CHEMSTEEL™ PUMP

CHEMSTEEL PUMPS SERIES R104 M

FEATURES

Gear/bearing design allows for “trimming” for optimizing the pump’s maximum flow to reach minimum turndown or to match flow to a specific OEM’s requirement.

Special materials combinations are available for specific liquids:

- Stainless or Alloy C housing construction.
- Gears available in 316stainless and Alloy C. Also in Polytetrafluoroethylene (PTFE) and Polyetheretherketone .
- Shafts are 316 stainless steel or Alloy C.
- Bearings available in carbon or Polytetrafluoroethylene (PTFE).
- Full range of seal options including lip seal, packing and mechanical design.

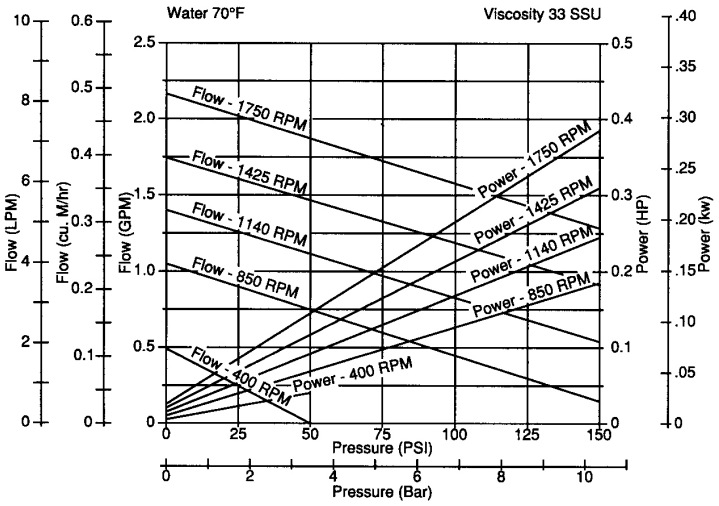
DRIVE

The pump is driven directly from the electric motor shaft by means of a flexible coupling. A close-coupled adapter connects the pump to the motor.

LIQUIDS AND TEMPERATURE

This pump is suitable to handle clear lubricating and non-lubricating fluids at temperatures to 450F. These pumps will handle viscous fluids to 100,000 cps (462,000 SSU) at reduced shaft speeds.

