

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

ETFE fluoropolymer and ceramic wetted materials used in this series are compatible with many corrosives liquids.

Typical Applications:

Acids: Hydrochloric, Nitric, Phosphoric and Sulfuric

Bases: Sodium Hydroxide

Coagulants: Ferric Chloride

Solvents: Acetone, Toluene

Refrigerants: Freons, Ammonia

Refined Fuels: Ethanol, Biodiesel

Adhesives: Cyanoacrylate, Epoxies

Odorants: Fragrances, Mercaptans, Aldehydes

Organics: Formaldehyde, Vinyl Chloride Monomer

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: Acetone, Toluene

Refrigerants: Freons, Ammonia

Refined Fuels: Ethanol, Biodiesel

Adhesives: Cyanoacrylate, Epoxies

Odorants: Fragrances, Mercaptans, Aldehydes

Organics: Formaldehyde, Vinyl Chloride Monomer

Sodium Hypochlorite

A special PVDF model has been developed specifically for sodium hypochlorite, which is commonly used in bleaching and disinfection applications.



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

SERIES OPERATING RANGE

Nominal Capacity	.4 to 20 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.

Metric conversions are based on US measurements and rounded to the nearest whole number.

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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.
- Patent pending 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.
- Patent pending liner provides wear protection to the casing.
- Self lubricating materials and patent pending geometry in the heavy duty bearings provide large wear areas and allow for dry-run capabilities.
- Single piece non-metallic gear/shaft assemblies eliminates the need for retaining rings and keys.

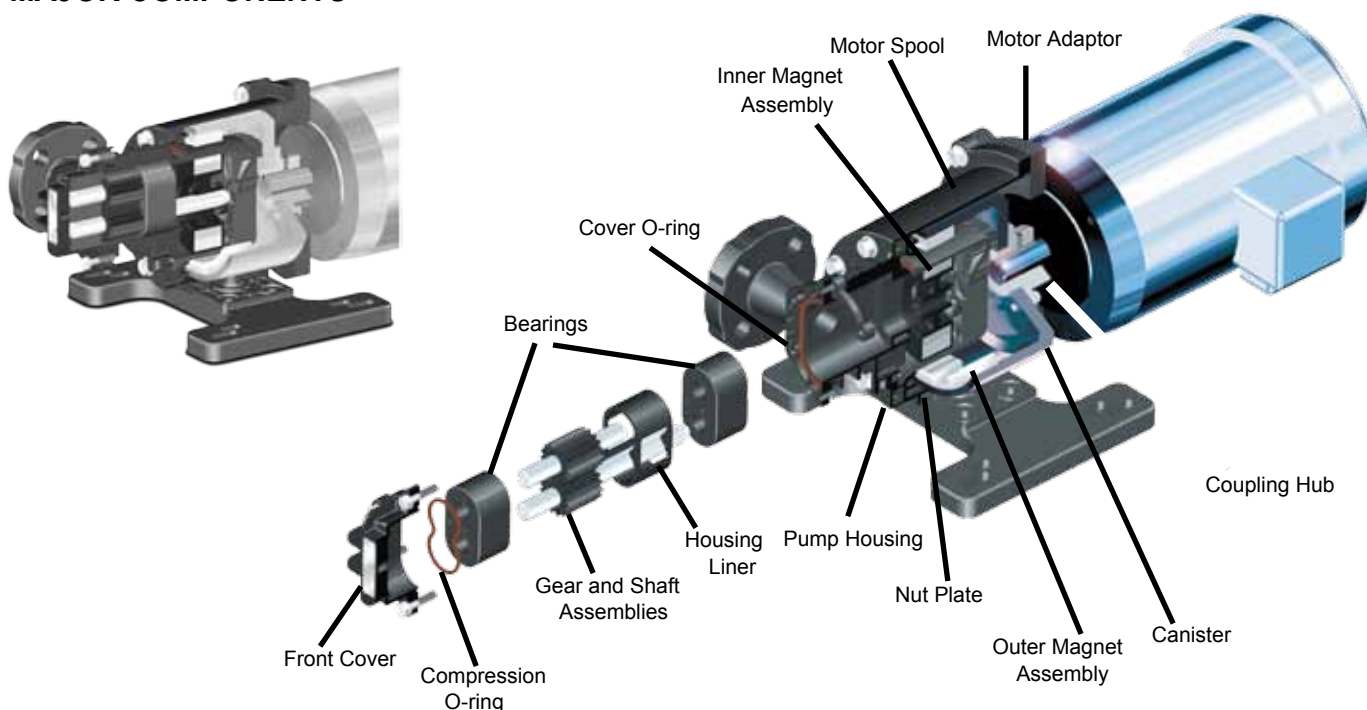
INNOVATIVE MAG DRIVE DESIGN

- Patent pending spline design allows the magnet to “float” on shaft.
- 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 to prolong magnet life.

