



## 2 GENERAL CHARACTERISTICS

Assembly 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 peak.
Ambient temperature range	-20°C to +70°C
Compliance	Explosion proof protection "Ex h", see section 7 RoHs Directive 2011/65/EU as last update by 2015/863/EU REACH Regulation (EC) n° 1907/2006

## 3 HYDRAULIC CHARACTERISTICS of PFEA - 31, 41, 51 based on mineral oil ISO VG 46 at 50 °C

Size code	31						41						51			
Displacement code	010	016	022	028	036	044	029	037	045	056	070	085	090	110	129	150
Displacement (cm <sup>3</sup> /rev)	10.5	16.5	21.6	28.1	35.6	43.7	29.3	36.6	45.0	55.8	69.9	85.3	90.0	109.6	129.2	150.2
Max working pressure (1) (bar)	160	210														
Recommended pressure on inlet port	from -0,15 to 1,5 bar for speed up to 1800 rpm; from 0 to +1,5 bar for speed over 1800 rpm															
Min speed (rpm)	800															
Max speed (2) (rpm)	2400	2800	2800	2800	2800	2500	2500	2500	2500	2500	2500	2000	2200	2200	2200	1800
Volumetric efficiency (3)	80	83	87	90	90	92	90	92	93	93	93	94	93	93	93	94
Noise level (3) (dBA)	62	62	63	63	63	64	67	67	68	68	69	69	72	72	73	74

**Notes:** For speeds over 1800 rpm the inlet port must be under oil level with adequate pipes.

**(1)** Max pressure for all models with water glycol fluid or option /PE is **160 bar**.

**(2)** Max speed with water glycol fluid or option /PE is **1800 rpm**.

**(3)** Measuring data with: n = 1450 rpm; P = 140 bar;

## 4 HYDRAULIC CHARACTERISTICS of PFEA - 32, 42, 52 based on mineral oil ISO VG 46 at 50 °C

Size code	32				42				52			
Displacement code	016	022	028	036	045	056	070	085	090	110	129	150
Displacement (cm <sup>3</sup> /rev)	16.5	21.6	28.1	35.6	45.0	55.8	69.9	85.3	90.0	109.6	129.2	150.2
Max working pressure (1) (bar)	210	300			280		250	210	250			210
Recommended pressure on inlet port	from -0,15 to 1,5 bar for speed up to 1800 rpm; from 0 to +1,5 bar for speed over 1800 rpm											
Min speed (rpm)	1000	1200			1000		800	1000			800	
Max speed (2) (rpm)	2500	2500			2200		2000	2000			1800	
Volumetric efficiency (3)	86	87	90	90	93	93	93	94	93	93	93	94
Noise level (3) (dBA)	62	63	63	63	66	66	67	67	71	71	72	72

**Notes:** For speeds over 1800 rpm the inlet port must be under oil level with adequate pipes.

**(1)** Max pressure for all models with water glycol fluid or option /PE is **160 bar**.

**(2)** Max speed with water glycol fluid or option /PE is **1800 rpm**.

**(3)** Measuring data with: n = 1450 rpm; P = 140 bar;

## 5 OPTION FOR PUMPS WITH THROUGH SHAFT

Pump size	PFEA-31 PFEA-32	PFEA-41 PFEA-42				PFEA-51 PFEA-52				
Through shaft option type	XA	XA	XB	XA7	XB7	XA	XB	XC	XA7	XB7
Splined coupling characteristics	SAE 16/32-9T	SAE 16/32-9T	SAE 16/32-13T	SAE 16/32-13T	SAE 12/24-14T	SAE 16/32-14T	SAE 13/32-13T	SAE 12/24-14T	SAE 16/32-13T	SAE 12/24-14T
2 <sup>nd</sup> pump	PFEA-3* shaft type 5	PFEA-3* shaft type 5	PFEA-4* shaft type 5	PFEA-3* shaft type 7	PFEA-4* shaft type 7	PFEA-3* shaft type 5	PFEA-4* shaft type 5	PFEA-5* shaft type 5	PFEA-3* shaft type 7	PFEA-4* shaft type 7

**6 SEALS AND HYDRAULIC FLUIDS** - for other fluids not included in below table, consult our technical office

Seals, recommended fluid temperature	NBR seals (standard) = -20°C ÷ +60°C, with HFC hydraulic fluids = -20°C ÷ +50°C FKM seals (/PE option) = -20°C ÷ +80°C		
Recommended viscosity	15÷100 mm <sup>2</sup> /s - max start-up viscosity = 1000 mm <sup>2</sup> /s		
Max fluid contamination level	normal operation	ISO4406 class 21/19/16 NAS1638 class 10	see also filter section at www.atos.com or KTF catalog
	longer life	ISO4406 class 19/17/14 NAS1638 class 8	
<b>Hydraulic fluid</b>	<b>Suitable seals type</b>	<b>Classification</b>	<b>Ref. Standard</b>
Mineral oils	NBR, FKM	HL, HLP, HLPD, HVLP, HVLPD	DIN 51524
Flame resistant without water	FKM	HFDU, HFDR	ISO 12922
Flame resistant with water	NBR	HFC	

