MILK-o-METER
AND SAMPLER

Instruction And Service Manual

The Milk-o-Meter will give long and satisfactory service if properly installed and reasonable care is exercised in operation and maintenance.

Guessing how to install and operate the Milk-o-Meter may cause unnecessary inconvenience or failure to receive the fine performance that has been engineered and built into it.

A few moments of your time to study the nomenclature and read the instructions will be most rewarding.

IMPORTANT!!!

THE MILK-o-METER MUST BE DISASSEMBLED AND THE PACKING MATERIAL REMOVED FROM BAFFLE PLATE BEFORE USE!

TESA METERS, INC. • Box 21519, Fort Lauderdale, Florida 33335 • 305-525-6688
MILK-o-METER FRAME AND COUNTER MECHANISM INSPECTION

It is a statistical fact that over 50% of the Milk-o-Meters returned to the Factory require no more than a good cleaning, excluding of course inadvertent external damage as from dropping, etc. It is important, therefore to properly clean the Meter Frame and Counter before attempting inspection and calibration check.

#030231 BRACKET GAGE

It is important that all pipe clamp Mounting Brackets in the barn be level. Drop the Bracket Gage into the "V" of the Mounting Bracket and note the bubble in the gage glass. If more than half the bubble is inside the ring, the Bracket is sufficiently level but the closer to the center the more accurate the setting. Make such adjustments to the Bracket as may be indicated. Seat the gage firmly in the "V" but do not force. Bent Brackets will be detected when gage is not held securely. If necessary, bend the V clip inward or outward as may be required to fit the gage.

FIELD REPAIR AND RECALIBRATION

The Milk-o-Meter Mechanism cannot be repaired or disassembled without affecting calibration. The Milk-o-Meter cannot be calibrated in the field without the required equipment and training of personnel.

The reason is that the components of the Mechanism must be fabricated with oversize mounting holes. Special assembly fixtures are used to hold the relative alignment of the components to maintain their correct relative alignment and position without regard to the normal differences between components due to material and processing tolerances. While you could as example remove the outer bracket, or the frame and reassemble so it would visually appear the same, the part would in fact have shifted within the limits of the hole clearances and disrupted the calibration. Except for Factory Authorized Service Centers, no repair or recalibration should be attempted in the field. All Milk-o-Meter Mechanisms are sealed at the Factory so any such attempt is immediately evident. Any indication of disassembly, tampering or attempted recalibration automatically voids the remaining Warranty.
MILK-O-METER ASSEMBLY

With any instrument.....the cleaner they are the more accurate they are likely to be. This is especially so when talking about a precision instrument such as the Milk-o-Meter. The inspection prior to repair or service must include adequate cleaning.

Check all plastics for cracks, chips or dirt. Hairline surface marks or crazing do not effect the Milk-o-Meter accuracy, but may cause a sanitation problem.

In addition to inspection for the usual checking and cracking, the Baffle Tray should be checked for warpage, in that the Baffle Box should fit properly inside the Tray, and the Tray itself should fit snugly inside the slots of a new Upper Shell. If the Baffle Tray fits loosely inside the slots in the boss of the opposite sides of the Upper Shell it should be discarded, as a loose Tray can become dislodged in operation and hang up the Rocker below.

Check the Upper or Lower Shell for excessive warpage by placing each Shell against an ordinary window pane or piece of glass. Run a dime around the outside perimeter of the Shell. The dime (Approx 1/32" thick) should not pass between the glass and flange of the Shell at any point. If it does, the Shell is warped beyond tolerance and will adversely affect the Milk-o-Meter operation and should be replaced.

On the #031622 Unitized Lower Shell, the outside "O" ring is solely for the purpose of air seal. The inside "O" ring is only a mechanical means of holding the Rocker and Rocker Shaft in place during installation of the Lower Shell into the frame. The inside "O" Ring has no function as a seal or relationship to the accuracy of the Meter.
LIMITED 5 YEAR WARRANTY
MILK-o-METER

Subject to applicable portions of published Limited Warranty in Terms and Conditions of Sale.

"TeSa products are warranted to be free of defects in material or workmanship. TeSa Meters, Inc. will promptly replace or repair, free of charge, a Milk-o-Meter Frame and Counter Mechanism returned prepaid and found defective in original material or workmanship by TeSa within a period of 5 years from the date of shipment from the factory on new, or 1 Year on repaired and recalibrated Milk-o-Meter Frame and Counter Mechanisms. TeSa Meters, Inc., will assume responsibility only for the part or parts as may be determined defective by the factory, excluding transportation or labor requirements, if any, outside the factory. Because it is impractical to date or establish serial number identification on plastic or other parts, these are not covered by the Warranty.

If errors are found in the Milk-o-Meter exceeding 3%, recalibration will be done by the factory free of charge for a period of 1 year from the original purchase date."

TESA METERS, INC.
Revised September 1, 1986
**PRINCIPLE OF OPERATION**

The Milk-o-Meter consists of the upper and lower shells which are held together by the frame and counter-mechanism. The upper shell contains the baffle assembly which consists of the baffle box, baffle plate, and baffle tray. The lower shell contains the rocker and rocker shaft, one end of which is connected to the magnet arm fork which extends from the back of the counter-mechanism.

During operation, vacuum from the milker system holds the shells tightly together forming a vacuum sealed chamber inside. Milk enters the upper shell through an inlet connection directly from the milking machine, and, after being weighed and registered, is discharged into the pipeline through an outlet in the lower shell.

Before the milk can be weighed it must be deaerated to assure precise accuracy of measurement. This is accomplished by passing it through the baffle assembly located in the upper shell. It leaves the baffle assembly through a row of holes in the bottom of the baffle tray. From here it drops into the two compartment rocker which is mounted on the rocker shaft in the lower shell. Each compartment of the rocker has a liquid capacity of four ounces. Milk flows into one compartment of the rocker unit which is automatically tripped at four ounces and the milk discharged into the lower shell to be drawn by vacuum into the pipeline. This procedure is then repeated in the opposite compartment of the rocker and continues to alternate between the two compartments.

Each time the rocker unit is tripped, the four ounce unit of weight is registered on the dial of the counter mechanism.

The standard Milk-o-Meter dial is graduated to 40 pounds in ¼ pound increments, however, with the Dual Dial Pointer it is possible to read up to 76 pounds. In areas where the metric system is used, the Milk-o-Meter is graduated in 16 kilos in 1/10 increments. The rocker and mechanism is calibrated to the 1/10 kilo measurement.

