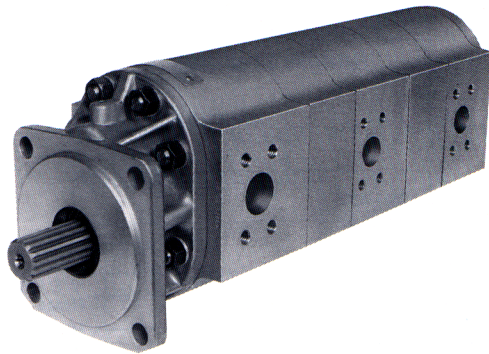


Model TP20



Description Gear Pump (Three-place)
 Flow Range To 98 GPM Per Section (370.9 LTR.)
 Displacements To 9.10 C.I.R. Per Section (149.12 CC's/REV.)
 Maximum Pressure to 2500 PSI (172 BAR)
 Maximum Speed to 2500 RPM
 Rotation A or C
 Bearing Journal
 Construction Aluminum or Cast Iron*

Performance Data

PUMP MODEL	SECTION SIZE	DISPLACEMENT/REVOLUTION (Theoretical)					MAXIMUM PRESSURE		MAXIMUM SPEED
		US Gallons	Cubic Inches	Liters	Cubic Centimeters	Imperial Gallons	PSI	BAR	RPM
TP20	100	.0087	2.01	.0330	32.938	.0072	2500	172	2500
TP20	150	.0131	3.02	.0496	49.498	.0108	2500	172	2500
TP20	200	.0175	4.04	.0662	66.204	.0146	2500	172	2500
TP20	250	.0219	5.06	.0829	82.919	.0182	2500	172	2500
TP20	300	.0262	6.05	.0992	99.142	.0218	2500	172	2500
TP20	350	.0306	7.07	.1158	115.857	.0255	2500	172	2500
TP20	400	.0350	8.08	.1325	132.408	.0292	2500	172	2500
TP20	450	.0394	9.10	.1491	149.123	.0328	2500	172	2500

All data based on SAE 10W oil at 150°F.

Available with Viton Seals for use with phosphate ester base fluids.

*Some models and sizes are available for pressure up to 3500 PSI. Cast-iron not available on all models. Consult factory for availability.

CAUTION: "Inlet vacuum" should not exceed 5" Hg at normal operating speed and temperature. Operation of pumps in excess of 5" Hg requires factory approval.

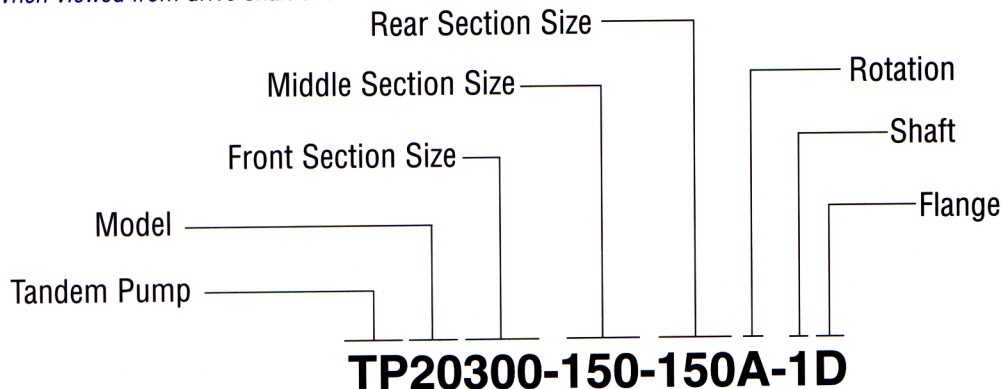
When sizing pumps, refer to the performance charts in the back of the catalog to determine the volumetric efficiency and input horsepower requirements.

How To Order

'A' denotes counterclockwise rotation

'C' denotes clockwise rotation

When viewed from drive shaft end



Note: Add prefix 'V' to pump model number (VTP20) when ordering pumps with Viton Seals for use with phosphate ester base fluids.
 Add prefix 'F' to pump model number (FTP20) or (VFTP20) when ordering pumps with cast iron construction.

