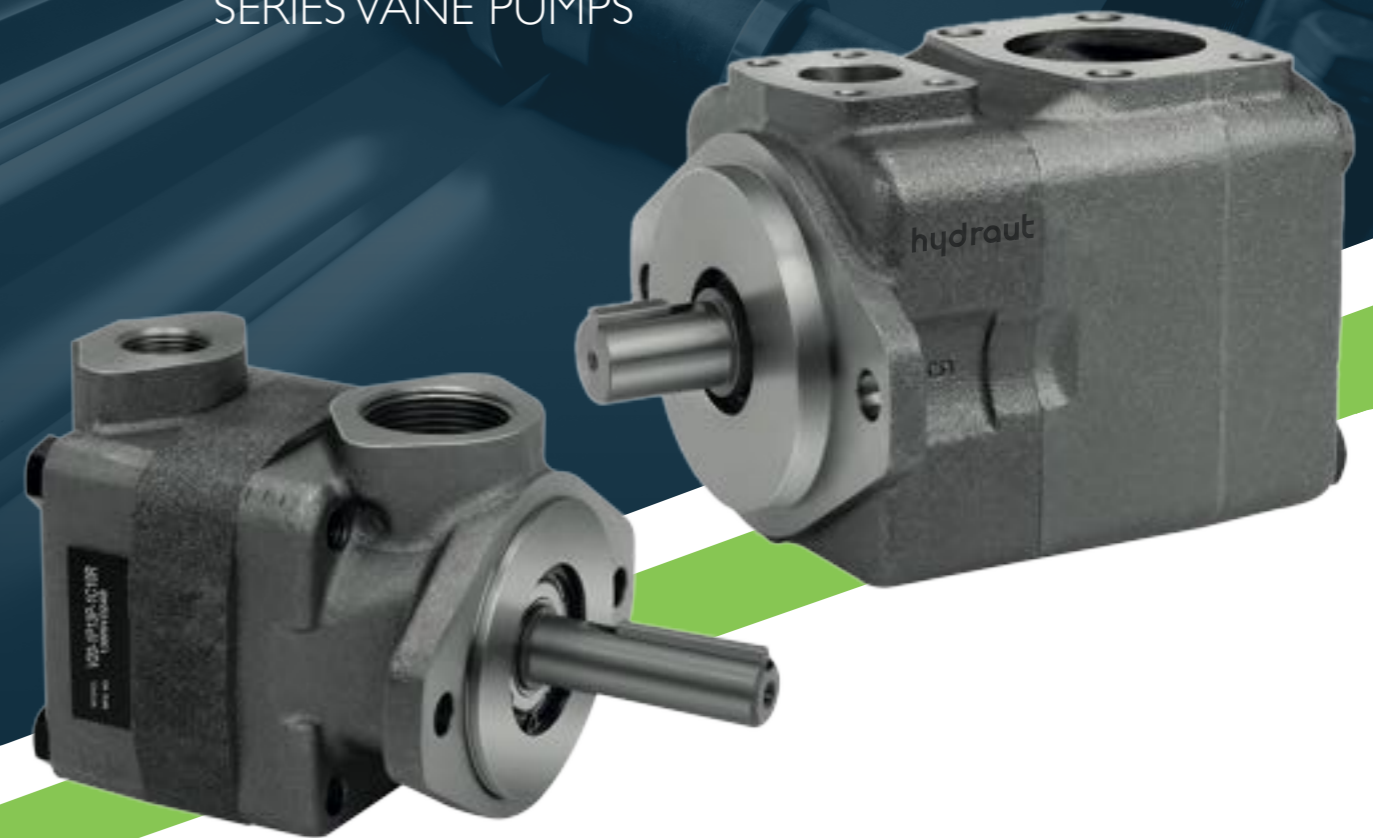


HS, HQ and VH

SERIES VANE PUMPS



hydrat

HS, HQ and VH

SERIES VANE PUMPS

hydrat

Summary



HS single pumps model code **02**



HS double pumps model code **07**



HQ single pumps model code **15**



HQ double pumps model code **16**



VH single pumps model code **18**

HS SINGLE PUMPS MODEL CODE



SPECIFICATIONS

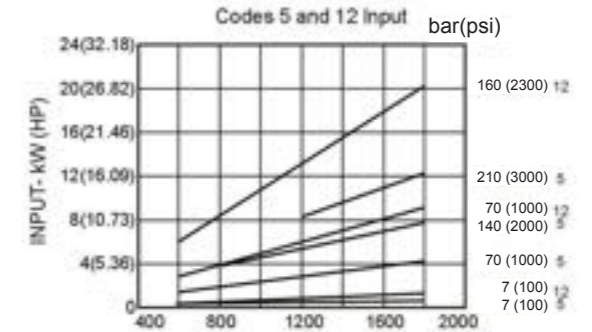
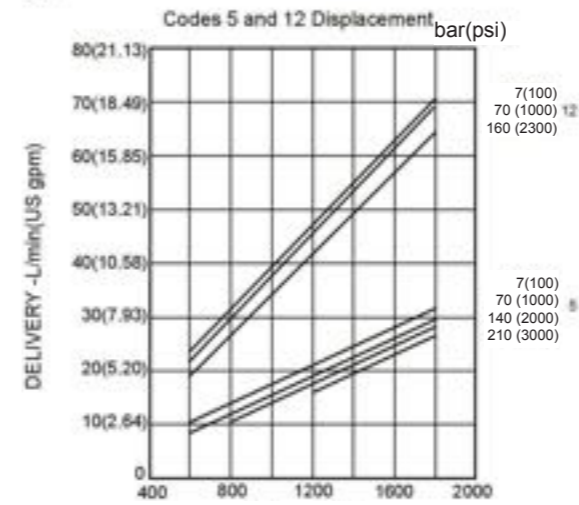
Prefix	Series HS / HST	Rear pump mounting with SAE mounting flange, 2-bolts**	Flow (GPM)	Rotation	Shafts	Port orientation	Adapter orientation**
Omit-using antiwear oil water glycol fluid F3-phosphate ester fluid	HS20*	A: SAE-A mounting flange B: SAE-B mounting flange C: SAE-C mounting flange	2, 5, 8, 9, 11, 12, 14	D = Right-hand direction of rotation CW L = Left-hand direction of rotation CCW	1 - Straight Key 151 - Splined	A = opposite inlet ports B = 90° CCW from inlet C = in line with inlet D = 90° CW from inlet	SAE A SAE B
	HS(T)25		10, 12, 14, 15, 17, 19, 21		1 - Straight Key 86 - HD Straight Key 11 - Splined		
	HS(T)35		21, 25, 30, 35, 38, 45	To check the direction of rotation view from the shaft end			
	HS(T)45		42, 45, 50, 60, 66, 75				

* HST series not available / ** valid only for HST series

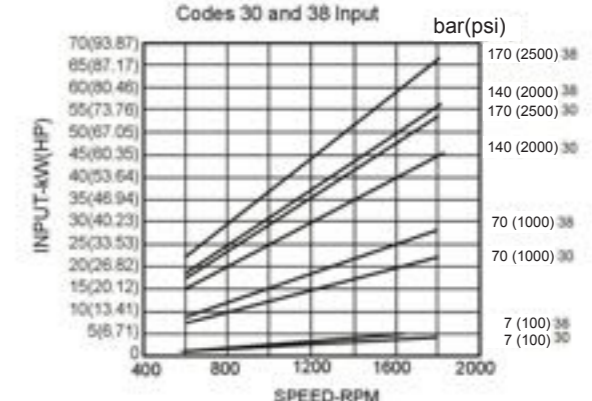
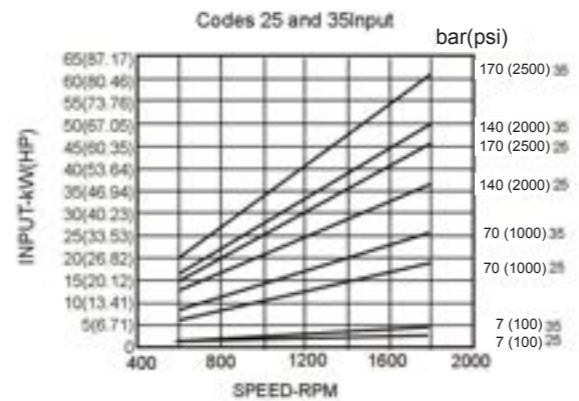
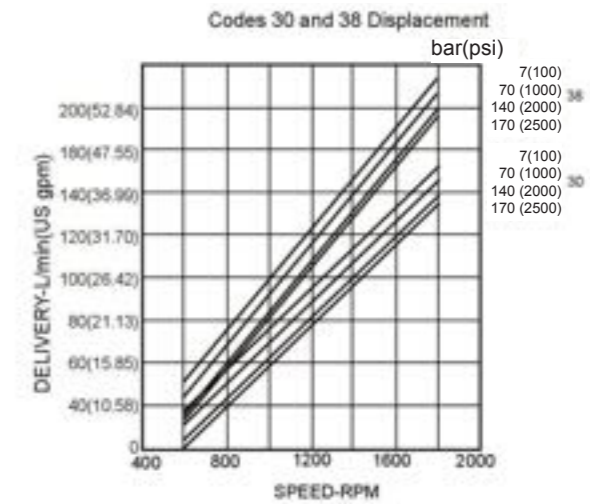
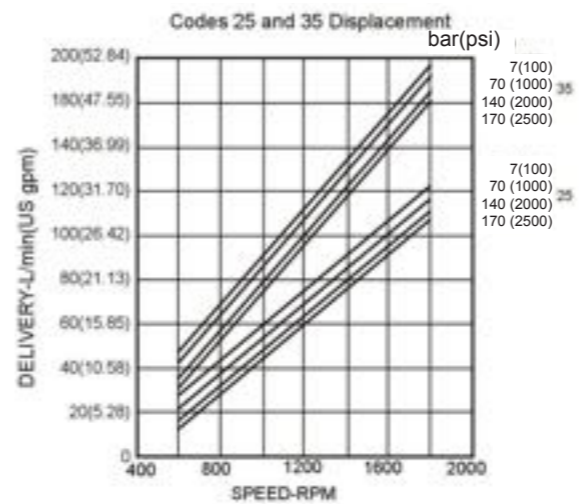
Model	Code	Geometric displacement (cc/rev)	Using anti-wear oil or phosphate ester fluid		Using water glycol fluid		Using water-in-oil emulsion		Min. speed (r/min)
			Max. pressure (bar)	Max. speed (r/min)	Max. pressure (bar)	Max. speed (r/min)	Max. pressure (bar)	Max. speed (r/min)	
HS20	2	7.5	138	1800	138	1500	69	1200	600
	5	17							
	8	27							
	9	30	207						
	11	36							
	12	40							
HS(T)25	14	45	138	1800	159	1500	69	1200	600
	10	32.5							
	12	40							
	14	43	172						
	15	45							
	17	55							
HS(T)35	19	59	172	1800	159	1500	69	1200	600
	21	67							
	21	67							
	25	81	172						
	30	97							
	35	112							
HS(T)45	38	121	138	1800	159	1500	69	1200	600
	45	140							
	42	138							
	45	142	172						
	50	162							
	60	193							
	66	212	138	1800	159	1500	69	1200	600
	75	237							

