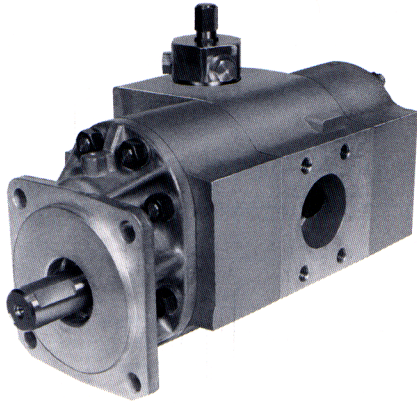


Model NDS20

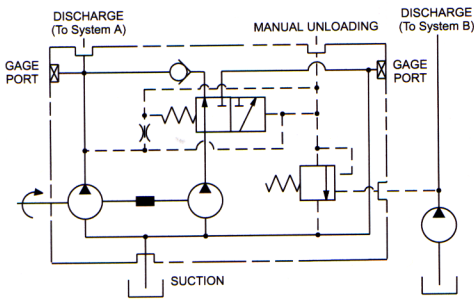


Description Pressure Summation Unloading Gear Pumps
 Combined Flow Range To 197 GPM (74.5 LTR.)
 Displacements To 9.10 IN³ Each Section (149.12 CC's/REV.)
 Maximum Pressure to 2500 PSI (172 BAR)
 Maximum Speed to 2500 RPM
 Rotation A or C
 Bearings Journal
 Construction Aluminum

Tandem Pump with Pressure Summation Unloading Valve

The NDS pump system is essentially the same as the NSH system, except the unloading pressure signal is the summation of the internal pressure, plus an external pressure from another pumping system. The NDS system is useful in limiting the horsepower withdrawn from the prime mover in a multiple pump circuit system. Refer to Figure 1, Page 106, for a typical circuit. Assume System B is operating at minimum pressure, then the NDS circuit (System A) can operate at a high pressure-high flow before unloading one of the tandem pumps.

Conversely, if System B is operating at high pressure, then the NDS circuit (System A) would unload the pump at a lower pressure to avoid overloading the engine. This relationship is shown in Figure 2, which illustrates the unloading characteristics for the NDS system when used in conjunction with another hydraulic Pump B.



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
NDS20	150	.0131	3.02	.0496	49.849	.0108	2500	172	2500
NDS20	200	.0175	4.04	.0662	66.204	.0146	2500	172	2500
NDS20	250	.0219	5.06	.0829	82.919	.0182	2500	172	2500
NDS20	300	.0262	6.05	.0992	99.142	.0218	2500	172	2500
NDS20	350	.0306	7.07	.1158	115.857	.0255	2500	172	2500
NDS20	400	.0350	8.08	.1325	132.408	.0292	2500	172	2500
NDS20	450	.0394	9.10	.1491	149.123	.0328	2500	172	2500

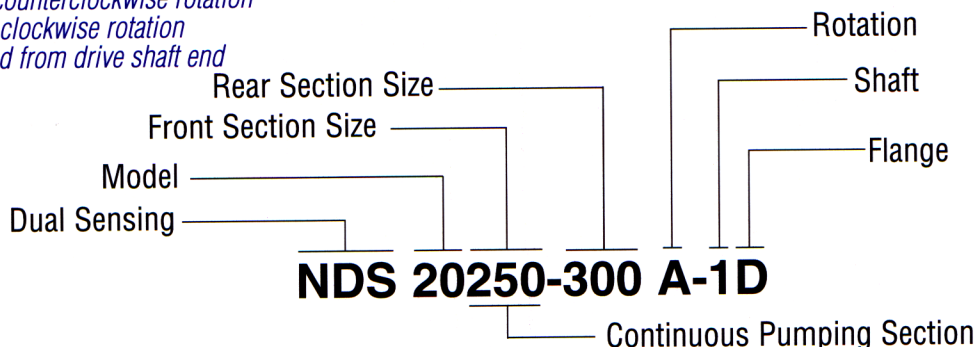
All data based on SAE 10W oil at 150°F. Available with Viton Seals for use with phosphate ester based fluid.

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 (VNDS20) when ordering pumps with Viton Seals for use with phosphate ester base fluids.

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 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 Pad Mount</p>

