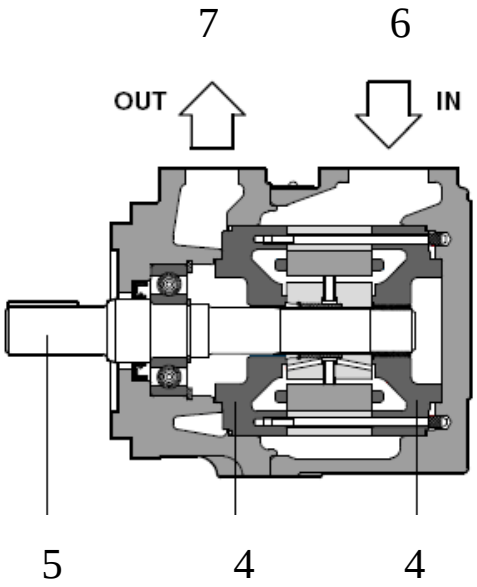
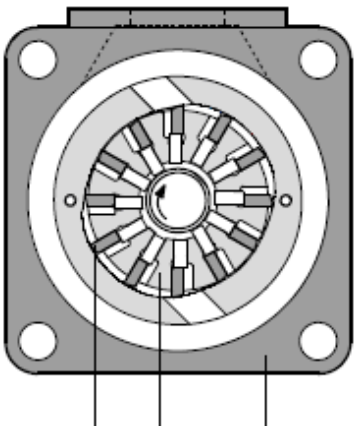
ATOS Single PFE Vane Pump

ATOS hydraulic vane pump PFE21 PFE31 PFE41 PFE51 PFE61 PFE22 PFE32 PFE42 PFE52





1 body 2 and 3 rotor with vanes 4 balanced plates 5 shaft 6 inlet port 7 outlet port

PFE are fixed displacement-twelve-vane pump, 2 and 3 cartridge design with integral hydraulic balancing 4 for high pressure operation and long service life with low noise level.
Suitable for hydraulic oils according to DIN 51524…535 OR synthetic fluids have similar lubricating characteristics.
These pumps are available as single, multiple or with through-shaft configuration. Mounting according to SAE J744 standard. Easy installation as inlet and outlet ports can be assembled in any of four relative positions. Easy maintains as the pumping cartridge can be replaced in a few minutes. Interchangeable with original ATOS vane pump of the same model.
Wide variety of displacements up to 150 cm3/rev. Maximum pressure 210 bar (21MPa)

1: MODEL CODE:

PFE-	31	036/	1	D	T	
Fixed disp. pump	Series (see 2)	Nominal displacement (cm3/rev)	Drive shaft: (see 6 and 7)	Direction of rotation (viewed from shaft end)	Port orientation (see section 5)	Synthetic fluids
PFE series single vane pump	21	005, 006, 008, 010, 012, 016	1=standard 2=long version 3=for high torque applications 5=splinded shaft for any position 6*= splinded shaft for first position 7*= splinded shaft for multiple pump	D= clockwise (standard) S= anti-clockwise	T=standard U, V, W= on request	WG= water- glycol PE= phosphate ester
	31	016, 022, 028, 036, 044				
	41	029, 037, 045, 056, 070, 085				
	51	090, 110, 129, 150				

2 Operating Characteristics at 1450 rpm (based on mineral oil ISO VG 46 at 50 ℃)

Model	Displacement cm3/rev	Max. pressure	Speed range rpm	210 bar L/min	210 bar kW	Weight KG	Oil ports Inlet port	Oil ports Outlet port
PFE-21005	5	210 bar	900-3000	4.8	3.5	6	3/4”	1/2”
PFE-21006	6.3			5.8	4			
PFE-21008	8			7.8	5.5			
PFE-21010	10			9.7	6.5			
PFE-21012	12.5			12.2	8			
PFE-21016	21.6			15.6	10			
PFE-31016	16.5		800-2800	16	8.3	9	1 1/4”	3/4”
PFE-31022	21.6			23	10.8			
PFE-31028	28.1			33	14			
PFE-31036	35.6			43	17.8			
PFE-31044	43.7		700-2500	55	22			
PFE-41029	29.3			34	14.7	14	1 1/2”	1”
PFE-41037	36.6			45	18.3			
PFE-41045	45			57	22.6			
PFE-41056	55.8			72	28			
PFE-41070	69.9			91	35			
PFE-41085	85.3		700-2000	114	43			
PFE-51090	90		600-2200	114	45	25.5	2”	1 1/4”
PFE-51110	109.6			141	55			
PFE-51129	129.2			168	65			
PFE-51150	150.2		600-1800	197	75			

