

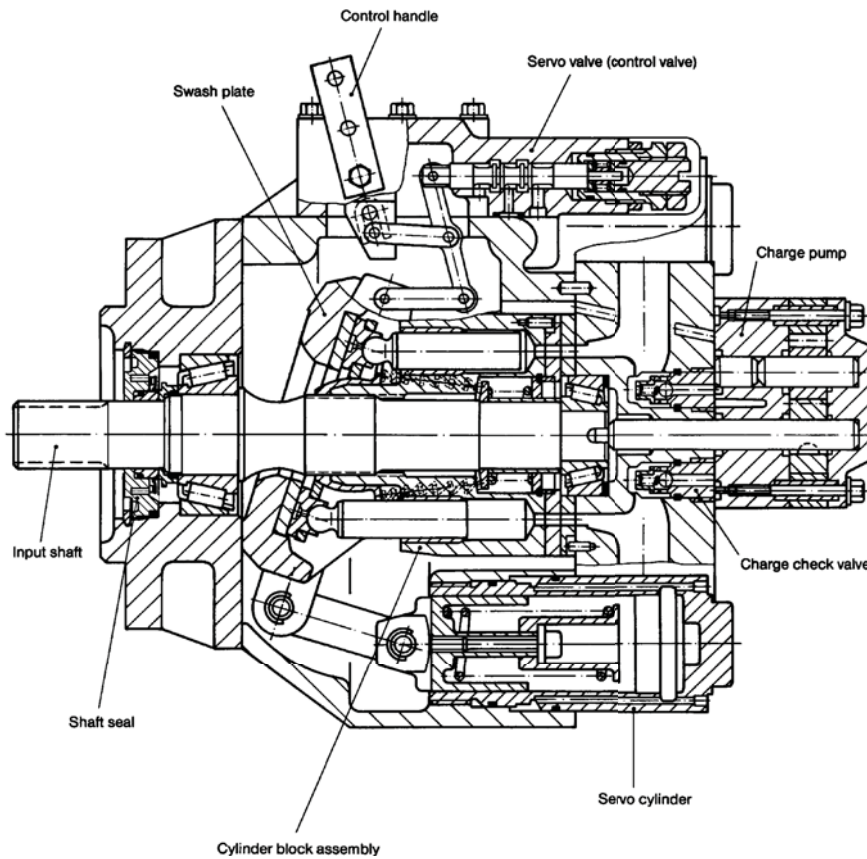


AXIAL PISTON PUMPS AND MOTORS

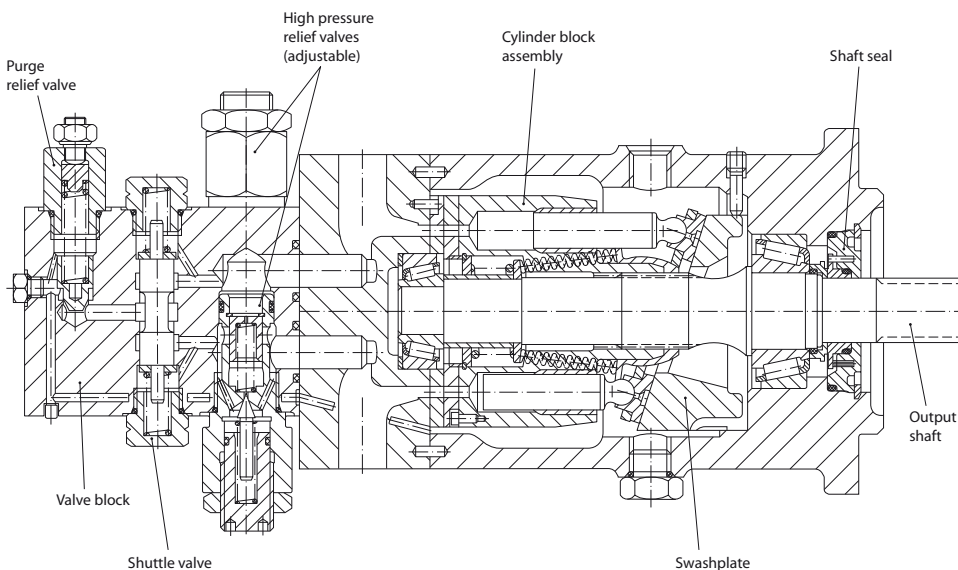
HPV-HMF SERIES

SECTIONAL VIEW

AXIAL PISTON VARIABLE DISPLACEMENT PUMP



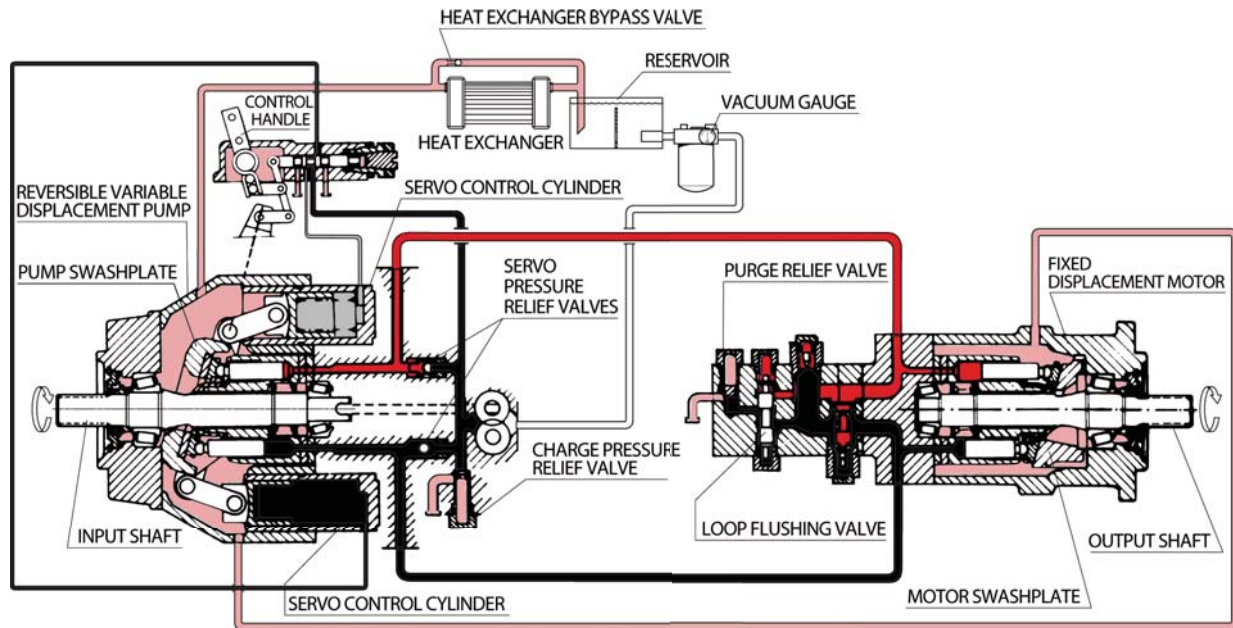
AXIAL PISTON FIXED DISPLACEMENT MOTOR



AXIAL PISTON PUMPS AND MOTORS

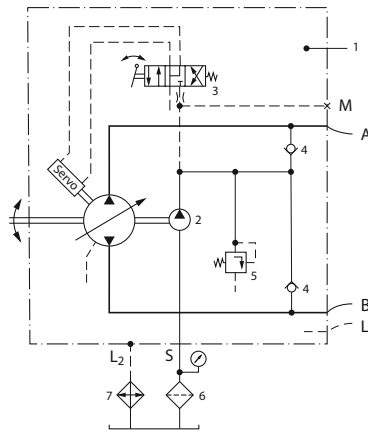
SYSTEM CIRCUIT DESCRIPTION

PUMP AND MOTOR CIRCUIT DESCRIPTION



■ WORKING LOOP (HIGH PRESSURE)
 ■ WORKING LOOP (LOW PRESSURE)
 ■ CONTROL FLUID
 SUCTION LINE
 ■ CASE DRAIN FLUID

PUMP CIRCUIT SCHEMATIC



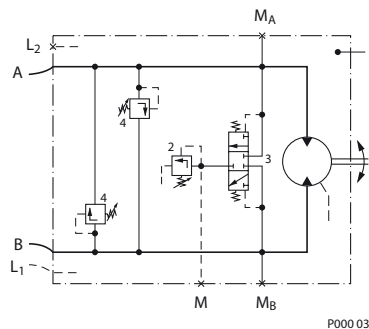
Designation:

- 1 = Variable displacement pump
- 2 = Charge pump
- 3 = Servo control valve
- 4 = Charge check valve
- 5 = Charge relief valve
- 6 = Filter
- 7 = Heat exchanger

Ports:

- A, B = Main pressure ports (working loop)
- S = Suction port - charge pump
- L1, L2 = Drain ports
- M = Gauge port - charge pressure

MOTOR CIRCUIT SCHEMATIC



Designation:

- 1 = Fixed displacement motor