Dimensional Data

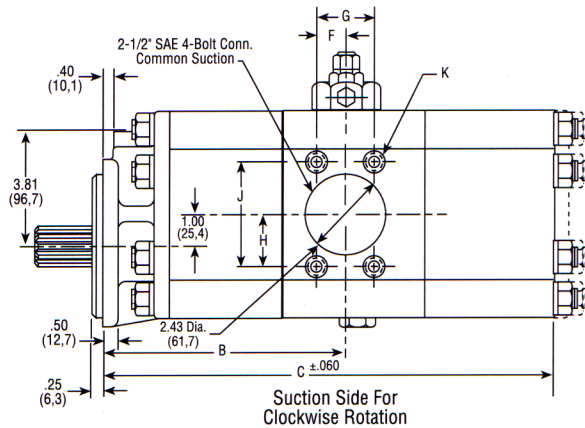
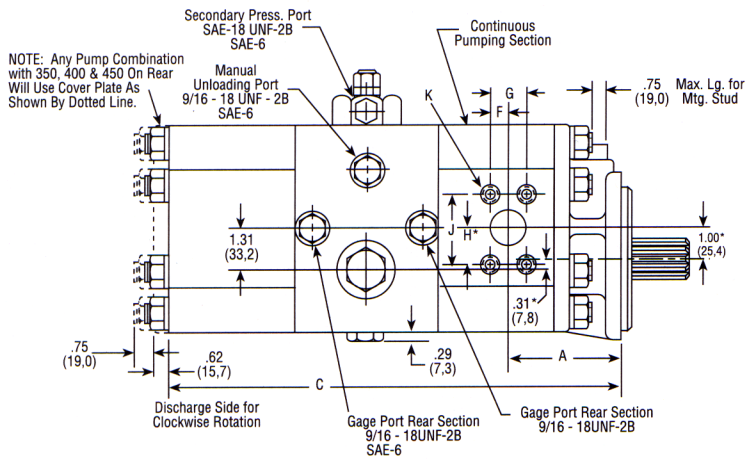
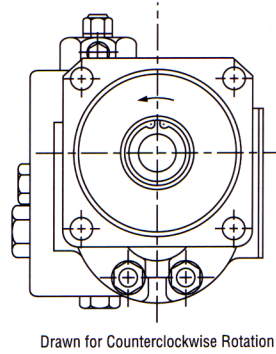
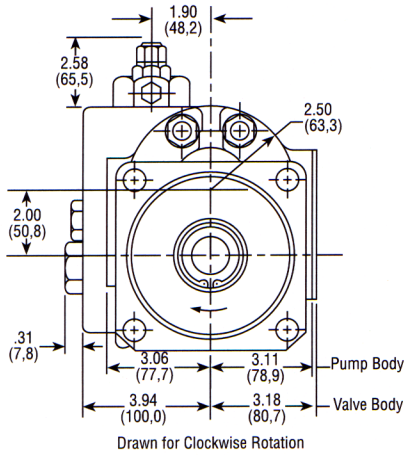
Mounting Dimensions

