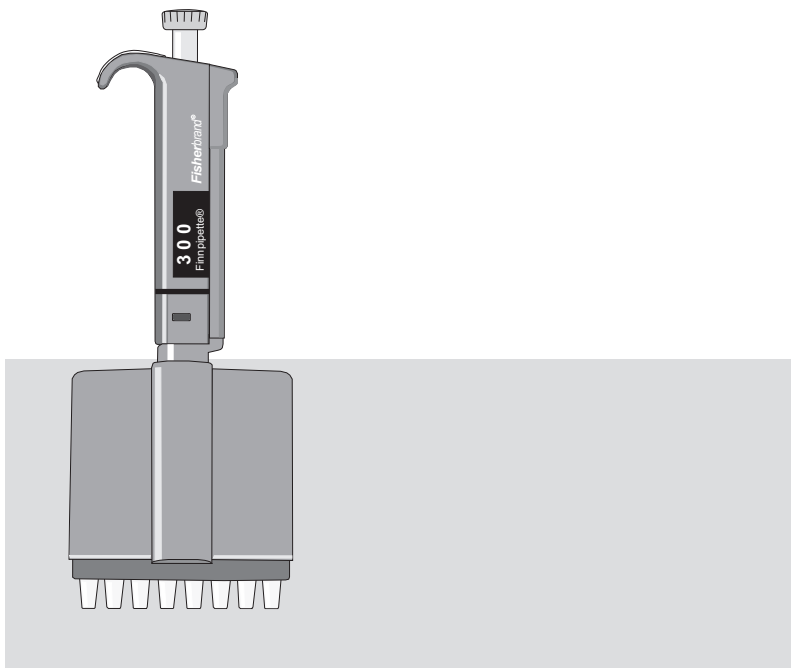


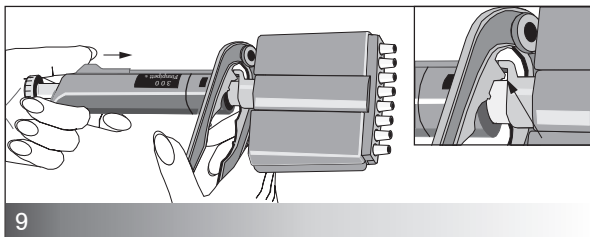
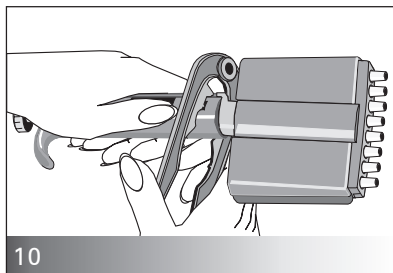
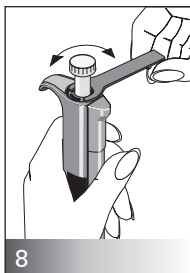
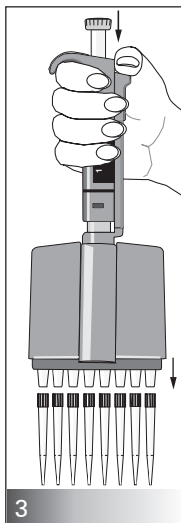
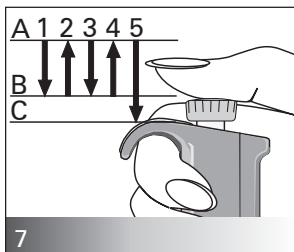
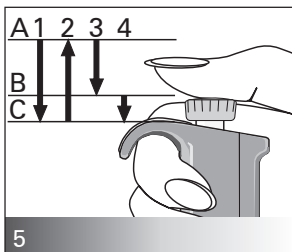
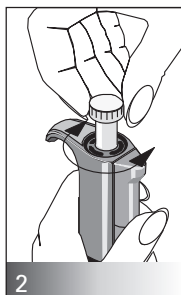
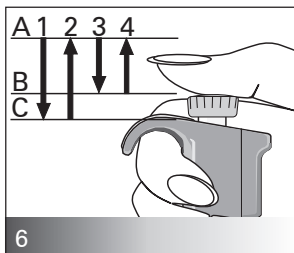
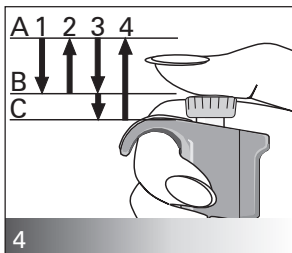
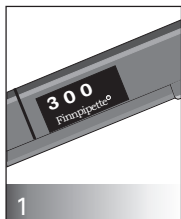
Fisherbrand[®] **Finnpipette II**