- 2 = Purge relief valve
- 3 = Shuttle valve
- 4 = High pressure relief valve

Ports:

- A, B = Main pressure ports (working loop)
- L1, L2 = Drain ports
- MA = Gauge port for port A
- MB = Gauge port for port B
- M = Gauge port - charge pressure

AXIAL PISTON PUMPS AND MOTORS

TECHNICAL DATA

Design: axial piston variable displacement pump and fixed displacement motor of swash plate design

Type of mounting: SAE four bolt flanges

Pipe connections

main pressure ports: SAE split flange

other ports: SAE O-ring boss

Direction of rotation: clockwise or counterclockwise (viewing from the input shaft)

Installation position: optional; pump and motor housings must be always filled with hydraulic fluid.

	Maximum displacement cm ³ /rev	Charge pump displacement cm ³ /rev		Minimum speed min ⁻¹ (rpm)	Maximum speed min ⁻¹ (rpm)	Maximum continuous pressure bar	Charge pressure bar	Maximum swashplate angle °	Mass moment of inertia Kg m ² 10 ⁻³	Weight kg
HPV 033	33,3	12,30	18,03	500	3.800	420	11 ÷ 25	±18	4,34	45
HPV 052	51,6	12,30	18,03	500	3.500	420	11 ÷ 25	±18	8,14	55
HPV 070	69,8	18,03	12,30	500	3.200	420	11 ÷ 25	±18	12,34	63
HPV 090	89,0	18,03	12,30	500	2.900	420	11 ÷ 25	±18	17,77	78
HPV 119	118,7	18,85	32,80	500	2.700	420	11 ÷ 25	±18	29,11	124
HPV 166	166,8	32,80	65,50	500	2.400	420	11 ÷ 25	±18	50,19	164
HPV 227	227,3	32,80	65,50	500	2.100	420	11 ÷ 25	±18	86,80	212
HPV 334	333,7	65,50		500	1.900	420	11 ÷ 25	±18	161,40	270

	Displacement cm ³ /rev	Theoretical specific torque Nm/bar	Minimum speed min ⁻¹ (rpm)	Maximum speed min ⁻¹ (rpm)	Maximum continuous pressure bar	Mass moment of inertia Kg m ² 10 ⁻³	Weight kg
HMF 033	33,3	0,53	500	3.800	420	4,34	30
HMF 052	51,6	0,82	500	3.500	420	8,14	35
HMF 070	69,8	1,11	500	3.200	420	12,34	40
HMF 090	89,0	1,42	500	2.900	420	17,77	47
HMF 119	118,7	1,89	500	2.700	420	29,11	70
HMF 166	166,8	2,64	500	2.400	420	50,19	124
HMF 227	227,3	3,62	500	2.100	420	86,80	152
HMF 334	333,7	5,31	500	1.900	420	161,40	197

