

Fixed Displacement Vane Pump V10 and V20 Series

HOF

Features

- V10 and V20 Series are fixed displacement and balanced type vane pumps. With compact sizes, they are available in single pumps and double pumps for both industrial and mobile application.
- The vane design with self compensation for wear and clearance makes volumetric efficiency of pump nearly constant over the service life. (the vanes always adjust its orbit to contact with the cam ring, even though wear occurs between the cam ring and vane tips)
- The vane pump is not damaged at low speed and high pressure operation because pumping action does not start until the speed is high enough for the vane to throw out. With hydraulically balanced design, the bearing is externally loaded only. Therefore, the pump requires minimized maintenance with long service life.
- The inlet or outlet ports can be rotated through increments of 90° in relation to each other, providing application flexibility and easy installation.
- With optional flow control and priority valve covers, the pump can be used in more applications. The flow control cover can limit the flow to the primary circuit at the required flow rate, while diverts remaining flow to the tank. The priority valve cover maintains a constant flow to the primary circuit, while diverts remaining flow to the secondary circuit. Each cover comes with a relief valve to limits the maximum pressure of the primary circuit.



Handling

- For medium service life, the pump should be protected from contamination. Filtering fluid before filling and during operation to maintain or exceed ISO cleanliness code 17/14. Replaceable elements should be changed as filter supplier instructions.
- The drive shaft must align with the power source shaft. Avoiding shaft end thrust and applications that impose radial loading.
- The start-up procedures should be as follows:
 - Check the rotation of power source to match the rotation of pump.
 - Check inlet and outlet ports to assure all connections are properly installed and check all mounting bolts and flanges to assure all are tight and properly aligned.
- Fill pump with fluid through the outlet port if the pump is mounted above the fluid level. The spline shaft models also need to be lubricated with an anti-fretting grease or similar lubricant.
- Place all controls in the neutral position so the pump is unloaded during initial start-up.
- Prime the pump within a few second when the pump is started.
- Bleed off entrapped air from outlet circuit until a steady output flow is observed.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change at any time without notice.

Ordering Code and Specifications

Single Pump

V20(F) - 1P11S - 1C(8)-(H)-(L)

Model V10, V20

Cover

- Omit - Standard Cover
- F - Flow Control Cover
- P - Priority Valve Cover

Mounting

- 1 - 2-Bolt Flange

Inlet Port Connection

- S - 1.3125"-12 Str. thd. (V10)
- 1.625"-12 Str. thd. (V20)
- P - 1.00" NPT (V10)
- 1.25" NPT (V20)
- B - 1.00" BSP (V10)
- 1.25" BSP (V20)
- T - 1.1875"-12 Str. thd. (V10)

Delivery (USgpm at 1200 rpm)

- V10 - 1, 2, 3, 4, 5, 6, 7
- V20 - 8, 7, 8, 9, 11, 12, 13

Outlet Port Connection

V10 and V20

- S - .750"-18 Str. thd. (V10)
- 1.0625"-12 Str. thd. (V20)
- P - .500" NPT (V10)
- .750" NPT (V20)
- B - .500" BSP (V10)
- .750" BSP (V20)

V10F, V10P, V20F, and V20P

- S - .750"-18 Str. thd. for outlet and 1.0625"-12 Str. thd. for tank port (V20F)
- P - .750"-18 Str. thd. for outlet and .500" NPT for tank port (V10F and V20F)
- T - .750"-18 Str. thd. for outlet and tank port (V10P)
- .750"-18 Str. thd. for primary outlet and tank port and .875"-14 Str. thd. for secondary outlet (V20P)
- K - .5625"-18 Str. thd. for primary outlet and tank port and .750"-18 Str. thd. for secondary outlet (V10P)

Shaft Rotation

- (Viewed from shaft end)
- Omit - Turn right
- L - Turn left

Pressure Setting for Flow control and

Priority Valve Cover bar (psi)

- A - 17 (250)
- B - 34 (500)
- C - 52 (750)
- D - 69 (1000)
- E - 86 (1250)
- F - 103 (1500)
- G - 121 (1750)
- H - 138 (2000)
- J - 155 (2250)
- K - 172 (2500)

Flow rate Setting for Flow control and

Priority Valve Cover L/min (USgpm)

- 2 - 7.6 (2)
- 3 - 11.4 (3)
- 4 - 15.2 (4)
- 5 - 19.0 (5)
- 6 - 22.7 (6)
- 7 - 26.5 (7)
- 8 - 30.3 (8)

Outlet Port Position

(Viewed from cover end)

- A - Opposite Inlet
- B - 90° CCW from Inlet
- C - Inline with Inlet
- D - 90° CW from Inlet

Shaft

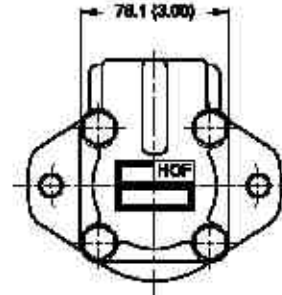
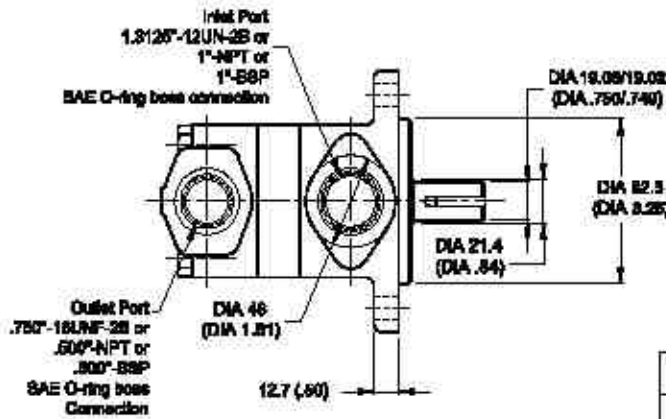
- 1 - Straight keyed
- 3 - Threaded with woodruff key
- 6 - Woodruff key stub (V20 only)
- 11 - Splined
- 12 - Splined (V10 only)
- 15 - Splined (V20 only)
- 35 - Splined

