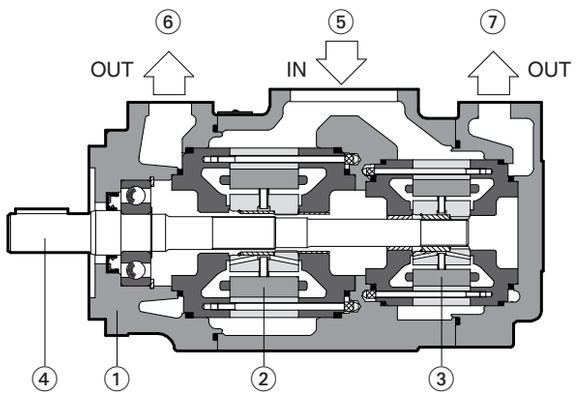
Table **A180-7/E**

Double vane pumps type PFED

fixed displacement



① Pump body
② First cartridge
③ Second cartridge
④ Shaft
⑤ IN port - SAE 3000 flange
⑥ First OUT port
⑦ Second OUT port

PFED-43

PFED are fixed displacement double vane pumps composed by two cartridges ②③ assembled into a main body having one IN port ⑤ and two indipendent OUT ports ⑥⑦.

Pumps are available with 2 body sizes:

PFED-43: SAE B mounting flange
fist element from 29 to 85 cc/rev
second element from 16 to 44 cc/rev

FPED-54: SAE C mounting flange
fist element from 90 to 150 cc/rev
second element from 29 to 85 cc/rev.

They can be assembled, with fixed vane pump type PFEX-4 and PFEX-5 to obtain triple pumps PFEXD, see table A190.

Easy installation as inlet and outlet ports can be assembled in any of four relative positions.

Simplified maintenance as pumping cartridge can be easily replaced.

Displacements: **from 29+16 up to 150+85 cm³/rev.**
Max pressure **up to 210 bar.**

1 MODEL CODE

PFED	-	43	045	/	022	/	1	D	TA	*	/	*
Fixed displacement double vane pump									Ports orientation, see section 5	Series number		Seals material: see section 4 **-** = NBR **PE** = FPM

Size:
43 = displacement from 29+16 to 85+45 cm³/rev
54 = displacement from 90+29 to 150+85 cm³/rev

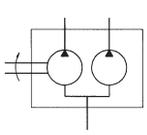
Displacement of first element [cm³/rev], see sec. 3

Displacement of second element [cm³/rev], see sec. 3

Direction of rotation (as viewed at the shaft end):
D = clockwise (supplied standard if not otherwise specified)
S = counterclockwise
Note: PFED are not reversible

Drive shaft, see section 7 and 8:
cylindrical, keyed
1 = supplied standard if not otherwise specified
2 = according to ISO/DIN 3019
3 = for high torque applications
splined
5 = for PFED-43: SAE B 13T 16/32 DP (13 teeth)
for PFED-54: SAE C 14T 12/24 DP (14 teeth)
6 = for PFED-43: SAE C 14T 12/24 DP (14 teeth)
7 = for PFED-43: SAE C 14T 12/24 DP (14 teeth) assembled in multiple pumps PFEXD and PFRXDE - seetech table A190

1.1 HYDRAULIC SYMBOL



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 ÷ +80°C
Compliance	REACH Regulation (EC) n°1907/2006 RoHS Directive 2011/65/EU as last update by 2015/863/EU

3 HYDRAULIC CHARACTERISTICS

Size code	**PFED-43**																									
First element displacement code	**029**			**037**				**045**					**056**					**070**					**085**				
First element displacement [cm³/rev]	29.3			36.6				45.0					55.8					69.9					85.3				
Second element displacement code	**016**	**022**	**028**	**016**	**022**	**028**	**036**	**016**	**022**	**028**	**036**	**044**	**016**	**022**	**028**	**036**	**044**	**016**	**022**	**028**	**036**	**044**	**016**	**022**	**028**	**036**	**044**
Second element displacement [cm³/rev]	16.5	21.5	28.1	16.5	21.5	28.1	35.6	16.5	21.5	28.1	35.6	43.7	16.5	21.5	28.1	35.6	43.7	16.5	21.5	28.1	35.6	43.7	16.5	21.5	28.1	35.6	43.7
Max working pressure (1) [bar]	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 to 1800 rpm;																										
Min speed [rpm]	800																										
Max speed (2) [rpm]	2500																						2000				

