

Milwaukee Mi 456 – Titrable Total Acidity Minititrator– Instruction manual

This visual manual is an integral part of the operating manual, supplied with the Mi456.

It contains some practical visual tips which can be helpful when using the instrument.

Please read carefully the operating manual before using the instrument.

Have a nice view !!!

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Specifications



- **Range:** 0 to 25.0 g/l tartaric acid
- **Resolution:** 0.1 g/L
- **Accuracy:** 5% of reading
- **Sample volume:** 2 ml

- **Method:** Acid/Base titration method
- **Principle:** End point titration
- **Power supply:** 220 V / 50 Hz
- **Dimensions:** 208x214x163 cm
(8,2 x 8,4 x 6,4")
- **Weight:** 2,2 kg (77,6 oz)

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Front Panel



- (1) Display
- (2) PUMP – to start/stop the pump.
- (3) STIR – to start/stop the stirrer while in measurement or purging.
- (4) CAL – to enter pump or pH calibration mode.
- (5) pH – to enter pH calibration mode (when CAL tag is active) to modify the end point.
- (6) START/STOP – to start/stop titration.

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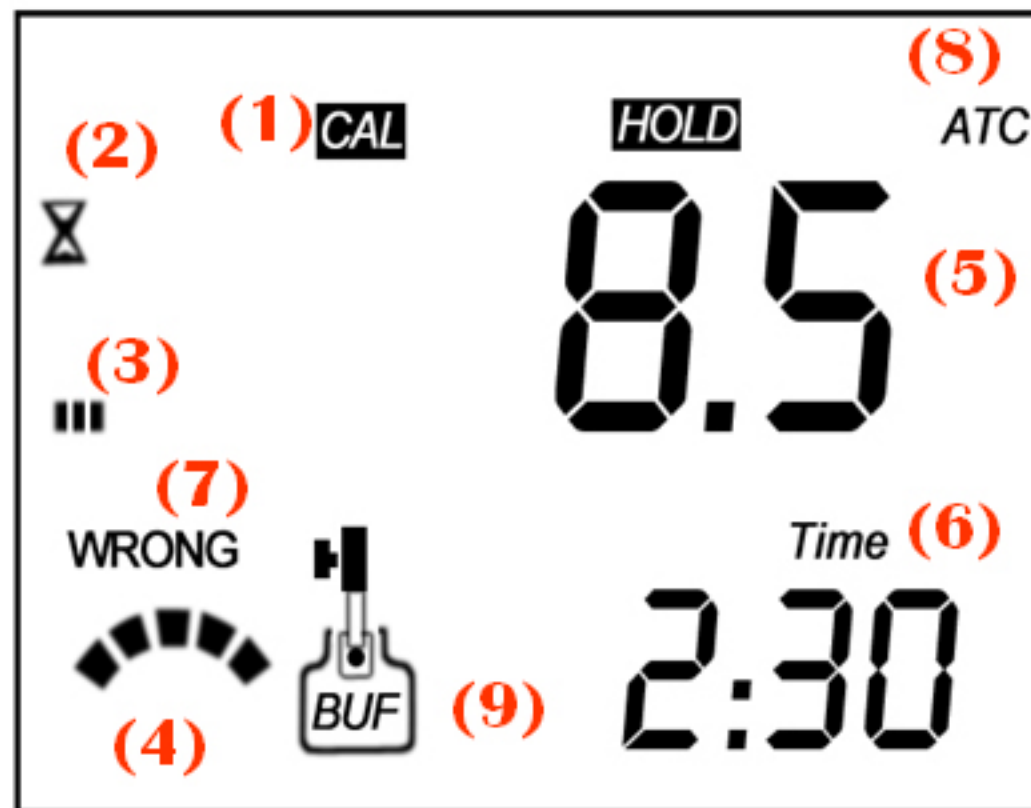
Rear Panel



1. Peristaltic pump
2. BNC pH electrode connector
3. Temperature probe connector
4. Power cable connector
5. Fuse holder
6. Power switch