Shafts Available

<p>1 SAE 'C' 1-1/4" 14 Tooth Flat Root Side Fit Torque limit 655 Lbs. Ft. (888, Nm) "Tandem" Pumps only</p> <p>Spline Data Diametral Pitch 12/24 Pressure Angle 30° No. Of Teeth 14</p>	<p>3 SAE 'C' 1-1/4" Straight Shaft Torque limit 655 Lbs. Ft. (888, Nm) Available on all sizes</p>	<p>5 1-1/4" Straight Shaft Torque limit 655 Lbs. Ft. (888 Nm) Available on all sizes</p>
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Mounting Flanges Available

<p>D SAE 'C' 4-Bolt</p>	<p>E SAE 'B' 4-Bolt</p>
<p>F SAE 'C' 2-Bolt</p>	<p>M 'M' Pad Mount</p>



See "General Product & Safety Information" on inside front cover of this catalog



Dimensional Data

Front Section Suction & Discharge Ports

Front Section	Hole Dia.	Suction	Hole Dia.	Disc.	E	F
20150	1.25 (31,7)	1-1/4"	.75 (19,0)	3/4"	3.60 (91,4)	4.87 (123,6)
20200	1.25 (31,7)	1-1/4"	1.00 (25,4)	1"	3.75 (95,2)	5.81 (147,5)
20250	1.50 (38,1)	1-1/2"	1.19 (30,2)	1-1/4"	4.00 (101,6)	6.09 (154,6)
20300	1.50 (38,1)	1-1/2"	1.19 (30,2)	1-1/4"	4.14 (105,1)	6.37 (161,7)
20350	1.50 (38,1)	1-1/2"	1.19 (30,2)	1-1/4"	4.35 (110,4)	6.66 (169,1)
20400	2.00 (50,8)	2"	1.37 (34,7)	1-1/2"	4.35 (110,4)	6.94 (176,2)
20450	2.00 (50,8)	2"	1.37 (34,7)	1-1/2"	4.66 (118,3)	7.23 (183,6)

Center and Rear Section Suction Ports

Section	Hole Dia.	Common Suction	A	B	C	D
100-100	1.25 (31,7)	1-1/4"	3.05 (77,4)	7.13 (181,1)	8.77 (222,7)	3.05 (77,4)
150-100	1.50 (38,1)	1-1/2"	3.05 (77,4)	7.37 (187,1)	9.01 (228,8)	3.20 (81,2)
150-150	1.50 (38,1)	1-1/2"	3.05 (77,4)	7.37 (187,1)	9.29 (235,9)	3.20 (81,2)
200-100	1.50 (38,1)	1-1/2"	3.69 (93,7)	8.80 (223,5)	10.44 (265,1)	3.80 (96,5)
200-150	2.00 (50,8)	2"	3.69 (93,7)	8.80 (223,5)	10.72 (272,2)	3.80 (96,5)
200-200	2.00 (50,8)	2"	3.69 (93,7)	9.44 (239,7)	12.06 (306,3)	3.80 (96,5)
250-100	2.00 (50,8)	2"	3.94 (100,0)	9.08 (230,6)	10.72 (272,2)	3.94 (100,0)
250-150	2.00 (50,8)	2"	3.94 (100,0)	9.08 (230,6)	11.00 (279,4)	3.94 (100,0)
250-200	2.00 (50,8)	2"	3.94 (100,0)	9.72 (246,8)	12.34 (313,4)	3.94 (100,0)
250-250	2.00 (50,8)	2"	3.94 (100,0)	9.97 (253,2)	12.74 (323,5)	3.94 (100,0)
300-100	2.00 (50,8)	2"	4.08 (103,6)	9.37 (237,9)	11.00 (279,4)	4.08 (103,6)
300-150	2.00 (50,8)	2"	4.08 (103,6)	9.37 (237,9)	11.29 (286,7)	4.08 (103,6)
300-200	2.00 (50,8)	2"	4.08 (103,6)	10.01 (254,2)	12.63 (320,8)	4.08 (103,6)
300-250	2.00 (50,8)	2"	4.08 (103,6)	10.26 (260,6)	13.03 (330,9)	4.08 (103,6)
300-300	2.50 (63,5)	2-1/2"	4.08 (103,6)	10.26 (260,6)	13.31 (338,0)	4.08 (103,6)

SAE 4-Bolt Connector Ports

Size	G	H	J	K	L
3/4"	.43 (10,9)	.875 (22,2)	.93 (23,6)	1.875 (47,6)	3/8-16NC
1"	.51 (12,9)	1.031 (26,1)	1.03 (26,1)	2.062 (52,3)	3/8-16NC
1-1/4"	.59 (14,9)	1.188 (30,1)	1.15 (29,2)	2.313 (58,7)	7/16-14NC
1-1/2"	.70 (17,9)	1.406 (35,7)	1.37 (34,7)	2.750 (69,8)	1/2-13NC
2"	.84 (21,3)	1.688 (42,8)	1.53 (38,8)	3.062 (77,7)	1/2-13NC
2-1/2"	1.00 (25,4)	2.000 (50,8)	1.75 (44,4)	3.500 (88,9)	1/2-13NC

SAE 4-Bolt NPT Connectors are available. See Accessory Section

Center & Rear Discharge Ports

Section Size	Discharge Port for Center & Rear Section	Hole Diameter
100	3/4"	.75 (19,0)
150	3/4"	.75 (19,0)
200	1"	1.00 (25,4)
250	1-1/4"	1.19 (30,2)
300	1-1/4"	1.19 (30,2)



See "General Product & Safety Information" on inside front cover of this catalog



Dimensional Data

PD Factors

Drive Shaft	Factors
#1-1/4	187
#3-1/4	187
#5-1/4	187
Coupling	110

The maximum size and number of sections of a tandem pump for a given application is limited to the torque capability of the input drive shaft and the spline coupling between the sections. To determine this capability, a "PD Factor" is used:

P = PSI (The relief valve setting of each individual section).

