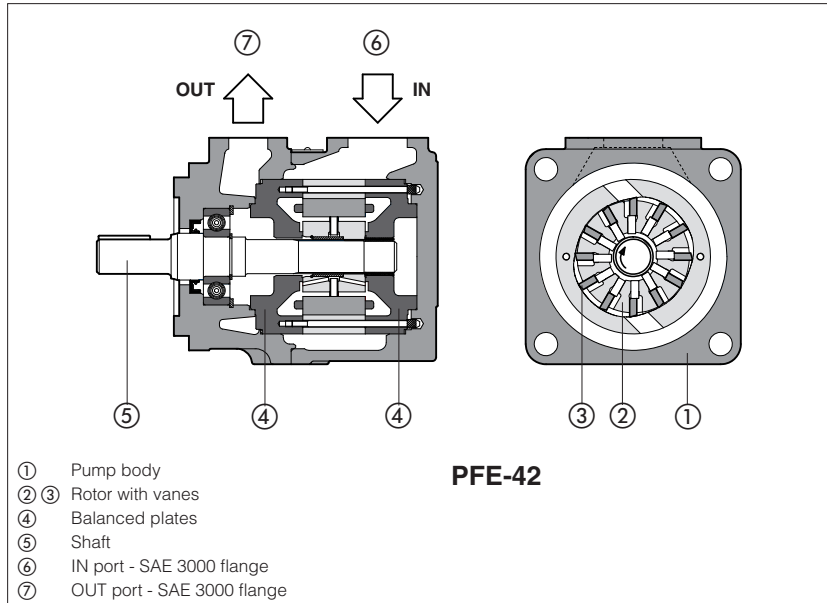


Vane pumps type PFE-32, PFE-42, PFE-52

fixed displacement - cartridge design - high pressure



PFE-2 are high pressure fixed displacement vane pumps, ② ③ cartridge design with integral hydraulic balancing ④ for high volumetric efficiency, long service life and low noise level.

They are available in three different body sizes with max displacements up to 44, 85 and 150 cm³/rev and single, multiple or with through-shaft configurations.

Mounting flange according to SAE J744 standard.

Inlet and outlet ports can be oriented in four different positions to match any installation requirement.

Simplified maintenance as the pumping cartridge can be easily replaced.

Max displacement: **up to 150 cm³/rev**
 Max pressure: **300 bar**

1 MODEL CODE OF SINGLE PUMPS

| | | | | | | | | | | | |
|--|-----------|---|-----------|------------|---|----------|----------|----------|---|---|---|
| PFE | XA | - | 32 | 036 | / | 1 | D | T | * | / | * |
| Fixed displacement vane pump | | | | | | | | | | | |
| <p>Option for pumps with through shaft, see section ③: XA, XA7, XB, XB7, XC = for coupling with other pumps type PFE XO = with through shaft, without rear flange</p> | | | | | | | | | | | |
| <p>Size, see section ②: 32, 42, 52</p> | | | | | | | | | | | |
| <p>Displacement (cm³/rev), see section ②</p> | | | | | | | | | | | |
| <p>Drive shaft, see section ⑧ and ⑨: cylindrical, keyed 3 = for high torque applications splined: 5 = for single and multiple pumps (any position) 6 = for single and multiple pumps (only first position) 7 = for second and third position in multiple pumps] only for PFE-32 and PFE-42</p> | | | | | | | | | | | |
| <p>Seals material: - = NBR PE = FKM</p> | | | | | | | | | | | |
| <p>Series number</p> | | | | | | | | | | | |
| <p>Port orientation, see section ④: T = standard U, V, W = on request</p> | | | | | | | | | | | |
| <p>Direction of rotation, viewed from the shaft end: D = clockwise (supplied standard if not otherwise specified) S = counterclockwise</p> | | | | | | | | | | | |