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.

CMD	-E02	E	L	V	F	-X
CMD = Series: Composite Mag Drive	Model ① E02 E05 E12 E25 E75 E125	Primary Material: E= ETFE / NPT K= PVDF / NPT (E02, E05, E12) B= ETFE / BSPT, ISO 7-1 M= PVDF / BSPT, ISO 7-1 (E02, E05, E12) F= ETFE / Flange N= PVDF / Flange (E25, E75, E125)	Bearings: L= Carbon Graphite B= Carbon-Impregnated Silicon Carbide	O-Rings: V=Viton® E= EPDM K= Kalrez Grade 4079	Options: ③ ④ X = Complete Pump, No Options A = Bearing Flush Port N = Without Drive Magnet (wet end only) B = Combination of A and N	Motor Mounting Arrangement ② F = NEMA 56C (E02, E05, E12, E25, E75) O = NEMA 143/5TC - 182/4C (E02, E05, E12, E25, E75, E125) R = NEMA 182TC - 184TC (E75, E125) W = NEMA 213TC - 215TC (E75, E125) H = IEC 63 B3/14 (E02, E05, E12) J = IEC 71 B3/14 (E02, E05, E12) K = IEC 80 B3/14 (E02, E05, E12, E25, E75) L = IEC 90 B3/14 (E25, E75) P = IEC 100/112 B3/14 (E25, E75, E125) Y = No Motor Mount Kit (E02, E05, E12, E25, E75, E125)

① U.S. Export Restriction apply to sizes E12, E25, E75 and E125.

② Motor mounting flanges are available to order. Motors are ordered separately as a line item. Customer is responsible for motor mounting. Option O 182/184C motor requires modified motor shaft and motor bolt pattern. Does not fit frames 182/184TC.

Option Y is for bare pump with drive magnet but not motor mounting hardware (magnet hub or applicable motor adaptor). This is typically used as a spare pump until a specific motor has been identified.

③ Option N is for bare pump without drive magnet and normally used as a replacement pump in an existing unit. This option can only be used in combination with a Y mounting arrangement.

④ ATEX options available. See page 6.

CONSTRUCTION

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

SPECIFICATIONS — UNMOUNTED PUMPS

Model Number	④ Ports			Nominal Pump Rating				Maximum Differential Pressure	Maximum Hydrostatic Pressure	⑤ Maximum Recommended Temperature for Cataloged Pump	Approximate Shipping Weight (less motor)
	TYPE	SIZE in		1750 RPM	1450 RPM						
				GPM (LPM)	GPM (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) ⑥	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) ⑦	200 (14)	150 (65)	44 (20)

④ 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.

⑤ Temperature is limited by the composite materials.

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

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

Viton® is a Registered Trademark of DuPont Dow Elastomers
ETFE = Ethylene Tetrafluoroethylene

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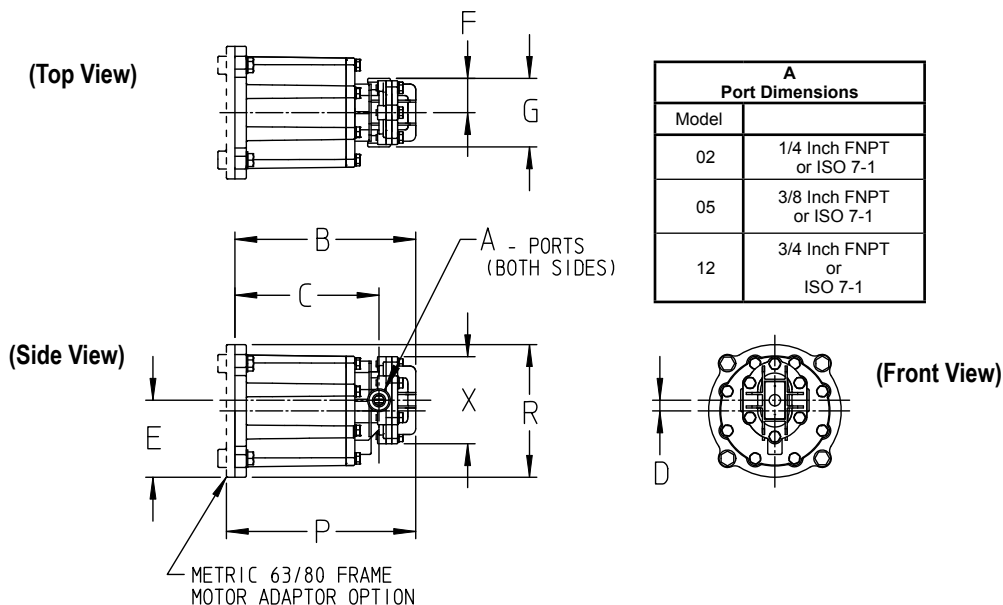
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Series CMD Models E02, E05, E12, E25, E75 and E125