Size code	**PFED-54**																							
First element displacement code	**090**						**110**						**129**						**150**					
First element displacement [cm³/rev]	90.0						109.6						129.2						150.2					
Second element displacement code	**029**	**037**	**045**	**056**	**070**	**085**	**029**	**037**	**045**	**056**	**070**	**085**	**029**	**037**	**045**	**056**	**070**	**085**	**029**	**037**	**045**	**056**	**070**	**085**
Second element displacement [cm³/rev]	29.3	36.6	45.0	55.8	69.9	85.3	29.3	36.6	45.0	55.8	69.9	85.3	29.3	36.6	45.0	55.8	69.9	85.3	29.3	36.6	45.0	55.8	69.9	85.3
Max working pressure (1) [bar]	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 to 1800 rpm;																							
Min speed [rpm]	800																							
Max speed (2) [rpm]	2000						2200					2000	2200					2000	1800					

(1) Max pressure is 160 bar for HFDU, HFDR and HFC fluids

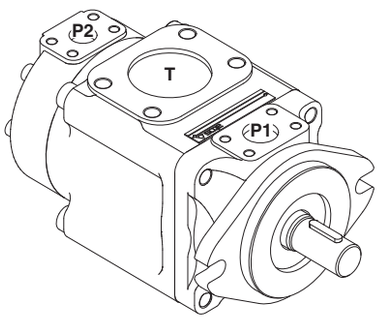
(2) Max speed is 1800 HFDU, HFDR fluids; 1500 rpm for HFC fluid

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

Seals, recommended fluid temperature		NBR seals (standard) = -25°C ÷ +60°C, with HFC hydraulic fluids = -20°C ÷ +50°C FKM seals (/PE option) = -20°C ÷ +80°C		
Recommended viscosity		10÷100 mm²/s - max at cold start 800 mm²/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 18/16/13 NAS1638 class 8		
Hydraulic fluid		**Suitable seals type**	**Classification**	**Ref. Standard**
Mineral oils		NBR, FKM	HL, HLP, HLPD, HVLP, HVLPD	DIN 51524
Flame resistant without water		FKM	HFDU, HFDR **(1)**	ISO 12922
Flame resistant with water		NBR	HFC **(1)**	

(1) See performance restrictions at section 2

5 PORT ORIENTATION



Pumps can be supplied with the oil ports oriented in different configuration in relation to the drive shaft. Port orientation of the first element is designated as follows (as wiewed at the shaft end);

T = inlet and outlet ports on the same axis (standard)
U = outlet orientated 180° with respect to the inlet
V = outlet oriented 90° with respect to the inlet
W = outlet oriented 270° with respect to the inlet

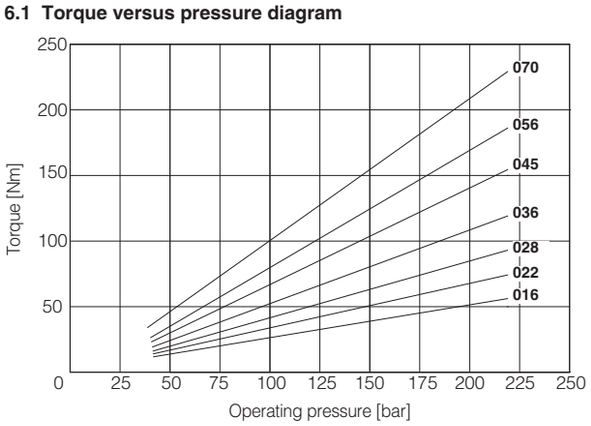
Outlet port of second element can be orientated, relative to the inlet port, in 8 positions at 45° **(O, A, B, C, D, E, F, G)**
Ports orientation can be easily changed by rotating the pump body that carries inlet port.

