

**Specifications  
for TP16 Series**

Description ..... Gear Pumps (Two-place)  
Flow Range ..... To 32 GPM (121.1 LTR) Per Section  
Displacements ..... To 3.904 C.I.R. (63.94 CC's/REV.)  
Maximum Pressure to ..... 3000 PSI (207 BAR)  
Maximum Speed to ..... 3100 RPM  
Rotation ..... A or C  
Bearings ..... Journal  
Construction ..... Cast Iron Gear Plates with  
Aluminum Flange, Connector and Cover Plates



**Performance Data Per Section**

Pump Model	Section Size	Displacement/Revolution (Theoretical)					Maximum Pressure		Maximum Speed
		US Gallons	Cubic In	Liters	Cubic Cm	Imperial Gallons	PSI	BAR	RPM Tandem
TP16	45	.0038	.878	.0144	14.388	.0031	3000	207	3100
TP16	65	.0055	1.270	.0208	20.812	.0045	3000	207	3000
TP16	85	.0072	1.663	.0273	27.252	.0059	3000	207	2900
TP16	100	.0085	1.964	.0321	32.184	.0070	3000	207	2800
TP16	115	.0097	2.241	.0367	36.723	.0080	3000	207	2600
TP16	150	.0127	2.934	.0481	48.080	.0105	3000	207	2400
TP16	180	.0152	3.511	.0575	57.535	.0126	2200	152	2100
TP16	200	.0169	3.904	.0639	63.942	.0140	2000	138	1900

Note: For best inlet conditions, place largest displacement section in the rear position and use both inlet ports.  
All data based on SAE 10W oil at 150°F.  
Available with Viton® Seals.

**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.

**Dimensional Data**

**PD Factors**

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:

Maximum allowable PD for the 7/8" drive shaft is 53.  
 Maximum allowable PD for a coupling is also 53.

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

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

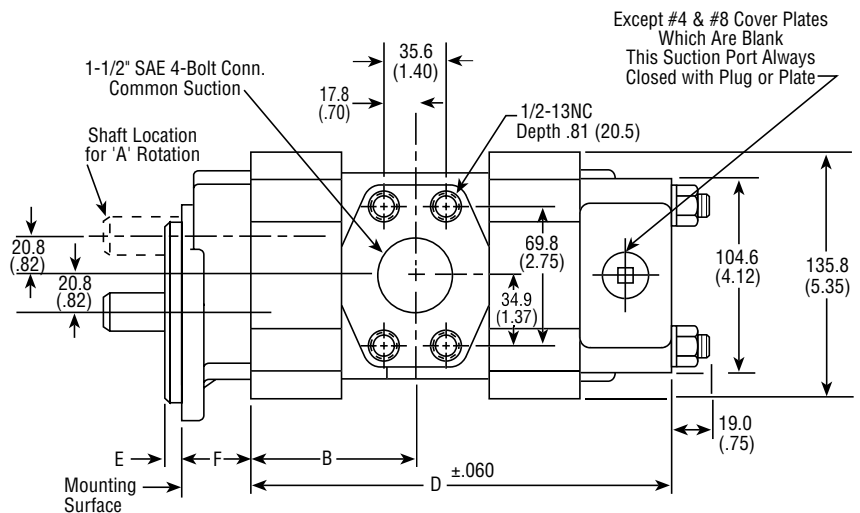
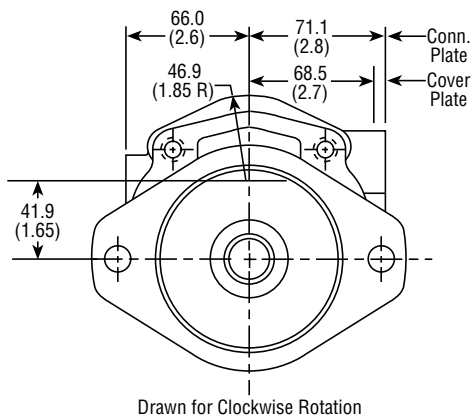
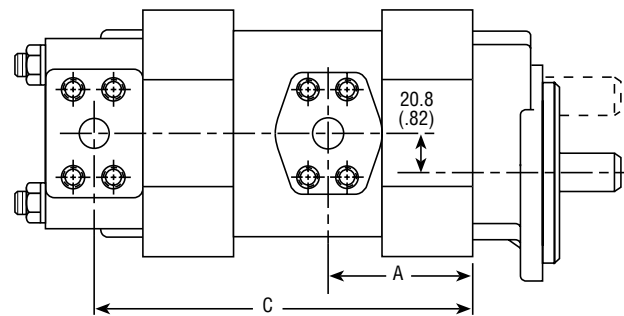
Example: Assume a two-place pump TP16-150 — 150 with front and rear sections on pressure at the same time at 2000 PSI:

