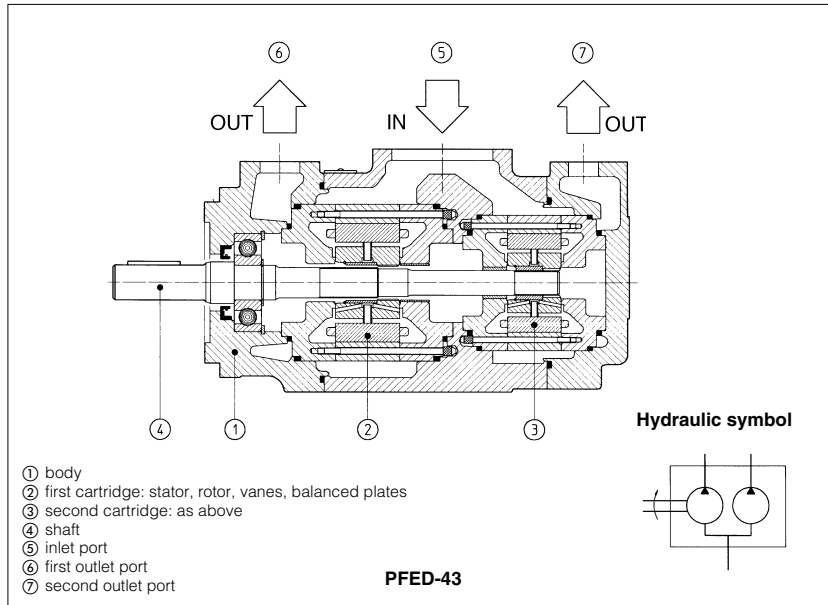


Double vane pumps type PFED

fixed displacement



PFED are fixed displacement double vane pumps (2)(3) composed by two cartridges of pumps type PFE (see tab. A005) assembled in a main body having one inlet port (5) and two outlet ports (6)(7).

PFED-43 are composed by one cartridge of PFE-41 and one cartridge of PFE-31. PFED-54 are composed by one cartridge of PFE-51 and one cartridge of PFE-41.

Suitable for hydraulic oils according to DIN 51524...535 or synthetic fluids having similar lubricating characteristics.

These pumps can be assembled, as second element, with PFE-4 and PFE-5 to obtain triple pumps, see tab A190.

Mounting according to SAE and ISO 3019 standards.

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

Easy maintenance as pumping cartridge can be replaced in a few minutes.

Wide variety of 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 | | Size of cartridges: 43 = composed by: one cartridge of PFE-41 + one cartridge of PFE-31 54 = composed by: one cartridge of PFE-51 + one cartridge of PFE-41 | | Displacement of first element [cm ³ /rev], see section 3 | | Displacement of second element [cm ³ /rev], see section 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 | | Synthetic fluids: WG = water-glycol PE = phopspate ester Design number Ports orientation, see section 4 | | |
| Drive shaft, see section 6 and 7: 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: according to SAE B 13T 16/32 DP (13 teeth) for PFED-54: according to SAE C 14T 12/24 DP (14 teeth) 6 = (only for PFED-43) = according to SAE C 14T 12/24 DP (14 teeth) 7 = (only for PFED-43) = similar to shaft type 6. It is used when PFED-43 is the last element of a multiple pump | | | | | | | | | | | | |

2 MAIN CHARACTERISTICS OF DOUBLE VANE PUMPS TYPE PFED

| | |
|-----------------------------------|--|
| 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 peak horsepower developed. |
| Ambient temperature | from -20°C to +70°C |
| Fluid | Hydraulic oil as per DIN 51524...535; for other fluids see section 1 |
| Recommended viscosity | max at cold start max at full power during operation min at full power |
| Fluid contamination class | ISO 19/16 (filters at 25 µm value with β ₂₅ ≥ 75 recommended) |
| Fluid temperature | T < 70°C, if T > 60 select /PE versions; |
| Recommended suction line pressure | from -0,5 to 1,5 bar for speed up to 1800 rpm; from 0 to +1,5 bar for speed over 1800 rpm |

