

## QUATROL.50B - SUMMARY

- maintenance-free In-line / Online alcohol and original gravity measuring system for all applications in the beverage industry
- very easy operating via touch screen
- comfortable product memory, freely configurable products
- fully automatic process survey, alarm setting and switch-off possibilities
- various data interfaces for external data transfer
- automatic quality control, DIN/ISO 900ff conformity
- compact and robust configuration of the sensors
- CO<sub>2</sub> independent in the range of +/- 0,5 g/l
- optional connection of CO<sub>2</sub>, O<sub>2</sub>, conductivity, pH, turbidity and colour sensors
- cleaning with the cleaning of the process line (CIP)

The modular concept allows the installation of additional sensors, the adaption of the software and the connection of external PC or PLC systems. The QUATROL-system is adaptable to each plant structure and increases its capabilities with customers demand.

### Technical Data

**Power supply:** 230 VAC / 3 Amp.  
**Measuring range:** °BRIX: 0...30 °BRIX  
 Density: 0,97...1,08 g/cm<sup>3</sup>  
 CO<sub>2</sub>: 0...10 Vol./0...20 g/l  
 Temperature: 0...30 °C  
 CIP until 130 °C

**Accuracies:** °BRIX: +/- 0,01 °BRIX  
 Density: +/- 0,0001 g/cm<sup>3</sup>  
 Original gravity: +/- 0,05 PLATO  
 Alcohol: +/- 0,05 %vol  
 CO<sub>2</sub>: +/- 0,02 Vol.

**Drift:** Drift-free  
**Temperature compensation:** 20/20 °C  
**Signal output:** RS 232 / 485  
 4...20 mA per value

**Process connections:** Varivent system  
 ND10 in the mainpipe

**Operating system:** WIN XP Embedded  
**User software:** QUATROL.50B by ACM

**ACM**

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# Beermonitorsystem QUATROL.50B



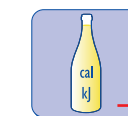
Original gravity



Alcohol



Degree of fermentation



Energy content



°BRIX



CO<sub>2</sub>, O<sub>2</sub>



Conductivity, pH



**ACM**

# Beermonitorsystem QUATROL.50B

A continuous and efficient quality control is important for the beverage industry. Especially during the filling process the individual beer parameters need to be monitored quickly, accurately and reliably. The flexible, modular

and future-save system QUATROL.50B monitors the specific quality parameters of the beverage. What makes this system outstanding is the easy operating and its high accuracy.

### Laserrefractometer LR.10

Caused by the varying quantity of dissolved matter in the medium, a laser beam in combination with a specially coated prism is deflected. A CCD camera detects accurately the deflection, the measuring signal is transferred into °BRIX. A fast temperature sensor reads the temperature of the sample, the BRIX value is compensated to 20 °C reference temperature. The original gravity content is determined from the BRIX value.



### CO<sub>2</sub> measuring unit CO.20

The CO<sub>2</sub> measuring unit serves the Inline/Online CO<sub>2</sub> measurement in the brewery and beverage industry. The measuring principle is based on the continuous ACM partial pressure method; membrane system. The space after a CO<sub>2</sub>-permeable silicone membrane, fixed in the front of the measuring chamber, is filled by diffusion CO<sub>2</sub> until the chamber pressure reaches the partial pressure of the dissolved CO<sub>2</sub> in the liquid. At de- or increasing CO<sub>2</sub> concentration in the liquid, the measuring chamber pressure corresponds. By using up-to-date microprocessor electronics, the current CO<sub>2</sub> value is continuously calculated from the determined pressure and temperature values and shown as the actual value in Vol.

### Densitometer DM.30

For measuring the density the U-tube densitometer is today's common and established method. The liquid to be measured is put into oscillation in a multiply bent pipe and the resonance frequency is measured. In addition, the influence of temperature is quickly compensated.