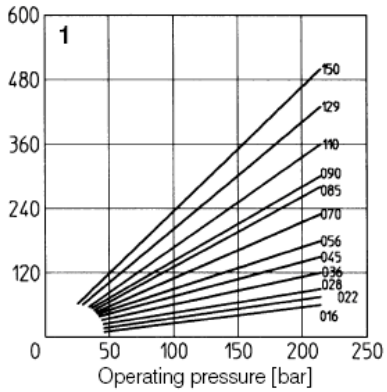
3 Main Characteristics of Vane Pumps type PFE- *1

Installation position	Any position
Loads on the shaft	Axial and radial loads are not allowed on the shaft.. The coupling should be sized to absorb the power beak.
Ambient temperature	From -20℃ to +70℃
Fluid	Hydraulic oil as per DIN 51524…535; for other fluid see section 1
Recommended viscosity	
Max. at cold start	800 mm2/s
Max. at full power	100 mm2/s
During operation	24 mm2/s
Min. at full power	10 mm2/s
Fluid contamination class	ISO 19/16
Fluid temperature	-20℃+60℃ -20℃+60℃ (/WG seals) -20℃+60℃(/PE seals)
Recommended pressure on inlet port	From -0.15 to 1.5 bar for speed up to 1800 rpm, from 0 to +1.5bar for speed over 1800rpm

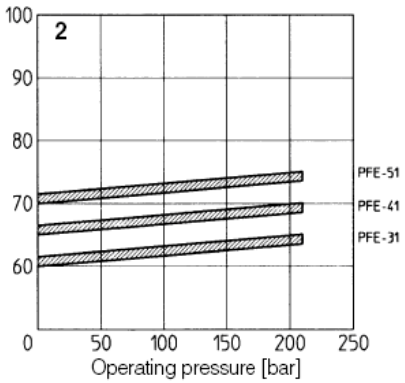
4 Diagrams (based on mineral oil ISO VG 46 at 50 ℃)

1= torque versus pressure diagram
2= ambient noise levels
Measured in compliance with
ISO 4412-1 oleo hydraulics – test procedure to define the shaft speed: 1450 rpm.

Torque needed to operate the pump(Nm)

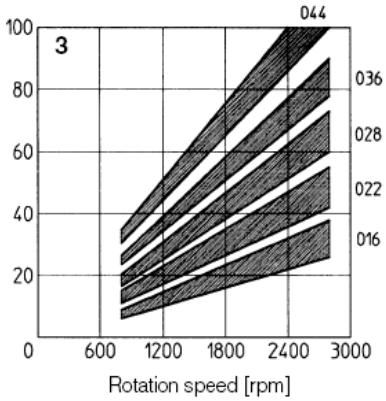


Noise level (dB:A)

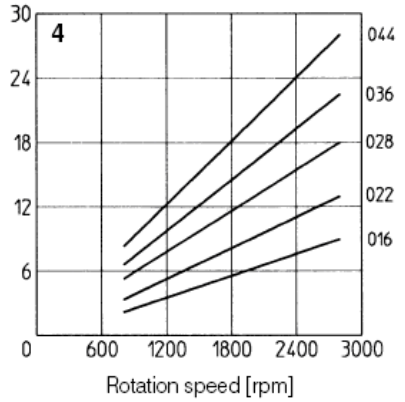


PFE-31:
3= Flow versus speed diagram
With pressure variation from 7-210 bar.
4= Power consumption versus speed diagram
At 140 bar. Power consumption is proportional to operation pressure

Flow (L/min)

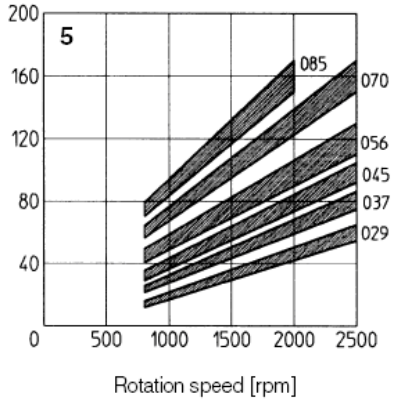


Power consumption (kW)

