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Congratulations on your purchase of an ANKOM Technology Fiber Analyzer. Your selection of an ANKOM system indicates that you desire to increase your wet chemistry efficiency and maintain the highest levels of precision and accuracy possible.

The ANKOM Fiber Analyzer was designed to efficiently and accurately analyze up to 24 samples individually enclosed in filter bags. Analyses for Acid Detergent Fiber, Neutral Detergent Fiber and Crude Fiber are accomplished in a batch operation. The system can also be used to support ADIN and ADL assays and more because the filter bags are nitrogen and ash free. "Digestion" and rinse operations are all performed within the same instrument and the separate filtration step is eliminated. The ANKOM Fiber Analyzer maintains a solution temperature of 100° C, while providing proper agitation to ensure a uniform flow of chemical solution across each sample.

By ensuring the proper care and maintenance of your fiber analyzer, you will help to keep your system running smoothly for years. Please review the entire contents of this manual before you begin operating this product. It is also important that you follow the procedure as closely as possible. Often discrepancies in values are the result of procedural errors.

ANKOM Technology is committed to your total satisfaction. We are always available to assure that you get the most out of your ANKOM products. Feel free to contact us with your questions and suggestions. We also provide a full range of products to support In Vitro and In Situ studies. We offer chemicals and other ancillary products that will assist you in getting results at a reasonable cost.

ANKOM Technology is Helping to Feed the World.

WARRANTY

ANKOM Technology Corporation warrants the ANKOM Fiber Analyzer against any defects due to faulty workmanship or material for a one-year period after the original date of consumer purchase. This warranty does not include damage to the instrument resulting from neglect or misuse. If the instrument is damaged as a result of defects in the workmanship or materials during the warranty period, ANKOM will repair or replace the instrument free of charge.

For any questions regarding the warranty or instrument, please contact ANKOM at:

Telephone (315)-986-8090    FAX: (315)-986-8091    service@ankom.com
Safety Precautions
Upper Surface

**Caution, Hazardous Pressure**- Do not open the vessel lid during operation - the contents of the vessel are hot and under pressure. **Failure to observe this caution may result in scalding or burning.**

**Caution, Hot Surfaces**- Do not touch the upper surfaces of the instrument during operation - surface can exceed 70 °C (160° F). **Failure to observe this caution may result in scalding or burning.**

Rear Surface

**Caution, Hazardous Voltages**- Do not operate the instrument with the cover removed - hazardous voltages present during operation. The power cord must be disconnected prior to rear panel removal. Electrical shock or electrocution may result if ignored.

**Caution Hazardous Materials**- Do not operate the instrument unless the leak detector is in place. The expulsion of hazardous chemicals could result. Dispose of fluid in the same manner as assay fluid.

**GENERAL**

- All switches must be off before plugging in the instrument. **Agitate and Heat** buttons are in the OFF position when extended.
- **WARNING:** The Heat button should only be on when the vessel contains liquid.
- **WARNING:** Do not open the vessel lid during or after an operation until both pressure and liquid are thoroughly exhausted. After securing the exhaust hose along the path to the drain, slowly open the exhaust valve. **NOTE: Failure to secure hose could result in uncontrolled chemical flow.**
  - Three safety devices turn off the heater in the instrument in the event of a malfunction
    1. An electric circuit breaker
    2. A temperature shut-off switch
    3. A pressure shut-off switch
- The user should be aware that if the equipment is used in manner not specified by the manufacturer the protection provided by the equipment may be impaired.

**Specifications**

ANKOM 200 - 120V~ 15 amp 60Hz
ANKOM 220 - 230V~ 8 amp 50Hz

**Acceptable Ambient Operating Temperature** - 15-30°C (60-85° F) Humidity- 20-60% RH
**Instrument Set-up**

Your instrument comes complete with a power cord, an exhaust hose, and a bag suspender with weight.