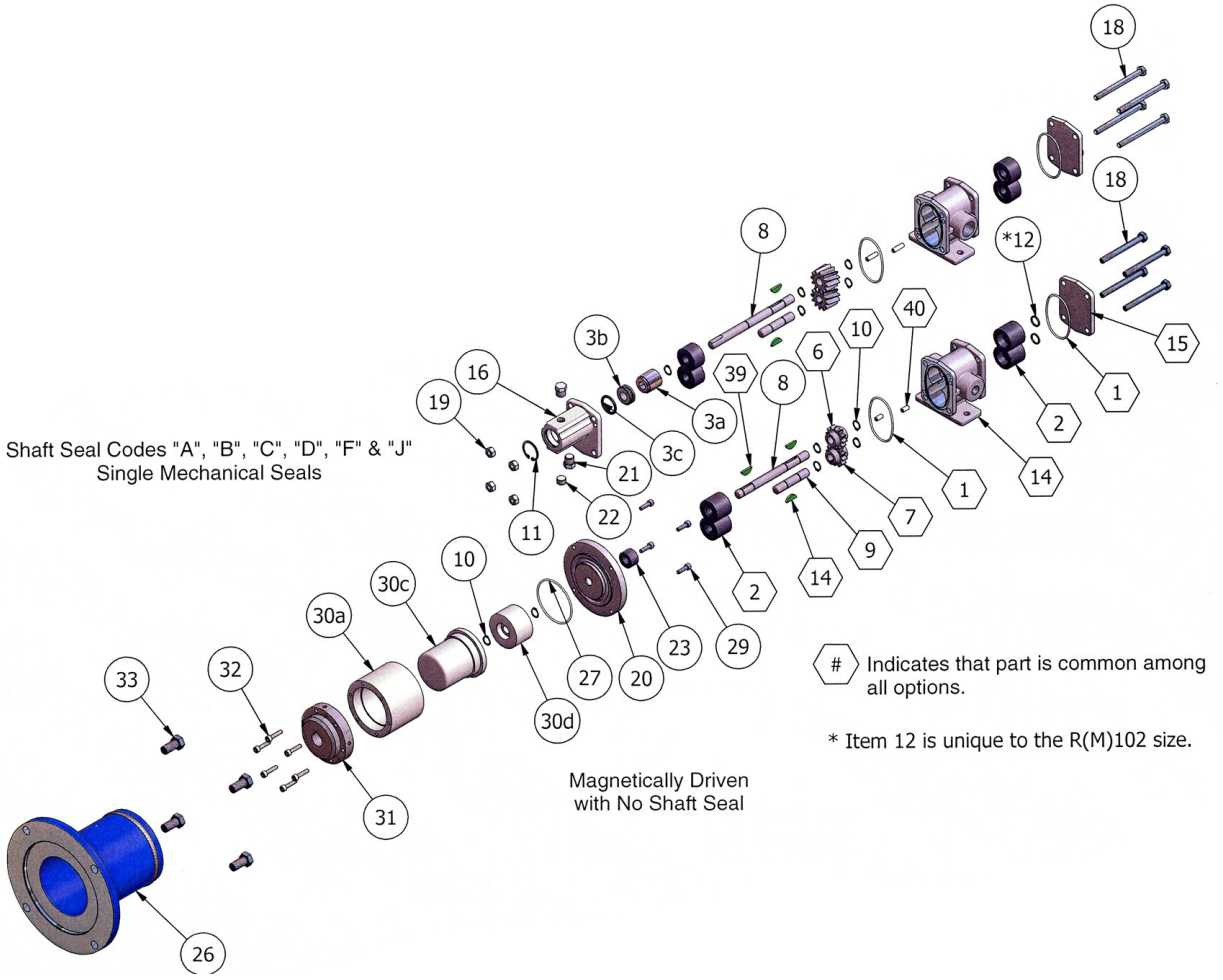
PERFORMANCE

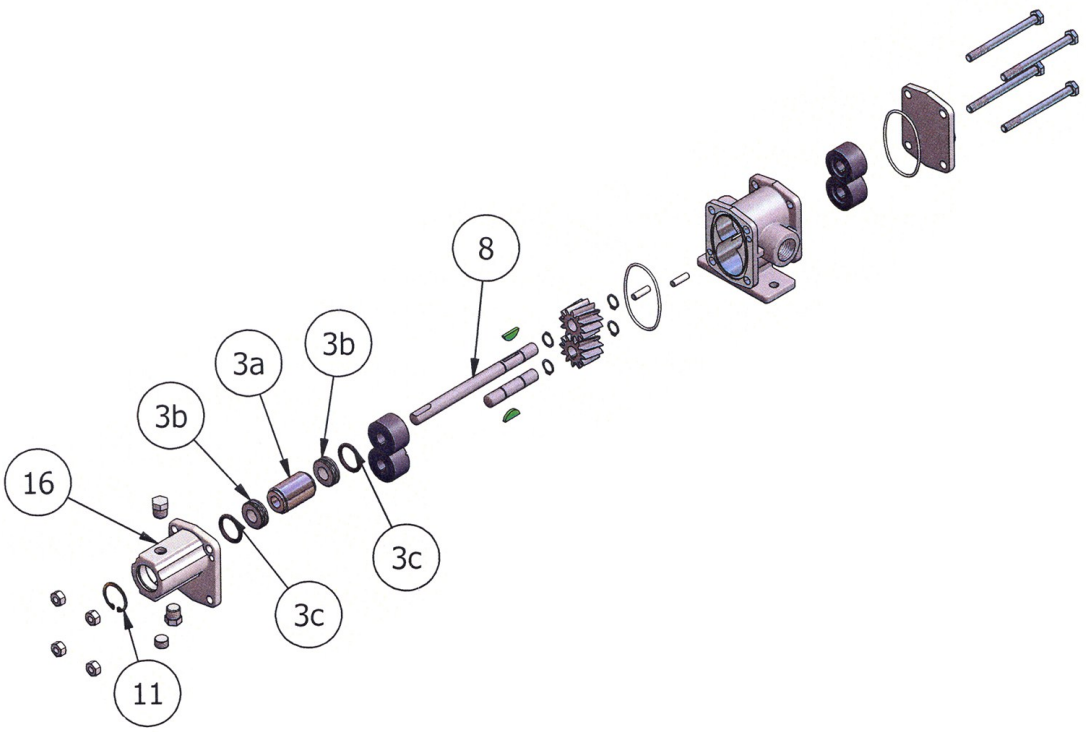


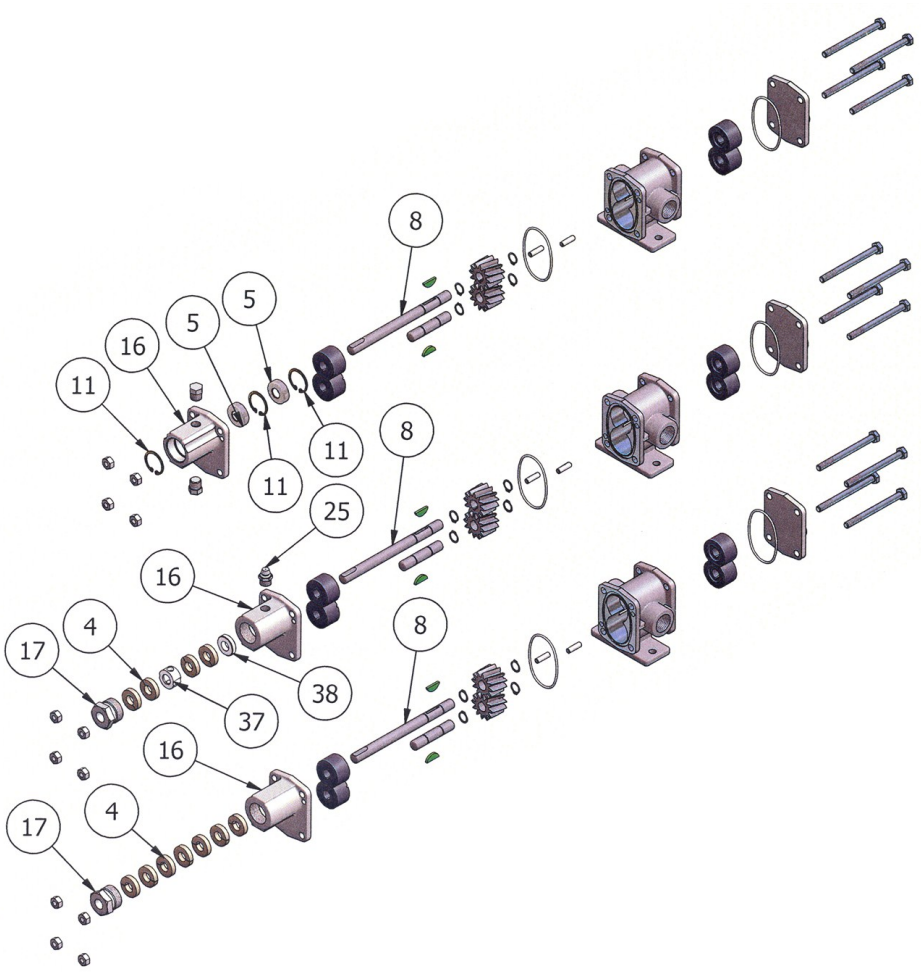
SUCTION LIFT

This pump has a suction lift capability of 20 feet for a new pump. Though gear pumps are self-priming, a foot valve is recommended. If possible, wet gears with the liquid to be pumped for the first dry start. Liquid retained in the system and gear chambers serves to wet the pump on subsequent starts.

EXPLODED VIEW AND PARTS LIST







Shaft Seal Codes ·.
Packing with Lante.

