

## CLARK SOLUTIONS

### S Series Rotary Gear Pump

Pressure to 200 PSI, Flow to 32 GPM, Drive Speed to 1800 RPM

#### DESCRIPTION

Series S pumps are general purpose positive displacement gear pumps and are a good choice for a variety of recirculating, mixing and transfer applications.

The pumps are available in cast iron, ductile iron, 316 SS and bronze. They are designed to operate at speeds to 1800 RPM, pressures to 200 PSI, and flow rates to 32 GPM. The standard seal is a mechanical self adjusting seal with Buna-N elastomer. Lubrication of the replaceable iron sleeve bearings is accomplished by the circulation of the pumped liquid. All models are available with foot or flange mounting and with integral relief valves.

These pumps are self-priming and uni-directional. The machining of the gears, shafts and housing faces are held to exacting tolerances (within 0.0005") This results in a pump with better lift, reduced slippage and longer service life. Standard pumps operate to 250°F and, with modifications, to 500°F.

Helical gears provide very smooth and quiet operation at direct motor speeds in hydraulic, lubrication and transfer applications, in oil field service as well as almost every other industry classification.

#### SPECIFICATIONS

##### GENERAL

Design: Drive speeds to 1800 RPM; discharge pressures to 200 PSI; flow rates to 32 GPM; foot or flange mounted; with or without integral relief valve.

Material: Cast Iron casings with precision machined, heat treated gears and case hardened shafts. Pumps are also available in Ductile Iron, 316 Stainless Steel and Carbon Steel.

Gears: helical gears

Bearings: Replaceable iron sleeve bearings. Also available with carbon graphite or bronze bearings.

Seal: Self adjusting mechanical seal. Also available with compression packing or lip seal. Mechanical seal and lip seals available with different elastomers for pumping different types of liquids.

Lubrication: Self-lubricating using the pumped liquid.

Also available for handling non-lubricating liquids.

Rotation: Pumps may be operated in either direction.

Discharge is always on the side of the pump toward which the top of the shaft rotates. Specify when ordering.

Liquid Viscosities: 32 SSU to 100,000 SSU. Adaptable for handling liquids from water soluble to molten lead.

Suction Lift: Up to 28" Hg / 31 feet depending on the type of liquid being pumped.

Drive Options: E-Drive (pump close coupled to motor); A-Drive (pump connected to C-face motor with adapter bracket and coupling); D-Drive (pump coupled to motor mounted on base plate); GR-Drive (pump coupled to gear reducer coupled to motor mounted on baseplate); B-Drive (pump and motor connected by V-belt and pulleys mounted on base plate).

Accessories: Repair Kits, Gear Sets, Bearing Kits, and Seal Kits.



S Series Gear Pump



#### FEATURES

##### • PRECISION GROUND JOINTS

**NO GASKETS-** Perhaps the biggest advantage to these pumps. As gaskets are not used, original tolerances are maintained for consistent performance and the time once lost in halting operations to replace a worn gasket is saved.

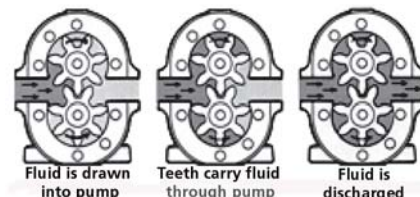
##### • BEARINGS

The heart of the pump. Sleeve and plain bearings are especially adapted to maintain even gear and shaft rotation for normal pump service. Anti-friction bearings minimize friction and provide higher load ratings for medium to high pressure service. Anti-friction and sleeve type bearings are replaceable.