PERFORMANCE CHARACTERISTICS

HS20

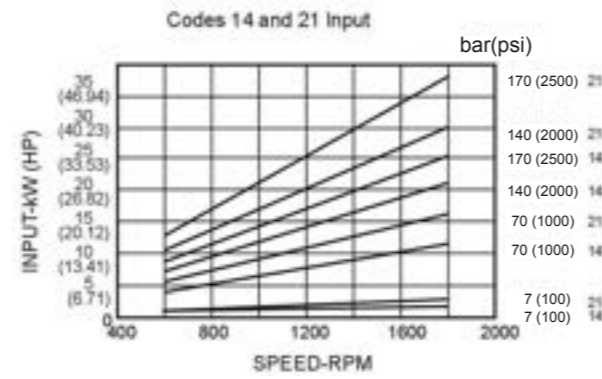
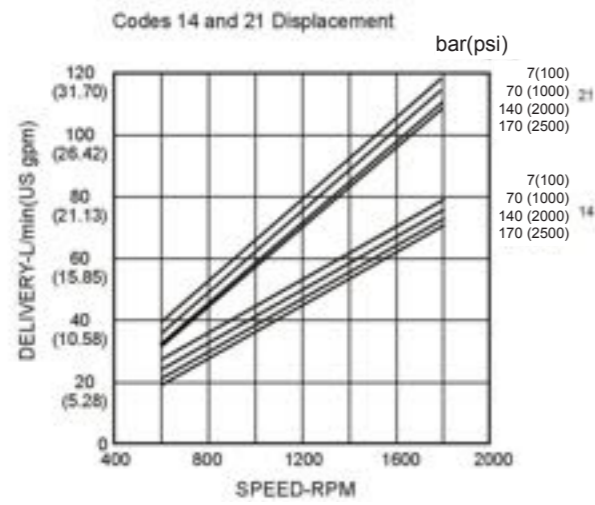


HS25

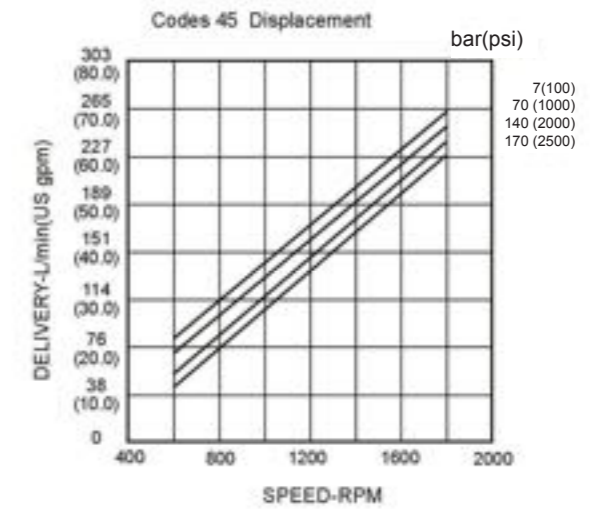
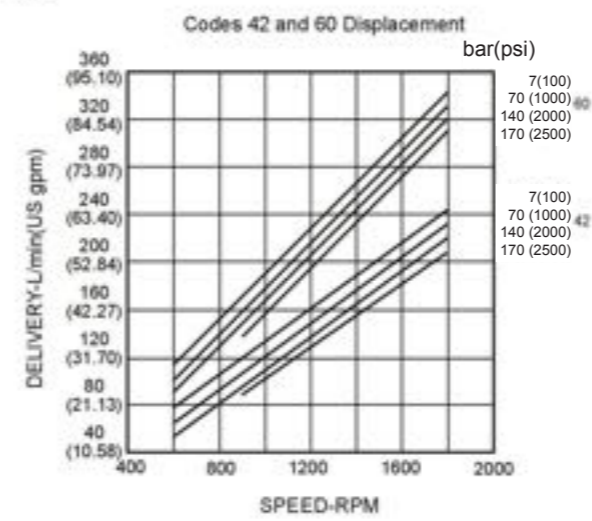


TYPE CODE FOR STANDARD PROGRAM

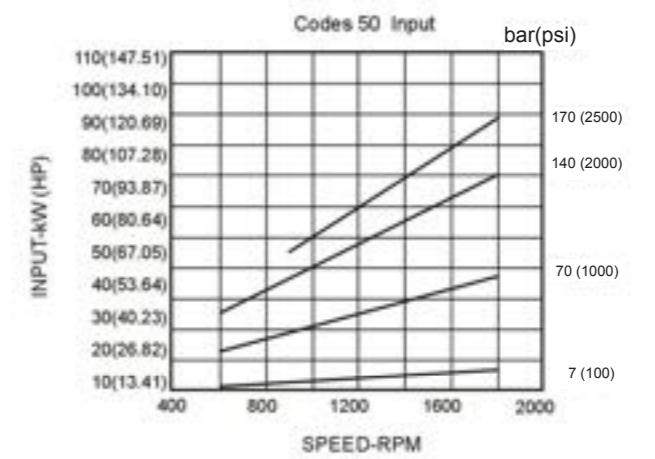
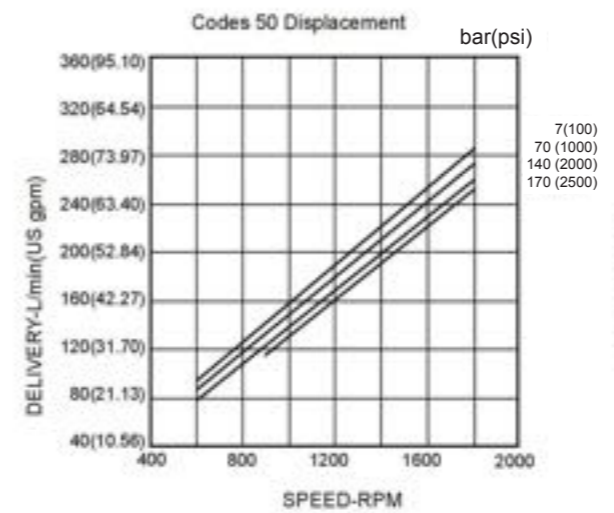
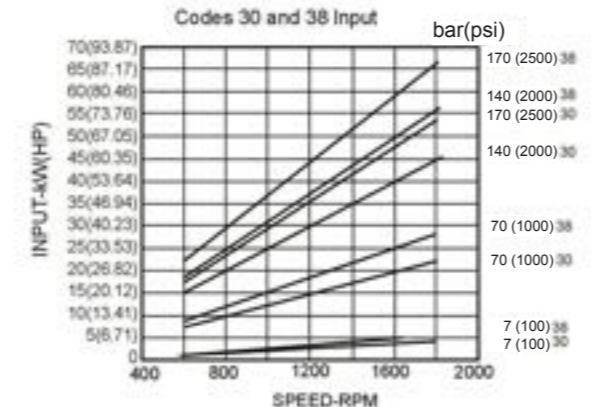
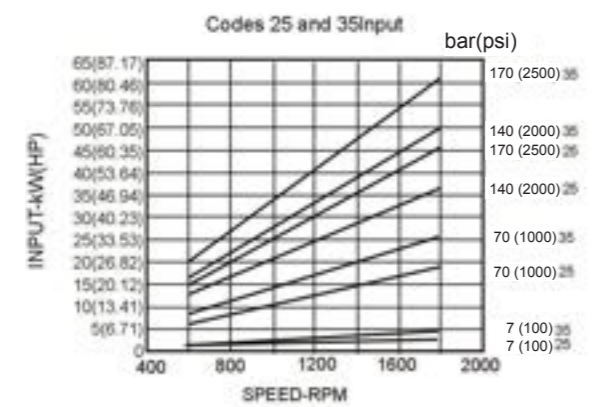
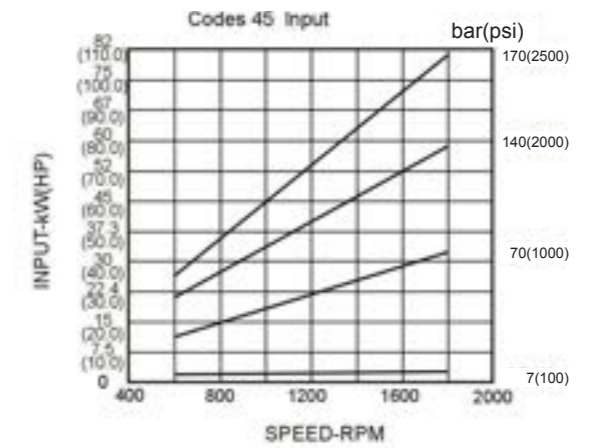
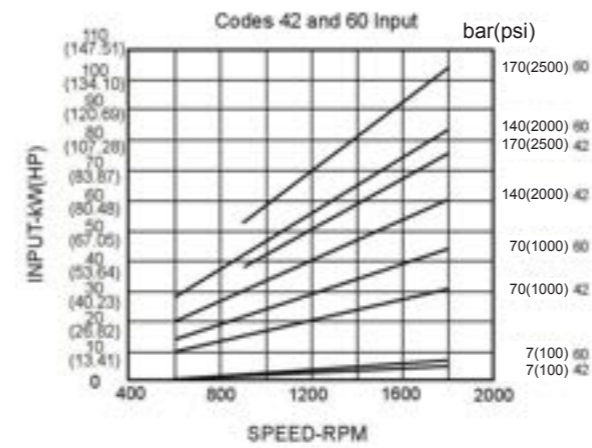
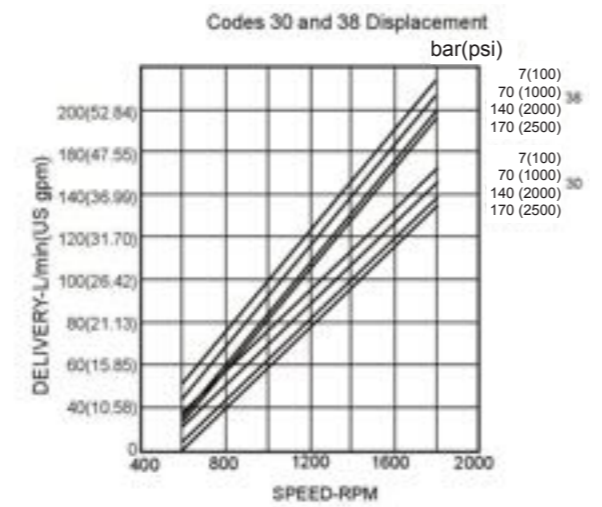
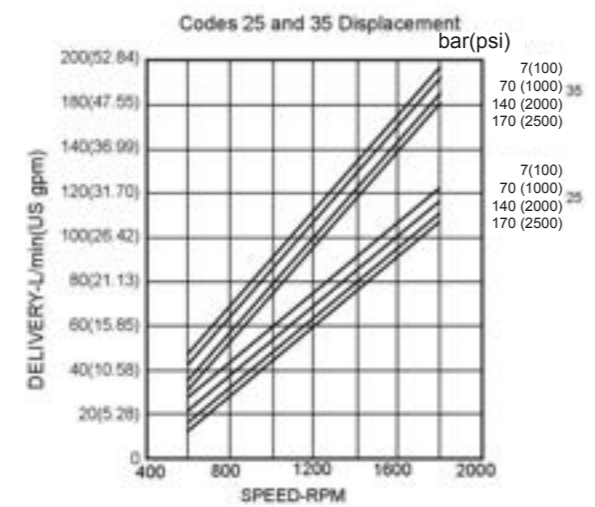
HS25