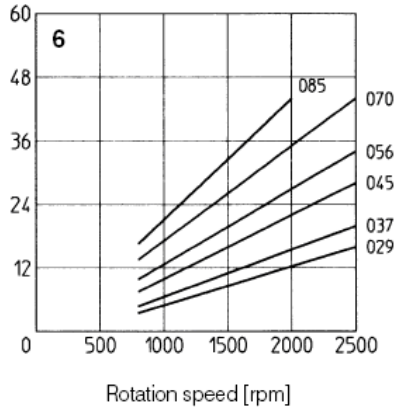


PFE-41:
5= Flow versus speed diagram
With pressure variation from 7-210 bar.
6= Power consumption versus speed diagram
At 140 bar. Power consumption is proportional to operation pressure

Flow (L/min)

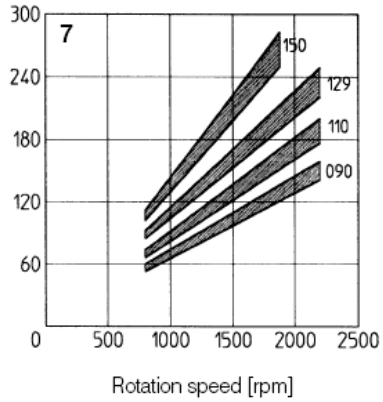


Power consumption (kW)

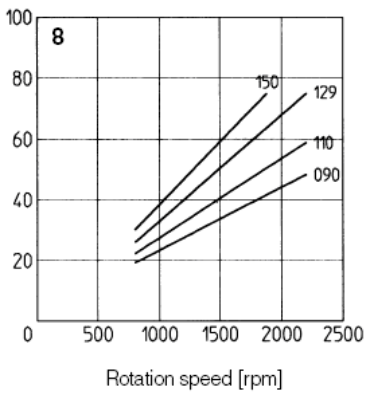


PFE-51:
7= Flow versus speed diagram
With pressure variation from 7-210 bar.
8= Power consumption versus speed diagram
At 140 bar. Power consumption is proportional to operation pressure

Flow (L/min)



Power consumption (kW)



5 Port of orientation:

Single pumps can be supplied with oil ports oriented in different configuration in ration to the drive shaft, as follow (viewed from the shaft end):

T= inlet and outlet ports on the same axis (standard)

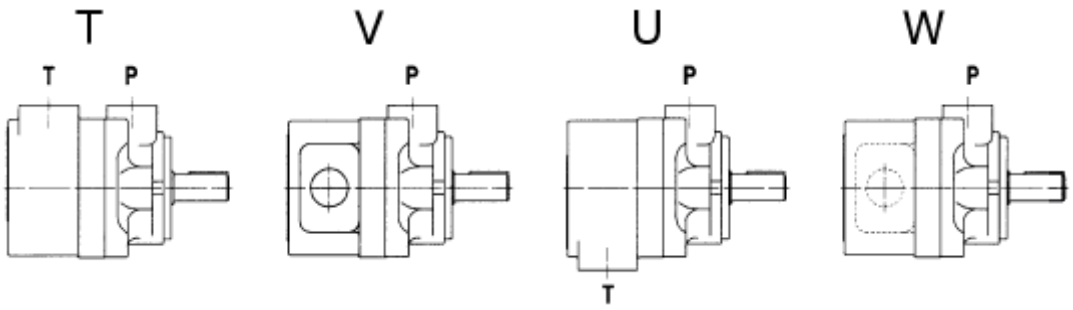
U=outlet orientation 180° with respect to the inlet

V= outlet orientation 90° with respect to the inlet

W= outlet orientation 270° with respect to the inlet

In multiple pumps inlet ports and outlet ports are in line.

Ports orientation can be easily changed rotating the pump body that carries inlet port.



