

# Instruction Manual Pocket Refractometer PAL-Urea

## Names and functions PAL-Urea

### 1. Liquid Crystal Display (LCD)

Displays measured value in % urea and battery indicator.

### 2. Sample stage

Prism to apply sample.

### 3. START key

Start measurement. Press and hold down for 2 seconds to turn off instrument.

### 4. ZERO key

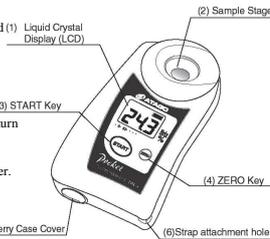
Press to perform zero-setting with water.

### 5. Battery Cover

Remove to insert or replace batteries

### 6. Strap attachment hole

To attach portability strap.

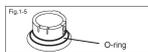
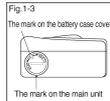
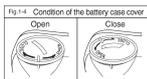


## Batteries

1. Remove battery case cover + protective tape (fig. 1-1)

2. Insert 2 AAA alkaline batteries, following diagram on back of unit (fig 1-2)

3. Put battery case cover back in place, use coin to turn clockwise completely as indicated in fig. 1-3 and 1-4



### Important!

Keep o-ring (fig. 1.5) under battery case cover clean and avoid deformation. A dirty or deformed o-ring may cause water to enter the instrument and damage the electronics.

## Battery indicator

When battery power is low (see symbol) batteries must be replaced. Use only new 1,5V LR03 AAA batteries.

Reset (ZERO) the instrument after replacing batteries.



## Zero Setting

### Important!

Perform Zero Setting each day prior to using the Instrument. Use water of approx. the same temperature as the PAL-Urea. If not, wait approx. 10 seconds to adjust to the prism temperature. Avoid direct sunlight or bright lights to shine onto the prism.

1. Prepare clean water (tap water of distilled water)

2. Clean prism surface (fig. 2-1)

3. Place approx. 0.3 mL of water onto the prism surface (fig. 2-2 en 2-3)

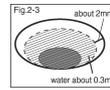
4. Push START. The Urea % value will be displayed after the arrow in the LCD display blinks 3 times.

5. If the display indicates 0.0% zero-setting is not needed. Wipe the water off of the prism surface using a tissue. The PAL-Urea is now ready to use.

6. If indicated value is not 0.0% , press the ZERO key with the water still on the prism (fig. 2-4)

7. After blinking 3 times "000" will be displayed (fig. 2-5). If display reads "AAA" add more water onto the prism surface and press ZERO again.

8. After "000" is displayed zero-setting has been completed. Dry the water off of the prism surface using a tissue. The PAL-Urea is now ready to use.



## Measure Urea % in AdBlue®

### Important!

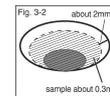
\* Do not use metal tools when sampling. Metal can damage the prism surface.  
\* If the AdBlue® has a different temperature than the instrument, wait approx. 10 sec. before pressing START, allowing the sample to adjust to the prism temperature.  
\* If the ELI (External Light Interference) function indicates [nnn] warning message, shade the sample stage with your hand from excessive light

1. Clean the prism surface

2. Place approx. 0.3 mL AdBlue® onto the prism surface (fig. 3-1 en 3-2)

3. Press START (fig. 3-3)

4. The Urea (%) value is displayed after the arrow blinks 3 times (fig. 3-4)



5. The measurement value will remain displayed for approx. 2 minutes. Press START key at least 2 seconds to turn off instrument.

6. Remove the sample by wiping it off with a tissue. Use water to remove any remaining sample. Dry off any excess moisture with a clean, dry tissue.

### Important!

Avoid AdBlue® to remain and crystallize on the prism. This will damage the prism.

## Error Messages

AAA = Zero Setting Error (fig. 4-1)

\* No water or insufficient water on the prism

During zero setting

\* A substance other than water is used for zero setting

LLL = Sampling Error, Measurement Error,

Battery Error (fig. 4-2)

\* Too little sample on the prism.

\* Low batteries

HHH = Over Range (fig. 4-3)

\* Concentration of sample higher than 40,0 %

Ambient Temperature Error (fig. 4-4)

Flashing arrow after pressing START: sample too hot, or ambient temperature above 40°C.

© NOX reducing agent as described by ISO 22241-1, AdBlue is a registered trademark from VDA.

## Warranty

The PAL-Urea is warranted for one year after date of purchase against any manufacturer defect in materials or workmanship. Mistreatment or misuse, e.g. scratching the prism, will void the warranty.