Note: for multiple pumps factory assembled, see tech. table A190

2 HYDRAULIC CHARACTERISTICS - based on mineral oil ISO VG 46 at 50 °C

| Size code | 32 | | | | 42 | | | | 52 | | | |
|-------------------------------------|--|------|------|------|------|------|------|------|------|-------|-------|-------|
| | 016 | 022 | 028 | 036 | 045 | 056 | 070 | 085 | 090 | 110 | 129 | 150 |
| Displacement code | | | | | | | | | | | | |
| Displacement (cm ³ /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 |

(1) Max pressure is 160 bar for HFUD, HFDR and HFC fluids
 (2) Max speed is 1800 rpm for /PE versions; 1500 rpm for HFUD, HFDR and HFC fluids
 (3) Measuring data with: n = 1450 rpm; P = 140 bar;

3 OPTION FOR PUMPS WITH THROUGH SHAFT

| Pump size | PFE-32 | | PFE-42 | | | PFE-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 nd pump | PFE-3* shaft type 5 | PFE-3* shaft type 5 | PFE-4* shaft type 5 | PFE-3* shaft type 7 | PFE-4* shaft type 7 | PFE-3* shaft type 5 | PFE-4* shaft type 5 | PFE-5* shaft type 5 | PFE-3* shaft type 7 | PFE-4* shaft type 7 |

4 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 |

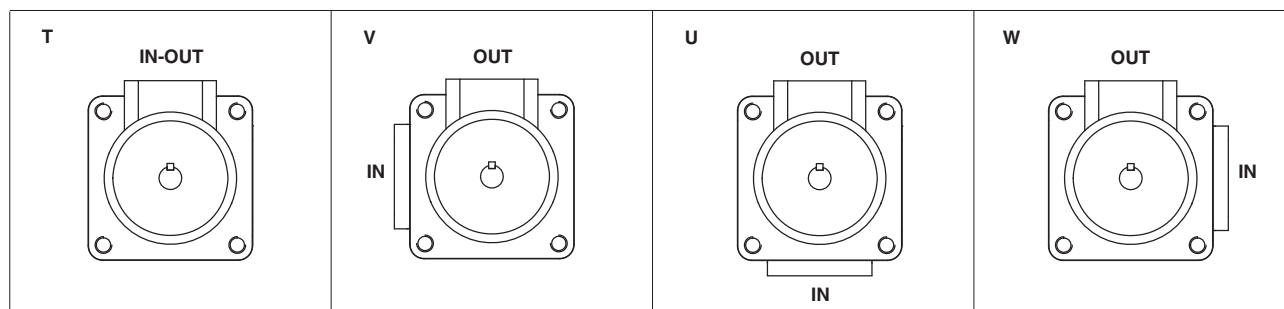
5 SEALS AND HYDRAULIC FLUIDS - for other fluids not included in below table, consult our technical office

| 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 mm ² /s - max at cold start 800 mm ² /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

6 PORT ORIENTATION

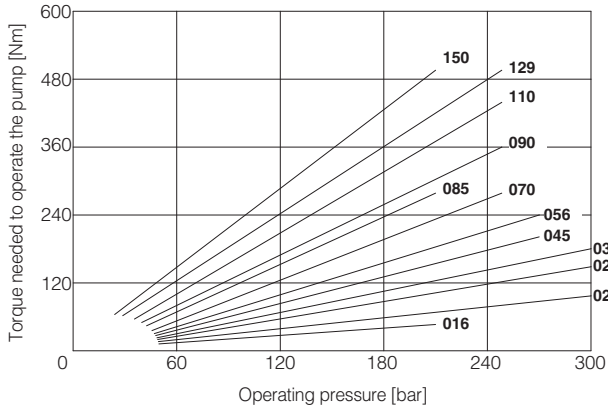
Single pumps can be supplied with oil ports oriented in different configuration in relation to the drive shaft, as follows (viewed from the shaft end); Ports orientation can be easily changed by rotating the pump body that carries inlet port.