3 OPERATING CHARACTERISTICS at 1450 rpm with hydraulic oil having viscosity of 24 mm²/sec and 40°C

| Model | 7 bar | | | | 70 bar | | | | 140 bar | | | | 210 bar | | | | Speed range min/max rpm |
|-----------------|--------|-----|--------|-----|--------|------|--------|------|---------|------|--------|------|---------|----|--------|-----|-------------------------|
| | 1°flow | | 2°flow | | 1°flow | | 2°flow | | 1°flow | | 2°flow | | 1°flow | | 2°flow | | |
| PFED-43 | l/min | Kw | l/min | Kw | l/min | Kw | l/min | Kw | l/min | Kw | l/min | Kw | l/min | Kw | l/min | Kw | |
| PFED-43 029/016 | 41 | 0,8 | 23 | 0,5 | 39 | 5,5 | 21 | 3 | 37 | 10 | 19 | 5 | 34 | 14 | 16 | 6,5 | |
| PFED-43 029/022 | 41 | 0,8 | 30 | 0,6 | 39 | 5,5 | 28 | 4 | 37 | 10 | 26 | 7 | 34 | 14 | 23 | 10 | |
| PFED-43 029/028 | 41 | 0,8 | 40 | 0,8 | 39 | 5,5 | 38 | 5,5 | 37 | 10 | 36 | 10 | 34 | 14 | 33 | 14 | |
| PFED-43 037/016 | 52 | 1 | 23 | 0,5 | 50 | 7 | 21 | 3 | 48 | 12,5 | 19 | 5 | 45 | 18 | 16 | 6,5 | |
| PFED-43 037/022 | 52 | 1 | 30 | 0,6 | 50 | 7 | 28 | 4 | 48 | 12,5 | 26 | 7 | 45 | 18 | 23 | 10 | |
| PFED-43 037/028 | 52 | 1 | 40 | 0,8 | 50 | 7 | 38 | 5,5 | 48 | 12,5 | 36 | 10 | 45 | 18 | 33 | 14 | |
| PFED-43 037/036 | 52 | 1 | 51 | 1 | 50 | 7 | 49 | 7 | 48 | 12,5 | 46 | 12,5 | 45 | 18 | 43 | 18 | |
| PFED-43 045/016 | 64 | 1,3 | 23 | 0,5 | 62 | 8,5 | 21 | 3 | 60 | 16 | 19 | 5 | 57 | 24 | 16 | 6,5 | |
| PFED-43 045/022 | 64 | 1,3 | 30 | 0,6 | 62 | 8,5 | 28 | 4 | 60 | 16 | 26 | 7 | 57 | 24 | 23 | 10 | |
| PFED-43 045/028 | 64 | 1,3 | 40 | 0,8 | 62 | 8,5 | 38 | 5,5 | 60 | 16 | 36 | 10 | 57 | 24 | 33 | 14 | |
| PFED-43 045/036 | 64 | 1,3 | 51 | 1 | 62 | 8,5 | 49 | 7 | 60 | 16 | 46 | 12,5 | 57 | 24 | 43 | 18 | |
| PFED-43 045/044 | 64 | 1,3 | 63 | 1,3 | 62 | 8,5 | 61 | 8 | 60 | 16 | 58 | 15,5 | 57 | 24 | 55 | 23 | |
| PFED-43 056/016 | 80 | 1,6 | 23 | 0,5 | 78 | 11 | 21 | 3 | 75 | 21 | 19 | 5 | 72 | 30 | 16 | 6,5 | |
| PFED-43 056/022 | 80 | 1,6 | 30 | 0,6 | 78 | 11 | 28 | 4 | 75 | 21 | 26 | 7 | 72 | 30 | 23 | 10 | |
| PFED-43 056/028 | 80 | 1,6 | 40 | 0,8 | 78 | 11 | 38 | 5,5 | 75 | 21 | 36 | 10 | 72 | 30 | 33 | 14 | |
| PFED-43 056/036 | 80 | 1,6 | 51 | 1 | 78 | 11 | 49 | 7 | 75 | 21 | 46 | 12,5 | 72 | 30 | 43 | 18 | |
| PFED-43 056/044 | 80 | 1,7 | 63 | 1,3 | 78 | 11 | 61 | 8 | 75 | 21 | 58 | 15,5 | 72 | 30 | 55 | 23 | |
| PFED-43 070/016 | 101 | 2 | 23 | 0,5 | 98 | 13,5 | 21 | 3 | 95 | 26 | 19 | 5 | 91 | 37 | 16 | 6,5 | |
| PFED-43 070/022 | 101 | 2 | 30 | 0,6 | 98 | 13,5 | 28 | 4 | 95 | 26 | 26 | 7 | 91 | 37 | 25 | 10 | |
| PFED-43 070/028 | 101 | 2 | 40 | 0,8 | 98 | 13,5 | 38 | 5,5 | 95 | 26 | 36 | 10 | 91 | 37 | 33 | 14 | |
| PFED-43 070/036 | 101 | 2 | 51 | 1 | 98 | 13,5 | 49 | 7 | 95 | 26 | 46 | 12,5 | 91 | 37 | 43 | 18 | |
| PFED-43 070/044 | 101 | 2 | 63 | 1,3 | 98 | 13,5 | 61 | 8 | 95 | 26 | 58 | 15,5 | 91 | 37 | 55 | 23 | |
| PFED-43 085/016 | 124 | 2,4 | 23 | 0,5 | 121 | 16 | 21 | 3 | 118 | 32 | 19 | 5 | 114 | 46 | 16 | 6,5 | |
| PFED-43 085/022 | 124 | 2,4 | 30 | 0,6 | 121 | 16 | 28 | 4 | 118 | 32 | 26 | 7 | 114 | 46 | 23 | 10 | |
