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GmbH

Better wine from must/mash with automatic fermentation control and management

using

FERMSTAR® 1



Fermentation is by far the most important process in the production of alcoholic liquids, e.g. wine, beer and spirits. Because errors or faults can occur that can only be corrected shortly after they happen, it is of fundamental importance that the development of decisive fermenting factors is **controlled** online and accurately in order to be able to react quickly. These factors are naturally sugar, alcohol and the fermentation temperature because the alcoholic fermentation produces alcohol, warmth, CO₂ among others from sugar. Fermentation faults and errors generally mean significant financial damages for winegrowers, distillers, brewers and others. If you want the optimum quality (e.g. of wine), fermentation must be correctly **managed** or **controlled**.

The most important measures within the scope of fermentation management are: Advance purification of the fermentation product, correct rehydration of the yeast and measures that influence the growth of the yeast (yeast nutrients, tempering and pressure).

The most important apparatus for optimum fermentation are:

- **Fermstar 5** for automatic, correct rehydration of dry yeast and the supply of yeast with nutrients and
- **Fermstar 1** to control fermentation with ongoing automatic measurements of the existing sugar, alcohol and fermentation temperature and for management of fermentation by tempering the fermentation product – preventing yeast growth and the fermentation reaction by cooling, acceleration by reducing the cooling or warming the fermentation product.

Pre-requisite: high performance tank cooling (briefly up to 11 °C under some circumstances). Cooling alone is not sufficient – ill-considered cooling can even cause fermentation stoppage.

Optimal advance purification is a task for the affected winegrower or involved party.

Most important elements in the Fermstar 1 standard delivery:

- ◆ 1 Fermstar 1 measurement device (30h x 20w x 12d - in cm, 4 kg).
- ◆ 1 Linux or Windows XP operating system + Fermstar software.
- ◆ 1 coordinator for organisation of the high performance wireless network, consisting of the individual hubs; communication takes place through a self organising wireless network in the 2.4GHz frequency range. The protocol is orientated towards the IEEE 802.15.4 standard and implements parts of this standard, as necessary for this special purpose.

Available as an option:

- ◆ Super bung to avoid escaping fermentation foam and the loss of sealed liquid (for use up to approx. 17 m³ of fermentation product).
- ◆ Uninterrupted supply voltage (USV) for 20 minute operation of the measurement system after a power failure (and simultaneous alarm trigger).
- ◆ Modem for alarm by text message.
- ◆ Loudspeakers for connection to the PC/laptop for acoustic amplification of alarm signals.

Easy assembly of Fermstar 1:

Mount the Fermstar 1 using a tube to the test tap or similar or place a tube from Fermstar 1 in the must or mash (e.g. through the bung hole or over the edge of a mash tank); then connect with the power supply and a magnetic valve for cold water (and hot water). Fermstar 1 stands on the ground or can be suspended using straps. Fermstar 1 draws a sample every few minutes (variable) of a few ml (variable) from the fermentation product, measures the sample in seconds and pumps it back into the fermentation container. The

measurement results are wirelessly transmitted to a PC or laptop for processing (see above).

Versatile uses of Fermstar 1:

- **Continuous, automatic and precise measurement of sugar, alcohol and temperature.**
- **Automatic production of visible, accurate fermentation curves on the PC/laptop display.**
- **Automatic control of the cooling/heating system.**
With the fastest temperature adjustments, the fermentation reaction of the yeast can be influenced so that the required fermentation level remains constant from the beginning to shortly before the end of fermentation. This means minimisation of the loss of flavour and alcohol, the risk of fermentation stoppage and electricity consumption during fermentation as a result of regular CO₂ emissions or regular fermentation, therefore
 - **Clear quality improvement in alcoholic beverages (full aroma)**
 - **Increase of the alcohol content**
 - **Electricity savings**
 - **Significant improvement to protecting fermentation**
- **Automatic, immediate alarm:**
 - **If fermentation does not start within 48 hours**
 - **In the case of fermentation stoppage and the end of fermentation**
 - **If the required sugar content is reached**
 - **In the event of power failure**

