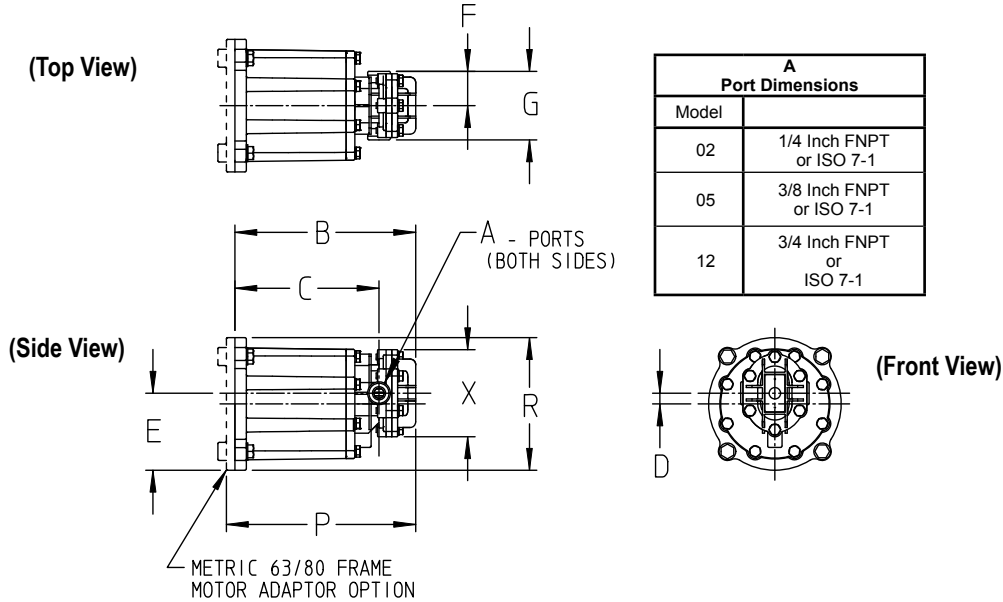
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DIMENSIONS -Models E02, E05, and E12

These dimensions are average and not for construction purposes. Certified prints on request. Millimeter dimensions shown in parentheses. *For specifications, see page 344.3*

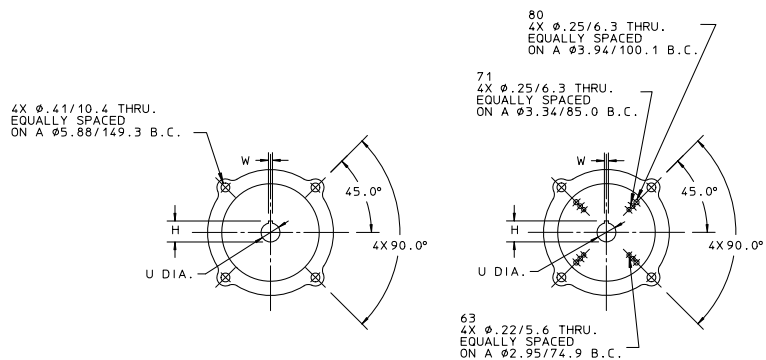


PUMP ONLY

Model		B	C	D	E	F	G	P	R	X
E02	in	7.22	6.08	0.25	3.16	1.38	2.75	7.60	5.81	3.00
	mm	183.5	154.4	6.4	80.2	34.9	69.9	193.0	147.6	76.2
E05	in	7.92	6.31	0.47	3.37	1.50	3.00	8.90	5.81	3.81
	mm	201.2	160.3	11.9	85.6	38.1	76.2	210.7	147.6	96.8
E12	in	8.54	6.63	0.47	3.37	1.88	3.75	8.93	5.81	3.81
	mm	217.0	168.3	11.9	85.6	47.6	95.3	226.6	147.6	96.8

MOTOR FLANGE

Motor Frame	U Shaft Diameter	W Key Width	H Key Height
56C	.626 (15.9)	.188 (4.7)	.71 (18.0)
140TC	.876	.188	.96
180C	(22.2)	(4.7)	(24.5)
63	.434 (11.0)	.159 (4.0)	.51 (12.9)
80	.750 (19.1)	.237 (6.0)	.865 (22.0)



56C-184C FR NEMA MOTOR MOUNTING

63-80 FR METRIC MOTOR MOUNTING

Motor Mounting Kit Part Number				
Model Number	56C	143TC-182C	63 IEC B14	80 IEC B14
E02	E02XXXF	--	E02XXXH	E02XXXX
E05	E05XXXF	E05XXXO	E05XXXH	E05XXXX
E12	E12XXXF	E12XXXK	E12XXXH	E12XXXX

Kit contains required coupling hub, motor adaptor and hardware for mounting to motor based on frame size.

Suction and discharge port is determined by shaft rotation.
Standard motor adaptor fits NEMA 56C, 143TC, 182C, and 184C frame motors
Does not fit frames 182/184TC.
Metric motor adaptor option fits 63 and 80 frame motors.
Must use foot mounted C-faced motor of specific frame sizes.