**7 CERTIFICATION DATA**


Certification	<b>ATEX</b>	<b>EAC</b>
Protection mode	Ex II 2/2G Ex h IIC T5, T4 Gb, Ex II 2/2D Ex h IIIC T100°C, T135°C Db	1Ex d IIC T5/T4 Gb X; Ex tb IIIC T100°C/T135°C Db X
Type examination certificate (1)	TUV CY 19 ATEX 026182X	RU C - IT.AЖ38.B.00425/21

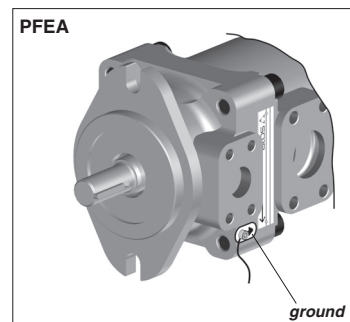
(1) The type examination certificates can be downloaded from [www.atos.com](http://www.atos.com)

Certification type	<b>ATEX, EAC</b>	
Pump version	<b>(std and /PE)</b>	<b>/7 /PE</b>
Temperature class	T6	T5
Surface temperature	≤ 85 °C	≤ 100 °C
Ambient temperature	-20 ÷ +60 °C	-20 ÷ +70 °C
Max inlet fluid temperature	+60 °C	+80 °C
Protection degree	IP 66	

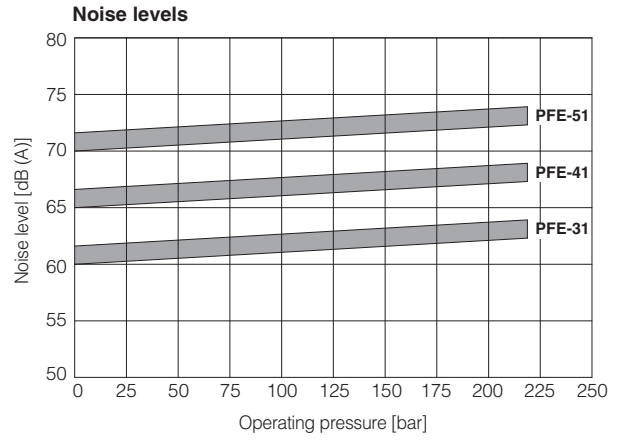
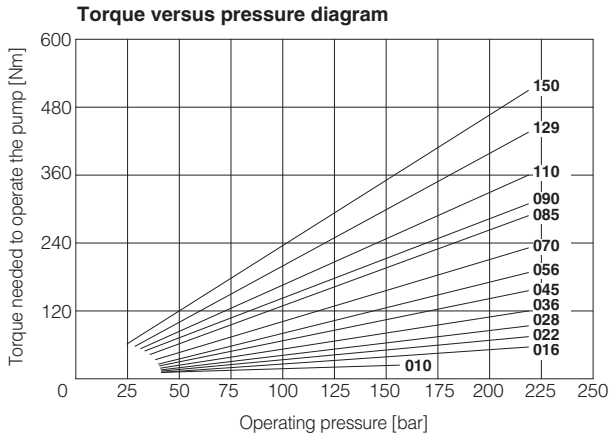
**⚠ WARNING: service work performed on the pump by the end users or not qualified personnel invalidates the certification**

**7.1 EXAMPLE OF PFEA NAMEPLATE MARKING**

 Atos spa - Via alla Piana, 57 21018 Sesto Calende (Va) Italy www.atos.com	MODEL N°	PFEA-31022/1DT **	SERIAL N°	220001
	← ROTATION → TP TC 012/2011 II 2/2G Ex h IIC T 6 Gb II 2/2D Ex h IIIC T 85 °C Db TÜV CY 19 ATEX 0206193 X   IP66 RPM 800 / 2800 Pin 0 :1.5 bar Pmax 210 bar -20°C ≤ Toil ≤ +60 °C -20°C ≤ Tamb ≤ +60 °C	№ ВАС RU C - ПЛЖ38.В.00425/21 Серия RU N°0333507 1Ex d IIC T 6 Gb X Ex tb IIIC T 85 °C Db X		made in Italy AT-765
Marking according to Atex Directive				
Notified body and certificate number				



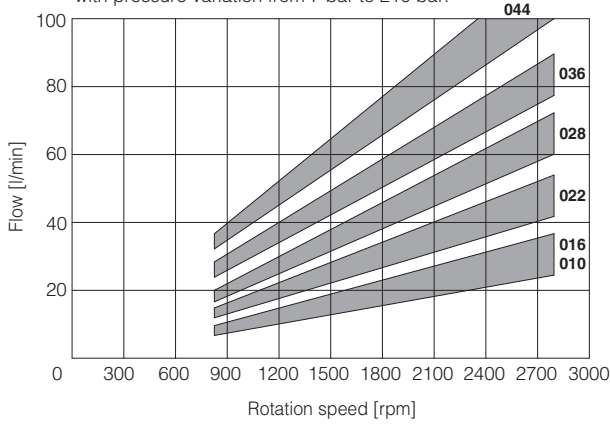
**8 DIAGRAMS** for PFEA -31, 41, 51 (based on mineral oil ISO VG 46 at 50°C)



**PFEA-31:**

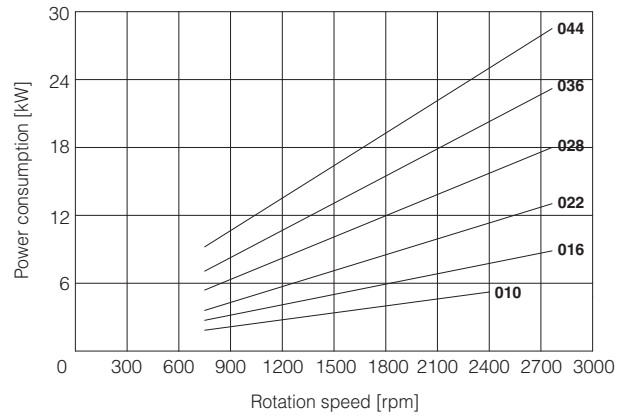
**Flow versus speed diagram**

with pressure variation from 7 bar to 210 bar.



