

# Foss Electric Milko-Scope II Meter Manual



# Foss Milko-Scope MK II

## General Description

*Adapted from the Technical Bulletin 16800-6GB – November 1980*

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### 1. Measuring Principle

The Milko-Scope meter collects a certain part of the total milk flow in order to determine the yield and to take out a sample for analysis.

### 2. Measuring System

The inlet tube connects to the milk claw and leads the milk into the top chamber. A constriction at the top ensures an adequate velocity of the milk stream when it hits the distributing plate.

The top chamber contains the distributing plate, the knife, and the outlet to the milk line.

The distributing plate spreads the milk in a dome and the knife separates a part of the milk (approximately 5%) into the measuring chamber. The rest of the milk is transferred to the milk line.

The measuring chamber is scaled in order to make a direct read-out of the yield. The chamber is fitted with two valves:

- A. An air valve at the bottom is used when air mixing is necessary before taking out a sample for analysis.
- B. The evacuating valve with pushbutton at the top is used when emptying the chamber. When activating this valve, the milk in the measuring chamber is re-transferred to the top chamber via the sampling system. Only the volume of milk wanted for chemical analysis remains in the system.

The sampling system transfers a yield proportional sample (PS) or a constant volume sample (CS) to the sample cup. The sampling system can easily be changed from one type to the other. The proportional sample system provides 4 ml per kg and the constant sample system provides volumes between 5-80 ml and is adjustable.

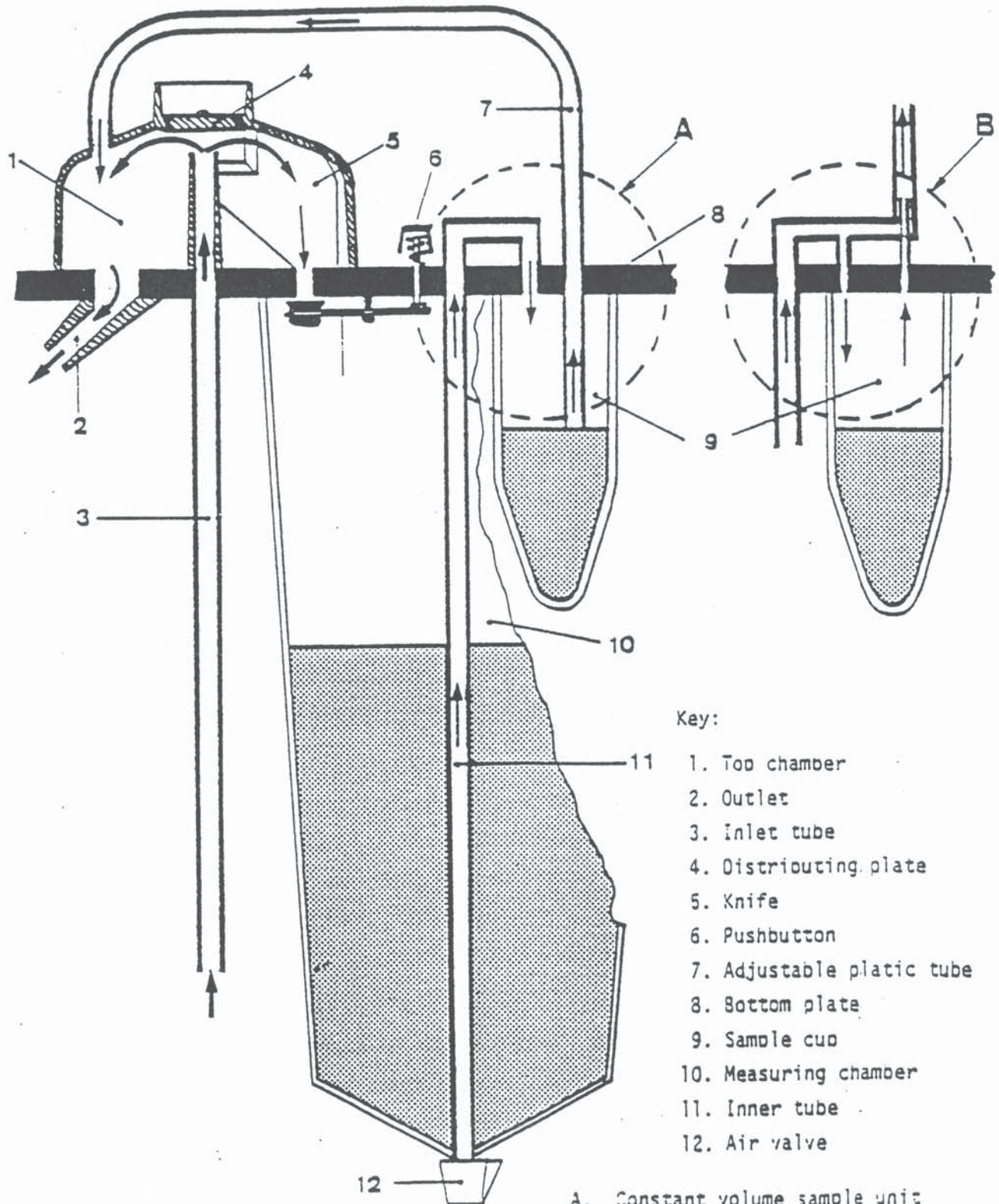
The sample cup is easily removable and scaled to make a read-out sample size.

### 3. Mounting System

The Milko-Scope is permanently fitted with a hanger for all around mounting.

For the most accurate measurements, a mounting bracket for fixed, vertical mounting is supplied. This system makes it possible to mount the Milko-Scope on low as well as high mounted milk lines, vertical or horizontal.

# MILKO-SCOPE MK II WORKING PRINCIPLE



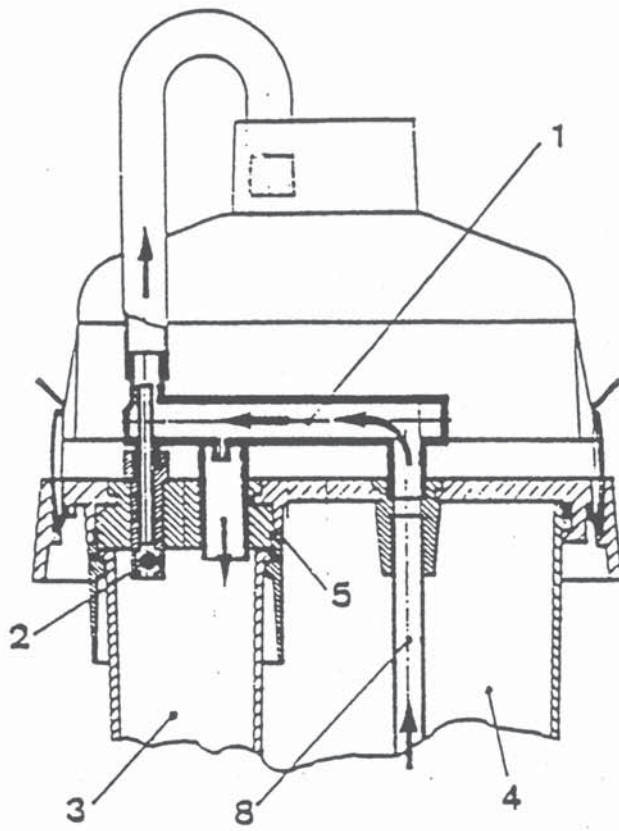
### Key:

1. Top chamber
2. Outlet
3. Inlet tube
4. Distributing plate
5. Knife
6. Pushbutton
7. Adjustable plastic tube
8. Bottom plate
9. Sample cup
10. Measuring chamber
11. Inner tube
12. Air valve

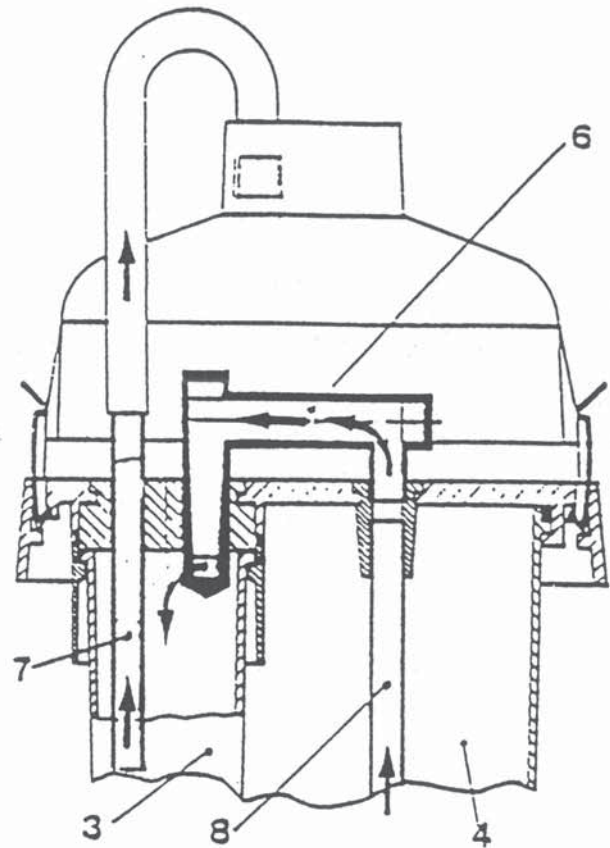
- A. Constant volume sample unit  
 B. Proportional volume sample unit



## Proportional Sampling



## Constant Sampling



## Key:

1. Venturi tube
2. Non-return valve
3. Sample cup
4. Measuring chamber
5. Milk inlet hole to the sample cup

6. Connection tube
7. Adjustable tube
8. Suction tube in the Measuring chamber

Before using any type of milk meter it should be checked that the milking system is working correctly, i.e. the vacuum level and the air inlet at the teat cups should be adjusted correctly. The Milko-Scope will accept vacuum levels between 20-50 cm Hg and air inlets of 0.7-0.8 mm  $\phi$ .

# Foss Milko-Scope MK II

## Operating Instructions

*Adapted from the Operating Instruction Manual – Part number 215079*

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### 4. Connecting the Meter to the Milk Line

The Milko-Scope is fitted with a hanger (Fig 1, item 3) for all around mounting purposes and a mounting bracket (Fig 4, item 23) for permanent use to ensure exact measurements.

Connect a hose from the milk claw to the inlet tube (Fig 1, item 13) and the milking pipeline or vacuum source to the outlet tube (Fig 1, item 9) as pictured in Fig 6.

### 5. Operating the Milko-Scope

When the milking is finished, shut off the vacuum and remove the teat cups. Read the yield on the scale (Fig 1, item 18) of the measuring chamber (Fig 1, item 12).

If a constant volume sample is wanted for analysis, squeeze the air valve (Fig 1, item 15) and allow air to agitate the milk for five seconds.

If the proportional sample fitting is used, there is no need to agitate the milk before collecting the sample. Press the button (Fig 2, item 8) to transfer the milk into the sample cup (Fig 1, item 11).

When the measuring chamber is empty, shut off the vacuum, remove the sample cup, pour the sample into a sample vial, and replace the sample cup.

### 6. Mounting of the Sample Units

To use the constant volume sample (CS) method, use the CS-U unit (Fig 5, item 5) and adjust the sample size by moving the plastic tube up and down as demonstrated in Fig 12. The sample volume can be adjusted from 5 – 80 ml.

To use the proportional volume sample (PS) method, use the PS-U unit (Fig 5, item 4).

### 7. Fixing the Mounting Bracket

The bracket can be used to mount the instrument in vertical position or vertical or horizontal pipes.

Fasten the bracket plate (Fig 4, item 25) to the pipe with two clamps. Tighten the nuts slightly, hang the meter, and adjust with a level until the bottom plate (Fig 1, item 10) is horizontal. Tighten the nuts and cut off the excess threading.

### 8. Using a Filter

A filter (Fig 2, item 16) is available and can be used where the thread of solid materials, such as straw, may be present in the milk.

