

ELECTRIC SUBMERSIBLE PUMPS

Submersible centrifugal pumps are used for pumping formation fluid from oil wells, as well as in reservoir pressure maintenance systems.

Flowrate/production boosting

- Wells with a high content of solids;
- Wells with a high GOR;
- Wells with high corrosiveness of formation fluid;
- Wells with high temperature of formation fluid;
- Wells after hydraulic fracturing;
- Wells after drilling, including horizontal, with sidetracks, exploratory and crooked borehole wells;
- Traditional wells.

FEATURES AND BENEFITS:

- Corrosion-resistant, corrosion-wear-resistant, and increased corrosion resistance pumps with stage material hardness of up to 240 HB;
- Corrosion-wear-resistant design of the pump housing, corrosion-wear-resistant coating of the housing or stainless steel housing;
- Floating, compression and packet design pumps;
- Simplified installation of compression design pumps. The shafts in pump sections can contact each other by means of an adjustment bolt, which is fixed by the sleeve to prevent unscrewing. A special device is used for the bolt adjustment procedure during installation, while the process does not involve any measuring tools;
- Optimal distribution of radial bearings through pump section; center bearings in pumps with a capacity of more than 1900 barrels/day (300 m³/day) at 60 Hz are built into the stage;
- Shafts are made of high-strength stainless steel;
- Involute spline connection of shafts;
- Symba produces standard and high-speed pumps with floating stages or compression-assembled pumps with a capacity of 76 to 11,725 barrels/day (12 – 1,864 m³/day) at 60 Hz with a speed control range of 2,400 – 6,000 rpm.

Floater design pumps: the impellers on the shaft inside the diffusers can move in axial directions within the permissible gap. The axial load of the shaft is transmitted to the motor protector bearing, while the axial load of the impellers is transmitted to the diffusers.

Compression design pumps: The impellers are fixed to the shaft and move up and down with it. The axial load the shaft and the impellers is transmitted to the motor protector bearing. Thrust bearing of the motor protector has a low coefficient of friction and is not subject to abrasion wear and the adverse effect of formation fluid.



EXAMPLE

ESP-A 406-950 84STG C UT 5M STD CR1 HSN ELECTRIC SUBMERSIBLE PUMPS

ESP-	A	406-	950	HS	CCW	84STG	C	UT	5M	STD	CR1	HSN
1	2	3	4	5	6	7	8	9	10	11	12	13
1	Electric Submersible Pump (ESP)											
2	Symba design											
3	ESP series											
4	ESP flow rate, bpd @ Best Efficiency Point (BEP) at 60 Hz (at 6,000 rpm for HS pump)											
5	Speed classification Blank – standard HS – high speed											
6	Rotation direction: Blank – clockwise CCW – counter-clockwise											
7	Number of stages											
8	Pump design C – compression F – floater P – packet											
9	Pump configuration: UT – upper tandem CT – central tandem LT – lower tandem											
10	Housing length, m											
11	Shaft rating STD – Standard strength shaft HSS – High strength shaft USS – Ultrahigh strength shaft											
12	Corrosion resistance design: CR0 – carbon steel head, base and housing, carbon steel fasteners CR1 – stainless steel head and base, carbon steel housing with anti-corrosion coating (super stainless flame coating), monel fasteners CR2 – stainless steel head, base and housing, monel fasteners											
13	Elastomers material: HSN – highly saturated nitrile AFL – high temperature fluoroelastomer											

ELECTRIC SUBMERSIBLE PUMPS SUMMARY

Pump	Stage Type	Housing Diameter, in. (mm)	60 Hz - 3,500 rpm		50 Hz - 2,917 rpm	
			Recommended Operating Range		Recommended Operating Range	
			bpd	rpm	m ³ /d	rpm
ESP-A 362-130	radial	3.62 (92.0)	76 – 170	3,500	10 – 23	2,917
ESP-A 362-170	radial		113 – 197		15 – 26	
ESP-A 362-200	radial		136 – 287		18 – 38	
ESP-A 362-270	radial		189 – 340		25 – 45	
ESP-A 362-400	radial		227 – 530		30 – 70	
ESP-A 362-410	radial		303 – 567		40 – 75	
ESP-A 362-600	radial		454 – 756		60 – 100	
ESP-A 362-750	radial		605 – 946		80 – 125	
ESP-A 362-950	radial		605 – 1,210		80 – 160	
ESP-A 362-1200	radial		908 – 1,513		120 – 200	
ESP-A 362-1400	radial		983 – 1,740		130 – 230	
ESP-A 362-2100	mixed flow		1,589 – 2,648		210 – 350	
ESP-A 406-270	radial	4.06 (103.0)	189 – 340	3,500	25 – 45	2,917
ESP-A 406-400	radial		189 – 605		25 – 80	
ESP-A 406-450	radial		303 – 605		40 – 80	
ESP-A 406-600	radial		454 – 756		60 – 100	
ESP-A 406-700	radial		530 – 983		70 – 130	
ESP-A 406-900	radial		567 – 1,324		75 – 175	
ESP-A 406-1250	radial		908 – 1,513		120 – 200	
ESP-A 406-1500	radial		946 – 1,891		125 – 250	
ESP-A 406-1900	radial		1,362 – 2,269		180 – 300	
ESP-A 406-1950	mixed flow		1,437 – 2,572		190 – 340	
ESP-A 406-2400	mixed flow		1,815 – 2,874		240 – 380	
ESP-A 406-3100	mixed flow		2,269 – 3,782		300 – 500	
ESP-A 406-3700	mixed flow		2,837 – 4,917		375 – 650	
ESP-A 406-5500	mixed flow		4,841 – 7,262		640 – 960	
ESP-A 449-5700	mixed flow	4.49 (114.0)	4,539 – 7,564	3,500	600 – 1,000	2,917
ESP-A 449-9400	mixed flow		7,186 – 11,725		950 – 1,550	
ESP-A 535-2500	mixed flow	5.35 (136.0)	1,600 – 3,200	3,500	212 – 423	2,917
ESP-A 535-3500	mixed flow		2,400 – 4,600		318 – 610	
ESP-A 535-4700	mixed flow		2,800 – 5,900		371 – 782	
ESP-A 535-7000	mixed flow		4,000 – 7,700		530 – 1,020	
ESP-A 535-7500	mixed flow		4,700 – 9,000		623 – 1,193	
ESP-A 535-10000	mixed flow		5,000 – 11,900		663 – 1,577	