Model Series	Ring Size Delivery at 1200 r/min & 7 bar (100 psi) USgpm	Geometric Displacement cm ³ /r (in ³ /r)	Delivery at 1500 r/min & 7 bar (100 psi) L/min (USgpm)	Maximum Pressure bar (psi)	Maximum Speed rpm	Minimum Speed rpm	Weight kg (lb)
V10 V10F V10P	1	3.3 (0.20)	4.70 (1.25)	172 (2500)	4800	650	4.5 - 6.8 (10 - 15)
	2	6.6 (0.40)	9.40 (2.50)	172 (2500)	4500	650	
	3	9.9 (0.60)	14.20 (3.75)	172 (2500)	4000	650	
	4	13.1 (0.80)	18.90 (5.00)	172 (2500)	3400	650	
	5	16.4 (1.00)	23.60 (6.25)	172 (2500)	3200	650	
	6	19.5 (1.19)	28.40 (7.50)	152 (2200)	3000	650	
	7	22.8 (1.39)	33.10 (8.75)	138 (2000)	2800	650	
V20 V20F V20P	8	19.5 (1.19)	28.39 (7.50)	172 (2500)	3400	650	7.3 - 8.2 (16 - 18)
	7	22.8 (1.39)	33.11 (8.76)	172 (2500)	3000	650	
	8	28.5 (1.82)	37.85 (10.00)	172 (2500)	2800	650	
	9	29.7 (1.81)	42.57 (11.25)	172 (2500)	2800	650	
	11	38.4 (2.22)	62.04 (13.76)	172 (2500)	2500	650	
	12	39.0 (2.36)	58.77 (15.00)	152 (2200)	2400	650	
13	42.4 (2.59)	61.50 (16.25)	152 (2200)	2400	650		

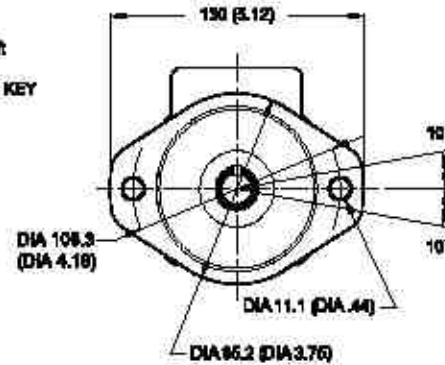
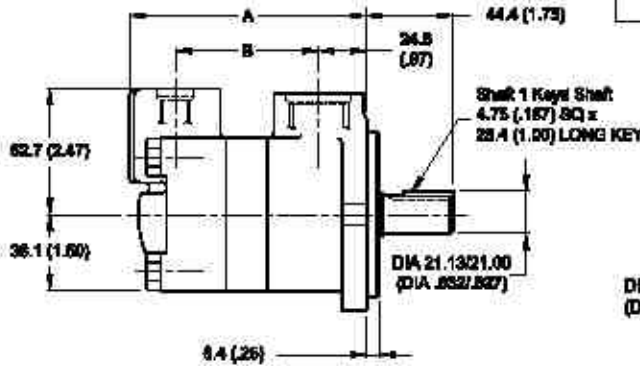
Installation Dimenals mm (inch)

Single Pump V10

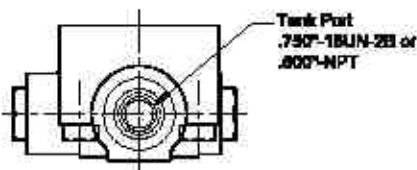
V10



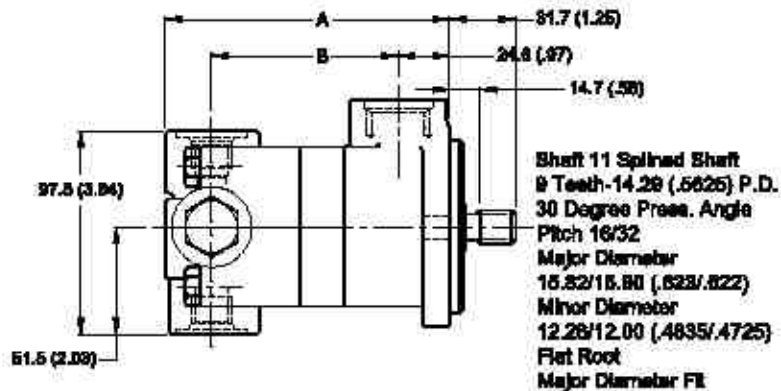
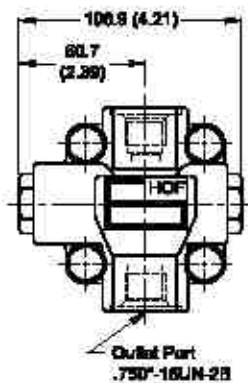
Delivery @ 1200 rpm 5.7 bar (100 psi)	Dimension	
	A	B
1, 2, 3	115.6 (4.55)	57.3 (2.25)
4, 5	121.0 (4.80)	73.7 (2.90)
6, 7	127.0 (5.00)	78.7 (3.10)



V10F



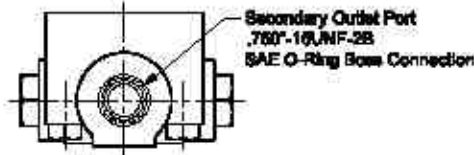
Delivery @ 1200 rpm 5.7 bar (100 psi)	Dimension	
	A	B
1, 2, 3	125.0 (5.07)	84.0 (3.34)
4, 5	135.1 (5.32)	91.2 (3.59)
6, 7	140.2 (5.52)	98.3 (3.79)



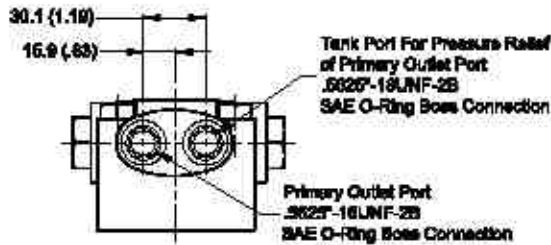
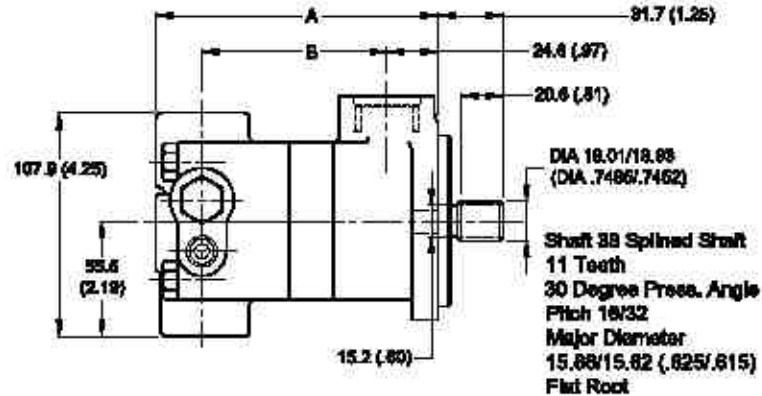
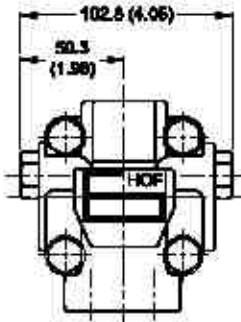
Installation Dimensions mm (inch)