HS45

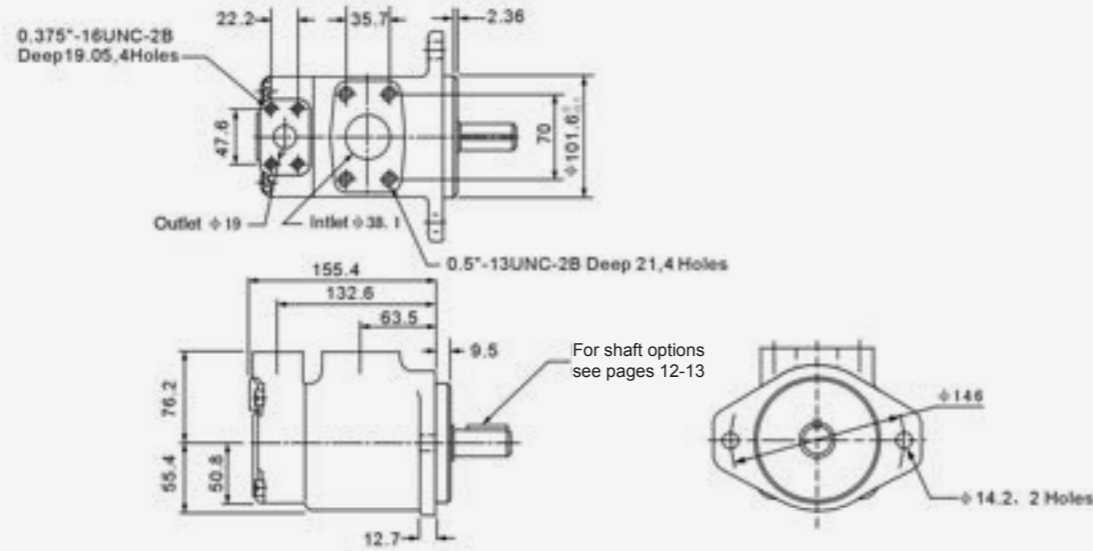


HS35

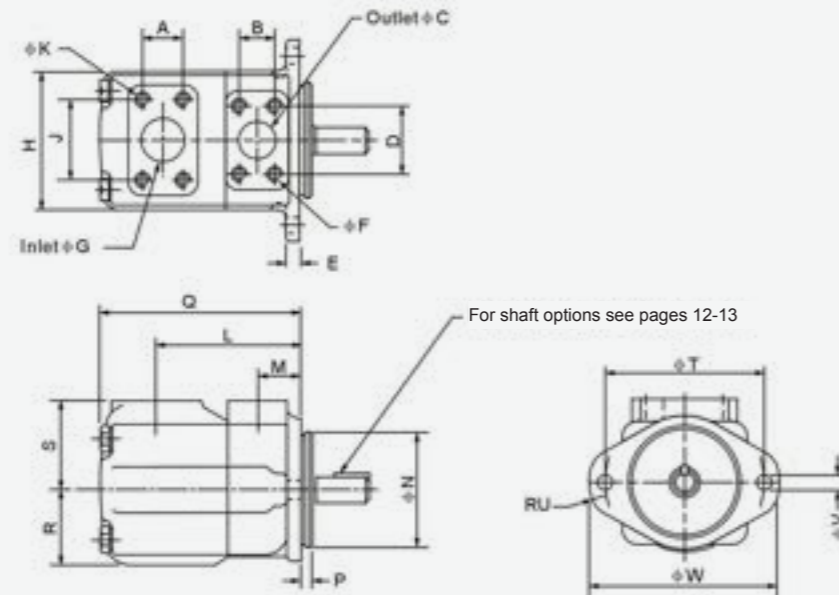


INSTALLATION DIMENSIONS

HS20



HS25, HS35, HS45



Model	A	B	C	D	E	G	H	J	L	M	N	P	Q	R
HS25	35.7	26.2	25.4	52.4	12.7	38.1	118	69.9	121	38.1	101.6/101.5	9.53	162.1	63.5
HS35	42.9	30.2	31.8	58.7	16	50.8	140	77.8	125.5	38.1	127.0/126.9	9.53	185	69.9
HS45	61.9	35.7	38.1	69.9	16	76.2	159	106.4	153	43	127.0/126.9	12.7	216	82.6

Model	S	T	U	V	W	F X full thread depth, 4holes	K X full thread depth, 4holes
HS25	76.2	146	14	14.2	175	3/8-16UNC-2Bx19.1 deep	1/2-13UNC-2Bx23.8 deep
HS35	82.6	181	16	17.5	213	7/16-14UNC-2Bx22.3 deep	1/2-13UNC-2Bx22.3 deep
HS45	93.7	181	16	17.5	213	1/2-13UNC-2Bx23.8 deep	1/2-13UNC-2Bx30 deep

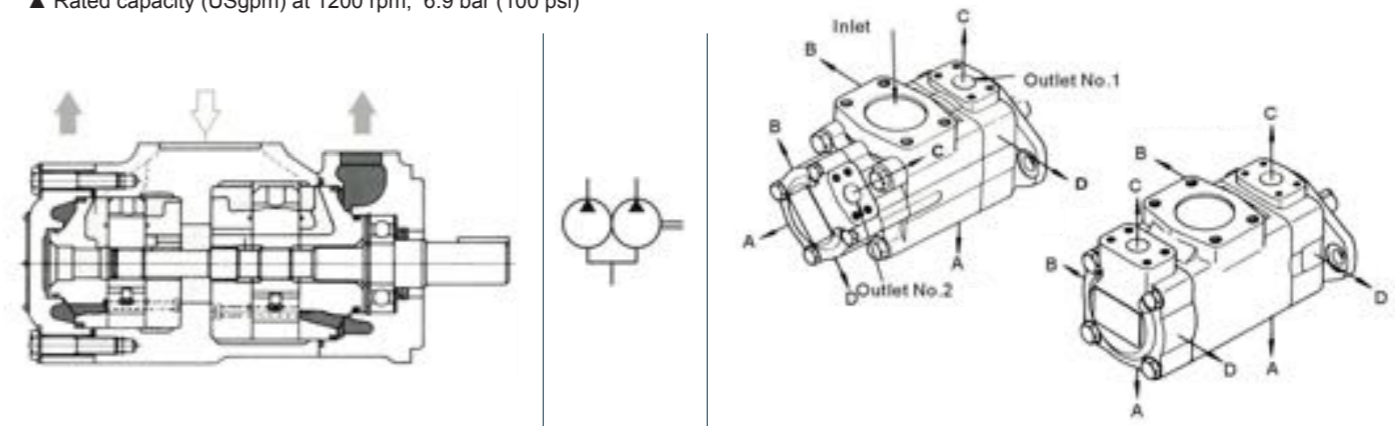
HS DOUBLE PUMPS MODEL CODE



SPECIFICATIONS

Prefix	Series HS	Flow P1 (GPM)	Flow P2 (GPM)	Rotation	Shafts	Port orientation
Omit-using antiwear oil water glycol fluid	HS2520	10, 12, 14, 15, 17, 19, 21	2, 5, 8, 9, 11, 12, 14	(Viewed from shaft end of pump) D - CW right hand L - CCW left hand	1: Straight Key 86: HD Straight Key 11: Splined	See below
	HS3520	21, 25, 30, 32, 35, 38, 45	2, 5, 8, 9, 11, 12, 14			
	HS3525	21, 25, 30, 32, 35, 38, 45	10, 12, 14, 15, 17, 19, 21			
F3-phosphate ester fluid	HS4520	42, 45, 50, 60, 66, 75	2, 5, 8, 9, 11, 12, 14			
	HS4525	42, 45, 50, 60, 66, 75	10, 12, 14, 15, 17, 19, 21			
	HS4535	42, 45, 50, 60, 66, 75	21, 25, 30, 35, 38, 45			

▲ Rated capacity (USgpm) at 1200 rpm, 6.9 bar (100 psi)