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*



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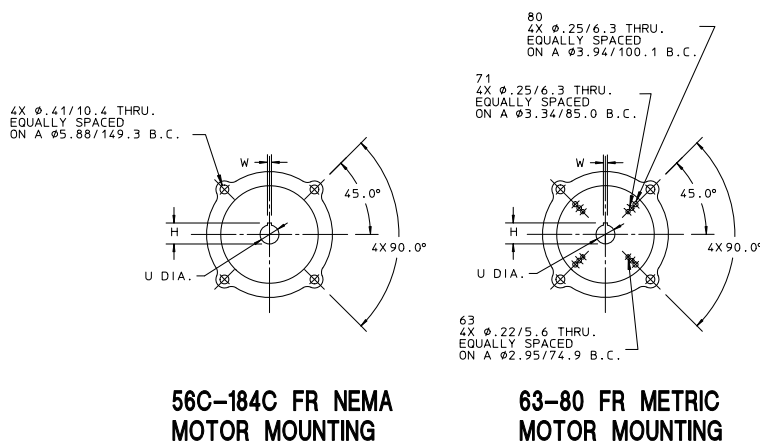
Model		B	C	D	E	F	G	P	R	X
E02	in	7.22	6.08	0.25	3.16	1.38	2.75	7.60	5.81	3.00
	mm	183.50	154.40	6.40	80.20	34.90	69.90	193.00	147.60	76.20
E05	in	7.92	6.31	0.47	3.37	1.50	3.00	8.90	5.81	3.81
	mm	201.20	160.30	11.90	85.60	38.10	76.20	210.70	147.60	96.80
E12	in	8.54	6.63	0.47	3.37	1.88	3.75	8.93	5.81	3.81
	mm	217.00	168.30	11.90	85.60	47.60	95.30	226.60	147.60	96.80

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 (22.2)	.188 (4.7)	.96 (24.5)
63	.434 (11.0)	.159 (4.0)	.51 (12.9)
80	.750 (19.1)	.237 (6.0)	.865 (22.0)

Motor Mounting Kit Part Number				
Model Number	56C	143TC-182C	63 IEC B14	80 IEC B14
E02	E02XXXF	--	E02XXXH	E02XXXK
E05	E05XXXF	E05XXXO	E05XXXH	E05XXXK
E12	E12XXXF	E12XXXK	E12XXXH	E12XXXK

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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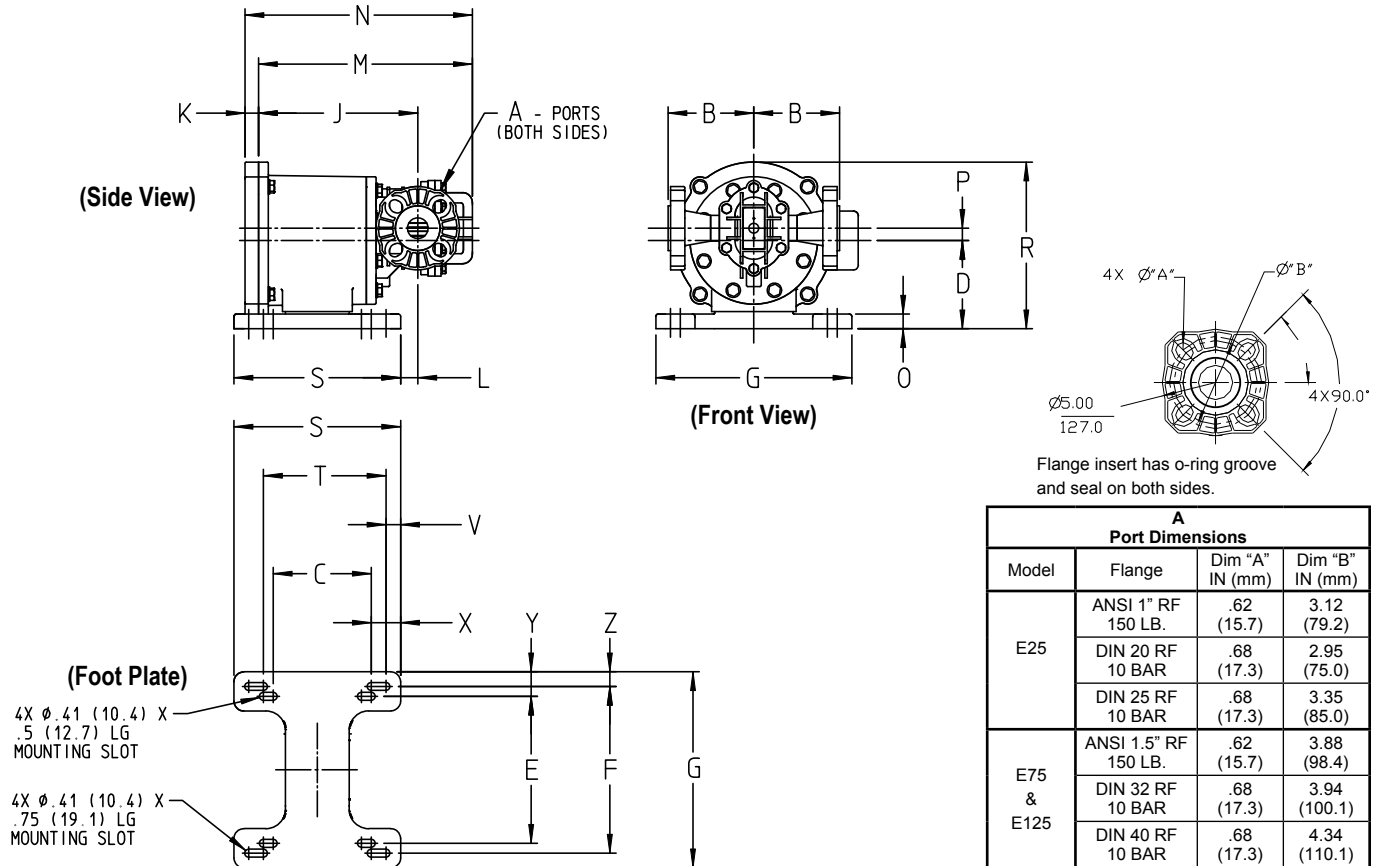
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DIMENSIONS -Models E25, E75 and E125