Each Milk-o-Meter will normally require approximately one half C.F.M. of vacuum for operation. Thus it is important that the vacuum supply be adequate to operate the milker system with enough reserve to handle the number of meters being used. If milker units tend to drop off the vacuum supply may be inadequate. Dealer should be consulted.
INSTALLATION INSTRUCTIONS

LOCATION

The Milk-o-Meter should be installed as near as possible to the milk inlet in the pipeline and still permit ease of accessibility for reading of the dial and operation of the Sampler.

We recommend the Milk-o-Meter be positioned so the outlet spout is as nearly above and as close to the pipeline inlet as practical. USE THE SHORTEST HOSE POSSIBLE to eliminate vacuum fluctuation. Tests show that when the Milk-o-Meter is correctly positioned it acts as a stabilizer and there is LESS vacuum fluctuation.

It should be well removed from contact or interference by the cow.

In some installations, most particularly those using high pipelines and long hoses, the shaking and vibration imparted to the Milk-o-Meter may be severe. This could affect accuracy and should be minimized. While the recommended solid pipe clamp bracket mounting will help, we have seen some “homemade” remedies that work well, one is illustrated. (fig. 1) This is made up of a hose clamp, a short length of bath tub chain and a hook provided out of 3/16" welding rod. By securing the hook over a pipe or stanchion header, other than the one holding the Meter, and leaving the hose out of the Meter Frame loop, the excessive vibration is snubbed by the chain/hook instead of being transmitted to the Meter.

THE ACCURACY OF THE MILK-o-METER DEPENDS ON ADEQUATE MOUNTING.

The use of mounting brackets other than the #032101 Pipe Clamp Bracket is NOT SATISFACTORY. Milk-o-Meter frames may not fit snugly in substitute brackets and induce error in weights.
INSTALLATION INSTRUCTIONS

continued

MOUNTING BRACKETS

The # 032101 Pipe Clamp Bracket should be mounted on a pipe or other surface which is solid and free from vibration. Excessive vibration may cause error.

1. The # 032101 Pipe Clamp Bracket is designed for mounting the meter on either vertical or horizontal pipeline. (fig. 1 & 2) It consists of a Base, two U-Bolts and a Clip. The Clip may be used for mounting on flat wall surfaces. (fig. 3)

2. The mounting bracket must be installed so that the Milk-o-Meter will be in a level position when in place. The # 030115 Bracket Gage should be used to level the mounting bracket during installation. Place the Gage in the bracket as illustrated, (fig. 4), adjust bracket to level position, then tighten bracket securely. CAUTION: DO NOT OVER TIGHTEN U-BOLTS. TIGHTEN NUTS ONLY ENOUGH TO HOLD ON PIPE. TOO MUCH PRESSURE CAN CAUSE CLIP EMBRITTLEMENT AND BE SUBJECT TO BREAKAGE. If pipe or wall are out of plumb, it may be necessary to shim the clip to make it level.

3. Place an assembled Milk-o-Meter into the mounting bracket. BE SURE METER IS SEATED FIRMLY IN THE BRACKET. Insert the milk hose from milker unit through the hose support loop at the top of the meter frame, then connect it to the inlet spout on the upper shell. Allow sufficient slack in the hose between the loop and the spout to prevent the shells from being pulled apart. Connect a short hose between the outlet spout in the lower shell and the milk inlet in the pipeline. Hose should be as short as practicable to prevent pulling off spout. Set dial pointer on zero and meter is ready for operation.
PREPARING FOR OPERATION

DISASSEMBLY

The Milk-o-Meter must be disassembled and the packing material removed from around the baffle plate before it is put in operation. The plastic components and the rocker shaft should also be washed and sanitized at this time. (See cleaning instructions.)

1. Hang the meter on one of the convenient wash up or assembly stands. (fig. 1)

2. With meter dial facing you, place right hand on top rear portion of upper shell and with left hand hold back retainer spring at back of frame. (fig. 2)

3. Pull right hand firmly forward springing retainer open enough to allow upper shell to clear frame. (fig. 2)

4. When upper shell is clear of frame, tilt shell up at rear and when clear of frame, lift out of assembly — away from slots in front of frame.

5. Lower shell assembly is removed in approximately the same way. Lift rear of shell first, then back in — out away from front of frame.

6. To remove baffle assembly from upper shell, hold upper shell in left hand, grasp baffle assembly with fingers of right hand along the side of the baffle tray. Snap tray toward you, then lift tray up and out of shell. Remove and discard packing around baffle plate. (fig. 3)

7. The lower shell assembly is composed of the lower shell, the rocker, rocker shaft, thrust pin and neoprene "o" ring. The rocker is removed by removing the two rocker spring clips and lifting it off the flat part of the shaft. The shaft is then removed from the shell by removing the neoprene "o" ring, allowing the shaft to be withdrawn from the shell as the "o" ring is pulled off the opposite end. Lift thrust pin out of shell flange at small end of shaft.

USE CARE IN WITHDRAWING OR INSERTING SHAFT TO AVOID COCKING OR BINDING IN BEARING HOLES IN SHELL WHICH WOULD SCORE THIS BEARING AREA. FOR MAXIMUM AND CONSISTENT ACCURACY, BEARING SURFACES ON SHAFT AND IN SHELLS SHOULD REMAIN SMOOTH, CLEAN AND FREE FROM MILK RESIDUE.
REASSEMBLY

1. Replace thrust pin and rocker shaft in lower shell. Care should be taken to properly locate the neoprene "o" rings on the shaft. One is located just inside the front of the shell. This serves as a retainer to hold the shaft in position. Another fits on the shaft just outside the shell. This ring is pulled into a counterbored recess in the shell by vacuum and acts as a seal. Both rings must be used for satisfactory performance.

2. Replace rocker unit on shaft being careful to center it on flat portion of shaft. Rocker should fit firmly on shaft. Place a stainless steel rocker clip on each side of rocker to hold it on shaft.

3. Replace lower shell in frame by tilting back of shell up and engaging front slots first. As this is being done the arm of the rocker shaft should also be engaged in the magnet arm fork. Press lightly against the retainer spring at the back of the frame and position back of shell.

4. Turn upper shell upside down. Place baffle box in shell with open or square side facing up. Place baffle plate in box. Place baffle tray over the baffle box and engage the ridge on one side into the slot in the upper shell. Press inward on the opposite side of the tray and snap it into place.