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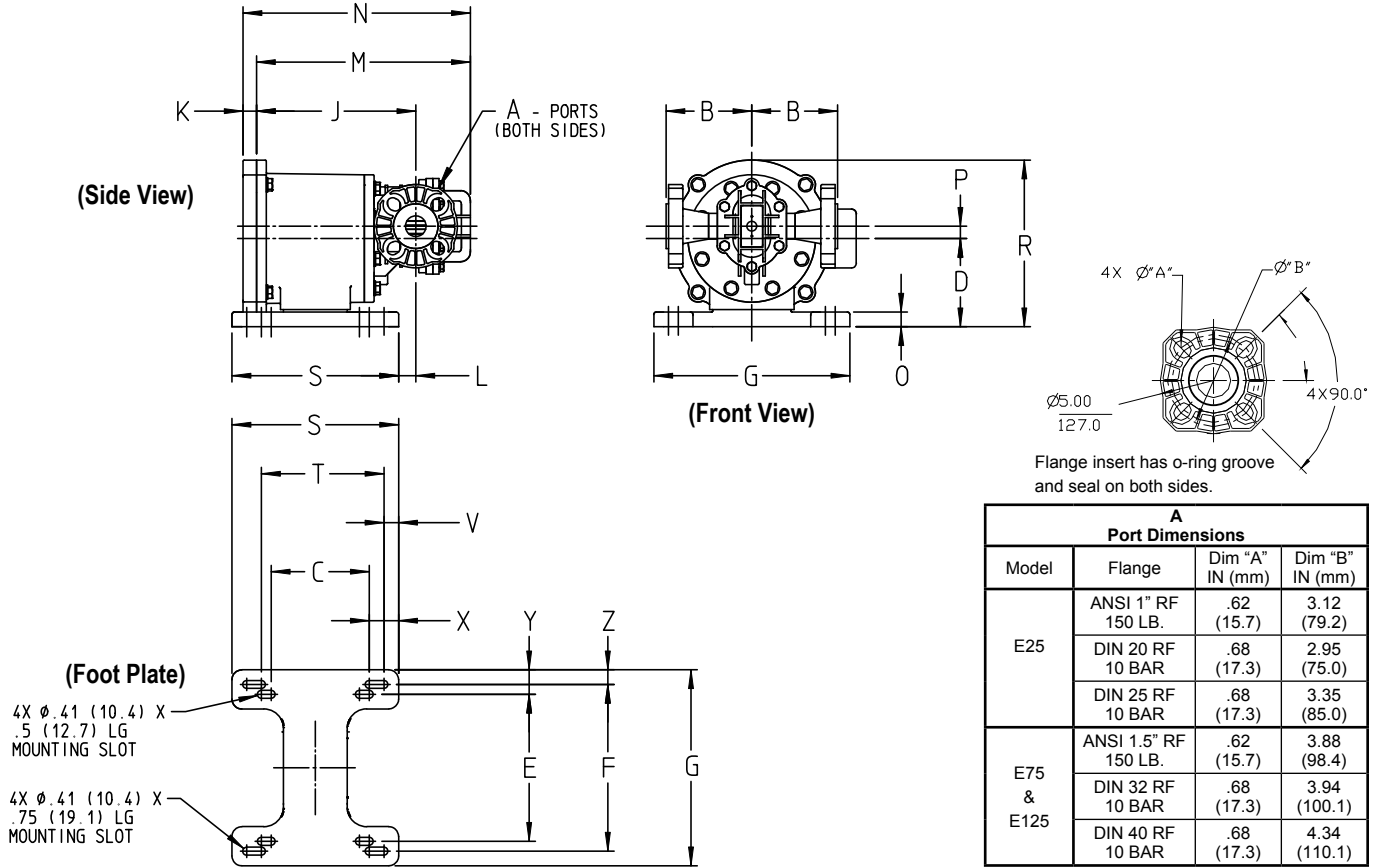
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DIMENSIONS -Models E25, E75 and E125

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PUMP ONLY

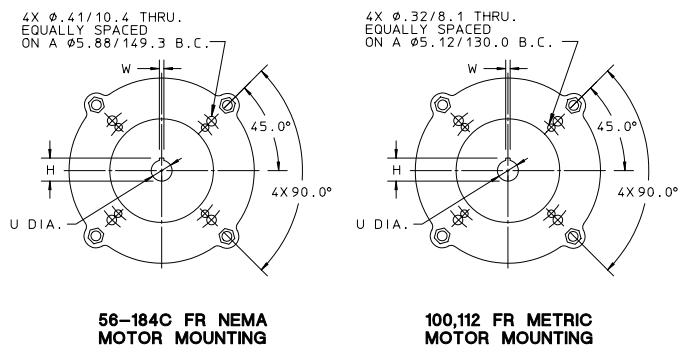
Model		B	C	D	E	F	G	J	K	L	M	N	O	P	R	S	T	V	X	Y	Z
E25	IN	4.38	2 X 5.00	4.50	2 X 7.50	2 X 8.50	10.00	8.12	0.69	0.88	10.91	11.60	0.75	0.62	8.50	8.50	2 X 6.25	2 x .75	2 x 1.50	2 x 1.25	2 X .75
	MM	111.1	127.0	114.3	190.5	215.9	254.0	206.4	17.5	22.2	277.1	294.6	19.1	15.8	215.9	215.9	158.8	19.0	38.1	31.7	19.0
E75 & E125	IN	5.00	2 X 5.00	5.38	2 X 7.50	2 X 8.50	10.00	9.50	1.00	2.25	13.77	14.77	0.75	0.93	10.12	8.50	2 x 6.25	2 x .75	2 x 1.50	2 x 1.25	2 X .75
	MM	127.1	127.0	136.5	190.5	215.9	254.0	241.3	25.4	57.1	349.6	375.0	19.1	23.6	257.2	215.9	158.8	19.0	38.1	31.7	19.0

