

IV. Calibration

A. Setup

When all equipment is in place and working under normal condition the meters should be calibrated.

NOTICE

It is important that the conditions, while calibrating, are exactly the way it is going to be in the future i.e. vacuum level, hose length etc. must not be changed after calibration is done. This would require a new calibration.

For a correct calibration you need the following equipment:

- A milk bucket and lid with two nipples min O.D. 7/8". If nipples are smaller, hose clamps can be used to fit the hoses on the nipples.
- A pail with a minimum capacity of 3 gallons.
- Rubber tube I.D. 5/8" to connect milk meter and milk bucket (if possible, use the already installed milk tube from milk meter to milk line).
- Rubber tube I.D. 5/8" for connection between milk bucket and milk line.
- Rubber tube I.D. 5/8", length 5' for connection between test pipe and milk meter.
- Calibrated test equipment for a water flow of 3,7 kg/min and air bleed of 7 liters/min. Use test kit PN 313365.
- Scale indicating at least every 0.02 pounds.
- Two hose closing devices e.g. hose clips, to go on hose between bucket and milk line and on hose between meter and test pipe.

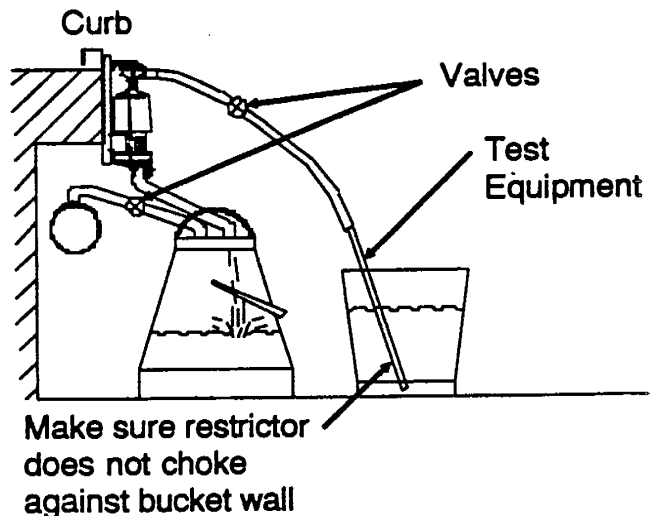


Figure 25

Alternative Calibration Setup.

Instead of collecting the water in a catch pail, run the required number of dumps of water through the meter in the regular milking setup and determine the weight metered by subtracting the difference of water in bucket. First weigh the pail with water (minimum 15Kg. required) then run the calibration test (50 dumps) and then re-weigh the pail and subtract the difference. This is the value which would be entered into the QuadTrac. Repeat this procedure for each of the three (3) calibration tests. (See Following Example).

1. Weigh bucket of water.	15.63Kg
2. Run 50 dumps of water through meter per instructions.	—
3. Weigh bucket of water.	6.32 Kg.
4. Subtract difference.	9.31Kg.
5. Enter this value in the QuadTrac per step 12	

B. Milk Meter Calibration Procedures:

Before you start calibration

- The Milk bucket must be completely empty and take a note on how much it weights empty.
1. Open all gates (gate switches closed). This will clear all units and set the milk weights to zero. Exit gates must remain open during the entire calibration procedure.
 2. Enter the Service program by, pressing the buttons "Illness", E, 9 and "Milk" in that order.
 3. Press the "E" or "ILLNESS" key until field "CALIBRATE" is displayed.

C A L B R A T E

4. Press "C-key", and

C A L V A L

will appear on the display

5. Enter the number 3 or the number of samples you wish to run.

C A L V A L 3

6. Press the "E" key to enter number and the display will show .

C A L 3 0 0

This will set the program to average the calibration over 3 calibration tests.

7. Fill the water bucket with 3 gallons of water.
8. Vacuumize the receiving bucket by opening the valve going to the milk line.

NOTICE

Vacuumizing the receiving bucket should only be done immediately before you are ready to begin flowing through water i.e. opening the valve to the bucket with water. Otherwise the meter could empty an extra dump down to the receiving bucket.

9. Open the valve on tube going to the bucket with water and draw water through the meter.

Make sure the restrictor does not choke up against the bucket wall. The display counts the dumps during the calibration.

10. Stop the calibration after 50 dumps.

C A L 3 5 0

If more dumps are let through there's no catastrophe but try to keep it to 50 and it is easier to recognize any unusual values on the scale.

11. Weigh the water in the receiving bucket which past through the meter.

Normal values on the scale is between 9.05kg and 9.55kg for 50 dumps. In case of other scale values check the meter visually for any leaking valves or other problems disturbing the operation.

NOTICE

Some scales can show kilogrammes directly (check your scale and change to this mode). If you can't read kg on your scale multiply the pound reading with 0.4536 and enter by you got.

12. Press the **E**-key and the LED will display blanks.

C A L 3 _ _ _ _

Enter the scale value in kilograms, e.g. 943 means 9.43 kg of water.