Single Pump V10

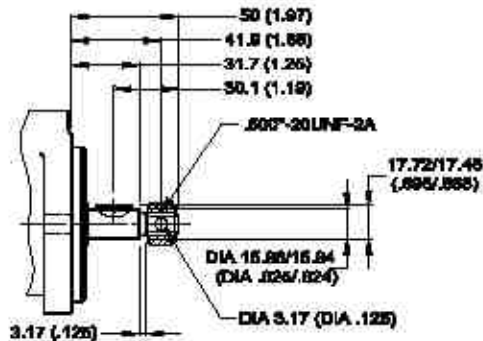
V10P



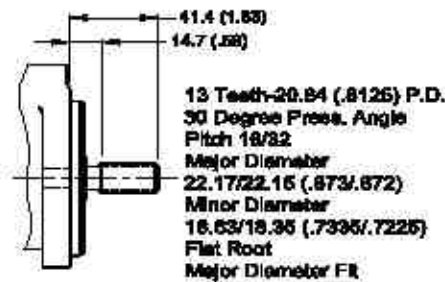
Delivery @ 1200 rpm @ 7 bar (100 psi)	Dimension	
	A	B
1, 2, 9	130.0 (5.12)	84.8 (3.34)
4, 5	136.4 (5.37)	91.2 (3.60)
6, 7	141.3 (5.57)	98.3 (3.78)



Other shaft options for V10 Series



Shaft 3 Threaded with #8 Woodruff Key

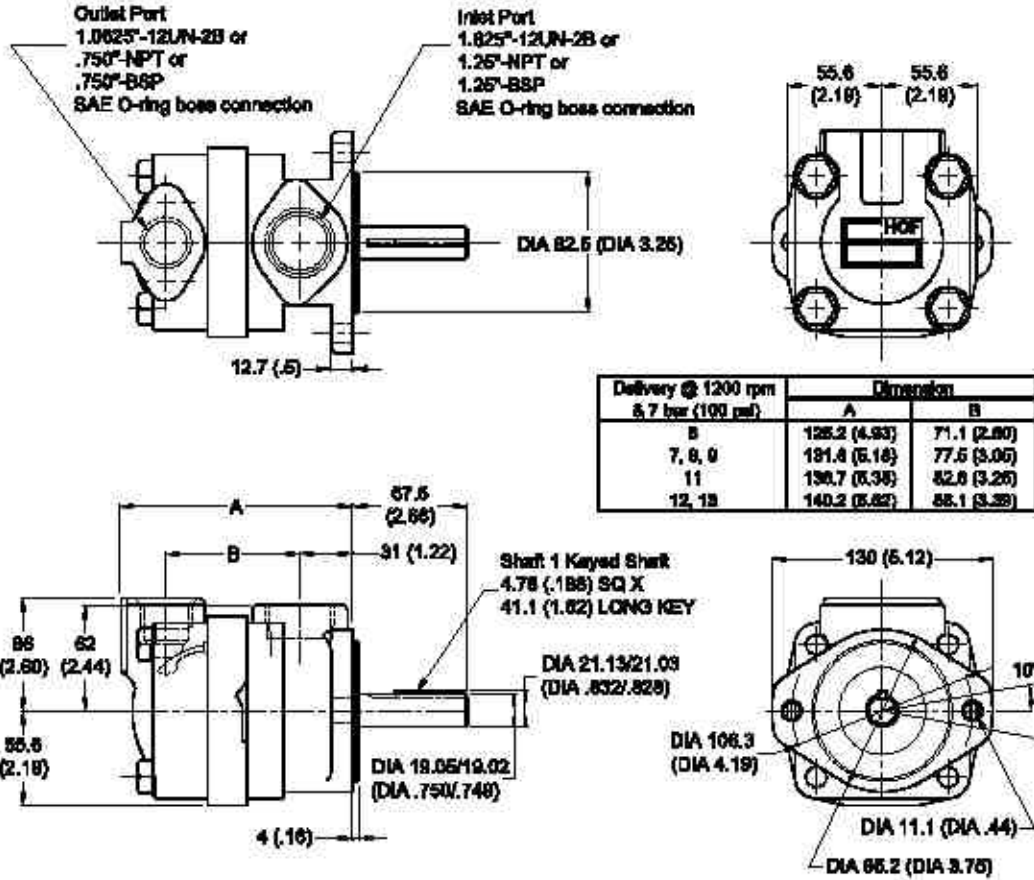


Shaft 12 Splined Shaft 13 Teeth

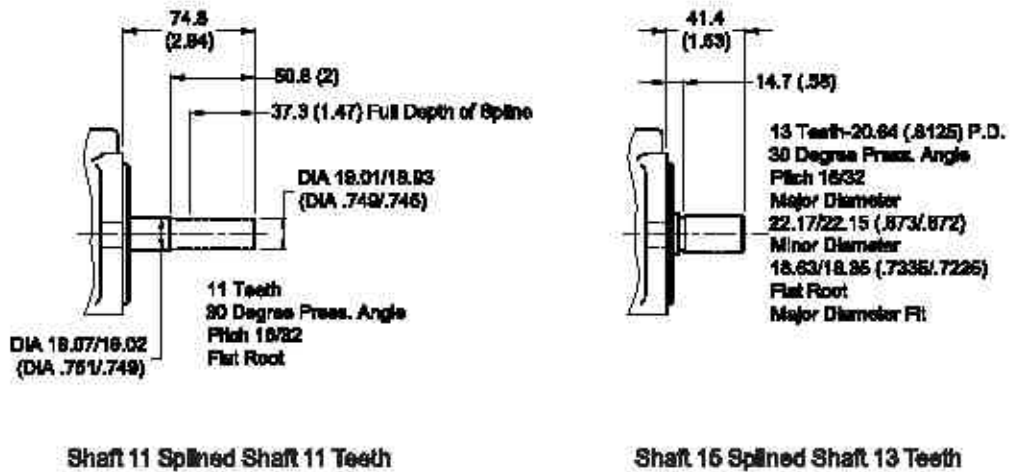
Installation Dimensions mm (inch)