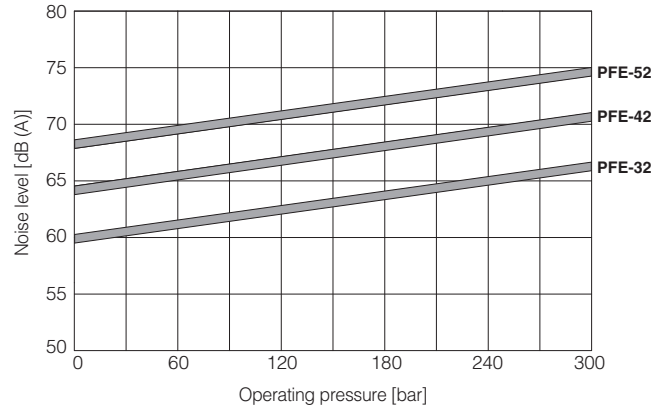
OUT = outlet port; **IN** = inlet port

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

Torque versus pressure diagram



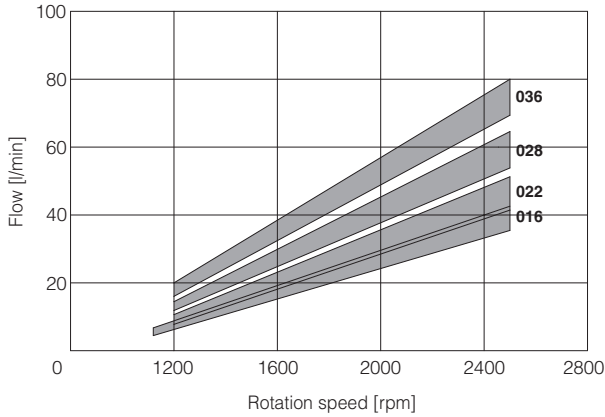
Noise levels



PFE-32:

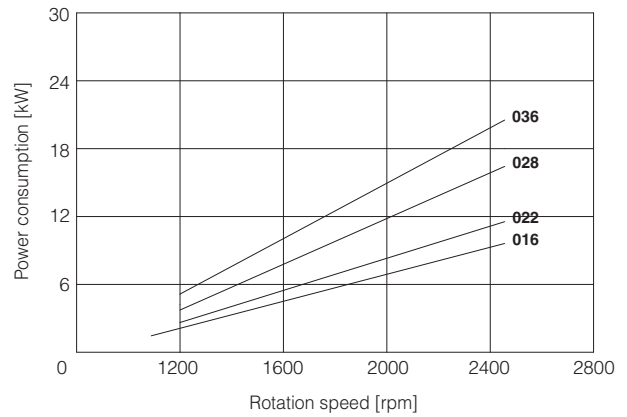
Flow versus speed diagram

with pressure variation from 7 bar to 210 bar.



Power consumption versus speed diagram at 140 bar.

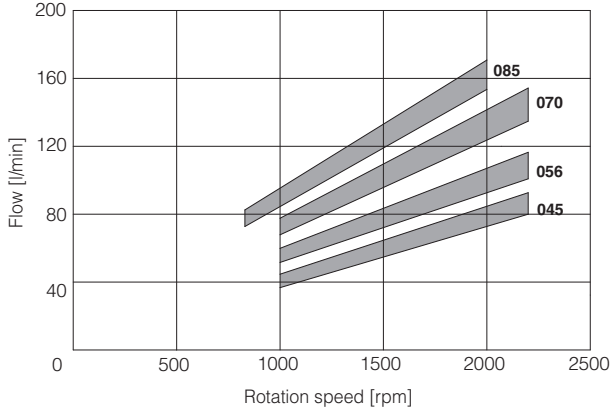
Power consumption is proportional to operating pressure.



PFE-42:

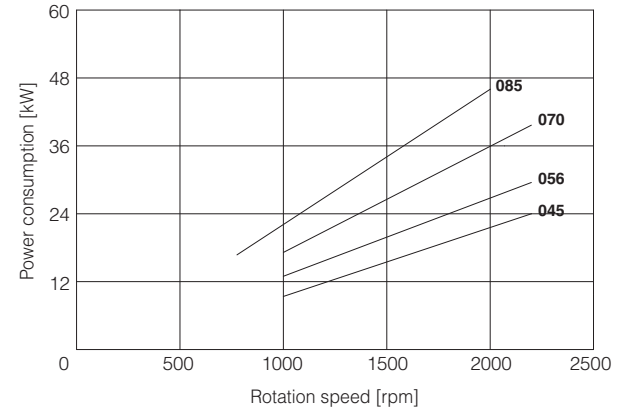
Flow versus speed diagram

with pressure variation from 7 bar to 210 bar.