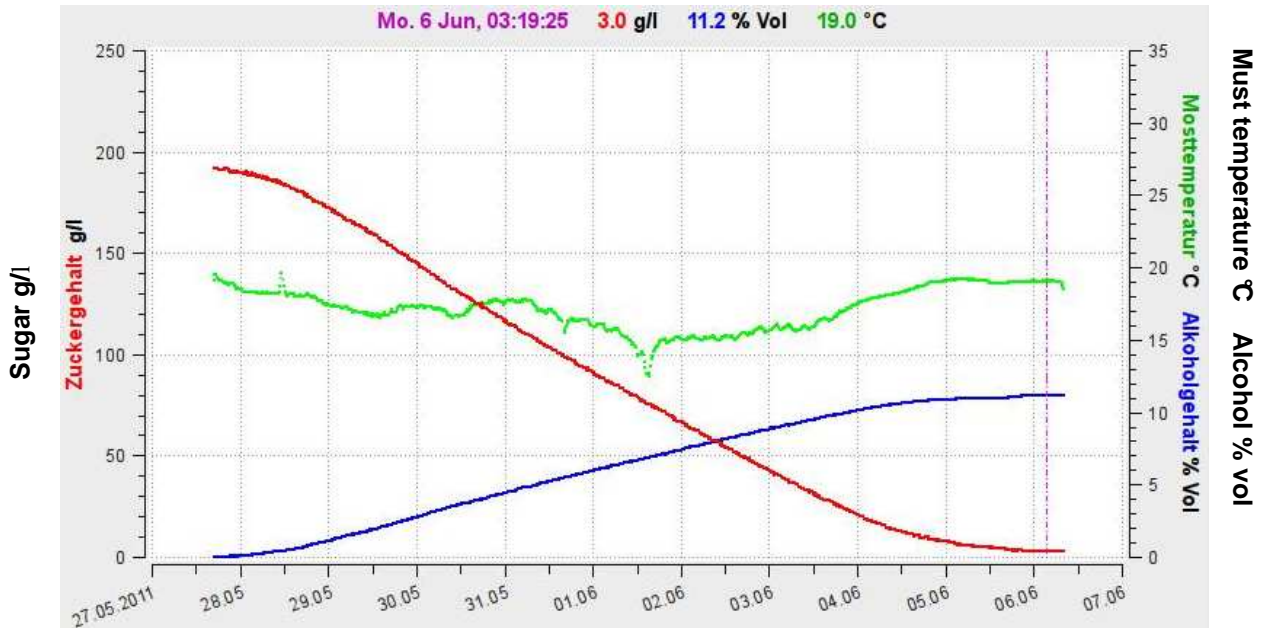
You may choose to be alarmed visually, acoustically or by text message.

When checking the fermentation process visually, a fermentation fault can only be identified immediately by chance.

- **For checking both white and red must fermentations, but also distillation and beer mashes etc.**
- **For all fermentation volumes (from approx. 10 l).**
- **Measurement value transmission to a PC/laptop with a new, high performance, global use wireless network.**
- **For an unlimited number of measurement devices in the wireless network.**
- **No bothersome "stripping" like with bus systems.**
- **Measurement device not connected to the tank (quick changeover to a different fermentation tank).**
- **Watertight, stainless steel housing**
- **No negative impact on measurements due to fermentation foam.**
- **Simple, self-explanatory software.**

- The larger the tank, the lower the costs: approx. 2-4 cent/litre at approx. 4,000 litres of must and normal use in 10 years, for 40,000 litre tanks just 0.2 – 0.4 cent/litre.

Fermentation in our own fermentation laboratory



With a constant fermentation level, the fermentation curve largely becomes a straight line.



- ▶ **Remember: the costs for addressing fermentation stoppage are high and the efforts are frequently without success – wasted money!**
- ▶ **Fermstar 1 is a universal measurement device of the highest quality for optimum wine quality and high fermentation safety – the right choice for you!**