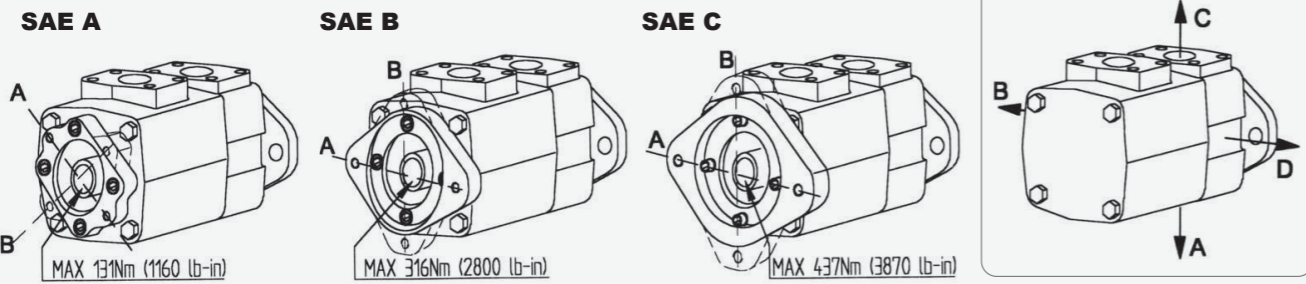


Port orientation	All series (except HS4535)	Series HS4535	
With No. 1 outlet Opposite inlet	AA	No, 2 outlet 135° CCW from inlet	No, 2 outlet opposite inlet
	AB	No, 2 outlet 45° CCW from inlet	No, 2 outlet 90° CCW from inlet
	AC	No, 2 outlet 45° CW from inlet	No, 2 outlet in line with inlet
	AD	No, 2 outlet 135° CW from inlet	No, 2 outlet 90° CW from inlet
With No. 1 outlet 90° CCW from inlet	BA	No, 2 outlet 135° CCW from inlet	No, 2 outlet opposite inlet
	BB	No, 2 outlet 45° CCW from inlet	No, 2 outlet 90° CCW from inlet
	BC	No, 2 outlet 45° CW from inlet	No, 2 outlet in line with inlet
	BD	No, 2 outlet 135° CW from inlet	No, 2 outlet 90° CW from inlet
With No. 1 outlet inline with inlet	CA	No, 2 outlet 135° CCW from inlet	No, 2 outlet opposite inlet
	CB	No, 2 outlet 45° CCW from inlet	No, 2 outlet 90° CCW from inlet
	CC	No, 2 outlet 45° CW from inlet	No, 2 outlet in line with inlet
	CD	No, 2 outlet 135° CW from inlet	No, 2 outlet 90° CW from inlet
With No. 1 outlet 90° CW inlet	DA	No, 2 outlet 135° CCW from inlet	No, 2 outlet opposite inlet
	DB	No, 2 outlet 45° CCW from inlet	No, 2 outlet 90° CCW from inlet
	DC	No, 2 outlet 45° CW from inlet	No, 2 outlet in line with inlet
	DD	No, 2 outlet 135° CW from inlet	No, 2 outlet 90° CW from inlet

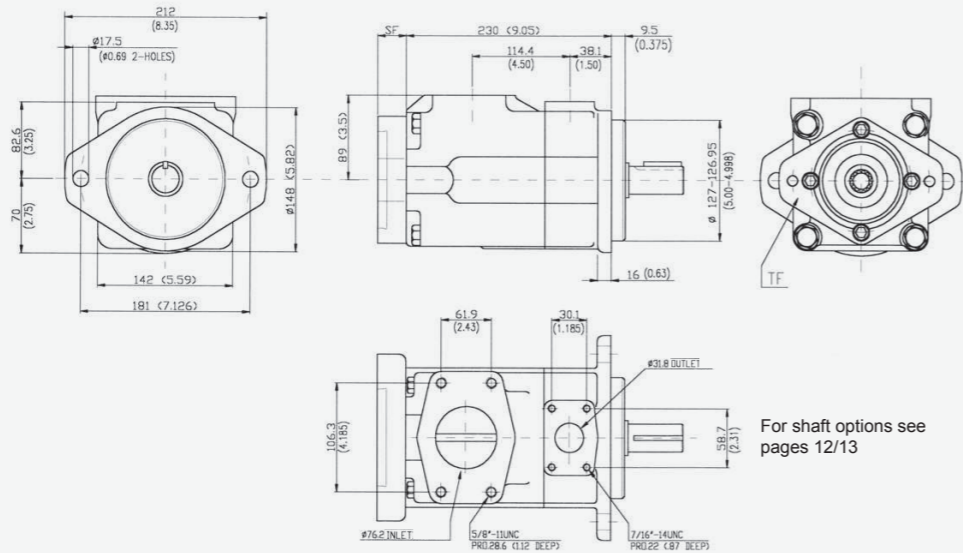
T-DRIVE VERSION

HS35T Series

■ Adapter orientation



■ Dimension mm (inches)

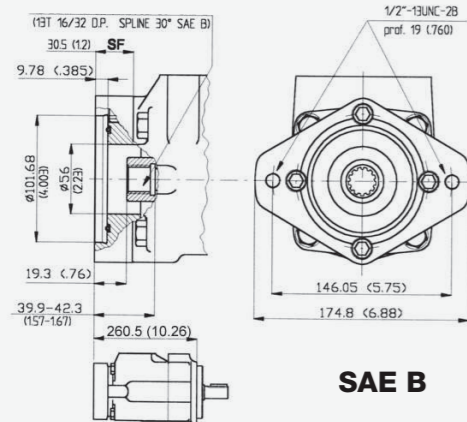
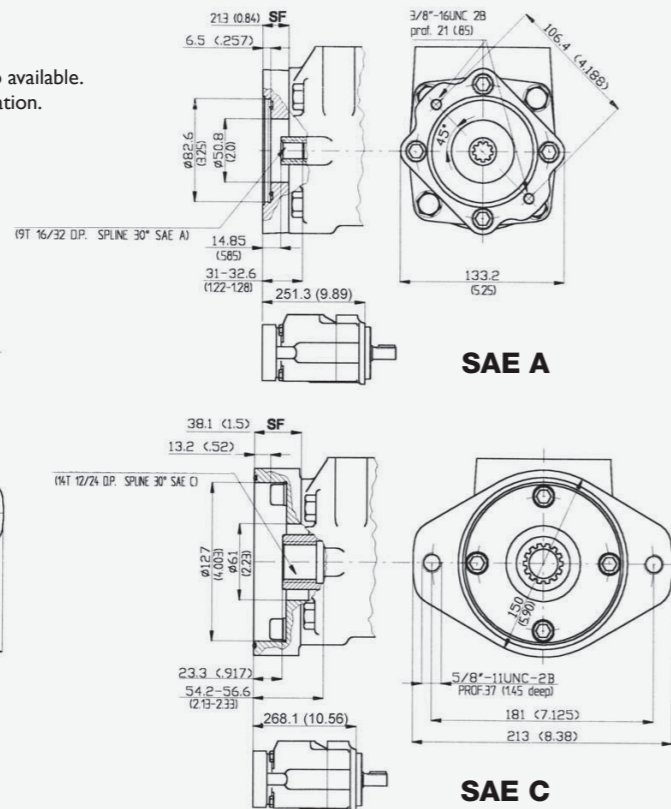


For shaft options see pages 12/13

Dry weight: 28,7 Kg (63 lbs.)

■ Rear attachment mm (inches)

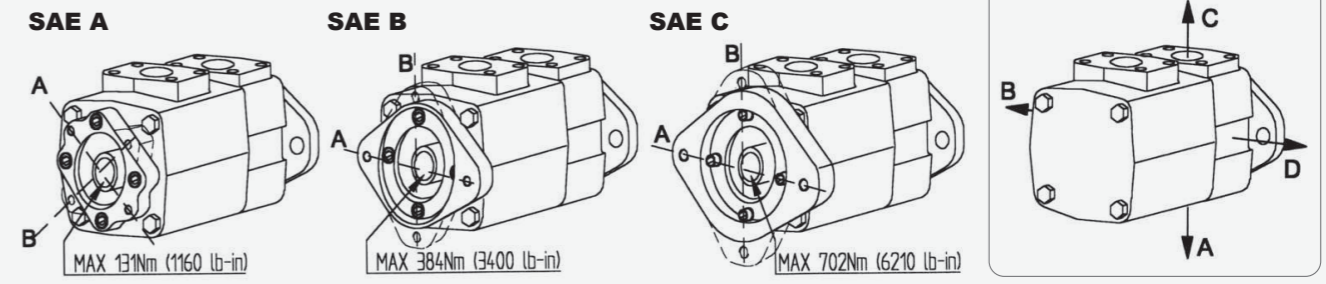
Other couplings with different types of pumps are also available. Contact our technical department for detailed information.



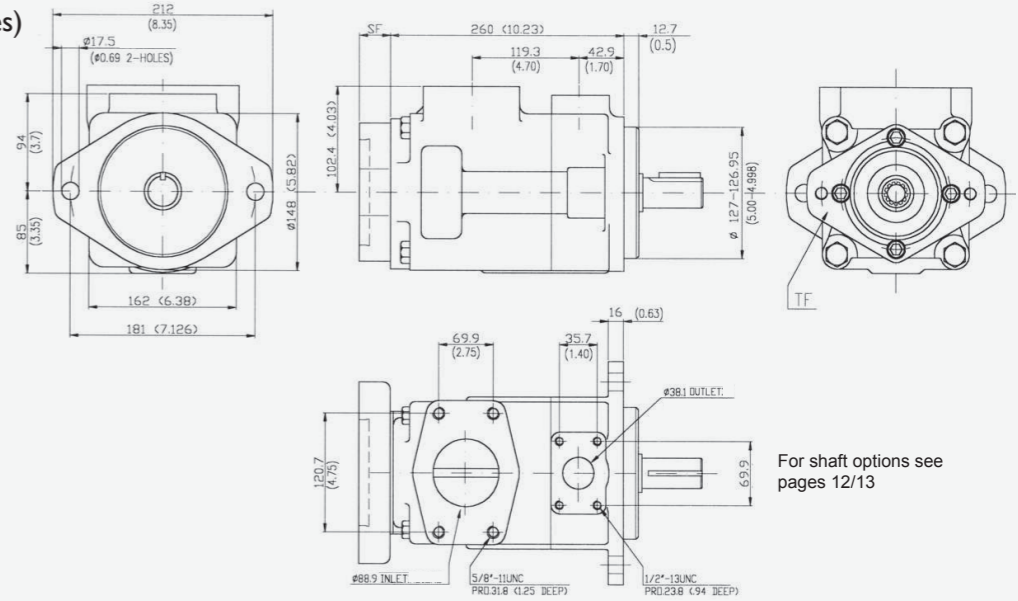
T-DRIVE VERSION

HS45T Series

■ Adapter orientation



■ Dimension mm (inches)