Shaft Seal Codes "N", "P" & "Q"
Packing

SERIES R104 / RM104 METAL PUMPS

Revised 01/27/05

CHEMkit Parts

No.	Part No.	Part Name	Req.	GEAR CODE													
				1	2	3	4	5	6	7	8	9	A	B	C	E	F
6	9656-01A	Drive Gear-Ryton PPS	1														
6	9698-01A	Drive Gear-316 SS	1														
6	9393-01A	Drive Gear-PEEK	1														
6	9149-01A	Drive Gear-Alloy C	1														
6	9150-01A	Drive Gear-W 88	1														
6	9151-01A	Drive Gear-Teflon	1														
7	9656-02A	Idle Gear- Ryton PPS	1														
7	9698-02A	Idle Gear-316 SS	1														
7	9393-02A	Idle Gear-PEEK	1														
7	9149-02A	Idle Gear-Alloy C	1														
7	9150-02A	Idle Gear-W 88	1														
7	9151-02A	Idle Gear-Teflon	1														

No.	Part No.	Part Name	Req.	BEARING CODE		
				C	P	J
2	9235TC-A	Bearing, Carbon Graphite	4			
2	9400TC-A	Bearing, Teflon	4			
2	9425TC-A	Bearing, Rulon	4			
23	2313	5th Bearing, Carbon Graphite	1			
23	2314	5th Bearing , Rulon	1			

No.	Part No.	Part Name	Req.	SEAL CODE's															MAG CODE's	
				A	B	C	D	F	G	H	J	Z	L	N	P	Q	R	S	T	M	W
1	9355-031	O-Ring, Body -Teflon Encapsulating Silicone	2																	
3	32674A	Single Mech. Stainless Wedge Carb/Ceramic/TFE/Kalrez	1																	
3	32823	Single Mech. Alloy C Wedge Carb/Ceramic/TFE/Kalrez	1																	
3	33067	Single Mech. Stainless Wedge Carb/SilCarb/TFE/Kalrez	1																	
3	33068	Single Mech. Alloy C Wedge Carb/SilCarb/TFE/Kalrez	1																	
3	33065	Single Mechanical Bellows Carb/Ceramic/Viton/Viton	1																	
3	33073	Single Mechanical Bellows SilCarb/Silcarb/EPDM/EPDM	1																	
3	33075	Double Mechanical Wedge Carb/SilCarb/TFE/Kalrez	1																	
3	33078	Double Mechanical Bellows Carb/Ceramic/Viton/Viton	1																	
3	33131	Single Mechanical Bellows SilCarb/Silcarb/Viton/Viton	1																	
4	9140	Packing Ring, Teflon with Graphite	7 or 4											7			4				
4	9483	Packing Ring, Grafoil	7 or 4												7			4			
4	2498	Packing Ring, Teflon	8 or 5													8			5		
5	2748	Lip Seal	2																		
8	3127	Drive Shaft - Single Mechanical Seals (Stainless)	1																		
8	3128	Drive Shaft - Single Mechanical Seals (Alloy C)	1																		
8	3129	Drive Shaft (Stainless)	1																		
8	3130	Drive Shaft (Alloy C)	1																		
8	2306	Drive Shaft - Mag (Stainless)	1																		
8	2307	Drive Shaft - Mag (Alloy C)	1																		
9	3131	Idle Shaft (Stainless)	1																		
9	3132	Idle Shaft (Alloy C)	1																		
10	2067	Clip, Retaining (Stainless)	4,5, or 6	5	5	5	5	5	4	4	5	5	4	4	4	4	4	4	4	5	6
10	2068	Clip, Retaining (Alloy C)	4,5, or 6	5	5	5	5	5	4	4	5	5	4	4	4	4	4	4	4	5	6
11	7065	Retaining Ring	1 or 3	1	1	1	1	1	1	1	1	1	3								
39	9524	Key, Woodruff	1																		
14	9524	Key, Woodruff	2																		