- Set the instrument on a firm, level surface. Place the back of the instrument no closer than three inches from a wall. **NOTE:** Do not locate this instrument where it will be subject to excessive shock, vibration, dirt, moisture, oil, or other fluids. Do not place near microwave ovens or mechanical devices.
- Plug the power cord into the instrument receptacle and then into an electrical outlet.
- The **AGITATE** button allows the agitator to move the solution flow through the filter bags by raising and lowering the bag suspender in the vessel.
- The **HEAT** button allows the controller to heat the vessel and solution. **NOTE:** Do not activate heat unless vessel contains an appropriate amount of solution.
- The **Timer/Clock** has four adjustable countdown settings and a clock function. An audible alarm will sound but will not turn off the instrument.
- The **Controller** is preset for 100°C. Do not adjust. It controls the temperature inside the digestion vessel.
- The **Exhaust Valve Handle** exhausts the pressure and solution from the vessel.
- The **Exhaust Hose** must be secured into a drain or suitable container. **NOTE:** The exhausted solution is under pressure and can cause the hose end to spray in all directions.
- The **Bag Suspender** holds up to three filter bags per tray. There are nine trays. The ninth tray acts as a cover and will not contain filter bags.
**Operation**

**To Start the Cycle:**
- Turn on the instrument’s Main Power Switch.
- Pour solution into the Vessel.
- Place bag suspender with the samples and bag suspender weight into the vessel.
- Turn on the Heat and Agitate buttons. After ensuring the bag suspender is agitating, close and tighten vessel lid.
- Start the Timer.

**To End the Cycle:**
- Turn off the Heat and Agitate buttons
- After securing the Exhaust Hose, slowly open the Exhaust Valve Handle and exhaust the solution.
- Close the Exhaust Valve Handle.
- Open the Vessel Lid.
- Pour in rinse water as per procedure instructions, lower lid and activate agitation.
- Agitate for three to five minutes, rinse and exhaust water, repeat as per procedure.
- Remove the Bag Suspender from the vessel. Turn off Main Power Switch.

**Initial Maintenance**
- During the first 20 hours of operation more frequent inspection of the agitator assembly is required.

- After every three to four hours of use, check the Reservoir of the Maintenance Alert for any fluid accumulation. If any fluid is present, unscrew the Reservoir and drain the fluid. Replace the Reservoir.

- Disconnect the power supply and remove the back of the instrument. Visually inspect the agitator assembly, specifically the area between the Maintenance Alert Collector and the Packing Nut. If signs of leakage are evident, clean the area thoroughly. Turn on the Agitate button and tighten the Packing Nut until the motor begins to labor (the motor sound will change). At this point, loosen the Packing Nut approximately 1/16 turn or until the motor noise returns to normal. Replace the rear panel. Check the Maintenance Alert Reservoir after the next assay for leakage.
**TROUBLESHOOTING**

Your ANKOM instrument has been designed for long service and ease of maintenance. Most problems are easily diagnosed and fixed. If you experience problems that are not addressed in the information below or if you have any questions, contact ANKOM Technology for assistance. We are committed to fast and reliable service.

**Problem:** The Fiber Analyzer will not turn on.  
**Possible Causes:** The power cord is not plugged into the unit or the power source.  
*The main power switch is not turned on.*  
*One of the system circuit breakers needs to be reset.*

**Problem:** Fluid is observed in the Maintenance Alert Reservoir.  
**Possible Causes:** Leakage has occurred at the agitator shaft. The **Packing Nut** inside the system requires attention. Refer to the Periodic Maintenance section of this manual for instructions.

**Problem:** The agitator is not moving and/or the motor sounds strained.  
**Possible Causes:** The **Packing Nut** may have been tightened too much during periodic maintenance. Try loosening the **Packing Nut** slightly until the motor begins to operate and agitator moves freely.

*If periodic maintenance was ignored and acid solution was allowed to leak into the packing assembly the shaft may become “frozen”. Check for corrosive buildup. The **Packing Set** and **Agitator** may need to be replaced.*

**Periodic Maintenance**

- To ensure trouble-free operation, tighten the **Packing Nut** every 1-3 months depending on instrument usage.

- Check the **Reservoir** after every 40 hours of use. If leakage is evident, tighten the **Packing Nut**.