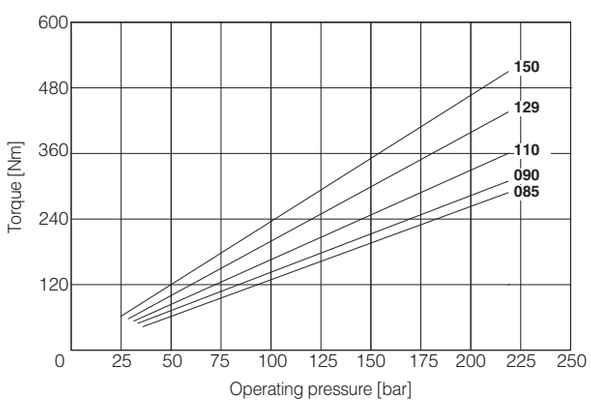
TO P1-T-P2	**TA** P1-T P2	**TB** P1-T P2	**TC** P1-T P2	**TD** P1-T P2	**TE** P1-T P2	**TF** P1-T P2	**TG** P1-T P2
WO P1-P2 T	**WA** P1 P2 T	**WB** P1 P2 T	**WC** P1 P2 T	**WD** P1 P2 T	**WE** P1 P2 T	**WF** P1 P2-T	**WG** P1 P2 T
UO P1-P2 T	**UA** P1 P2 T	**UB** P1 P2 T	**UC** P1 P2 T	**UD** P1 P2-T	**UE** P1 P2 T	**UF** P1 P2 T	**UG** P1 P2 T
VO P1-P2 T	**VA** P1 P2 T	**VB** P1 P2-T	**VC** P1 T P2	**VD** P1 T P2	**VE** P1 T P2	**VF** P1 P2 T	**VG** P1 P2 T

P1 = outlet port of first element; **P2** = outlet port of second element; **T** = inlet port

6 DIAGRAMS (based on mineral oil ISO VG 46 at 50°C)

6.1 Torque versus pressure diagram

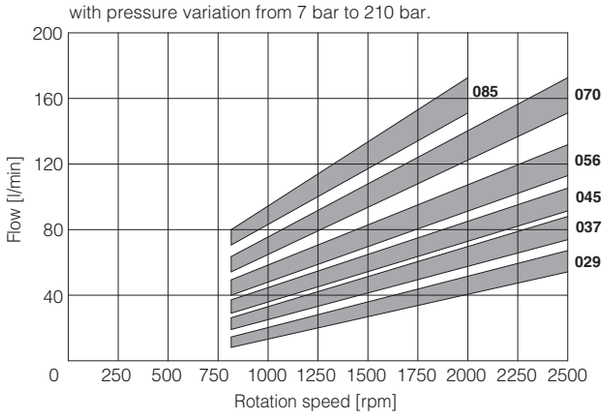




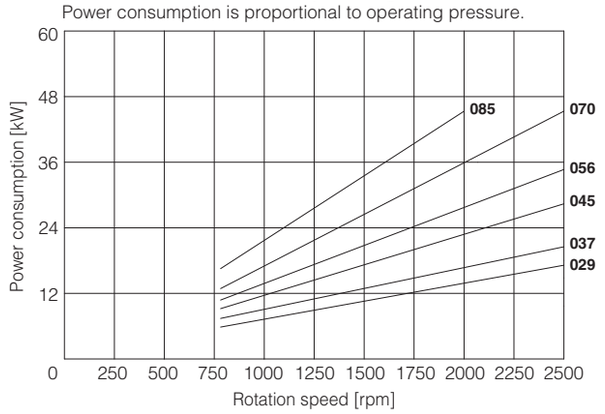
Note: values in above diagrams refer to the torque required to operate each single cartridge. The total torque applied to the pump shaft is given by the sum of the torque of each single cartridge (first element + second element)

6.2 PFED-43 FIRST ELEMENT

Flow versus speed diagram
with pressure variation from 7 bar to 210 bar.

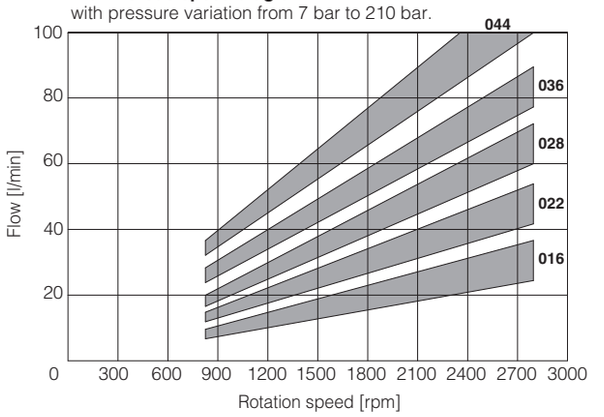


Power consumption versus speed diagram at 140 bar.
Power consumption is proportional to operating pressure.