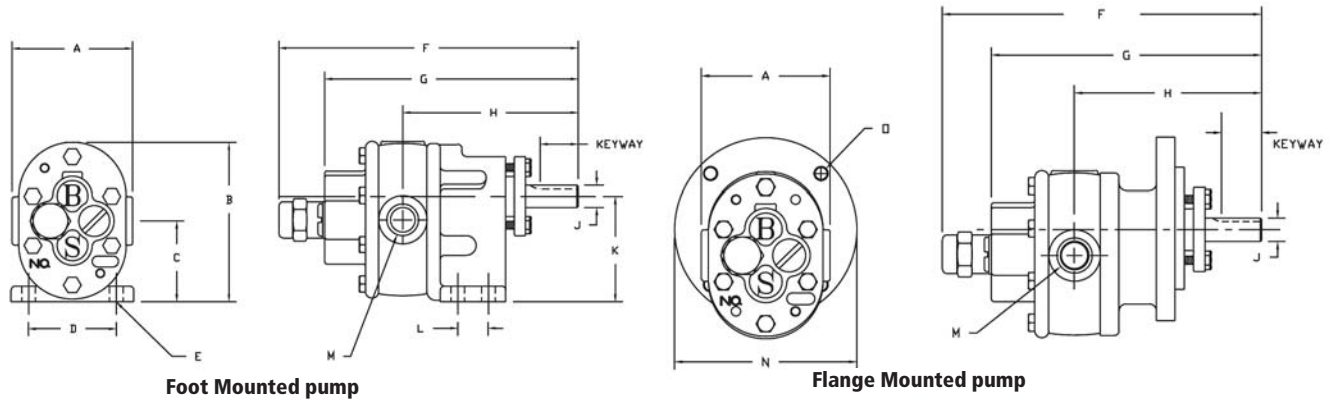
##### • SEALS

Self-adjusting mechanical seal provides an ample safeguard against liquid leakage and the entrance of air.

#### PRINCIPLE OF OPERATION



## PUMP DIMENSIONS (INCHES)



Note: Unit is dimensioned with optional integral relief valve (F dimension). The purpose of the relief valve is to relieve pressure in the pump when the discharge line is closed or otherwise obstructed. This is accomplished internally by routing the discharge back to the suction side of the pump when discharge pressure exceeds the set value. The relief valve is designed as a safety device and is not intended as a directional control valve nor is it intended for use under conditions calling for extended periods of by-pass. The relief valve should always be positioned on the discharge side of the pump. Placement on the suction side of the pump will render the pump inoperable.

Table 1

Model	A	B	C	D	E	F	G	H	J	K	L	M	N	O	Keyway
1S	3.00	3.69	1.78	2.00	0.39	7.50	6.25	4.56	0.56	2.38	0.75	3/8" NPT	4 7/8	3/8-16	1/8 x 1/16
2S	3.44	4.53	2.31	2.50	0.39	8.47	7.22	5.00	0.68	3.00	0.88	1/2" NPT	4 7/8	3/8-16	3/16 x 3/32
3S	4.44	5.72	2.88	3.00	0.45	10.50	8.88	6.19	0.75	3.88	1.25	3/4" NPT	4 7/8	3/8-16	3/16 x 3/32
4S	4.44	5.91	2.88	3.00	0.45	10.50	8.88	6.19	0.75	3.88	1.25	1" NPT	4 7/8	3/8-16	3/16 x 3/32
5S	5.00	5.97	2.88	3.00	0.45	10.50	8.88	6.69	0.75	3.88	1.25	1 1/4" NPT	4 7/8	3/8-16	3/16 X 3/32

## OPERATING CHARACTERISTICS

Table 2

Model	Gallons per Revolution	Slip GPM/PSI	Drive Speed RPM	0 PSI		50 PSI		75 PSI		100 PSI		14.018.5200 PSI	
				GPM	HP	GPM	HP	GPM	HP	GPM	HP	GPM	HP
1S	0.00262	0.0024	600	1.6	0.03	1.5	0.08	1.4	0.11	1.3	0.15	1.1	0.33
			860	2.3	0.04	2.1	0.13	2.07	0.18	2.0	0.23	1.8	0.49
			1140	3.0	0.06	2.9	0.17	2.8	0.23	2.7	0.30	2.5	0.63
			1725	4.5	0.14	4.4	0.29	4.3	0.36	4.28	0.48	4.0	0.95
2S	0.00521	0.0035	600	3.1	0.05	3.0	0.15	2.9	0.24	2.8	0.31	2.4	0.65
			860	4.5	0.08	4.3	0.22	4.2	0.34	4.1	0.45	3.8	0.93
			1140	5.9	0.13	5.8	0.31	5.7	0.41	5.6	0.51	5.2	1.00
			1725	9.0	0.44	8.8	0.64	8.7	0.78	8.6	0.94	8.3	1.60
3S	0.00947	0.0026	600	5.7	0.08	5.6	0.34	5.5	0.47	5.4	0.60	5.2	1.10
			860	8.1	0.25	8.0	0.54	7.9	0.68	7.8	0.83	7.6	1.50
			1140	10.8	0.38	10.7	0.77	10.6	0.97	10.5	1.10	10.2	2.00
			1725	16.2	0.92	16.1	1.40	16.0	1.7	15.9	2.00	15.7	3.10
4S	0.0135	0.009	600	8.1	0.30	7.9	0.50	7.8	0.6	7.7	0.80	7.4	1.20
			860	11.6	0.40	11.3	0.70	11.2	0.9	11.1	1.10	10.7	1.80
			1140	15.3	0.50	15.0	0.90	14.8	1.2	14.7	1.45	14.2	2.30
			1725	23.2	0.80	22.7	1.40	22.5	1.8	22.3	2.20	21.4	3.50
5S	0.0186	0.02	600	11.1	0.45	10.8	0.55	10.6	0.75	10.4	0.95	9.7	1.60
			860	15.9	0.65	15.5	0.80	15.2	1.0	15.0	1.30	14.0	2.30
			1140	21.1	0.80	20.5	1.10	20.2	1.4	19.8	1.80	18.5	3.10
			1725	32.0	1.30	31.0	1.60	30.5	2.1	30.0	2.70	28.0	4.70