- Check the Bag Suspenders Trays for wear or melted sections every three to six months depending on usage. The underside of the Bag Suspenders Trays (especially the bottom Tray) should be flat. If it appears concave, the Bag Suspenders may stick in the Digestion Vessel and melt. Replace the trays as necessary.

- Check the Bag Suspenders Tip for excessive wear every three to six months. Replace when the tip has worn flat or is lopsided.

**Storage**

- When the instrument will not be in use for a long period of time (+ one month), fill the vessel with water and run the agitator for approximately 10 minutes. Rinse the vessel thoroughly out with water. This will ensure no acid residue will corrode the instrument during storage.

- To maintain the outside cabinet, wipe the outside of the instrument with window cleaner or a retail cleaner. Acid residue left on the exterior may damage external electrical components.
For problems relating to the results of your analyses using the ANKOM Fiber Analyzer first check to ensure the procedures sent with your machine were followed. Some possible variables that may affect your results are:

- Improper solution concentrates.
- Some chemicals may have come out of solution in your mixes and need to be heated and re-mixed.
- Rinse water was not heated to 95°-100° C (especially the first rinse).
- Oven drying temperatures were too high (drying temperatures higher than 105° C may affect results).
- Improper calculation of blank bag correction or using the wrong values in the formula.
- Modifying the settings on the temperature controller.
- Improper weighing technique—see the Fiber weighing technique in the Manual Appendix
- Too fine or coarse a sample grind size—see the assay procedure in the Manual Appendix
Appendix
Method for Determining Acid Detergent Fiber

ANKOM Technology - 01/02

A. Reagents
(a) Acid Detergent Solution (AD) - Add 20 g cetyl trimethylammonium bromide (CTAB) to 1 L 1.00N H₂SO₄ previously standardized (ANKOM Technology, premixed chemical solution - FAD20 or FAD20C). Agitate and heat to aid solution.
(b) Acetone - Use grade that is free from color and leaves no residue upon evaporation (ANKOM Technology - FACE).

Safety Precautions -
Acetone is highly flammable. Use fume hood when handling acetone and avoid inhaling or contact with skin. Make sure bags are completely dry and that all the acetone has evaporated before placing in oven. Rubber gloves and face shield should be worn when handling sulfuric acid. Always add sulfuric acid to water.
If acid contacts skin wash with copious amounts of water.
(c) CTAB will irritate the mucous membranes. A dust mask and gloves should be worn when handling this chemical.

Apparatus
(a) Digestion apparatus - ANKOM 200/220 Fiber Analyzer
(b) Filtration device - ANKOM Technology - F57 Filter Bags
(c) Impulse bag sealer - Requires high enough temperature to melt and seal polymer in filter bags. (ANKOM Technology - 1915/1920).
(d) Desiccator -- ANKOM Technology - MoistureStop weigh pouch - X45

D. Procedure
(a) Prepare Sample
1) Weigh Filter Bag (W₁) record weight and tare balance.
2) Weigh 0.5g (±0.05 g) of air-dried sample (W₂), ground to pass through a 1mm screen (2mm screen when using a cyclone mill), directly into filter bag. Weigh one blank bag and include in digestion to determine blank bag correction (C₁).
3) Seal the bags closed within 0.5cm from the open edge using the heat sealer. Spread sample uniformly inside the filter bag by shaking and lightly flicking the bag to eliminate clumping. A maximum of 24 bags may be placed in the bag suspender. All nine trays are used regardless of the number of bags being processed. Place three bags per tray and then stack trays on center post with each level rotated 120 degrees. The weight is placed on top of the empty 9th tray to keep the bag suspender submerged.

NOTE: SAMPLES CONTAINING SOY PRODUCT OR >5% FAT - Extract fat from samples by placing 24 bags with samples into a 500 ml bottle with a top. Pour enough acetone into bottle to cover bags and secure top. Shake the container 10 times and allow bags to soak for 10 minutes. Repeat with fresh acetone. Pour out acetone and place bags on a wire screen to air-dry (approximately 5 minutes).
EXCEPTION: Roasted Soy - Due to special properties of Roasted Soy a modification to the fat extraction is required. Place Roasted Soy samples into a 500ml bottle with a top. Pour enough acetone into bottle to cover bags and secure top. Shake the container 10 times and pour off acetone. Add fresh acetone and allow samples to soak for twelve hours. After soak time, drain off acetone as stated above and allow to air-dry before the next step.