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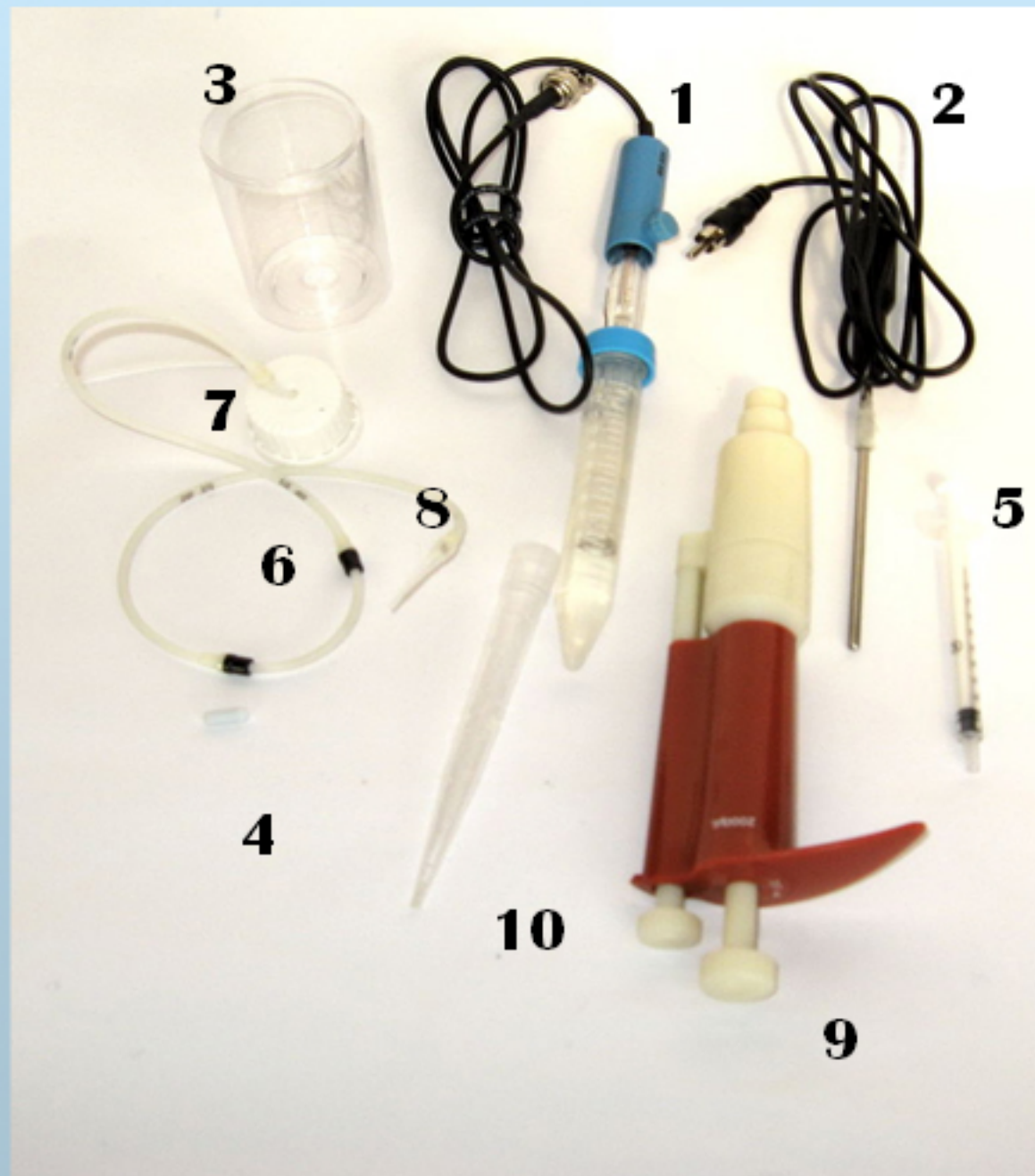
Display