Delivery and horsepower are based on liquid viscosity of 300 SSU at speed and pressures shown.

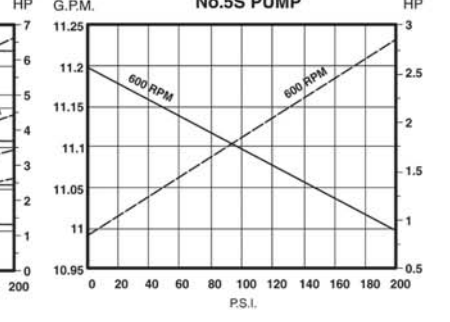
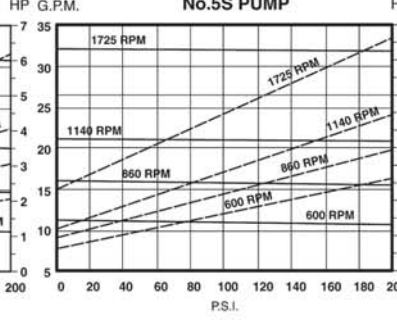
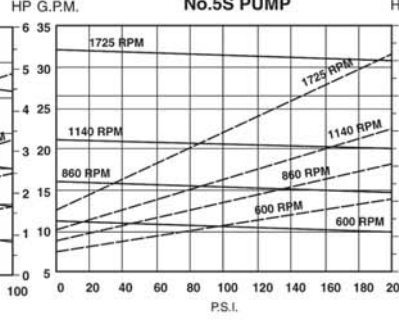
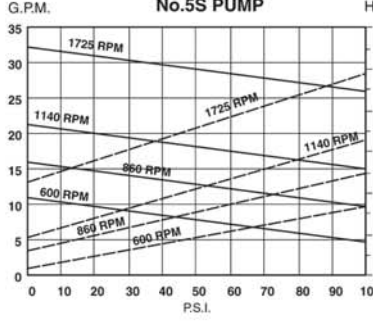
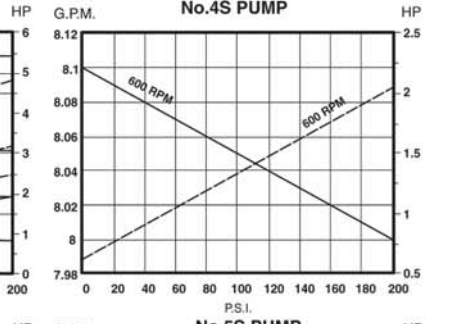
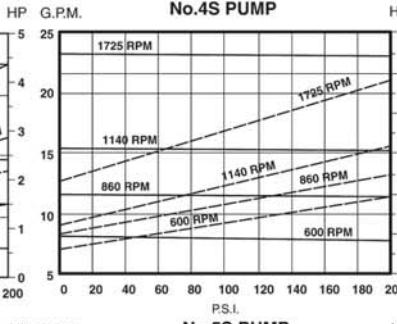
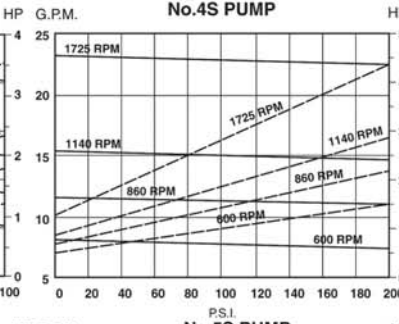
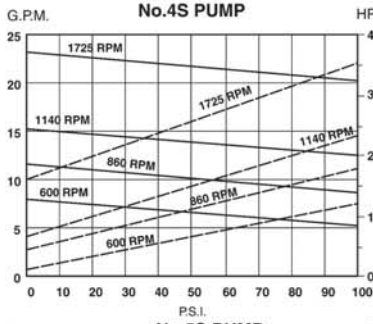
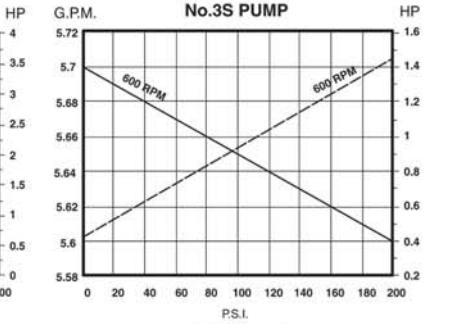