- A. Drive Shaft:  
 $PD = (2000) (.0127) + (2000) (.0127) = 50.8$  vs. 53. Capability is OK
- B. Coupling between front and center sections:  
 $PD = (2000) (.0127) = 25.4$  vs. 53. Capability is OK.

**Flange Dimensions**

FLANGE TYPE	E		F	
D	6.35	(.250)	41.15	(1.62)
E	4.75	(.187)	69.85	(2.75)
F	—	—	44.45	(1.75)
J	6.35	(.250)	69.85	(2.75)
N	9.52	(.375)	38.10	(1.55)
S	5.08	(.200)	84.07	(3.31)

Inch equivalents for millimeter dimensions are shown in (\*\*).

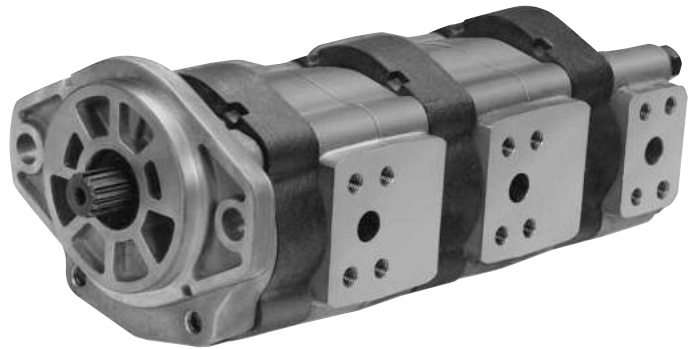


**Dimensional Data**

PUMP SIZES	A		B		C		D		Shipping Weights (Approx.)	
	lbs.	kgs.	lbs.	kgs.	lbs.	kgs.	lbs.	kgs.	lbs.	kgs.
TP16-45-45	48.01	(1.89)	61.47	(2.42)	149.9	(5.90)	175.5	(6.91)	26	11.8
TP16-65-45	53.59	(2.11)	67.06	(2.64)	155.2	(6.11)	180.9	(7.12)	28	12.7
TP16-65-65	53.59	(2.11)	67.06	(2.64)	160.8	(6.33)	186.4	(7.34)	30	13.6
TP16-85-45	58.93	(2.32)	72.39	(2.85)	160.8	(6.33)	186.4	(7.34)	31	14.1
TP16-85-65	58.93	(2.32)	72.39	(2.85)	166.1	(6.54)	191.8	(7.55)	33	15.0
TP16-85-85	58.93	(2.32)	72.39	(2.85)	171.7	(6.76)	197.4	(7.77)	35	15.9
TP16-100-45	62.99	(2.48)	76.45	(3.01)	164.9	(6.49)	190.5	(7.50)	34	15.4
TP16-100-65	62.99	(2.48)	76.45	(3.01)	170.2	(6.70)	195.8	(7.71)	36	16.3
TP16-100-85	62.99	(2.48)	76.45	(3.01)	175.8	(6.92)	201.4	(7.93)	38	17.2
TP16-100-100	62.99	(2.48)	76.45	(3.01)	179.8	(7.08)	205.5	(8.09)	39	17.7
TP16-115-45	67.06	(2.64)	80.52	(3.17)	168.9	(6.65)	194.6	(7.66)	39	17.7
TP16-115-65	67.06	(2.64)	80.52	(3.17)	174.2	(6.86)	199.9	(7.87)	41	18.6
TP16-115-85	67.06	(2.64)	80.52	(3.17)	179.8	(7.08)	205.5	(8.09)	43	19.5
TP16-115-100	67.06	(2.64)	80.52	(3.17)	183.9	(7.24)	209.6	(8.25)	44	20.0
TP16-115-115	67.06	(2.64)	80.52	(3.17)	188	(7.40)	213.6	(8.41)	46	20.9
TP16-150-45	76.45	(3.01)	89.92	(3.54)	178.3	(7.02)	204	(8.03)	44	20.0
TP16-150-65	76.45	(3.01)	89.92	(3.54)	183.6	(7.23)	209.3	(8.24)	47	21.3
TP16-150-85	76.45	(3.01)	89.92	(3.54)	189.2	(7.45)	214.9	(8.46)	49	22.2
TP16-150-100	76.45	(3.01)	89.92	(3.54)	193.3	(7.61)	219	(8.62)	50	22.7
TP16-150-115	76.45	(3.01)	89.92	(3.54)	197.4	(7.77)	223	(8.78)	52	23.6
TP16-150-150	76.45	(3.01)	89.92	(3.54)	206.8	(8.14)	232.4	(9.15)	54	24.5
TP16-180-45	84.58	(3.33)	98.04	(3.86)	186.4	(7.34)	212.1	(8.35)	52	23.6
TP16-180-65	84.58	(3.33)	98.04	(3.86)	191.8	(7.55)	217.4	(8.56)	54	24.5