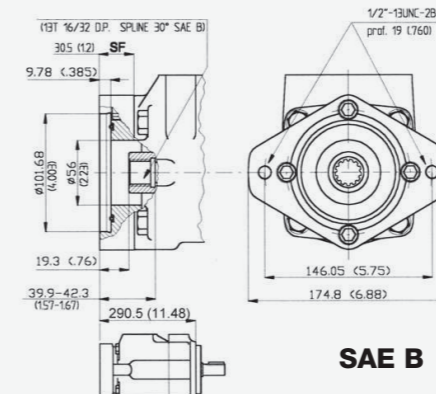
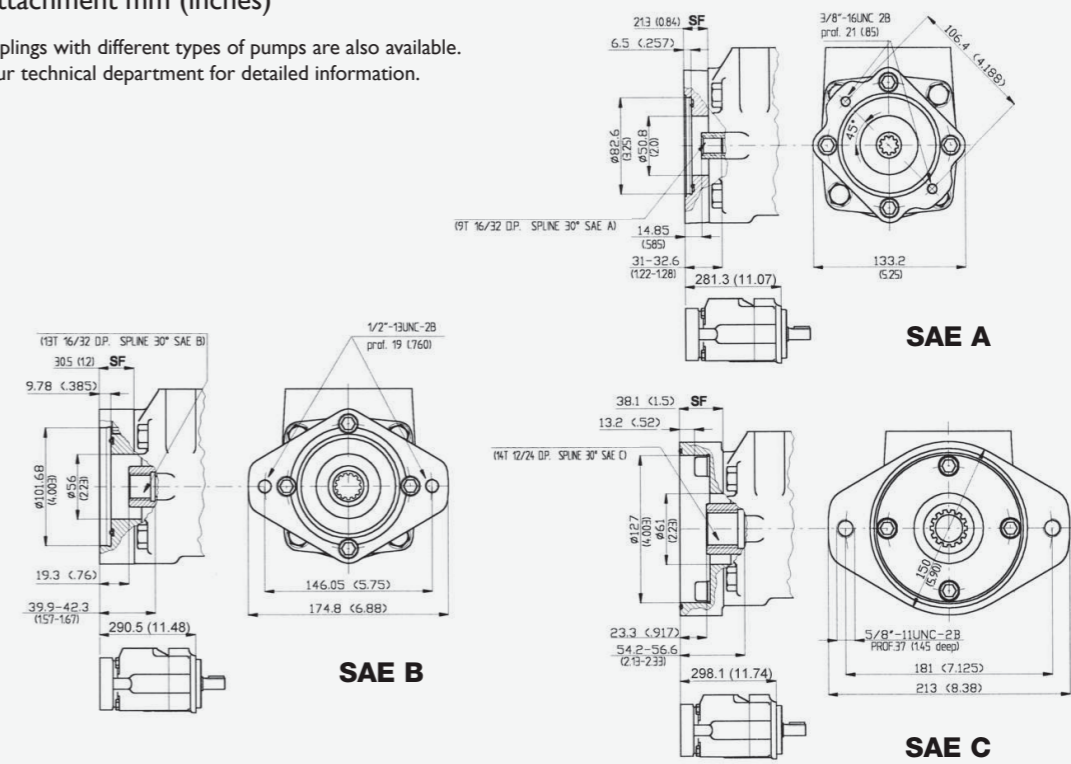


For shaft options see pages 12/13

Dry weight: 38,1 Kg (84 lbs.)

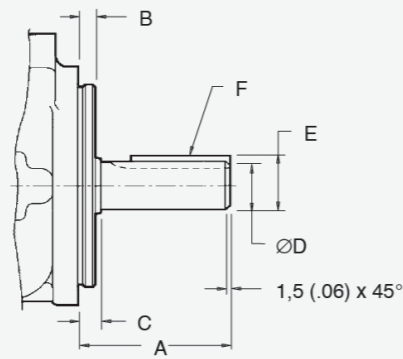
■ Rear attachment mm (inches)

Other couplings with different types of pumps are also available. Contact our technical department for detailed information.



OPTIONAL SHAFTS

Straight Key Shafts

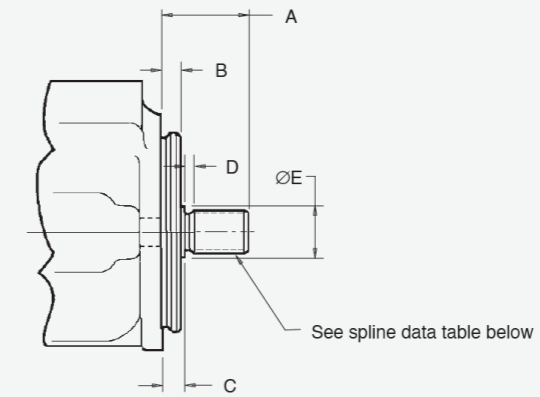


Pump	Shaft code	A	B	C	ØD	E	F key width x length
HS20	1	59 (2.32)	9,53 (.375)	12,1 (.476)	22,23 (.875) 22,20 (.874)	24,5 (.966) 24,4 (.961)	4,75 (.817) x 32 (1.25)
HS25 HS2520	1	59 (2.32)	9,53 (.375)	11,1 (.435)	22,23 (.875) 22,20 (.874)	24,5 (.966) 24,4 (.961)	4,75 (.817) x 32 (1.25)
HS25 HS2520	86	78 (3.06)	9,53 (.375)	11,1 (.435)	25,37 (.999) 25,35 (.998)	28,3 (1.11) 28,1 (1.10)	6,36 (.250) x 50,8 (2.00)
HS25T	203	77,7 (3.06)	9,53 (.375)	7,9 (.310) ▲	25,40 (1.00) 25,35 (.998)	28,20 (1.11) 27,94 (1.10)"	6,36 (.250) x 50,8 (2.00)
HS35 HS352*	1	73,2 (2.88)	9,53 (.375)	11,1 (.435)	31,75 (1.25) 31,70 (1.24)	35,36 (1.39) 34,10 (1.38)	7,94 (.313) x 38,1 (1.50)
	86	86 (3.88)	9,53 (.375)	11,1 (.435)	34,90 (1.374) 34,97 (1.373)	38,6 (1.52) 38,3 (1.51)	7,92 (.312) x 54 (2.13)
HS35T	203	84,1 (3.31)	12,7 (.500)	7,9 (.310) ▲	34,90 (1.374) 34,87 (1.373)	38,56 (1.518) 38,30 (1.508)	7,92 (.312) x 54 (2.125)
HS45 HS452*	1	62 (2.44)	12,7 (.500)	14,22 (.560)	31,75 (1.25) 31,70 (1.24)	35,36 (1.39) 34,10 (1.38)	7,92 (.312) x 28,5 (1.12)
	86	87,4 (3.44)	12,7 (.500)	14,22 (.560)	38,07 (1.499) 38,05 (1.498)	42,4 (1.67) 42,1 (1.66)	9,53 (.375) x 50,8 (2.00)
HS45T	203	87,4 (3.44)	9,14 (.360)	7,9 (.310)	38,07 (1.499) 38,05 (1.498)	42,4 (1.67) 42,1 (1.66)	9,53 (.375) x 57,1 (2.25)

▲ Shaft shoulder inside recess in pilot.

OPTIONAL SHAFTS

Splined shafts



Pump	Shaft code	A	B	C	D	ØE	Spline data (see below)
HS25 HS2520	11	44,5 (1.57)	9,53 (.375)	11,1 (.437)	3,9 (.156)	27,8 (1.09)	A
HS25T	297	41,1 (1.62)	9,14 (.36)	7,9 (.31)	4,1 (.16)	27,8 (1.09)	B
HS35 HS352*	11	58,7 (2.31)	9,53 (.375)	11,1 (.437)	6,35 (.25)	35,1 (1.38)	C
HS35T	297	55,5 (2.19)	9,14 (.360)	7,9 (.310)	5,5 (.21)	35,1 (1.38)	D
HS45 HS452*	11	61,9 (2.44)	12,7 (.500)	14,3 (.565)	9,7 (.38)	39,6 (1.56)	C
HS45T	297	55,5 (2.19)	9,14 (.360)	7,9 (.310)	9,7 (.38)	39,6 (1.56)	D

Spline data reference	Number of teeth	Pitch	Major diameter	Form diameter	Minor diameter	Minor diameter
A	13	16/32	22,17 (.873) 22,15 (.872)	19,03 (.749)	18,63 (.734) 18,35 (.723)	Major dia, fit
B	13	16/32	22,2 (.875) 21,7 (.853)	19,03 (.749)	18,4 (.725)	Side fit
C	14	12/24	31,7 (1.25) 31,67 (1.247)	27,2 (1.07)	26,99 (1.06) 26,64 (1.05)	Major dia, fit
D	14	12/24	31,6 (1.25) 31,1 (1.22)	27,48 (1.08)	26,7 (1.05)	Side fit

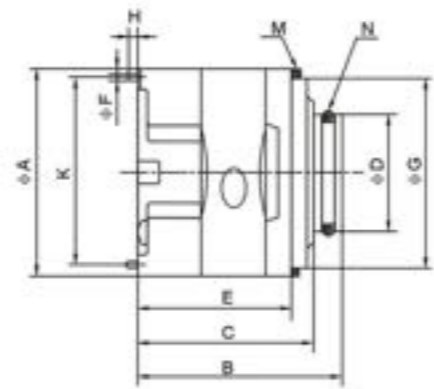
HS SERIES CARTRIDGE KITS

MODEL CODE

Prefix	Series	Flow	Position *	Rotation
CKIT	20HS	2, 8, 9, 11, 12, 14	P1 / P2	CW / CCW
	25HS	10, 12, 14, 15, 17, 19, 21		
	35HS	21, 25, 30, 35, 38, 45		
	45HS	42, 45, 50, 60, 66, 75		

* Omit for single pump cartridge.