5. Place the upper shell into the frame by tilting upward at the back and slipping the front lip of shell under the roller catch on the back of the counter mechanism. At the same time, position notches on shell into the slots in the frame, then press retainer spring and position back of shell into slots. Check to be sure both shells are properly aligned with slots in frame.

6. Where applicable, remove two plug buttons on upper dial. Snap plastic dial cover over meter dial with drain slot down.
CLEANING INSTRUCTIONS

The following procedure should be used to connect Milk-o-Meter into the system for washing in the milk room:

Fasten # 032103 Clips immediately above the wash vat and position meters in them.

Connect hose from milker unit to bottom spout of meter. Connect hose from top shell spout to cleaner system manifold. Jumper hoses may be utilized for these connections.

In-place-cleaning in the milking parlor or barn may very likely require changes in the pipeline to the extent of having a double line system with outlet nipples on the wash line. This will permit flow of cleaner from the wash line through the bottom of the meter then into the milk line. Correct adjustment of the air bleed/injection into the wash system is also necessary to secure the right amount of turbulence for proper washing action. If milker washers/jetters are used it is recommended that the cleaning/sanitizing solution go through the meter first, then to the jetter.

For these reasons it is suggested that the milker dealer be consulted regarding necessary changes before attempting in-place-cleaning.

NOTE: The Milk-o-Meter has been designed with C.I.P. in mind. TesA does not manufacture nor install the pipeline or C.I.P. equipment, therefore, we cannot blanketly say all systems will clean the Milk-o-Meter to the satisfaction of the local Sanitarian. The effectiveness of the C.I.P. washing equipment is up to its manufacturer and supplier, and its acceptability is up to the local Sanitarian. Adequate airflow, (for volume) air injection, (for turbulence) and temperature at each Meter should attain satisfactory results.

COUNTER MECHANISMS - ALL MODELS

Periodically, the entire Milk-o-Meter counter mechanism should be completely submerged and thoroughly flushed with Stoddard solvent, or white mineral spirits. This will remove all milk, fat or dirt buildup with no harm to the mechanism. As a general rule, such cleaning would be required two or three times per year under normal conditions. It is suggested that the mechanism be soaked overnight in the solutions and operated by hand a few times to remove the hardened material.

In extreme cases it may be desirable to remove the dial pointer and the dial and use a small brush to clean the inside of the counter-mechanism. The recommended solvents will not affect the pointer or dial.

NOTE: When the frame and counter mechanism may be subjected to a sanitizing solution such as sodium hypochlorate, it should immediately thereafter be submerged in clean rinsewater. Sanitizer solution residue when dry can adversely affect the operation of the Meter mechanism, clear water will not.
CLEANING IN PLACE INSTRUCTIONS

THE CLEANING OF THE MILK-o-METER WITH CIP INSTALLATIONS IS SUBJECT TO ACCEPTANCE BY THE LOCAL SANITARIAN AND APPLICABILITY OF CIP INSTALLATION.

ON COMPLETION OF MILKING:

1. Reverse inlet and outlet milk hose to meter... To reverse direction of cleaning and sanitizing flow for best scrubbing action.

2. Flush exterior of Meter... When hosing down milk barn, thoroughly wash exterior of Meter plastics and mechanism to remove milk residue, dust, etc.

As the milking machines are washed, the Meters will also be washed, rinsed and sanitized.

3. Rinse circulate warm (approx. 95°) water, 3 min. @ 0.6 gpm per meter... To flush out milk and fat residue.

4. Rinse circulate hot water 3 min. @ 0.6 gpm per Meter at 140°F... To flush out warm water and preheat system.

5. Circulate cleaning solution 7 min. @ 0.6 gpm per Meter maintaining 140°F, while alternating air injection, closing vacuum supply after first 40 seconds, reopening vacuum supply 20 seconds thereafter... During first cleaning cycle, the closing of vacuum supply will permit cleaning fluid to run out by gravity between Meter shell flanges, removing residue that may have been lodged there by vacuum operation.

6. Circulate hot water rinse 3 min. @ 0.6 gpm per Meter while alternating air injection, maintaining 140°F... To flush out cleaning solution and free residue.

7. Circulate sanitizing solution 7 min. @ 0.6 gpm per Meter, while alternating air injection, maintaining room temperature.

8. Reverse inlet and outlet milk hose to Meter... To be ready for next milking.
CLEANING IN PLACE INSTRUCTIONS

continued

NOTES AND SUGGESTIONS

1. 0.6 gpm is the minimum recommended per Meter but greater volume may be beneficial.

2. 140°F is the minimum, 170°F the maximum recommended for effective cleaning and rinsing of the Meter and should be measured at the first Meter for maximum, the last Meter for minimum from the wash vat.

3. The cleaning and rinsing times are representative and dependent on the cleaning and sanitizing solutions and procedures approved by the local Sanitarian. It should be noted that washing times greater than 7 min. or temperature below 140°F may permit a redeposition of residue on the inside surfaces of the Meter.

4. Alternating air injection rate is flexible but must be sufficient to provide a clean break between air and fluid. Seven cycles per min. with 30 cfm capacity may be representative.

5. Air bleed at the milk claw will vary, but if less than 0.66 cfm at 15" mercury may indicate a blockage and deter effective scrubbing action at the Meter.

6. Automatic drain valves should be provided at the lowest point of the hose to the lower shell of the Meter for free draining between wash and rinse cycles.

7. Pre-mixing of cleaner in a bucket of hot water will assure its effective solution. Cleaner residue in the wash vat won't clean your equipment.

8. The Meters will withstand any solution that is normally used to wash, rinse and acidify. CAUTION: Do NOT use Caustic Soda. (Sodium Hydroxide).

9. Sanitize before using again.

10. DO NOT USE BOILING WATER IN METERS. This may cause the plastic shells to warp.
SERVICE INSTRUCTIONS

With reasonable care and proper cleaning of the counter mechanism, the service requirements can be held to a minimum.

Since the Milk-o-Meter is a precision weighing apparatus, special equipment and training is required for servicing the counter-mechanism. It is very important, therefore, that the counter-mechanism NEVER be removed from the frame, nor any changes or adjustments made to the internal components except by authorized factory personnel. Any such adjustments or changes by unauthorized persons will void the warranty and DHIA approval. Meters requiring repair or recalibration should be returned to the factory or Authorized Service Center for such service. Meters returned for service should include the plastic parts.