Single Pump V20

V20



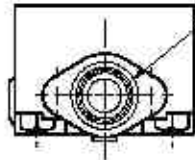
Other shaft options for V20 Series



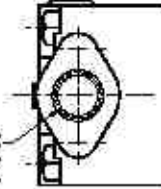
Installation Dimensions mm (inch)

Single Pump V20

V20F and V20P

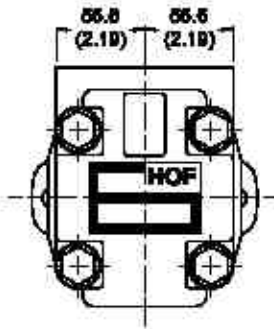


Secondary Outlet Port
 .875-14UNF-2B
 SAE O-Ring Boss Connection

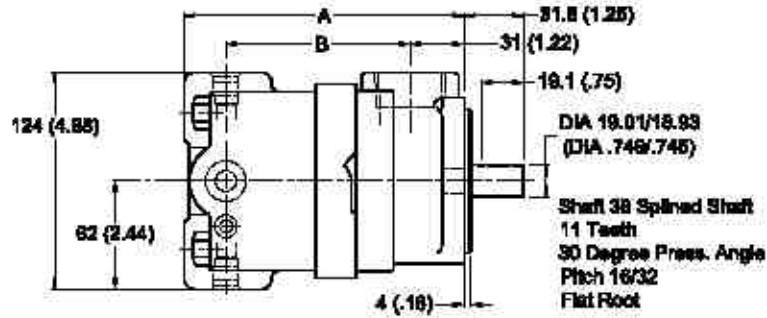


Tank Port
 1.0625-12UN-2B or
 .500" NPT

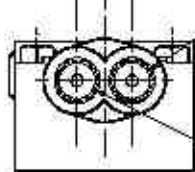
Delivery @ 1200 rpm & 7 bar (100 psi)	Dimension	
	A	B
6	140.6 (5.54)	94.7 (3.73)
7, 8, 9	166.0 (6.54)	101.1 (3.98)
11	161.0 (6.34)	105.9 (4.17)
12, 13	164.3 (6.47)	108.6 (4.31)



55.8 (2.19) 55.5 (2.19)

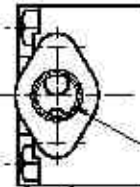


16.8 (.62) 15.5 (.62)



Tank Port For Pressure Relief
 of Primary Outlet Port
 .750"-16UNF-2B
 SAE O-Ring Boss Connection

