

Measuring point	Installation	Measuring task
1	pipeline	concentration monitoring of lautering wort and initial extract in the wort boiler; recognition of the sparge water point
2	wort boiler	concentration monitoring of wort in the internal boiler
3	pipeline	concentration monitoring of wort in the external boiler
4	pipeline	concentration monitoring of cast wort

# Wort boiler

## Introduction

The wort boiling takes place either in the wort pan or externally with an external boiler, which can be designed as a shell or plate heat exchangers. The boiling time per brew is between 50 and 75 minutes.

Objectives of wort boiling:

- adjustment of the desired wort concentration
- destruction of malt enzyme
- fixation of the wort composition
- sterilization of the wort
- protein coagulation
- hop isomerization
- flavor formation
- evaporation of undesirable flavors

For quality and efficiency reasons, the wort concentration must be controlled continuously in the brew-house.

## Application

The LiquiSonic® Plato system determines the wort at different points of the brewing process. In the wort pan, the LiquiSonic® Plato system is used for:

- control of the boiling process
- accurate monitoring of the cast wort concentration

The immersion sensor is fully made of stainless steel, and due to the robust construction the sensor works maintenance-free and drift-free with long life time. The LiquiSonic® high-power technology provides a stable measurement even with gas bubbles in the liquid.

The LiquiSonic® controller enables an automatic product switching. The internal limit value monitoring signals exceeding or falling below thresholds and transfers the real-time information via analog or digital outputs, serial interfaces, or fieldbus (Profibus DP, Modbus) to the process control system.

## Customer value

The LiquiSonic® analyzer provides a precise inline concentration measurement with real-time monitoring. The system is used in the indoor as well as in the outdoor boiler. Thus, no expensive bypass solutions are required.

LiquiSonic® enables a reduction of labor cost and eliminates complex manual sampling:

time saving: 2 h per day

cost per hour: 100 € (120 \$)

total cost savings: 20.000 € (24,000 \$) per year

Through the continuous determination of the cast wort, the boiling time can be shortened.

Example for 1,700 brews per year with 560 hl cast wort per brew and heating oil price of 0.86 € per liter:

- saving of 1 kWh/hl corresponds to a cost saving of 85,000 € per year (106,000 \$)

Investment: 12.000 € (15,000 \$)

Amortization: 1 month

## Installation

For the internal boiler, the LiquiSonic® sensor is installed directly into the wort pan. The immersion length is variable and can reach up to 3 m. A special design of the sensor keeps the influence of deposits low. Additionally, the sensor in the internal boiler can be equipped with a cleaning head, in order to avoid encrustation by foam.

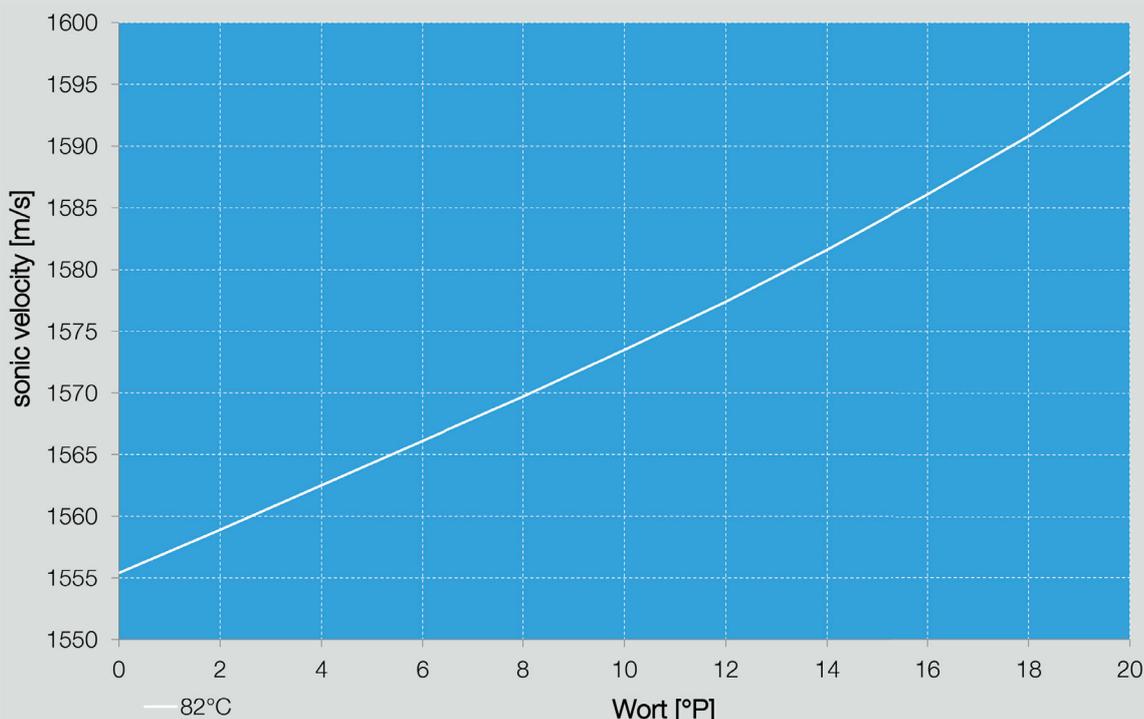
If the LiquiSonic® sensor is used in an outdoor boiler, it is mounted directly into the circulating pipe between wort the supply pump and heat exchanger.

Installing the LiquiSonic® sensor eliminates dead space and avoids high installation costs for bypasses.

By using the LiquiSonic® Plato controller 30, up to four sensors can be connected, allowing the simultaneous monitoring of several measuring points. Furthermore, up to 99 beer types with specific calculation models can be stored in the controller.

concentration range: 0 °P to 20 °P  
temperature range: 40 °C to 120 °C

## LiquiSonic® sonic velocity measurement in wort boiler



## LiquiSonic® Plato



21007232  
LiquiSonic® Plato Controller 30 V10



21010116  
Immersion sensor V10 Food, Varivent, L061



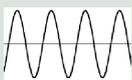
21004463  
Field housing (stainless steel) for LiquiSonic Controller V10

BUS

21004435  
BUS connection: Profibus DP



21004449  
Network integration



21004110  
High power sensor electronic



21004202  
Bus cable indoor (100m)



21007846  
Factory acceptance test (FAT) certificate



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