(b) When processing 24 sample bags add 1900 - 2000 ml of ambient temperature Acid Detergent solution into the ANKOM Fiber Analyzer vessel. If processing less than 20 bags add 100 ml/bag of detergent solution (minimum of 1500ml (ensure Bag Suspender is covered)).

(c) Place bag suspender with samples into the solution in vessel. Turn Agitate and Heat ON and confirm that Bag Suspender is agitating properly. Set timer for 60 minutes and push Start. Close and seal lid of vessel.

(d) After 60 minutes (timer will beep) have elapsed turn Agitate and Heat OFF, open the exhaust valve and exhaust hot solution before opening lid. WARNING: The solution in vessel is under pressure. The valve must be opened first to remove pressure before lid can be opened. Ensure exhaust hose is securely positioned for safe disposal of effluent.

(e) After the solution has been exhausted close valve and open the lid. Add approximately 2000 ml of hot (95-100°C) H2O and lower lid but do not tighten. Turn Agitate ON and leave Heat OFF and rinse for 3-5 minutes. Exhaust water and repeat rinses for a total of three times or until water is at neutral pH(2nd-4th rinses 90°C-100°C).

(f) After final rinse remove filter bags from bag suspender and gently press out excess water. Place in beaker and cover with acetone. Allow bags to soak 3 minutes, then remove and lightly press out excess acetone.

(g) Spread bags out and allow acetone to evaporate. Complete drying in oven at 105°C for at least 2 hours.

WARNING: Do not place bags in the oven until acetone has completely evaporated. Longer drying period may be required depending on oven and frequency of sample introduction. Remove bags from oven, place directly into MoistureStop weigh pouch and flatten pouch to remove air. Cool to ambient temperature and weigh bags (W3).

E. Calculate percent ADF (as-is basis):  \[
(\frac{W_3 - (W_1 \times C_1)}{W_2}) \times 100
\]

ADF (DM basis):  \[
(\frac{W_3 - (W_1 \times C_1)}{W_2 \times DM}) \times 100
\]

ADF_{OM} (DM basis):  \[
(\frac{W_4 - (W_1 \times C_2)}{W_2 \times DM}) \times 100
\]

Where:
W_1 = Bag tare weight
W_2 = Sample weight
W_3 = Weight after extraction process
W_4 = Weight of Organic Matter (OM) (Loss of weight on ignition of bag and fiber residue)
C_1 = Blank bag correction (final oven-dried weight/original blank bag weight)
C_2 = Ash corrected blank bag (Loss of weight on ignition of bag/original blank bag)
Method for Determining Neutral Detergent Fiber (aNDF)

A. Reagents
   (a) Neutral Detergent Solution (ND) -- Add 30.0 g sodium lauryl sulfate, USP; 18.61 g Ethylenediaminetetraacetic Disodium Salt, Dihydrate; 6.81 g sodium tetraborate decahydrate; 4.56 g sodium phosphate dibasic, anhydrous; and 10.0 ml triethylene glycol, in 1L distilled H2O (ANKOM Technology, premixed chemical solution FND20 or FND20C). Agitate and heat to facilitate solubility. Check pH range to 6.9 to 7.1.
   (b) Alpha-amylase -- Heat-stable bacterial alpha-amylase: activity = 17,400 Liquefon Units / ml (ANKOM Technology - FAA). One Liquefon Unit is the measure of digestion time required to produce a color change with iodine solution indicating a definite stage of dextrinization of starch substrate under specified conditions.
   (c) Sodium sulfite -- Na2SO3, anhydrous (ANKOM Technology - FSS).
   (d) Acetone -- Use grade that is free from color and leaves no residue upon evaporation (ANKOM Technology - FACE).