MOTOR FLANGE

Motor Frame	U Shaft Diameter	W Key Width	H Key Height
56C	.626 (15.9)	.188 (4.7)	.71 (18.0)
140TC	.876	.188	.96
180C	(22.2)	(4.7)	(24.5)
182TC	1.13	.252	1.24
184TC	(28.6)	(6.4)	(31.5)
100	1.10	.317	1.24
112	(28.0)	(8.0)	(31.5)

Motor Mounting Kit Part Number				
Model Number	56C	143TC-182C	182TC - 184TC	100/112 IEC B14
E25	E25XXXF	E25XXXO	--	E02XXXP
E75	--	E75XXXO	E75XXXR	E05XXXP
E125	--	E125XXXP	E125XXXR	E05XXXP

Kit contains required coupling hub, motor adaptor and hardware for mounting to motor based on frame size.



© CMD E75 series only.

Suction and discharge port is determined by shaft rotation.

Standard motor adaptor fits NEMA 56C, 143TC, 182C, and 184C frame motors.

Does not fit frames 182/184TC.

Metric motor adaptor options fit 80, 90, 100/112 frame motors.

Must use foot mounted C-faced motor of specific frame sizes.

Pump mounting foot removable for use with footed motors.

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SERIES CMD PUMP MODEL STRING

This table is used to develop the model number code for the features and mounting required.

Available Model	Code	Description	CMD-E
POSITIONS 1,2,3			
PUMP SIZE	CMD	SIZE E02 - MAX. CAPACITY 0.4 GPM (1.5 LPM) 1/4"-18 FNPT / 1/4"-19 BSPT, ISO 7-1 SIZE E05 - MAX. CAPACITY 1.3 GPM (4.9 LPM) 3/8"-18 FNPT / 3/8"-19 BSPT, ISO 7-1 SIZE E12 - MAX. CAPACITY 3.2 GPM (12.1 LPM) 3/4"-14 FNPT / 3/4"-14 BSPT, ISO 7-1 SIZE E25 - MAX. CAPACITY 6.5 GPM (24.6 LPM) FLANGED 1"-150 ANSI / DIN 20/25 SIZE E75 - MAX. CAPACITY 20.0 GPM (75.0 LPM) FLANGED 1 1/2"-150# ANSI / DIN 32/40 SIZE E125 - MAX. CAPACITY 33.0 GPM (125.0 LPM) FLANGED 1 1/2"-150# ANSI / DIN 32/40	
POSITION 4	02,05 02,05	K CARBON-FILLED PVDF, FNPT M CARBON-FILLED PVDF, BSPT, ISO 7-1 <i>Export Restrictions May Apply to the following sizes listed below</i>	
PRIMARY MATERIAL	12 12 25,75,125	K CARBON-FILLED PVDF, FNPT M CARBON-FILLED PVDF, BSPT, ISO 7-1 N CARBON-FILLED PVDF, FLANGED	
POSITION 5 BEARINGS	02,05,12,25,75,125 L B	L CARBON B SILICON CARBIDE	
POSITION 6 O-RINGS	02,05,12,25,75,125 V E K	V VITON-A E EPDM K Kalrez Grade 4079	
POSITION 7 MOTOR MOUNTING ARRANGEMENTS	02,05,12,25,75 02,05,12,25,75 75,125 02,05,12 02,05,12 02,05,12,25,75 25,75 25,75,125 02,05,12,25,75,125 F O R W H J K L P Y	F NEMA 56C (C-face, rigid base, 5/8" shaft diameter, 4x 3/8"-16 tapped holes on a 5-7/8" bolt circle) O NEMA 143/5TC-182/4C (C-face, rigid base, 7/8" shaft diameter, 4x 3/8"-16 tapped holes on a 5-7/8" bolt circle) R NEMA 182TC-184TC (C-face, rigid base, 1-1/8" shaft diameter, 4x 1/2"-13 tapped holes on a 7-1/4" bolt circle) W NEMA 213TC-215TC (C-face, rigid base, 1-3/8" shaft diameter, 4x 1/2"-13 tapped holes on a 7-1/4" bolt circle) H IEC 63 B3/B14 (rigid base, face, 11 mm motor shaft diameter, 4x M5 tapped holes on a 75 mm bolt circle) J IEC 71 B3/B14 (rigid base, face, 14 mm motor shaft diameter, 4x M6 tapped holes on a 85 mm bolt circle) K IEC 80 B3/B14 (rigid base, face, 19 mm motor shaft diameter, 4x M6 tapped holes on a 100 mm bolt circle) L IEC 90 B3/B14 (rigid base, face, 24 mm motor shaft diameter, 4x M8 tapped holes on a 115 mm bolt circle) P IEC 100/112 B3/B14 (rigid base, face, 28 mm motor shaft diameter, 4x M8 tapped holes on a 130 mm bolt circle) Y NO MOTOR MOUNTING KIT (Pump includes Drive Magnet)	
POSITION 8	02,05,12,25,75,125 -	DASH	
POSITION 9 OPTIONS	02,05,12,25,75,125 05,12,25,75,125 02,05,12,25,75,125 05,12,25,75,125 05,12,25,75,125 02,05,12,25,75,125 05,12,25,75,125 02,05,12,25,75,125 05,12,25,75,125 X A N B X-ATEX A-ATEX N-ATEX B-ATEX	X STANDARD (COMPLETE PUMP - NO OPTIONS) A BEARING FLUSH PORT (1x 1/8" FNPT / BSPT Connection located in the center of the front cover) N PUMP WET END ONLY - WITHOUT DRIVE MAGNET (Only available in conjunction with 7th position option "Y") B COMBINATION OF 9TH POSITION OPTIONS "A" AND "N" X-ATEX Standard Pump with ATEX Directive - CE Ex II 2G T6 II 2D T6 A-ATEX Bearing Flush with ATEX Directive - CE Ex II 2G T6 II 2D T6 N-ATEX Wet End Only with ATEX Directive - CE Ex II 2G T6 II 2D T6 B-ATEX Wet End Only and Bearing Flush with ATEX Directive - CE Ex II 2G T6 II 2D T6	