TP16-180-85	84.58	(3.33)	98.04	(3.86)	197.4	(7.77)	223	(8.78)	56	25.4
TP16-180-100	84.58	(3.33)	98.04	(3.86)	201.4	(7.93)	227.1	(8.94)	57	25.9
TP16-180-115	84.58	(3.33)	98.04	(3.86)	205.5	(8.09)	231.1	(9.10)	59	26.8
TP16-180-150	84.58	(3.33)	98.04	(3.86)	214.9	(8.46)	240.5	(9.47)	61	27.7
TP16-180-180	84.58	(3.33)	98.04	(3.86)	223	(8.78)	248.7	(9.79)	63	28.6
TP16-200-45	90.17	(3.55)	103.6	(4.08)	191.8	(7.55)	217.7	(8.57)	60	27.2
TP16-200-65	90.17	(3.55)	103.6	(4.08)	197.1	(7.76)	222.8	(8.77)	62	28.1
TP16-200-85	90.17	(3.55)	103.6	(4.08)	202.7	(7.98)	228.4	(8.99)	64	29.0
TP16-200-100	90.17	(3.55)	103.6	(4.08)	206.8	(8.14)	232.4	(9.15)	65	29.5
TP16-200-115	90.17	(3.55)	103.6	(4.08)	210.8	(8.30)	236.5	(9.31)	67	30.4
TP16-200-150	90.17	(3.55)	103.6	(4.08)	220.2	(8.67)	245.9	(9.68)	69	31.3
TP16-200-180	90.17	(3.55)	103.6	(4.08)	228.4	(8.99)	254	(10.00)	71	32.2
TP16-200-200	90.17	(3.55)	103.6	(4.08)	233.7	(9.20)	259.3	(10.21)	73	33.1

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for TP16 Series**

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Displacements ..... To 3.904 C.I.R. (63.94 CC's/REV.)  
Maximum Pressure to ..... 3000 PSI (207 BAR)  
Maximum Speed to ..... 3100 RPM  
Rotation ..... A or C  
Bearings ..... Journal  
Construction ..... Cast Iron Gear Plates with  
Aluminum Flange, Connector and Cover Plates



**Performance Data Per Section**

Pump Model	Section Size	Displacement/Revolution (Theoretical)					Maximum Pressure		Maximum Speed
		US Gallons	Cubic Inches	Liters	Cubic Centimeters	Imperial Gallons	PSI	BAR	RPM
P16	45	.0038	.878	.0144	14.388	.0031	3000	207	3100
P16	65	.0055	1.270	.0208	20.812	.0045	3000	207	3000
P16	85	.0072	1.663	.0273	27.252	.0059	3000	207	2900
P16	100	.0085	1.964	.0321	32.184	.0070	3000	207	2800
P16	115	.0097	2.241	.0367	36.723	.0080	3000	207	2600
P16	150	.0127	2.934	.0481	48.080	.0105	3000	207	2400
P16	180	.0152	3.511	.0575	57.535	.0126	2200	152	2100
P16	200	.0169	3.904	.0639	63.942	.0140	2000	138	1900

Note: Three-place pumps assembled from maximum displacement size sections should be checked for operating inlet conditions.  
If "PD Factor" is not exceeded, place the largest displacement section in the rear position and use all inlet ports.  
All data based on SAE 10W oil at 150°F.  
Available with Viton® Seals.