Maximum case pressure

constant: 2,5 bar

peak: 5 bar

Working fluid: mineral oil

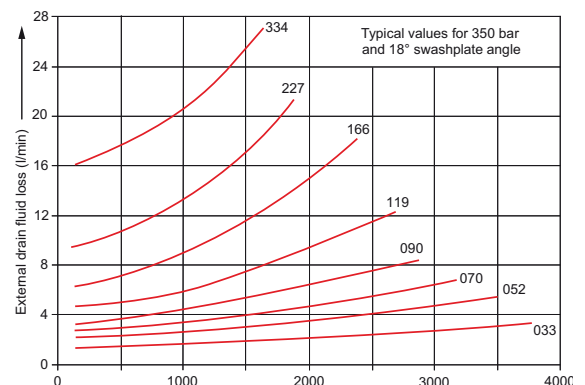
kinetic viscosity range: 12 ÷ 1.000 cSt (optimum: 25 ÷ 36 cSt)

purity class: 18 ÷ 13 (ISO 4406)

maximum temperature: 80 °C

External temperature: -40 ÷ +25 °C

External drain fluid loss



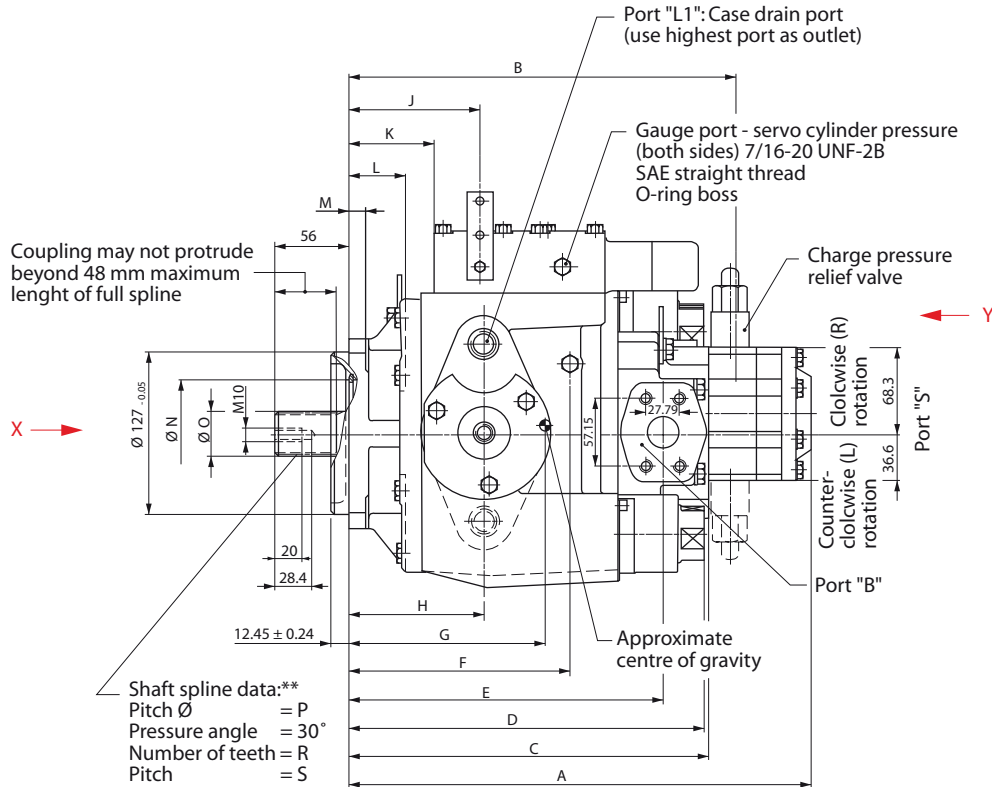
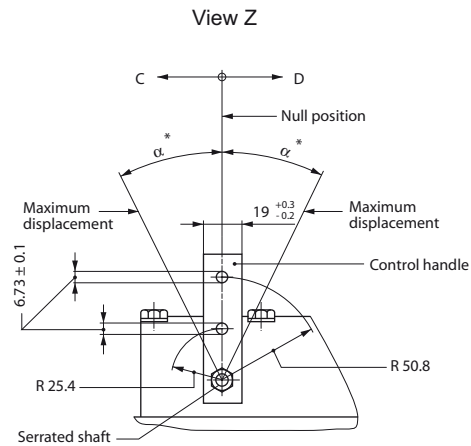
AXIAL PISTON PUMPS AND MOTORS

