



## Twister Gas Separator

The Gas Separator has been designed as a continuous flow down hole gas separator to be used in conjunction with progressing cavity pumps. The Gas Separator uses centrifugal forces to separate the gas from the produced liquids, before they enter the pump. Liquids will be carried through into the pump suction while the separated gases are forced to migrate up the annulus.

Eliminating the associated gases before entering the pump has definite advantages:

- The pump efficiency and pump rate will be increased.
- CO<sub>2</sub> and H<sub>2</sub>S present in solution will cause premature degradation of the stator elastomer. Elimination of these gases before they enter the pump will extend it's life.



### Specifications

Size	Configuration	Tool Length	Tool O.D.	Tool I.D.	Inlet Ports Size	Inlet Flow Area	Outlet Ports Size	Outlet Flow Area	Top connect	Bottom connect
Units		IN	IN	IN	IN	IN	IN	IN	EU BOX	EU BOX
9-5/8	Light Oil	49.65	7.00	6.25	8x1.5	14.60	6x1.625	12.44	4-1/2	4-1/2
	Heavy Oil	69.40	7.00	6.25	8x1.50	14.60	6x1.625	12.44	4-1/2	4-1/2
7	Light Oil	40.10	5.25	4.25	8x1.125	8.00	6x1.250	7.37	3-1/2	3-1/2
	Light Oil	39.48	5.50	4.25	8x1.125	8.00	6x1.250	7.37	4-1/2	4-1/2
7	Heavy Oil	56.10	5.25	4.25	8x1.125	8.00	6x1.250	7.37	3-1/2	3-1/2
	Heavy Oil	56.10	5.50	4.25	8x1.125	8.00	6x1.250	7.37	4-1/2	4-1/2
5-1/2	Light Oil	38.00	4.25	3.25	8x0.813	4.16	6x0.875	3.61	2-7/8	2-7/8
	Light Oil	37.80	4.50	3.25	8x0.813	4.16	6x0.875	3.61	3-1/2	3-1/2
5-1/2	Heavy oil	45.00	4.25	3.25	8x0.813	4.16	6x0.875	3.61	2-7/8	2-7/8
	Heavy Oil	45.00	4.50	3.25	8x0.813	4.16	6x0.875	3.61	3-1/2	3-1/2
5	Light Oil	38.00	4.00	3.25	8x0.813	4.16	6x0.875	3.61	2-7/8	2-7/8
4-1/2	Light Oil	29.76	3.63	2.68	8x0.750	3.53	6x0.813	3.12	2-7/8	2-7/8
4	Light Oil	28.13	3.25	2.63	8x0.594	2.24	6x0.625	1.86	2-3/8	2-3/8



## Twister Gas Separator

### Function of the Gas Separator

The P.C. Pump Gas Separator functions by forcing the fluids (which contain gases) to flow through it before reaching the pump. As the fluids first enter the Gas Separator they must flow through 8 intake port which divide the flow and begin gas separation. The fluid then moves through the auger chamber, which subjects the fluid to centrifugal force. The principles of centrifugal force maintain that the more dense materials (eg. water and oil) will be forced to the outside of the chamber while the gas will remain close to the middle. As the fluids reach the top of the auger chamber liquid is removed via 6 outlet ports (around the perimeter of the top sub) which lead to the pump itself. As the separated gas reaches the top of the auger chamber it flows along a tapered end which guides it to an outlet port in the center of the top sub. This central outlet port then vents the gas into the annulus, where it may then migrate up the casing.

There are two configurations of the Gas Separator:

- Light Oil configuration for oil 24o API and greater
- Heavy Oil configuration for oil less than 24o API.

The heavy oil Gas Separator is designed to generate more intense separation forces to “shear” the gas out

#### P.C. Pump Gas Heavy Oil Configuration

Casing OD		Tool OD		Heavy Oil Tool Length		Top Connection	Bottom Connection
inch	mm	inch	mm	inch	mm	inch	Inch
5-1/2	139.7	4.50	114.3	45.0	1143.0	2-7/8 & 3-1/2 EU	2-7/8 & 3-1/2 EU
7	177.8	5.50	139.7	55.0	1397.0	3-1/2 & 4-1/2 EU	3-1/2 & 4-1/2 EU

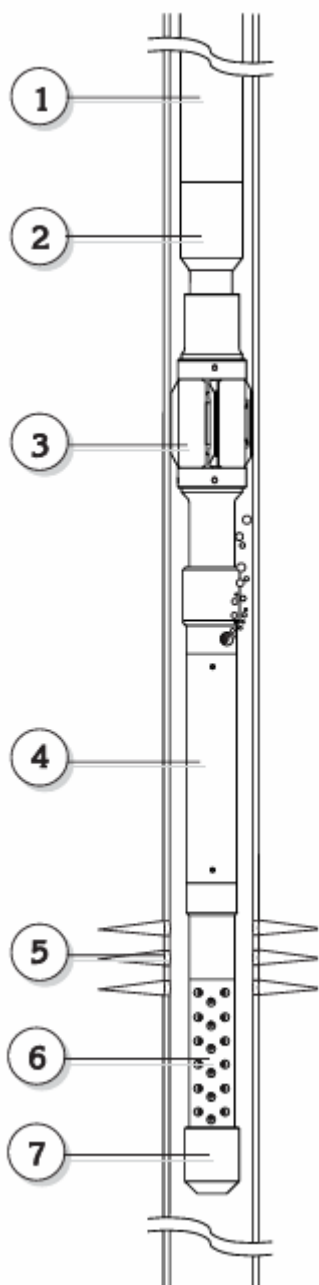
#### P.C. Pump Gas Light Oil Configuration