THE FOLLOWING SERVICES AND CHECKS MAY BE PERFORMED BY THE USER:

REPLACEMENT OR ADJUSTMENT OF DIAL POINTER

In the event the Dial Pointer becomes broken or jammed into the dial by accident, use 5/64 allen wrench to loosen set screws, then replace or reset as necessary. The Dial Pointer should be set so that it will just clear the screw heads in the dial. If a grinding or ratcheting occurs when resetting the Dial Pointer, hold the rocker shaft arm to one side. If this is a constant problem with any particular meter, it should be sent to the factory or Authorized Service Center for adjustment.

INSTALLATION OF DUAL DIAL POINTER

To install Dual Dial Pointer, first remove existing plastic dial pointer using allen wrench at base of pointer, and then the Dial Face. Remove existing Pin Stop and replace by Pin Stop # 031233. Carefully align # 031233 Pin Stop with edge of Indicator at zero when tightening 4/40 nut. Remove Indicator. Replace Dial Face, aligning center hold of Dial Face with shaft and replace 2 screws.

Slip Brass Spacer over shaft, deburr shaft if rough. Verify that Brass Spacer does not rub on center hole of Dial Face. Place Indicator over shaft with tab out. Slip Washer over shaft, replace Dial Pointer. Install the # 031234 Stainless Spring Washer with crowned outer edge toward plastic dial pointer.

Using allen wrench on Dial Pointer, press Dial Pointer in against Meter shaft with approximately 2 lb. force while tightening allen wrench. Indicator drag should only be enough to assure Indicator moves with Dial Pointer without slipping. Too much pressure will induce drag, too little will permit Indicator to slip during use.

In operation, Indicator will stop at Pin Stop while Dial Pointer will continue clockwise. Turning Dial Indicator counterclockwise will automatically stop both at the zero mark.

CAUTION! Dual Dial Pointer is not to be used with cows exceeding 76 lbs., as this is the maximum the Dual Dial Pointer can accommodate.

Excessive wear on old Milk-o-Meter dial shafts may permit binding, as will mis-aligned outer bracket. Such meters should be sent to your nearest Service Center for repair.

REPLACEMENT OR ADJUSTMENT OF ROLLER CATCH ON THE BACK OF THE COUNTER-MECHANISM

This is designed to hold the shells together with slight tension. To adjust tension, loosen the two screws and slide catch up and down as required.
ROCKER CLIP

Rocker Clips should have a slight amount of tension when in place. If too loose it will not hold properly — if there is too much tension it may distort the rocker and cause inaccuracy. To check tension, hook one end of the clip over the edge of the rocker as though preparing for assembly. Hold the clip as though ready to snap over opposite edge of rocker. In this position the top of the clip should be about 1/32" below the edge of the rocker to provide proper tension. Bend as necessary to attain desired tension.

PLASTICS

Cracked or warped plastics may cause a loss of vacuum and should be replaced as needed. Warpage of shells or rocker may also cause inaccuracy. Therefore, the plastic components and rocker shaft should be returned for checking when factory serviced. The Baffle Plate should drop easily into the Baffle Box which in turn should fit loosely into the Baffle Tray. The Baffle Tray should snap firmly into the grooves provided inside the upper shell. If the Baffle Tray fits too loosely into the upper shell because of warpage, it should be discarded and replaced.

ROCKER SHAFT

Excessive wear in either the shaft bearing hole in the front of the lower shell or the rounded bearing surface at the bent end of the rocker shaft may cause excess vacuum loss and possible inaccuracy. If an air leak is present in this area with the outer "o" ring in place, either the lower shell or rocker shaft or possibly both, should be replaced.

FRAME & COUNTER MECHANISM

A bent or sprung meter frame can cause an error in reading.

The hooked part of the frame should fit snugly into the clip on the mounting bracket. If it does not, either the clip or the frame hook may be sprung. The Clip should be checked with the # 030115 Bracket Gage. The Gage should fit snugly into the Clip. If it does not, replace it. The frame may then be adjusted to fit solidly into the clip by opening or closing the spread at the top of the "V" in the hooked part.

Meters found to be out of tolerance should have the counter-mechanism cleaned according to the instruction under "Cleaning" and then be rechecked. If still out of tolerance the meter, with plastics, should be sent to the factory or Authorized Service Center for repair.

AGE OF MILK-o-METER

To check the approximate age of your Milk-o-Meter . . . note the serial number stamped on the back plate of the dial mechanism and compare with the following:

<table>
<thead>
<tr>
<th>Year Range</th>
<th>Serial Number Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1956 - 1960</td>
<td>1100 to 2-0455</td>
</tr>
<tr>
<td>1961 - 1965</td>
<td>2-0456 to 3-1041</td>
</tr>
<tr>
<td>1966 - 1970</td>
<td>3-1042 to 4-1149</td>
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<tr>
<td>1971 - 1974</td>
<td>4-1150 to 4-4217</td>
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<tr>
<td>1975 - 1982</td>
<td>4-4218 to 4-8999</td>
</tr>
<tr>
<td>1983 - 1985</td>
<td>4-4900 to 5-0016</td>
</tr>
<tr>
<td>1986 - 1987</td>
<td>5-0017 to 6-0000</td>
</tr>
<tr>
<td>1988 - 1989</td>
<td>6-0000 to 8-0000</td>
</tr>
</tbody>
</table>
SERVICE INSTRUCTIONS
continued

SERVICE CENTERS

While Meter service will always be available at the Factory, it may be more convenient for you to send your Milk-o-Meter to one of the following Authorized Milk-o-Meter Repair and Recalibration Service Centers. These Service Centers maintain Factory trained technicians and Factory furnished tools and parts. No other organization is equipped to offer Milk-o-Meter repair and recalibration which meet the rigid accuracy requirements of the DHIA.

Arizona D.H.I.A.
3414 South 48th St., Unit 3
Phoenix, AZ 95040
Phone (602) 243-7059

Central Colorado DHIC
2752 S.E. Frontage Rd.
Johnsons Corner
Loveland, CO 80537
(303) 669-3730

Minnesota State DHIA
134 Lake Blvd.,
Buffalo, MN 55313
(612) 682-1091

Dairy Herd Improvement, Inc.
9550 Liberty Rd. Box E,
Powell, OH 43065-0505
1-800-344-6446 or (614) 888-5925

Missouri DHIA
C/O Livestock Nutrition Lab.
Rt. 5. Hwy 40,
Columbia, Missouri 65205
(314) 445-4476

Ga./So. Carolina DHIA Inc.,
Richard Culbreth,
Route 4, Box 131,
Abbeville, SC 29620
(803) 446-2671

Vermont DHIA-Meter Lab
Gillman Office Complex Bldg.3
Holiday Drive
White River Junction, VT 05001
(802) 295-3379

Washington State DHIA
105 South Pine
Burlington, WA 98233
(206) 755-0375

Western Service Co.
284 Monrovia Ave.,
Long Beach, CA 90803
(213) 438-9091

Wisconsin DHIC
890 South Westland Drive
Appleton, WI 54911
(414) 731-5484

Texas DHIA
Dennis Carr
Rt. 1. Box 116D
Princeton, TX 75077
PRINCIPLE OF OPERATION

A Sampler is available for attachment to the Milk-o-Meter for Butterfat Test samples. The Sampler is an automatic device to obtain a true proportionate sample in relation to the total milking volume.