| PFED-43 085/028 | 124 | 2,4 | 40 | 0,8 | 121 | 16 | 38 | 5,5 | 118 | 32 | 36 | 10 | 114 | 46 | 33 | 14 | |
| PFED-43 085/036 | 124 | 2,4 | 51 | 1 | 121 | 16 | 49 | 7 | 118 | 32 | 46 | 12,5 | 114 | 46 | 43 | 18 | |
| PFED-43 085/044 | 124 | 2,4 | 63 | 1,3 | 121 | 16 | 61 | 8 | 118 | 32 | 58 | 15,5 | 114 | 46 | 55 | 23 | |
| PFED-54 | | | | | | | | | | | | | | | | | |
| PFED-54 090/029 | 128 | 2,7 | 41 | 0,8 | 124 | 17 | 39 | 5,5 | 119 | 33 | 37 | 10 | 114 | 48 | 34 | 14 | |
| PFED-54 090/037 | 128 | 2,7 | 52 | 1 | 124 | 17 | 50 | 7 | 119 | 33 | 48 | 12,5 | 114 | 48 | 45 | 18 | |
| PFED-54 090/045 | 128 | 2,7 | 64 | 1,3 | 124 | 17 | 62 | 8,5 | 119 | 33 | 60 | 16 | 114 | 48 | 57 | 24 | |
| PFED-54 090/056 | 128 | 2,7 | 80 | 1,6 | 124 | 17 | 78 | 11 | 119 | 33 | 75 | 21 | 114 | 48 | 72 | 30 | |
| PFED-54 090/070 | 128 | 2,7 | 101 | 2 | 124 | 17 | 98 | 13,5 | 119 | 33 | 95 | 26 | 114 | 48 | 91 | 37 | |
| PFED-54 090/085 | 128 | 2,7 | 124 | 2,4 | 124 | 17 | 121 | 16 | 119 | 33 | 118 | 32 | 114 | 48 | 114 | 46 | |
| PFED-54 110/029 | 157 | 3,2 | 41 | 0,8 | 152 | 21 | 39 | 5,5 | 147 | 40 | 37 | 10 | 141 | 58 | 34 | 14 | |
| PFED-54 110/037 | 157 | 3,2 | 52 | 1 | 152 | 21 | 50 | 7 | 147 | 40 | 48 | 12,5 | 141 | 58 | 45 | 18 | |
| PFED-54 110/045 | 157 | 3,2 | 64 | 1,3 | 152 | 21 | 62 | 8,5 | 147 | 40 | 60 | 16 | 141 | 58 | 57 | 24 | |
| PFED-54 110/056 | 157 | 3,2 | 80 | 1,6 | 152 | 21 | 78 | 11 | 147 | 40 | 75 | 21 | 141 | 58 | 72 | 30 | |
| PFED-54 110/070 | 157 | 3,2 | 101 | 2 | 152 | 21 | 98 | 13,5 | 147 | 40 | 95 | 26 | 141 | 58 | 91 | 37 | |
| PFED-54 110/085 | 157 | 3,2 | 124 | 2,4 | 152 | 21 | 121 | 16 | 147 | 40 | 118 | 32 | 141 | 58 | 114 | 46 | |
| PFED-54 129/029 | 186 | 3,7 | 41 | 0,8 | 180 | 25 | 39 | 5,5 | 174 | 47 | 37 | 10 | 168 | 69 | 34 | 14 | |
| PFED-54 129/037 | 186 | 3,7 | 52 | 1 | 180 | 25 | 50 | 7 | 174 | 47 | 48 | 12,5 | 168 | 69 | 45 | 18 | |
| PFED-54 129/045 | 186 | 3,7 | 64 | 1,3 | 180 | 25 | 62 | 8,5 | 174 | 47 | 60 | 16 | 168 | 69 | 57 | 24 | |
| PFED-54 129/056 | 186 | 3,7 | 80 | 1,6 | 180 | 25 | 78 | 11 | 174 | 47 | 75 | 21 | 168 | 69 | 72 | 30 | |
| PFED-54 129/070 | 186 | 3,7 | 101 | 2 | 180 | 25 | 98 | 13,5 | 174 | 47 | 95 | 26 | 168 | 69 | 91 | 37 | |
| PFED-54 129/085 | 186 | 3,7 | 124 | 2,4 | 180 | 25 | 121 | 16 | 174 | 47 | 118 | 32 | 168 | 69 | 114 | 46 | |
| PFED-54 150/029 | 215 | 4,2 | 41 | 0,8 | 211 | 29 | 39 | 5,5 | 204 | 55 | 37 | 10 | 197 | 80 | 34 | 14 | |
| PFED-54 150/037 | 215 | 4,2 | 52 | 1 | 211 | 29 | 50 | 7 | 204 | 55 | 48 | 12,5 | 197 | 80 | 45 | 18 | |
| PFED-54 150/045 | 215 | 4,2 | 64 | 1,3 | 211 | 29 | 62 | 8,5 | 204 | 55 | 60 | 16 | 197 | 80 | 57 | 24 | |
| PFED-54 150/056 | 215 | 4,2 | 80 | 1,6 | 211 | 29 | 78 | 11 | 204 | 55 | 75 | 21 | 197 | 80 | 72 | 30 | |
| PFED-54 150/070 | 215 | 4,2 | 101 | 2 | 211 | 29 | 98 | 13,5 | 204 | 55 | 95 | 26 | 197 | 80 | 91 | 37 | |
| PFED-54 150/085 | 215 | 4,2 | 124 | 2,4 | 211 | 29 | 121 | 16 | 204 | 55 | 118 | 32 | 197 | 80 | 114 | 46 | |