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



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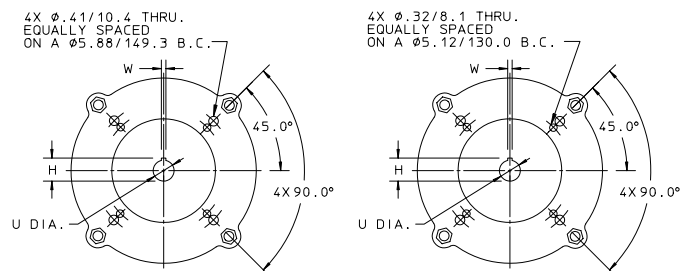
Model		B	C	D	E	F	G	J	K	L	M	N	O	P	R	S	T	V	X	Y	Z
E25	IN	4.38	2 X 5.00	4.50	2 X 7.50	2 X 8.50	10.00	8.12	0.69	0.88	10.91	11.60	0.75	0.62	8.50	8.50	2 X 6.25	2 x .75	2 x 1.50	2 x 1.25	2 X .75
	MM	111.10	127.00	114.30	190.50	215.90	254.00	206.40	17.50	22.20	277.10	294.64	19.10	15.75	215.90	215.90	158.8	19.00	38.10	31.7	19.00
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	127.10	127.00	136.50	190.50	215.90	254.00	241.30	25.40	57.10	349.60	375.00	19.10	23.62	257.20	215.90	158.80	19.00	38.10	31.7	19.00

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 (22.2)	.188 (4.7)	.96 (24.5)
180C			
182TC ①	1.13 (28.6)	.252 (6.4)	1.24 (31.5)
184TC ①			
100	1.10 (28.0)	.317 (8.0)	1.24 (31.5)
112			

Motor Mounting Kit Part Number				
Model Number	56C	143TC-182C	182TC - 184TC	100/112 IEC B14
E25	E25XXXF	E25XXXO	--	E02XXXXP
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.



56-184C FR NEMA MOTOR MOUNTING

100,112 FR METRIC MOTOR MOUNTING

① 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 option fits 63 and 80 frame motors.

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

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

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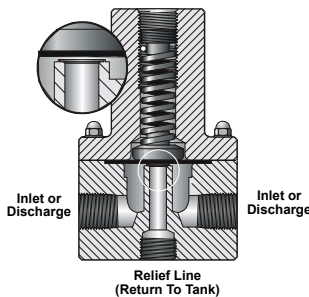
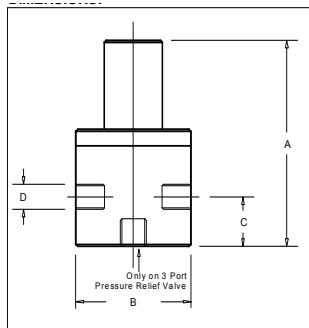
RELIEF VALVE INFORMATION

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.