# MILKO-SCOPE MK II

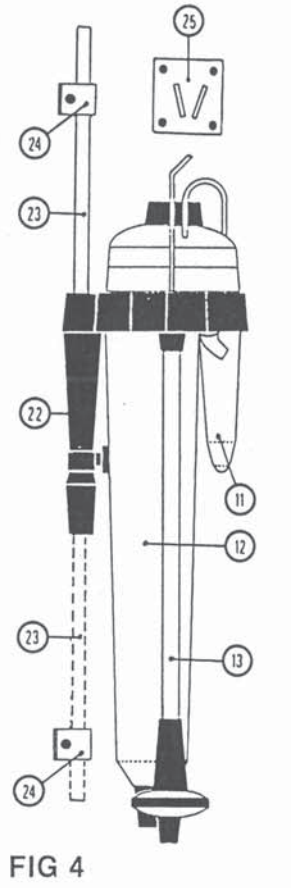
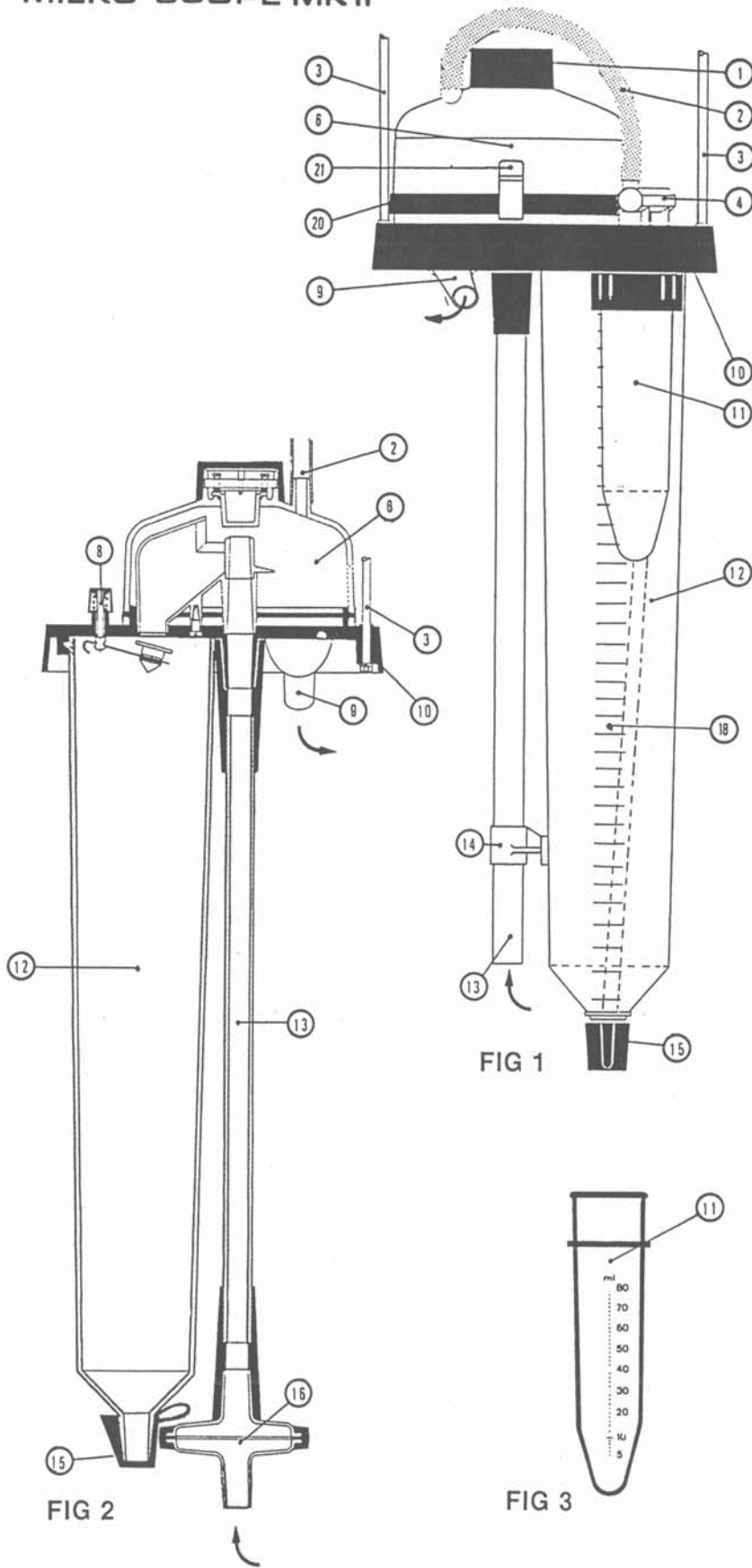