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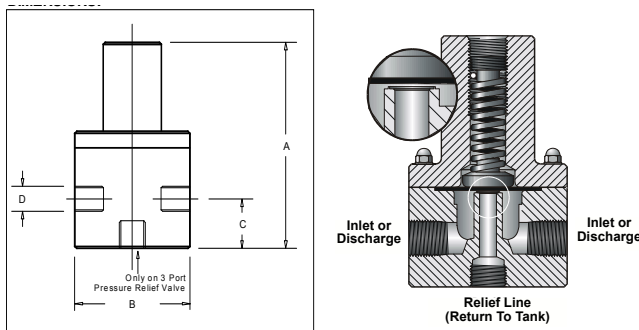
RELIEF VALVE INFORMATION

The CMD series pump is a positive displacement pump and requires some sort of over pressure protection, however, an internal relief valve is **not** provided as standard with this series.

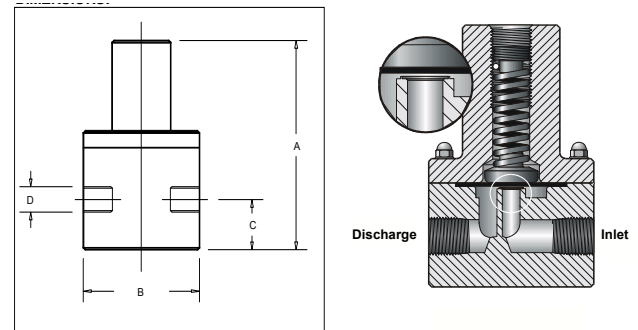
Optional third party adjustable spring loaded diaphragm in-line pressure relief valves, constructed of either PVC or PVDF, are available in two or three port configurations. These in-line valves are easily set in the field for system pressures ranging between 0 - 150 PSI. Vendor recommendation is to set the pressure valve at 15 PSI above the system pressure. This pressure relief valve should be placed as close to the pump as possible without any other valves or accessories placed between the pump and relief valve.

DIMENSIONS

THREE PORT PRESSURE RELIEF VALVE

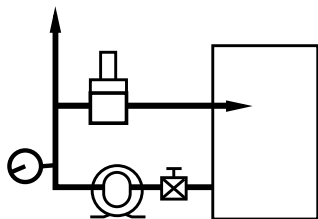


TWO PORT PRESSURE RELIEF VALVE

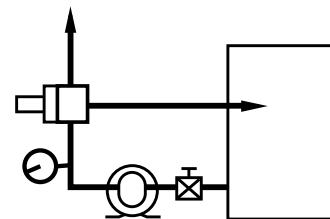


D	A	B (in)	C (in)	Ports	PN - PVC Construction	PN - PVDF Construction	Notes
1/2"	5.5	3.5	1.125	NPT	W777267-PVC	W777267-KYN	3rd bottom port option is piped as a return-to-tank line.
1"	5.8	3.5	1.25	NPT	W777259-PVC	W777259-KYN	3rd bottom port option is piped as a return-to-tank line.
1-1/2"	90	5.5	2.25	NPT	W777260-PVC	W777260-KYN	2 port straight line configuration, Discharge line would require a tee off. Line must be back to the tank.