(1) Max pressure is 160 bar for /PE and /WG versions (2) Max speed is 1800 rpm for /PE versions; 1500 rpm for /WG versions

4 PORT ORIENTATION (pumps viewed from the shaf end)

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 viewed at the shaft end);

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

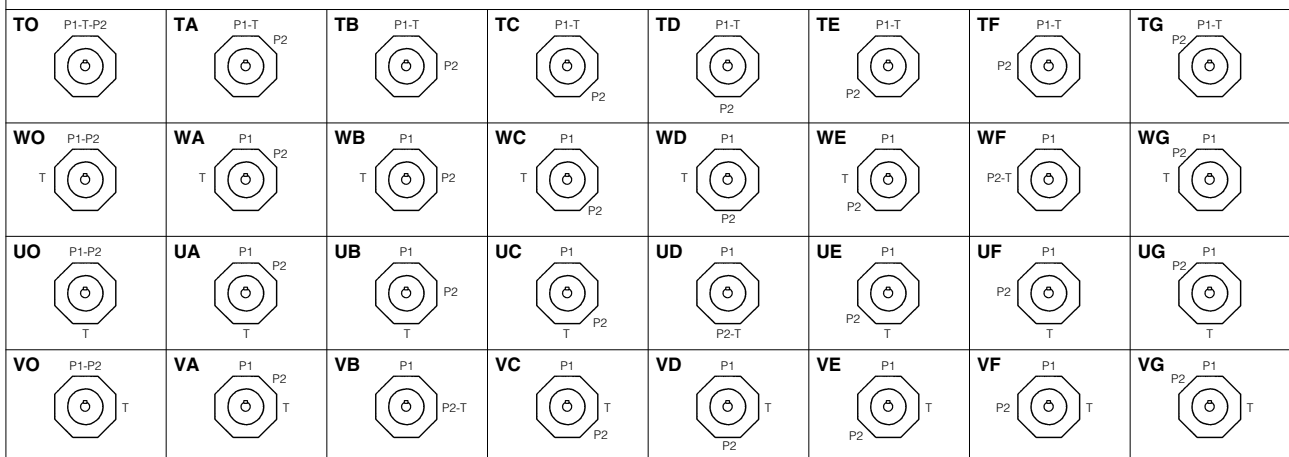
U = outlet orientated 180° with respect to the inlet