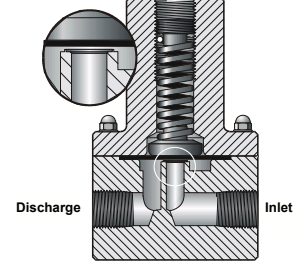
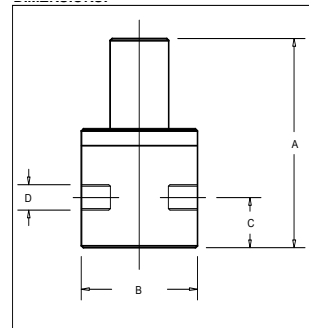
Optional third party adjustable spring loaded diaphragm in-line pressure relief valves, constructed of either PVC or PVDF, are available in two or three port configurations. These in-line valves are easily set in the field for system pressures ranging between 0 - 150 PSI. Vendor recommendation is to 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

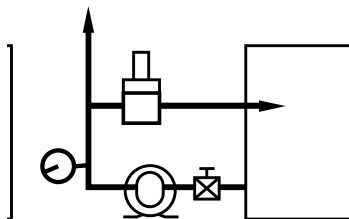


TWO PORT PRESSURE RELIEF VALVE

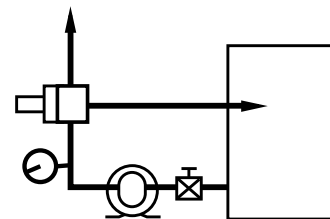


D	A	B (in)	C (in)	Ports	PN - PVC Construction	PN - PVDF Construction	Notes
1/2"	5.5	3.5	1.125	NPT	W777267-PVC	W777267-KYN	3rd bottom port option is piped as a return-to-tank line.
1"	5.8	3.5	1.25	NPT	W777259-PVC	W777259-KYN	3rd bottom port option is piped as a return-to-tank line.
1-1/2"	90	5.5	2.25	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	
	ETFE	Alumina Ceramic	PTFE	Carbon Graphite	Silicon Carbide (Option)	Viton	EPDM (Option)
Acetaldehyde	95°C		A	A	A	X	A
Acetamide	A		A	A	A	A	A
Acetic Acid (Glacial)	65°C	A	A	A	A	X	A
Acetic Acid, Dilute (50% H2O)	A	A	A	A	A	X	A
Acetone	50°C	A	A	A	A	X	A
Acetonitrile	65°C		A	A	A	X	A
Acetylene Tetrachloride	A		A	A	A	X	X
Acrylonitrile	65°C		A	A	A	X	X
Adipic Acid	A		A	A	A	X	X
Allyl Chloride	100°C		A	A	A	X	X
Alum (Aluminum Ammonium Sulfate)	A		A	A	A	A	A
Aluminum Chloride	A	A	A	A	A	A	A
Aluminum Fluoride	A		A	A	A	A	A
Aluminum Hydroxide	A		A	A	A	X	A
Aluminum Nitrate	A		A	A	A	A	A
Aluminum Potassium Sulfate	A		A	A	A	A	A
Ammonia (Anhydrous)	A		A	A	A	X	A
Ammonia (Aqueous 30%)	A	A	A	A	A	X	A
Ammonium Chloride	A	A	A	A	A	A	A
Ammonium Fluoride	A		A	A	A	A	A
Ammonium Hydroxide	A	A	A	A	A	A	A
Ammonium Sulfate	A	A	A	A	A	X	A
Ammonium Sulfide	A		A	A	A	X	A
Aniline	65°C	A	A	A	A	X	A
Anthraquinone	A		A	A	A	A	A
Barium Chloride	A	A	A	A	A	A	A
Barium Hydroxide	A	A	A	A	A	A	A
Barium Sulfate	A	A	A	A	A	A	A
Barium Sulfide	A	A	A	A	A	A	A
Benzene	100°C	A	A	A	A	A	X
Benzene Sulfonic Acid	100°C	A	A	A	A	A	X
Benzoic Acid	A	A	A	A	A	A	X
Benzyl Alcohol	A	A	A	A	A	A	A
Benzyl Chloride	65°C			A	A	A	X
Borax	A	A	A	X	A	A	A
Boric Acid	A	A	A	A	A	A	A
Brine	A		A	X	A	A	A