C A L 3 _ 9 . 4 3

13. Press the **"E"** and the display will now show the average flow rate for this test.

F L W R T 0 3 . 8

If the flow rate is not within plus or minus 0.2 kg/min of 3.7 kg/min check vacuum and test pipe and start all over again (push Reset key and start from pos. 2 again). If another flow is used the calibration can't be trusted and the calibration is useless. If you can't get a proper flow just leave the meters uncalibrated until you have good equipment.

14. Repeat the procedure from number six (6) the second time by pressing the **"E**-key" again. The display will now read.

C A L 2 _ _ _ _

Allow 50 dumps of water through the meter.

C A L 2 _ _ 5 0

Press **"E"**

C A L 2 _ _ . _ _ _

Enter the weight of water run through meter.

C A L 2 _ 9 . 1 3

Press **"E"** and the flow rate for this test will be displayed.

F L O R T 0 3 . 6

15. Repeat the procedure from number six (6) a third time by pressing the **"E**-key" again. The display will now read.

C A L 1 _ _ _ _

Allow 50 dumps of water through the meter.

C A L 1 _ _ 5 0

Press **"E"**

C A L 1 _ _ . _ _ _

Enter the weight of water run through meter.

C A L 1 _ 9 . 4 3

Press **"E"** and the flow rate for this test will be displayed.

F L O R T 0 3 . 7

16. When the last calibration is done, pressing the **"E**-key" will show the average measured flow rate of all three (3) tests in kg/min.

F L W R T 0 3 . 7

17. Press the **"E**-key" again and the program goes back to the Service/Calibration program again.

C A L B R A T E

18. Check the new **"OFFSET"** and **"TEST"** values. These are automatically calculated by the program when calibration is done.

Offset and Test are program functions number 9 and 10 on the QuadTrac.

Press **"ILLNESS"** until you reach offset.

O F F S _ _ 1 5 1

SECTION M

The onset value should be in the range of 148 - 158. If not You might have a problem, please check:

- That all springs inside meter is in position,
- That no straw, hair or other alien material is obstructing operation of meter,
- Possible vacuum leakage. (Check rubber seals, bellow and hoses in meter.)
- Tightness of outlet valve in the milkmeter. Do as follows:

Fill the measuring chamber with just enough water so that the float does not float up and cause a dump. Now check under the outlet valve if there is any dripping. There is always some dripping from water sitting on surfaces under the valve and on the guide pins but after a while all dripping should stop.

If there is a leak, take the meter apart and check for dents or dirt on the sealing surface on the valve or valve seat. If nothing is detected, put the meter together again and check if it's still leaking. If so change to a new valve.

- Reed switch level(use gauge or calipers). Do as follows:

Take off the inlet chamber and inlet valve and put them aside. Take also off the black conical shaped weight on top of float.

The float should be within 29.5mm to 30.5mm under the top surface of outlet valve when reed switch is switching. With calipers check if float is activating the dump valve within this range or...

With gauge slide it on the outlet valve with black O-ring down. Lift float up so it touches the gauge. The dump valve shouldn't activate. Turn the gauge with O-ring facing up and lift float. Now the dump valve should activate.

If it activates any other way the reed switch need to be pushed up or down. Use the Allen wrench, on the gauge, to loosen the grub screw, holding the reed switch pin, and push the pin up or down. Repeat until switching is within range.

19. To exit the Service program,
Press the Reset button.

NOTICE

All values shown in the calibration procedures in this manual are examples only. These values will vary during an actual meter calibration.

To confirm a good calibration, the milk meter can be checked with a so called "water test".

For a correct water test you need the same equipment as for calibration hooked up in the same way.

Before you start the water test

- The milk bucket and milk meter must be completely empty.

To start the water test, open all gates (gate switch closed)

1. Press the buttons below in a rapid succession:

"COW " "E "

"CALENDAR " "E "

"TEMP " "E "

the display will show:

T E S T 0 0 . 0 0

2. Draw approximately 10 kilograms of water through the meter.

3. Stop the water test when the display shows 10 kg.

T E S T 1 0 . 0 0

4. Weigh the water which passed the meter and compare it with the value of the display. Write down the value of the display, the scale and the difference between those.

5. After the water test, press the "E-key".

F L W R T 0 2 . 4

The average flow rate will be displayed in kg/min.

Press the "E - key" a second time and the

T E S T 0 0 . 0 0

displayed value will be reset and the procedure can be restarted.

6. Repeat the procedure a second time.

7. If the average of the two compared water values are within the 200 grams limit, the water test is OK, if not make a new calibration.

8. During the water test, the "OFFSET" and "TEST" value can be displayed by pressing the "C-key". Press the "C-key" one time to display offset value.

O F F S 1 5 1

Press the "C-key" a second time to display the test value.

T E S T 1 8 5

9. To exit the water test program, just press the "RESET" button. The

C L E A N

display will return to a clean because the gate switch is still closed.

Closing the exit gates, (opening the gate switch contacts) the display will return to normal operation.