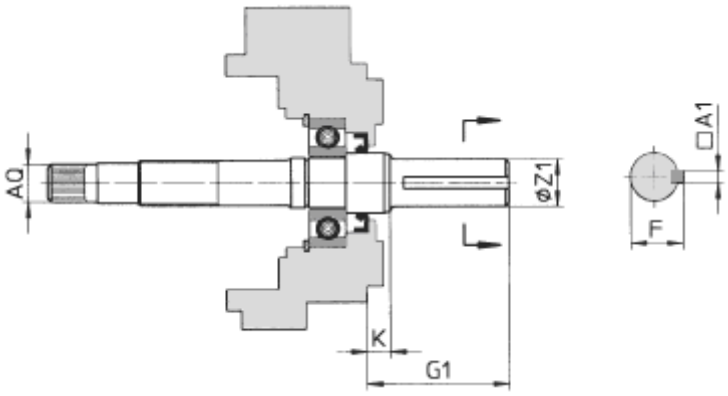
6 *Drive shaft*

Cylindrical shaft keyed

1= for single and multiple pump (only first position)
Supplied as standard if not specified in the model code.

2= for single and multiple pumps (only for position)
long version (only for PFE-41, PFE-51 and double pump)

3= for single and multiple pump (only first position)
for high torque applications



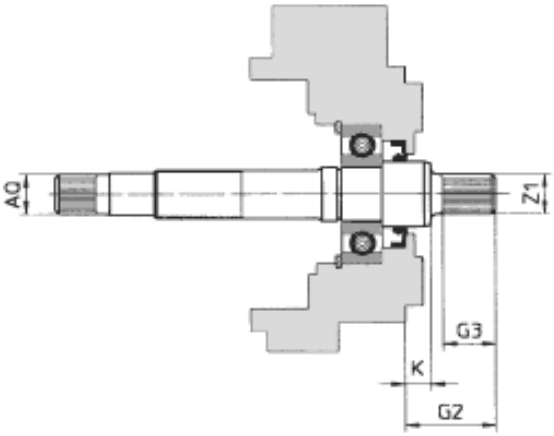
Model	Keyed shaft type 1 (standard)						Keyed shaft type 2						Keyed shaft type 3					
	A1	F	G1	K	Z1	AQ	A1	F	G1	K	Z1	AQ	A	F	G1	K	Z1	AQ
PFE-31	4.78 4.75	21.11 20.94	56	8	19.05 19	SAE 16/32-9T	--	--	--	--	--	--	4.78 4.75	24.54 24.41	56	8	22.22 22.2	SAE 16/32-9T
PFE-41	4.78 4.75	24.54 24.41	59	11.4	22.22 22	SAE 32/64-24T	6.36 6.35	25.03 24.77	71	8	22.22 22.2	SAE 32/64-24T	6.38 6.35	28.3 28.1	78	11.4	25.38 25.36	SAE 32/64-24T
PFE-51	7.97 7.94	35.33 35.07	73	14	31.75 31.7	SAE 16/32-13T	7.95 7.94	35.33 35.07	84	8.1	31.75 31.7	SAE 16/32-13T	7.97 7.94	38.58 38.46	84	14	34.9 34.88	SAE 16/32-13T

Splinded shaft

5= for single and multiple pump (any position)
for PFE-31 according to SAE A 16/32 DP, 9 teeth;
for PFE-41 according to SAE B 16/32 DP, 13 teeth;
for PFE-51 according to SAE C 12/24 DP, 14teeth;

6= for single and multiple pump (only first position)
for PFE-31 and PFEX*-31 according to SAE B 16/32 DP, 13 teeth;
for PFE-41 and PFEX*-41 according to SAE B 12/24 DP, 14 teeth;

7=for second and third position pump in multiple configuration:
for PFEX*-31 according to SAE B 16/32 DP, 13 teeth;
for PFEX*-41 according to SAE B 12/24 DP, 14 teeth;



Model	Splined shaft type 5					Splined shaft type 6					Splined shaft type 7				
	G2	G3	K	Z1	AQ	G2	G3	K	Z1	AQ	G2	G3	K	Z1	AQ
PFE-31	32	19.5	6.5	SAE 16/32-9T	SAE 16/32-9T	41	28	8	SAE 16/32-13T	SAE 16/32-9T	32	19	8	SAE 16/32-13T	SAE 16/32-9T
PFE-41	41.25	28	8	SAE 16/32-13T	SAE 32/64-24T	55.6	42	8	SAE 12/24-14T	SAE 32/64-24T	41.6	28	8	SAE 12/24-14T	SAE 32/64-24T
PFE-51	56	42	8.1	SAE 12/24-14T	SAE 16/32-13T	--	--	--	--	--	--	--	--	--	--