TYPICAL PIPING EXAMPLES



Two-Port Valve Arrangement



Three-Port Valve Arrangement

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LIQUID COMPATIBILITY GUIDE

This list is intended as a general guide. The liquid compatibility of materials and elastomers has been compiled from many sources. Although the sources are believed reliable, the rating cannot be guaranteed. In any given case many factors such as concentration, temperature and the presence of impurities or trace elements may influence material performance.

For additional information, consult the CMD series pump selection software. For specific questions, contact the factory for assistance.

Liquid List	Key: "A" Excellent "C" Questionable "X" Not Recommended							
	Wetted Parts							
	Primary Material	Shaft	Gears	Bearings & Wear Plates		O-Rings		
	PVDF	Alumina Ceramic	PTFE	Carbon Graphite	Silicon Carbide (Option)	Viton	EPDM (Option)	Kalrez
Acetaldehyde	X		A	A	A	X	A	A
Acetamide	C		A	A	A	A	A	A
Acetic Acid (Glacial)	A	A	A	A	A	X	A	A
Acetic Acid, Dilute (50% H2O)	A	A	A	A	A	X	A	A
Acetone	X	A	A	A	A	X	A	A
Acetonitrile			A	A	A	X	A	A
Acetylene Tetrachloride			A	A	A	X	X	A
Acrylonitrile	22°C		A	A	A	X	X	A
Adipic Acid	66°C		A	A	A	X	X	A
Allyl Chloride			A	A	A	X	X	A
Alum (Aluminum Ammonium Sulfate)	--		A	A	A	A	A	A
Aluminum Chloride	A	A	A	A	A	A	A	A
Aluminum Fluoride	A		A	A	A	A	A	A
Aluminum Hydroxide	A		A	A	A	X	A	A
Aluminum Nitrate	48°C		A	A	A	A	A	A
Aluminum Potassium Sulfate			A	A	A	A	A	A
Ammonia (Anhydrous)	X		A	A	A	X	A	A
Ammonia (Aqueous 30%)	X	A	A	A	A	X	A	A
Ammonium Chloride	A	A	A	A	A	A	A	A
Ammonium Fluoride			A	A	A	A	A	A
Ammonium Hydroxide	A	A	A	A	A	A	A	A
Ammonium Sulfate	A	A	A	A	A	X	A	A
Ammonium Sulfide	52°C		A	A	A	X	A	A
Aniline	38°C	A	A	A	A	X	A	A
Anthraquinone			A	A	A	A	A	A
Barium Chloride	A	A	A	A	A	A	A	A
Barium Hydroxide	A	A	A	A	A	A	A	A
Barium Sulfate	A	A	A	A	A	A	A	A
Barium Sulfide	A	A	A	A	A	A	A	A
Benzene	48°C	A	A	A	A	A	X	A
Benzene Sulfonic Acid		A	A	A	A	A	X	A
Benzoic Acid	A	A	A	A	A	A	X	A
Benzyl Alcohol		A	A	A	A	A	A	A
Benzyl Chloride				A	A	A	X	A
Borax	A	A	A	X	A	A	A	A
Boric Acid	A	A	A	A	A	A	A	A
Brine			A	X	A	A	A	A
Bromic Acid			A	X	A	X	X	A
Bromine (Dry)	A	A	A	X	A	A	X	A
Butadiene	A	A	A	A	A	A	A	A
Butane	A	A	A	A	A	A	X	A
Butanediol			A	A	A	A	A	A
n-Butyl Alcohol	A		A	A	A	A	A	A
Butyl Bromide			A	X	A	A	X	A
Butyl Chloride			A	A	A	A	X	A
Butyl Phenol			A	A	A	A	A	A
Calcium Bisulfate				A	A	A	A	A

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LIQUID COMPATIBILITY GUIDE (CONT'D)