Primary Outlet Port
 .750"-16UNF-2B
 SAE O-Ring Boss Connection

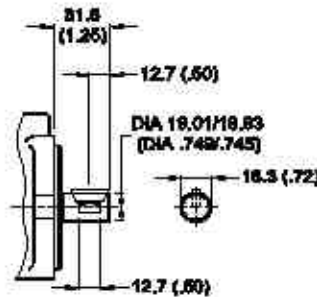


Outlet Port
 SAE O-Ring Boss Connection

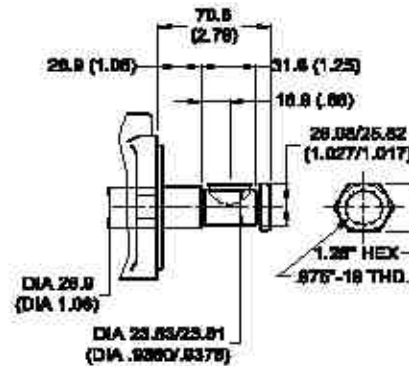
V20P

V20F

Other shaft options for V20 Series



Shaft 6 Straight Stub Keyed Shaft

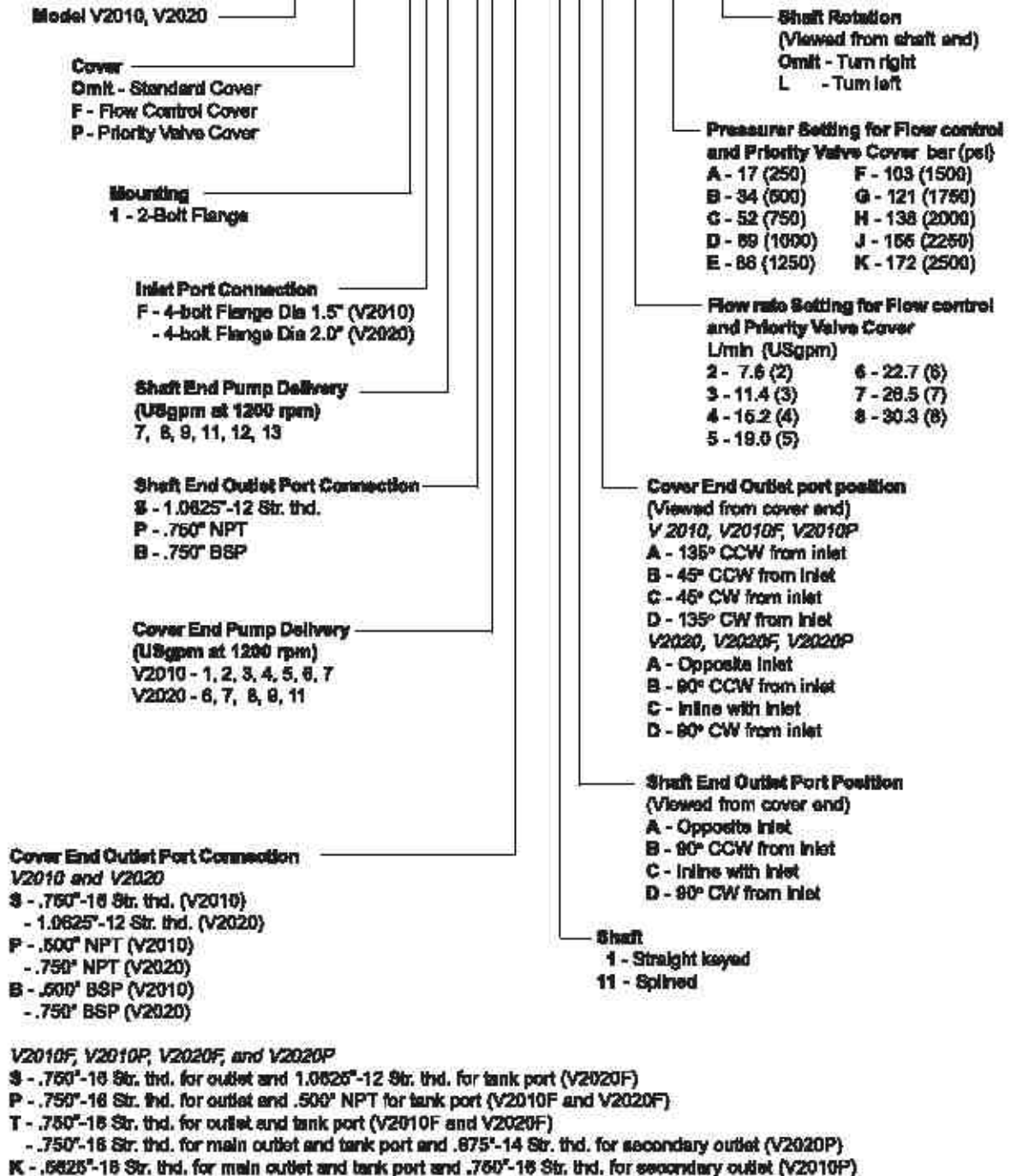


Shaft 3 Threaded with #6 Woodruff Key

Ordering Code

Double Pump

V2010(F) - 1F13S75 - 1CC-(8)(H)-(L)



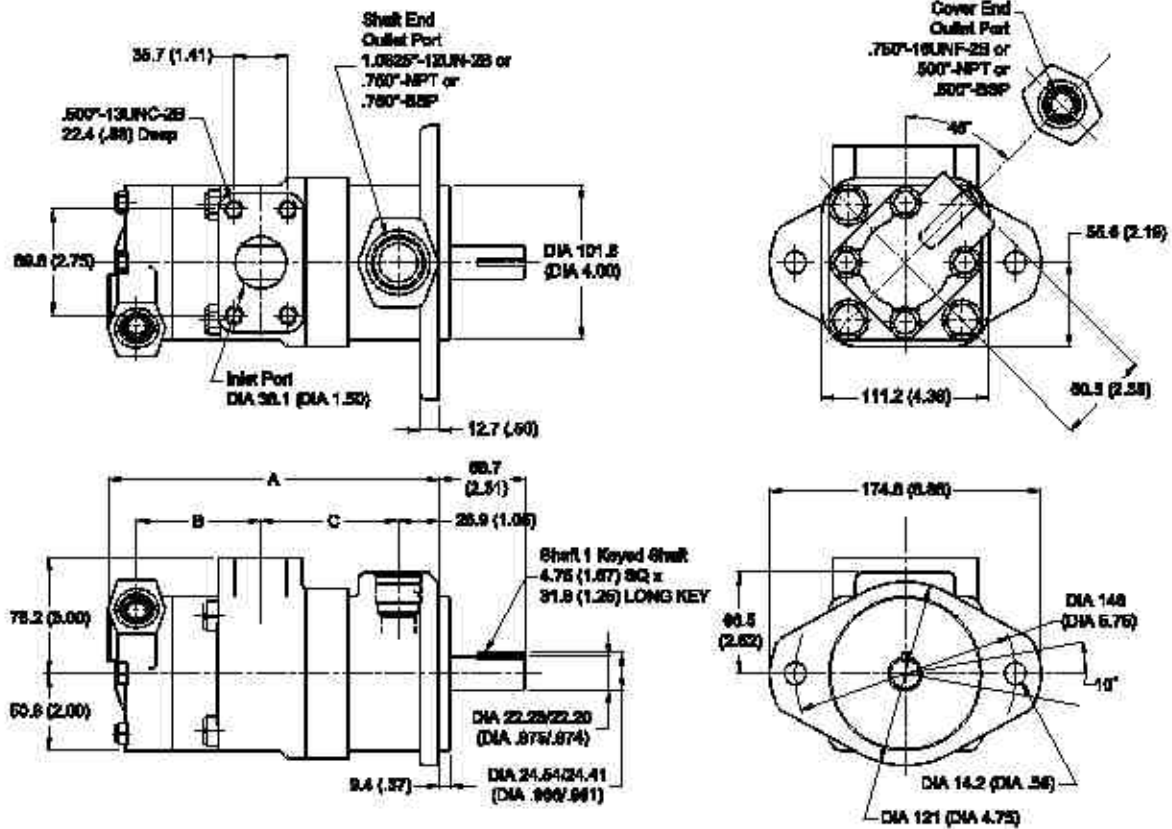
Specifications

Double Pump

Model Series	Cartridge Position	Ring Size Delivery at 1200 r/min & 7 bar (100 psi) USgpm	Geometric Displacement cm ³ /r (in ³ /r)	Delivery at 1500 r/min & 7 bar (100 psi) L/min (USgpm)	Maximum Pressure bar (psi)	Maximum Speed rpm	Weight kg (lb)
V2010	Shaft End	7	22.8 (1.39)	33.11 (8.75)	172 (2500)	3000	13.6 (30)
		8	26.5 (1.62)	37.85 (10.00)	172 (2500)	2800	
		9	29.7 (1.81)	42.57 (11.25)	172 (2500)	2800	
		11	36.4 (2.22)	52.04 (13.75)	172 (2500)	2500	
		12	39.0 (2.38)	58.77 (15.00)	152 (2200)	2400	
		13	42.4 (2.59)	61.50 (16.25)	152 (2200)	2400	
	Cover End	1	3.3 (0.20)	4.70 (1.25)	172 (2500)	3000	
		2	6.6 (0.40)	9.40 (2.50)	172 (2500)	3000	
		3	9.9 (0.60)	14.20 (3.75)	172 (2500)	3000	
		4	13.1 (0.80)	18.90 (5.00)	172 (2500)	3000	
		5	16.4 (1.00)	23.60 (6.25)	172 (2500)	3000	
		6	19.5 (1.19)	28.40 (7.50)	152 (2200)	3000	
		6	22.8 (1.39)	33.10 (8.75)	138 (2000)	2800	
		7	22.8 (1.39)	33.11 (8.75)	172 (2500)	3000	
V2020	Shaft End	7	22.8 (1.39)	33.11 (8.75)	172 (2500)	3000	15.9 (35)
		8	26.5 (1.62)	37.85 (10.00)	172 (2500)	2800	
		9	29.7 (1.81)	42.57 (11.25)	172 (2500)	2800	
		11	36.4 (2.22)	52.04 (13.75)	172 (2500)	2500	
		12	39.0 (2.38)	58.77 (15.00)	152 (2200)	2400	
		13	42.4 (2.59)	61.50 (16.25)	152 (2200)	2400	
	Cover End	8	19.5 (1.19)	28.39 (7.50)		3000	
		7	22.8 (1.39)	33.11 (8.75)		3000	
		8	26.5 (1.62)	37.85 (10.00)	172 (2500)	2800	
		9	29.7 (1.81)	42.57 (11.25)		2800	
		11	36.4 (2.22)	52.04 (13.75)		2500	

