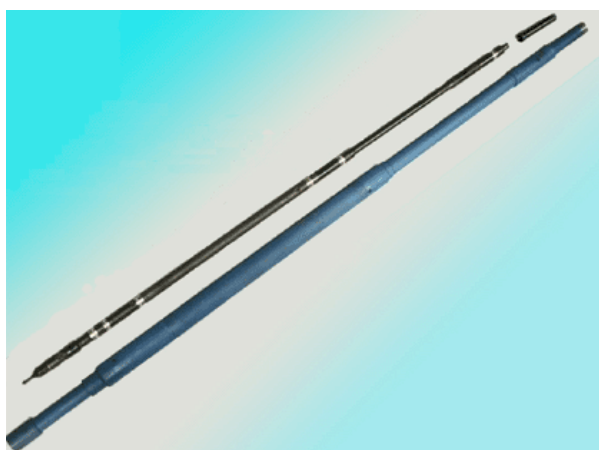


Hydraulic Pump

Hydraulic pump includes hydraulic piston pump and hydraulic jet pump which are drove by power fluid with high pressure. Hydraulic pumping system includes surface power pump and downhole pump equipment. The surface pump can be station-installed or solo skid-mounted, to supply power fluid for single downhole pump or multiple downhole pumps. The downhole pump unit includes free pump and mandrel. The free pump can be easily pulled and run by power fluid for replacement.



Hydraulic Piston Pump

Hydraulic piston pump consists of a double acting hydraulic pump and a double acting hydraulic engine. It can meet the different requirement of capacity and head depending on the different sizes of pistons. Hydraulic piston pump is applicable to deep well, slant well, high solidifying point and high viscosity crude oil well etc.. Also, it can be used for well testing.

Main Technical Parameters

| Model | SHB 2.5×20/20 | SHB 2.5×30/20 | SHB 2.5×10/20 | SHB 2.5×6/20 | SHB 2.5×5/25 | SHB 2.5×4/30 |
|--|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Power fluid system | OPF | OPF | OPF | OPF | OPF | OPF |
| Tubing I.D. (mm) | 62 | 62 | 62 | 62 | 62 | 62 |
| Downhole Installation | single plunger | single plunger | single plunger | single plunger | single plunger | single plunger |
| Max. rated speed (rpm) | 58 | 53 | 58 | 58 | 58 | 53 |
| Max . head (m) | 2000 | 2000 | 2000 | 2500 | 3000 | 3500 |
| rated capacity (m ³ /d) | 199.1 | 300.9 | 99.6 | 60.2 | 50.4 | 40.5 |
| Rated consuming volume of power fluid (m ³ /d) | 172 | 260 | 136.3 | 205.2 | 133 | 122.6 |
| P/E Ratio | 1.166 | 1.166 | 0.734 | 0.734 | 0.706 | 0.59 |
| Max. O. D. (mm) | 59 | 59 | 59 | 59 | 59 | 59 |



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| | | | | | | | |
|-----------------------------------|----------|------|------|------|------|------|------|
| Pump Length (mm) | | 3415 | 4395 | 3415 | 4395 | 3415 | 3415 |
| Downhole Well-bore Dimension (mm) | Max O.D. | 114 | 114 | 114 | 114 | 114 | 114 |
| | Min I.D. | 50 | 50 | 50 | 50 | 50 | 50 |
| | Length | 3965 | 4945 | 3965 | 4945 | 3965 | 3965 |
| Casing Min I.D. (mm) | | 124 | 124 | 124 | 124 | 124 | 124 |

Hydraulic Jet Pump

Hydraulic jet pump is designed on Venturi Principle to pump well fluid. It has a long run life as no moving parts in downhole equipment. Hydraulic jet pump is applicable to defluctive grinding well, directional well, horizontal well and offshore cluster well. By using the heat and chemical characteristics of power fluid it is also applicable to high solidifying oil, heavy crude oil and high wax wells. Also, hydraulic jet pump can be used to test well and pump the well fluid with high sand content.

Main Technical Parameters

| Model | SPB2.5-I | SPB2.5-II |
|--------------------------------------|------------|---------------|
| Submersible pump size (mm×mm) | Φ62×3415 | Φ62×1274 |
| Submersible pump Weight (kg) | 42.5 | 17.9 |
| Bottom hole wellbore size (mm×mm) | Φ114×3965 | Φ114×1500 |
| Min.I.D of bottom hole wellbore (mm) | Φ50 | Φ50 |
| Bottom hole wellbore Weight (kg) | 105 | 75 |
| Nozzle dia. (mm) | Φ1.9~6.0 | Φ1.9 ~Φ6.0 |
| Throat dia. (mm) | Φ4.5~Φ11.0 | Φ4.3 ~Φ11.0 |
| Capacity range (m ³ / d) | 0~250 | 0~250 |
| Tubing I.D (mm) | Φ62 | Φ62 |
| Casing I.D (mm) | ≥Φ127 | ≥4.5 " casing |
| Temperature (°C) | ≤120 | ≤120 |

Matched Nozzle and Throat

| Item | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Nozzle Dia. (mm) | 2.4 | 2.5 | 2.6 | 2.7 | 2.8 | 3.0 | 3.2 | 3.4 | 3.6 | 3.8 | 4.0 | 4.5 | 4.8 | 5.0 |
| Throat Dia. (mm) | 4.0 | 4.2 | 4.4 | 4.5 | 4.8 | 5.0 | 5.3 | 5.8 | 6.0 | 6.4 | 6.8 | 7.2 | 7.8 | 9.8 |