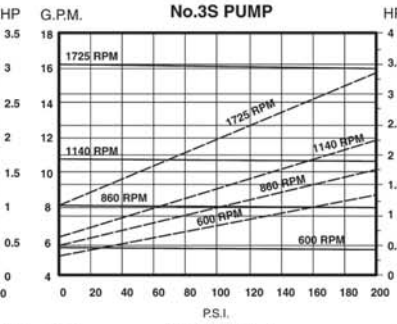
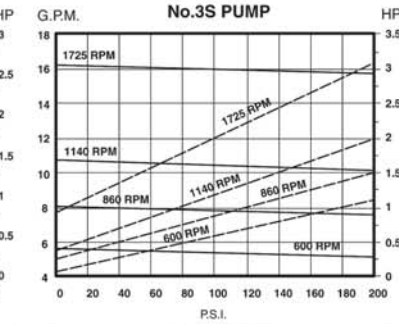
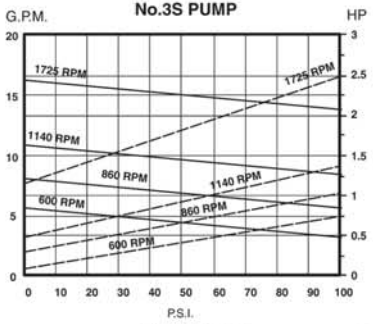
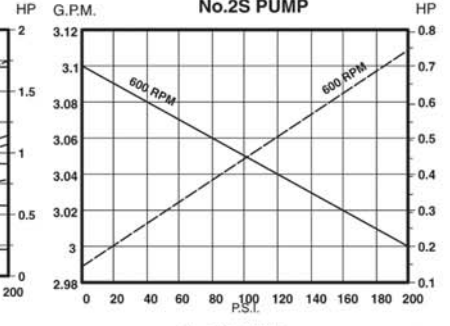
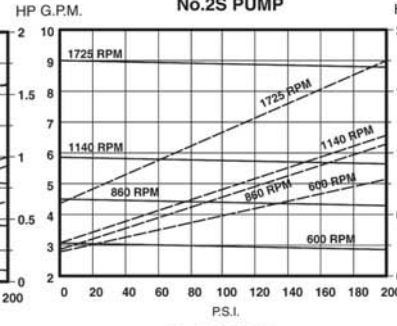
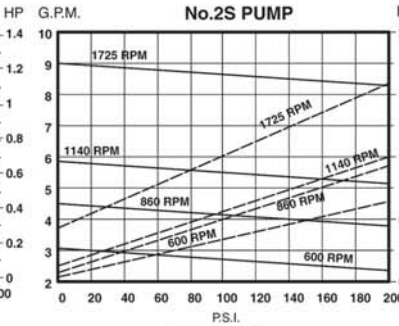
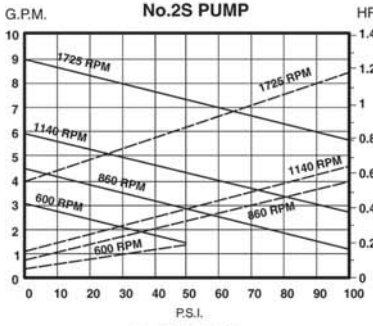
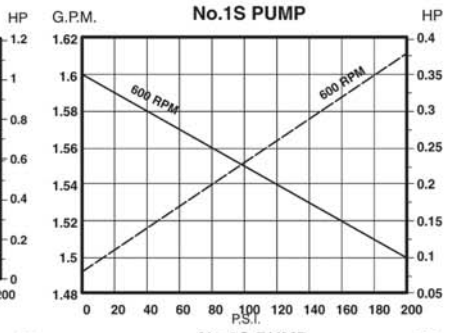
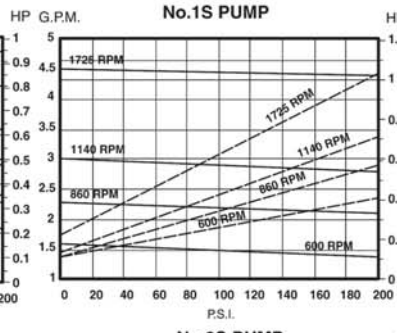
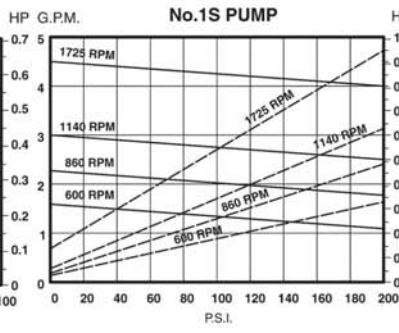
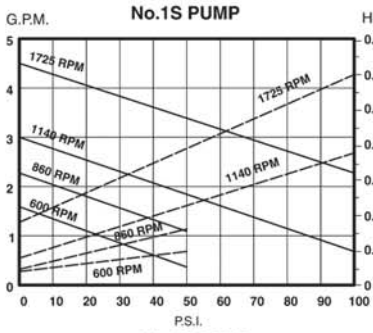
**SOLID LINE = GPM    BROKEN LINE= HP**