FIG 4

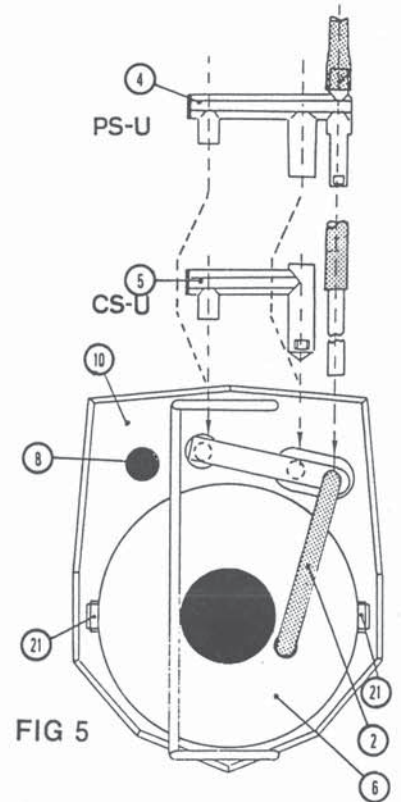


FIG 5

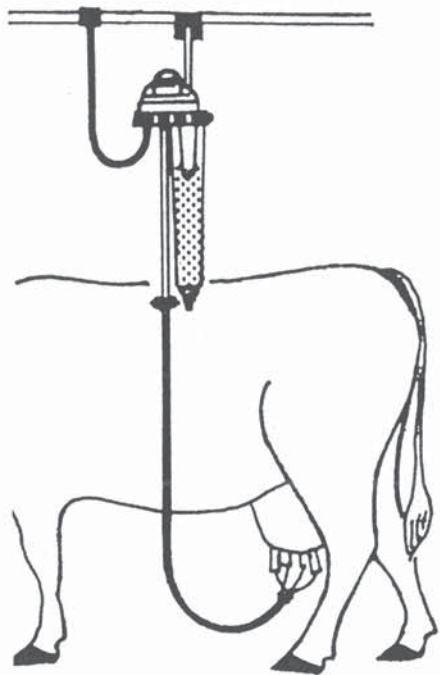


FIG 6

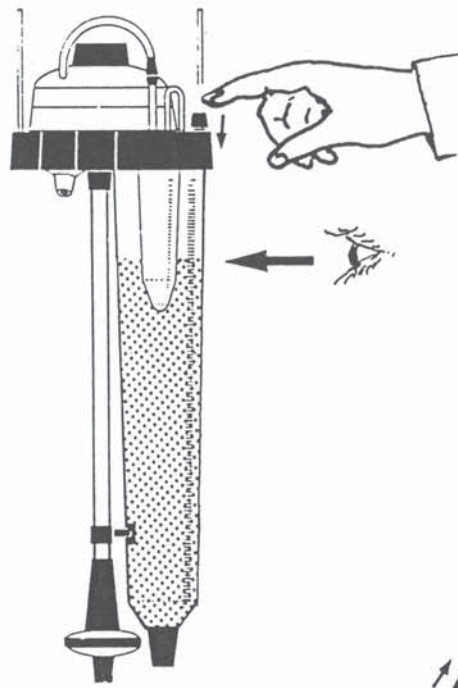


FIG 7

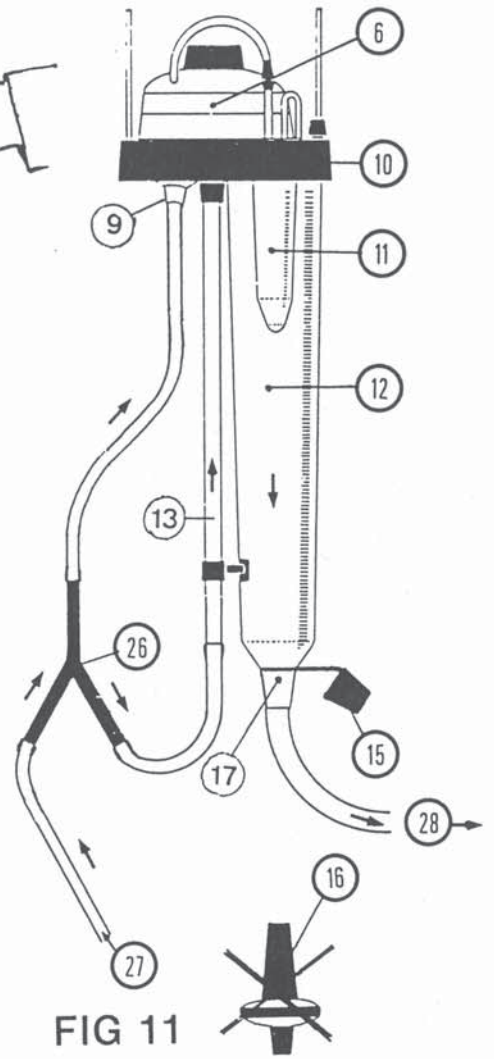


FIG 11

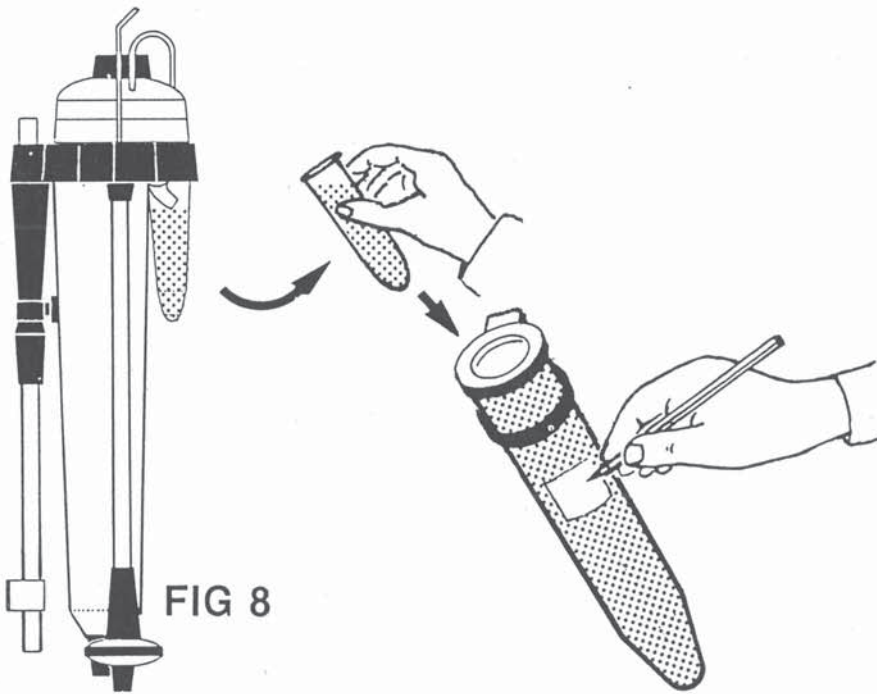


FIG 8

FIG 9

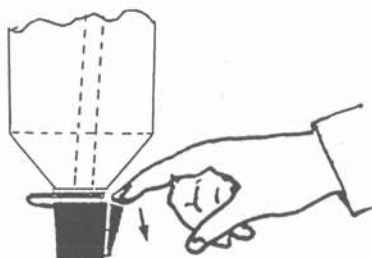


FIG 10

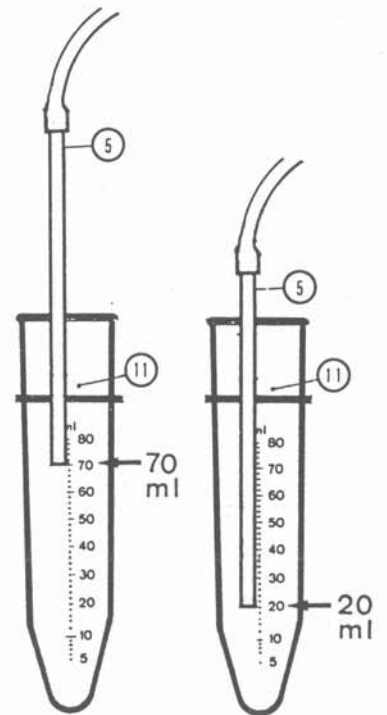


FIG 12



# Foss Milko-Scope MK II

## Maintenance

*Adapted from the Technical Bulletin 16800-9GB – November 1980*

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### 9. Replacement of the Knife

When the meter cannot be adjusted to meet the required tolerances or there is physical damage to the knife, it can be replaced using the following procedure:

- a. Remove the top chamber (assembly 428144).
- b. Unscrew the fastening screw (202986) situated in the bottom plate and remove the knife.

Before inserting a new knife, the following procedures must be carried out:

- A. Grease the knife O-rings (209452 & 054312) with silicone and placed in the bottom plate recessions.
- B. Press the knife in place.
- C. The O-rings must fit precisely around the tubes. Grease the fastening screw with silicone and insert the screw. Tighten it with a torque wrench to 5 kp / cm and check the screw at regular intervals.

### 10. Pushbutton

It is important that the conical spring (202416) in the pushbutton be inserted with the wide side upwards against the pushbutton knob (202648) and the narrow end down against the bottom plate.

The rubber gasket (227850) situated under the bottom plate must be inserted with the lip against the bottom plate. Otherwise, the lead-in will not be tight.

### 11. Filter

To clean the filter, remove the rubber ring around the filter and take it apart. The filter must be removed when cleaning the Milko-Scope.

# Foss Milko-Scope MK II

## Cleaning Instructions

*Adapted from the Operating Instruction Manual – Part number 215079*

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### 12. Connecting the Meter to the Milk Line

Whenever possible, the Milko-Scope should be cleaned in place with the milking system.

If mounted, remove the filter (Fig 2, item 16) and the rubber cap (Fig 2, item 15) from the bottom of the measuring chamber (Fig 2, item 12).

Connect the Y-shaped fitting (Fig 11, item 26) supplied to the inlet tube (Fig 11, item 13) and the outlet stud (Fig 11, item 9) as shown in Fig 11.

Connect the hose from the milk claw (Fig 11, item 27) to the Y-shaped fitting and connect the hose from the milk line or vacuum source (Fig 11, item 28) to the bottom of the measuring chamber (Fig 11, item 17).

The cleaning fluid should be drawn through the meter in the direction shown in Fig 11.

### 13. Cleaning Agents

The Milko-Scope can withstand common types of cleaning liquids including detergents, acids, and caustics in moderate concentrations and at a maximum temperature of 90° C.

### 14. Tips for Proper Cleaning

To achieve a proper cleaning, lead a volume of air continuously into the stream. If necessary, mount an air intake in the hose.

After cleaning, keep the rubber cap (Fig 11, item 15) off of the meter to ensure proper draining of the measuring chamber.

The sample cup must be washed manually.

### 15. Manual Cleaning

Every second week, the Milko-Scope meter must be taken apart and cleaned with a soft brush.

Remove the measuring chamber from the bottom plate (Fig 1, item 10) as follows:

- A. Release the two joints (Fig 1, item 14 and Fig 4, item 22) by moving them upwards. Press the measuring chamber firmly against the bottom plate and twist the chamber counterclockwise.
- B. Release the two springs (Fig 5, item 21) and remove the top chamber.