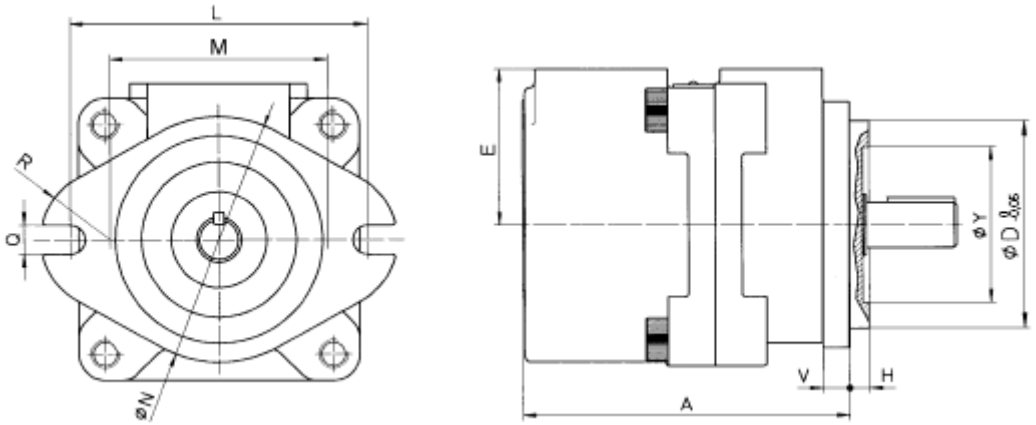
7 Limits of shaft torque:

Model	Maximum driving torque (Nm)						Max. torque available at the end of the through shaft (Nm)
	Shaft type 1	Shaft type 2	Shaft type 3	Shaft type 5	Shaft type 6	Shaft type 7	Any type of shaft
PFE-31	160	--	240	110	240	240	130
PFE-41	250	250	400	200	400	400	250
PFE-51	500	500	850	450	--	--	400

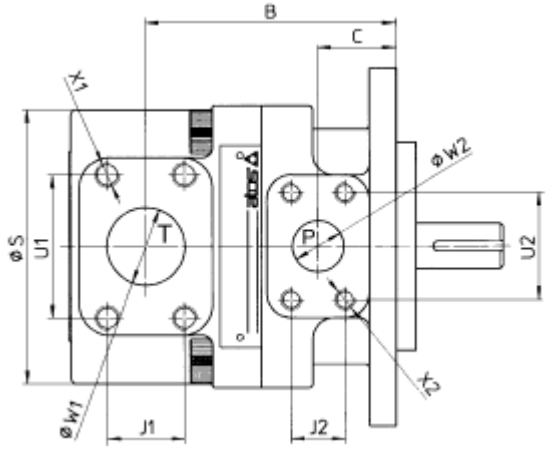
The values of torque required to operate the pumps are shown for each type on the “torque versus pressure” diagram at section 4:, In multiple pumps the total torque applied to the shaft of the first element (drive shaft) is the sum of the single torque needed for operating each single pump and it is necessary to verity that this total torque applied to the shaft is not higher then the values indicated in the table.

8 Dimensions of single pump (mm)

T=inlet port
P=outlet port



SAE flanges
PFE-31: port T=1 1/4”, port P=3/4”
PFE-41: port T=1 1/2”, port P=1”
PFE-51: port T=2”, port P=1 1/4”



Model	A	B	C	D	E	H	L	M	N	Q	R
PFE-31	136	100	28	82.5	70	6.4	106	73	95	11.1	28.5
PFE-41	160	120	38	101.6	76.2	9.7	146	107	120	14.3	34
PFE-51	186.5	125	38	127	82.6	12.7	181	143.5	148	17.5	35
Model	**S**	**U1**	**U2**	**V**	**W1**	**W2**	**J1**	**J2**	**X1**	**X2**	**Y**
PFE-31	114	58.7	47.6	10	32	19	30.2	22.2	M10X20	M10X17	47
PFE-41	134	70	52.4	13	38	25	35.7	26.2	M12X20	M10X17	76
PFE-51	160	77.8	58	15	51	32	42.9	30.2	M12X20	M10X17	76