**Power consumption versus speed diagram** at 140 bar.

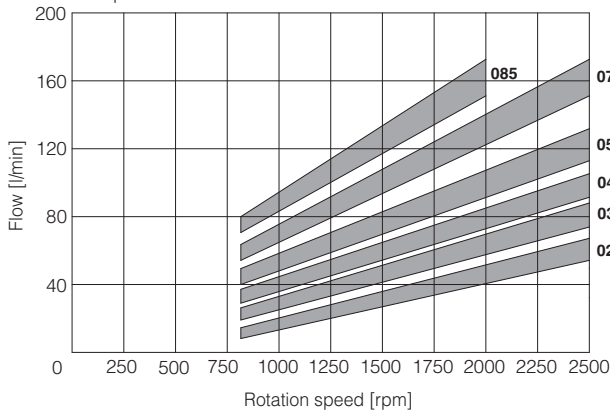
Power consumption is proportional to operating pressure.



**PFEA-41:**

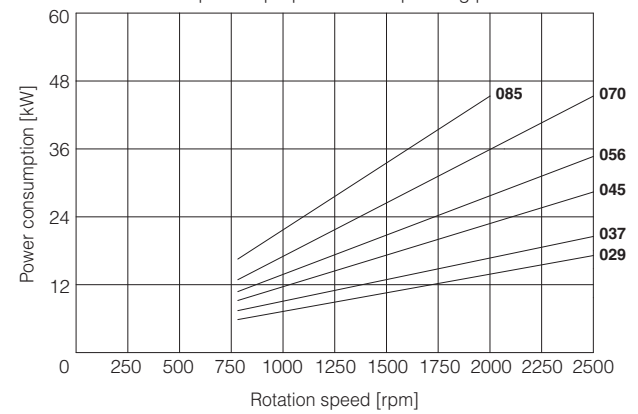
**Flow versus speed diagram**

with pressure variation from 7 bar to 210 bar.



**Power consumption versus speed diagram** at 140 bar.

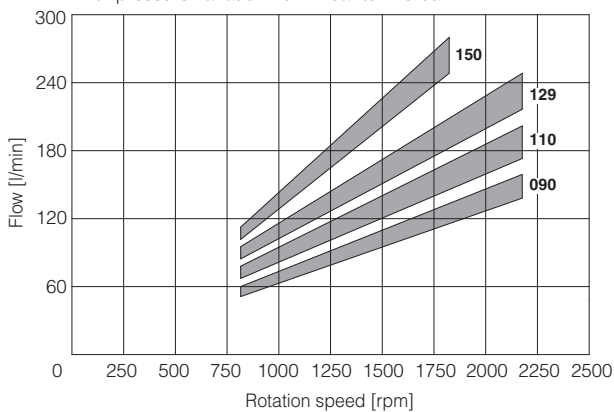
Power consumption is proportional to operating pressure.



**PFEA-51:**

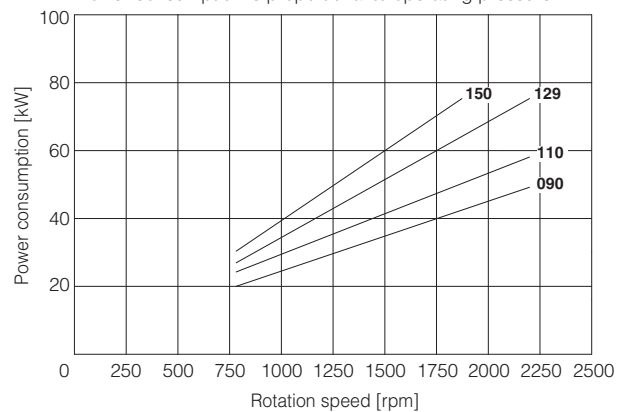
**Flow versus speed diagram**

with pressure variation from 7 bar to 210 bar.