**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.

**Dimensional Data**

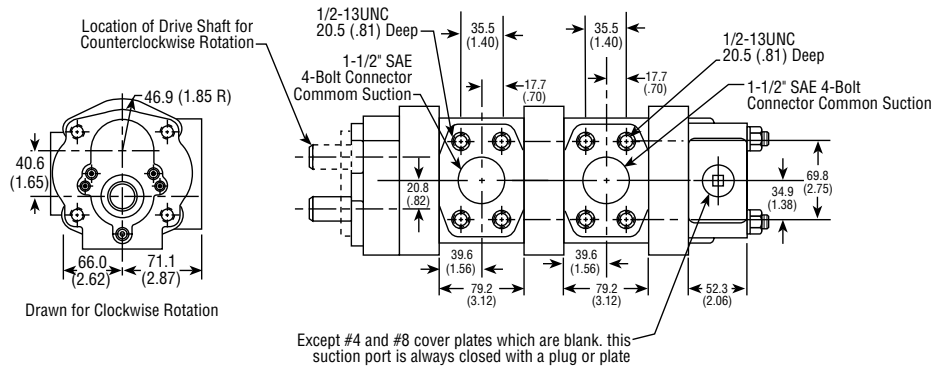
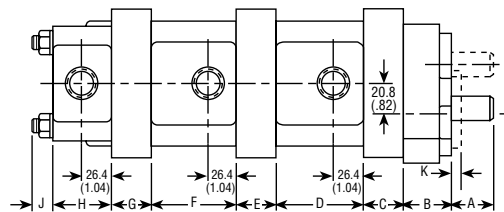
To determine overall pump length  
 Add together the dimensions that apply to the pump you  
 are considering.

- A = \_\_\_\_\_ Shaft Extension
- B = \_\_\_\_\_ Flange Length
- C = \_\_\_\_\_ Front Gear Plate Length
- D =  $\frac{79.2 \text{ mm}}{3.12 \text{ in.}}$  Connector Plate Length
- E = \_\_\_\_\_ Center Gear Plate Length
- F =  $\frac{79.2 \text{ mm}}{3.12 \text{ in.}}$  Connector Plate Length
- G = \_\_\_\_\_ Rear Gear Plate Length
- H =  $\frac{52.3 \text{ mm}}{2.06 \text{ in.}}$  Cover Plate Length
- J =  $\frac{19.0 \text{ mm}}{.75 \text{ in.}}$  Stud Extension
- \_\_\_\_\_ Total = Overall Length

PUMP SIZE	C, E & G
-45	21.84 (.86)
-65	27.18 (1.07)
-85	32.77 (1.29)
-100	36.83 (1.45)
-115	40.89 (1.61)
-150	50.29 (1.98)
-180	58.42 (2.30)
-200	63.75 (2.51)

**Flange Dimensions**

FLANGE TYPE	B	K
D	41.1 (1.62)	6.3 (.250)
E	69.8 (2.75)	4.7 (.187)
F	44.4 (1.75)	—
J	69.8 (2.75)	6.3 (.250)
N	39.3 (1.55)	9.5 (.375)
S	84.0 (3.31)	5.0 (.200)



**Inch equivalents for millimeter  
 dimensions are shown in (\*\*).**

**PD Factors**

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:

Maximum allowable PD for the 7/8" drive shaft is 53.  
 Maximum allowable PD for a coupling is also 53.

When: 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 three-place pump TP16-150-150-100 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) (.0127) + (2000) (.0127) = 50.8 vs. 53. Capability is OK
  - (2) PD = (1500) (.0085) = 12.7 vs. 53. Capability is OK.
- B. Coupling between front and center sections:
  - PD = (2000) (.0127) = 25.4 vs. 53. Capability is OK.
- C. Coupling between center and rear sections:
  - PD = (1500) (.0085) = 12.7 vs. 53. 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) (.0127) + (2000) (.0127) + (1500) (.0085) = 63.5 vs. 53. Capability is not OK

Because the PD Factor for the shaft is 53, operating all three sections at the same time (to relief valve pressure) would exceed the torque capability of the drive shaft.

- B. Coupling between front and center sections:
  - PD = (2000) (.0127) + (1500) (.0085) = 35.1 vs. 53. Capability is OK

Remember also that the PD factor for the coupling is 53. 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.