

Concentration meter for Binary liquids



CONCENTRATION METER - 8500 PRODUCT INFORMATION



8500 – Concentration meter for binary liquids

INTRODUCTION

Model 8500 is an ultrasonic concentration meter that enables accurate measurement of one concentration in binary liquids.

These analysers can be fruitfully applied to measure electrolyte solutions, liquid purity, and hydrocarbon concentrations in water.

The model 8500 allows measurement of single industrial chemicals in water. Thanks to its innovative electronics and sensor design, it allows continuous in-line monitoring of diluted chemicals with a high degree of accuracy. Furthermore, the concentration meter has no moving or degrading parts, which means that virtually no maintenance is needed.

INDUSTRIES

Model 8500 is used in the following industries:

- FPD displays (KOH / TMAH)
- Petrochemistry (NaOH)
- Chemistry (H₂SO₄)



KOH



NaOH

DESCRIPTION

The Model 8500 is a powerful instrument to measure the composition of industrial liquids.

Model 8500 operates with a UMP probe, available with several process connections and materials such as 316L, Hastelloy and Alloy20.

The measurement technology for the model 8500 is based on speed of sound determination in combination with temperature measurement.

FEATURES AND BENEFITS

- Very low cost of ownership
- High accuracy and reproducibility
- Maintenance free
- Installation methods for different applications
- Easy operation
- Color display
- Data logging
- Supports various communication protocols, including Modbus, Profibus & HART

INSTALLATION

UMP-50

The UMP-50 can be used in the flat panel display industry. The sample cell will be installed in the bypass in the small tubes. It is a PVDF sample cell with a 3/4" connection.



UMP-085/130

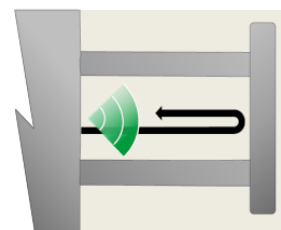
The UMP-085/130 can be used in the petro chemistry and chemistry industry. This analyser is connected in the process line on the flange.



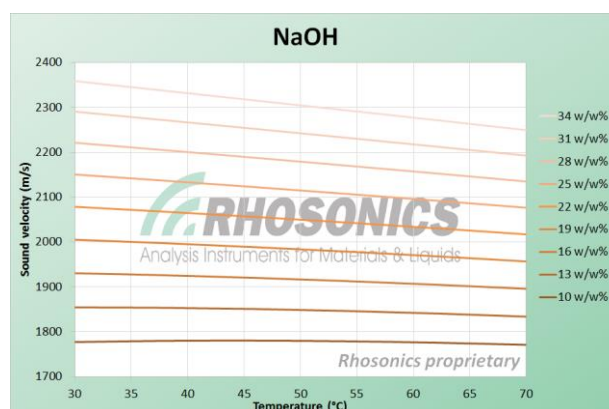
HOW DOES IT WORK?

Measurement is done by an ultrasonic sound velocity. The sensor sends and receives the ultrasonic signal which is traveling through the liquid and returns to the sensor by means of reflection. The total time flight through the liquid is measured from the total travel distance and this time of flight the sound velocity is calculated. The speed of sound is strongly influenced by the temperature and for this reason also the temperature is measured by an integrated Pt100 temperature sensor.

Sound velocity measurement



In our laboratory, we measure the sound velocity and the temperature of several samples with known concentrations. With this data we make a so called polynomial. We use this polynomial to measure inline the speed of sound and temperature, which results in a very accurate concentration reading.

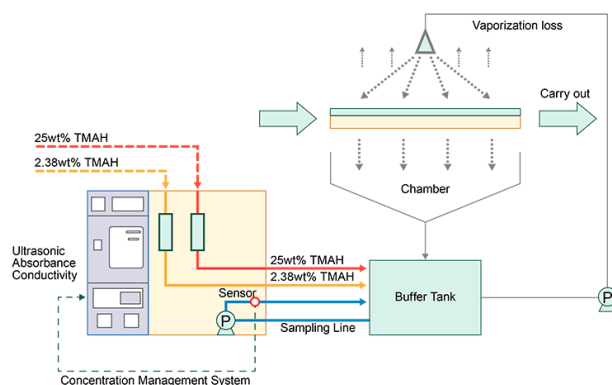


APPLICATIONS

KOH and TMAH (FPD displays)

KOH is produced by electrolysis of potassium chloride, or by boiling a solution of potassium carbonate (potash) with calcium hydroxide (slaked lime). The process leads to a metathesis reaction that results in calcium carbonate. When it precipitates, it leaves potassium hydroxide in solution. KOH forms a strong alkaline solution when dissolved in water or alcohol. It has almost the same properties as NaOH.

30% of our binary concentration analysers are sold in the Flat Panel Display (FPD) industry.



NaOH (Petro chemistry)

NaOH, sodium hydroxide or caustic soda is a chemical that is used in many industries and in different processes. Accurate measurement of NaOH online and in real time is important. There are many different systems on the market, but most of them have one or more disadvantages. Some, for example, are sensitive to pollution or difficult to calibrate; others may incur high maintenance costs.

The model 8500 can measure sodium hydroxide concentration from zero up to the saturation point in different ranges. The concentration meter determines the actual concentration of the sodium hydroxide solution through measuring the velocity of sound through the medium.

It also eliminates high operating costs and the need for frequent, complex maintenance.

NaOH is one of the other applications where we supply our binary concentration analyser Model 8500 in a huge quantity. This is because of the Rhosonics technology is able to measure up to the saturation point accurately.

H2SO4 (Chemistry)

Sulphuric acid is an important raw material in the chemical industry, used in many different processes. Oleum is produced by dissolving SO₃ in H₂SO₄. Sulphuric acid is produced by dissolving water in oleum (also called double contact process). The most important thing with sulphuric acid is that it becomes oleum above 100%. This makes it a very interesting liquid. In order to monitor the dilution process, an accurate and reliable real-time in-line analyser is needed.

As Model 8500 contains the technology which can measure very accurate in this hard application, it's not a surprise that 50% of the binary concentration analysers of Rhosonics sales is in H₂SO₄/Oleum applications.



Specifications

PERFORMANCE SPECIFICATIONS

Measurement parameters:	Ultrasonic sound velocity Temperature
Purpose:	Measuring a concentration in a binary liquid
Ranges:	Auto ranging
Factory calibrations:	200 chemicals max
Accuracy:	+/- 0.1% of reading or 0.05% of range
Temperature accuracy:	+/- 0.1 °C
Temperature range:	0...130 °C
Probe materials:	Standard wetted parts: 316L, Hastelloy, Alloy20

GENERAL SPECIFICATIONS

Response time:	0...90s (adjustable)
Analog outputs:	(2x) 4-20 mA (+/- 0.02%)
Alarm outputs:	(2x) SPDT, Hi-Hi, Lo-Lo
Sample hold:	External trigger can hold data during process stands still
Max pressure:	25 bar
Process connection:	DIN or ANSI flange
Housing:	WPF (Weather Proof Housing)
Screen:	5,7" Color Touch Screen
Display values:	Temperature & concentration
Power supply:	VAC (100...240 VAC, 50/60 Hz, 10W) or VDC (24VDC, 10W)
Communication:	4...20mA, RS485/RS422 using Modbus Optional: Ethernet, HART, Profibus
Optional sensor installations:	UMP-50 UMP-085/130

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