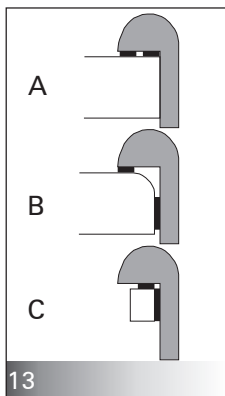
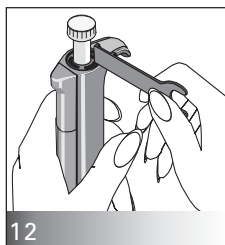
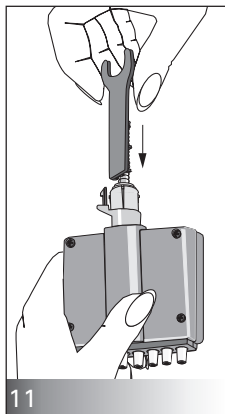
Multichannel INSTRUCTIONS FOR USE



Fisher Scientific

2000 PARK LANE
Pittsburgh PA 15275
800-766-7000





CONTENTS

PRODUCT DESCRIPTION	4
PIPETTE OPERATION	4
PIPETTING TECHNIQUES	5
CALIBRATION	7
MAINTENANCE	9
TROUBLE SHOOTING	11
PACKAGE	11
SPARE PARTS	12-13

PRODUCT DESCRIPTION

The **Fisherbrand**[®] Finn timer II Multichannel is a manual digital pipette. It operates on the air displacement principle (i.e. an air interface) and uses detachable, disposable tips.

The adjusted delivery volume is displayed digitally on a readout window on the handle.

The five different models of **Fisherbrand**[®] Finn timer II Multichannel pipettes cover a volume range from 0.5 μl to 300 μl .

Fisher Catalog Number	Volume Range	Tip Size
21377825	8 channel, 0.5-10 μl , micro	10
21377827	8 channel, 5-50 μl	250, 300
21377829	8 channel, 50-300 μl	250, 300
21377826	12 channel, 0.5-10 μl , micro	10
21377828	12 channel, 5-50 μl	250, 300
21377830	12 channel, 50-300 μl	250, 300

1 DIGITAL DISPLAY

The adjusted delivery volume is clearly indicated in the large digital display on the handle.

RAW MATERIALS

The **Fisherbrand**[®] Finn timer II Multichannel is made of mechanically durable and chemically resistant materials.

PIPETTE OPERATION

SETTING THE DELIVERY VOLUME

1. Set the delivery volume using the push button on the top of the pipette. To increase the delivery volume, turn the push button counterclockwise. To decrease the delivery volume, turn it clockwise.
2. Make sure that the desired delivery volume clicks into place and that the digits are completely visible in the display window.
3. Do not set volumes outside the pipette's specified volume range.

Using excessive force to turn the push button outside the range may jam the mechanism and eventually damage the pipette.

3 TIP EJECTION

To help eliminate the risk of contamination, each pipette is fitted with a tip ejector system.

The tip ejector system consists of a soft-touch tip ejector and specially designed gearing mechanism. To release the tip, point the pipette at suitable waste receptacle and press the tip ejector with your thumb.

SAFETY LABEL

12

You can mark the pipette application your initials the calibration date, etc. on the safety label.

Remove the clear plastic window on the edge closest to the push button (use the service tool that comes with the pipette, or a screwdriver). Mark the adhesive label with a felt-tipped or other pen and snap the window back in place.

SHELF HANGER

13

You can attach the pipette shelf hanger on a counter, pipette stand or anywhere where you want to hang your pipette.

Clean the area where you plan to attach the shelf hanger. Apply two stickers to the underside of the shelf hanger. Press the shelf hanger firmly into place – on a shelf, countertop or pipette stand. To use, hang the grippy finger rest on the shelf hanger.

PIPETTING TECHNIQUES

Push and release the push button slowly at all times, particularly when working with high viscosity liquids. Never allow the push button to snap back.

Make sure that the tip is firmly attached to the tip cone. Check for foreign particles in the tip.

Before you begin your actual pipetting work, fill and empty the tip 2-3 times with the solution that you will be pipetting. Hold the pipette in an upright position while aspirating liquid. The grippy should rest on your index finger. Make sure that the tips, pipette and solution are at the same temperature.

Figures 4-7:

A = Ready position

B = First stop

C = Second stop

FORWARD TECHNIQUE

4

Fill a clean reagent reservoir with the liquid to be dispensed.

1. Depress the push button to the first stop.
2. Dip the tip under the surface of the liquid in the reservoir to a depth of about 1 cm and slowly release the push button. Withdraw the tip from the liquid touching it against the edge of the reservoir to remove excess liquid.
3. Deliver the liquid by gently depressing the push button to the first stop. After a delay of about one second, continue to depress the push button all the way to the second stop. This action will empty the tip.
4. Release the push button to the ready position.