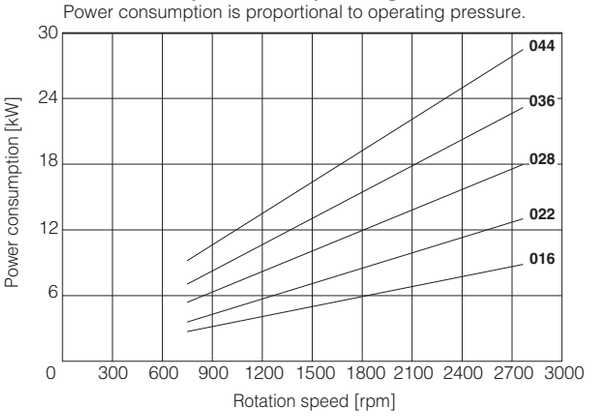


6.3 PFED-43 SECOND ELEMENT

Flow versus speed diagram
with pressure variation from 7 bar to 210 bar.

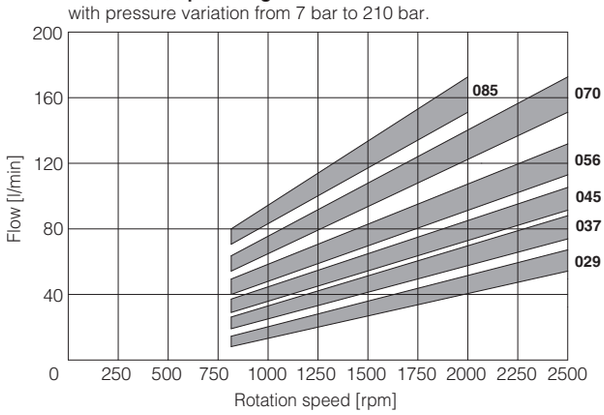


Power consumption versus speed diagram at 140 bar.
Power consumption is proportional to operating pressure.

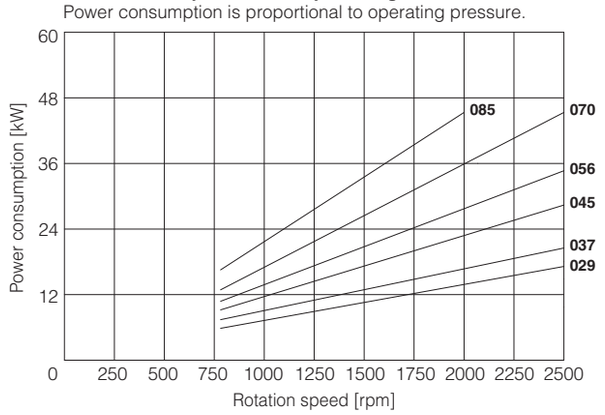


6.4 PFED-54 FIRST ELEMENT

Flow versus speed diagram
with pressure variation from 7 bar to 210 bar.

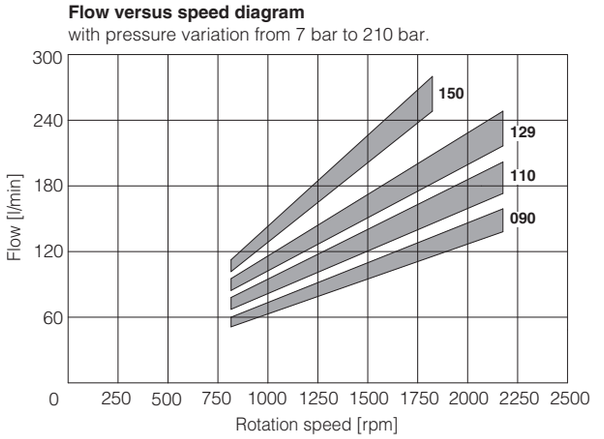


Power consumption versus speed diagram at 140 bar.
Power consumption is proportional to operating pressure.

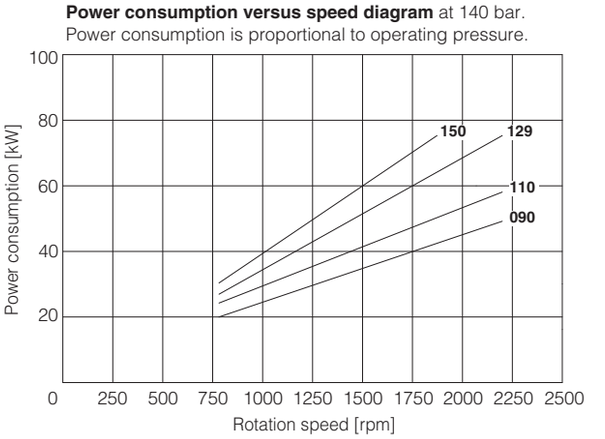


6.5 PFED-54 SECOND ELEMENT

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.