**32 SSU LIQUID**

**300 SSU LIQUID**

**1,000 SSU LIQUID**

**5,000 SSU LIQUID**





## PUMP DIMENSIONS (INCHES) DIRECT COUPLED TO STANDARD C-FACE MOTOR

S-Series pumps are available direct coupled to a Nema C-Face foot mounted motor. This assembly, referred to as an A-Drive, ensures accurate alignment and requires less space and is less costly than a pump and motor mounted on a baseplate.

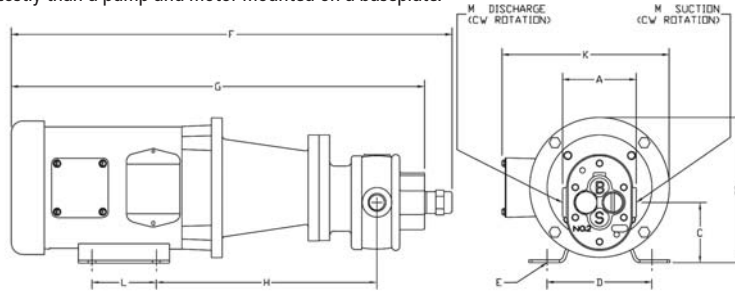


Table 3

Model	Motor Frame	A	B	C	D	E	F	G	H	K	L	M
1SA	56C	3.00	6.88	2.91	4.88	0.34	19.81	18.56	9.81	8.31	3.00	3/8
	145TC	3.00	6.88	2.91	5.50	0.34	21.53	20.28	10.12	8.56	5.00	3/8
	182TC	3.00	8.69	3.91	7.50	0.41	23.12	21.87	11.75	9.81	4.50	3/8
2SA	56C	3.44	6.88	2.81	4.88	0.34	20.78	19.53	10.25	8.31	3.00	1/2
	145TC	3.44	6.88	2.81	5.50	0.34	22.50	21.25	10.56	8.56	5.00	1/2
	182TC	3.44	8.69	3.81	7.50	0.41	24.09	22.84	12.19	9.81	4.50	1/2
	184TC	3.44	8.69	3.81	7.50	0.41	25.09	23.84	12.19	9.81	5.50	1/2
3SA	56C	4.44	6.88	2.50	4.88	0.34	22.82	21.19	11.43	8.31	3.00	3/4
	145TC	4.44	6.88	2.50	5.50	0.34	24.54	22.91	11.75	8.56	5.00	3/4
	182TC	4.44	8.69	3.50	7.50	0.41	26.13	24.50	13.37	9.81	4.50	3/4
	184TC	4.44	8.69	3.50	7.50	0.41	27.13	25.50	13.37	9.81	5.50	3/4
	213TC	4.44	10.25	4.25	8.50	0.41	29.04	27.41	14.25	12.16	5.50	3/4
	215TC	4.44	10.25	4.25	8.50	0.41	30.54	28.91	14.25	12.16	7.00	3/4
4SA	56C	4.44	6.88	2.50	4.88	0.34	22.82	21.19	11.43	8.31	3.00	1
	145TC	4.44	6.88	2.50	5.50	0.34	24.54	22.91	11.75	8.56	5.00	1
	182TC	4.44	8.69	3.50	7.50	0.41	26.13	24.50	13.37	9.81	4.50	1
	184TC	4.44	8.69	3.50	7.50	0.41	27.13	25.50	13.37	9.81	5.50	1
	213TC	4.44	10.25	4.25	8.50	0.41	29.04	27.41	14.25	12.16	5.50	1
5SA	56C	5.00	6.88	2.50	4.88	0.34	23.20	21.57	11.63	8.31	3.00	1 1/4
	145TC	5.00	6.88	2.50	5.50	0.34	24.92	23.29	11.95	8.56	5.00	1 1/4
	182TC	5.00	8.69	3.50	7.50	0.41	26.51	24.88	13.57	9.81	4.50	1 1/4
	184TC	5.00	8.69	3.50	7.50	0.41	27.51	25.88	13.57	9.81	5.50	1 1/4
	213TC	5.00	10.25	4.25	8.50	0.41	29.42	27.79	14.45	12.16	5.50	1 1/4
	215TC	5.00	10.25	4.25	8.50	0.41	30.92	29.29	14.45	12.16	7.00	1 1/4
	254TC	5.00	12.88	5.25	10.00	0.53	37.26	35.63	16.19	16.09	8.25	1 1/4

## PUMP DIMENSIONS (INCHES) BASE MOUNTED TO STANDARD FOOT MOUNTED MOTOR

S-Series pumps are available as base mounted pump and motor assemblies. Each assembly includes the base, flexible coupling, coupling guard, riser blocks (if required), lifting eye-bolts, and mounting hardware. The fabricated steel or channel steel bases are available with optional features such as drip-lip construction, drain plugs, mounting lugs, casters, etc..