Casing OD		Tool OD		Light Oil Tool Length		Top Connection	Bottom Connection
inch	mm	inch	mm	inch	mm	inch	Inch
4-1/2	114.3	3.625	92.1	30.0	763.0	2-7/8 EU	2-7/8 EU
5-1/2	139.7	4.50	114.3	33.35	844.6	2-7/8 & 3-1/2 EU	2-7/8 & 3-1/2 EU
7	177.8	5.50	139.7	39.50	1000.3	3-1/2 & 4-1/2 EU	3-1/2 & 4-1/2 EU



## Twister Gas Separator

### PCP System Downhole Assembly



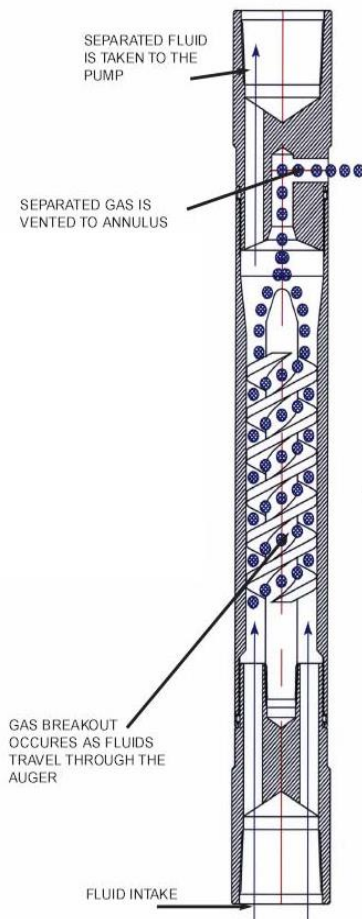
1. PC Pump
2. Stop Bushing
3. Dynamic Torque Anchor
4. Gas Separator
5. Perforations
6. Perforated Pup Joints
7. Cap

### Installation

- 1). The Gas Separator must be installed in the string below the pump.
- 2). When the pump is landed in the well, the Gas Separator should be above the perforations.
- 3). If it is desired or necessary for the fluid intake to be below the perforations, tubing may be ran below the Gas Separator (tail joints).

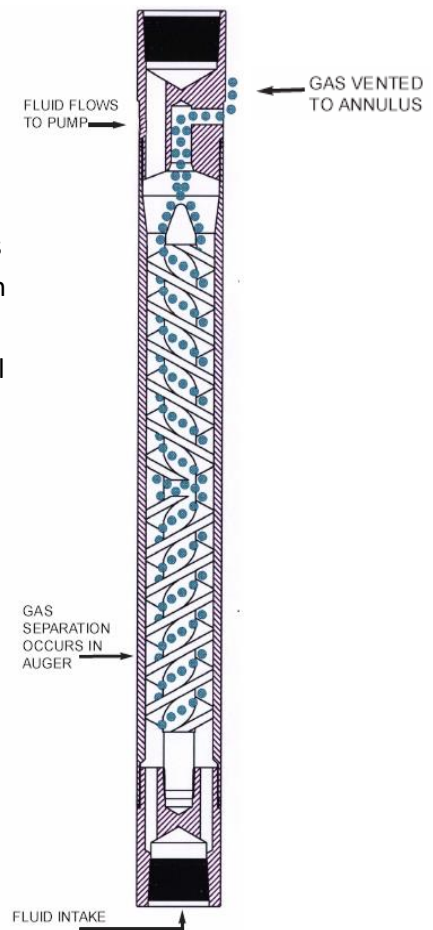


## Twister Gas Separator



A Gas Separator may be run into any P.C. well where you might suspect gas content to be affecting the production performance. There are 4 main reasons why you would want to install a Gas Separator in your well.

- 1) The efficiency of your P.C. Pump is low. This can be caused by significant gas content in the fluids you are lifting.
- 2). Your P.C. Pump's working life is short. A high gas content can cause the stator to burn up and break apart due to friction without lubrication as the rotator turns inside it.



- 3). Your pump elastomer experiences blistering when pulled from the hole. Over time gas becomes absorbed under pressure into the elastomer. Upon pulling the pump, the gas will want to escape to the lower pressure. This will cause the elastomer of your pump to blister.
- 4). You have torquing problems with your pump due to sand content. As the fluids and sand are pulled through the Gas Separator the centrifugal forces