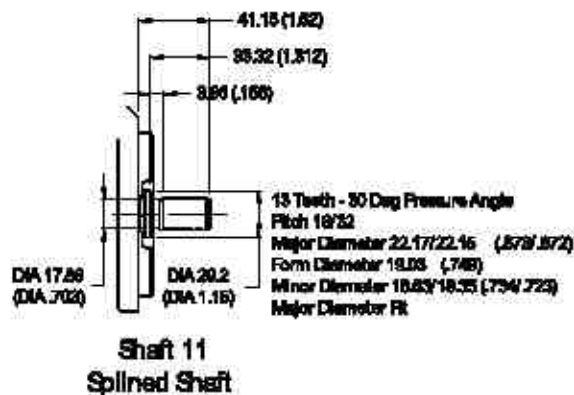
Installation Dimensions mm (inch)

Double Pump V2010



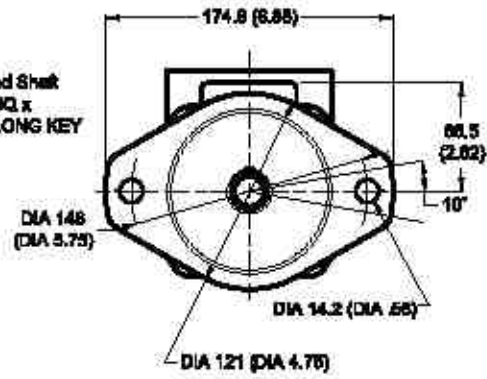
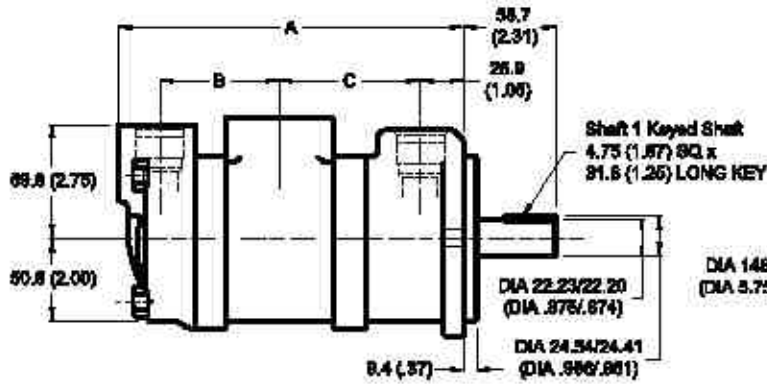
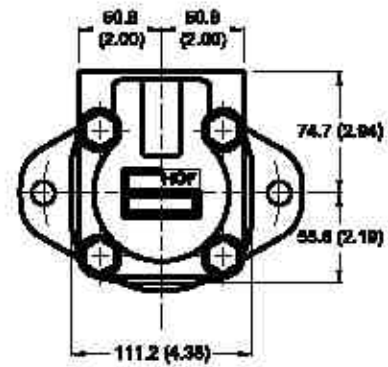
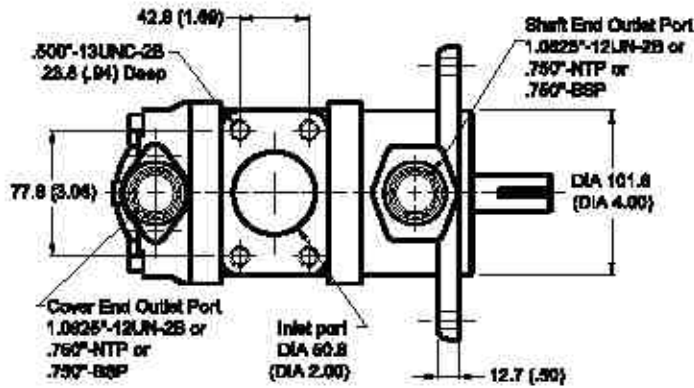
Delivery @ 1200 rpm @ 7 bar (100 psi)		Dimension		
Shaft End	Cover End	A	B	C
7, 8, 9	1, 2, 3	213.1 (8.39)	78.9 (3.09)	86.4 (3.40)
7, 8, 9	4, 6	218.5 (8.64)	82.3 (3.24)	86.4 (3.40)
7, 8, 9	6, 7	224.5 (8.84)	87.4 (3.44)	86.4 (3.40)
11	1, 2, 3	216.2 (8.58)	75.9 (2.99)	81.2 (3.59)
11	4, 6	221.5 (8.74)	82.3 (3.24)	81.2 (3.59)
11	6, 7	226.6 (8.94)	87.4 (3.44)	81.2 (3.59)
12, 13	1, 2, 3	221.7 (8.73)	76.9 (2.99)	84.7 (3.73)
12, 13	4, 5	227.8 (8.97)	82.3 (3.24)	84.7 (3.73)
12, 13	6, 7	232.9 (9.17)	87.4 (3.44)	84.7 (3.73)

Other shaft options for Double Pump V2010 and V2020



Installation Dimensions mm (inch)