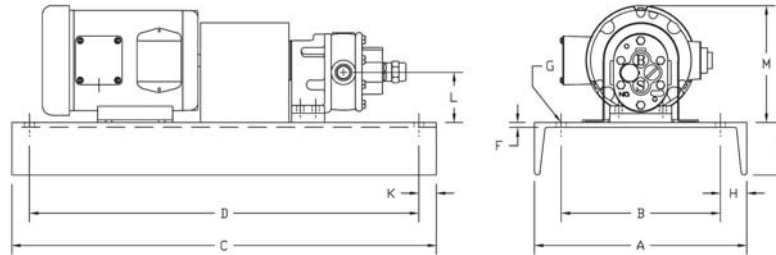


Table 4

Model	Motor Frame	A	B	C	D	E	F	G	H	K	L	M
1SD	56C	12.00	9.00	24.00	22.00	2.94	0.28	0.56	1.50	1.00	2.91	6.88
	145TC	12.00	9.00	26.00	24.00	2.94	0.28	0.56	1.50	1.00	2.91	6.88
	182TC	12.00	9.00	30.00	28.00	2.94	0.28	0.56	1.50	1.00	3.91	8.69
2SD	56C	12.00	9.00	24.00	22.00	2.94	0.28	0.56	1.50	1.00	2.81	6.88
	145TC	12.00	9.00	26.00	24.00	2.94	0.28	0.56	1.50	1.00	2.81	6.88
	182TC	12.00	9.00	30.00	28.00	2.94	0.28	0.56	1.50	1.00	3.81	8.69
	184TC	15.00	12.00	32.00	30.00	3.41	0.41	0.56	1.50	1.00	3.81	8.69
3SD	56C	12.00	9.00	24.00	22.00	2.94	0.28	0.56	1.50	1.00	2.50	6.88
	145TC	12.00	9.00	26.00	24.00	2.94	0.28	0.56	1.50	1.00	2.50	6.88
	182TC	12.00	9.00	30.00	28.00	2.94	0.28	0.56	1.50	1.00	3.50	8.69
	184TC	15.00	12.00	32.00	30.00	3.41	0.41	0.56	1.50	1.00	3.50	8.69
	213TC	15.00	12.00	34.00	32.00	3.41	0.41	0.56	1.50	1.00	4.25	10.25
	215TC	15.00	12.00	36.00	34.00	3.41	0.41	0.56	1.50	1.00	4.25	10.25
4SD	56C	12.00	9.00	24.00	22.00	2.94	0.28	0.56	1.50	1.00	2.50	6.88
	145TC	12.00	9.00	26.00	24.00	2.94	0.28	0.56	1.50	1.00	2.50	6.88
	182TC	12.00	9.00	30.00	28.00	2.94	0.28	0.56	1.50	1.00	3.50	8.69
	184TC	15.00	12.00	32.00	30.00	3.41	0.41	0.56	1.50	1.00	3.50	8.69
	213TC	15.00	12.00	34.00	32.00	3.41	0.41	0.56	1.50	1.00	4.25	10.25
	215TC	15.00	12.00	36.00	34.00	3.41	0.41	0.56	1.50	1.00	4.25	10.25
5SD	56C	12.00	9.00	24.00	22.00	2.94	0.28	0.263	2.00	1.00	2.50	6.88
	145TC	12.00	9.00	26.00	24.00	2.94	0.28	0.85	1.50	1.00	2.50	6.88
	182TC	12.00	9.00	30.00	28.00	3.41	0.28	0.56	1.50	1.00	3.50	8.69
	184TC	15.00	12.00	32.00	30.00	3.41	0.41	0.56	1.50	1.00	3.50	8.69
	213TC	15.00	12.00	34.00	32.00	3.41	0.41	0.56	1.50	1.00	4.25	10.25
	215TC	15.00	12.00	36.00	34.00	3.41	0.41	0.56	1.50	1.00	4.25	10.25
	254TC	18.00	15.00	42.00	40.00	3.95	0.45	0.56	1.50	1.00	5.25	12.88

## PUMP DIMENSIONS (INCHES) CLOSE COUPLED MOTOR (E-DRIVE)

S-Series pumps are available direct coupled to the end bell of a foot mounted motor. This assembly, referred to as an E-Drive, ensures accurate alignment and requires less space than a pump connected to the C-Face of a motor.