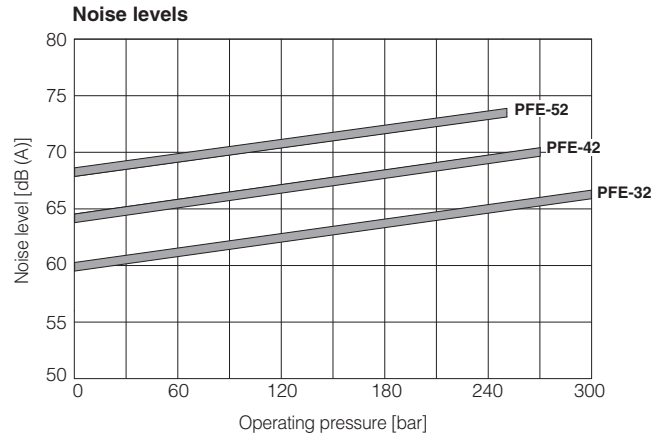
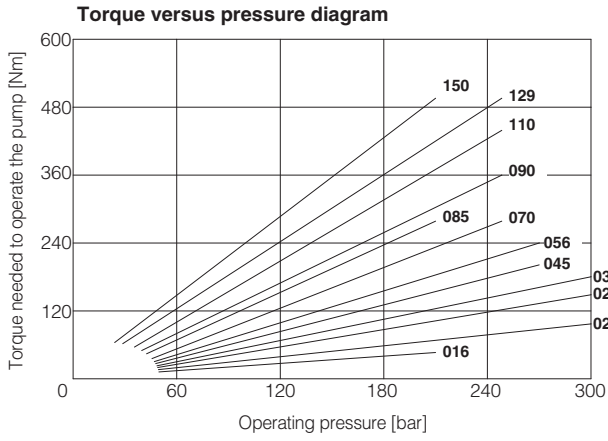


**Power consumption versus speed diagram** at 140 bar.

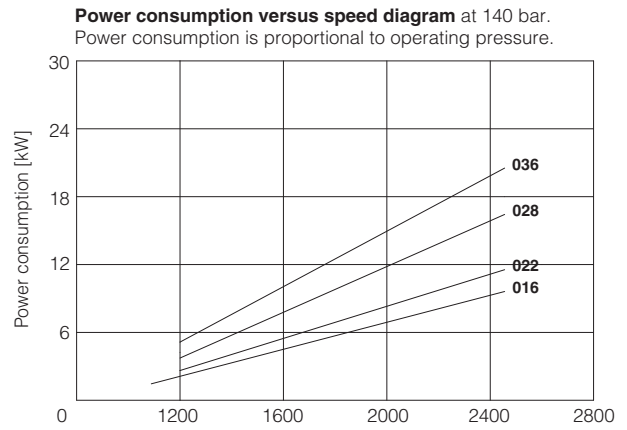
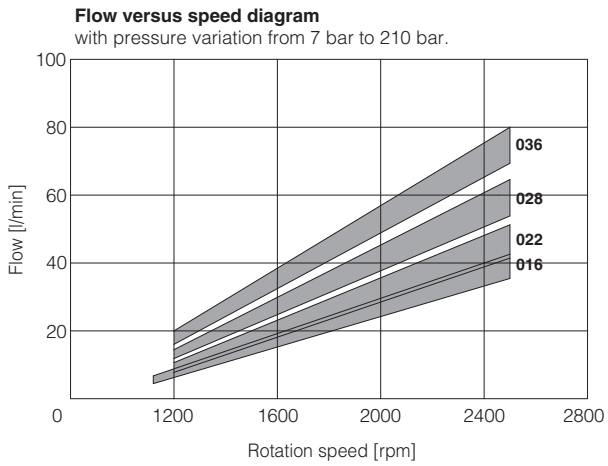
Power consumption is proportional to operating pressure.



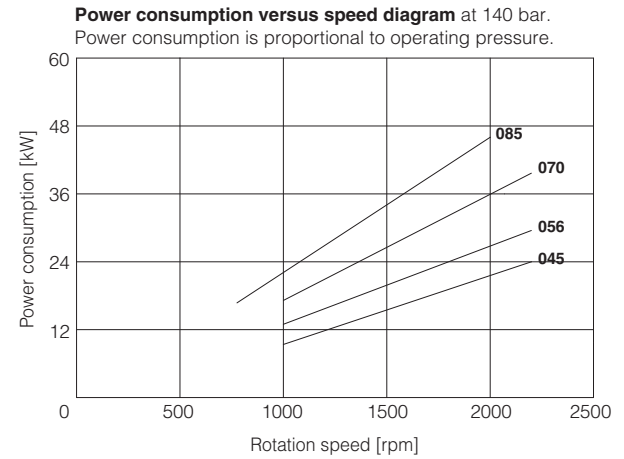
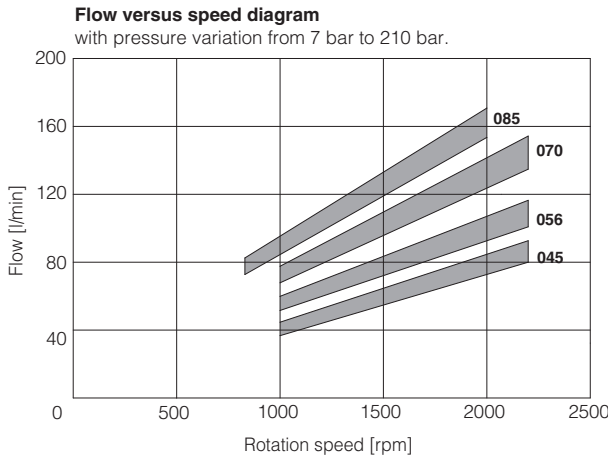
**9 DIAGRAMS** for PFEA -32, 42, 52 (based on mineral oil ISO VG 46 at 50°C)