DRAWINGS

HPV 070 / HPV 090

* Minimum and maximum angle α

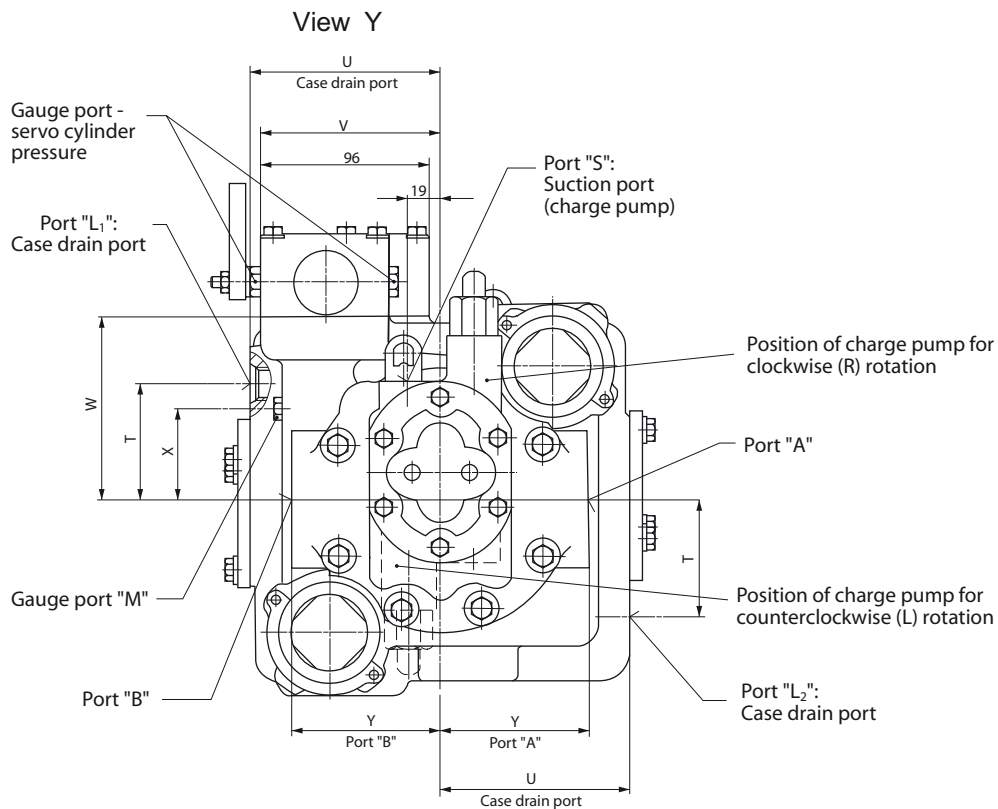
** Shaft spline data: spline shaft with involute spline, according to SAE hand-book, 1963, class 1, fillet root side fit.



AXIAL PISTON PUMPS AND MOTORS

DRAWINGS

HPV 070 / HPV 090



Max. torque for charge pump inlet port (7/8 -14 UNF - 2B) is 22 - 28 Nm [195 - 248 lbf•in].