Power consumption versus speed diagram at 140 bar.

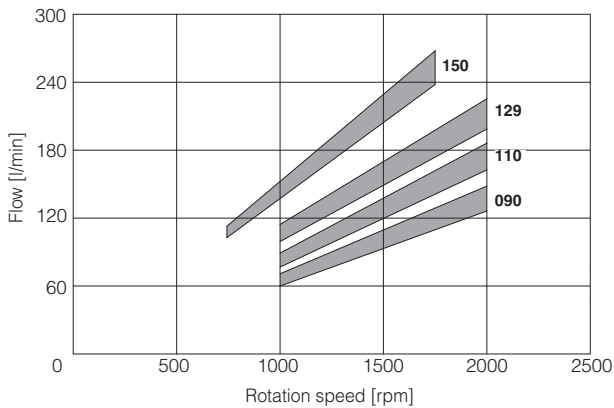
Power consumption is proportional to operating pressure.



PFE-52:

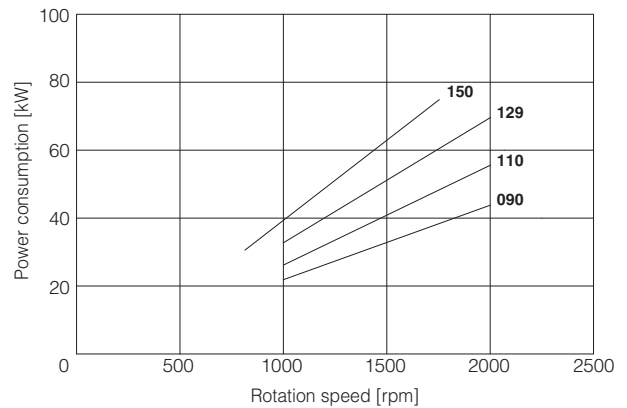
Flow versus speed diagram

with pressure variation from 7 bar to 210 bar.



Power consumption versus speed diagram at 140 bar.

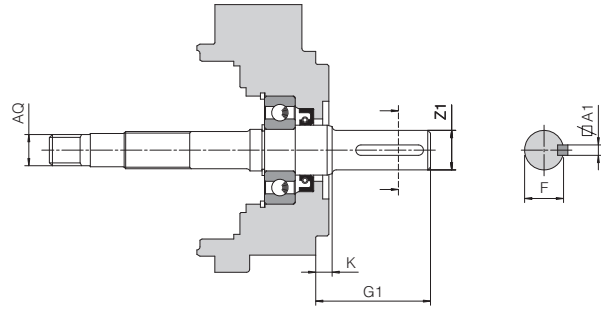
Power consumption is proportional to operating pressure.



8 DRIVE SHAFT

CYLINDRICAL SHAFT KEYED

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



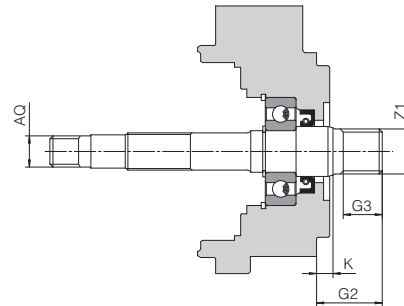
| Pump size | Keyed shaft type 3 | | | | | Only for through shaft execution Ø AQ |
|-----------|--------------------|-------|-------|-------|-------|--|
| | A1 | F | G1 | K | ØZ1 | |
| PFE-32 | 4,78 | 24,54 | 56,00 | 8,00 | 22,22 | SAE 16/32-9T |
| | 4,75 | 24,41 | | | 22,20 | |
| PFE-42 | 6,38 | 28,30 | 78,00 | 11,40 | 25,38 | SAE 32/64-24T |
| | 6,35 | 28,10 | | | 25,36 | |
| PFE-52 | 7,97 | 38,58 | 84,00 | 14 | 34,90 | SAE 16/32-13T |
| | 7,94 | 38,46 | | | 34,88 | |