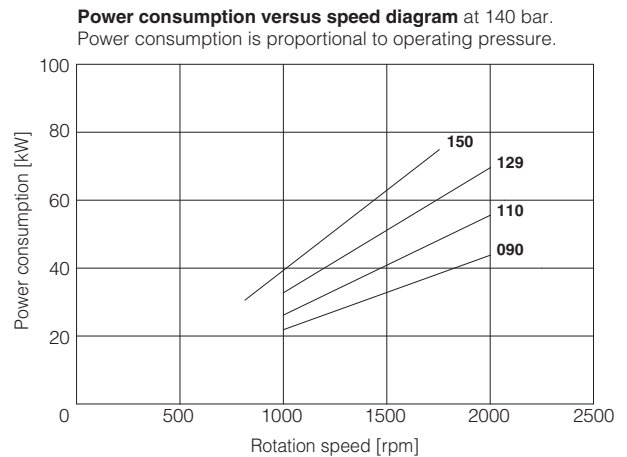
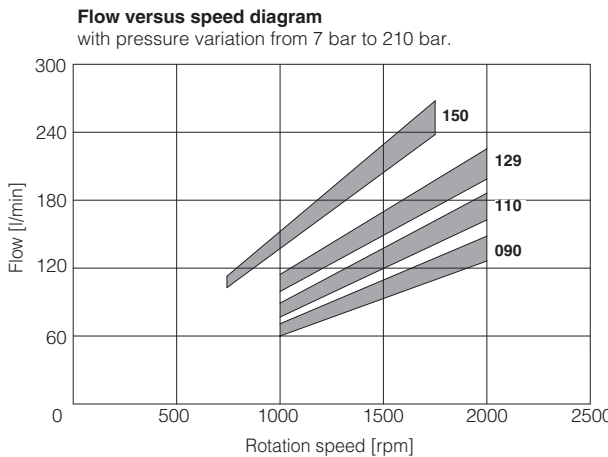
**PFEA-32:**



**PFEA-42:**

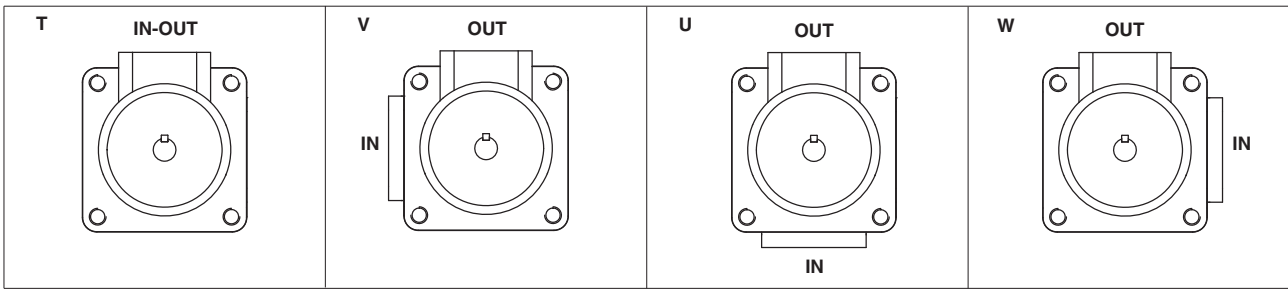


**PFEA-52:**



## 10 PORT ORIENTATION

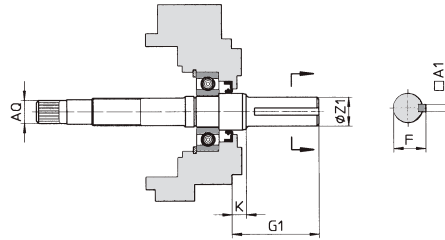
Single pumps can be supplied with oil ports oriented in different configuration in relation to the drive shaft, as follows (viewed from the shaft end); Ports orientation can be easily changed by rotating the pump body that carries inlet port.



OUT = outlet port; IN = inlet port

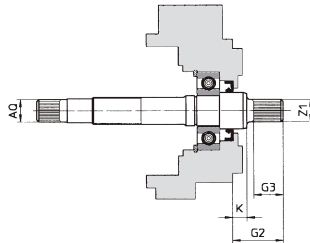
## 11 DRIVE SHAFT

### CYLINDRICAL SHAFT KEYED



PFEA Model	PFEA - 31,41,51						PFEA - 41,51						ALL VERSIONS					
	Keyed shaft type 1 (only PFEA - 31,41,51)						Keyed shaft type 2 (only PFEA - 41,51)						Keyed shaft type 3					
	A1	F	G1	K	ØZ1	Ø AQ	A1	F	G1	K	ØZ1	Ø AQ	A1	F	G1	K	ØZ1	Ø AQ
31,32	4,78	21,11	56,00	8,00	19,05	SAE 16/32-9T	-	-	-	-	-	-	4,78	24,54	56,00	8,00	22,22	SAE 16/32-9T
	4,75	20,94			19,00								4,75	24,41			22,20	
41,42	4,78	24,54	59,00	11,40	22,22	SAE 32/64-24T	6,36	25,03	71,00	8,00	22,22	SAE 32/64-24T	6,38	28,30	78,00	11,40	25,38	SAE 32/64-24T
	4,75	24,41			22,20		6,35	24,77			22,20		6,35	28,10			25,36	
51,52	7,97	35,33	73,00	14	31,75	SAE 16/32-13T	7,95	35,33	84,00	8,10	31,75	SAE 16/32-13T	7,97	38,58	84,00	14	34,90	SAE 16/32-13T
	7,94	35,07			31,70		7,94	35,07			31,70		7,94	38,46			34,88	