INSTALLATION DIMENSIONS



Series	A	B	C	D	E	F	G	H	K	M (Gasket)	N (O-Ring)
HS20	82.5	81.5	70.1	47	61.5	4.8	76.2	6	73.6	82.76x76.26x3.5	40x3.5
HS(T)25	96.8	98.8	87	52.2	71.2	4.8	90.5	5	88.19	97x91x3.5	44x3.53
HS(T)35	114.3	117.7	105	72.2	90.3	6.4	108	6	103.94	114.5x108.5x3.5	63.09x3.53
HS(T)45	133.35	141.1	129.6	80.2	105.5	6.4	127	10	133.35	133.6x127.6x3.5	71x3.55

Series	Inner spline dentiform parameter of rotor				
	Pitch	Number of teeth	Pressure angle	Major diameter	Minor diameter
HS20	48/96	30	45°	16.617	15.56
HS(T) 25	48/96	40	45°	21.9	20.86
HS(T)35	40/80	37	45°	24.38	23.1
HS(T)45	12/24	14	30°	32.59	27.60

HQ SINGLE PUMPS MODEL CODE



Note: For drawings and shaft information refer to HS section

SPECIFICATIONS

Prefix	Series HQ / HQT	Rear pump mounting with SAE mounting flange, 2-bolts**	Flow (GPM) ▲	Rotation	Shafts	Port orientation	Adapter orientation**
Omit-using antiwear oil water glycol fluid	HQ20	A: SAE-A mounting flange B: SAE-B mounting flange C: SAE-C mounting flange	2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14	D = Right-hand direction of rotation CW L = Left-hand direction of rotation CCW	1 - Straight Key 151 - Splined	(Viewed from cover end of pump)	SAE A A = Rotated to 45° CW to the pump flange B = Rotated to 45° CCW to the pump flange
	HQ(T)25		10, 12, 14, 15, 17, 19, 21				
F3-phosphate ester fluid	HQ(T)35		21, 25, 30, 32, 35, 38, 45	To check the direction of rotation view from the shaft end	1 - Straight Key 86 - HD Straight Key 11 - Splined	A = opposite inlet ports B = 90° CCW from inlet C = in line with inlet D = 90° CW from inlet"	SAE B A = In line with the pump flange B = Rotated to 90° to the pump flange
	HQ(T)45		42, 45, 50, 57, 60, 66, 75				

▲ Rated capacity (US gpm) at 1200 r/min and 7 bar (100psi) / ** valid only for HQT series

Model	Flow (GPM) ▲	Geometric displacement (cc/rev)	Max. speed (r/min)	Max. pressure (bar)	Typical del l/min ▲ max speed & pressure	Typical input kW ▲ max speed & pressure	Weight			
HQ20	2	7	2700	210	16.4	7.2	11.8			
	3	11.7			24.4	10.8				
	4	15			32.7	14.4				
	5	18			42.3	17.9				
	6	19			50.6	21.5				
	7	22			58.8	23.7				
	8	27		56.4	25.1					
	9	30		73.4	26.0					
	10	31.5		81.7	26.8					
	11	36		88.5	27.7					
	12	40		96.5	28.4					
	HQ(T)25	14		45	2500	140		115.4	29.1	14.5
10		32.5	81.4	35.2						
12		38.3	88.5	41.0						
14		43.3	103.8	46.6						
15		47.3	109.4	48.1						
17		52.5	119.2	51.8						
19		60	133.5	55.2						
21		65.0	146.2	61.9						
21		64.0	145.5	63.7						
HQ(T)35		25	79.2	2400		210	173.1	75.3	22.7	
		30	95.0				211.5	87.7		
		32	101				220.2	92.2		
	35	109	230.8		98.5					
	38	118	250		104.4					
	45	140	271.2		99.8					
HQ(T)45	42	134	2200	175	255.8	91.4	34.1			
	45	147			271.2	99.8				
	50	156			303.8	105.2				
	57	180			343.7	120.2				
	60	189			369.2	126.8				
	66	208			408.7	142.4				
	75	237			460	120.2				
						140		460	120.2	

Performance constants: SAE 10W fluid ▲ 82°C (180F) and pump inlet ▲ 0 PSIG (14.7 PSIA)
Note: outlet pressure must always be higher than inlet pressure.

HQ

DOUBLE PUMPS

MODEL CODE

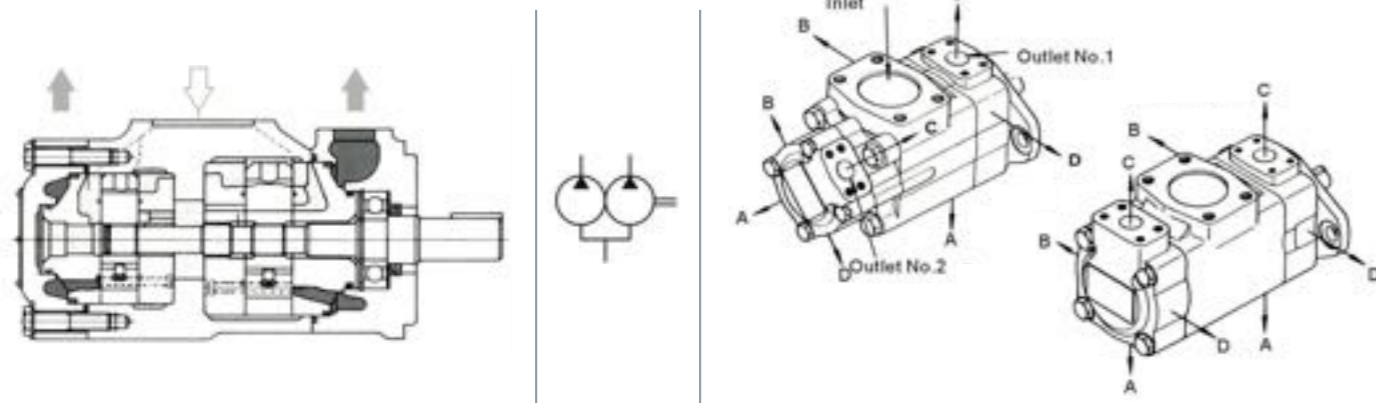


Note: For drawings and shaft information refer to HS section

SPECIFICATIONS

Prefix	Series HQ	Flow P1 (GPM)	Flow P2 (GPM)	Rotation	Shafts	Port orientation
Omit-using antiwear oil water glycol fluid	HQ2520	10, 12, 14, 15, 17, 19, 21	2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14	(Viewed from shaft end of pump) D - CW right hand L - CCW left hand	1: Straight Key 86: HD Straight Key 11: Splined	See below
	HQ3520	21, 25, 30, 32, 35, 38, 45	2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14			
	HQ3525	21, 25, 30, 32, 35, 38, 45	10, 12, 14, 15, 17, 19, 21			
F3-phosphate ester fluid	HQ4520	42, 45, 50, 57, 60, 66, 75	2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14			
	HQ4525	42, 45, 50, 57, 60, 66, 75	10, 12, 14, 15, 17, 19, 21			
	HQ4535	42, 45, 50, 57, 60, 66, 75	21, 25, 30, 32, 35, 38, 45			

▲ Rated capacity (USgpm) at 1200 rpm, 6.9 bar (100 psi)



Port orientation	All series (except HQ4535)	Series HQ4535
With No. 1 outlet Opposite inlet	AA	No, 2 outlet 135° CCW from inlet
	AB	No, 2 outlet 45° CCW from inlet
	AC	No, 2 outlet 45° CW from inlet
	AD	No, 2 outlet 135° CW from inlet
With No. 1 outlet 90° CCW from inlet	BA	No, 2 outlet 135° CCW from inlet
	BB	No, 2 outlet 45° CCW from inlet
	BC	No, 2 outlet 45° CW from inlet
	BD	No, 2 outlet 135° CW from inlet
With No. 1 outlet inline with inlet	CA	No, 2 outlet 135° CCW from inlet
	CB	No, 2 outlet 45° CCW from inlet
	CC	No, 2 outlet 45° CW from inlet
	CD	No, 2 outlet 135° CW from inlet
With No. 1 outlet 90° CW inlet	DA	No, 2 outlet 135° CCW from inlet
	DB	No, 2 outlet 45° CCW from inlet
	DC	No, 2 outlet 45° CW from inlet
	DD	No, 2 outlet 135° CW from inlet

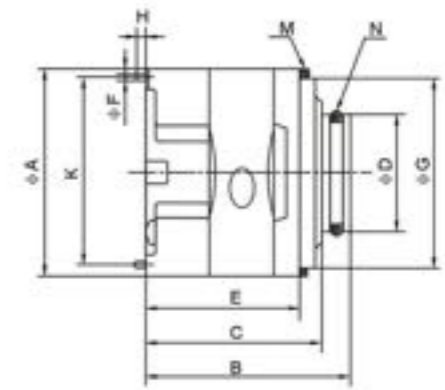
HQ SERIES CARTRIDGE KITS

MODEL CODE

Prefix	Cartridge kits mark	Series	Flow	Position*	Rotation
CKIT	PC-single pump cartridge kits	20HQ	2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14	P1 / P2	CW / CCW
	Double pumps shaft end pump cartridge kits	25HQ	10, 12, 14, 15, 17, 19, 21		
		35HQ	21, 25, 30, 32, 35, 38, 45		
	PCT-double pump cover end pump cartridge kits	45HQ	42, 45, 50, 57, 60, 66, 75		

* Omit for single pump cartridge.

