

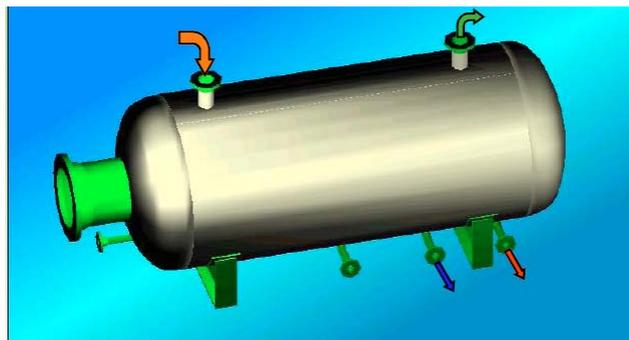
## BAGGI BA-3PS 3 Phase Well Test Separator

The *SensEvolution BAGGI BA-3PS* is a skid mounted horizontal 3 Phase Well Test Separator, equipped with all the necessary valves, measurement devices and an embedded computer. The skid is easily truck transportable.

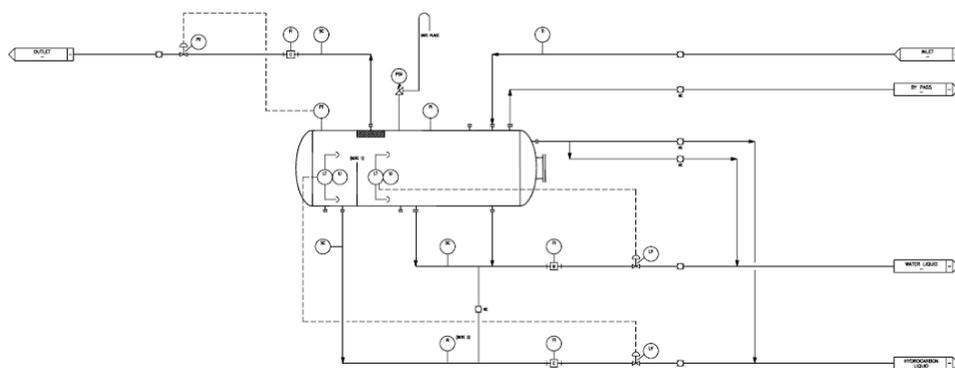
The flow rates of gas and oil are measured by Coriolis meters, while the Water flow rate is measured by an electromagnetic meter. The total level of the fluid and the level of the water/oil interface are measured by 2 radar transmitters.

The signals, from all the above sensors and from any additional sensor required by the application, are collected by the embedded computer. This one,

besides displaying the actual readings on the LCD screen, is able to archive the historical data in Excel compatible format, to show the measurement trends in graphical format and to generate alarms when out-of-range values occur. Finally, the computer can transmit remotely the measurements and the alarms by means of 4...20 mA analogue outputs and digital (relay) outputs. A Modbus serial port is available. In short the computer, together with its circuitry, acts as a PLC to operate the skid during normal operation, start-up, shut-down and emergency.



The typical configuration of the 3 phase separator is depicted in the figure below:



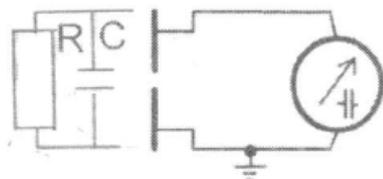
The stream enters the separator from the inlet nozzle on the top (with an interception manual ball valve). Gas is separated from liquid by gravity and by means of a demister on the gas outlet nozzle, on the top. The gas outlet line is equipped with a Coriolis meter and a pressure regulating valve, for keeping the separator's pressure at the desired set point.

Liquid is accumulated in the lower part of the vessel and water is separated from hydrocarbons by a weir that is adjustable in height. Level in the two compartments is indicated by the level indicators/transmitters that are used to operate the control valves placed in the liquid outlets, at the bottom. One of them measures the total level of the fluid, the other one measures the level of the interface. The weir height can be regulated by a pneumatic actuator.

Both liquid outlet nozzles are equipped with vortex breakers.  
Both liquid outlet lines are equipped with the relevant flow meters and with isolating ball valves.

A bypass line from the vessel can discharge directly into the outlet lines (manual ball valves are provided).

In addition, the hydrocarbons outlet line is equipped with a watercut analyzer.  
The watercut measurement is performed by measuring a Radio Frequency signal absorption and frequency shift by the fluid.



The antenna of a RF generator, applied to the line, transmits energy into the fluid; please refer to the figure.

The resulting electromagnetic field (modelled by the RC circuit) will change according to the oil/water content of the fluid.

The dielectric loss resistance (R in the figure) will reduce for fluid with water content.

Due to the dipole character of water molecules, liquid water has a very high relative dielectric constant (C in the figure) in comparison with dry crude oil.

The measurement of the C capacity, by the frequency shift of the RF signal, gives a value that is proportional to the water content.

The embedded computer software performs the temperature compensation and all the necessary data processing (a temperature sensor is provided).

The embedded computer is the heart of the system.

The figure shows an ATEX certified version, contained within an enclosure provided with a protective air purge system and a Vortex cooler (connected to the plant instrument air).



Here follow the standard specifications of the BA-3PS phase separator.

For specific requirements, please contact the e-mail address below:

[info@baggi.com](mailto:info@baggi.com)

Specifications	
Vessel size, horizontal, cm x m	100 x 3.05
Working pressure, kPa at °C	9,930 at 37.8°C or 9,170 at 125°C
Min. operating temperature, °C	-20
Max. operating temperature, °C	125
Safety valve set pressure, kPa	9,066
Max gas flow rate (low liquid level)	1.66 million m <sup>3</sup> /d at 9,930 kPa
Max gas flow rate (high liquid level)	1.16 million m <sup>3</sup> /d at 9,930 kPa
Max oil flow rate (low liquid level)	1,255 m <sup>3</sup> /d
Max oil flow rate (high liquid level)	2,304 m <sup>3</sup> /d
Max water flow rate (low interface level)	659 m <sup>3</sup> /d
Max water flow rate (high interface level)	1,676 m <sup>3</sup> /d
Hazardous area certification	Zone 1, gas IIB, T4, EExd, ATEX 94/9, CE marked
Overall dimensions (LxWxH), m	6.00 x 2.46 x 2.70
Weight, kg	15,000
Inlet/Outlet connections	3-in (pressure safety valve outlet: 4-in)
Measurement accuracy	1% ÷ 5%
Certifications	Third party certifications available upon request

All the specifications subject to change without notice  
Rev 1.1