Each time the rocker unit of the Milk-o-Meter trips on the Sampler side, an identical volume of milk enters the inlet tube of the Lower Shell above the Sampler.

The resultant accumulated sample is thoroughly mixed by the air inrush through the two lower vent tube holes when the valve is opened. The air inrush also raises the vent tube upward forcing the top flange against the inlet. This restricts the flow of air and causes the vacuum to draw the excess of milk not required for the sampler through the upper holes in the vent tube and back into the lower shell of the Milk-o-Meter.

The milk retained in the Sampler, between the bottom of the Sampler cup and the upper vent tube holes is a true proportionate sample in relation to total milking volume. Shutting off the vacuum between meter and pipeline permits the vent tube to drop into its normal down position permitting the sample to drain out the lower holes in the vent tube into the sample cup. The # 031626 Lower Shell includes the PBV Pushrod which is a built-in vacuum shutoff valve for this purpose.
ASSEMBLY AND OPERATION
TWIST VALVE - BALL VALVE

ASSEMBLY

1. Insert vent plug halfway through center hole of vent tube. (E)

2. Place vent tube in Sampler spigot. (D)

3. Place gasket on top of Sampler Cup. (B)

4. Place Sampler cup and gasket on lower shell of Milk-o-Meter, aligning notch on Sampler cup with locating lug on lower shell. (A)

5. Snap retainer springs over pins in lower shell. (C)

OPERATION — USING STANDARD LOWER SHELL #031622

1. After recording weight reading from meter dial — and with vacuum still on — open the twist valve or ball valve, depending on style of sampler, until milk is mixed and excess removed. (approx. 3 to 5 seconds). The sound from air inrush will change tone when excess milk is removed.

2. Hold sample bottle under spigot.

3. Shut off vacuum between meter and pipe line with shut off valve or clamp.

4. After milk is completely drained from Sampler Cup, reset valve over spigot.

OPERATION — USING PBV (PUSH BUTTON VALVE) LOWER SHELL #031626. STEPS 1 AND 2 ARE THE SAME FOR PBV AS FOR STANDARD LOWER SHELL

3. Shut off vacuum by pulling out pushrod of PBV Shell.

4. After milk is completely drained from Sampler cup, reset twist valve or ball valve over spigot.

5. Release vacuum by pushing in pushrod of PBV Shell and proceed with next milking.

CAUTION: DO NOT SHUT OFF VACUUM OR WITHDRAW SAMPLE UNTIL MILK HAS BEEN MIXED PER STEP NO. 1. FOLLOWING INSTRUCTIONS EXACTLY WILL RESULT IN ACCURATE SAMPLES.

NOTE: See Page 21-22 for Complete Illustrations and Part Numbers

ASSEMBLY AND OPERATION
AUTOMATIC DRAIN SAMPLER

ASSEMBLY

1. Place gasket on top of Sampler Cup (D)

2. Place Sampler cup and gasket on lower shell of Milk-o-Meter, aligning notch on Sampler cup with locating lug on lower shell. (A)

3. Snap retainer springs over pins in lower shell (E)

4. Slide wire loop over sampler cup discharge boss and snap wire hooks at top of hanger over retainer spring.

Note: While the Automatic Drain Sampler can be used with the standard lower shell #031622, operations are much more effective when used with the PBV lower shell #031626.

OPERATION

WITH PBV LOWER SHELL

Verify Hanger and Collection Cup is in place. Push in the PBV pushbutton which cuts the vacuum, releasing all of the collected sample into your cup in seconds. Pull out the PBV pushbutton and the vacuum seals the check valve and you are ready to start milking the next cow.

WITH STANDARD LOWER SHELL

Shut vacuum off manually and follow procedure above.

After completion of the above, when convenient for you, slip the collection cup out of the hanger, mix as required and take as much as needed for your regular sample bottle or bag, discarding the balance.
REPAIR AND SERVICE

For trouble free and accurate operation, the following points should be adhered to:

1. The Sampler should always be removed from the Milk-o-Meter and disassembled for cleaning. It may be washed and sanitized with any approved dairy cleaner and sanitizers. Clean spigot with brush provided to prevent build-up of fat or milkstone.

2. The Vent Tube should move up and down freely in the spigot. If it does not, check for burrs on the end of the tube or milkstone build-up in spigot.

3. Vent Plug should fit tight when halfway through tube. If it does not, it should be replaced.

4. Rubber parts should be replaced periodically to prevent air leaks.

The Sampler extracts an identical amount of milk from each ½ pound which passes through the Milk-o-Meter. Based upon the amount extracted, it requires a minimum of approximately 16 lbs. of milk to accumulate a one ounce sample. If recorded milk weight is over 16 lbs. and the Sampler delivers less than approximately 1 ounce of milk, the following procedures should be followed:

1. If the problem occurs intermittently it indicates a leaking valve. Check and, if necessary, replace.

2. If the problem is consistent with every milking, it indicates an air leak at the sampler gasket or through a crack in the sampler cup. It may also indicate a vent tube stuck in the down position. To isolate the problem, as soon as the milker is removed from the cow, shut off the vacuum and carefully remove the entire Sampler from the Milk-o-Meter. If cup contains the proper amount of milk, based upon total weight as shown on dial (approximately 1 oz. at 16 lbs., 3 oz. at 48, etc.) it indicates a stuck vent tube. This should be removed and checked for burrs and Sampler spigot checked for possible fat or milkstone build-up.