INSTALLATION DIMENSIONS



Series	A	B	C	D	E	F	G	H	K	M (Gasket)	N (O-Ring)
HQ20	82.5	81.5	70.1	47	61.5	4.8	76.2	7	73.6	82.76x76.26x3.5	40x3.5
HQ(T)25	96.8	98.8	87	52.2	71.2	4.8	90.5	7	88.19	97x91x3.5	44x3.53
HQ(T)35	114.3	117.7	105	72.2	90.3	6.4	108	7	103.94	114.5x108.5x3.5	63.09x3.53
HQ(T)45	133.35	141.1	129.6	80.2	105.5	6.4	127	11	133.35	133.6x127.6x3.5	71x3.55

Series	Inner spline dentiform parameter of rotor				
	Pitch	Number of teeth	Pressure angle	Major diameter	Minor diameter
HQS20	48/96	30	45°	16.617	15.56
HQ(T)25	48/96	40	45°	21.9	20.86
HQ(T)35	40/80	37	45°	24.38	23.1
HQ(T)45	12/24	14	30°	32.59	27.60

VH

SINGLE PUMPS

MODEL CODE



SPECIFICATIONS

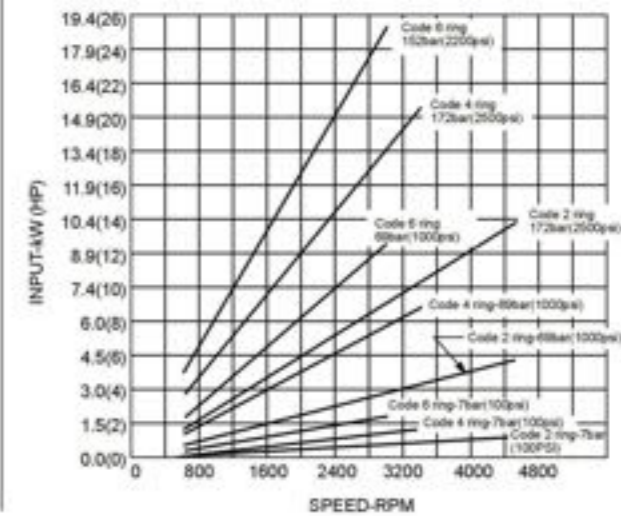
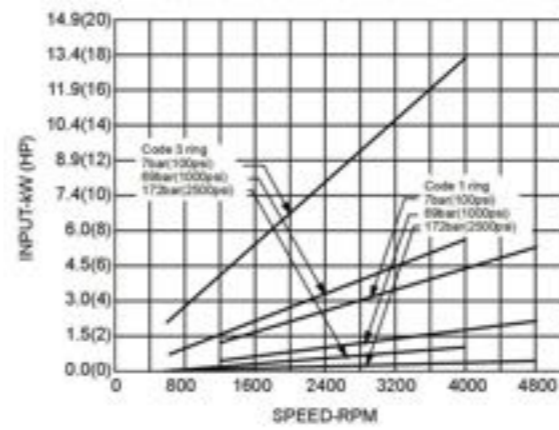
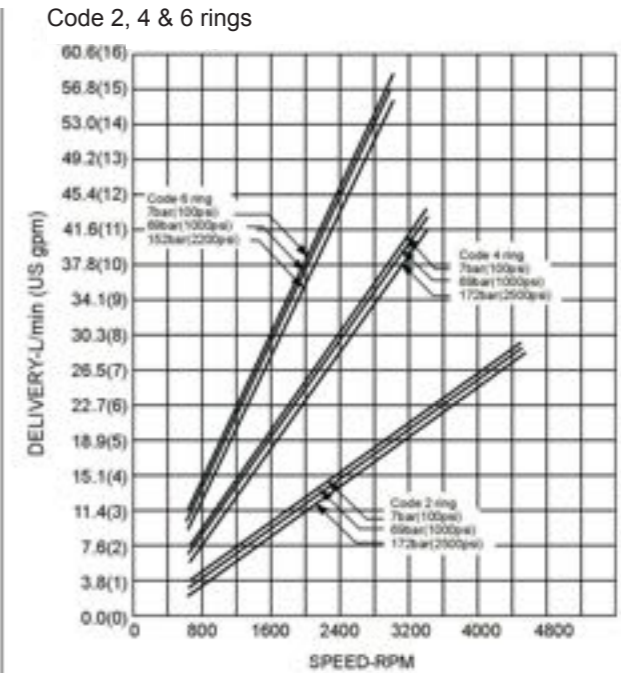
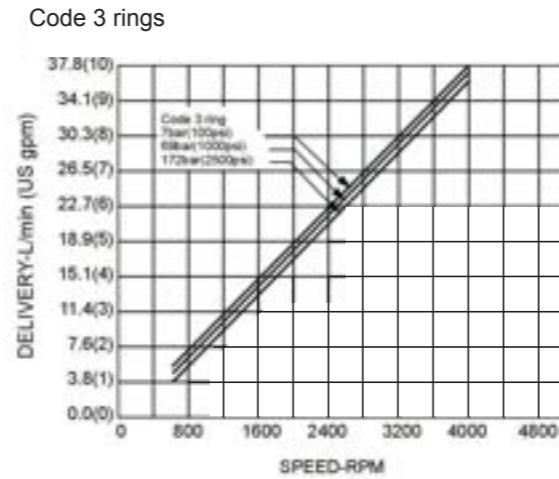
Prefix	Series VH	Inlet port connections	Flow (GPM)	Outlet port connections	Rotation	Shafts	Port orientation
Omit-using antiwear oil water glycol fluid	VH10	1B: G1" thread	2, 3, 4, 5, 6, 7	B: G 1/2" thread	(Viewed from shaft end of pump) R = Right-hand direction or if rotation CW L = Left-hand direction of rotation CCW	1 - Straight Key 11 - Splined	(Viewed from cover end of pump) A = opposite inlet ports B = 90° CCW from inlet C = in line with inlet D = 90° CW from inlet
F3-phosphate ester fluid	VH20	1B: G1 1/4" thread	6, 7, 8, 9, 10, 11, 12, 13	B: G 3/4" thread			

Model	Flow (GPM)	Geometric displacement (cc/rev)	Using anti-wear oil or phosphate ester fluid		Using water glycol fluid		Using water in oil emulsion			
			Max. pressure bar	Max. speed r/min	Max. pressure bar	Max. speed r/min	Max. pressure bar	Max. speed r/min		
VH10	2	6.6	172	4500	124	1800	103	1800		
	3	9.8		4000						
	4	13.1		3400						
	5	16.4	3200							
	6	19.5	152	3000						
VH20	6	19.5	172	3400	109	1800	109	1800		
	7	22.8		3000						
	8	26.5		2800						
	9	29.7	152	2500					109	93
	10	30.0		2400						
	11	36.4		2400						
	12	39		2400						
13	42.4	2400								

PERFORMANCE CHARACTERISTICS

VH10

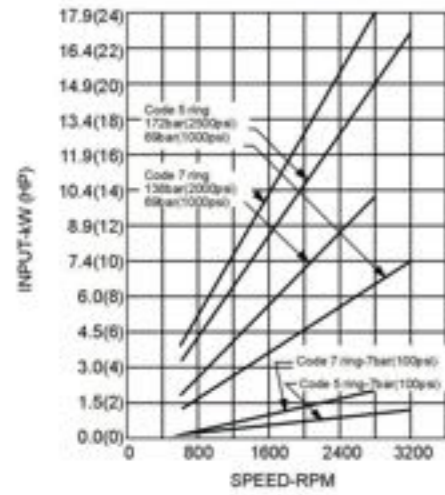
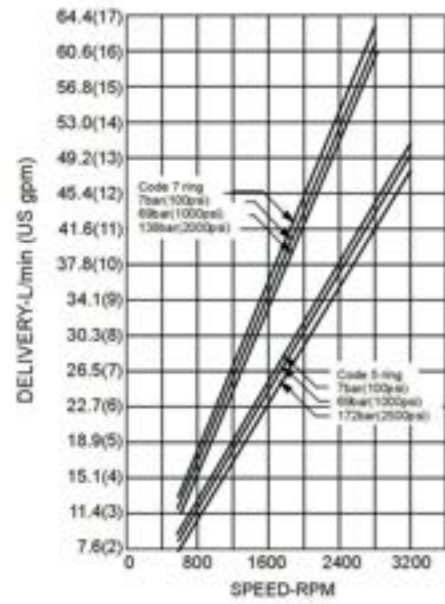
Typical flows at 49°C, oil at 26cSt (38°C), 0 bar.



PERFORMANCE CHARACTERISTICS

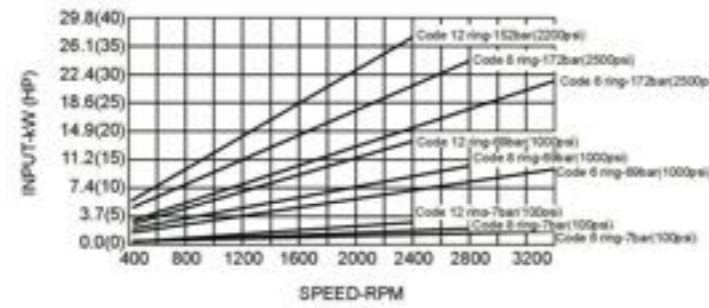
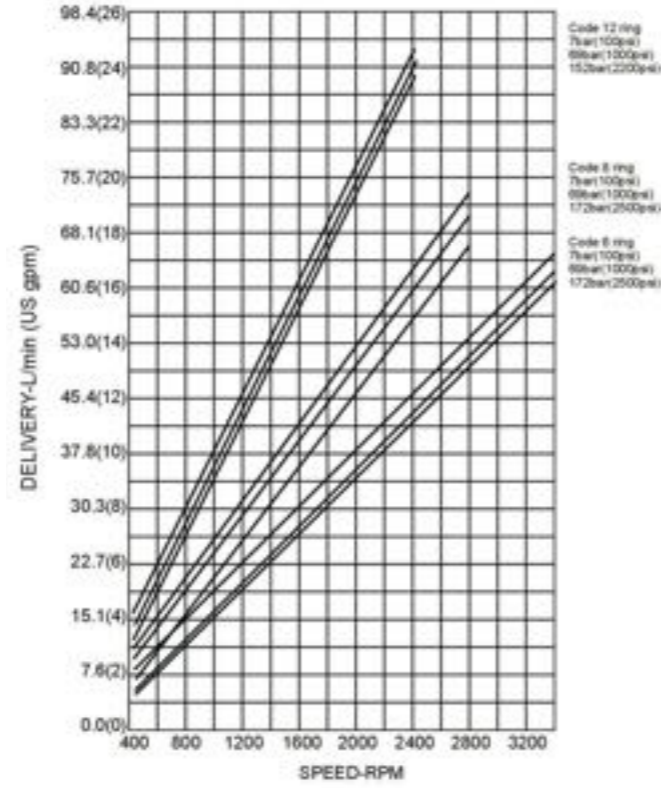
VH10 Typical flows at 49°C, oil at 26cSt (38°C), 0 bar.

Code 5 & 7 rings



VH20 Typical flows at 49°C, oil at 26cSt (38°C), 0 bar.