FRONT SECTION SIZE	REAR SECTION SIZE	DISCHARGE Front Section			SHIPPING WEIGHTS (Approx.)			
		Conn. Size	Hole Dia.	A	B	C	lbs.	kgs.
20150	—150	1"	.93 (23,6)	3.60 (91,4)	7.07 (179,5)	12.68 (322,0)	56	20.9
	—200	1"	.93 (23,6)	3.60 (91,4)	7.07 (179,5)	13.54 (343,9)	57	21.3
	—250	1"	.93 (23,6)	3.60 (91,4)	7.07 (179,5)	13.93 (353,8)	58	21.7
	—300	1"	.93 (23,6)	3.60 (91,4)	7.07 (179,5)	14.22 (361,1)	60	22.4
	—350	1"	.93 (23,6)	3.60 (91,4)	7.07 (179,5)	13.83 (351,2)	62	23.1
	—400	1"	.93 (23,6)	3.60 (91,4)	7.07 (179,5)	14.11 (358,3)	64	23.9
	—450	1"	.93 (23,6)	3.60 (91,4)	7.07 (179,5)	14.40 (365,7)	66	24.6
20200	—150	1-1/2"	1.19 (30,2)	3.75 (95,2)	7.97 (202,4)	13.58 (344,9)	58	21.7
	—200	1-1/2"	1.19 (30,2)	3.75 (95,2)	7.97 (202,4)	14.44 (366,7)	59	22.0
	—250	1-1/2"	1.19 (30,2)	3.75 (95,2)	7.97 (202,4)	14.83 (376,3)	60	22.4
	—300	1-1/2"	1.19 (30,2)	3.75 (95,2)	7.97 (202,4)	15.11 (383,7)	62	23.1
	—350	1-1/2"	1.19 (30,2)	3.75 (95,2)	7.97 (202,4)	14.72 (373,8)	64	23.9
	—400	1-1/2"	1.19 (30,2)	3.75 (95,2)	7.97 (202,4)	15.00 (381,0)	66	24.6
	—450	1-1/2"	1.19 (30,2)	3.75 (95,2)	7.97 (202,4)	15.29 (388,3)	68	25.4
20250	—150	1-1/2"	1.19 (30,2)	4.00 (101,6)	8.25 (209,5)	13.86 (352,0)	59	21.7
	—200	1-1/2"	1.19 (30,2)	4.00 (101,6)	8.25 (209,5)	14.71 (373,6)	60	22.4
	—250	1-1/2"	1.19 (30,2)	4.00 (101,6)	8.25 (209,5)	15.11 (383,7)	62	23.1
	—300	1-1/2"	1.19 (30,2)	4.00 (101,6)	8.25 (209,5)	15.39 (390,9)	64	23.9
	—350	1-1/2"	1.19 (30,2)	4.00 (101,6)	8.25 (209,5)	15.00 (381,0)	66	24.6
	—400	1-1/2"	1.19 (30,2)	4.00 (101,6)	8.25 (209,5)	15.28 (388,1)	68	25.4
	—450	1-1/2"	1.19 (30,2)	4.00 (101,6)	8.25 (209,5)	15.57 (395,4)	70	26.1
20300	—150	1-1/2"	1.19 (30,2)	4.14 (105,1)	8.54 (216,9)	14.15 (359,4)	60	22.4
	—200	1-1/2"	1.19 (30,2)	4.14 (105,1)	8.54 (216,9)	15.00 (381,0)	64	23.9
	—250	1-1/2"	1.19 (30,2)	4.14 (105,1)	8.54 (216,9)	15.40 (391,1)	66	24.6
	—300	1-1/2"	1.19 (30,2)	4.14 (105,1)	8.54 (216,9)	15.68 (398,2)	68	25.4
	—350	1-1/2"	1.19 (30,2)	4.14 (105,1)	8.54 (216,9)	15.29 (388,3)	70	26.1
	—400	1-1/2"	1.19 (30,2)	4.14 (105,1)	8.54 (216,9)	15.57 (395,4)	72	26.9
	—450	1-1/2"	1.19 (30,2)	4.14 (105,1)	8.54 (216,9)	15.86 (402,8)	74	27.6
20350	—150	1-1/2"	1.19 (30,2)	4.35 (110,4)	8.82 (224,0)	14.43 (366,5)	62	23.1
	—200	1-1/2"	1.19 (30,2)	4.35 (110,4)	8.82 (224,0)	15.28 (388,1)	64	23.9
	—250	1-1/2"	1.19 (30,2)	4.35 (110,4)	8.82 (224,0)	15.68 (398,2)	66	24.6
	—300	1-1/2"	1.19 (30,2)	4.35 (110,4)	8.82 (224,0)	15.96 (405,3)	70	26.1
	—350	1-1/2"	1.19 (30,2)	4.35 (110,4)	8.82 (224,0)	15.57 (395,4)	72	26.9
	—400	1-1/2"	1.19 (30,2)	4.35 (110,4)	8.82 (224,0)	15.85 (402,5)	74	27.6
	—450	1-1/2"	1.19 (30,2)	4.35 (110,4)	8.82 (224,0)	16.14 (409,9)	76	28.4
20400	—150	1-1/2"	1.37 (34,7)	4.35 (110,4)	9.10 (231,1)	14.71 (373,6)	64	23.9
	—200	1-1/2"	1.37 (34,7)	4.35 (110,4)	9.10 (231,1)	15.56 (395,2)	66	24.6
	—250	1-1/2"	1.37 (34,7)	4.35 (110,4)	9.10 (231,1)	15.96 (405,3)	68	25.4
	—300	1-1/2"	1.37 (34,7)	4.35 (110,4)	9.10 (231,1)	16.24 (412,4)	70	26.1
	—350	1-1/2"	1.37 (34,7)	4.35 (110,4)	9.10 (231,1)	15.85 (402,5)	72	26.9
	—400	1-1/2"	1.37 (34,7)	4.35 (110,4)	9.10 (231,1)	16.13 (409,7)	76	28.4
	—450	1-1/2"	1.37 (34,7)	4.35 (110,4)	9.10 (231,1)	16.42 (417,0)	78	29.1
20450	—150	1-1/2"	1.37 (34,7)	4.66 (118,3)	9.39 (238,5)	15.00 (381,0)	66	24.6
	—200	1-1/2"	1.37 (34,7)	4.66 (118,3)	9.39 (238,5)	15.85 (402,5)	68	25.4
	—250	1-1/2"	1.37 (34,7)	4.66 (118,3)	9.39 (238,5)	16.25 (412,7)	70	26.1
	—300	1-1/2"	1.37 (34,7)	4.66 (118,3)	9.39 (238,5)	16.53 (419,8)	74	27.6
	—350	1-1/2"	1.37 (34,7)	4.66 (118,3)	9.39 (238,5)	16.14 (409,9)	76	28.4
	—400	1-1/2"	1.37 (34,7)	4.66 (118,3)	9.39 (238,5)	16.42 (417,0)	78	29.1
	—450	1-1/2"	1.37 (34,7)	4.66 (118,3)	9.39 (238,5)	16.71 (424,4)	80	29.9

Dimensional Data

SAE 4-Bolt Connector Ports

Size	F	G	H	J	K
1"	.51 (12,9)	1.03 (26,1)	1.03 (26,1)	2.06 (52,3)	3/8-16NC
1-1/2"	.70 (17,7)	1.40 (35,5)	1.37 (34,7)	2.75 (69,8)	1/2-13NC
2-1/2"	1.00 (25,4)	2.00 (50,8)	1.75 (44,4)	3.50 (88,9)	1/2-13NC



* These dimensions locate \bar{C} of bolt pattern only

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