If there is not enough or no milk at all in the cup, it indicates an air leak in the Sampler gasket or cup. This causes a column of air to go up the inlet tube which prevents part or all of the milk from entering the sampler cup. In such cases, the gasket should be checked for cracks or deterioration and if necessary, replaced. NOTE: Use only “O” Rings supplied by TeSa — other types may look the same but are not manufactured to the required close tolerance and will cause problems.
### MILK-o-METER

#### PARTS LIST

<table>
<thead>
<tr>
<th>Key</th>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>031601</td>
<td>Upper Shell, Std. White</td>
</tr>
<tr>
<td>B</td>
<td>031602</td>
<td>Baffle Box</td>
</tr>
<tr>
<td>C</td>
<td>031604</td>
<td>Baffle Plate</td>
</tr>
<tr>
<td>D</td>
<td>032080</td>
<td>Baffle Tray</td>
</tr>
<tr>
<td>E</td>
<td>031650</td>
<td>Rocker Clip</td>
</tr>
<tr>
<td>F</td>
<td>031605</td>
<td>Rocker</td>
</tr>
<tr>
<td>G</td>
<td>031607</td>
<td>Rocker Shaft</td>
</tr>
<tr>
<td>H</td>
<td>031608</td>
<td>Shaft &quot;O&quot; Ring</td>
</tr>
<tr>
<td>I</td>
<td>031606</td>
<td>Thrust Pin</td>
</tr>
<tr>
<td>J</td>
<td>031622</td>
<td>Standard 1&quot; Lower Shell</td>
</tr>
<tr>
<td></td>
<td>031626</td>
<td>Push Button Valve (PBV) Lower Shell</td>
</tr>
<tr>
<td>K</td>
<td>031627</td>
<td>Pushrod Only for PBV Lower Shell</td>
</tr>
<tr>
<td>L</td>
<td>031631</td>
<td>&quot;O&quot; Ring for Pushrod (5 Required)</td>
</tr>
<tr>
<td>M</td>
<td>032108</td>
<td>Shell Clip</td>
</tr>
</tbody>
</table>
Key No. Description

N. 032086 1" to 9/16" Flex-Adapter
O. 032085 1" to 9/16" Stainless Steel Adapter
Q. 036505 Vent Plug
R. 037021 Small Shell Stopper
S. 031500 Brush for Milk-o-Meter
T. 031130 Dial Pointer (Old Style)
U. 031235 Dial Pointer (New Style)
    used with Dual Dial Pointer Kit
V. 031230 Dual Dial Pointer Kit

031231 Indicator 4-40 Hex Nut
031232 Brass Spacer 031234 Spring Washer
031233 Pin Stop 8-32 Allen Wrench
PIPE CLAMP BRACKET — 032101
Rigid molded, complete with U-bolts, nuts, clip and base. For universal application, either horizontal or vertical pipe mounting. Use one at each milk valve or inlet on line.

CLIP — 032103 (Steel), CLIP — 032109 (Molded)
Only, for mounting on wood stanchions, or on wall for Milk-o-Meter washup and storage.

U-BOLTS and 2 NUTS — 032104
Spare for Pipe Clamp Bracket

HANDLE FOR MILK-o-METER — 032105
Easily attached and removable. A big help in moving the meter in stanchion barns or other installations.

PLASTIC DIAL COVER — 032106
Required in some states for Official Testing, helpful in preventing accidental movement of dial pointer during usage, reset to zero with key.

PLASTIC DIAL RING — 032206
Same as cover, but open faced. No key required.

VAT EDGE STAND — 030060
A “must” for the washup room. Hang over the edge inside the wash vat for ease of disassembly and handling. One per installation.

TABLE MODEL STAND — 030070
A great convenience for table top storage, demonstrations and displays.

HI-FLO FRAME AND COUNTER MECHANISM — 033200
Sold without plastics. Every user should own one as a spare for any contingency.
PARTS LIST

UNITIZED LOWER SHELL -- 031622

A. 031622  Unitized Lower Shell 1" outlet
Complete Sampler assemblies
  037002  Twist Valve Sampler, 1 oz. Standard
  038051  Ball Valve, 1 oz. Standard

Parts only
B. 037029  Flat Gasket
C. 037012  Retainer spring (2)
D. 036006  Vent tube 1 oz. (Length 5 5/8"
E. 036506  Vent plug
F. 037011  Cup only for twist valve
G. 036770L  Cup only for ball valve
H. 037015  Twist valve only
I. 037020  Twist valve "O" ring
J. 036015  Ball valve assembly only
K. 038200  Twist valve Sampler
L. 038300  Ball valve Sampler

PUSH BUTTON VALVING — 031626
LOWER SHELL (PBV)

A. 031626  PBV Lower Shell only 1" outlet
B. 031627  Push rod only for PBV Lower Shell
C. 031631  "O" ring for Push rod (5 required)

(It is essential to order the above parts for operation of the PBV Shell)

Complete Sampler assemblies
  037002  Twist Valve Sampler, 1 oz. Standard
  038051  Ball Valve Sampler, 1 oz. Standard

Parts only
D. 037029  Flat Gasket
E. 037012  Retainer spring (2)
F. 036006  Vent tube 1 oz. (Length 5 5/8"
G. 036506  Vent plug
H. 037011  Cup only for twist valve
I. 036770L  Cup only for ball valve
J. 037015  Twist valve only
K. 037020  Twist valve "O" ring
L. 036015  Ball valve only

Patent Numbers:
United States 2917926
Great Britain 860043
Canada 597187
United States 4030355
PARTS LIST

AUTOMATIC DRAIN SAMPLER #038100

A.  #031626  PBV Lower Shell 1" outlet
B.  #031627  Push Rod only for PBV Lower Shell
C.  #031631  "O" Ring for Push Rod (five required)
D.  #037029  Flat Gasket
E.  #037012  Retainer Spring (2)
M.  #038105  A/D Ball
N.  #038104  A/D Rivet
O.  #038103  Collection Cup Hanger
P.  #038101  A/D Cup Only

ASSEMBLY
1. Place gasket on top of Sampler Cup (D)
2. Place Sampler cup and gasket on lower shell of Milk-o-Meter, aligning notch on Sampler cup with locating lug on lower shell.
3. Snap retainer springs over pins in lower shell (E)
4. Slide wire loop over sampler cup discharge boss and snap wire hooks at top of hanger over retainer spring.

Note: While the Automatic Drain Sampler can be used with the standard lower shell #031622, operations are much more effective when used with the PBV lower shell #031626

OPERATION

With PBV Lower Shell
Verify Hanger and Collection Cup is in place.
Push in the PBV pushbutton which cuts the vacuum, releasing all of the collected sample into your cup in seconds. Pull out the PBV pushbutton and the vacuum seals the check valve and you are ready to start milking the next cow.