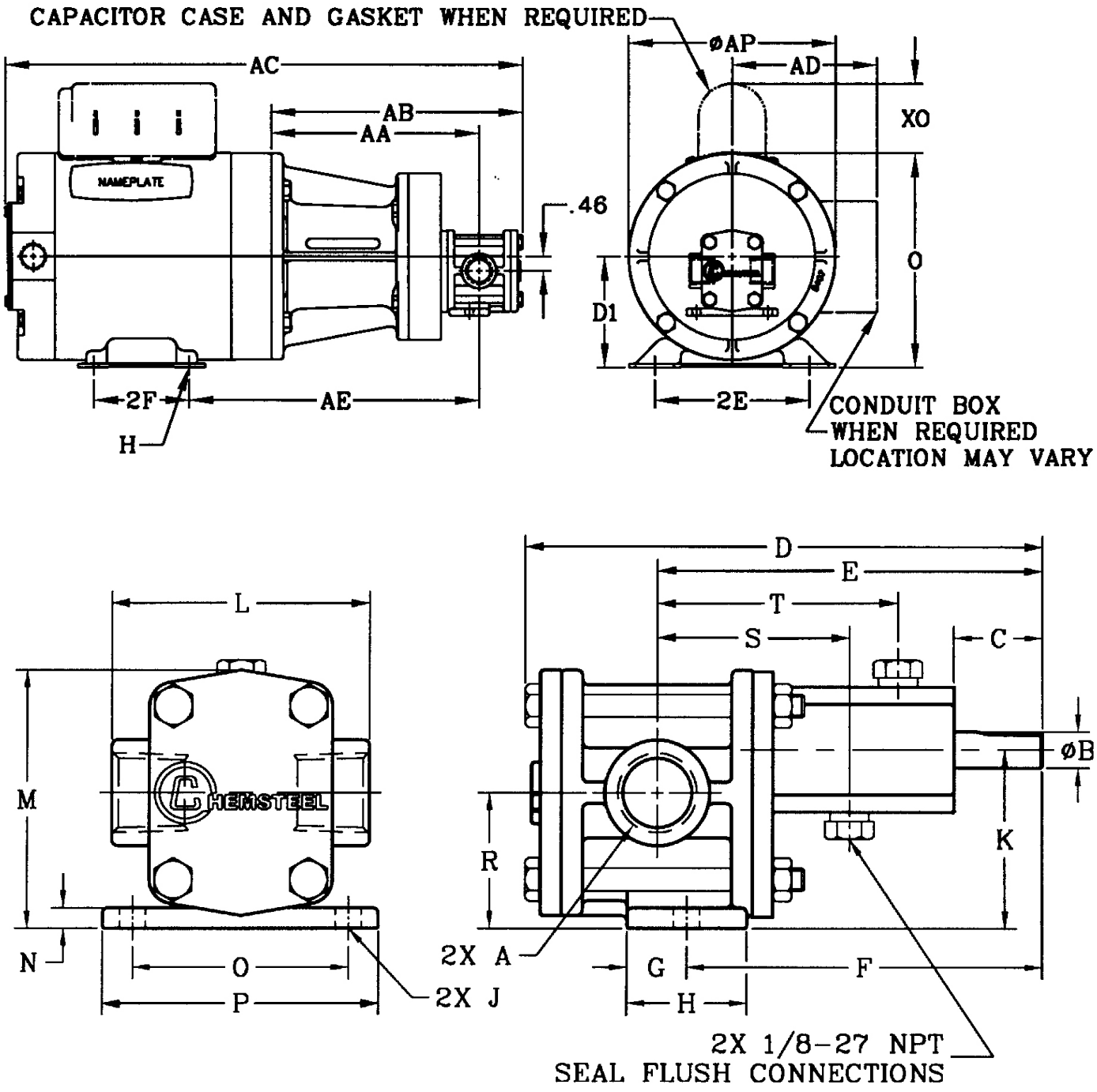
Other Parts

No.	Part No.	Part Name	Req.	SEAL CODE's															MAG CODE's	
				A	B	C	D	F	G	H	J	Z	L	N	P	Q	R	S	T	M	W
14	9127S-5P	Body with 1/2" NPT Ports (Stainless)	1																		
14	9127H-5P	Body with 1/2" NPT Ports (Alloy C)	1																		
15	9128S-1	Rear Cover (Stainless)	1																		
15	9128H-1	Rear Cover (Alloy C)	1																		
16	9130S-3	Front Cover, Single/ Double Mechanical (Stainless)	1																		
16	9130H-3	Front Cover, Single/ Double Mechanical (Alloy C)	1																		
16	9129S-5	Front Cover, Lip (Stainless)	1																		
16	9129S-1	Front Cover, Packing (Stainless)	1																		
16	9129H-1	Front Cover, Packing (Alloy C)	1																		
16	9129S-3	Front Cover, Lantern Packing (Stainless)	1																		
16	9129H-3	Front Cover, Lantern Packing (Alloy C)	1																		
17	9138	Pack Nut (Stainless)	1																		
17	2746	Pack Nut (Alloy C)	1																		
18	9365-070	Hex Head Cap Screws	4																		
18	9365-062	Hex Head Cap Screws (Mag)	4																		
19	9367	Hex Nuts	4																		
40	9793	Dowel Pin	2																		
21	6600-01	Hex Head Pipe Plug (Stainless)	2																		
21	6600-02	Hex Head Pipe Plug (Alloy C)	2																		
25	5390-01	Grease Lubrication Fitting	1																		
38	2695	Starter Ring	1																		
37	2671	Lantern Ring	1																		
20	2312S	Pump Adapter (Stainless)	1																		
20	2312H	Pump Adapter (Alloy C)	1																		
26	2302-01	Bell Housing	1																		
27	9355-033	O-Ring, Containment Can -Teflon Encapsulating Silicone	1																		
29	2481-014	Hex Head Cap Screws (Bell/Pump Adapter)	4																		
30 a b c d	2023-3NS	Magnet Kit, Neo (Stainless)	1																		
30 a b c d	2023-3NH	Magnet Kit, Neo (Alloy C)	1																		
30a b c d	2023-3SS	Magnet Kit, Sam C (Stainless)	1																		
30a b c d	2023-3SH	Magnet Kit, Sam C (Alloy C)	1																		

