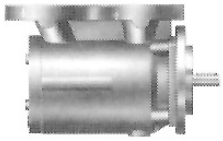
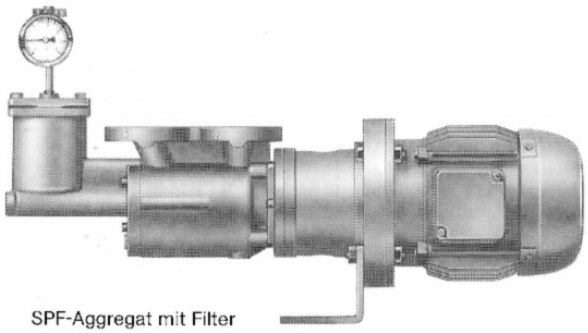
# Screw Pumps
# Series SPF



SPF



SPF-Aggregat mit Filter

**Application**
For the delivery of fuel oils, lube oils, hydraulic oils or other lubricating liquids. The fluid media must not contain any abrasive particles nor attack the pump materials chemically.

**Main fields of application**
SPF pumps operate as transfer, booster and burner operation pumps in fuel oil engineering, as transfer and filling pumps in tank farms as well as lube-oil pumps in any industrial branches. They are moreover used for pressure generation in oil-hydraulic plants of all kinds.

**Design**
Self-priming three-screw type of pump with internal bearing. The hardened and ground screws run in an exchangeable casing insert.

The driving screw is hydraulically balanced. The axial thrust of the working screws is absorbed by the endside pump cover. Their drive is hydraulic. The thread flanks merely transmit the torque resulting from the liquid friction. Thus, the thread flanks are practically stress-free and not subject to any wear. All sliding parts are lubricated by the delivery medium being within the range of full liquid friction.

The radial and axial bearing of the driving screw with pump size 10 and 20 is by the balancing piston guided in the bearing ring, with pump size 40 by a groove ball bearing.

A maintenance-free mechanical seal is provided as the shaft sealing.

Sealing chamber and suction chamber are interconnected by way of a return gallery. Thus, independently of the delivery pres-sure at the shaft sealing, only the suction pressure becomes effective.

Complete units being supplied, the connection pump/driving motor is by a pump bracket with mounting foot.

**Operation**
Owing to a special profiling of the thread flanks, the three screws from sealed chambers the contents of which are axially and completely continuously shifted from the suction to the pump side of the pump as the screws turn. There will be no turbulence in spite of the screw rotation. The constant chamber volume excludes squeezing.

**Noise/Pulsation**
The structural design and operation of the screw pump ensure a very low noise level and an almost pulsation-free delivery.

**Twin units**
For all plants requiring stand-by pumps, twin units are supplied. See descriptive literature VM 533.

**Shaft sealing**
By means of a maintenance-free mechanical seal of the un-balanced type.

Material design:

| | |
|---|---|
| Rotating seal ring | Tungsten carbide, Co-binder |
| Stationary seal ring | Tungsten carbide, Co-binder |
| Joint ring | FPM |
| Spring | CrNiMo steel |
| Metal parts | Cr steel |

**Performance data**

| | | | | | |
|---|---|---|---|---|---|
| Capacity | Q up to 112 l/min ① | | resp. | 6720 | l/h ① |
| Temperature of the fluid pumped | t | | up to | 150 | °C |
| Inlet pressure | $p_z$ | | up to | 5 | bar |
| Pump outlet pressure | $p_d$ | | up to | 40 | bar ② |
| Viscosity range | ν | 3 | up to | 750 | mm²/s |
| Delivery flange | $DN_d$ | 20 | up to | 25 | mm |

① With n = 2900 1/min and □ = 750 mm²/s

② With higher temperatures, please inquire.

③ For the attainable delivery pressure as a function of viscosity and speed, please refer to the individual characteristics. The pressure data only apply to nearly static pressure load. With dynamic pressure change load, please inquire.

**Pressure relief valves**
As an overload protection, installed in each pump is a pressure relief valve which, with all designs, is set at a response pressure approx. 10% above the operating pressure.

In case different response pressures are requested, same must be indicated in the order.

**Flanges/Connections**

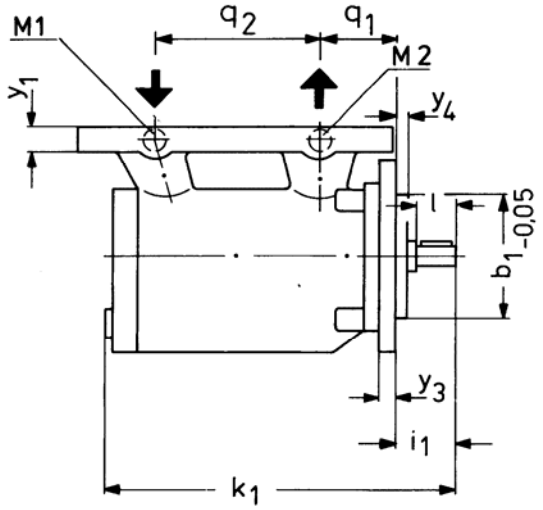
| | | |
|---|---|---|
| Flanges | Suction side: | PN 16, DIN EN 1092-2 |
| | Delivery side: | PN 40, DIN EN 1092-2 |
| Connections | SPF without filter: | M1, M2 Pressure gauge |
| | SPF with filter: | B7 Draining filter casing<br>E7 Venting filter casing<br>M1, M2, M3 Pressure gauge |