- (1) When CAL button is pressed.
- (2) Stability Indicator: when reading is unstable or calibration is in progress
- (3) Stirrer active tags
- (4) Pump active tags
- (5) Main display
- (6) Secondary display
- (7) Calibration messages
- (8) Automatic temperature compensation. When ATC blink, the temperature probe is not connected and the temperature is considered to be 25°C
- (9) Calibration messages

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The meter is supplied with the following accessories:



- 1 - pH electrode MA919B/1
- 2 - Temperature probe MA831R
- 3 - 100 ml Beaker (x2)
- 4 - Stir bar
- 5 - 1 ml syringe
- 6 - Tube set with cap for titrant bottle (7) and titrant tip (8)
- 9 - 2 ml pipette
- 10 - Tips for 2 ml pipette (x2)

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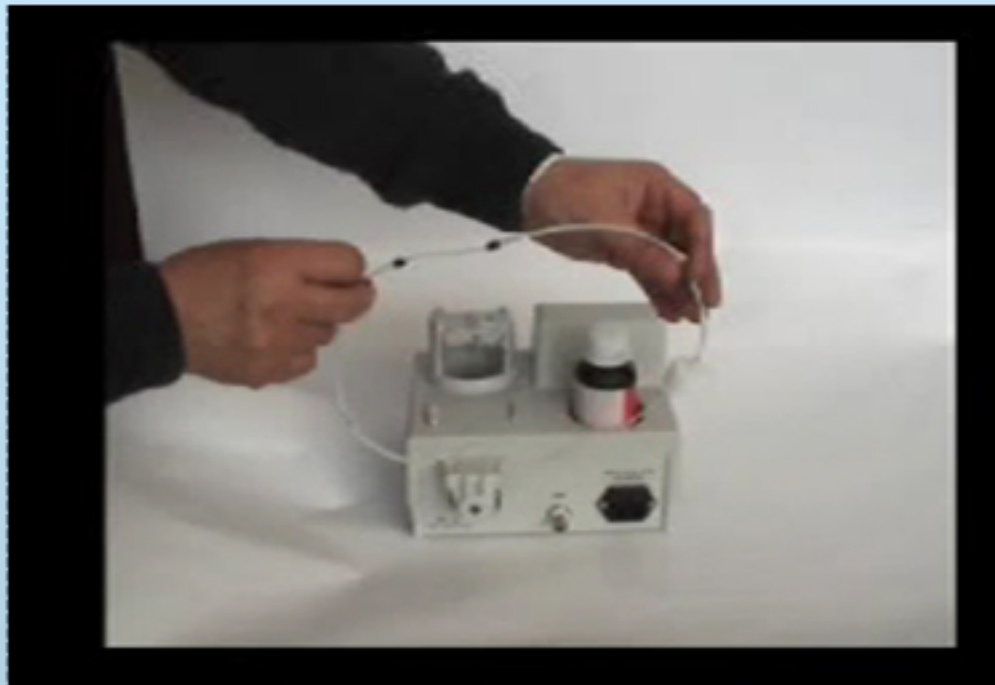
The meter is supplied with the following reagents/solutions:



- 1 Mi556-001 - Calibration standard
(100 ml)
- 2 Mi556-002 – Titrant solution
(100 ml)
- 3 Mi556-003 – Buffer solution pH 7.0
(100 ml)
- 4 Mi556-004 – BufferSolution pH 8.2
(100 ml)

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Connect tubing to the pump



**Click on the frame above
to activate video**

To mount the peristaltic tube follow the next steps:

- 1/ Position the first peristaltic pump fitting ring on its location
- 2/ Stretch the tube around the peristaltic pump cylinders
- 3/ Fix the second peristaltic pump fitting ring on its location
- 4/ Attach the tube to the titrant bottle (Mi555-002) and position the titrant tip on to the central hole of the electrode holder.

See video 1

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Attach titrant cap to the bottle



**Click on the frame above
to activate video**

- 1/ Place the cap of the peristaltic tube on the titrant bottle Mi555-002.
- 2/ Screw the bottle on to the cap and put it in to place.
- 3/ Press the PUMP button.
- 4/ Purge the peristaltic pump until drops of the titrant appear on the dosing tip.
- 5/ Make sure no air bubbles are in the tube or tip.

