

**Lg - automatic aps**

DENMARK

*We are specialized in sample and test equipment for breweries.*

*Since 1977 LG-automatic has delivered simple and trustworthy instruments to measure the quality of beer production.*



## Laboratory shaker

RY-002

This apparatus is specially designed for bitterstuf determination.

Shaking movements are adjusted in order to obtain an optimum mixing and to prevent the sample from getting too hot.

As a very heavy sample shaking is required all moving parts are supplied with strong stainless steel ball bearings.

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### General:

This shaking apparatus has been developed to meet the heavy demands made on an altogether accurate shaking process which is one of the conditions of a reproducible and precise determination of bitterness.

In order to avoid developing a product exclusively to be used for determination of bitterness the motor is operated by an electronic unit not only regulation the engine speed at the preset speed but also displaying the shaking speed in cycles per min. Moreover, the electronic unit is fitted with an electronic timer operated through a digital pushbutton system at the front panel to set the shaking duration at digits from 1 to 99 minutes.

It is possible to set the shaking speed at digits from approx. 150 to 650 cycles per min. The shaking motion which is locked to 20 mm Amplitude and cannot immediately be changed has been fixed on the basis of numerous experiments with determination of bitterness where the most important thing is to attain a sufficiently heavy shaking with a minimum heating of the sample.

Considering the fact that determination of bitterness requires a very heavy shaking special attention has been given to the construction of the mechanical system to make sure that it can meet the requirements including a very long life. Consequently, all movable parts are fitted with heavy duty closed ball bearings. To secure the motor against too heavy and too many loads on the motor shaft, motor and eccentric system are separated.

The driving power is transmitted through a toothed belt system to a shaft fitted with an eccentric arrangement including a connecting rod fastened to the motion system.

### Speed setting:

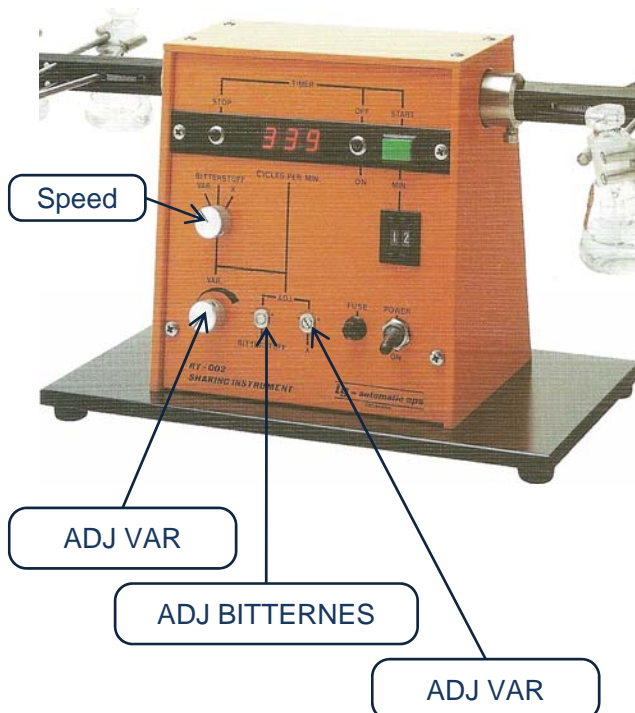
There are three options to set the shaking speed by turning the speed button.

VAR: When moving the rotary switch to setting VAR it is possible to adjust the shaking speed all over the range of measurement by turning the button marked VAR.

BITTERNES: When delivered, the instrument is preset at 600 cycles per min. At this speed the timer must be set to 15 minutes. It is possible to change the preset speed by using a screwdriver - setting marked ADJ.BITTERNES.

X: Also when moving the rotary switch to setting X the speed will be preset and may be adjusted by using a screwdriver - setting marked ADJ.X

Note: Above adjustments (ADJ.BITTERNES and ADJ.X) must be made only when the instrument is turned on and the speed is displayed. The adjusted speed will be stored and will be available also when the load is changed.



### Time Setting:

An electronic timer integrated in the instrument is connected or disconnected when switch marked TIMER ON/OFF is activated.

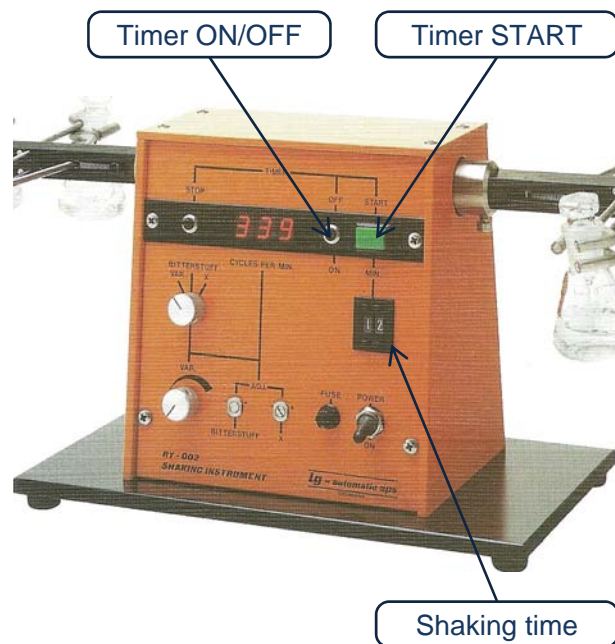
In position OFF the instrument is started by pressing the button marked TIMER START. The instrument will then operate continuously until pushing the switch marked TIMER STOP.

In position TIMER ON the shaking time is set at digits of whole minutes from 1 to 99 by pressing the digital switch marked TIMER MIN.

In position TIMER ON the instrument is started by pressing the button marked TIMER START. The instrument will operate until the set time is reached and the timer automatically disconnects the instrument and reset, ready for next period.

It will always be possible to stop the instrument by pressing the button marked TIMER STOP. The timer is simultaneously reset.

Loss of power or disconnection of the switch POWER ON will also reset the timer.



### Instrument operation:

#### Variable speed with timer duration 15 min:

- 1 Set the timer switch in position ON.
- 2 Set the digital timer switch at 15 min. by pressing the (+ or - ) buttons above and below the digits.
- 3 Set the rotary switch in position VAR.
- 4 Set the main switch POWER in position ON.
- 5 Start the instrument by pressing TIMER START.
- 6 Turn the adjustment button marked VAR until the desired speed is displayed

#### Bitterness with timer 15 minutes:

- 1 Set the timer switch in position ON.
- 2 Set the digital timer switch at 15 minutes by pressing the buttons (+ or - ) above and below the digits.
- 3 Set the rotary switch in position BITIERNNESS.
- 4 Set the main switch POWER in position ON.
- 5 Start the instrument by pressing TIMER START

#### X operation without timer: (operates until manual stop)

- 1 Set the timer switch in position OFF.
- 2 Set the rotary switch in position X
- 3 Set the main switch POWER in position ON
- 4 Start the instrument by pressing TIMER START.