Liquid List	Key: "A" Excellent "C" Questionable "X" Not Recommended							
	Wetted Parts							
	Primary Material	Shaft	Gears	Bearings & Wear Plates		O-Rings		
	PVDF	Alumina Ceramic	PTFE	Carbon Graphite	Silicon Carbide (Option)	Viton	EPDM (Option)	Kalrez
Calcium Bisulfide	A		A	A	A	A	A	A
Calcium Carbonate	A	A	A	A	A	A	A	A
Calcium Chlorate	A	A	A	X	A	A	A	A
Calcium Chloride	A	A	A	A	A	A	A	A
Calcium Hydroxide	48°C	A	A	A	A	A	A	A
Calcium Hypochlorite	A	A	A	X	A	A	A	A
Calcium Nitrate	A	A	A	A	A	A	A	A
Calcium Oxide	A		A	A	A	A	A	A
Calcium Sulfate	A	A	A	A	A	A	A	A
Carbon Disulfide	48°C		A	A	A	A	X	A
Carbon Tetrachloride	48°C	A	A	A	A	A	A	A
Carbonic Acid	A		A	A	A	A	X	A
Caustic Potash (10 and 50%)	A	A	A	A	A	X	A	A
Caustic Soda (10 and 50%)	A	A	A	A	A	X	A	A
Chlorinated Brine			A	X	A	A	A	A
Chlorinated Phenol			A	X	A	A	A	A
Chlorine (Dry)	A		A	X	A	A	X	A
Chlorine (Wet)	A	A	A	X	A	A	X	X
Chlorine Dioxide			A	A	A	A	X	X
Chloroacetic Acid (5-1/2 Cl2)	22°C	A	A	A	A	A	A	X
Copper Chloride	A	A	A	A	A	A	A	A
Copper Cyanide	A	A	A	A	A	A	A	A
Copper Fluoride		X	A	A	A	A	A	A
Copper Nitrate	A	A	A	A	A	A	A	A
Copper Sulfate	A	A	A	A	A	A	A	A
Cyclohexane	A	A	A	A	A	A	X	A
Cyclohexanol			A	A	A	A	X	A
Cyclohexanone	X	A	A	A	A	X	X	A
Dichloroacetic Acid			A	A	A	X	A	A
Dichloroethylene			A	A	A	A	X	A
Dichloropropionic Acid			A	A	A	A	A	A
Diethyl Benzene			A	A	A	A	X	A
Diethyl Ether			A	A	A	X	X	A
Diisobutylene			A	A	A	A	A	A
Dimethylamine	22°C	A	A	A	A	X	X	A
Epichlorhydrin	X		A	A	A	X	A	A
Ethyl Acetate	X	A	A	A	A	X	A	A
Ethyl Alcohol (Ethanol)		A	A	A	A	A	A	A
Ethylamine		A	A	A	A	X	A	X
Ethyl Chloride	A	A	A	A	A	A	X	A
Ethyl Chloroacetate			A	A	A	A	A	A
Ethylene Bromide	A		A	A	A	A	X	A
Ethylene Chlorohydrin	A		A	A	A	A	A	A
Ethylene Glycol	A	A	A	A	A	A	A	A
Ethylene Oxide	A	A	A	A	A	X	X	A
Ferric Chloride	A	A	A	A	A	A	A	A
Ferric Hydroxide			A	A	A	X	A	A
Ferric Nitrate	A	A	A	A	A	A	A	A
Ferric Sulfate	A	A	A	A	A	A	A	A
Ferrous Chloride	A	A	A	A	A	A	A	A
Ferrous Hydroxide			A	A	A	X	A	A
Ferrous Nitrate			A	A	A	A	A	A
Ferrous Sulfate	A	A	A	A	A	A	A	A
Fluorine (Gaseous)	22°C		X	X	A	X	X	A
Formaldehyde (37% in H2O)	52°C	A	A	A	A	A	A	X
Freon 11		A	A	A	A	A	X	A
Freon 12	A		A	A	A	A	A	A
Freon 22	A		A	A	A	X	X	X
Fumaric Acid			A	A	A	A	A	A

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LIQUID COMPATIBILITY GUIDE (CONT'D)

Liquid List	Key: "A" Excellent "C" Questionable "X" Not Recommended							
	Wetted Parts							
	Primary Material	Shaft	Gears	Bearings & Wear Plates		O-Rings		
	PVDF	Alumina Ceramic	PTFE	Carbon Graphite	Silicon Carbide (Option)	Viton	EPDM (Option)	Kalrez
Gasoline-Unleaded	A	A	A	A	A	A	X	A
Glycerol			A	A	A	A	A	A
Glycolic Acid	A		A	A	A	A	A	A
Glycol			A	A	A	A	A	A
Heptane	A	A	A	A	A	A	X	A
Hexane	A	A	A	A	A	A	X	A
Hydrobromic Acid (50%)		C	A	A	A	A	A	A
Hydrochloric Acid (20%)	A	A	A	A	A	A	A	A
Hydrochloric Acid (Conc.)	66°C	80°C	A	A	A	A	X	A
Hydrochloric Acid (Gas)	A		A	A	A	A	X	A
Hydrocyanic Acid	A		A	A	A	A	A	A
Hydrofluoric Acid (35%)	A	X	A	X	A	X	A	A
Hydrofluoric Acid (70%)	A	X	A	X	A	X	X	A
Hydrofluoric Acid (100%)	A	X	A	X	A	X	X	A
Hydrogen Cyanide	A	A	A	A	A	A	A	A
Hydrogen Peroxide (30%)	A	A	A	X	A	A	A	A
Hydrogen Peroxide (90%)	22°C	A	A	X	A	A	X	A
Hydrogen Sulfide (Dry)	A		A	A	A	X	A	A
Hydrogen Sulfide (Wet)	A	A	A	A	A	X	A	A
Hypochlorous Acid			A	X	A	A	A	A
Iodine (Dry)	66°C		A	X	A	X	A	A
Iodine (Wet)	66°C	A	A	X	A	A	A	A
Isobutyl Alcohol			A	A	A	A	A	A
Isopropylamine			A	A	A	X	X	A
Jet Fuel - JP4	A		A	A	A	A	X	A
Lactic Acid	53°C	A	A	A	A	A	A	A
Lauric Acid		A	A	A	A	A	A	A
Lauryl Chloride			A	A	A	A	A	A
Lauryl Sulfate			A	A	A	A	A	A
Linseed Oil	A		A	A	A	A	A	A
Lithium Bromide			A	X	A	A	X	A
Lithium Hydroxide			A	X	A	X	A	A
Lubricating Oil	A		A	A	A	A	X	A
Magnesium Carbonate	A	A	A	A	A	A	X	A
Magnesium Chloride	A	A	A	A	A	A	A	A
Magnesium Hydroxide	A	A	A	A	A	A	A	A
Magnesium Nitrate	A	A	A	A	A	A	A	A
Magnesium Sulfate	A	A	A	A	A	A	A	A
Maleic Acid	A	A	A	A	A	A	X	A
Maleic Anhydride	A		A	A	A	A	X	A
Malic Acid	A		A	A	A	A	X	A
Mercuric Chloride	A	A	A	A	A	A	A	A
Methacrylic Acid			A	A	A	X	A	A
Methyl Alcohol (Methanol)	A	A	A	A	A	X	A	A
Methyl Benzoate			A	A	A	A	X	A
Methyl Bromide	A		A	A	A	A	A	A
Methyl Chloride	A		A	A	A	A	X	A
Methyl Chloroform			A	A	A	X	A	A
Methyl Ethyl Keytone (MEK)	X	A	A	A	A	X	X	A
Methyl Sulfuric Acid			A	A	A	A	A	A
Methylene Bromide			A	A	A	A	X	A
Methylene Chloride	53°C	A	A	A	A	A	X	A
Methylene Iodide			A	A	A	A	X	A
Methyl Methacrylate	53°C		A	A	A	X	X	A
Monochlorobenzene			A	A	A	A	X	A
Monoethanolamine	C		A	A	A	X	A	A
Nickel Chloride	A	A	A	A	A	A	A	A
Nickel Nitrate	A	A	A	A	A	A	A	A
Nickel Sulfate	A	A	A	A	A	A	A	A
Nitric Acid (Conc. 70%)	X	A	A	X	A	A	X	A
Nitric Acid (50%)	53°C	A	A	X	A	A	X	A