With Standard Lower Shell
Shut vacuum off manually and follow procedure above.

After completion of the above, when convenient for you, slip the collection cup out of the hanger, mix as required and take as much as needed for your regular sample bottle or bag, discarding the balance.
MILK-o-METER COMPLETE ASSEMBLY
[Sampler not included and must be ordered separately]

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
<th>Price ea.</th>
</tr>
</thead>
<tbody>
<tr>
<td>033020</td>
<td>Milk-o-Meter, includes 031626 PBV Lower Shell, Pushrod and &quot;O&quot; Rings.........</td>
<td>$205.00</td>
</tr>
<tr>
<td>033000</td>
<td>Milk-o-Meter, includes 031622 Unitized Lower Shell...</td>
<td>$189.00</td>
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<tr>
<td>033010</td>
<td>Milk-o-Meter, includes 031622 Unitized Lower Shell, with KILO Dial...........</td>
<td>$222.00</td>
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<tr>
<td>033011</td>
<td>Milk-o-Meter, includes 031626 PBV Lower Shell, Pushrod, &quot;O&quot; Rings, with KILO Dial...</td>
<td>$237.00</td>
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<tr>
<td>034000</td>
<td>Milk-o-Meter, same as 033000 plus electronic provisions for computer application...</td>
<td>$308.00</td>
</tr>
<tr>
<td>034020</td>
<td>Milk-o-Meter, same as 034000 except including PBV Lower Shell, Pushrod and &quot;O&quot; Rings...</td>
<td>$323.00</td>
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<tr>
<td>033200</td>
<td>Milk-o-Meter Frame &amp; Counter Mechanism only...</td>
<td>$126.00</td>
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</table>

MOLDED METER HOUSING MODIFIED FOR LOW LINE INCLUDING CLEAR DIAL RING OR CLEAR DIAL COVER [SPECIFY WHICH]:

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
<th>Price ea.</th>
</tr>
</thead>
<tbody>
<tr>
<td>033050</td>
<td>PBV Milk-o-Meter, with clear Dial Ring or Cover....</td>
<td>$215.00</td>
</tr>
<tr>
<td>033060</td>
<td>STD Milk-o-Meter, with clear Dial Ring or Cover....</td>
<td>$200.00</td>
</tr>
<tr>
<td>033150</td>
<td>Milk-o-Meter Frame &amp; Counter Mechanism only, with dial ring or cover for low line installation...</td>
<td>$139.00</td>
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MILK-o-METER ACCESSORIES

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
<th>Quantity- 1-24</th>
<th>25-499</th>
<th>500 up</th>
</tr>
</thead>
<tbody>
<tr>
<td>032101</td>
<td>Pipe Clamp Bracket, molded..........</td>
<td>4.50</td>
<td>4.30</td>
<td>4.10</td>
</tr>
<tr>
<td>032102</td>
<td>Base only for Pipe Clamp Bracket....</td>
<td>2.30</td>
<td>2.00</td>
<td>1.90</td>
</tr>
<tr>
<td>032109</td>
<td>Clip only for wall mounting....</td>
<td>2.30</td>
<td>2.00</td>
<td>1.90</td>
</tr>
<tr>
<td>032110</td>
<td>Pipe Clamp Bracket, with steel Clip...</td>
<td>5.00</td>
<td>4.80</td>
<td>4.35</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
<th>Price ea.</th>
</tr>
</thead>
<tbody>
<tr>
<td>032103</td>
<td>Steel Clip only, PCB, for welding...</td>
<td>3.30</td>
</tr>
<tr>
<td>032104</td>
<td>U-Bolt for Pipe Clamp Bracket, with 2 nuts...</td>
<td>.60</td>
</tr>
<tr>
<td>032105</td>
<td>Handle for Milk-o-Meter...</td>
<td>10.65</td>
</tr>
<tr>
<td>Part No.</td>
<td>Description</td>
<td>Price ea.</td>
</tr>
<tr>
<td>-----------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>032106</td>
<td>Clear Plastic Dial Cover, closed, less key, for aluminum and molded dial.</td>
<td>6.60</td>
</tr>
<tr>
<td>032206</td>
<td>Clear Plastic Dial Ring, Open faced, no key required, for aluminum and molded dial.</td>
<td>6.60</td>
</tr>
<tr>
<td>033106</td>
<td>Clear Plastic Dial Cover, or 033206 ring, for molded Meter Mechanism [Low line installation only]</td>
<td>6.60</td>
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<tr>
<td>032107</td>
<td>Key, for Clear Plastic Dial Cover</td>
<td>3.50</td>
</tr>
<tr>
<td>030060</td>
<td>Vat Edge Stand, for Meter washup at vat</td>
<td>14.00</td>
</tr>
<tr>
<td>030070</td>
<td>Table Model Stand, for Meter support</td>
<td>13.20</td>
</tr>
<tr>
<td>031500</td>
<td>Brush for Meter Lower Shell Shaft cleaning</td>
<td>.90</td>
</tr>
<tr>
<td>032108</td>
<td>Shell Clips for holding Meter shells together</td>
<td>1.10</td>
</tr>
</tbody>
</table>