Double Pump V2020

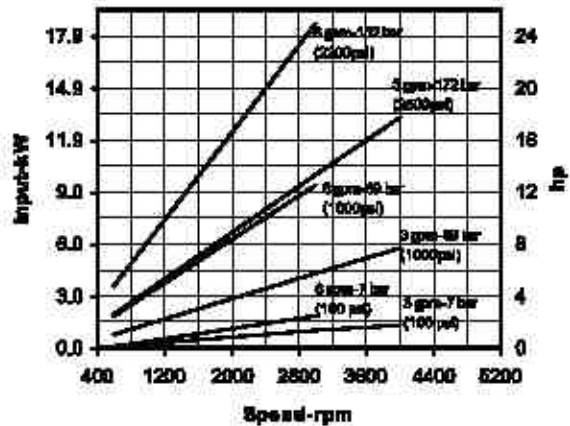
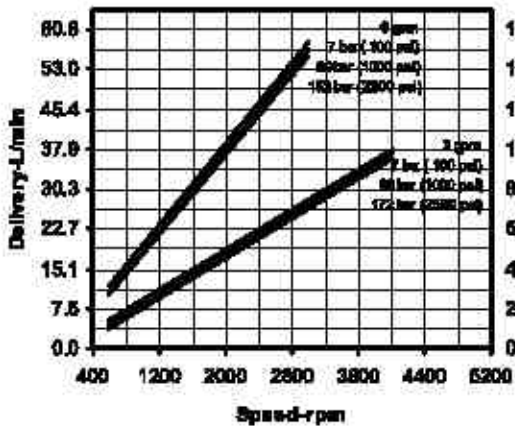
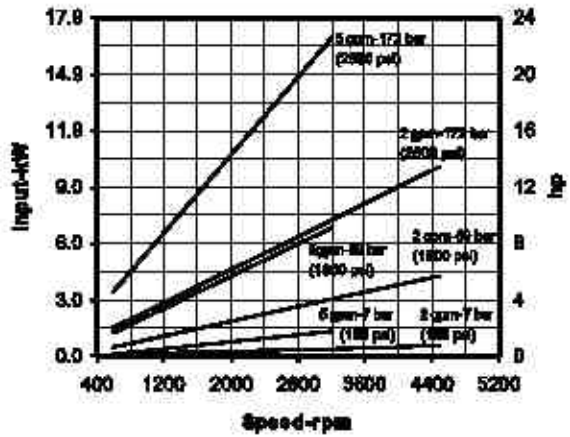
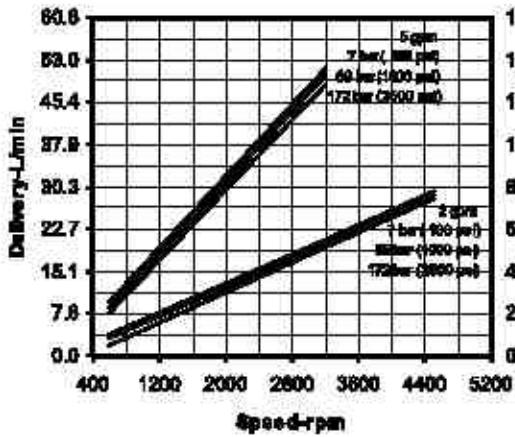
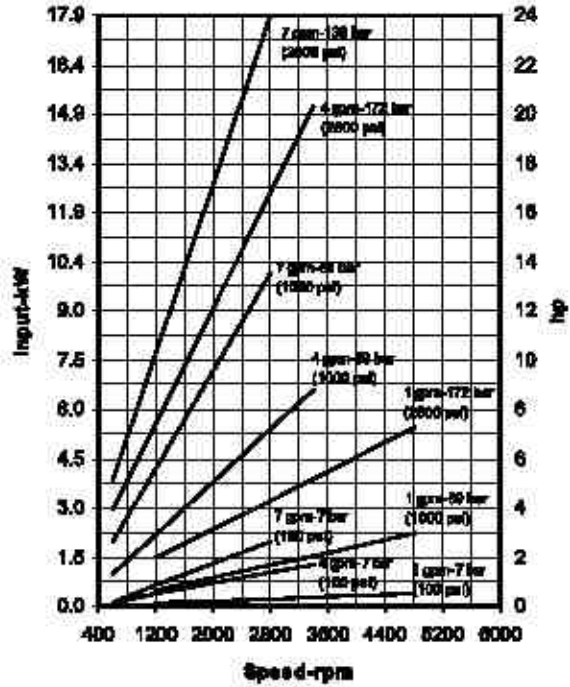
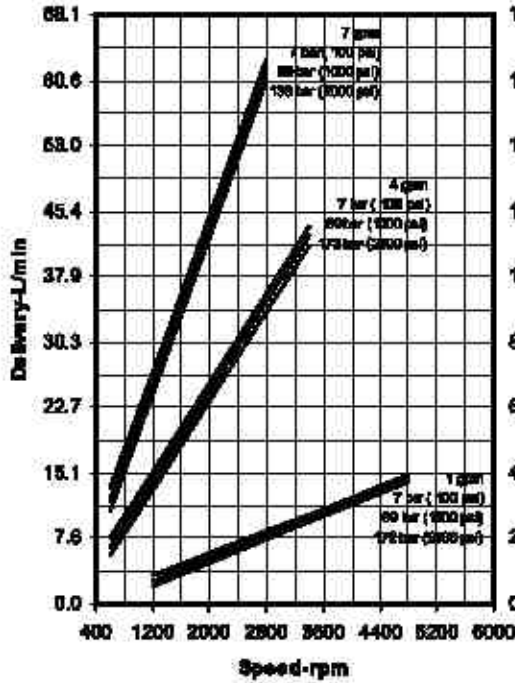


Delivery @ 1200 rpm & 7 bar (100 psi)		Dimension		
Shaft End	Cover End	A	B	C
7, 8, 9	0	213.6 (8.41)	73.7 (2.90)	87.1 (3.43)
7, 8, 9	7, 8, 9	220.0 (8.66)	60.0 (2.36)	87.1 (3.43)
11	0	218.7 (8.61)	73.7 (2.90)	92.2 (3.63)
11	7, 8, 9	225.0 (8.86)	60.0 (2.36)	92.2 (3.63)
11	11	228.9 (9.01)	65.1 (2.56)	92.2 (3.63)
12, 13	0	222.3 (8.75)	73.7 (2.90)	98.5 (3.88)
12, 13	7, 8, 9	228.3 (9.00)	60.0 (2.36)	95.5 (3.76)
12, 13	11	230.4 (9.07)	65.1 (2.56)	95.5 (3.76)

Performance Characteristics

V10, Cover End of V2010

Based on viscosity 32 cSt (150 SSU) oil at 40 °C (120 °F) and pump inlet at 0 PSIG (14.7 PSIA)