D = Displacement (In U.S. gallons per revolution of each individual section).

Example: Assume a triple pump TP20450-450-450 A-3D with front and center sections on pressure at the same time at 2000 PSI, and with the rear section on pressure at 1500 PSI but not at the same time as the front and center sections:

A. Drive Shaft:

(1) $PD = (2000) (.0394) + (2000) (.0394) = 157.6$ vs. 187. Capability is OK

(2) $PD = (1500) (.0394) = 59.1$ vs. 187. Capability is OK.

B. Coupling between front and center sections:

(1) $PD = (2000) (.0394) = 78.8$ vs. 110. Capability is OK.

C. Coupling between center and rear sections:

(1) $PD = (1500) (.0394) = 59.1$ vs. 110. Capability is OK.

Note: For purpose of illustration, assume all three pump sections to be on pressure at the same time.

A. Drive Shaft:

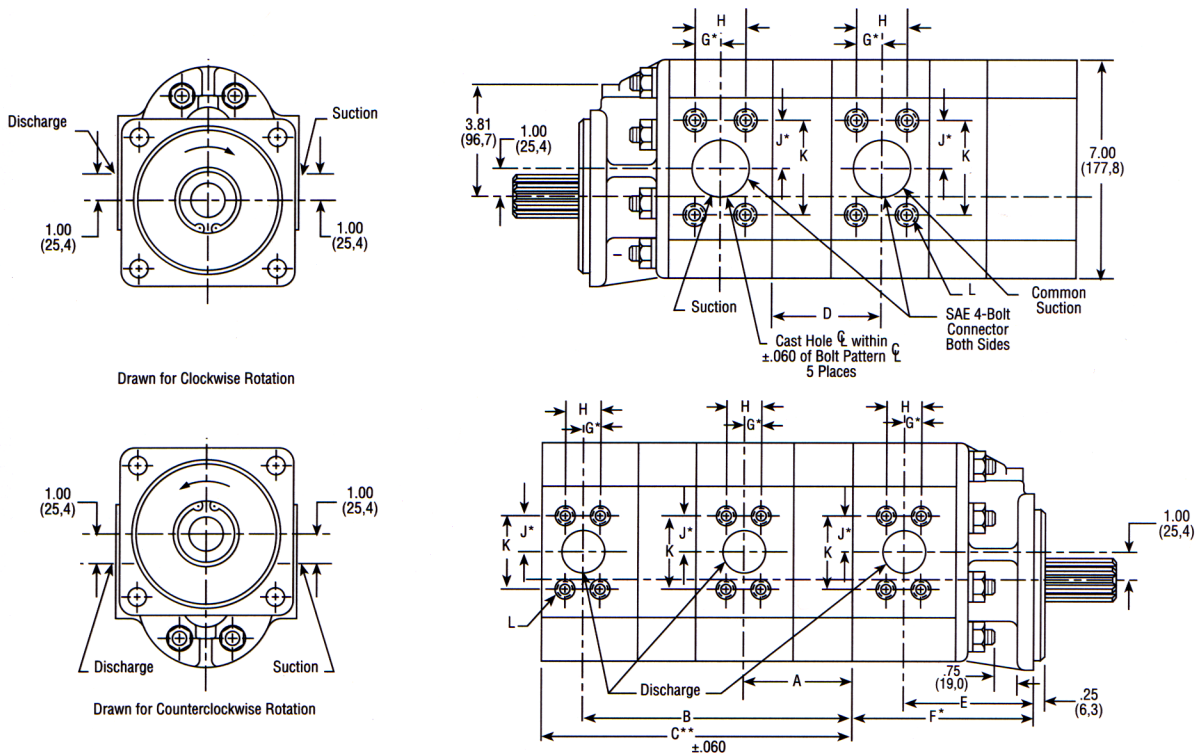
$PD = (2000) (.0394) + (2000) (.0394) = (1500) (.0394) = 216.7$. Capability is not OK

The "PD Factor" for a No. 3 shaft is 187. Therefore, to operate all three sections at once (to relief valve pressure) would exceed the torque capability of the drive shaft.

B. Coupling between front and center sections:

(1) $PD = (2000) (.0394) + (1500) (.0394) = 137.9$. Capability is not OK.

The "PD Factor" for the coupling is 110. If the center and rear sections are on pressure at the same time, the coupling between the front and center sections must transmit the torque for the center and rear sections.



* These dimensions locate ϕ of bolt pattern only