**MILK-o-METER PARTS**

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
<th>Price ea.</th>
</tr>
</thead>
<tbody>
<tr>
<td>031601</td>
<td>Upper Shell</td>
<td>$23.20</td>
</tr>
<tr>
<td>031626</td>
<td>Lower Shell, 1&quot;, Push Button Valving, PBV</td>
<td>37.95</td>
</tr>
<tr>
<td>031622</td>
<td>Lower Shell, 1&quot;, Std.</td>
<td>34.10</td>
</tr>
<tr>
<td>032086</td>
<td>Flex-Adapter Assembly</td>
<td>6.90</td>
</tr>
<tr>
<td>032087</td>
<td>Stainless tube, for Flex-Adapter</td>
<td>3.40</td>
</tr>
<tr>
<td>032088</td>
<td>Flex-Adapter less stainless tube</td>
<td>3.40</td>
</tr>
<tr>
<td>031627</td>
<td>Pushrod for PBV Lower Shell</td>
<td>17.50</td>
</tr>
<tr>
<td>031631</td>
<td>&quot;O&quot; Ring for PBV Pushrod, [5 req'd.][bulk 100- .37]</td>
<td>.55</td>
</tr>
<tr>
<td>031602</td>
<td>Baffle Box</td>
<td>9.90</td>
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<tr>
<td>031604</td>
<td>Baffle Plate</td>
<td>6.60</td>
</tr>
<tr>
<td>032080</td>
<td>Baffle Tray</td>
<td>12.75</td>
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<tr>
<td>031605</td>
<td>Rocker</td>
<td>14.50</td>
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<tr>
<td>031607</td>
<td>Rocker Shaft</td>
<td>21.55</td>
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<tr>
<td>031650</td>
<td>Rocker Clip [2 required per Rocker].</td>
<td>.70</td>
</tr>
<tr>
<td>031608</td>
<td>&quot;O&quot; Ring for Rocker Shaft [Bulk 100- .26]</td>
<td>.40</td>
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<tr>
<td>031606</td>
<td>Thrust Pin for Lower Shell</td>
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</tr>
<tr>
<td>031005</td>
<td>Kilo Dial Face Assembly</td>
<td>16.15</td>
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<tr>
<td>031007</td>
<td>Molded Dial Face Assembly, with 031242 Spacer</td>
<td>14.00</td>
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<tr>
<td>031006</td>
<td>Adhesive Backed Dial Face</td>
<td>5.95</td>
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<tr>
<td>031130</td>
<td>Dial Pointer Assembly with spring stop.</td>
<td>7.25</td>
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<tr>
<td>031235</td>
<td>Dial Pointer Assembly, [new style]</td>
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<tr>
<td>031230</td>
<td>Dual Dial Pointer Kit [update old style, alum.face]</td>
<td>6.60</td>
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<tr>
<td>031240</td>
<td>Dual Dial Pointer Kit for Molded Dial Face</td>
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<tr>
<td>033416</td>
<td>Dual Dial Pointer Kit for Molded Housing</td>
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<tr>
<td>031231</td>
<td>Stainless Indicator only, for Dual Dial Pointer</td>
<td>3.85</td>
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<tr>
<td>031233</td>
<td>Pin Stop, Dual Dial Pointer</td>
<td>1.65</td>
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<tr>
<td>031234</td>
<td>Spring Washer, Dual Dial Pointer</td>
<td>.55</td>
</tr>
<tr>
<td>037021</td>
<td>Small Shell Stopper,[bulk 100- .22]</td>
<td>.35</td>
</tr>
</tbody>
</table>
# MILK-o-METER INSPECTION TOOLS

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
<th>Price ea.</th>
</tr>
</thead>
<tbody>
<tr>
<td>030115</td>
<td>Bracket Gage for levelling Pipe Clamp Brackets</td>
<td>28.60</td>
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</tbody>
</table>

## SAMPLER, COMPLETE ASSEMBLIES

(Sampler not included in Milk-o-Meter price and must be ordered separately)

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
<th>Price ea.</th>
</tr>
</thead>
<tbody>
<tr>
<td>037002</td>
<td>Twist Valve Sampler</td>
<td>$23.65</td>
</tr>
<tr>
<td>038051</td>
<td>Ball Valve Sampler</td>
<td>29.15</td>
</tr>
<tr>
<td>038100</td>
<td>A/D Sampler [Automatic Drain]</td>
<td>17.25</td>
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<tr>
<td>038200</td>
<td>Twist Valve Sampler, less vent tube and plug</td>
<td>19.45</td>
</tr>
<tr>
<td>038300</td>
<td>Ball Valve Sampler, less vent tube and plug</td>
<td>19.70</td>
</tr>
</tbody>
</table>

## SAMPLER PARTS

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
<th>Price ea.</th>
</tr>
</thead>
<tbody>
<tr>
<td>037011</td>
<td>Twist Valve, Cup only</td>
<td>$17.05</td>
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<tr>
<td>036770</td>
<td>Ball Valve, Cup only</td>
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<tr>
<td>038101</td>
<td>A/D, Cup only</td>
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<tr>
<td>038103</td>
<td>A/D Collection Cup Hanger</td>
<td>16.10</td>
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<tr>
<td>036015</td>
<td>Loop Ball Valve</td>
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<tr>
<td>037015</td>
<td>Twist Valve</td>
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<tr>
<td>036006</td>
<td>Vent Tube</td>
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<tr>
<td>037029</td>
<td>Sampler Gasket</td>
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<tr>
<td>036505</td>
<td>Vent Tube Plug</td>
<td>.40</td>
</tr>
<tr>
<td>037012</td>
<td>Retainer Spring, Sampler Cup</td>
<td>4.20</td>
</tr>
<tr>
<td>037020</td>
<td>Twist Valve &quot;O&quot; Ring [Bulk 100-.33]</td>
<td>.50</td>
</tr>
<tr>
<td>038104</td>
<td>A/D Cup Ball Rivet</td>
<td>.75</td>
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<tr>
<td>038105</td>
<td>A/D Ball [Stainless]</td>
<td>1.10</td>
</tr>
<tr>
<td>038106</td>
<td>A/D &quot;O&quot; Ring Seal</td>
<td>.35</td>
</tr>
</tbody>
</table>
RECORDER

Part No.       Description                                      Price ea.
061000        AM/PM Standard Interval Recorder, Toggle Switch...... $145.00
063000        AM/PM Standard Interval Recorder, Key Switch........ 138.00
062000        AM/PM Portable Interval Recorder, Toggle Switch...... 161.00
064000        AM/PM Portable Interval Recorder, Key Switch........ 155.00

Recorders are furnished with a standard 10 minute time delay setting, but are available in 20 minute, 30 minute or 60 minute time delay setting upon request at no extra charge, where required.

RECORDER ACCESSORIES AND PARTS

061020        AM/PM Field Tester Unit.............................. $ 92.00
060158        Wall Receptacle for Portable Model use................. 21.00
061006        Replacement Electronic Module, Toggle Switch........ 121.00
063006        Replacement Electronic Module, Key Switch........... 114.00

TERMS AND CONDITIONS OF SALE

MINIMUM ORDER IS $15.00 NET, excluding shipping charges. Please add additional supply items to reach this total, or if you would prefer us to do so, we will use our best judgement.

ALL SALES ARE MADE NET FOB Fort Lauderdale, Florida with prices in effect at the time of shipment. Advance authorization will be requested of any increase exceeding 10% above the most recent published price list.

Ground UPS shipping cost will be prepaid when payment is received with orders over $50.00. Please add $3.00 on prepaid orders under $50.00 to cover shipping charges.

August 15, 1989

TESA METERS, INC. • Box 21519, Fort Lauderdale, Florida 33335 • 305-525-6688