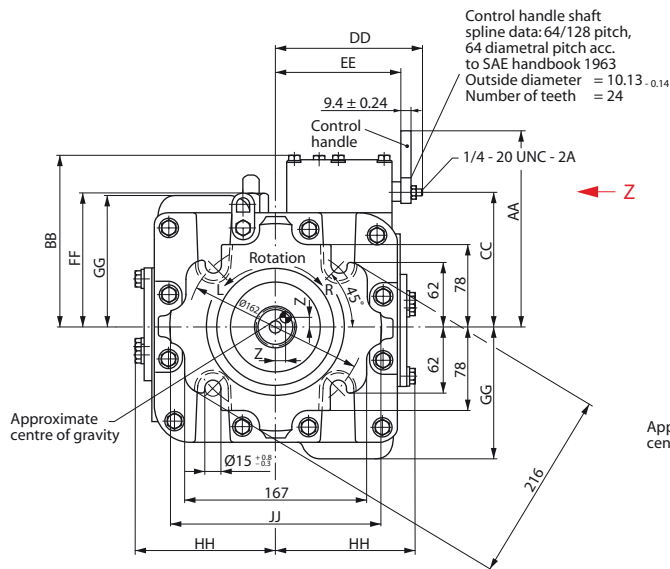
	Port A and B	Port L ₁ and L ₂	Port S	Port M
HPV 033	SAE flange, size 1			
HPV 052	SAE split flange boss 6000 psi	7/8-14 UNF-2B		7/16-20 UNF-2B
HPV 070	4 threads	SAE straight thread		SAE straight thread
HPV 090	7/16-14 UNC-2B 18 deep	O-ring boss		O-ring boss

AXIAL PISTON PUMPS AND MOTORS

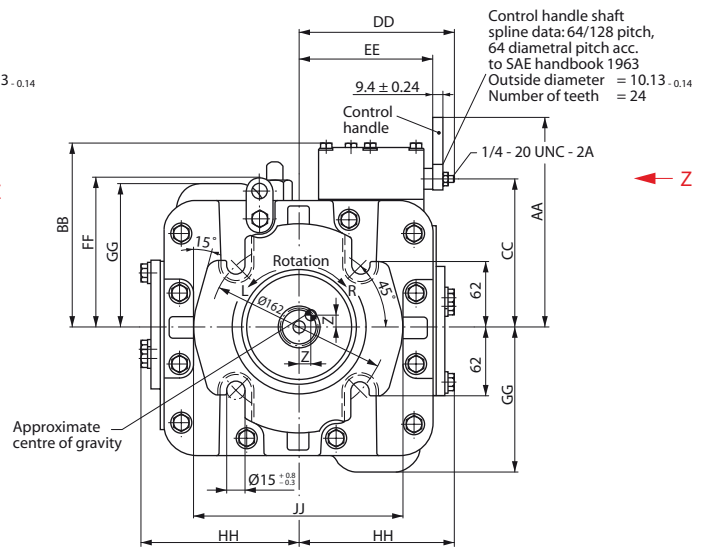
DRAWINGS

HPV 070 / HPV 090

View X (for HPV 070 only)



View X (for HPV 090)