See video 2

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Set up pH electrode



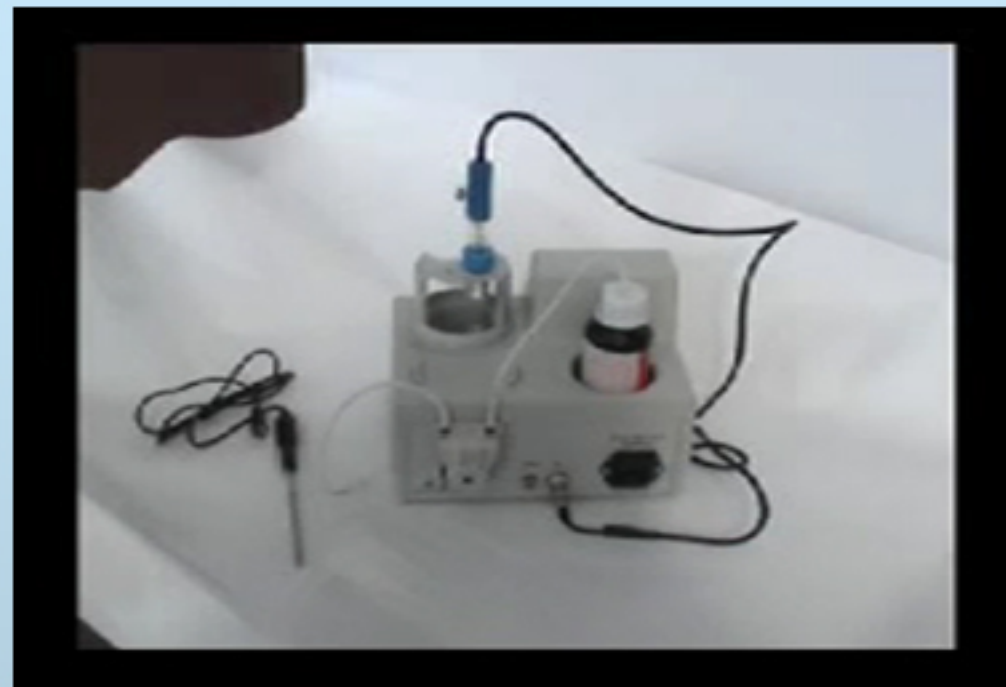
**Click on the frame above
to activate video**

- Connect the pH electrode to the BNC connector, located in the rear part of the instrument.
- Open the refill cap on top of the pH electrode.
- Take off to protective vial, the pH electrode.
- Place the pH electrode on the electrode holder.

See video 16

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Set up temperature probe



**Click on the frame above
to activate video**

- Connect the temperature probe to the connector, located in the rear part of the instrument.
- Place the temperature probe on the electrode holder.
- The central hole of electrode holder is for the titrant solution tip.

See video 15

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Pump Calibration procedure (1)



**Click on the frame above
to activate video**

- Use the 2 ml automatic pipette to add exactly 2 ml of Mi556-001 standard in to 100 ml beaker.
- Fill the beaker up to 50 ml mark with deionized water.

See video 13

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Pump Calibration procedure (2)



Click on the frame above
to activate video



- Place the stir bar into the 100 ml beaker
- Place the 100 ml beaker into the beaker holder
- Place the electrode holder on the top of the beaker and fix by turning clockwise
- Open the refill cap on the ORP electrode and put the electrode in the electrode holder
- immerse the electrode approximately 2 cm (0.8") into the sample to be tested, making sure it does not touch the bottom of the beaker
- Ensure there is the titrant in the dosing tip. If not press the PUMP key for a few seconds until the titrant is in the dosing tip. No air bubble should be in the dosing tip/tube.
- Place the dosing tip, in the electrode holder.

