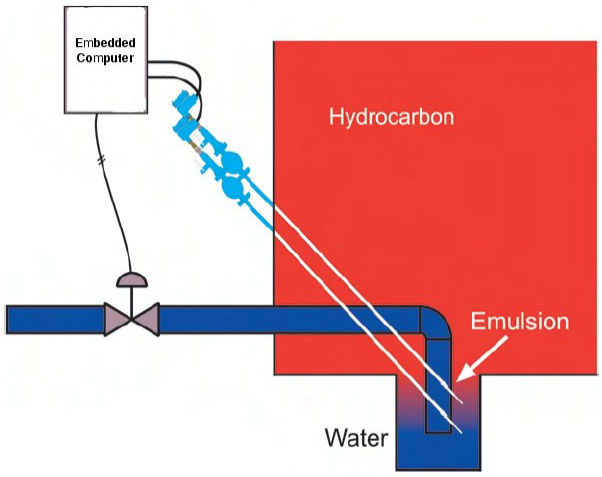
BA-DWTR

AUTOMATIC TANK DEWATERING SYSTEM

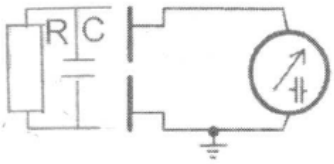
The BA-DWTR is part of the **BAGGI BASE® Instruments Series**.
They are the result of combining the latest state-of-the-art-technology with over 50 years of industry experience.



This automatic tank dewatering system comprises the following main components:

- ✓ In-tank electromagnetic probes (two per each tank), that measure the spot water/hydrocarbon concentration at the tip of the probe.
- ✓ An embedded computer, that collects the raw data from the probes, actuates the drain valve, operates the alarms and offers a convenient Graphical User Interface.

Please refer to the figure.
When the upper probe detects hydrocarbon free water, the computer opens the water discharge valve. As water is drained from the bottom of the tank, the hydrocarbon/water interface begins to drop. When the probe detects the presence of the interface, the computer closes again the valve. The data link between the computer and the probe is typically a 4…20 mA loop. The valve can be actuated either by an electrical or a pneumatical signal.
The lower probe is used for control and alarm purposes: when it detects hydrocarbon presence, the valve is anyway kept closed and an alarm is generated by the computer.
A single computer is in charge of the whole tank farm.



Principle of operation

The probe is essentially an electromagnetic antenna.
A high frequency generator transmits energy into the liquid; please refer to the figure on the right. The resulting electromagnetic field (modelled by the RC circuit) will change according to the hydrocarbon/water content of the fluid. The dielectric loss resistance (R in the figure) will reduce for fluid with water content. Due to the dipol 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 (frequency shift of the electromagnetic signal) and of the R resistance (energy absorption) gives values that are a function of the water content. The application software performs all the necessary data processing.

Embedded computer

The BASE® Series 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). Besides displaying the actual readings on the LCD screen, it 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, it can transmit remotely the measurements by means of 4...20 mA analogue outputs and the alarms by means of digital (relay) outputs. In short the computer, together with its circuitry, acts as a PLC to operate the dewatering system during normal operation, start-up, shut-down and emergency.

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Here follow the typical specifications of the BA-DWTR automatic tank dewatering system.
For specific requirements, please contact the e-mail address below:
info@baggi.com

Probe Specifications	
Emulsion Concentration	0 ÷ 100% Hydrocarbon/Water by volume
Process temperature	Standard: 32°F ÷ 300°F (0°C ÷ 149°C) High-Temp: 32°F ÷ 450°F (0°C ÷ 232°C)
Ambient temperature	-40°F ÷ 131°F
Pressure rating	Standard: 300 psig (higher pressures subject to review)
Probe Materials	Standard: 316 Stainless Steel and Teflon Optional: Zirconium, Hastelloy, Monel (others on request)
Seal Materials	Standard: Aflas and Teflon Optional: Viton
Enclosure protection	IP56 / NEMA4X
Compliances	EN 61326, EN 61010-1 Intrinsically Safe: Class 1, Div.1, Groups C & D, T3C ATEX II 1G EEx ia IIB T4 (-40°C<Ta<+70°C) ATEX II 1G EEx ia IIC T5 (-40°C<Ta<+65°C)

Embedded Computer (Controller) Specifications	
Power	Standard: 90-264 VAC, 47-63 Hz; 6 A max
Ambient temperature	32°F ÷ 104°F (0°C ÷ 40°C) 32°F ÷ 131°F (0°C ÷ 55°C) with vortex cooler
Dimensions H x W x D	500mm x 400mm x 250mm (19.68” x 15.74” x 9.84”)
Weight	15 Kg (approx.)
Analogue outputs	Standard: three isolated 4 - 20 mA outputs Optional: three additional isolated 4 – 20 mA outputs
Digital intputs	Six inputs, user defined
Digital outputs	Four isolated relay output signals
Serial communication	One serial port (RS-232 / RS-422 / RS-485) available, protocol: Modbus / Profibus / Fieldbus-Foundation (optional)
Ethernet connectivity	Two 10/100 Mbps with RJ-45 port
WiFi connectivity	One integrated card 11Mbit/s
Enclosure protection	IP66
Compliances	EN 61326, EN 61010-1 ATEX II 2 G Ex px II T6 ATEX II 3 G Ex pz II T6
Cooling system	Passive heatsink (Fanless)

All the specifications subject to change without notice
Rev 1.0

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