SPLINED SHAFT

5 = for single and multiple pumps (any position)
for PFE-32 according to SAE A 16/32 DP, 9 teeth;
for PFE-42 according to SAE B 16/32 DP, 13 teeth;
for PFE-52 according to SAE C 12/24 DP, 14 teeth;

6 = for single and multiple pumps (only first position)
for PFE-32 and PFEX*-32 according to SAE B 16/32 DP, 13 teeth;
for PFE-42 and PFEX*-42 according to SAE C 12/24 DP, 14 teeth;

7 = for second and third position pump in multiple configuration:
for PFEX*-32 according to SAE B 16/32 DP, 13 teeth;
for PFEX*-42 according to SAE C 12/24 DP, 14 teeth;



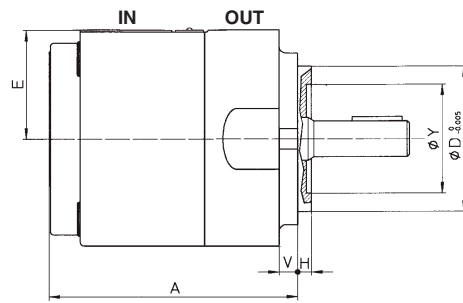
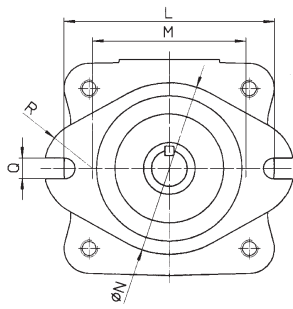
| Pump size | Splined shaft type 5 | | | | | Splined shaft type 6 | | | | | Splined shaft type 7 | | | | |
|-----------|----------------------|-------|------|---------------|--|----------------------|----|------|---------------|--|----------------------|----|------|---------------|--|
| | G2 | G3 | K | Z1 | Only for through shaft execution Ø AQ | G2 | G3 | K | Z1 | Only for through shaft execution Ø AQ | G2 | G3 | K | Z1 | Only for through shaft execution Ø AQ |
| PFE-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 |
| PFE-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 |
| PFE-52 | 56,00 | 42 | 8,10 | SAE 12/24-14T | SAE 16/32-13T | - | - | - | - | - | - | - | - | - | - |

9 LIMITS OF SHAFT TORQUE

| Pump size | Maximum driving torque [Nm] | | | | Maximum torque available at the end of the through shaft [Nm] |
|-----------|-----------------------------|--------------|--------------|--------------|---|
| | Shaft type 3 | Shaft type 5 | Shaft type 6 | Shaft type 7 | Any type of shaft |
| PFE-32 | 240 | 110 | 240 | 240 | 130 |
| PFE-42 | 400 | 200 | 400 | 400 | 250 |
| PFE-52 | 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 6. 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.

10 DIMENSIONS OF SINGLE PUMPS [mm]

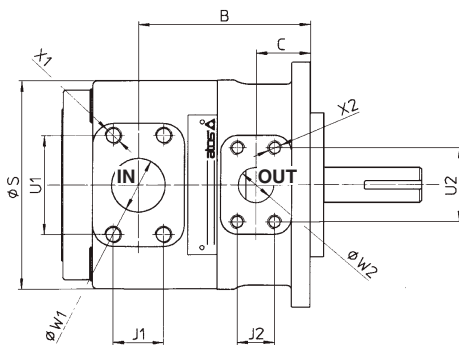


PORTS DIMENSION (SAE 3000)