Bromic Acid	A		A	X	A	X	X
Bromine (Dry)	X	A	A	X	A	A	X
Butadiene	A	A	A	A	A	A	A
Butane	A	A	A	A	A	A	X
Butanediol	A		A	A	A	A	A
n-Butyl Alcohol	A		A	A	A	A	A
Butyl Bromide	A		A	X	A	A	X
Butyl Chloride	A		A	A	A	A	X
Butyl Phenol	A		A	A	A	A	A
Calcium Bisulfate	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	
	ETFE	Alumina Ceramic	PTFE	Carbon Graphite	Silicon Carbide (Option)	Viton	EPDM (Option)
Calcium Bisulfide	A		A	A	A	A	A
Calcium Carbonate	A	A	A	A	A	A	A
Calcium Chlorate	A	A	A	X	A	A	A
Calcium Chloride	A	A	A	A	A	A	A
Calcium Hydroxide	A	A	A	A	A	A	A
Calcium Hypochlorite	A	A	A	X	A	A	A
Calcium Nitrate	A	A	A	A	A	A	A
Calcium Oxide	A		A	A	A	A	A
Calcium Sulfate	A	A	A	A	A	A	A
Carbon Disulfide	65°C		A	A	A	A	X
Carbon Tetrachloride	65°C	A	A	A	A	A	A
Carbonic Acid	A		A	A	A	A	X
Caustic Potash (10 and 50%)	100°C	A	A	A	A	X	A
Caustic Soda (10 and 50%)	100°C	A	A	A	A	X	A
Chlorinated Brine	A		A	X	A	A	A
Chlorinated Phenol	100°C		A	X	A	A	A
Chlorine (Dry)	100°C		A	X	A	A	X
Chlorine (Wet)	A	A	A	X	A	A	X
Chlorine Dioxide	A		A	A	A	A	X
Chloroacetic Acid (5-1/2 Cl ₂)	A	A	A	A	A	A	A
Copper Chloride	A	A	A	A	A	A	A
Copper Cyanide	A	A	A	A	A	A	A
Copper Fluoride	A	X	A	A	A	A	A
Copper Nitrate	A	A	A	A	A	A	A
Copper Sulfate	A	A	A	A	A	A	A
Cyclohexane	A	A	A	A	A	A	X
Cyclohexanol	A		A	A	A	A	X
Cyclohexanone	A	A	A	A	A	X	X
Dichloroacetic Acid	65°C		A	A	A	X	A
Dichloroethylene	65°C		A	A	A	A	X
Dichloropropionic Acid	65°C		A	A	A	A	A
Diethyl Benzene	A		A	A	A	A	X
Diethyl Ether	100°C		A	A	A	X	X
Diisobutylene	A		A	A	A	A	A
Dimethylamine	50°C	A	A	A	A	X	X
Epichlorhydrin	65°C		A	A	A	X	A
Ethyl Acetate	65°C	A	A	A	A	X	A
Ethyl Alcohol (Ethanol)	A	A	A	A	A	A	A
Ethylamine	40°C	A	A	A	A	X	A
Ethyl Chloride	A	A	A	A	A	A	X
Ethyl Chloroacetate	100°C		A	A	A	A	A
Ethylene Bromide	A		A	A	A	A	X
Ethylene Chlorohydrin	65°C		A	A	A	A	A
Ethylene Glycol	A	A	A	A	A	A	A
Ethylene Oxide	A	A	A	A	A	X	X
Ferric Chloride	A	A	A	A	A	A	A
Ferric Hydroxide	A		A	A	A	X	A
Ferric Nitrate	A	A	A	A	A	A	A
Ferric Sulfate	A	A	A	A	A	A	A
Ferrous Chloride	A	A	A	A	A	A	A
Ferrous Hydroxide	A		A	A	A	X	A
Ferrous Nitrate	A		A	A	A	A	A
Ferrous Sulfate	A	A	A	A	A	A	A
Fluorine (Gaseous)	40°C		X	X	A	X	X
Formaldehyde (37% in H ₂ O)	65°C	A	A	A	A	A	A