See video 14

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Pump Calibration procedure (3)



- Press the CAL button, to enter in the pump calibration mode
- Press the PUMP button, in order to start the pump calibration
- At the end of calibration, “DONE” appears for 1 second, and the meter returns to the measurement mode

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pH Calibration procedure (1)



**Click on the frame above
to activate video**

- Fill the 100 ml beaker up to 50 ml mark, with buffer solution 7.0 pH (Mi556-003) or with buffer solution 8.2 pH (Mi556-004)

See video 17

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pH Calibration procedure (2)



Click on the frame above
to activate video



- Place the stir bar into the 100 ml beaker
- Place the 100 ml beaker in to the beaker holder
- Place the electrode holder on the top of the beaker and fix by turning clockwise
- Open the refill cap on the ORP electrode and put the electrode in the electrode holder
- immerse the electrode approximately 2 cm (0.8") into the sample to be tested, making sure it does not touch the bottom of the beaker
- Ensure there is the titrant in the dosing tip. If not press the PUMP key for a few seconds until the titrant is in the dosing tip. No air bubble should be in the dosing tip/tube.
- Place the dosing tip, in the electrode holder.

See video 18

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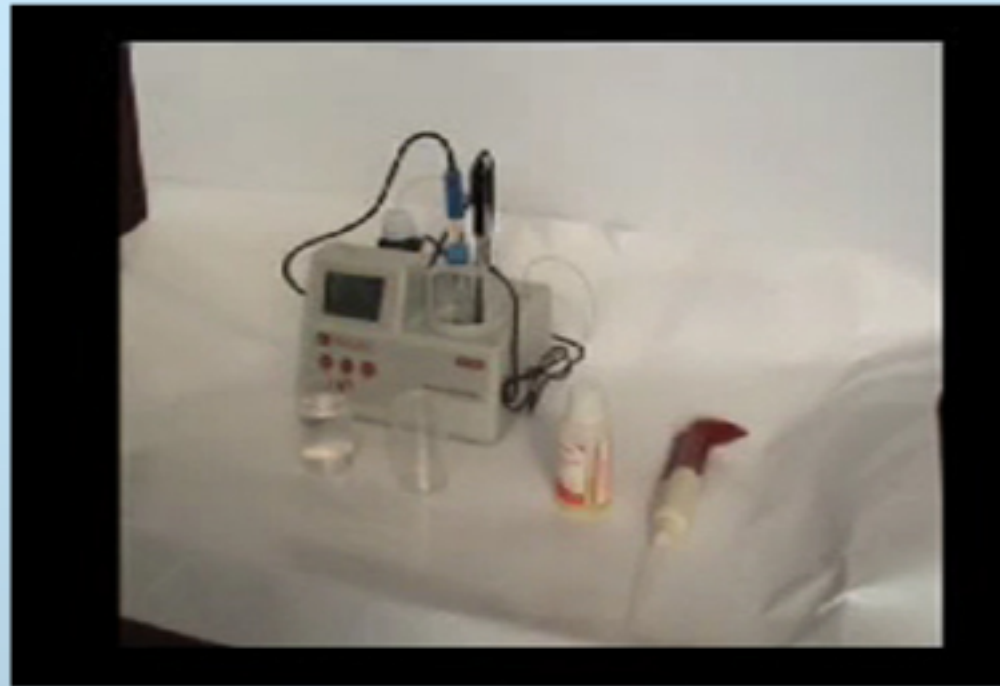
pH Calibration procedure (3)



- Press the CAL button.
- The CAL tag will appear blinking
- Press the pH button in order to start the pH electrode calibration
- At the end of the calibration procedure "DONE" appears for 1 seconds, and then the meter automatically returns to the measurement mode

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Measurement procedure (1)



**Click on the frame above
to activate video**

- Use the 2 ml automatic pipette to add exactly 2 ml of wine sample in to 100 ml beaker.
- Fill the beaker up to 50 ml mark with deionized water.