The continuous Online measurement QUATROL.50B covers as beer physical parameters

- the refraction number
- the density of the liquid
- and the CO<sub>2</sub>-value

Based on these readings a complete mathematical beer analysis according to MEBAK / Balling is carried out.

The following values are determined:

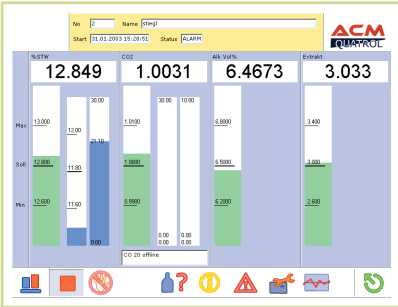
- Alcohol in %vol and g/l,
- Original gravity direct and calculated,
- Extract apparent and real,
- Degree of fermentation,
- Energy content in cal and kJ.

For easy reading verifying to laboratory results, measuring values are compensated to 20 °C.

### Determination of original gravity according to the Laser principle

The refraction index (BRIX value) is highly accurately measured by the combination of a laser beam and a special prism, including unique signal evaluation electronics and algorithm.

A CCD camera detects a deflection caused by concentration. The deflection is transformed into a proportional measuring signal. A temperature sensor measures the beverage temperature and compensates the BRIX-reading to 20 °C reference temperature.



All measuring signals are recorded, calculated and stored by a micro computer system.

Density is continuously measured at an accuracy of +/- 0.0001 g/cm<sup>3</sup>.

The optional CO<sub>2</sub> measurement is carried out via the real Inline continuous analyser CO.20. No moving parts, robust and highly accurate, +/- 0,02 Vol.

### QUATROL.50B user terminal features:

The system owns a big versatile product storage, media settings with up to 200 products are possible.

When a product is selected by its individual number or name, the production control process runs fully automatically.

If measuring values exceed given limits, an alarm is given.

The connection of audio-visual alarm devices and a filler switch-off is always possible.

The start-up and finishing process are monitored without problems in the Manual-mode.

A protocol printer brings transparency in the filling process.

For easy-to-handle system calibration, an adjustment to laboratory values can be done during production.

Simple operation is guaranteed by modern touch screen-display technology.

Operation errors are excluded.

**Start:** Button „START“, Selection of the product number; Button „ENTER“. The system starts in the Manual-mode, no alarms are set.

**Automatic:** Button „AUTO“. After start-up the system is switched to surveillance mode, On case of exceeding readings alarms are given.

**Manual:** Button „MANUAL“. Manual operation. Avoids unnecessary alarms in case of errors.

**Stop:** Whilst the filling process stops, the surveillance mode is halted, no alarms are caused by production stop.

**Production finish:** Button „FINISH“. End of surveillance.

All these events as well as additional data can be recorded by in- or external protocol printers.

| Name                  | Wert    | Name           | Wert    |
|-----------------------|---------|----------------|---------|
| Brechungsindex        | 1.3410  | Brennwert kJ   | -37.10  |
| Refraktionszahl       | 35.4560 | Brennwert kcal | -148.75 |
| BRIX                  | 5.50    | BRIX Temp      | 20.70   |
| Dichte                | 1.0532  | Dichte Temp    | 18.90   |
| %STW errechnet        | -11.95  | CO Temp        | 0.00    |
| %STW LR               | 5.50    | CO Druck       | 0.00    |
| Vergärungsgrad Schein | 209.90  | CO Ist         | 0.00    |
| Vergärungsgrad Wirkl  | 178.60  |                |         |

QUATROL.50B is an open and modular system, growing with customers demand. CO<sub>2</sub>, O<sub>2</sub>, conductivity, turbidity and pH sensors can be connected and their readings monitored.

By this, QUATROL.50 represents a complete automatic quality control system according to IFS/DIN/ISO 900ff. The QUATROL.50B system provides with all up-to-date data interfaces, to be bind into existing PC networks or PLC systems.