31,32,33,34,35	catalog	Mag - Power End Kit (motor hub, adapters, hardware)
	2464	Optional Mag Foot Kit (not shown)
	catalog	Sealed - Close Coupled Adapter Kit (not shown- faceplate, motor adapter, couplings, hardware)
	catalog	Sealed- Long Mount Bedplate Kits (not shown - base, shims, couplings, coupling guard, hardware)
	catalog	Motors (not shown)
	catalog	Pressure Relief Valve (not shown)

Series	Model	Repair Kit
R104 M	R10437CD-C1	R10437CD-C1K
	R10437CD	R10437CDK
	R10434CD	R10434CDK
	R10431CR	R10431CRK
	R10431CN	R10431CNK
	R1041FPJ-C3	R1041FPJ-C3K
	R1041FPJ	R1041FPJK
	R1041FPH-C1	R1041FPH-C1K
	R1041FPH	R1041FPHK
	R1041FPC-T5C1	R1041FPC-T5C1K
	R1041FPC-T5	R1041FPC-T5K
	R1041FPC-C1	R1041FPC-C1K
	R1041FPC	R1041FPCK
	R1041FPB	R1041FPBK
	R1041FJC	R1041FJCK
	R1041FCB-C1	R1041FCB-C1K
	R1041FCB	R1041FCBK
	R1041FCA-J98	R1041FCA-J98K
	R1041EPB	R1041EPBK
	R1041EPA	R1041EPAK
	R1041ECC-C2	R1041ECC-C2K
	R1041ECC-C1	R1041ECC-C1K
	R1041ECC	R1041ECCK
	R1041ECB-X1	R1041ECB-X1K
	R1041ECB-EC4	R1041ECB-EC4K
	R1041ECB-E	R1041ECB-EK

DIMENSIONS


CAPACITOR CASE AND GASKET WHEN REQUIRED
AC
AB
AA
NAMEPLATE
.46
ØAP
AD
XO
O
D1
2F
AE
H
2E
CONDUIT BOX
WHEN REQUIRED
LOCATION MAY VARY
L
M
N
O
P
2X J
D
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T
S
C
ØB
K
R
2X A
G
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2X 1/8-27 NPT
SEAL FLUSH CONNECTIONS

SHAFT CENTERLINE STUDY

Metal

Series	A	B	C			D	E	F	G	H	J	K		L	M	N	O	P	R
			Mechanical	Pack [1]	Lip						Diameter	Standard drive	Lower drive						
103	0.25	0.375	0.92	0.72	1.25	5.36	4.00	3.69	0.63	1.25	0.28	1.88	0.95	2.69	2.69	0.22	2.25	2.88	1.41
104/106	0.50	0.375	0.92	0.72	1.25	5.36	4.00	3.69	0.63	1.25	0.28	1.88	0.95	2.69	2.69	0.22	2.25	2.88	1.41
2	0.50	0.500	1.28	0.72	1.26	6.28	4.60	4.22	0.56	1.38	0.34	2.63	1.33	2.63	3.75	0.25	2.25	3.00	1.97
4	0.75	0.625	1.65	1.02	1.60	7.56	5.38	4.28	1.13	2.13	0.34	3.00	1.50	3.38	4.33	0.25	2.50	3.38	2.25
9	1.50	0.625	1.65	1.02	1.60	7.81	5.50	4.16	1.25	2.13	0.41	3.88	1.88	4.00	5.53	0.25	3.00	4.00	2.88