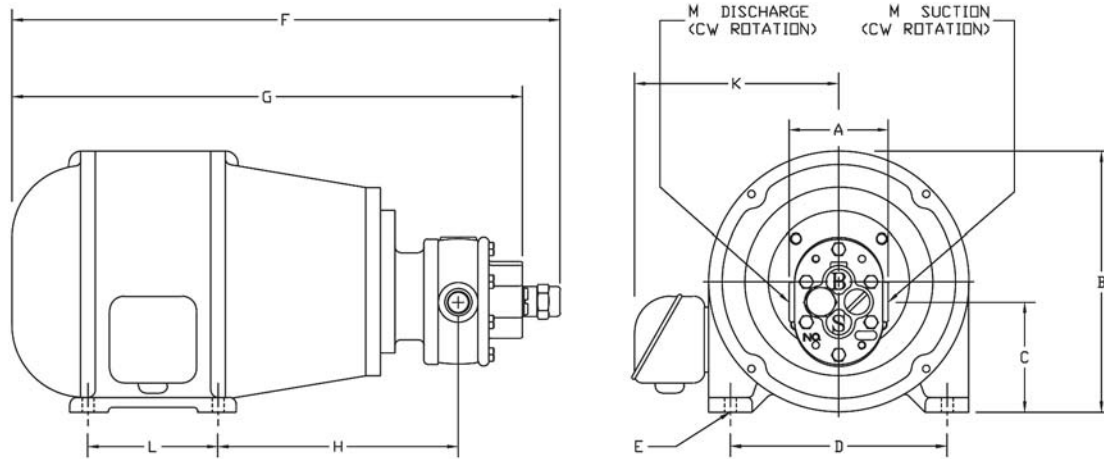


Table 5

Model	Motor Frame	A	B	C	D	E	F	G	H	K	L	M
1SE	182	3.00	9.00	3.90	7.50	0.406	17.94	16.69	7.88	7.06	4.50	3/8
	182	3.44	9.00	3.81	7.50	0.406	18.91	17.66	8.31	7.06	4.50	1/2
	184	3.44	9.00	3.81	7.50	0.406	19.91	18.66	8.31	7.06	5.50	1/2
2SE	213	3.44	10.38	4.56	8.50	0.406	21.47	20.22	9.12	7.94	5.50	1/2
	182	4.44	9.00	3.50	7.50	0.406	20.94	19.31	9.50	7.06	4.50	3/4
	184	4.44	9.00	3.50	7.50	0.406	21.94	20.31	9.50	7.06	5.50	3/4
3SE	213	4.44	10.38	4.25	8.50	0.406	23.50	21.88	10.31	7.94	5.50	3/4
	215	4.44	10.38	4.25	8.50	0.406	24.00	22.38	10.31	7.94	7.00	3/4
	182	4.44	9.00	3.50	7.50	0.406	20.94	19.31	9.50	7.06	4.50	1
4SE	184	4.44	9.00	3.50	7.50	0.406	21.94	20.31	9.50	7.06	5.50	1
	213	4.44	10.38	4.25	8.50	0.406	23.54	21.88	10.31	7.94	5.50	1
	215	4.44	10.38	4.25	8.50	0.406	24.00	22.38	10.31	7.94	7.00	1
	254U	4.44	12.38	5.25	6.03	0.406	26.19	24.56	12.49	9.81	8.25	1
	182	5.00	9.00	3.47	7.50	0.406	21.94	20.31	10.00	7.06	4.50	1 1/4
5SE	184	5.00	9.00	3.47	7.50	0.406	22.94	21.31	10.00	7.06	5.50	1 1/4
	213	5.00	10.38	4.22	8.50	0.406	24.50	22.88	10.81	7.94	5.50	1 1/4
	215	5.00	10.38	4.22	8.50	0.406	25.00	23.38	10.81	7.94	7.00	1 1/4
	254U	5.00	12.38	5.22	6.03	0.406	27.19	25.56	12.99	9.81	8.25	1 1/4

## ORDERING INFORMATION

ORDER PUMP ONLY 713-A-B-E

ORDER PUMP & DRIVE 713-A-B-C-D-E

A Pump		B	C Drive	D Assembly
Pump Model		Turning Direction Relief Valve	Pump Drive/Bracket	Assembly: Pump & Bracket
910= Flange Mount Model 1S	10= Foot Mount Model 1S	2= CW Without Relief Valve	Select Model & Motor Frame From Tables 3, 4 or 5  Example: 3SA-182TC	A= Factory Assembly B= Field Assembly