After cleaning, grease the rubber gaskets of the measuring chamber and the bushings of the bottom plate with silicone grease and reverse the steps.

# Foss Milko-Scope MK II

## Calibration Checks & Adjustment

*Adapted from the Technical Bulletins 16800-7GB & 8GB – November 1980*

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### 16. Original Calibrations

Each Milko-Scope has been adjusted at the factory to show the correct readings. Before any check of the Milko-Scope, the meter must be thoroughly cleaned.

### 17. Approved Calibration Check Methods

The calibration of the Milko-Scope can be checked using the *Standard Water Test Method*. It has not been approved for use with the *Fast-Flow Water Test Method*.

### 18. Adjustment of Calibrations

The Milko-Scope can easily be adjusted to show correct readings.

The distributing plate in the top chamber is slightly sloped and when turned, changes the amount of milk separated and therefore, the volume of milk led to the measuring chamber.

Before making any adjustments, perform a calibration check to determine the meter reading. If the meter is more than 2% from the established goal, adjust the distributing plate as follows:

- A. Remove the rubber cap (202259) and seal disc (202291) by plunging a screw driver through the seal. Twist out the seal disc.
- B. Loosen the two screws (820837) locking the distributing plate (202317) and turn the plate slightly using the special adjustment key. Counterclockwise turns lower the reading and clockwise turns increase the reading.
- C. Tighten the locking screws slightly and make a calibration check.
- D. Repeat steps A-C until the desired accuracy is achieved. Then, tighten the locking screws carefully, insert a new seal disc, and replace the rubber cap.

# Foss Milko-Scope MK II

## Technical Specifications

*Adapted from the Technical Bulletin 16800-10GB - November 1980*

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Measuring range .....	0 - 30 kg
Accuracy (95% of measurements).....	+/- 3-5%
Accuracy (factory tested with water) .....	+/- 1%
Milking speed .....	0 - 10 l/min
Vacuum drop .....	Below 2.3 cm Hg at 3 l/min
Analytical sample.....	Proportional = 4 ml / kg ..... Constant = Adjustable from 5-80 ml
Height.....	68.0 cm
Width.....	19.0 cm
Depth .....	21.0 cm
Weight.....	1.4 kg



# Foss Milko-Scope MK II

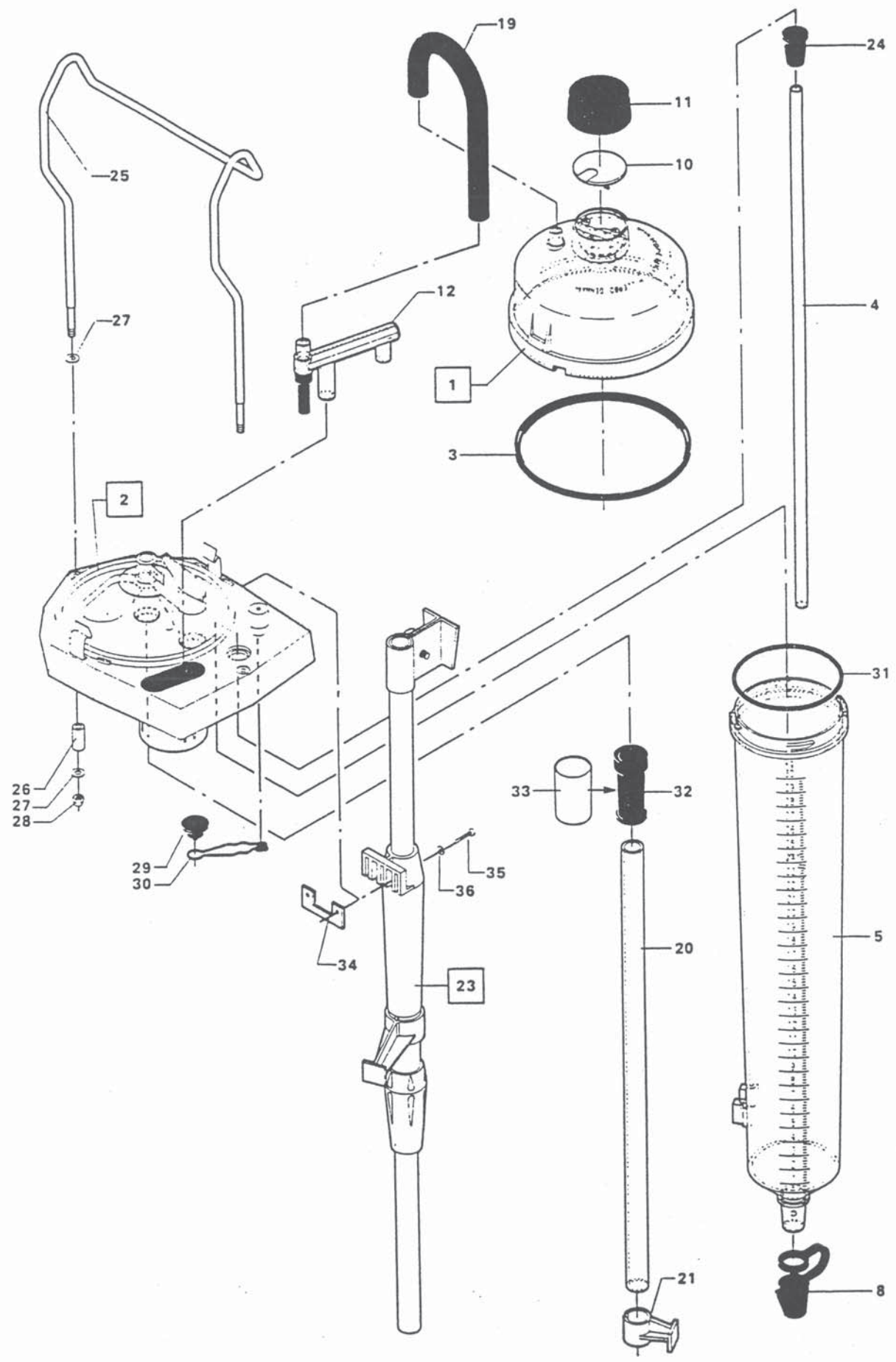
## Basic Unit

*Assembly 203000 (Metric) and 235358 (English)*

Diagram	Part Number	Description
1	428144	Top chamber
2	244731	Bottom plate
3	202275	Top gasket
4	202903	Suction tube
5	428102	Measuring tube (Metric)
5	281485	Measuring tube (English)
8	245522	Air mixer valve
10	202291	Seal
11	202259	Stopper
12	202861	Venturi tube (PS-U)
19	287524	Tube, PVC
20	202887	Tube
21	243949	Support for inlet tube
23	202499	Holder
24	202812	Rubber bush
25	202523	Hanger
26	202655	Distance tube
27	221366	Washer
28	213751	Top nut
29	202549	Valve flap
30	202432	Valve arm
31	202697	O-ring for measuring tube
32	238352	Coupling piece
33	238360	Bushing
34	268797	Threaded rod
35	820241	Screw, M3 x 15
36	011791	Washer