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Liquid List	Key: "A" Excellent "C" Questionable "X" Not Recommended							
	Wetted Parts							
	Primary Material	Shaft	Gears	Bearings & Wear Plates		O-Rings		
	PVDF	Alumina Ceramic	PTFE	Carbon Graphite	Silicon Carbide (Option)	Viton	EPDM (Option)	Kalrez
Nitrous Acid	A	A	A	X	A	A	X	A
Oleic Acid	A	A	A	A	A	A	A	A
Oleum		A	A	X	A	A	X	A
Oxalic Acid	A	A	A	A	A	X	A	A
Perchloric Acid (72%)		A	A	A	A	A	X	A
Perchloric Acid (10%)		A	A	A	A	A	X	A
Perchloroethylene	A	A	A	A	A	A	X	A
Phenol (100%)	22°C	A	A	A	A	A	X	A
Phenol (10%)	A	A	A	A	A	A	X	A
Phosphoric Acid (30%)		A	A	A	A	A	A	A
Phosphoric Acid (85%)	A	A	A	A	A	A	A	A
Phosphorus Oxychloride		A	A	A	A	A	A	A
Phosphorus Pentachloride			A	A	A	A	A	A
Phosphorus Trichloride	48°C	A	A	A	A	A	A	A
Phthalic Anhydride	A	A	A	A	A	X	A	A
Potassium Aluminum Chloride			A	A	A	A	A	A
Potassium Bicarbonate	A	A	A	A	A	A	A	A
Potassium Bromate			A	A	A	A	A	A
Potassium Bromide	A	C	A	A	A	A	A	A
Potassium Carbonate	A	X		A	A	A	A	A
Potassium Chlorate	A	C	A	A	A	A	A	A
Potassium Chloride	A	A	A	A	A	A	A	A
Potassium Cyanide	A	X	A	A	A	A	A	A
Potassium Fluoride			A	A	A	A	A	A
Potassium Hydroxide (25%)	66°C	X	A	X	A	X	A	A
Potassium Hypochlorite	22°C	X		X	A	A	X	A
Potassium Nitrate	A	C	A	A	A	A	A	A
Potassium Perchlorate			A	X	A	A	X	A
Potassium Permanganate	A	A	A	A	A	A	A	A
Potassium Sulfate	A	A	A	A	A	A	A	A
Propionic Acid			A	A	A	A	A	A
Propyl Alcohol			A	A	A	A	A	A
Propylene Dichloride	A	A	A	A	A	A	X	A
Propylene Oxide	X	A	A	X	A	A	A	A
Salicylic Acid	A		A	A	A	A	A	A
Salt Brine	A		A	X	A	A	A	A
Sea Water	A	A	A	A	A	A	A	A
Silicon Tetrachloride			A	A	A	A	A	A
Silver Cyanide		A	A	A	A	X	A	A
Silver Nitrate	A		A	A	A	A	A	A
Sodium Acetate	A	A	A	A	A	X	A	A
Sodium Bicarbonate	A	A	A	A	A	A	A	A
Sodium Bisulfate	A	A	A	A	A	A	A	A
Sodium Borate (Borax)	A	A	A	A	A	A	A	A
Sodium Bromide	A	A	A	A	A	A	A	A
Sodium Carbonate	A	A	A	A	A	A	A	A
Sodium Chlorate	A	A	A	A	A	A	A	A
Sodium Chloride	A	A	A	A	A	A	A	A
Sodium Chromate	A	A	A	X	A	A	A	A
Sodium Cyanide	A	A	A	A	A	A	A	A
Sodium Dichromate	A	A	A	A	A	A	A	A
Sodium Ferrocyanide	A	A	A	A	A	A	A	A
Sodium Fluoride	A	X	A	A	A	A	A	A
Sodium Glutamate			A	A	A	A	A	A
Sodium Hydroxide	A	A	A	A	A	X	A	A
Sodium Hypochlorite	A	A	A	X	A	A	X	A
Sodium Hyposulfite			A	A	A	A	A	A
Sodium Iodide			A	A	A	A	X	A
Sodium Metasilicate			A	A	A	A	A	A
Sodium Nitrate	A	A	A	A	A	A	A	A
Sodium Nitrite	A	A	A	A	A	A	A	A