### SPLINED SHAFT



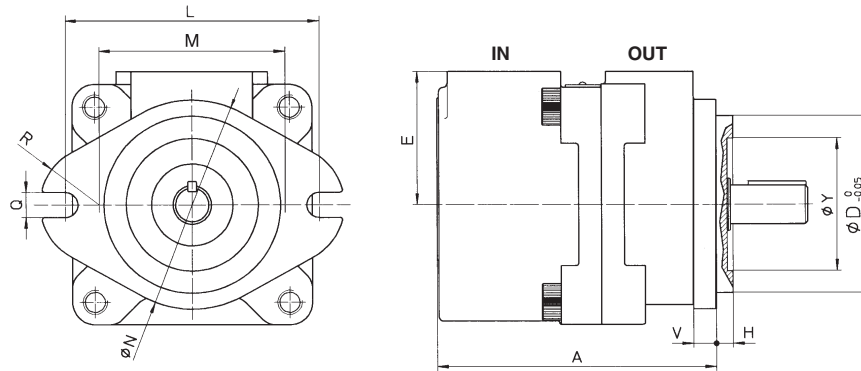
PFEA Model	Splined shaft type 5					Splined shaft type 6					Splined shaft type 7				
	G2	G3	K	Z1	Ø AQ	G2	G3	K	Z1	Ø AQ	G2	G3	K	Z1	Ø AQ
31,32	32,00	19,50	6,50	SAE 16/32-9T	SAE 16/32-9T	41,00	28	8,00	SAE 16/32-13T	SAE 16/32-9T	32,00	19	8,00	SAE 16/32-13T	SAE 16/32-9T
41,42	41,25	28	8,00	SAE 16/32-13T	SAE 32/64-24T	55,60	42	8,00	SAE 12/24-14T	SAE 32/64-24T	41,60	28	8,00	SAE 12/24-14T	SAE 32/64-24T
51,52	56,00	42	8,10	SAE 12/24-14T	SAE 16/32-13T	-	-	-	-	-	-	-	-	-	-

## 12 LIMITS OF SHAFT TORQUE

PFEA Model	Maximum driving torque [Nm]						Maximum 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
31,32	160	-	240	110	240	240	130
41,42	250	250	400	200	400	400	250
-51,52	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 verify that this total torque applied to the drive shaft is not higher than the values indicated in the table.

