Running a Blank

Blanks must be run every 12 hours, after a Soak Cleaning has been performed, after a reagent pack change, and after the instrument has been restarted. It is not necessary to run blanks on days that samples are not run. Additionally, blanks need to be run after self tests and Deep Cleaning.

1. From the Home Screen, touch **Measure** then **Run**. If no blank has been run in the last 12 hours, an expired blank message will appear. Touch **OK** to start the blank.

2. If no warning message appears, **Accept** the blank and proceed to running patient samples.

3. If blank values are high, a pop-up warning will appear. Touch **OK**, to view the blank results and the corresponding Warning flag (top right of screen).

   There are parameters with high blank values! Check the User’s Manual Troubleshooting section for guidance and then repeat the blank.

If Warning flags are present, refer to the troubleshooting section of this guide or the Operator’s Manual to resolve the warning.
Running Samples

Before running a patient sample, take a few seconds to visually inspect the sample for clots.

Hold the test tube at eye level and slowly invert the tube. If a clot is found, the sample should be discarded and a new sample should be drawn.

*Even small sized clots will affect the patient results and could damage your HM5.*
1. From the *Home Screen*, touch the **Measure** icon.

2. Touch **Run**.

3. Select the appropriate species **Type**. Optionally, input additional patient information. Touch **Run**.

4. Mix as directed and ensure the bubble moves from the top to the bottom of the sample tube to ensure all of the sample is mixing with the anticoagulant. Remove the cap of the tube, place the tube in the tube holder and touch **Run**.
1. From the Home Screen, touch the Maintenance icon.

2. Touch the Quality Control.

3. Select the appropriate control level to match the vial being used.

4. Touch Measure.

5. Touch Run QC.

6. If the lot number displayed matches the control value sheet, check that the target and gap values match the screen and touch Accept.

   If the lot number does NOT match, touch New.

Controls should be run when reagent packs are changed, after a Soak Cleaning has been performed, and to check the calibration of the analyzer when results are in question.

Remove the control from the refrigerator and allow to warm to room temperature for 15 minutes before use. Mix control tubes thoroughly immediately prior to use. Roll 10X between hands before gently inverting 10-15X.

Controls should be discarded if expired or if they have been open for more than 14 days.
7. From the New QC Lot screen, select the method for entering the control target and ranges:
   - **Enter Manually** allows the user to type in the target and range values from the control package insert sheet.
   - **Load from USB Drive** allows the user to upload the values downloaded onto a USB drive from http://www.abaxis.com/veterinary/products/vetscan-hm5
   - **Scan Barcode** allows the user to scan the barcode on the control package insert sheet using a 2D barcode scanner to upload the values.

8. **Accept** the new values.

9. **Confirm** that the values entered are correct.

10. Follow the mixing instructions, remove cap, and place tube in the sample adapter. Touch **Run**.

11. Run the control 2-3 times to make sure values are similar from run to run. If all values reported are within reference range, the analyzer is in calibration and samples may be run. If values are repeatedly out of range, consult Abaxis Technical Support before calibrating.

(See Calibrating the Analyzer)
Calibration should be performed when the quality control runs are showing values consistently out of range and it has been determined that the analyzer is not in need of cleaning and the quality control material itself is not degraded. Use only the Abaxis Normal HM5 Control for calibration. Allow the control to come to room temperature by setting it on the counter for 15 minutes before use. Do not calibrate with controls that are expired or have been open for more than 14 days.

1. From the Home Screen, touch Maintenance, Calibration then Measure.

2. Accept settings for Prediluted [No] and Cal Sampling Depth [-2mm].

3. If calibration is being performed with the same lot number last used for quality control, touch Copy. If not, manually enter the target values from the control package insert. Touch Accept.

4. Run Cal three or more times in a row, following the mixing instructions displayed in between each run. The analyzer will calculate the average of the 3+ sample runs.

5. Touch Calibrate at the bottom of the screen after the 3+ runs have completed.

6. Accept the new coefficients displayed on the Calibration Results Screen. If any error messages pop-up during calibration, call Abaxis Technical Support.

7. Run Quality Control again 2-3 times to make sure the calibration was successful and all values are now within range.
Changing the Reagent Pack

Materials needed:
HM5 Reagent Pack, HM5 Normal Control and latex or nitrile gloves.
If “Change Reagent Pack” is used when installing new reagents, the analyzer will warn the user when there are fewer than 10 tests left in any given bottle. This feature will also track the number of samples, number of blanks, install date and the volume remaining in each of the bottles.

1. From the Home Screen, touch the Maintenance icon.

2. Touch Change Reagent Pack.

3. Follow the detailed directions on the screen for changing the reagents. Touch Next to advance through the various steps.

4. Run Quality Control to ensure the Analyzer is within calibration.
The wash head should be cleaned once a week. Warnings will alert users when a wash head cleaning is due. The warnings will differ depending on whether Scheduled Maintenance is Enabled or Disabled.

If **Scheduled Maintenance** is **Enabled**, a message will appear when a cleaning is due. Touch **Clean**, then follow the on-screen instructions. Alerts will start appearing 3 days before the cleaning is due. Maintenance is required on the due date.

To Clean the Wash Head for troubleshooting, touch the **Maintenance** icon from the **Home screen**, then **Cleaning**, then **Clean Wash Head**. On-screen instructions will guide the user through the cleaning.
Soak Cleaning should be performed every 14 days. When the software is upgraded to v2.3 or higher, the Soak Clean Interval will automatically be defaulted to 14 days.