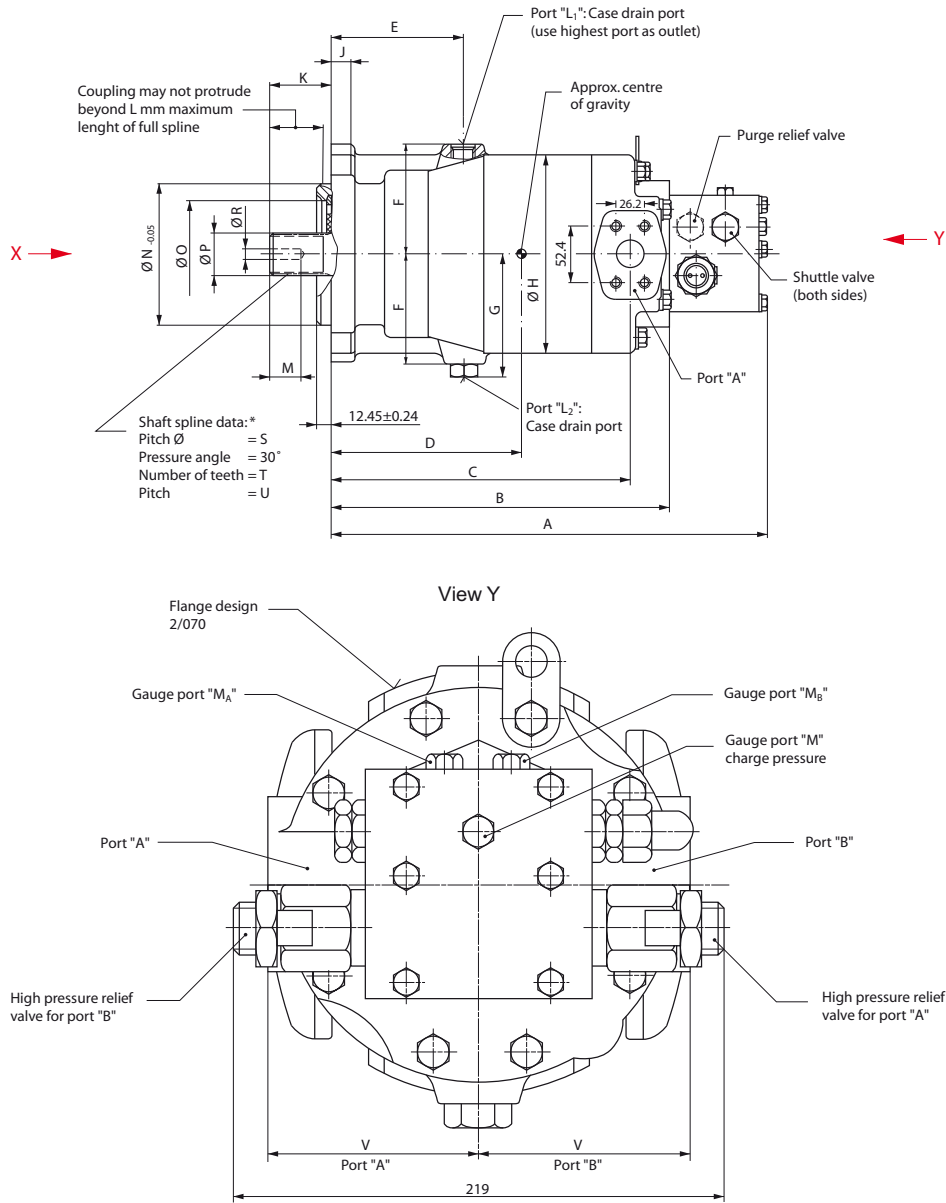


	B	C	D	E	F	G	H	J	K	L	M	Ø N
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
HPV 070	315	294	305	259	188	146	112	120	84	48	16	84
HPV 090	328	307	312	271	195	140	118	129	91	49	17,5	98
	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
HPV 070	71,4	112,7	105	108	60,5	85,8	9,5	187,6	162	128,6	133	113
HPV 090	77,7	128,7	115	119	65	95,2	12,7	198,6	173	139,6	144	123
					Charge pump displacement		Shaft spline					
					cm ³ /rev	cm ³ /rev						Bore diameter for shaft coupling mm
					12,30	18,03	Ø O	Ø P	R	S		
	FF	GG	HH	JJ	A	A	Ø O	Ø P	R	S		
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm		
HPV 070	126	123	130	194	372	381	34,50_{-0,17}	33,338	21	16/32	31,75_{+0,062}	
HPV 090	140	134	148	194	358	394	37,68_{-0,17}	36,513	23	16/32	34,95_{+0,062}	