13 DIMENSIONS OF PFEA - 31, 41, 51 SINGLE PUMPS [mm]

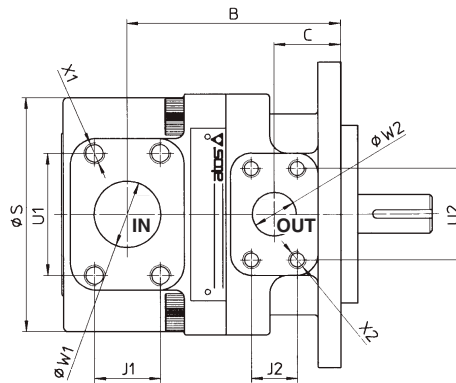


**PORTS DIMENSION (SAE 3000)**

**PFEA-31:** IN = 1 1/4"; OUT = 3/4"  
**PFEA-41:** IN = 1 1/2"; OUT = 1"  
**PFEA-51:** IN = 2"; OUT = 1 1/4"

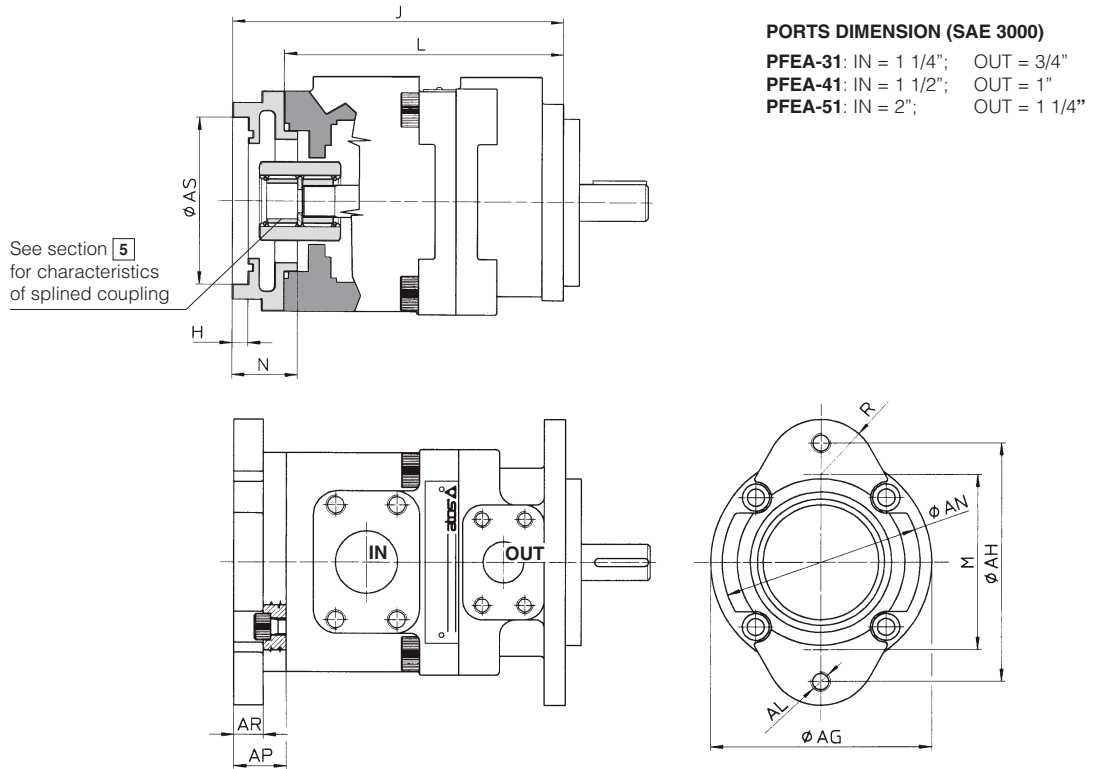
**Mass:**

PFEA-31 = 9 kg  
 PFEA-41 = 14 kg  
 PFEA-51 = 25,5 kg



Pump size	A	B	C	ØD	E	H	L	M	ØN	Q	R
PFEA-31	136	100	28	82,55	70	6,4	106	73	95	11,1	28,5
PFEA-41	160	120	38	101,6	76,2	9,7	146	107	120	14,3	34
PFEA-51	186,5	125	38	127	82,6	12,7	181	143,5	148	17,5	35
Pump size	ØS	U1	U2	V	ØW1	ØW2	J1	J2	X1	X2	ØY
PFEA-31	114	58,7	47,6	10	32	19	30,2	22,2	M10X20	M10X17	47
PFEA-41	134	70	52,4	13	38	25	35,7	26,2	M12X20	M10X17	76
PFEA-51	160	77,8	58,7	15	51	32	42,9	30,2	M12X20	M10X20	76

14 DIMENSIONS OF PFEA-31, 41, 51 WITH THROUGH-SHAFT (XA\*, XB\*, XC options) [mm]



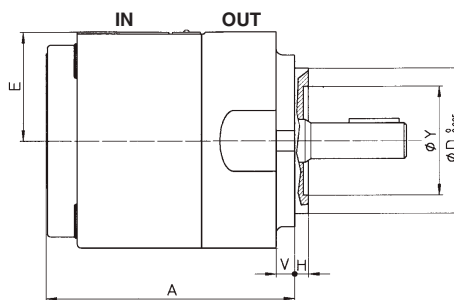
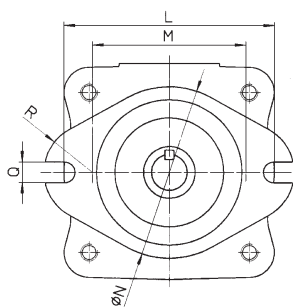
For other dimensions, see section 10

Pump size	Ø AG	Ø AH	AL	Tightening torque (Nm) <sup>(1)</sup>	Ø AN	AP	AR	Ø AS	H	J	L	M	N	R
<b>PFEAXA-31</b>	114	106	M10X17	70	95	33	25	82,57 82,63	6,42 6,47	165,5	132,5	79	32	28,5
<b>PFEAXA-41</b>	134	106	M10X17	70	95	23	11	82,57 82,63	6,42 6,47	194	171	73	32	28,5
<b>PFEAXB-41</b>	134	146	M12	125	120	32	18	101,62 101,68	9,73 9,78	203	171	107	41	34
<b>PFEAXA-51</b>	134	106	M10X17	70	95	22,7	11	82,57 82,63	6,42 6,47	206,2	183,5	73	32	28,5
<b>PFEAXB-51</b>	134	146	M12	125	120	32	18	101,62 101,68	9,73 9,78	215,5	183,5	107	41	34
<b>PFEAXC-51</b>	134	181	M16	300	148	46,5	30,7	127,02 127,02	12,73 12,78	230	183,5	143,5	56	35