Freon 11	A	A	A	A	A	A	X
Freon 12	A		A	A	A	A	A
Freon 22	A		A	A	A	X	X
Fumaric Acid	95°C		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	
	ETFE	Alumina Ceramic	PTFE	Carbon Graphite	Silicon Carbide (Option)	Viton	EPDM (Option)
Gasoline-Unleaded	A	A	A	A	A	A	X
Glycerol	A		A	A	A	A	A
Glycolic Acid	A		A	A	A	A	A
Glycol	A		A	A	A	A	A
Heptane	A	A	A	A	A	A	X
Hexane	A	A	A	A	A	A	X
Hydrobromic Acid (50%)	A	C	A	A	A	A	A
Hydrochloric Acid (20%)	A	A	A	A	A	A	A
Hydrochloric Acid (Conc.)	A	80°C	A	A	A	A	X
Hydrochloric Acid (Gas)	A		A	A	A	A	X
Hydrocyanic Acid	A		A	A	A	A	A
Hydrofluoric Acid (35%)	A	X	A	X	A	X	A
Hydrofluoric Acid (70%)	A	X	A	X	A	X	X
Hydrofluoric Acid (100%)	A	X	A	X	A	X	X
Hydrogen Cyanide	A	A	A	A	A	A	A
Hydrogen Peroxide (30%)	A	A	A	X	A	A	A
Hydrogen Peroxide (90%)	65°C	A	A	X	A	A	X
Hydrogen Sulfide (Dry)	A		A	A	A	X	A
Hydrogen Sulfide (Wet)	A	A	A	A	A	X	A
Hypochlorous Acid	A		A	X	A	A	A
Iodine (Dry)	A		A	X	A	X	A
Iodine (Wet)	A	A	A	X	A	A	A
Isobutyl Alcohol	A		A	A	A	A	A
Isopropylamine	50°C		A	A	A	X	X
Jet Fuel - JP4	A		A	A	A	A	X
Lactic Acid	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
Lithium Bromide	A		A	X	A	A	X
Lithium Hydroxide	A		A	X	A	X	A
Lubricating Oil	A		A	A	A	A	X
Magnesium Carbonate	A	A	A	A	A	A	X
Magnesium Chloride	A	A	A	A	A	A	A
Magnesium Hydroxide	A	A	A	A	A	A	A
Magnesium Nitrate	A	A	A	A	A	A	A
Magnesium Sulfate	A	A	A	A	A	A	A
Maleic Acid	A	A	A	A	A	A	X
Maleic Anhydride	95°C		A	A	A	A	X
Malic Acid	A		A	A	A	A	X
Mercuric Chloride	A	A	A	A	A	A	A
Methacrylic Acid	95°C		A	A	A	X	A
Methyl Alcohol (Methanol)	A	A	A	A	A	X	A
Methyl Benzoate	A		A	A	A	A	X
Methyl Bromide	A		A	A	A	A	A
Methyl Chloride	100°C		A	A	A	A	X
Methyl Chloroform	65°C		A	A	A	X	A
Methyl Ethyl Keytone (MEK)	100°C	A	A	A	A	X	X
Methyl Sulfuric Acid	100°C		A	A	A	A	A
Methylene Bromide	100°C		A	A	A	A	X
Methylene Chloride	100°C	A	A	A	A	A	X
Methylene Iodide	100°C		A	A	A	A	X
Methyl Methacrylate	80°C		A	A	A	X	X
Monochlorobenzene	A		A	A	A	A	X
Monoethanolamine	65°C		A	A	A	X	A
Nickel Chloride	A	A	A	A	A	A	A
Nickel Nitrate	A	A	A	A	A	A	A
Nickel Sulfate	A	A	A	A	A	A	A
Nitric Acid (Conc. 70%)	25°C	A	A	X	A	A	X
Nitric Acid (50%)	65°C	A	A	X	A	A	X

