Vapro Multiphase Gas-Handling Pump

Increase production and ESP run life in gassy wells

Applications

- Wells with high Gas/Liquid Ratio
- Wells exhibiting slugging gas flow
- Gas well dewatering
- Gas lift to ESP conversions

Benefits

Increased production

Longer ESP run life through:

- Increased tolerance to abrasive solids
- Reduced frequency of shutdowns due to underload

Features

Optimized axial flow impeller design to reduce gas locking

Packet-style pump construction

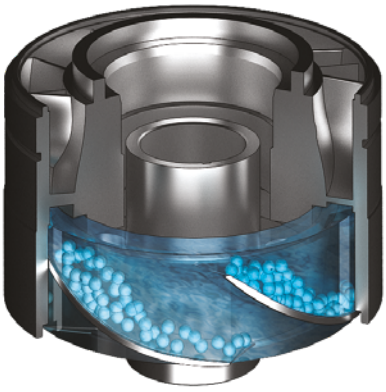
Abrasion-resistant tungsten carbide bearings

High-strength Inconel shafts for higher horsepower loads

Gas lift effect from managed gas-liquid mixture in tubing flow

Increasing gas-volume fraction (GVF) is a universally common challenge to ESP production as reservoir pressure declines. In wells with high gas/liquid ratio (GLR), the Levare Vapro multiphase gas-handling pump manages free gas volumes up to 70% to help maintain ESP system uptime and increase production.

When free gas arrives at the impeller of a conventional pump, it accumulates and restricts the liquid path. This can result in unstable production rates, pump surging, and ultimately gas-lock. The Vapro multiphase pump incorporates an axial-flow impeller optimized to reduce gas bubble size and create a more homogenous flow regime at a higher GLR, in the pump.



This mixture of gas and liquid behaves more like a single-phase fluid helping to stabilize the flow moving into the primary pump.

When sand or other abrasives accompany high gas volume as a production concern, the Vapro pump is equally suited to meet this challenge. The Vapro gas handler employs Levare' "packet" style pump construction. Levare packet pumps utilize an adaptive down thrust management design and so are able to run longer by withstanding prolonged durations of down thrust, often typical for ESPs in unconventional applications.

The Vapro multiphase pump is available in two series sizes:

- 400 series Vapro with flow range from 692 bpd (110 m^3/d) to 6,200 bpd (985 m^3/d)
  – up to 70% GVF
- 538 series Vapro with flow range from 400 bpd (64 m^3/d) to 13,000 bpd (2,067 m^3/d)
  – up to 65% GVF

When the Vapro pump is run in combination with the Levare Vortex gas separator, ESP production with GVF up to 90% is achievable.

400 Series Vapro Gas Handlers

	400 Vapro 3500	
	60 Hz	50 Hz
Housing diameter, in.(mm)	4.00 (101.6)	
Shaft diameter, in. (mm)	0.866 (22.0)	
Shaft area, in.^{2} (mm^2)	0.589 (380.13)	
Shaft BHP limit, hp (kW)		
MONEL K-500	345 (257)	287 (214)
INCONEL 718	538 (401)	448 (334)
Maximum power consumed 1 stage within operating range, hp (kW)	1.126 (0.828)	0.649 (0.478)
Flow range, bpd (m^3/d)	692 – 3,145 (110 – 500)	577 – 2,620 (92 – 416)

538 Series Vapro Gas Handlers

	538 Vapro 2600		538 Vapro 4400		538 Vapro 12500	
	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz
Housing diameter, in.(mm)	5.38 (136.7)					
Shaft diameter, in. (mm)	0.866 (22.0)		1.181 (30.0) splines – 1.102 (28.0)		1.181 (30.0) splines – 1.102 (28.0)	
Shaft area, in.^{2} (mm^2)	0.589 (380.13)		1.096 (706.86) splines – 0.954 (615.75)		1.096 (706.86) splines – 0.954 (615.75)	
Shaft BHP limit, hp (kW)						
MONEL K-500	345 (257)	287 (214)	768 (572)	639 (477)	768 (572)	639 (477)
INCONEL 718	538 (401)	448 (334)	1,200 (894))	1,000 (745)	1,200 (894)	1,000 (745)
Maximum power consumed 1 stage within operating range, hp (kW)	0.832 (0.620)	0.481 (0.359)	2.706 (2.019)	1.566 (1.168)	4.569 (3.408)	2.644 (1.972)
Flow range, bpd (m^3/d)	400 – 2,300 (64 – 366)	333 – 1,917 (53 – 305)	1,600 – 4,400 (254 – 700)	1,333 – 3,667 (212 – 583)	4,000 – 13,000 (636 – 2,067)	3,333 – 10,830 (530 – 1,722)