Assembly No.	203000	235338
Basic Unit	Kg. Scale	Pound Scale

**Spare Parts**  
Milko-Scope MK II



# Foss Milko-Scope MK II

## Top Chamber *Assembly 428144*

Diagram	Part Number	Description
2	202317	Joint
3	287904	O-ring
4	287698	Washer
5	231514	Spindle
6	820837	Screw, M3 x 8

## Bottom Plate *Assembly 244731*

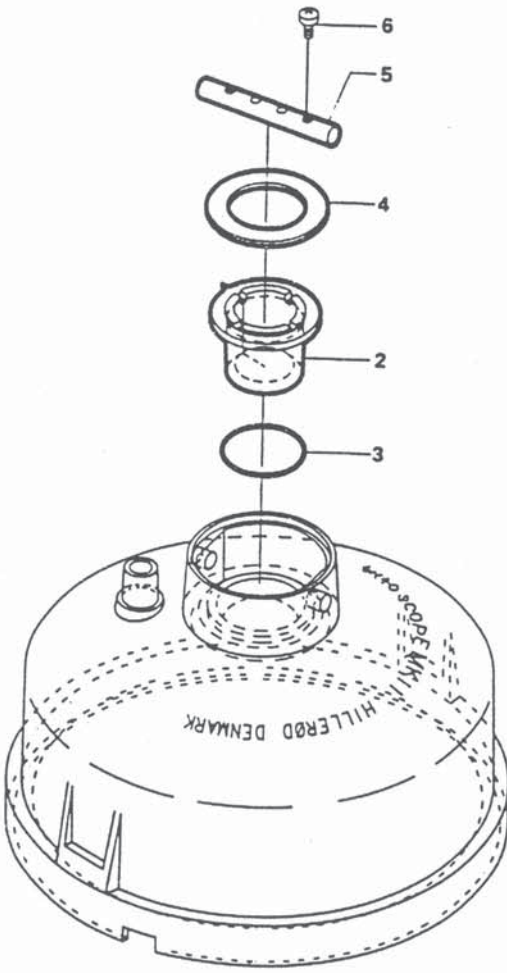
Diagram	Part Number	Description
5	202994	Knife
8	209452	O-ring for knife
9	054312	O-ring for knife
10	202986	Screw, M3 x 12
11	202572	Rod
14	227850	Gasket for rod
15	202648	Knob
16	202416	Spring
19	202663	Clamp for sample beaker
20	202564	Gasket
21	243931	Lock

## Filter *Assembly 227421*

Diagram	Part Number	Description
3	202390	Filter mesh

Assembly No. 428144  
Top Chamber

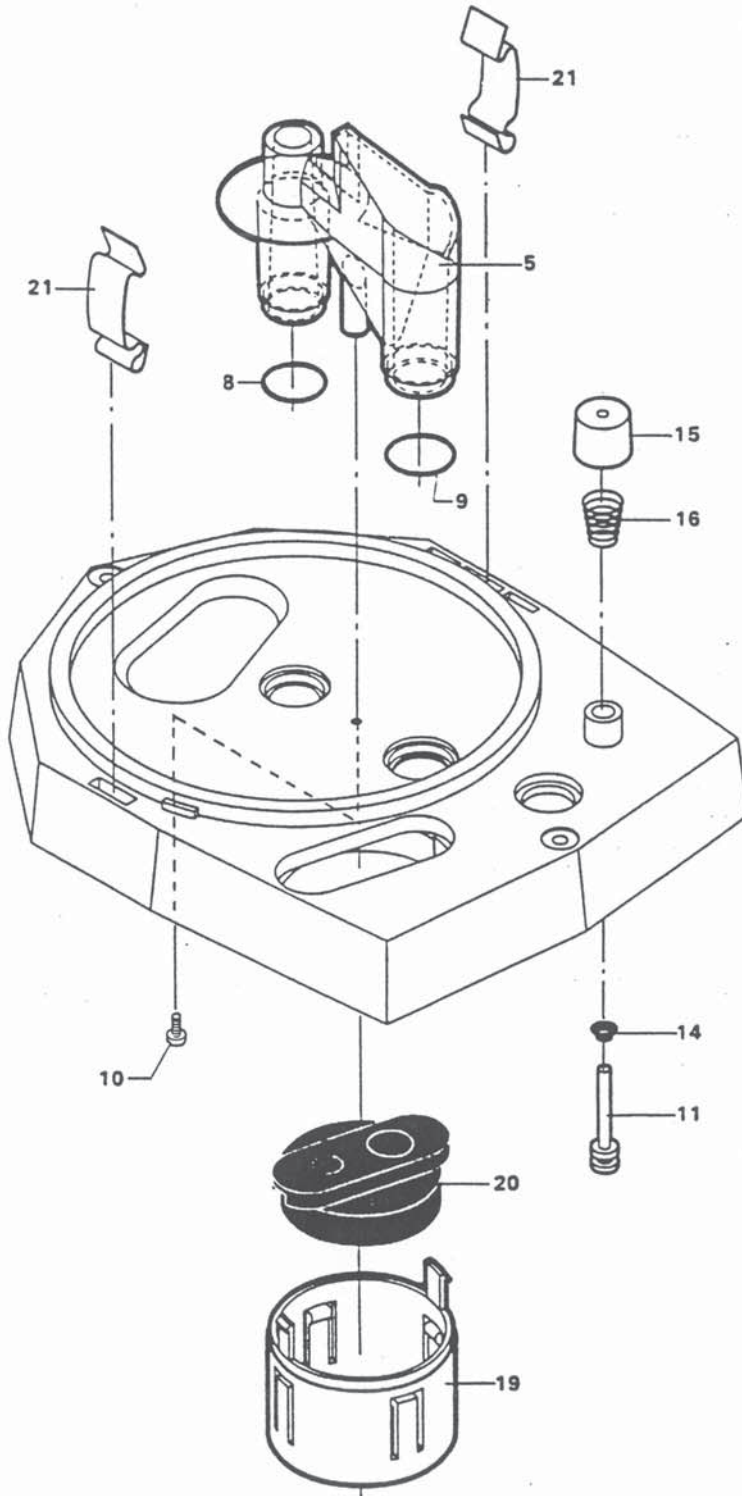
Spare Parts  
Milko-Scope MK II





Assembly No. 244731  
Bottom Plate

Spare Parts  
Milko-Scope MK II

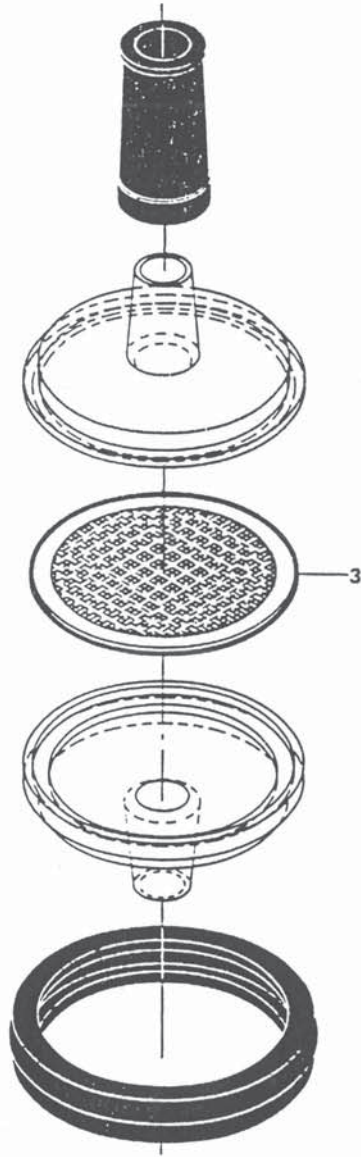


Assembly No. 227421

Filter, complete (5 pieces)