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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	
	ETFE	Alumina Ceramic	PTFE	Carbon Graphite	Silicon Carbide (Option)	Viton	EPDM (Option)
Nitrous Acid	100°C	A	A	X	A	A	X
Oleic Acid	A	A	A	A	A	A	A
Oleum	50°C	A	A	X	A	A	X
Oxalic Acid	A	A	A	A	A	X	A
Perchloric Acid (72%)	65°C	A	A	A	A	A	X
Perchloric Acid (10%)	A	A	A	A	A	A	X
Perchloroethylene	A	A	A	A	A	A	X
Phenol (100%)	100°C	A	A	A	A	A	X
Phenol (10%)	A	A	A	A	A	A	X
Phosphoric Acid (30%)	A	A	A	A	A	A	A
Phosphoric Acid (85%)	A	A	A	A	A	A	A
Phosphorus Oxychloride	100°C	A	A	A	A	A	A
Phosphorus Pentachloride	100°C		A	A	A	A	A
Phosphorus Trichloride	A	A	A	A	A	A	A
Phthalic Anhydride	100°C	A	A	A	A	X	A
Potassium Aluminum Chloride	A		A	A	A	A	A
Potassium Bicarbonate	A	A	A	A	A	A	A
Potassium Bromate	A		A	A	A	A	A
Potassium Bromide	A	C	A	A	A	A	A
Potassium Carbonate	A	X		A	A	A	A
Potassium Chlorate	A	C	A	A	A	A	A
Potassium Chloride	A	A	A	A	A	A	A
Potassium Cyanide	A	X	A	A	A	A	A
Potassium Fluoride	A		A	A	A	A	A
Potassium Hydroxide (25%)	100°C	X	A	X	A	X	A
Potassium Hypochlorite	A	X	A	X	A	A	X
Potassium Nitrate	A	C	A	A	A	A	A
Potassium Perchlorate	100°C		A	X	A	A	X
Potassium Permanganate	A	A	A	A	A	A	A
Potassium Sulfate	A	A	A	A	A	A	A
Propionic Acid	100°C		A	A	A	A	A
Propyl Alcohol	100°C		A	A	A	A	A
Propylene Dichloride	100°C	A	A	A	A	A	X
Propylene Oxide	65°C	A	A	X	A	A	A
Salicylic Acid	A		A	A	A	A	A
Salt Brine	A		A	X	A	A	A
Sea Water	A	A	A	A	A	A	A
Silicon Tetrachloride	A		A	A	A	A	A
Silver Cyanide	A	A	A	A	A	X	A
Silver Nitrate	A		A	A	A	A	A
Sodium Acetate	A	A	A	A	A	X	A
Sodium Bicarbonate	A	A	A	A	A	A	A
Sodium Bisulfate	A	A	A	A	A	A	A
Sodium Borate (Borax)	100°C	A	A	A	A	A	A
Sodium Bromide	A	A	A	A	A	A	A
Sodium Carbonate	A	A	A	A	A	A	A
Sodium Chlorate	A	A	A	A	A	A	A
Sodium Chloride	A	A	A	A	A	A	A
Sodium Chromate	A	A	A	X	A	A	A
Sodium Cyanide	A	A	A	A	A	A	A
Sodium Dichromate	100°C	A	A	A	A	A	A
Sodium Ferrocyanide	A	A	A	A	A	A	A
Sodium Fluoride	A	X	A	A	A	A	A
Sodium Glutamate	A		A	A	A	A	A
Sodium Hydroxide	A	A	A	A	A	X	A
Sodium Hypochlorite	A	A	A	X	A	A	X
Sodium Hyposulfite	A		A	A	A	A	A
Sodium Iodide	A		A	A	A	A	X
Sodium Metasilicate	A		A	A	A	A	A
Sodium Nitrate	A	A	A	A	A	A	A
Sodium Nitrite	A	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	
	ETFE	Alumina Ceramic	PTFE	Carbon Graphite	Silicon Carbide (Option)	Viton	EPDM (Option)
Sodium Perchlorate	65°C		A	A	A	A	A
Sodium Peroxide	A	A	A	X	A	A	A
Sodium Persulfate	80°C		A	A	A	A	A
Sodium Phosphate	A	A	A	A	A	A	A
Sodium Silicate	A	A	A	A	A	A	A
Sodium Sulfate	A	A	A	A	A	A	A
Sodium Sulfide	A	A	A	A	A	A	A
Sodium Sulfite	A	A	A	A	A	A	A
Sodium Thiosulfate	A	A	A	A	A	A	A
Stannous Chloride	A	A	A	A	A	A	A
Stannous Fluoride	A		A	X	A	A	A
Stearic Acid	A	A	A	A	A	A	A
Styrene Monomer	100°C		A	A	A	A	X
Succinic Acid	A		A	A	A	X	X
Sulfamic Acid	100°C		A	X	A	A	X
Sulfur (Molten)	A		A	X	A	A	X
Sulfur Dioxide	A	A	A	X	A	A	A
Sulfuric Acid (60%)	A	A	A	A	A	A	A
Sulfuric Acid (Conc.)	A	A	A	A	A	A	X
Sulfuric Acid (Fuming-Oleum)	50°C		A	X	A	A	X
Sulfurous Acid	A	A	A	A	A	A	X
Tannic Acid	A	A	A	A	A	A	X
Tartaric Acid	A	A	A	A	A	A	A
Tetrahydrofuran	100°C	A	A	A	A	X	X
Thionyl Chloride	100°C		A	A	A	A	X
Tin Tetrachloride	A		A	X	A	A	X
Titanium Tetrachloride	100°C		A	A	A	A	X
Toluene	A	A	A	A	A	A	X
Tributyl Phosphate	65°C	A	A	A	A	X	X
Trichloroacetic Acid	100°C		A	A	A	A	A
Trichloroethylene	A	A	A	A	A	A	X
Trichloromethane	100°C		A	A	A	A	X
Triethylamine	A	A	A	A	A	A	A
Trioxane	50°C		A	A	A	X	X
Turpentine	A	A	A	A	A	A	X
Urea (50% H2O)	A	C	A	A	A	X	X
Vinyl Acetate	A	C	A	A	A	X	X
Vinyl Chloride (Monomer)	65°C	A	A	A	A	A	X
Water	A	A	A	A	A	A	A
Wax (Paraffin)	A		A	A	A	A	X
Xylene	A	A	A	A	A	A	X
Zinc Acetate	A		A	A	A	X	A
Zinc Chloride	A	C	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

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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.