THE

REVOLUTION

Downhole Gas and Solids Separator
This gas separator was born of an idea from a man observing the loading of oil from a battery. The man watched as the fluid samples were placed in a centrifuge, or spin out machine, and rotated to separate the solids, water and oil. This conceptualized the beginning of Superior Anchor’s quest to build a down hole separator that utilized this centrifugal force in separating the components found in produced fluids. This 5 year development period has produced two of the most efficient gas separators available on the market today, the Revolution One and the Revolution Two gas separators.
Reservoir Fluids from inside of Casing going up and into lowest part of Revolution Jacket Slots of the separator, then downward through the flighting where it is spun, centrifugal force then takes heavy matter outward and lighter matter inward, gas coalesces in the center against the Dip Tube OD, gas then becomes larger which enables it to rise between the annular space left between the Dip Tube OD and the Flighting ID, larger gas bubbles made in the separator, allow them to rise faster than conventional gravity separators.

Free gas naturally rising up casing without entering the separator

Reservoir Fluids from inside of Casing going up and into lowest part of Revolution Jacket Slots of the separator, then downward through the flighting where it is spun, centrifugal force then takes heavy matter outward and lighter matter inward, gas coalesces in the center against the Dip Tube OD, gas then becomes larger which enables it to rise between the annular space left between the Dip Tube OD and the Flighting ID, larger gas bubbles made in the separator, allow them to rise faster than conventional gravity separators.

TAC w/bull plug on bottom or extended MAJ/s below TAC with Bull Plug on bottom or TAC on bottom of extended MAJ’s with Bull Plug on bottom, solids are forced to lowest point (above Bull Plug)

Gas Free Liquid moving into the Seating Nipple/Pump intake

Gas separated inside of the gas separator exhausting out of the lower part of the Revolution Body Ports and is moving upward inside the casing

Transition from gas entrained fluid to gas free liquid

Gas free liquid leaving bottom of Flighting around Flighting Rest, turning the corner and heading into the Dip Tube headed towards the Dip Tube Coupling then Seating Nipple/Pump intake
REVOLUTION GAS AND SOLIDS SEPARATOR TYPE TWO
TAC w/bull plug on bottom or extended MAJ/s below

TAC with Bull Plug on bottom or TAC on bottom of extended MAJ’s with Bull Plug on bottom, solids are forced to lowest point (above Bull Plug)

Reservoir Fluids from inside of Casing going up and into lowest part of Revolution Body Ports of the separator, then downward through the flighting where it is spun, centrifugal force then takes heavy matter outward and lighter matter inward, gas coalesces in the center hole of flighting and becomes larger which enables it to rise out of the separator faster than conventional gravity gas separators

Free gas naturally rising up casing without entering the separator

Gas Free Liquid moving into the Seating Nipple/Pump intake

Gas separated inside of the gas separator exhausting out of upper part of body ports and is moving upward inside the casing

Transition from gas entrained fluid to gas free liquid

Reservoir Fluids from inside of Casing going up and into lowest part of Revolution Body Ports of the separator, then downward through the flighting where it is spun, centrifugal force then takes heavy matter outward and lighter matter inward, gas coalesces in the center hole of flighting and becomes larger which enables it to rise out of the separator faster than conventional gravity gas separators

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Gas free liquid leaving bottom of Cone Sand Tube, turning the corner and heading into the annulus between the Revolution Jacket ID and Flighting Tube OD headed towards the Revolution Body vertical passage holes, then to the Seating Nipple/Pump intake

TAC w/bull plug on bottom or extended MAJ/s below

TAC with Bull Plug on bottom or TAC on bottom of extended MAJ’s with Bull Plug on bottom, solids are forced to lowest point (above Bull Plug)
DIFFERENT COMPANY - 1ST OF THREE EXAMPLES -
Example 1. These are surface and pump cards of a competitors separator in 5 ½” casing, a Rotoflex PU, 1 ¾” pump, 258” DH SL on VSD (Variable Speed Drive) set on 70% PF (Pump Fillage). Actual PF is ~54% at 1 SPM. Customer Rep says the well has a high fluid level and will not pump down even though the analysis data shows the well to be pumped off, you can correlate this card date to the production graph.
Example 1. These are surface and pump cards after running a Revolution gas separator in the same well. Well is now running 2.8 SPM with the same sized lift system with ~98% actual PF.
Example 1. Customer Rep says the well is now pumping off for the first time ever since conversion to Rod Pump!
**Example 1.** Well is making more production on Rod Pump after installing the Revolution gas separator.
Example 2. These cards are with a leading packer separator, PF is ~58% @ 3.6 SPM w/1.5” pump. Customer Rep says that this well is shutting down with a high FL.
**Example 2.** Red cards are Revolution gas separator, Blue cards are packer type gas separator. Revolution is running faster, with same size pump, and with better pump fillage.
Example 2. Production was averaging 40 oil, 51 water, and 131 gas prior to installing the Revolution gas separator. Production after the Revolution installation is 59 oil, 109 water, and 270 gas.
- EXAMPLE 3 -
Example 3. Latest Revolution installation following a packer type gas separator.
Example 3. Red card is packer type separator and Blue is Revolution. Again, the Revolution is running faster with better PF. Well was pulled after failure. The Revolution separator was run because of high FL in combination with low PF conditions with the packer type separator. Do not have production data yet, will include when received.
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<th>Type</th>
<th>.2'/Sec</th>
<th>.3'/Sec</th>
<th>.4'/Sec</th>
<th>.5'/Sec</th>
<th>.6'/Sec</th>
<th>.7'/Sec</th>
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THE REVOLUTION SEPARATOR FLUID HANDLING ABILITY IS RATED WITH THE FLUID TRAVELING .5’ PER SECOND BUT WITH THE CENTRIFUGAL FORCE GENERATED, THIS BENCHMARK CAN BE EXCEEDED SOMEWHAT AND STILL GET THE GAS SEPARATION NEEDED TO EFFICIENTLY PUMP A WELL. IN SOME OF THE APPLICATIONS, THE CUSTOMER IS REACHING CLOSE TO OR A LITTLE ABOVE A .6’ PER SECOND FLUID VELOCITY WHILE STILL MAINTAINING 97% TO 98% PUMP FILLAGE.
TOOL IS MADE OF 316 STAINLESS STEEL AND BRASS TO RESIST CORROSION.

ALL COMPONENTS ARE REPARABLE OR REPLACEABLE.

TOOL CAN BE CLEANED AND REDRESSED IN SHOP.

TOOL IS MADE UP IN SHOP AND WHEN DELIVERED, IT IS READY TO PICK UP AND INSTALL IN WELL.

NO ADDITIONAL PERSONNEL ON LOCATION.