Spare Parts

Milko-Scope MK II



# Foss Milko-Scope MK II

## Bracket with Holder

*Assembly 202499*

Diagram	Part Number	Description
4	210310	Handle
5	202945	Nut
6	202606	Holder
7	202556	Finger screw
11	202739	Support for handle
12	008821	Washer

## Cleaning Equipment

*Assembly 202721*

Diagram	Part Number	Description
1		
2		
3		
4		
5		

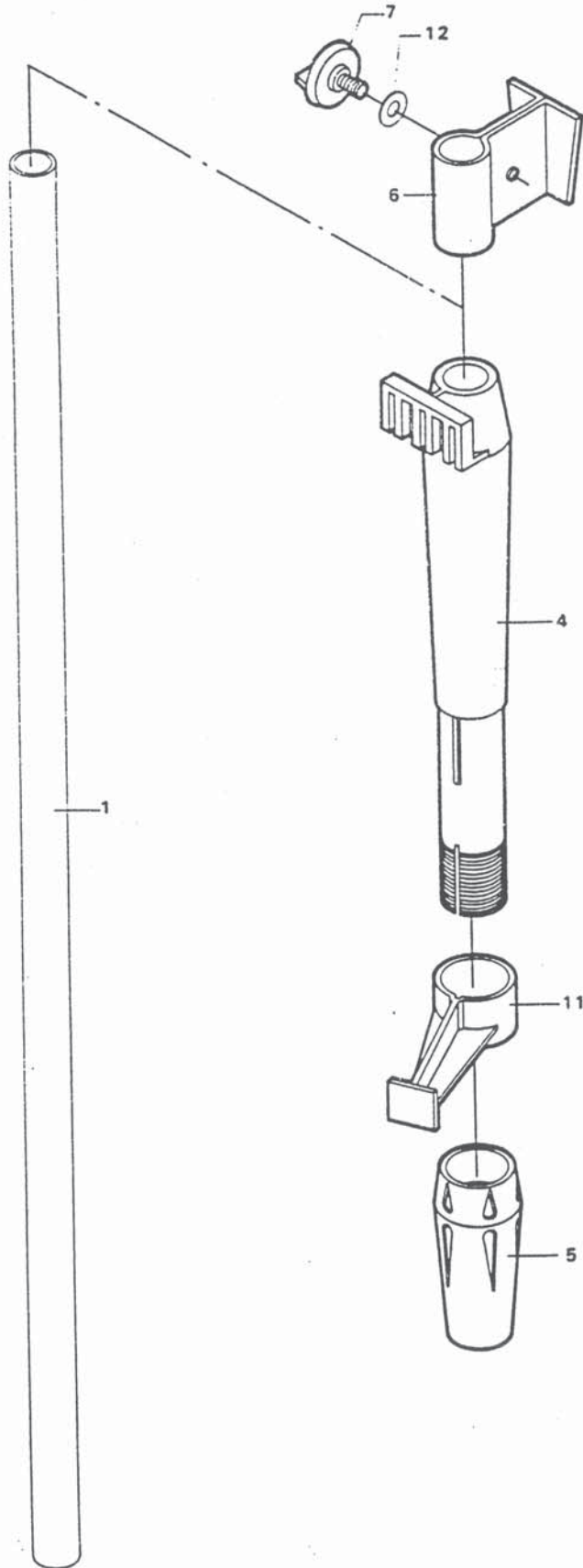
## Accessories

Diagram	Part Number	Description
1	428003	CSU-Tube
7	280784	Tube
8	215087	Bracket, complete
13	202234	Sample beaker
14	215079	Instruction manual
15	215202	Cleaning tube
18	394783	Outlet tube
23	009142	Hanger