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Liquid List	Key: "A" Excellent "C" Questionable "X" Not Recommended							
	Wetted Parts							
	Primary Material	Shaft	Gears	Bearings & Wear Plates		O-Rings		
	PVDF	Alumina Ceramic	PTFE	Carbon Graphite	Silicon Carbide (Option)	Viton®	EPDM (Option)	Kalrez®
Sodium Perchlorate			A	A	A	A	A	A
Sodium Peroxide	A	A	A	X	A	A	A	A
Sodium Persulfate			A	A	A	A	A	A
Sodium Phosphate	A	A	A	A	A	A	A	A
Sodium Silicate	A	A	A	A	A	A	A	A
Sodium Sulfate	A	A	A	A	A	A	A	A
Sodium Sulfide	A	A	A	A	A	A	A	A
Sodium Sulfite	A	A	A	A	A	A	A	A
Sodium Thiosulfate	A	A	A	A	A	A	A	A
Stannous Chloride	A	A	A	A	A	A	A	A
Stannous Fluoride			A	X	A	A	A	A
Stearic Acid	A	A	A	A	A	A	A	A
Styrene Monomer			A	A	A	A	X	A
Succinic Acid			A	A	A	X	X	A
Sulfamic Acid			A	X	A	A	X	A
Sulfur (Molten)			A	X	A	A	X	A
Sulfur Dioxide	A	A	A	X	A	A	A	A
Sulfuric Acid (60%)	66°C	A	A	A	A	A	A	A
Sulfuric Acid (Conc.)	66°C	A	A	A	A	A	X	A
Sulfuric Acid (Fuming-Oleum)	X		A	X	A	A	X	A
Sulfurous Acid	A	A	A	A	A	A	X	A
Tannic Acid	A	A	A	A	A	A	X	A
Tartaric Acid	A	A	A	A	A	A	A	A
Tetrahydrofuran	22°C	A	A	A	A	X	X	A
Thionyl Chloride			A	A	A	A	X	A
Tin Tetrachloride			A	X	A	A	X	A
Titanium Tetrachloride			A	A	A	A	X	X
Toluene	79°C	A	A	A	A	A	X	A
Tributyl Phosphate	C	A	A	A	A	X	X	A
Trichloroacetic Acid	A		A	A	A	A	A	A
Trichloroethylene	A	A	A	A	A	A	X	A
Trichloromethane			A	A	A	A	X	A
Triethylamine	48°C	A	A	A	A	A	A	A
Trioxane			A	A	A	X	X	X
Turpentine	A	A	A	A	A	A	X	A
Urea (50% H2O)	A	C	A	A	A	X	X	A
Vinyl Acetate	A	C	A	A	A	X	X	A
Vinyl Chloride (Monomer)	22°C	A	A	A	A	A	X	A
Water	A	A	A	A	A	A	A	A
Wax (Paraffin)			A	A	A	A	X	A
Xylene	A	A	A	A	A	A	X	A
Zinc Acetate			A	A	A	X	A	A
Zinc Chloride	A	C	A	A	A	A	A	A
Zinc Hydrosulfite (10%)			A	A	A	A	A	A
Zinc Nitrate			A	A	A	A	A	A
Zinc Sulfide			A	A	A	A	A	A
Zinc Sulfate	A	C	A	A	A	A	A	A

Viton® and Kalrez® are Registered Trademarks of DuPont Dow Elastomers
 ETFE = Ethylene Tetrafluoroethylene
 PVDF = Polyvinylidene Fluoride

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Performance Curve Notes

Printed performance curves are not available.

Performance curves can be electronically generated with the Viking Pump Selector Program. This program can be located on www.vikingpump.com for the general public.

For authorized distributors, this program can be found listed under the "Products" tab at www.idexconnect.com. Security passwords are required to access IDEXconnect.