If necessary, change the tip and continue pipetting.

5 REVERSE TECHNIQUE

The reverse technique is suitable for dispensing liquids that have a high viscosity or a tendency to foam easily. The technique is also recommended for dispensing very small volumes.

Fill a clean reagent reservoir with the liquid to be dispensed.

1. Depress the push button all the way to the second stop.
2. Dip the tip under the surface of the liquid in the reservoir to a depth of about 1 cm, and slowly release the push button.
This action will fill the tip. Withdraw the tip from the liquid touching it against the edge of the reservoir to remove excess liquid.
3. Deliver the preset volume by gently depressing the push button to the first stop. Hold the push button at the first stop. Some liquid will remain in the tip and this should not be included in the delivery.
4. The remaining liquid should either be discarded with the tip or pipetted back into the container.

6 REPETITIVE TECHNIQUE

The repetitive technique offers a rapid and simple procedure for repeated delivery of the same volume. Fill a clean reagent reservoir with the liquid to be dispensed.

1. Depress the push button all the way to the second stop.
2. Dip the tip under the surface of the liquid in the reservoir to a depth of about 1 cm, and slowly release the push button. This action will fill the tip. Withdraw the tip from the liquid touching against the edge of the reservoir to remove excess liquid.
3. Deliver the preset volume by gently depressing the push button to the first stop. Hold the push button at the first stop. Some liquid will remain in the tip and this should not be included in the delivery.
4. Continue pipetting by repeating steps 2 and 3.

7 PIPETTING WHOLE BLOOD

(deproteinization in blood glucose determination, for example)

Use steps 1 and 2 of the forward technique to fill the tip with blood.

Wipe the tip carefully with a dry clean tissue.

1. Immerse the tip into the reagent and depress the push button to the first stop, making sure the tip is well below the surface.
2. Release the push button slowly to the ready position. This will fill the tip. Keep the tip in the solution.
3. Depress the push button to the first stop and release slowly. Keep repeating this procedure until the interior wall of the tip is clear.
4. Finally, depress the push button all the way to the second stop to completely empty the tip.

CALIBRATION

All Finnpiettes are factory calibrated and adjusted to give the volumes as specified with distilled or deionized water. The pipettes are constructed to permit re-adjustment for liquids of different temperature and viscosity.

DEVICE REQUIREMENTS AND TEST CONDITIONS

An analytical balance must be used. The scale graduation value of the balance should be chosen according to the selected test volume of the pipette:

Volume range readable graduation

under 10 μl	0.00 1 mg
10-100 μl	0.01 mg
above 100 μl	0.1 mg

Test liquid: Water, distilled or deionized, "grade 3" water conforming ISO 3696. Tests are done in a draft-free room at a constant ($\pm 0.5^\circ\text{C}$) temperature of water, pipette and air between 15°C to 30°C .

The relative humidity must be above 50%. Especially with volumes under 50 μl the air humidity should be as high as possible to reduce the effect of evaporation loss. Special accessories, such as the evaporation trap, are recommended.

PROCEDURE TO CHECK CALIBRATION

The pipette is checked with the maximum volume (nominal volume) and with the minimum volume. A new tip is first pre-wetted 3-5 times and a series of ten pipettings is done with both volumes. A pipette is always adjusted for delivery (Ex) of the selected volume.

Procedure:

1. Do 10 pipettings with the minimum volume.
2. Do 10 pipettings with the maximum volume.
3. Calculate the accuracy (A) and precision (cv) of both series.
4. Compare the results to the limits in the Table 1.

If the calculated results are within the selected limits, the adjustment of the pipette is correct.

TABLE 1: Maximum permissible errors according ISO8655

Range	Channel	Volume μl	Accuracy		Precision	
			μl	%	s.d. μl	cv%
1-10 μl	8, 12	10	± 0.24	± 2.4	0.16	1.6
		1	± 0.24	± 24	0.16	16
5-50 μl	8, 12, 16	50	± 1.0	± 2.0	0.4	0.8
		5	± 1.0	± 20	0.4	8.0
30-300 μl	8, 12	300	± 8.0	± 2.7	3.0	1.0
		30	± 8.0	± 26.7	3.0	10.0

8 ADJUSTMENT:

Adjustment is done with the service tool.

1. Place the service tool into the openings of the calibration nut at the top of the handle.
2. Turn the service tool clockwise to increase, or counterclockwise to decrease the volume.
3. After adjustment check the calibration according to the instructions above.