Assembly No. 202499

Bracket with Holder

Spare Parts  
Milko-Scope MK II



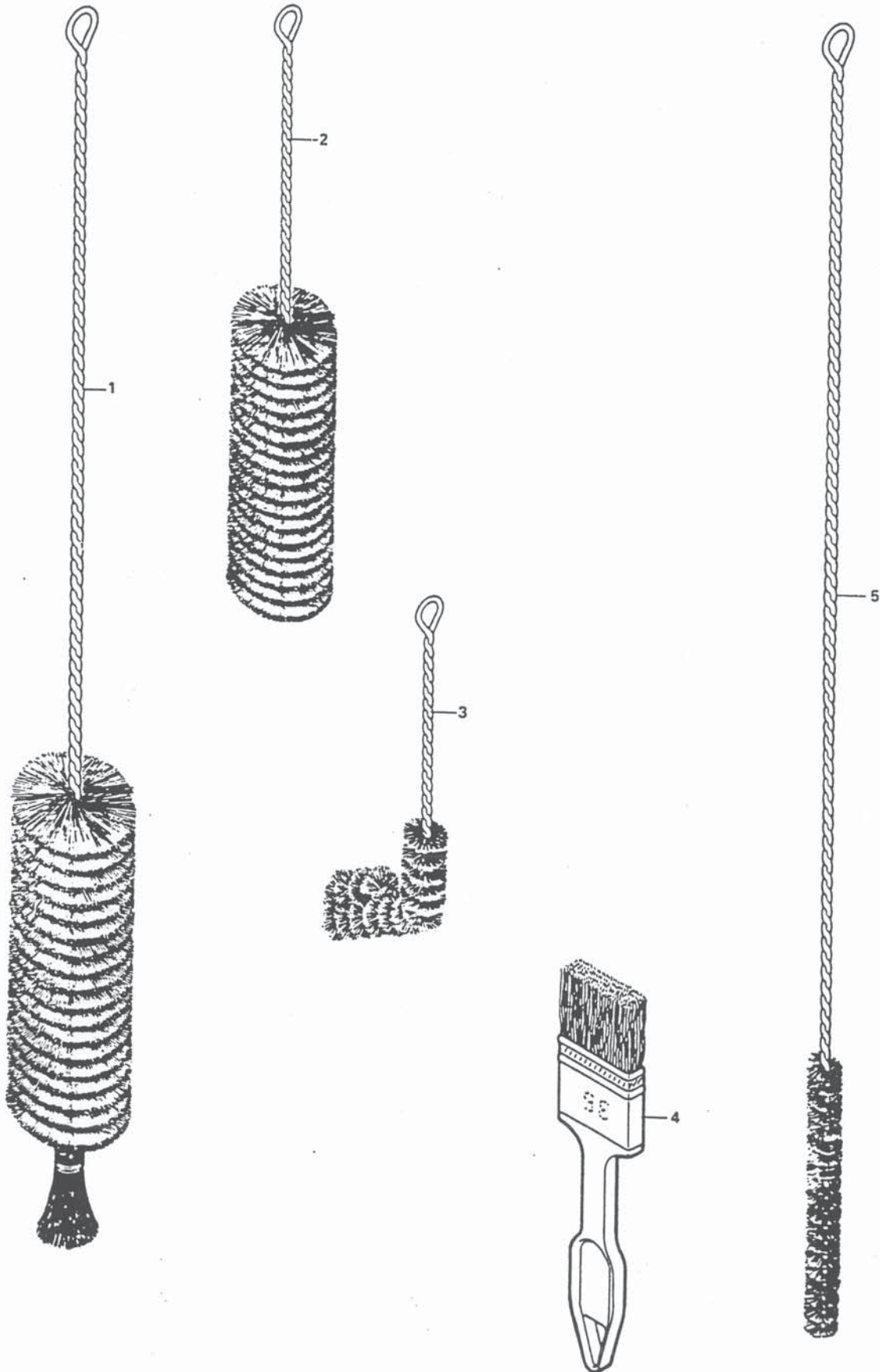


Assembly No. 202721

Cleaning Equipment

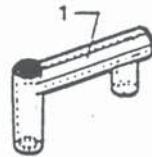
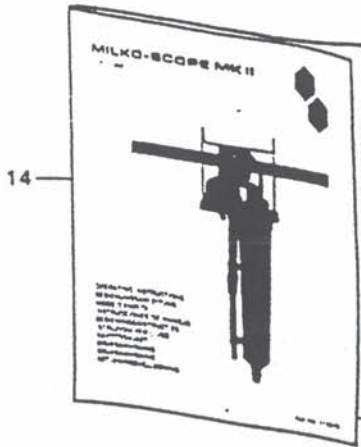
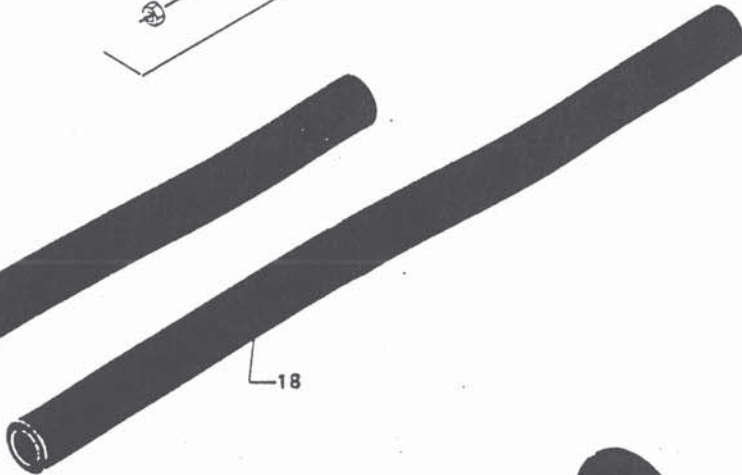
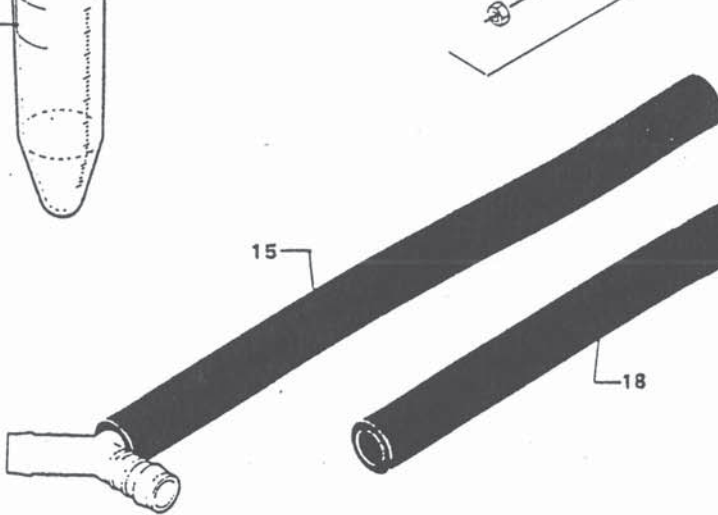
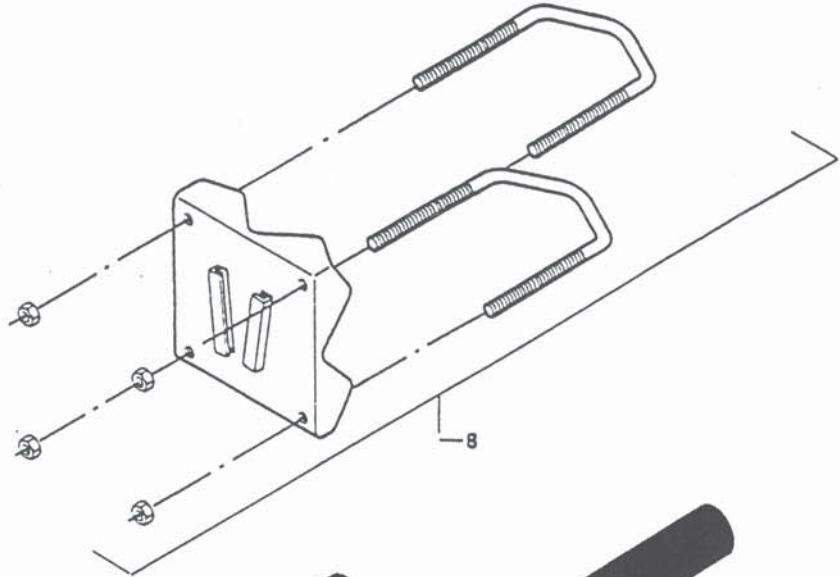
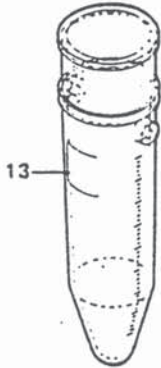
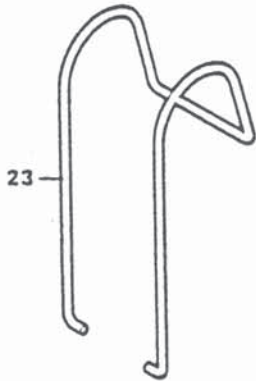
Spare Parts

Milko-Scope MK II



Assembly No.
Accessories

Spare Parts  
Milko-Scope MK II



# Foss Milko-Scope MK II

## Calibration Checks & Adjustment

*Adapted from the Technical Bulletins 16800-7GB & 8GB – November 1980*

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# **Quality Certification Services Inc.**

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