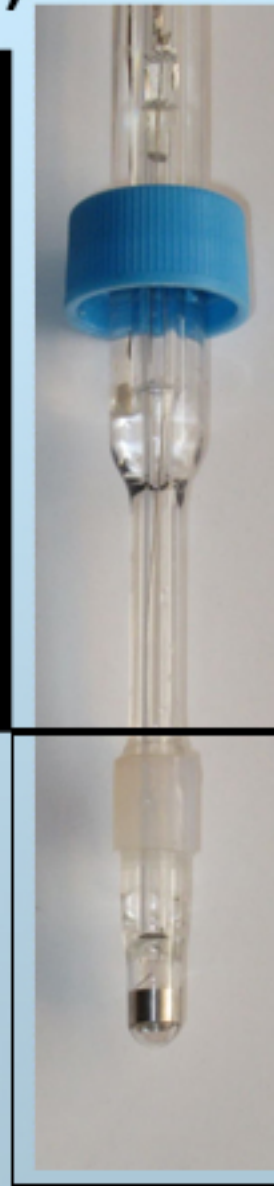
See video 13

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Measurement procedure (2)



Click on the frame above
to activate video



- Place the stir bar into the 100 ml beaker
- Place the 100 ml beaker in to the beaker holder
- Place the electrode holder on the top of the beaker and fix by turning clockwise
- Open the refill cap on the ORP electrode and put the electrode in the electrode holder
- immerse the electrode approximately 2 cm (0.8") into the sample to be tested, making sure it does not touch the bottom of the beaker
- Ensure there is the titrant in the dosing tip. If not press the PUMP key for a few seconds until the titrant is in the dosing tip. No air bubble should be in the dosing tip/tube.
- Place the dosing tip, in the electrode holder.

See video 14

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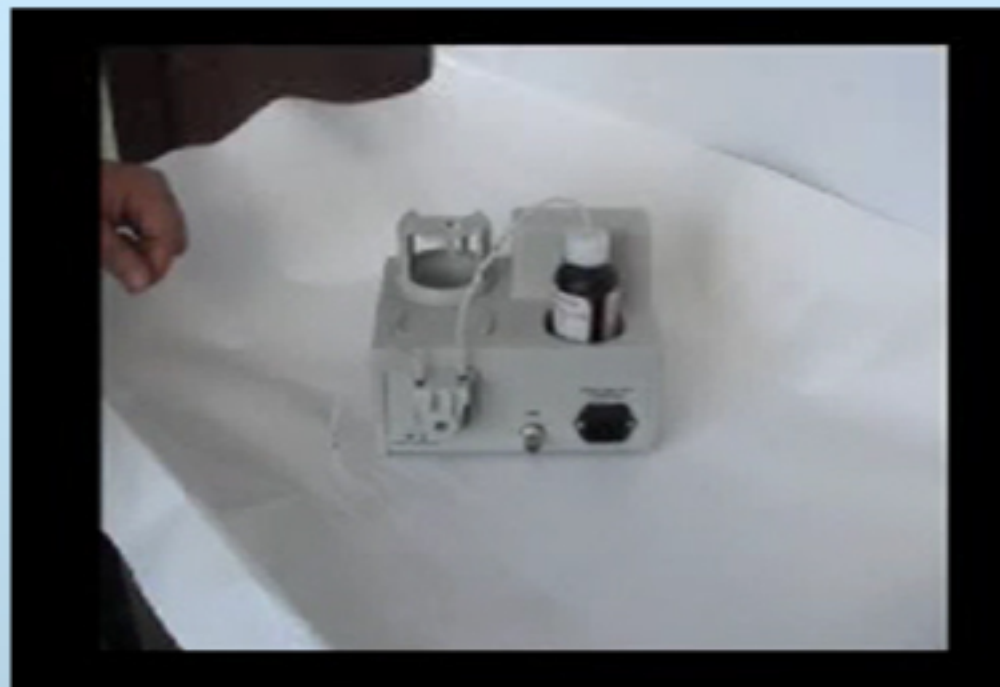
Measurement procedure (3)



- Press the START/STOP button to start the titration
- The display will show “- - -” during the titration, along with stirrer and pump tags blinking on the display, and 7.0 or 8.2 pH buffer on the secondary display
- At the end of the titration calibration procedure the Total Titrable Acidity concentration is displayed in g/L.

