



## WATER LEVEL MEASUREMENT

WATER LEVEL MEASUREMENT AND INDICATION FOR THE STEAM POWER INDUSTRY

# Aquarian 3000Mini

The Aquarian 3000Mini was developed to satisfy basic level indication needs utilizing vacuum brazed probes for boiler drum, feedwater heaters and other liquid level applications. The Aquarian system consists of three major components: the column with probes, the detection and verification unit (D&V) and the remote display.

The Fossil conductivity probe with vacuum brazed insulators, has been used and proven reliable for many years of service. The Swagelok metal to metal seal of the Aquarian probe insures leak proof installation in the Aquarian column.

The electronic system in the (D&V) unit is connected to 5, 8, 10, 12 or more probes on the water column. The number of probes can be selected and spaced to indicate liquid level through a desired operating range. The Aquarian column is custom manufactured to provide the most accurate indication for any application. An individual relay is provided for every probe level to provide versatility in selecting high/low or other system alarm and trip points.

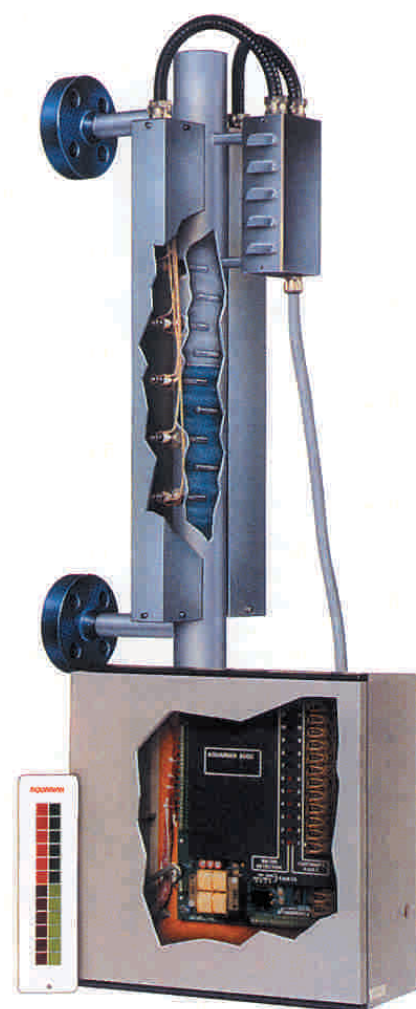
A remote LED display panel, customized for the number of probes and their locations, is standard. A local display mounted on the D&V door is optional.

Operation of the system is based on measurement of the difference in resistance between water and steam, which is compared with a known reference resistor. The signal output to the probes is a symmetrical source wave  $\pm 5$  VDC current which precludes electroplating of the probe. The Aquarian 3000Mini measures the returning signal to indicate 'water' or 'steam'.

System diagnostics perform an ongoing wire continuity check (using optional two wires per probe) to ensure the integrity of the cable connecting the probes to the D&V. System fault indication is provided by a relay which monitors the internal power supply, clock and wire continuity. A second relay, for level fault, activates if water is detected above steam.

### FEATURES AND BENEFITS

- Solid state electronics and two color display
- Solid state output to drive up to three remote displays
- NEMA 4X (IP65) enclosed detection and verification unit
- 10 amp power relay contact output for each probe to control trips and alarm
- Three way adjustment for water conductivity
- Electronic self-monitoring and indication in the D&V unit; optional probe wire continuity monitor, power supply failure (redundant power supplies), clock (DC detection circuit) failure
- 10 amp power relay contact output for electronic faults
- 10 amp power relay contact output for level fault (water over steam)
- On board water detection indication in the D&V unit



Controlling  
the **power**  
of **steam**

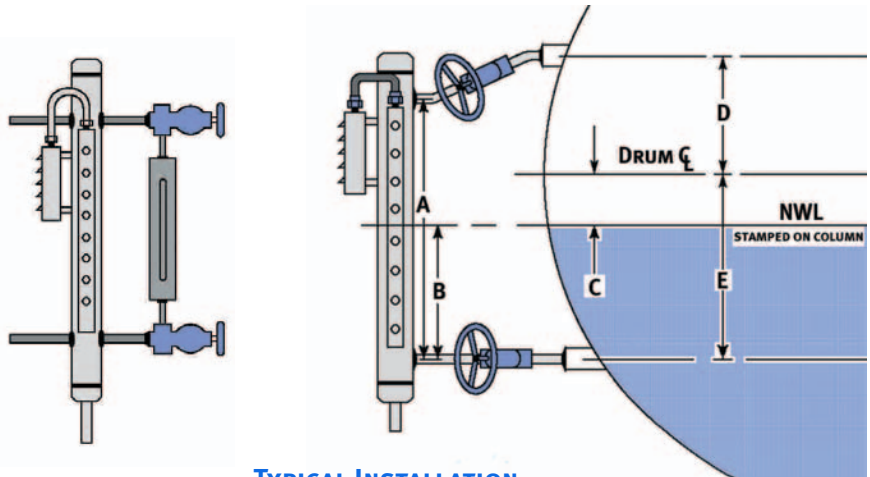
# Aquarian 3000Mini

## SPECIFICATIONS

- Power source: 120 or 240 VAC, single phase, 50-60 Hz, 1/2 - 1/4 A
- Relay contact ratings: 10A @ 120 VAC, 8 A @ 24 VDC, 1/3 HP @120 VAC.
- Column: Ratings - up to 3000psi and 1200°F maximum. Materials - Carbon Steel, Stainless Steel and Chrome Moly
- Enclosure: NEMA 4X (IP65)
- Minimum conductivity capability 0.5 micro mho
- Electronics to column distance:  
0.5 to 4 micro mho - 65 ft (20m)  
4 to 25 micro mho - 165ft (50m)  
Above 25 micro mho - 500ft 150m)

## OPTIONS

- To customize unit for individual applications:
  - Door mounted local display
  - Small Remote display (reduced size for desk mounting)
  - Dual power source
  - Adjustable trip/alarm time delay
  - In service test switch
  - Additional remote displays
  - Column mounted pre-wired junction box
  - Wire continuity fault detection
  - Zener barrier for intrinsically safe probe connections
  - 4-20mA analog output
  - 2000 psi and 3000 psi FM approved systems
  - 16, 20, 24 (and up) probe systems
  - Column ratings: up to 3000 psi maximum and 1200°F maximum
  - Column materials: carbon steel, stainless steel, chrome moly



TYPICAL INSTALLATION

## APPLICATIONS

For high and low pressure feedwater heater, and boiler drum level indication.

The 1998 ASME\* Boiler and Pressure Code (Section I, Para. PG-60) states: "Two independent remote level indicators may be provided instead of one of the two required gage glasses for boiler drum water level indication in the case of power boilers with all drum safety valves set at or above 400 psi. When both remote level indicators are in reliable operation, the remaining gage glass may be shut off, but shall be maintained in serviceable condition".

"When the direct reading of gage glass water level is not readily visible to the operator in the area where immediate control actions are initiated, two dependable indirect indications shall be provided, either by transmission of the gage glass image or by remote level indicators".

The Fossil Aquarian 3000Mini was designed to satisfy the described code requirement. An Aquarian installed as one of two remote indicators along with the required gauge is shown. A duplicate Aquarian can be used as the second remote indicator. The Aquarian column with probes provides remote indication and it also acts as a stabilizer for the gauge.

## ORDERING

Request Form # 9340-1203

Water column to be certified in accordance with ASME\* Section I.

\* American Society of Mechanical Engineers

*The manufacturer reserves the right to change the designs and materials of its products without notice.*

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