B. Safety Precautions
   (a) Acetone is highly flammable. Use fume hood when handling acetone and avoid inhaling or contact with skin. Make sure bags are completely dry and that all the acetone has evaporated before placing in oven.
   (b) Sodium lauryl sulfate will irritate the mucous membranes. A dust mask and gloves should be worn when handling this chemical.

C. Apparatus
   (a) Digestion apparatus - ANKOM200/220 Fiber Analyzer
   (b) Filtration device - ANKOM Technology - F57 Filter Bags
   (c) Impulse bag sealer - Requires high enough temperature to melt and seal polymer in filter bags ANKOM Technology - 1915/1920.
   (d) Desiccator - ANKOM Technology - MoistureStop weigh pouch - X45

D. Procedure
   (a) Prepare Sample
      1) Weigh Filter Bag (W1) record weight and tare balance.
      2) Weigh 0.5g (+0.05 g) of air-dried sample (W2), ground to pass through a 1mm screen (2mm screen when using a cyclone mill), directly into filter bag. Weigh one blank bag and include in digestion to determine blank bag correction (C1).
      3) Seal the bags closed within 0.5cm from the open edge using the heat sealer.
      4) Spread sample uniformly inside the filter bag by shaking and lightly flicking the bag to eliminate clumping. A maximum of 24 bags may be placed in the bag suspender. All nine trays are used regardless of the number of bags being processed. Place three bags per tray and then stack trays on center post with each level rotated 120 degrees. The weight is placed on top of the empty 9th tray to keep the bag suspender submerged.

NOTE: SAMPLES CONTAINING SOY PRODUCT OR >5% FAT - Extract fat from samples by placing 24 bags with samples into a 500 ml bottle with a top. Pour enough acetone into bottle to cover bags and secure top. Shake the container 10 times and allow bags to soak for 10 minutes. Repeat with fresh acetone. Pour out acetone and place bags on a wire screen to air-dry (approximately 5 minutes).
D. Procedure (con't)

EXCEPTION: Roasted Soy - Due to special properties of Roasted Soy a modification to the fat extraction is required. Place Roasted Soy samples into a 500ml bottle with a top. Pour enough acetone into bottle to cover bags and secure top. Shake the container 10 times and pour off acetone. Add fresh acetone and allow samples to soak for twelve hours. After soak time, drain off acetone as stated above and allow to air-dry before next step.

(b) When processing 24 sample bags add 1900 - 2000ml of ambient Neutral Detergent solution into ANKOM Fiber Analyzer vessel. If processing less than 20 bags add 100 ml/bag of detergent solution (minimum of 1500 ml (ensure Bag Suspender is covered)). Add 20 g (0.5 g/50 ml of ND solution) of sodium sulfite to the solution in the vessel and 4.0 ml of heat stable alpha-amylase.

(c) Place bag suspender with samples into the solution in vessel. Turn Agitate and Heat ON and confirm that Bag Suspender is agitating properly. Set timer for 75 minutes and push Start. Close and seal lid of vessel.

(d) After 75 minutes (timer will beep) turn Agitate and Heat OFF, open the drain valve and exhaust hot solution before opening lid. WARNING: The solution in vessel is under pressure. The valve should be opened first to remove pressure before lid can be opened. Ensure exhaust hose is securely positioned for safe disposal of effluent.

(e) After the solution has been exhausted close close valve and open the lid. Add approximately 2000 ml of hot (95-100°C) H2O and 4.0ml of alpha-amylase to the first and second rinses. Lower lid but do not tighten. Turn Agitate ON and leave Heat OFF. Each rinse should last 3-5 minutes. Exhaust water and repeat rinse (95-100°C) two more times (total of three rinses).

(f) Remove filter bags from bag suspender and gently press out excess water. Place in beaker and soak in acetone. Allow bags to soak 3 minutes then remove and lightly press out excess acetone.

(g) Spread bags out and allow acetone to evaporate. Complete drying in oven at 105°C for at least 2 hours. WARNING: Do not place bags in the oven until acetone has completely evaporated. Longer drying period may be required depending on oven and frequency of sample introduction into the oven. Remove bags from oven, place directly into MoistureStop weigh pouch and flatten to remove air. Cool to ambient temperature and weigh bags (W3).