If Scheduled Maintenance is Enabled, a message will appear when a cleaning is due. Touch Next, then follow the on-screen instructions. Alerts will start appearing 3 days before the cleaning is due. Maintenance is required on the due date.

Instructions will guide the user through the cleaning. This cleaning takes 10 minutes; after the cleaning is completed run a Blank, and if the Blank is acceptable, proceed with Quality control.

If your HM5 analyzer is not set up for Soak Cleanings every 14 days, refer to HM5 Operator’s manual.
This cleaning is meant to be used as an emergency procedure when a high HCT trend is noticed: and it is *not* part of the regularly scheduled maintenance.

Please ensure that your HM5 is on software version 2.3 or higher.

1. **Deep Cleaning.** Go to Maintenance> Cleaning> Deep Cleaning.

   1a. Remove the cap and place the VetScan HemaClean tube into the tube holder in the front of the analyzer.

   Touch **Next** to start the cleaning. It takes approximately 20 minutes to complete.
2. **Quality control.**

Go to Maintenance> Quality Control> QC Normal. Make sure the control has come to room temperature. Mix well by rolling the tube flat between your hands 10 times (A) and then slowly invert the tube 10-15 times (B). Run the well mixed HM5 control 2-3 times and ensure the **results are within range to confirm the analyzer is ready to be used.**

2a. If 2 out of 3 QC runs fail, proceed to **Calibration.**

Go to Maintenance> Calibration> Measure> Accept, then enter in the values from the Package insert. Accept> Run Cal. After a successful calibration is completed, go to Maintenance> Quality Control> QC Normal and run QC again.

**Note:** If a warning message pops up or the Quality control fails, call Abaxis Technical Support.
## Blank Warning Flags

<table>
<thead>
<tr>
<th>Flag</th>
<th>Meaning</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>p</td>
<td>PLT blank is high</td>
<td>Visually inspect the wash head and clean if necessary; run 2-3 automatic self cleanings, then repeat the blank. If the warning persists, run Soak Cleaning and the repeat the Blank.</td>
</tr>
<tr>
<td>X</td>
<td>EOS blank high</td>
<td>Visually inspect the wash head and clean if necessary: check Diluent (green) and Lyse2 (orange) lines for loose connections; prime Diluent and/or Lyse2 if bubbles are present or were introduced while checking the tubing; repeat the blank.</td>
</tr>
<tr>
<td>b</td>
<td>RBC blank is high</td>
<td>Visually inspect the wash head and chamber below it for blood debris; clean if necessary. Run a Soak Cleaning, then an automatic self-cleaning; repeat the Blank.</td>
</tr>
</tbody>
</table>

*More thorough troubleshooting procedures can be found in the Abaxis HM5 Operator’s Manual.*
<table>
<thead>
<tr>
<th>Flag</th>
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</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>Empty sample</td>
<td>Ensure the sampling depth is appropriate for the tube being used and that the tube is filled at least 1/2 full. If not, redraw a new sample.</td>
</tr>
<tr>
<td>M,N</td>
<td>Lyse delivery issue or very high WBC count</td>
<td>Check Lyse (yellow) tube for kinks and loose connections at the bottle cap or dip tube and back of the analyzer and verify the Lyse line is connected to the correct port on the analyzer and the correct bottle from the pack. Prime Lyse if bubbles are present. If a high WBC value is suspected, view manual smear to confirm high WBC.</td>
</tr>
<tr>
<td>c,C,Q</td>
<td>Cellular clumping</td>
<td>Run 2 automatic self cleanings. Redraw then rerun if the draw was difficult. Run Soak Cleaning if error continues.</td>
</tr>
<tr>
<td>L</td>
<td>Platelet clumping, Lyse resistance or Macroplatelets</td>
<td>If the patient is a King Charles Cavalier Spaniel or other breed with known predisposition to macro-platelets, perform a manual smear for the WBC and PLT. If the draw was difficult, the platelets are low or there were delay in filling the tube, redraw and rerun. Check Lyse tube for kinks or bubbles. If no Lyse issues found and the warning persists, rerun the sample with an increased Lyse +0.1 or +0.2.</td>
</tr>
<tr>
<td>W</td>
<td>Large Platelet clumps in cat samples</td>
<td>Redraw sample, being sure to immediately transfer the sample into the tube and invert completely 10-15 times or more.</td>
</tr>
<tr>
<td>Y</td>
<td>EOS clogging</td>
<td>Ensure Lyse 2 (orange line) is connected properly to the back of the analyzer and to the correct reagent bottle. If connections are good but bubbles are present, prime Lyse 2 twice and re-run sample. Run automatic self cleanings and re-run well-mixed sample.</td>
</tr>
</tbody>
</table>
Work List requires the use of additional VetScan connectivity products which enable bi-directional communication between the HM5 and compatible veterinary practice management software systems.

1. Order the CBC in the Practice Management Software.

2. From the Home Screen, touch the Measure icon then Work List.

OR ……

Touch the blood drop icon at the top of the screen.

Using Work List
3. Select a patient from the list by checking the associated box.

4. Touch Run.

5. Follow the mixing directions on the screen. Touch Run. When the CBC is complete, the animal sample just run will no longer be displayed on the Work List.