Overall Cover length

				less 25%					
Mechanical	Pack	nut #	nut length	engagement	Pack+exposed nut	diff	Lip	diff
2.07	1.72	9138	0.74	0.55	2.27	**-0.201**	1.74	**0.330**
2.07	1.72	9138	0.74	0.55	2.27	**-0.201**	1.74	**0.330**
2.06	2.06	7552	0.75	0.56	2.62	**-0.563**	2.08	**-0.020**
2.03	2.05	8347	0.81	0.61	2.66	**-0.628**	2.08	**-0.050**
2.03	2.05	8347	0.81	0.61	2.66	**-0.628**	2.08	**-0.048**

9 Series Metallic

	A	B	C			D	E	F	G	H	J	K		L	M	N	O	P	R
			Mechanical	Pack [2]	Lip						Diameter	Standard drive	Lower drive						
inches	1.50	0.625	1.65	1.65	1.65	7.81	5.50	4.16	1.25	2.13	0.41	3.88	1.88	4.00	5.53	0.25	3.00	4.00	2.88
millimeters		*15.9*	*41.9*	*41.9*	*41.9*	*198.4*	*139.7*	*105.7*	*31.8*	*54.1*	*10.4*	*98.4*	*47.6*	*101.6*	*140.5*	*6.4*	*76.2*	*101.6*	*73.2*

Notes:
1 Dimension is approximated with packing nut installed

9 Series Non-Metallic

	A	B	C			D	E	F	G	H	J	K		L	M	N	O	P	R	S		T	
			Mechanical	Pack [1]	Lip						Diameter	Standard drive	Lower drive							Mechanical	Lip	Mechanical	Lip
inches	1.50	0.625	1.29	1.00	1.61	8.21	5.50	4.55	1.25	3.50	0.40	3.98	1.98	4.19	5.89	0.29	4.25	5.63	2.98	2.76	3.13	3.21	1.73
millimeters		*15.9*	*32.8*	*25.4*	*40.9*	*208.5*	*139.7*	*115.6*	*31.8*	*88.9*	*10.2*	*101.1*	*50.3*	*106.4*	*149.6*	*7.4*	*108.0*	*143.0*	*75.7*	70.1	0	81.5	43.9

Notes:
1 Dimension is approximated with packing nut installed

4 Series Metallic

	A	B	C			D	E	F	G	H	J	K		L	M	N	O	P	R
			Mechanical	Pack [1]	Lip						Diameter	Standard drive	Lower drive						
inches	0.75	0.625	1.65	1.02	1.60	7.56	5.38	4.28	1.13	2.13	0.34	3.00	1.50	3.38	4.33	0.25	2.50	3.38	2.25
millimeters		*15.9*	*41.9*	*26.0*	*40.6*	*192.0*	*136.7*	*108.7*	*28.7*	*54.1*	*8.6*	*76.2*	*38.1*	*85.9*	*110.0*	*6.4*	*63.5*	*85.9*	*57.2*

Notes:
1 Dimension is approximated with packing nut installed

2 Series Metallic

	A	B	C			D	E	F	G	H	J	K		L	M	N	O	P	R
			Mechanical	Pack [2]	Lip						Diameter	Standard drive	Lower drive						
inches	0.50	0.50	1.28	0.72	1.26	6.28	4.60	4.22	0.56	1.38	0.34	2.63	1.33	2.63	3.75	0.25	2.25	3.00	1.97
millimeters		*12.7*	*32.5*	*18.2*	*32.0*	*159.5*	*116.8*	*107.2*	*14.2*	*35.1*	*8.6*	*66.7*	*33.7*	*66.8*	*95.3*	*6.4*	*57.2*	*76.2*	*50.0*