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Titrant Tube Replacement



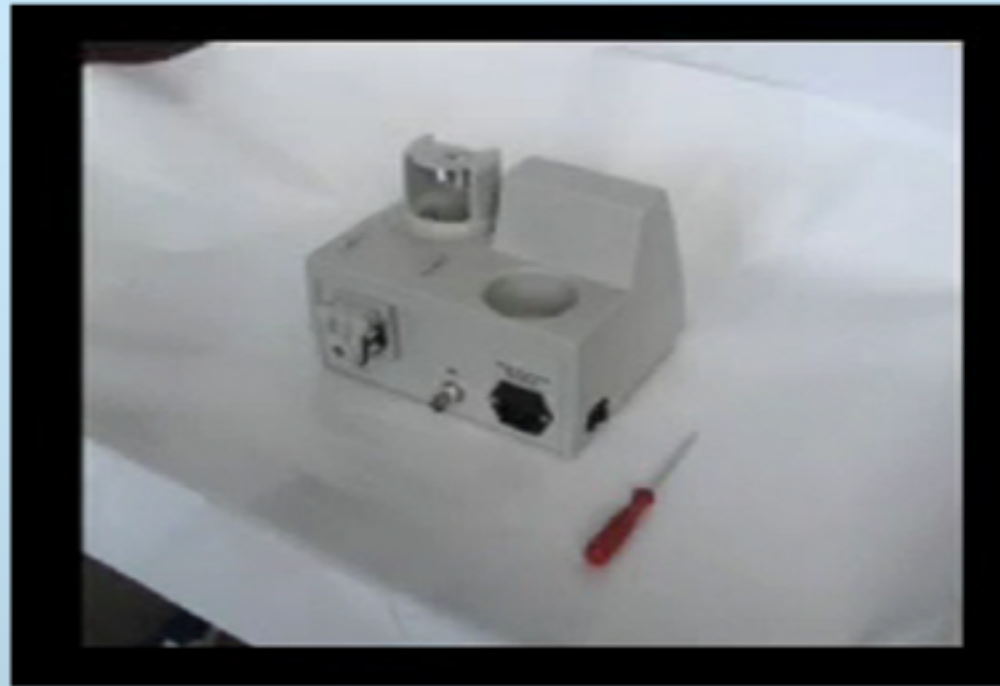
**Click on the frame above
to activate video**

- To remove the tube of the peristalting pump proceed as follows:
 1. Detach the old tube system (tube, cap and tip), from the titrant bottle.
 2. Lift and take off the fixing ring (black) of the peristaltic pump tube.
 3. Pull the tube until it's taken out from its location.
 4. Remove the other side of the tube.
 5. To mount the new peristaltic pump tube, refer to slide 8 (set up titration tube)

- ***See video 10***

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Fuse Replacement



**Click on the frame above
to activate video**

- To change the fuse procede as follow:
 1. Disconnect the power cord from the rear panel of the instrument.
 2. Pull out the fuse holder located near the power cable connector
 3. Replace the fuse with a new one.
 4. Push the fuse holder with the fuse in the appropriate place.

- ***See video 11***

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Electrode Refilling procedure



**Click on the frame above
to activate video**

- If the filling solution (electrolyte) is more than 2.5 cm (1") below the fill hole, add MA9011 3,5 M KCl Electrolyte solution, by using the syringe supplied with the meter
- For faster response, unscrew the fill hole screw during the measurements.
- ***See video 12***

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Electrode Cleaning procedure



- For wine deposits and wine stain use M10016 cleaning solution.
- Put the electrode for 15/20 minutes in the cleaning solution.
- After the cleaning procedure, rinse the electrode (for 20 seconds) thoroughly in distilled water.
- Before the use of electrode, perform the pump calibration procedure (slide 11) .