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**)

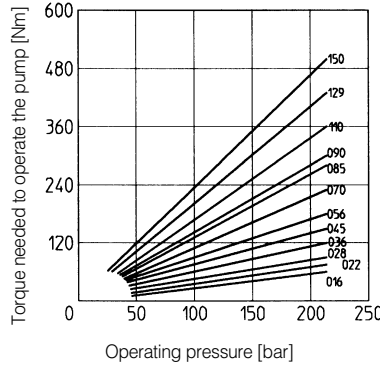
Ports orientation can be easily changed by rotating the pump body that carries inlet port.



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

5 DIAGRAMS

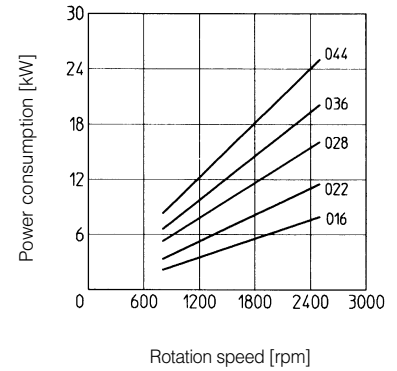
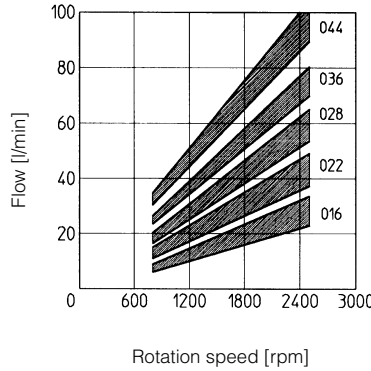
1 = Torque versus pressure diagram



PFED-43: Second element (cartridge SC-PFED-31)**

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

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

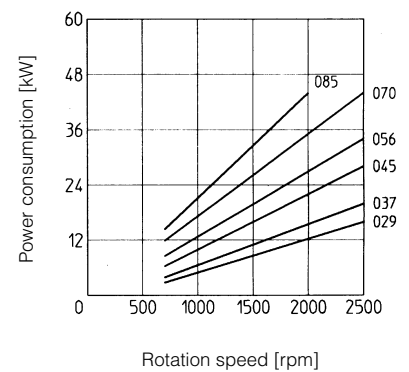
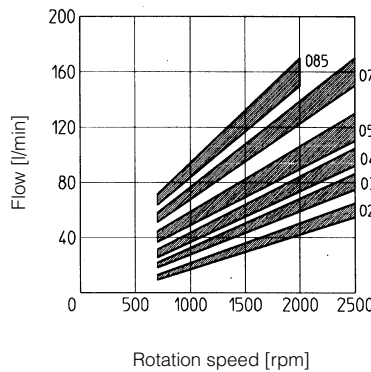


PFED-43: First element (cartridge SC-PFE-41)**

PFED-54: Second element (cartridge SC-PFED-41)**

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

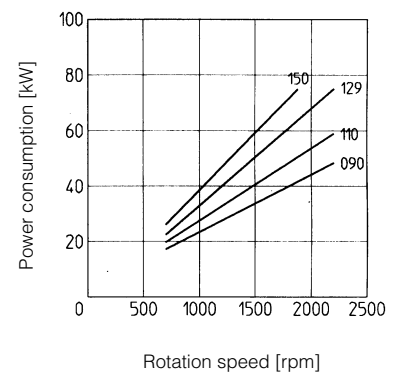
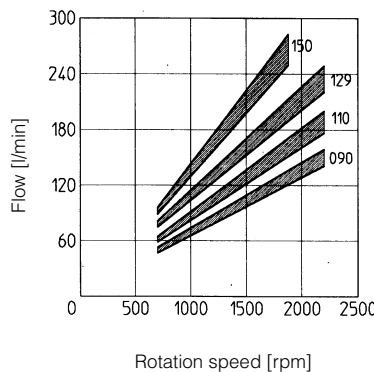
5 = Power consumption versus speed diagram at 140 bar. Power consumption is proportional to operating pressure.



PFED-54: First element (cartridge SC-PFE-51)**

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

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



6 LIMITS OF SHAFT TORQUE

| Pump model | 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 5. The total torque applied to the shaft of the pump is the sum of the single torque needed for operating each single cartridge 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.