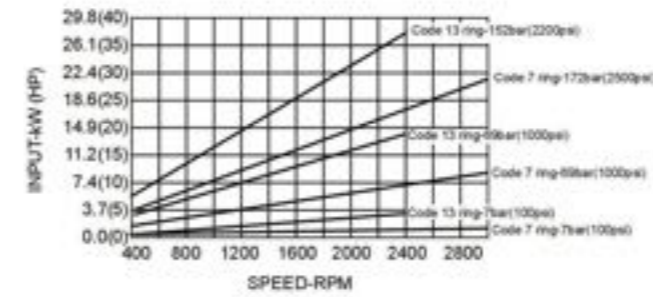
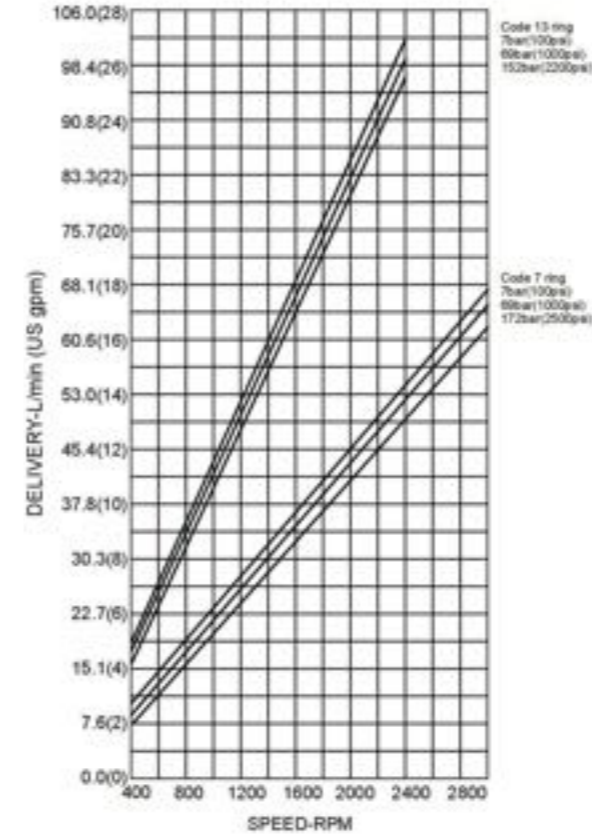
Code 6, 8 & 12 rings



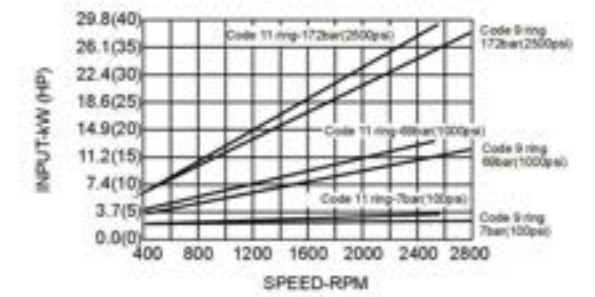
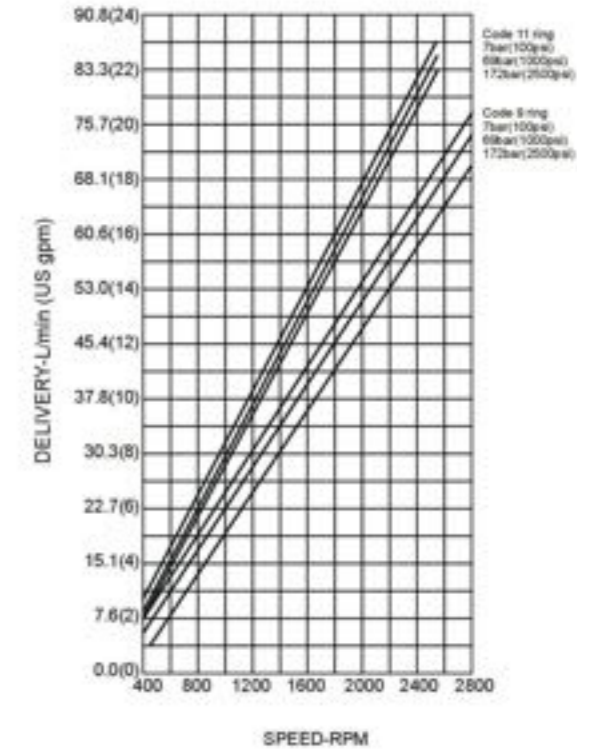
PERFORMANCE CHARACTERISTICS

VH20 Typical flows at 49°C, oil at 26cSt (38°C), 0 bar.

Code 7 & 13 rings

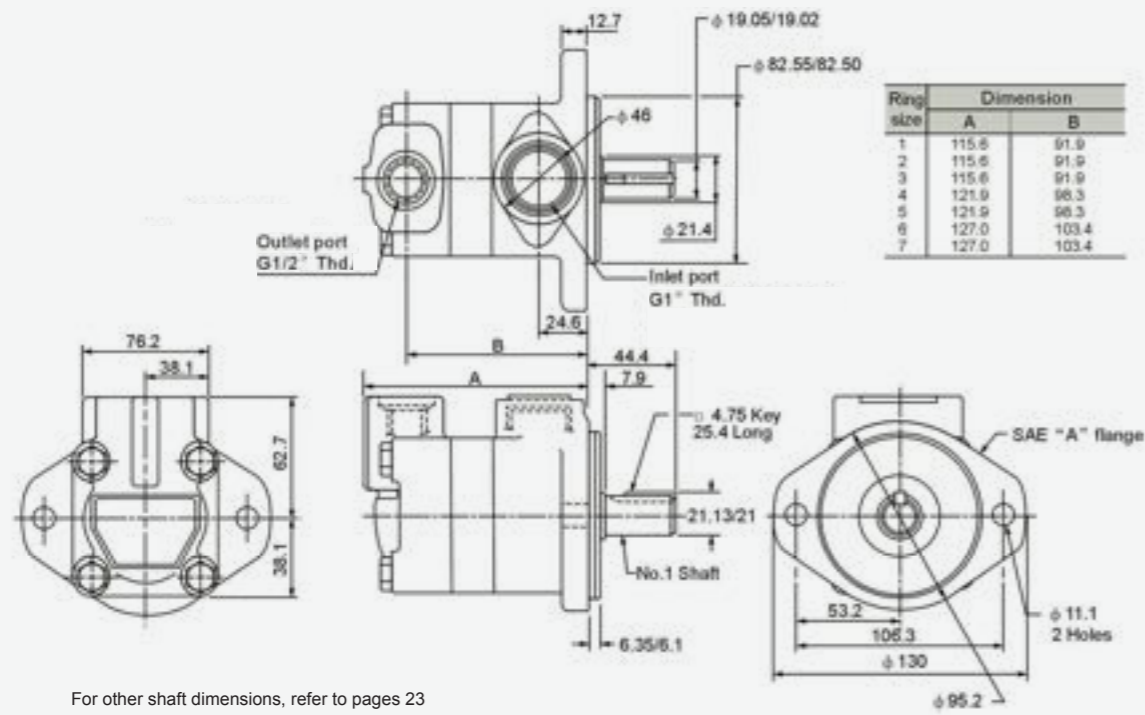


Code 9 & 11 rings



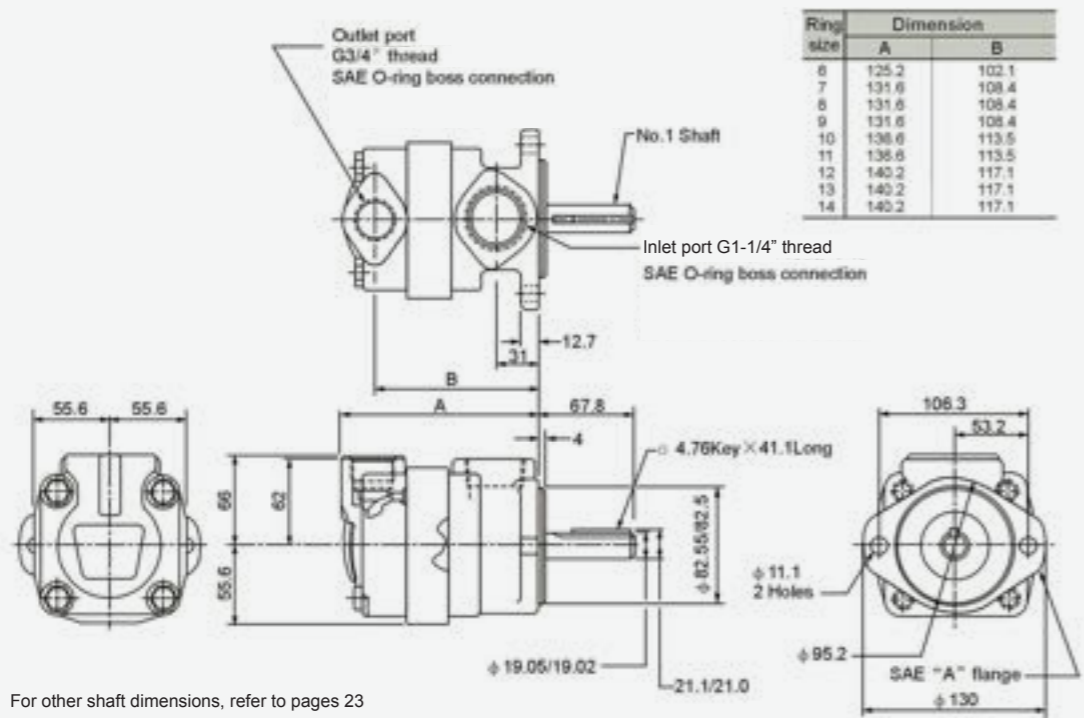
INSTALLATION DIMENSIONS

VH10



For other shaft dimensions, refer to pages 23

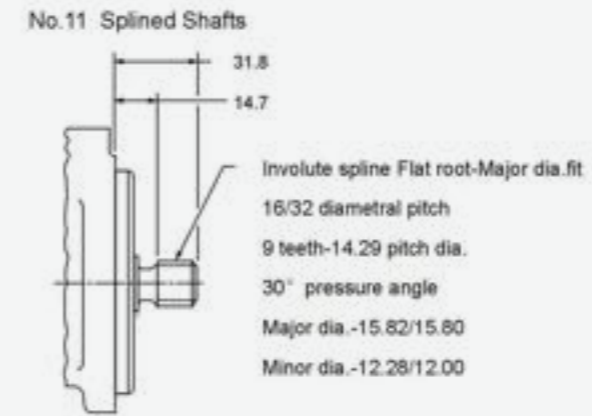
VH20



For other shaft dimensions, refer to pages 23

OPTIONAL SHAFTS

VH10 Series Splined Shafts



VH20 Series Splined Shafts