E. Calculate percent aNDF (as-is basis) = \( \frac{(W_3 - (W_1 \times C_1)) \times 100}{W_2} \)

aNDF (DM basis): = \( \frac{(W_3 - (W_1 \times C_1)) \times 100}{W_2 \times DM} \)

aNDF_{OM} (DM basis): = \( \frac{(W_4 - (W_1 \times C_2)) \times 100}{W_2 \times DM} \)

Where: W1 = Bag tare weight
W2 = Sample weight
W3 = Weight after extraction process
W4 = Weight of Organic Matter (OM) (loss of weight on ignition of bag and fiber residue)
C1 = Blank bag correction (final oven-dried weight/original blank bag weight)
C2 = Ash corrected blank bag (loss of weight on ignition of blank bag/original blank bag weight)
**Electronic Balance**
ANKOM recommends a four place readout on the balance and suggests “Balance Talk™” or other LIMS software for data input and management.

1. Number all bags using a solvent resistant marker

2. Weigh and record filter bag weights.

3. Tare weight of Filter Bag.
4. Add ~0.5g (for NDF & ADF) or ~1g (for CF) of sample to bag using a spatula. Be careful not to get sample particles on top edge of the bag sealing area.

5. Weigh sample and record weight.

6. Heat sealer dial should be set between ~ 4 and 5. The setting may vary from sealer to sealer.

7. Seal each Filter Bag as close as possible to its open end. Hold down handle for 2-3 seconds after the red light turns off.

8. The seal can be seen as a solid melted stripe along the top edge.

9. Stack each tray on Bag Suspender rod. Insert weighed Filter Bags into each Bag Suspender trays as shown. Perform the extraction.

11. After fiber extraction is complete, acetone-rinse and dry according to procedure. Remove from oven and immediately store in the ANKOM MoistureStop™ Pouch (Part # X45).

12. Cool to room temperature and re-weigh each bag.

As-Is Basis- \[
\frac{(W_3-(W_1 \times C_1)) \times 100}{W_2}
\]

DM Basis- \[
\frac{(W_3-(W_1 \times C_1)) \times 100}{W_2 \times DM}
\]

OM DM Basis- \[
\frac{(W_4-(W_1 \times C_2)) \times 100}{W_2 \times DM}
\]

Where:

- \(W_1\) = bag tare weight
- \(W_2\) = sample weight
- \(W_3\) = weight after extraction
- \(W_4\) = weight of organic matter (OM) (loss of weight on ignition of bag and fiber residue)
- \(C_1\) = Blank bag correction (final oven-dried weight/original bag weight)
- \(C_2\) = Ash corrected blank bag (loss of weight on ignition of blank bag/original blank bag weight)
**F1**
Temperature Probe

Instructions-F1  
BIN  
$65.00  
1 lb

---

**F3**
Hinge Block  
BIN  
$35.50  
1 lb

---

**F4**
Lid  
BIN  
$110.00  
3 lb

---

**F4.5**
Oring  
Instructions-F4.5  
NO BIN  
$14.25  
1 lb

---

**F4.8**
Lid Handle  
NO BIN  
$10.50  
1 lb
F7
120 motor

Instructions-F7/F8
BIN
125.00
4 lb

F8
220 motor

Instructions-F7/F8
BIN
$140.00
4 lb

F8.9
Agitator

Instructions-F8.9
BIN
$65.00
1 lb

F11
Bag Suspender With Weight

BIN
$185.00
2 lb
F 12  
Outer Exhaust Hose

BIN
$10.00
1 LB

F 16  
120v Fuse
Instructions-F16

BIN
$8.75
1 LB

F 17  
Timer

BIN
$34.55
1 LB

F 18  
Heat Switch

BIN
$35.00
1 LB

F 19  
Agitate Switch

BIN
$35.00
1 LB
F 26
Packing Assembly

Instructions-F26
BIN
$21.50
1 LB

F 27
Maintenance Alert Inner Assembly

Instructions-F27
NO BIN
$14.00
1 LB

F 28
Agitator Packing Assembly

Instructions-F28
NO BIN
$86.50
1 LB

F 29
Controller Assembly

NO BIN
$280.00
1 LB
STEPS TO ACCESS MENUS AND PROGRAM CONTROLLER

Your controller is preset at the factory. To set (or reset) the controller, follow the steps outlined below. You will find a menu of settings below. **All settings must be done in sequence.** The menu Ac.Cd 05 is set first, then Ac.Cd 02, then Ac.Cd 03. To make the settings permanent after the menus are completed, set Ac.Cd to 01.