Notes:
1 Dimension is approximated with packing nut installed

2 Series Non-Metallic

	A	B	C			D	E	F	G	H	J	K		L	M	N	O	P	R	S		T	
			Mechanical	Pack [1]	Lip						Diameter	Standard drive	Lower drive							Mechanical	Lip	Mechanical	Lip
inches	0.50	0.50	1.21"	0.72	2.25	6.67	4.38	3.82	1.12	2.38	0.26	2.38	1.08	2.50	3.41	0.22	2.88	3.50	1.73	2.19	1.73	2.75"	1.73
millimeters		*12.7*	*30.7*	*18.3*	*57.2*	*169.4*	*111.3*	*97.0*	*28.4*	*60.5*	*6.6*	*60.5*	*27.4*	*63.5*	*86.6*	*5.6*	*73.2*	*88.9*	*43.9*	55.6	43.9	69.9	43.9

Notes:
1 Dimension is approximated with packing nut installed

103 Series Metallic

	A	B	C			D	E	F	G	H	J	K		L	M	N	O	P	R
			Mechanical	Pack [1]	Lip						Diameter	Standard drive	Lower drive						
inches	0.25	0.38	0.92	0.72	1.25	5.36	4.00	3.69	0.63	1.25	0.28	1.88	0.95	2.69	2.69	0.22	2.25	2.88	1.41
millimeters		*9.5*	*23.4*	*18.3*	*31.8*	*136.1*	*101.6*	*93.7*	*16.0*	*31.8*	*7.1*	*47.6*	*24.0*	*68.3*	*68.3*	*5.6*	*57.2*	*73.2*	*35.8*

Notes:
1 Dimension is approximated with packing nut installed

104/106 Series Metallic

	A	B	C			D	E	F	G	H	J	K		L	M	N	O	P	R
			Mechanical	Pack [2]	Lip						Diameter	Standard drive	Lower drive						
inches	0.50	0.38	0.92	0.72	1.25	5.36	4.00	3.69	0.63	1.25	0.28	1.88	0.95	2.69	2.69	0.22	2.25	2.88	1.41
millimeters		*9.5*	*23.4*	*18.3*	*31.8*	*136.1*	*101.6*	*93.7*	*16.0*	*31.8*	*7.1*	*47.6*	*24.0*	*68.3*	*68.3*	*5.6*	*57.2*	*73.2*	*35.8*

Notes:
1 Dimension is approximated with packing nut installed
1

Non-Metallic

Series	A	B	C			D	E	F	G	H	J	K		L	M	N	O	P	R
			Mechanical	Pack [1]	Lip						Slot Width	Standard drive	Lower drive						
2	0.50	0.500	1.23	0.72	2.25	6.67	4.38	3.82	1.12	2.38	0.26	2.38	1.08	2.50	3.41	0.22	2.88	3.50	1.73
9	1.50	0.625	1.29	1.00	1.61	8.21	5.50	4.55	1.25	3.50	0.40	3.98	1.98	4.19	5.89	0.29	4.25	5.63	2.98

2674
2675

Notes: 1 Dimension is approximated with packing nut installed

MAINTENANCE

A three-part housing provides easy disassembly and service. Full size bearings match the gear diameter, and eliminate the need for separate wear plates. TFE encapsulating silicone o-ring pump housing seals provide elastic memory to assure an effective long lasting seal and thus avoiding the re-torqueing required of pumps using pure TFE. The upper shaft configuration lends itself to inline pump seal maintenance without the leakage of trapped chemicals from an incompletely drained pump.

LIFE CYCLE/COST OF OWNERSHIP

Pump design and materials selection,together provide the longest life available from a gear pump.
Key attributes include:

- Gear & bearing combinations of metallic and nonmetallic wear surfaces.
- Slotted bearings to lubricate shaft and gear surfaces.
- Hydraulic porting to balance axial thrust and to reduce wear.
- Ample port sizing to reduce the likelihood of cavitation when inlet pressure is marginal.
- Effective housing seals with elastic memory prevent leakage of corrosives.

FIT

Connections are 1/2” female NPT or BSPT, pump hardware is metric and close couple adapters mount to both NEMA and IEC standard motor frame sizes for worldwide acceptance. “Near” dimensional interchangeability offers easy upgrade to CHEMSTEEL™ pump. The port size is the same as competitive pumps.