920=Flange Mount Model 2S	20= Foot Mount Model 2S	3= CCW Without Relief Valve		
930=Flange Mount Model 3S	33= Foot Mount Model 3S	7= CW With Relief Valve		
940=Flange Mount Model 4S	40= Foot Mount Model 4S	8=CCW With Relief Valve		
950=Flange Mount Model 5S	50=Foot Mount Model 5S			

### E- Options

Opt 1= Ductile Iron Casing	Opt 5=Mechanical Seal
Opt 2= Carbon Steel Casing	Opt 6= Teflon Compression Packing
*Opt 3= 316 Stainless Steel Casing & 17-4 SS Gears	Opt 4= Carbon Graphite Bearings
*Opt 3 not available for models 4S & 5S some variations in HP requirements exist for this option, please consult us	

### Complete Pump, Drive & Motor Combinations

Our most popular complete assemblies are listed below & typically available from stock.

Order #	Model	Description	GPM	Max. Visc(SSU)	Max PSIG
713-91043-4992	1SA	Relief valve, 1/2 HP-1725 RPM, 230/460-3/60-56FR-TEFC	4.5	1000	100
713-92043-4882	2SA	Relief valve, 1/2 HP-1140 RPM, 230/460-3/60-56FR-TEFC	5.9	2000	100
713-92045-4992	3SA	Relief valve, 1 HP-1725 RPM, 230/460-3/60-56FR-TEFC	9.0	1000	100
713-93045-4992	4SA	Relief valve, 1 HP-1725 RPM, 230/460-3/60-145FR-TEFC	10.8	2000	100
713-93046-4992	5SA	Relief valve, 1 1/2 HP-1725 RPM, 230/460-3/60-56FR-TEFC	16.2	1000	60
713-94047-4992	4SA	Relief valve, 2 HP-1725 RPM, 230/460-3/60-145TC FR-TEFC	23.2	1000	75
713-95048-4992	5SA	Relief valve, 1/2 HP-1725 RPM, 230/460-3/60-56FR-TEFC	35	1000	75

Please call us to discuss your motor requirements. We offer a complete range of AC & DC motors as well as variable frequency drives.