2. Use △ or ▽ to display “Ac.Cd 05”.
3. Push until “SnSr” will flash and alternate with the code “d”. Use △ or ▽ to change the code. The settings should match those listed below.
4. Push once to reach the next setting. Each push will change the setting once. If you miss one you must start the sequence again. To do this, press until the first setting of the menu appears again.

<table>
<thead>
<tr>
<th>Ac. Cd 05 (Menu)</th>
<th>SETTING</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SnSr</td>
<td>d</td>
<td></td>
</tr>
<tr>
<td>Out1</td>
<td>Ht.P</td>
<td></td>
</tr>
<tr>
<td>Out2</td>
<td>CL.O</td>
<td></td>
</tr>
<tr>
<td>CoL.t</td>
<td>H2o</td>
<td></td>
</tr>
<tr>
<td>A1.H.L.</td>
<td>HI</td>
<td></td>
</tr>
<tr>
<td>A1.P.d.</td>
<td>Pr</td>
<td></td>
</tr>
<tr>
<td>A1.O.P.</td>
<td>OFF</td>
<td></td>
</tr>
<tr>
<td>A2.H.L.</td>
<td>Lo</td>
<td></td>
</tr>
<tr>
<td>A2.P.d.</td>
<td>Pr</td>
<td></td>
</tr>
<tr>
<td>A2.O.P.</td>
<td>OFF</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>C</td>
<td></td>
</tr>
</tbody>
</table>

5. When the above menu is completed, push then . Use △ or ▽ to display “Ac. Cd 02”. Push the button to advance to the next menu setting. △ Or ▽ are used to change the settings.

<table>
<thead>
<tr>
<th>Ac.Cd 02 (Menu)</th>
<th>SETTING</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gn.o1</td>
<td>250</td>
<td></td>
</tr>
<tr>
<td>rAtE</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>rSEt</td>
<td>120</td>
<td></td>
</tr>
<tr>
<td>C.HYS</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>C.SPr</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>dPnG</td>
<td>nL</td>
<td></td>
</tr>
</tbody>
</table>

6. Repeat actions indicated on Step 5 to get to “Ac. Cd 03” and program as follows.

<table>
<thead>
<tr>
<th>Ac.Cd 03</th>
<th>SETTING</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CY.t1</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>SP.tt</td>
<td>Off</td>
<td></td>
</tr>
<tr>
<td>L.SP.L</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>U.SP.L</td>
<td>105</td>
<td></td>
</tr>
</tbody>
</table>

Push then to get to Ac,Cd display then push until setting reads Ac.Cd 01. Push . Electronic interference may disrupt or damage the ANKOM200/220. Locate the instrument away from possible electrical interference. If all the settings are correct please call or fax us immediately. **Technical Support Phone:** 315-986-8090 **Fax:** 986-8091
To recalibrate the temperature of the controller-
- Fill the instrument with 2 liters of water.
- Bring to boil using Heat and Agitate.
- Press the far left button for 5 seconds to access the AC menus.
- Use the arrow buttons to reach AC 04.
- Press the far left key and find CAL. H
- Stir the water vigorously.
- Measure the water temperature using a calibrated thermometer. Measure next to the temperature probe in the vessel. This will be your reference temperature.
- Use the arrow buttons to set the calibration to the thermometers’ reading.
- Press the far right button, then the far left button to find AC again. Use the arrows to get to AC 01.
- Press the far right button to lock the controller out

This should calibrate the controller to the probe. The water should now boil at the calibrated temperature and maintain the temperature properly.