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

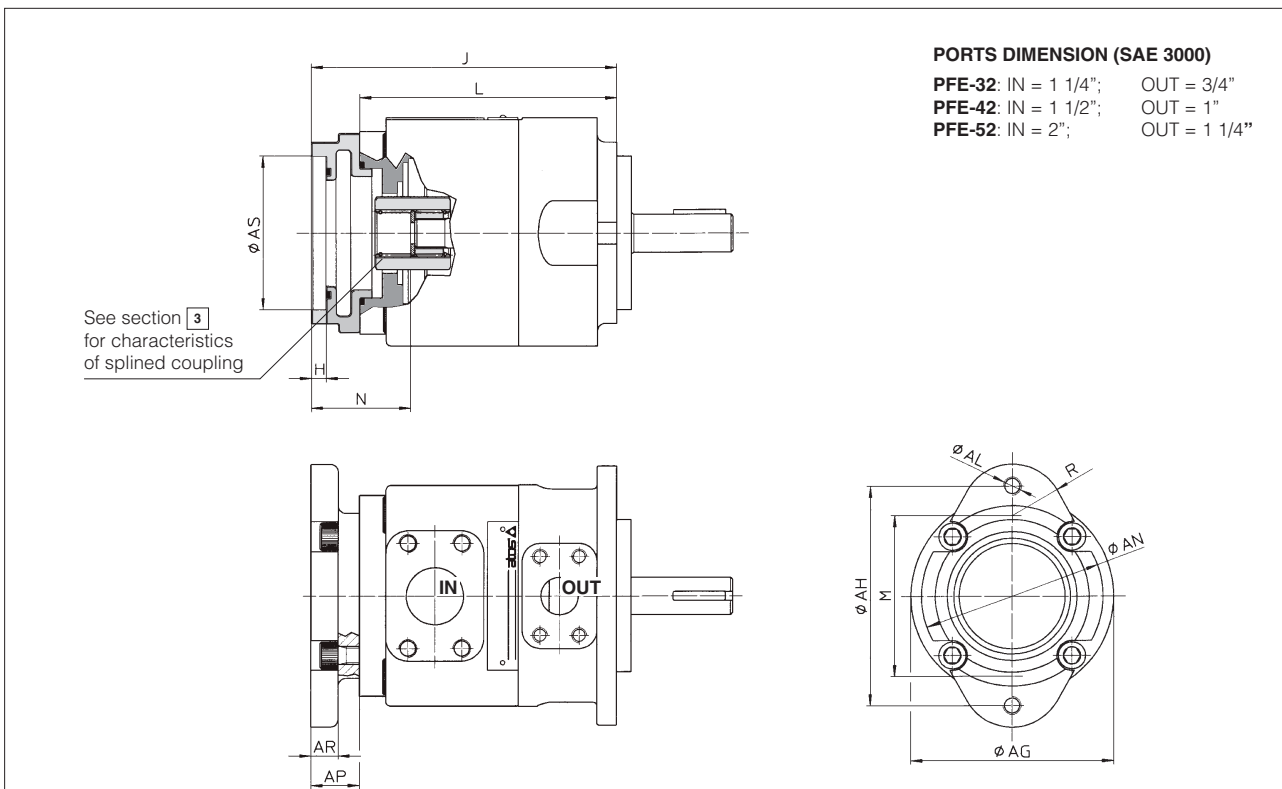
Mass:

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



| Pump size | A | B | C | ØD | E | H | L | M | ØN | Q | R |
|-----------|-------|------|------|-------|-----|------|------|-------|--------|--------|------|
| PFE-32 | 136 | 100 | 28 | 82,5 | 70 | 6,4 | 106 | 73 | 95 | 11 | 28,5 |
| PFE-42 | 175,5 | 121 | 38 | 101,6 | 78 | 9,7 | 146 | 107 | 121 | 14,3 | 34 |
| PFE-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 |
| PFE-32 | 114 | 58,7 | 47,6 | 10 | 32 | 19 | 30,2 | 22,2 | M10X20 | M10X17 | 47 |
| PFE-42 | 148 | 70 | 52,4 | 13 | 38 | 25 | 35,7 | 26,2 | M12X20 | M10X17 | 76 |
| PFE-52 | 174 | 77,8 | 58,7 | 16,3 | 50 | 50 | 42,9 | 30,2 | M12X20 | M10X20 | 76 |