(1) Tightening torque for screw class 12.9



15 DIMENSIONS OF PFEA - 32, 42, 52 SINGLE PUMPS [mm]

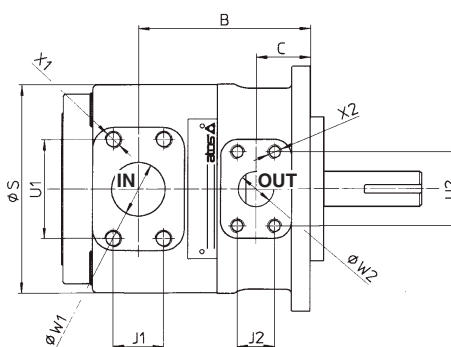


**PORTS DIMENSION (SAE 3000)**

**PFEA-32:** IN = 1 1/4"; OUT = 3/4"  
**PFEA-42:** IN = 1 1/2"; OUT = 1"  
**PFEA-52:** IN = 2"; OUT = 1 1/4"

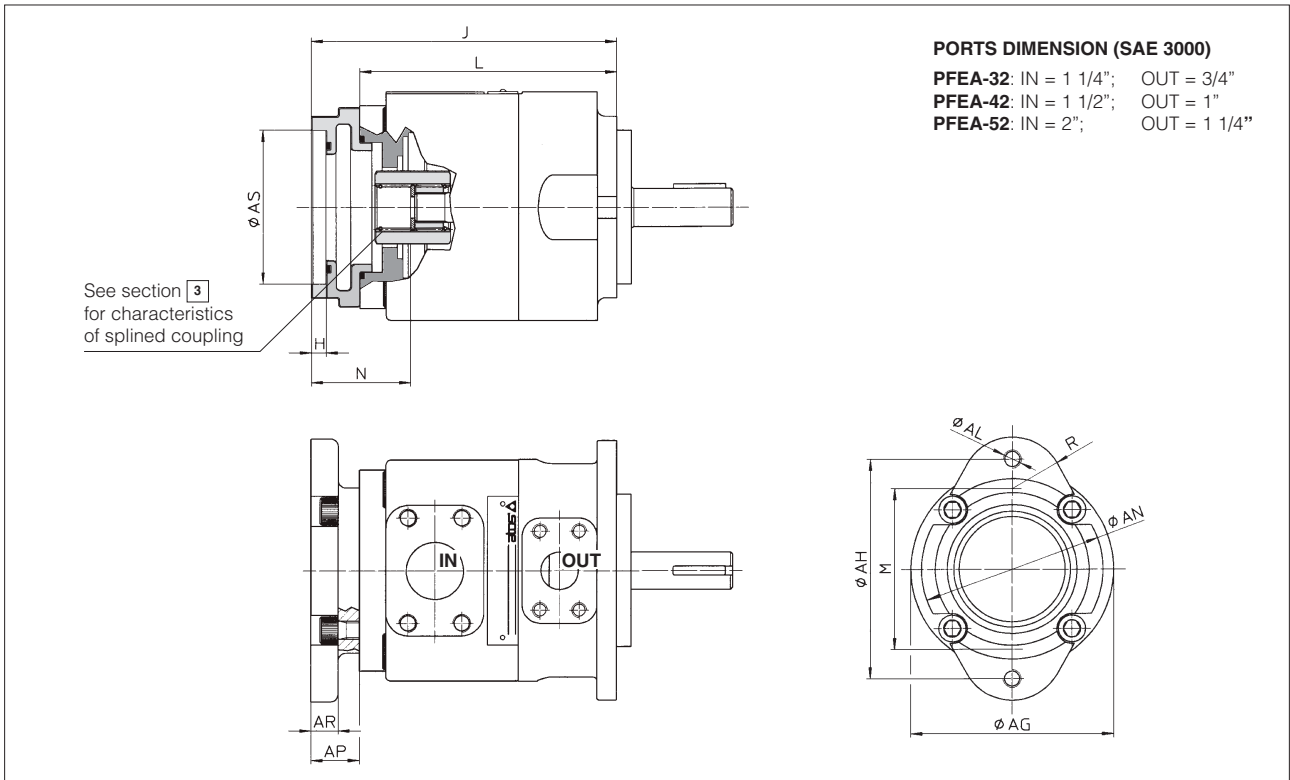
**Mass:**

PFEA-32 = 9 kg  
 PFEA-42 = 20,5 kg  
 PFEA-52 = 32,1 kg



Pump size	A	B	C	ØD	E	H	L	M	ØN	Q	R
PFEA-32	136	100	28	82,5	70	6,4	106	73	95	11	28,5
PFEA-42	175,5	121	38	101,6	78	9,7	146	107	121	14,3	34
PFEA-52	189	125	38	127	89	12,7	181	143,5	148	17,5	35
Pump size	ØS	U1	U2	V	ØW1	ØW2	J1	J2	X1	X2	ØY
PFEA-32	114	58,7	47,6	10	32	19	30,2	22,2	M10X20	M10X17	47
PFEA-42	148	70	52,4	13	38	25	35,7	26,2	M12X20	M10X17	76
PFEA-52	174	77,8	58,7	16,3	50	50	42,9	30,2	M12X20	M10X20	76

**16** DIMENSIONS OF PFEA - 32, 42, 52 WITH THROUGH-SHAFT (XA\*, XB\*, XC\* options) [mm]



For other dimensions, see section 11

Pump size	Ø AG	Ø AH	AL	Tightening torque (Nm) <sup>(1)</sup>	Ø AN	AP	AR	Ø AS	H	J	L	M	N	R
PFEAXA-32	114	106	M10X17	70	95	33	25	82,57 82,63	6,42 6,47	193,7	132,5	79	32	28,5
PFEAXA-42	134	106	M10X17	70	95	22,7	11	82,57 82,63	6,42 6,47	194	171	73	34	28,5
PFEAXB-42	134	146	M12	125	120	32	18	101,62 101,68	9,73 9,78	203	171	107	43	34
PFEAXA-52	134	106	M10X17	70	95	22,7	11	82,57 82,63	6,42 6,47	206,2	183,5	73	34,5	28,5
PFEAXB-52	134	146	M12	125	120	32	18	101,62 101,68	9,73 9,78	215,5	183,5	107	43,8	34
PFEAXC-52	134	181	M16	300	148	46,7	30,7	127,02 127,02	12,73 12,78	230,2	183,5	143,5	58,5	35

(1) Tightening torque for screw class 12.9

**17** RELATED DOCUMENTATION

<b>X010</b>	Basics for electrohydraulics in hazardous environments
<b>X020</b>	Summary of Atos ex-proof components certified to ATEX, IECEx, EAC, CCC, PESO
<b>AX900</b>	Operating and maintenance information for ex-proof pumps