AXIAL PISTON PUMPS AND MOTORS

DRAWINGS

HMF 070 / HMF 090



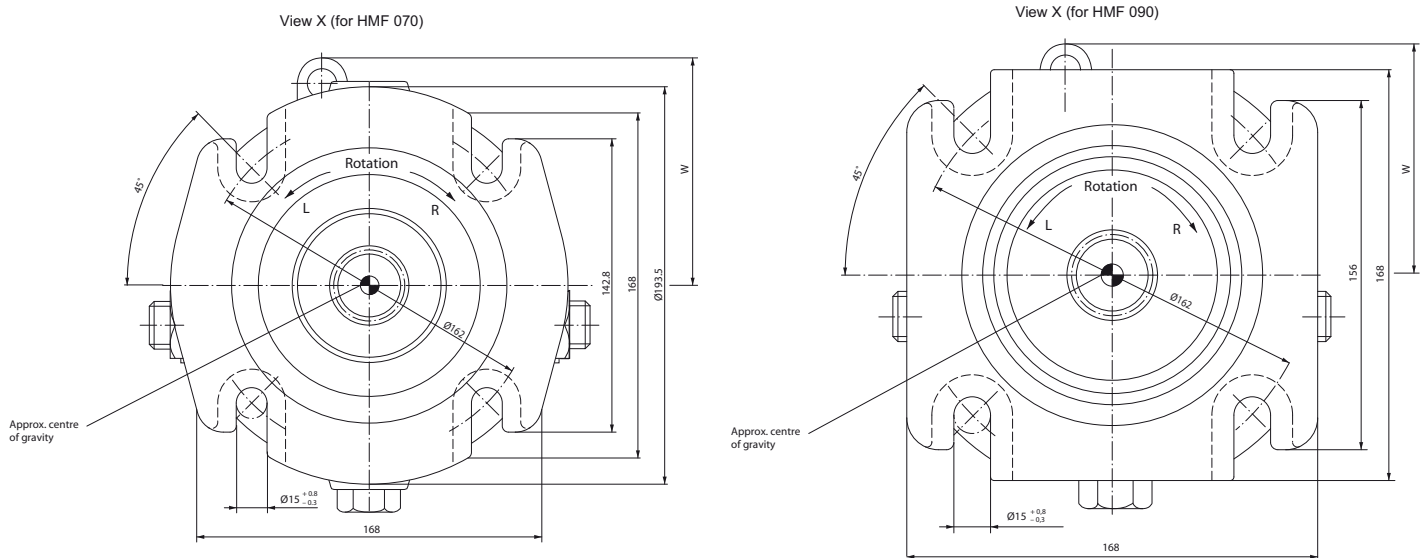
* Shaft spline data: spline shaft with involute spline, according to SAE handbook, 1963, class 1, fillet root side fit.

	Port A and B	Port L ₁ and L ₂	Port M _A and M _B	Port M
HMF 070	SAE flange, size 1 SAE split flange boss 5000 psi	7/8-14 UNF-2B SAE straight thread O-ring boss	7/16-20 UNF-2B SAE straight thread O-ring boss	
HMF 090	4 threads 3/8-16 UNC-2B 18 deep			

AXIAL PISTON PUMPS AND MOTORS

DRAWINGS

HMF 070 / HMF 090



	A	B	C	D	E	F	G	Ø H	J	K	L	M
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
HMF 070	378	290	255	165	108	86,5	98	161	16	56	48	28,4
HMF 090	395	307	273	170	118	96,0	107	181	18	56	48	28,4
	Ø N	Ø O	Ø P	Ø R	Ø S	T	U	V	W	Diameter for shaft coupling		
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm		
HMF 070	127	84	34,50 ^{-0,17}	8,5	33,338	21	16/32	85,8	101	31,75 ^{+0,062}		
HMF 090	127	98	37,68 ^{-0,17}	8,5	36,513	23	16/32	95,2	114	34,95 ^{+0,062}		