11 DIMENSIONS OF PUMPS WITH THROUGH-SHAFT (XA*, XB*, XC* options) [mm]

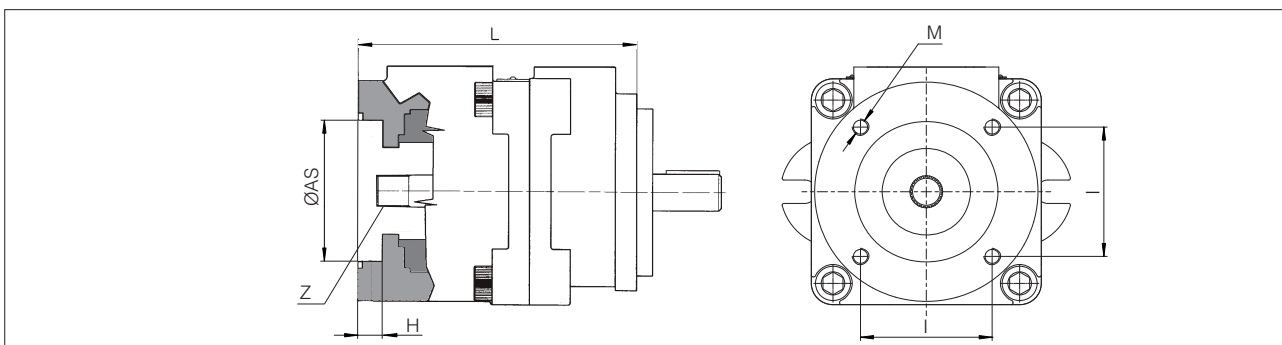


For other dimensions, see section 10

| Pump size | Ø AG | Ø AH | AL | Tightening torque (Nm) (1) | Ø AN | AP | AR | Ø AS | H | J | L | M | N | R |
|-----------|------|------|--------|----------------------------|------|------|------|------------------|----------------|-------|-------|-------|------|------|
| PFEXA-32 | 114 | 106 | M10X17 | 70 | 95 | 33 | 25 | 82,57 82,63 | 6,42 6,47 | 193,7 | 132,5 | 79 | 32 | 28,5 |
| PFEXA-42 | 134 | 106 | M10X17 | 70 | 95 | 22,7 | 11 | 82,57 82,63 | 6,42 6,47 | 194 | 171 | 73 | 34 | 28,5 |
| PFEXB-42 | 134 | 146 | M12 | 125 | 120 | 32 | 18 | 101,62 101,68 | 9,73 9,78 | 203 | 171 | 107 | 43 | 34 |
| PFEXA-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 |
| PFEXB-52 | 134 | 146 | M12 | 125 | 120 | 32 | 18 | 101,62 101,68 | 9,73 9,78 | 215,5 | 183,5 | 107 | 43,8 | 34 |
| PFEXC-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

12 DIMENSIONS OF PUMPS WITH THROUGH SHAFT, WITHOUT REAR FLANGE (XO option) [mm]



| Pump size | L | Ø AS | H | M | I | Z |
|-----------|-------|-----------------------------------|-----|-----------------|----|---------------------|
| PFEXO-32 | 132,5 | 60 ^{+0,03} ₀ | 6,5 | n°4 M6x13(max) | 70 | SAE 16/32-9T x15mm |
| PFEXO-42 | 171 | 86 ^{+0,035} ₀ | 15 | n°4 M10x17(max) | 79 | SAE 32/64-24T x20mm |
| PFEXO-52 | 183,5 | 86 ^{+0,035} ₀ | 15 | n°4 M10x17(max) | 79 | SAE 16/32-13T x20mm |

13 RELATED DOCUMENTATION

| | |
|-------------|---|
| A900 | Operating and maintenance information for pumps |
|-------------|---|