

## Chapter 6: Milk Meter Calibration

Each Surge milk meter is water tested and calibrated at the factory before shipping. However, each meter should be water tested at the farm and re-calibrated if necessary after installation. View the *Milk Meter Water Test Video* (89850) and then use these instructions for reference.

**Note:** Do not mix the glass and the valves between meters so that re-calibration adjustments will be minimized.

### Pounds & Kilogram Meter Calibration

#### Equipment Needed

- Five gallon (19L) bucket
- Shut-off valve
- Milk pail with test lid and hoses to catch water
- 5/8" milk hoses (one 3 inch hose, two short hoses approx. 6 inches, one long hose approx. 3 feet)
- 7/8" milk hose (length determined by distance to bucket)
- If milk pail has a 5/8" inlet, a 7/8" to 5/8" stainless steel reducer nipple (47047 or 36241) is needed.
- Water test flow control valve (88033) which is included in all demo kits
- Sensor gage (88034)
- Scale (88035) calibrated to the tenth of a pound or kilogram
- Water test video (89850) (optional)
- Thermometer

#### Water Test Procedure

##### **IMPORTANT!**

Check the diameter of the valve assembly before calibrating.

1. Check the diameter of the valve assembly before calibrating. If the valve assembly (47125) does not slip into the valve gage (88045) freely, replace the valve (47123) as per instructions in Chapter 9.
2. Fill a five gallon (19L) bucket with at least 25 pounds (11kg) of water. The water must be between 45° and 75°F (7.2° and 23.9°C).
3. Put a 6 inch long 5/8" milk hose on the milk meter inlet. Install a milk hose shut-off valve, another 6 inch long 5/8" milk hose, and the flow control valve (88033). Connect a milk hose long enough to reach to the bottom of the five gallon pail. See Figure 6.1.
4. If the milk pail has a 5/8" inlet, install a 5/8" to 7/8" reducer nipple onto the milk pail using a three inch piece of 5/8" milk hose.

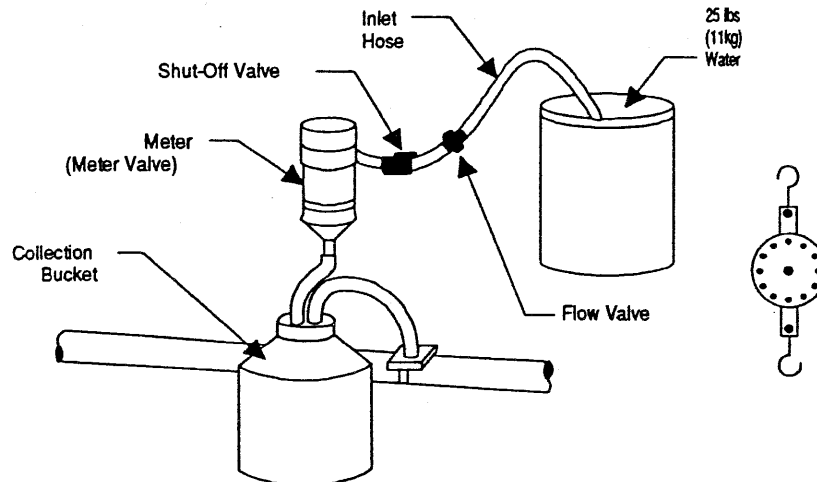


Figure 6.1 Water Test Setup

5. Set up a collecting bucket under the meter. Connect the 7/8" milk hose to the meter outlet and the reducer nipple or directly to the milk pail. Keep the 7/8" hose as short as possible.
6. Close the shut-off valve and turn the vacuum system on. Vacuum should measure between 11 inches and 13 inches of mercury. Insert the inlet hose into the bucket and open the shut-off valve.
7. Let water flow through the meter until one more dump will display on the meter an amount that is greater than or equal to 20 pounds (9.07 kg) but not over 22 pounds (9.98 kg). When this is reached and the meter valve is seated, quickly close the shut-off valve before another dump occurs. Record this reading on the *DairyManager Meter Calibration Form #89739* (at the end of this chapter).
8. Remove the collecting bucket before the meter does the final detach dump. You have the length of time of the meter detach delay to do this. (The detach delay is set in the software or on the back of the controller. Refer to Chapter 2.)
9. Weigh and record the weight of the water on the meter calibration Form #89739 (at the end of this chapter).
10. The water should be 1.2 to 2.4 pounds (0.54 kg to 1.09 kg) more than the meter reading. (The water weight is greater than the meter reading because water is more dense than milk.) For optimum accuracy set the meters as close to 1.8 pounds (.82 kg) as possible.

**Note:** The formula is: **Actual Water Weight - Meter Reading = Difference**  
 The difference should be as close to 1.8 pounds (0.82 kg) as possible.

## Sensor Gage

The sensor gage measures the height of the meter sensor. The scale on the gage is graduated in 1/64-inch intervals. Every 1/32 inch interval is numbered. Use the sensor gage (88034) to make it easier to adjust meters. Every turn of the sensor changes the meter reading by approximately 0.3 pounds (0.14 kg) and changes its height by 1/32 inch. Make sure the sensor gage is zeroed out before taking a reading. See *Milk Meter Water Test Video* (89850). Use the gage to verify changes made to the sensor height to achieve the desired meter reading and to measure the final sensor reading. Record this reading on the *DairyManager Meter Calibration Form #89739* (at the end of this chapter.)

## Recalibration

### If Meters Fail

Test failing meters two more times and record the results. Add the three readings together and divide by three to get an average reading. If the average is outside the 1.2 to 2.4 pounds (0.54 kg to 1.09 kg) range, follow the procedure below to recalibrate the meter.

1. Remove the bottom cover, glass, and valve. Locate the sensor (Figure 6.2).

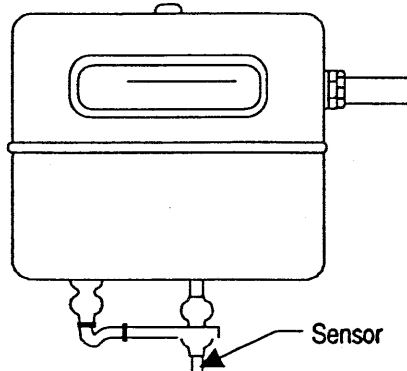


Figure 6.2 Sensor in Meter

2. Turn the sensor clockwise (or up into the head) to decrease the meter reading. Turn the sensor counterclockwise (or down out of the head) to increase the meter reading. One turn of the sensor changes the meter reading by approximately 0.3 pounds (0.14 kg). Adjust the sensor so the meter reads as close as possible to 1.8 pounds (0.8 kg) less than the weight of the water in the test.
3. Verify the sensor setting by running the water test again three times and recording the results. Add the three readings together and divide by three to get an average reading. If the average is still outside the 1.2 to 2.4 pounds (0.54 kg to 1.09 kg) range, continue to adjust the meter sensor as required until the meter is within specifications.

### Recalibration

For DHIA verification, complete each portion of the 89739 meter calibration form. Give one copy to the dairyman for DHIA use. Keep one copy with dealer records.

### DHIA Verification

Recalibrate meters *at least* once each year. Also, recalibrate if:

- A part such as the glass has been changed.
- The sensor position changes more than 1/32 inch.
- A meter head has been changed.



# DairyManager Meter Calibration Form

Farm Name: \_\_\_\_\_ Dairyman: \_\_\_\_\_  
Address: \_\_\_\_\_ Tester: \_\_\_\_\_  
Test Date: \_\_\_\_\_

| Stall #: | Meter S/N: | Meter Reading vs. Scale Wgt.: | Final Sensor Reading: |
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