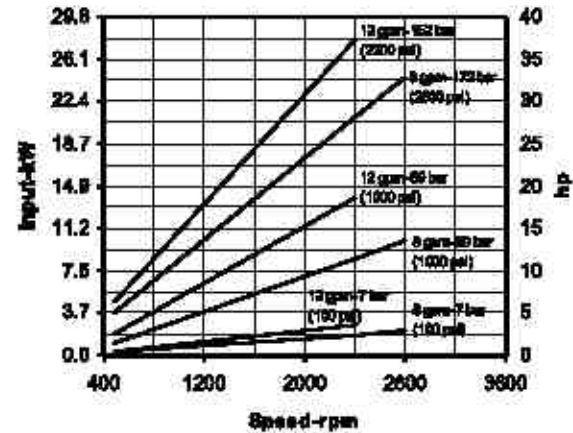
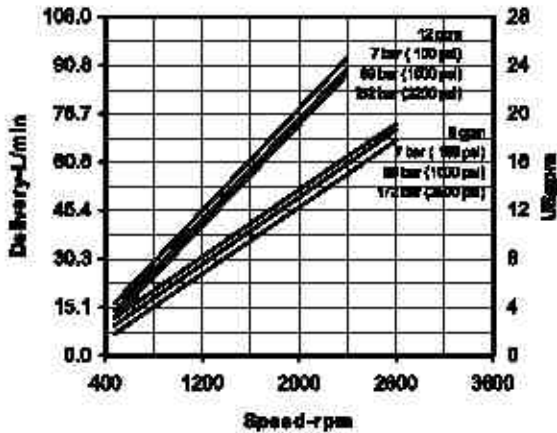
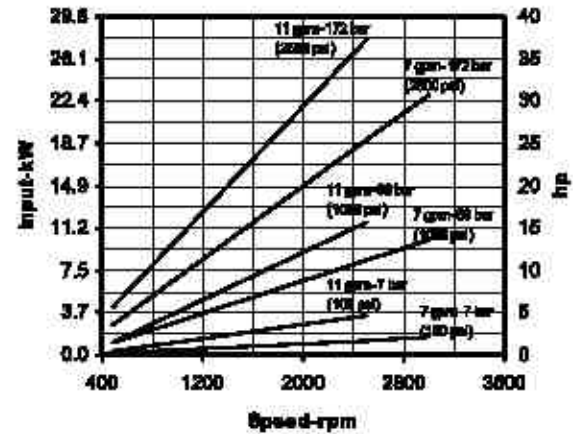
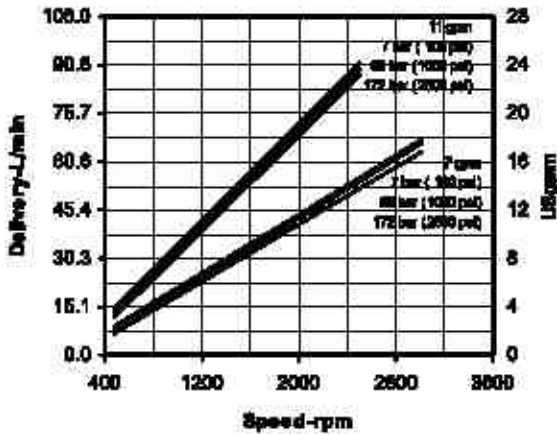
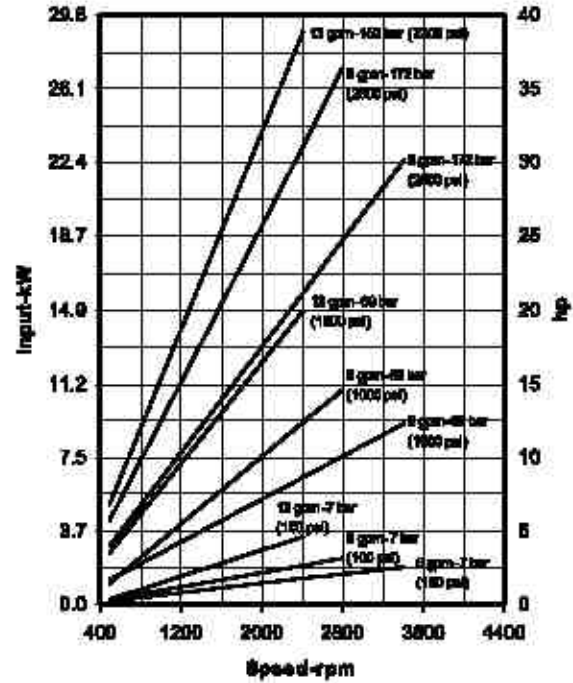
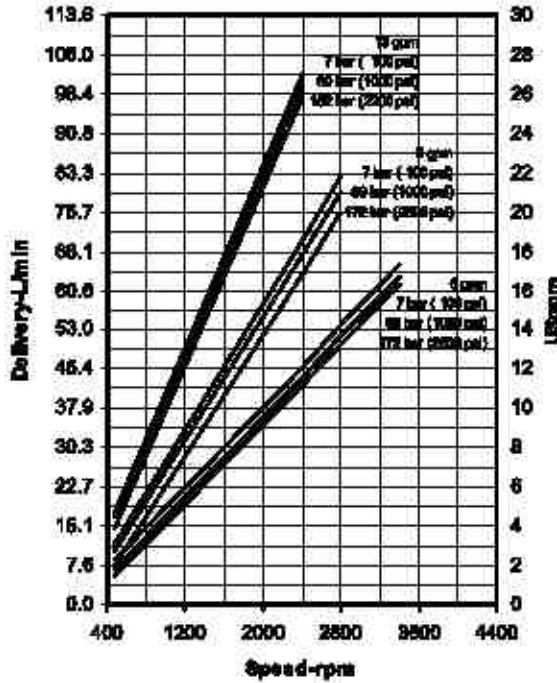


For the Cover End Cartridge, the speed could not exceed the maximum speed of the Shaft End Cartridge.

Performance Characteristics

V20, Shaft End of V20SM, Cover End of V2020

Based on viscosity 32 cSt (160 SSU) oil at 49 °C (120 °F) and pump inlet at 0 PSIG (14.7 PSIA)



For the Cover End Cartridge, the speed could not exceed the maximum speed of the Shaft End Cartridge.