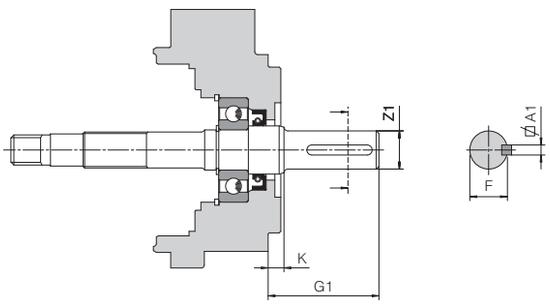
7 DRIVE SHAFT

CYLINDRICAL SHAFT KEYED

1 = supplied as standard if not specified in the model code

2 = according to ISO/DIN 3019 standards

3 = for high torque applications



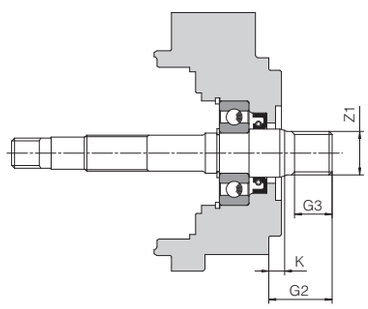
Model	Keyed shaft type 1 (standard)					Keyed shaft type 2					Keyed shaft type 3				
	A1	F	G1	K	ØZ1	A1	F	G1	K	ØZ1	A1	F	G1	K	ØZ1
PFED-43	4,78 4,75	24,54 24,41	59,00	11,40	22,22 22,20	6,38 6,35	25,03 24,77	71,00	8,00	22,22 22,20	6,38 6,35	28,30 28,10	78,00	11,40	25,38 25,35
PFED-54	7,97 7,94	35,33 35,07	74,25	14	31,75 31,70	7,97 7,94	35,33 35,07	84,25	8,1	31,75 31,70	7,97 7,94	38,58 38,46	84,25	14	34,90 34,88

SPLINED SHAFT

5 = for PFED-43 according to SAE B 16/32 DP, 13 teeth;
for PFED-54 according to SAE C 12/24 DP, 14 teeth;

6 = (only for PFED-43) according to SAE C 12/24 DP, 14 teeth;

7 = only for PFED-43 when used as the last element of a multiple pump: similar to shaft type 6.



Model	Splined shaft type 5				Splined shaft type 6				Splined shaft type 7			
	G2	G3	K	Z2	G2	G3	K	Z2	G2	G3	K	Z2
PFED-43	41,25	28	8,00	SAE 16/32-13T	55,60	42	8,00	SAE 12/24-14T	41,60	28	8,00	SAE 12/24-14T
PFED-54	55,7	42	8,1	SAE 12/24-14T	—	—	—	—	—	—	—	—