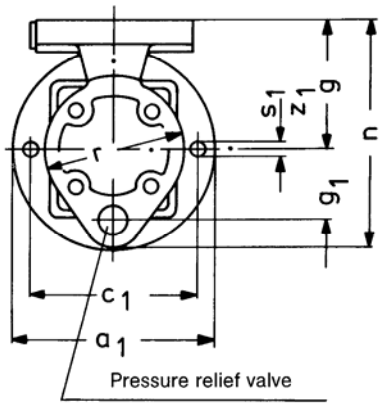
**Materials**

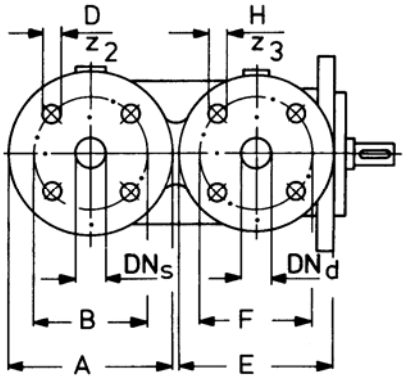
| Denomination | Part No. | Material design | | |
|---|---|---|---|---|
| | | W 20 | W 16 | W 8 |
| Pump casing | 1 | EN-GJL-250 | EN-GJL-250 | EN-GJS-400-15 |
| Casing insert | 2 | AlMgSi1 | EN-GJL-250 | AlMgSi1 |
| Pump cover | | | | |
| driving side | 3 | EN-GJL-250 | ENI-GJL-250 | EN-GJS-400-15 |
| end side | 4 | EN-GJL-250 | ENI-GJL-250 | EN-GJS-400-15 |
| Casing cover | 7 ① | EN-GJL-250 | ENI-GJL-250 | EN-GJS-400-15 |
| Filter casing | 9 ① | EN-GJL-250 | ENI-GJL-250 | EN-GJS-400-15 |
| Bearing bush | 10 | AlMgSi1 | ENI-GJL-250 | AlMgSi1 |
| Driving screw | 12 | 16MnCrS 5 | 16MnCrS 5 | 16MnCrS 5 |
| Idler screw | 13 | 16MnCrS 5 | 16MnCrS 5 | 16MnCrS 5 |
| Wire mash at radial screen filter | 481① | Steel galvanized | Steel galvanized | Stahl verzinkt |

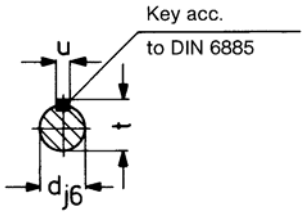
① for design with filter only

**Pump dimensions**
SPF without filter




Dimensions in mm
Subject to alterations

$z_1/z_2/z_3$ = No. of holes

Sense of rotation: clockwise as seen from the driving side

| Pump size | Pump dimensions | | | | | | | | | | | | | | | Shaft end | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SPF | $a_1$ | $b_1$ | $c_1$ | g | $g_1$ | $i_1$ | $k_1$ | n | $q_1$ | $q_2$ | r | $s_1$ | $y_3$ | $y_4$ | $z_1$ | d | l | t | u |
| 10 | 130 | 82,55 | 106 | 90 | 45 | 42 | 232 | 155 | 54 | 110 | 95 | 11 | 12 | 9 | 2 | 14 | 30 | 16 | 5 |
| 20 | 175 | 101,6 | 146 | 95 | 56 | 53 | 280 | 177 | 77 | 125 | 110 | 14 | 15 | 10 | 2 | 19 | 40 | 21,5 | 6 |
| 40 | 175 | 101,6 | 146 | 110 | 60 | 53 | 330 | 198 | 77 | 135 | 146 | 14 | 15 | 10 | 2 | 19 | 40 | 21,5 | 6 |

| Pump size | Connecting dimensions | | | | | | | | | | | | Pressure gauge |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Suction side ① | | | | | | Delivery side ② | | | | | | |
| SPF | $DN_S$ | A | B | D | $y_1$ | $z_2$ | $DN_d$ | E | F | H | $y_1$ | $z_3$ | M1/M2 |
| 10 | 20 | 105 | 75 | 14 | 18 | 4 | 20 | 105 | 75 | 14 | 18 | 4 | G 1/4 |
| 20 | 25 | 120 | 85 | 14 | 18 | 4 | 25 | 120 | 85 | 14 | 18 | 4 | G 1/4 |
| 40 | 32 | 140 | 100 | 18 | 18 | 4 | 25 | 120 | 85 | 14 | 18 | 4 | G 1/4 |

① PN 16, DIN EN 1092-2; ② PN 40, DIN EN 1092-2