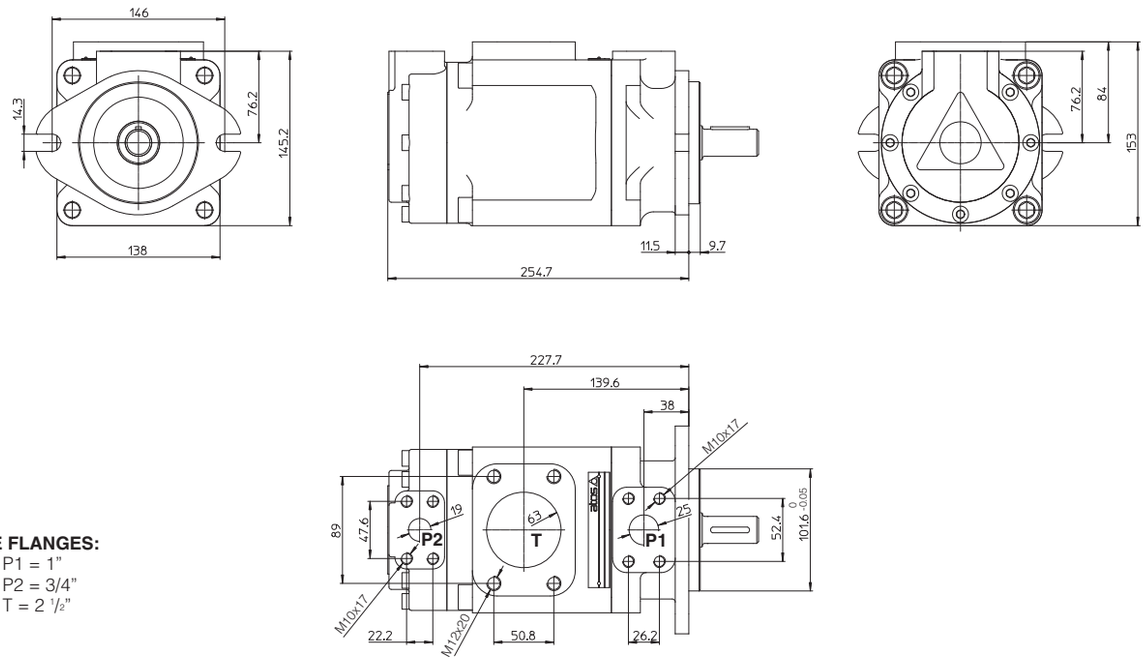
8 LIMITS OF SHAFT TORQUE

Pump size	Maximum driving torque [Nm]					
	Shaft type 1	Shaft type 2	Shaft type 3	Shaft type 5	Shaft type 6	Shaft type 7
PFED-43	250	250	400	200	400	400
PFED-54	500	500	850	450	–	–

The values of torque needed to operate each single cartridge are shown on the "torque versus pressure diagram" at section 6.
The total torque applied to the shaft of the pump is the sum of the single torque needed for operating each single cartridge and its valve must be lower than the vaues indicated in the table.

9 DIMENSIONS [mm]

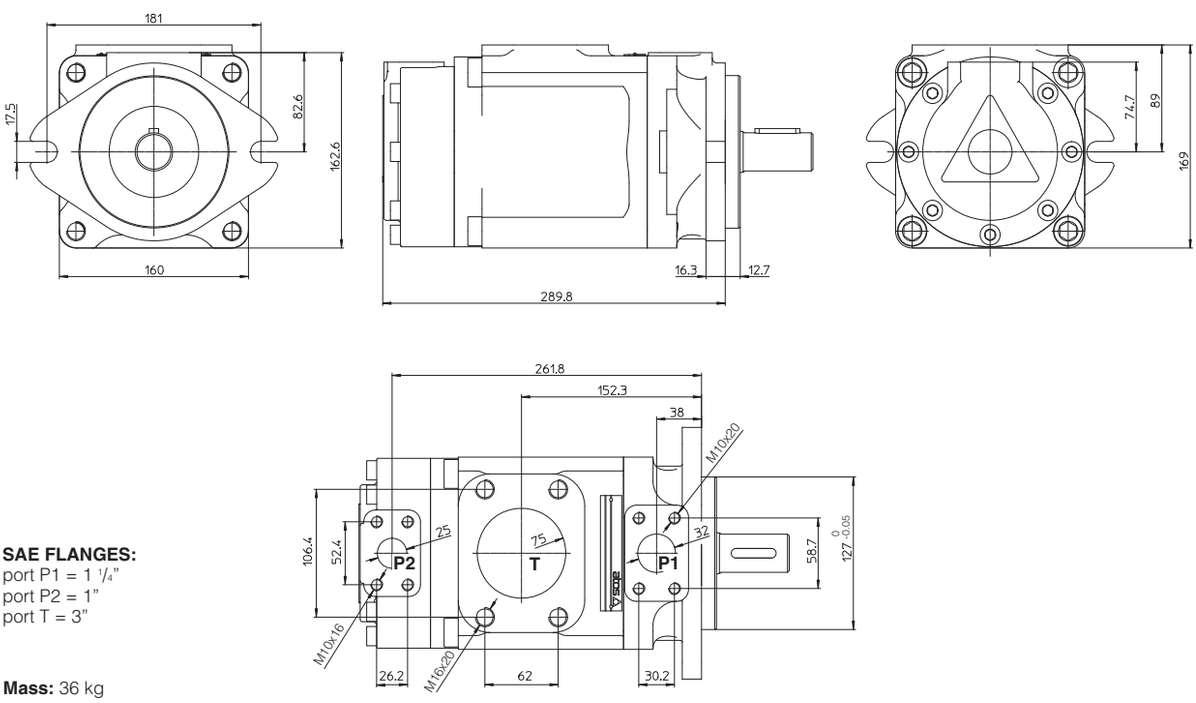
PFED-43



SAE FLANGES:
port P1 = 1”
port P2 = 3/4”
port T = 2 ½”

Mass: 24,5 kg

PFED-54



SAE FLANGES:
port P1 = 1 ¼”
port P2 = 1”
port T = 3”

Mass: 36 kg

10 RELATED DOCUMENTATION

A900	Operating and maintenance information for pumps

02/22