FORMULAS FOR CALCULATING RESULTS

Conversion of mass to volume

$$\mathbf{V = (w + e) \times Z}$$

V = volume (μl)
 w = weight (mg)
 e = evaporation loss (mg)
 Z = conversion factor for mg/ μl conversion

Evaporation loss can be significant with low volumes. To determine mass loss, dispense water to the weighing vessel, note the reading and start a stopwatch. See how much the reading decreases during 30 seconds (e.g. 6 mg = 0.2 mg/s).

Compare this to the pipetting time from taring to reading. Typically pipetting time might be 10 seconds and the mass loss is 2 mg (10 s x 0.2 mg/s) in this example. If an evaporation trap or lid on the vessel is used the correction of evaporation is usually unnecessary.

The factor Z is for converting the weight of the water to volume at test temperature and pressure. A typical value is 1.0032 $\mu\text{l}/\text{mg}$ at 22°C and 95 kPa. See the conversion table on page 15.

Accuracy (systematic error)

Accuracy is the difference between the dispensed volume and the selected volume of a pipette.

$$\mathbf{A = \bar{V} - V_0}$$

A = accuracy
 \bar{V} = mean volume
 V_0 = nominal volume

Accuracy can be expressed as a relative value: $\mathbf{A\% = 100\% \times A / V_0}$

Precision (random error)

Precision refers to the repeatability of the pipettings. It is expressed as standard deviation (s) or coefficient of variation (cv)

$$\mathbf{S = \sqrt{\frac{\sum_{i=1}^n (V_i - \bar{V})^2}{n-1}}}$$

s = standards deviation
 \bar{V} = mean volume
 n = number of measurements

Standard deviation can be expressed as a relative value (CV)

$$\mathbf{CV = 100\% \times S / \bar{V}}$$

MAINTENANCE

When the **Fisherbrand**[®] Finnpiquette II Multichannell is not in use, make sure it is stored in an upright position. We recommend a Finnpiquette stand for this purpose.

SHORT-TERM CHECKING

The pipette should be checked at the beginning of each day for dust and dirt on the outside surfaces of the pipette.

Particular attention should be paid to the tip cone. No other solvents except 70 % ethanol should be used to clean the pipette.

LONG-TERM MAINTENANCE

If the pipette is used daily it should be checked every three months. The servicing procedure starts with the disassembly of the pipette.

DISASSEMBLING ASSEMBLING MULTICHANNEL PIPETTES

1. Press down the tip ejector. 9
2. Insert the maintenance pliers under the tip ejector bar to release the tip ejector.
3. Remove the tip cone module by pressing it with the maintenance pliers. 10
4. Press the spring and remove the locking pieces from the groove. Remove the spring, spring support and o-ring.
5. Place the maintenance key in the adapter groove and pull off the adapter. 11
6. Pull out the tip ejector adapter. Lift the upper end of the tip ejector bar slightly and push it back. Lift out the module spring.
7. Use a screwdriver to remove the four/six screws in the module cover and lift off the cover.
8. Remove the piston bar and clean the pistons with a dry nap-free cloth.
9. Clean the tip cones.
10. If needed, replace the seal by carefully releasing the cover ring from its snap joint with the screwdriver. Remove all the parts from the tip cone. Clean all the parts.

Reassemble the tip cone. 14

5–50 µl and 50–300 µl: Take one piston. Slide cover ring 32 (larger hole), spring 33, support ring 35, (o-ring 37 bigger 5-50µl) and o-ring 36 (smaller) onto the piston. Grease the o-ring with the lubricant provided in the pipette package. Slide all the parts into the tip cone and close the snap joint of the cover ring.

0.5–10 µl: Take one piston. Slide cover ring 32 (larger hole), support 35, o–ring 36 (bigger), o–ring 37 (smaller) and o–ring support 38 onto the piston. Then slide spring 39, spring support 40 (sharp edges first) and o–ring 41 onto the o–ring support 38. Grease the o–rings with the lubricant provided in the pipette package. Slide all the parts into the tip cone and close the snap joint of the cover ring.

11. Grease cleaned pistons with the lubricant provided in the pipette package.
12. Install the piston bar with pistons and tip cones in the cover and close the cover with the four/six screws.
13. Place the tip ejector and module spring on the neck of the module. Press the spring below the tip ejector. Close the tip ejector with the tip ejector adapter.
14. Use the maintenance key to slide the adapter to wider groove in the module neck.
15. Slide the o–ring, spring support and spring onto the piston bar and lock with the locking pieces.
16. Attach the tip cone module to the handle and the tip ejector adapter to the tip ejector bar.

SERVICE INSTRUCTIONS FOR MULTICHANNEL PIPETTE TIP CONES

To ensure even performance between all channels in a multichannel pipette, all tip cones have to be changed at the same time, if any of them needs to be changed. Don't mix tip cones of different packages, because one bag contains a matched set of tip cones.

CAUTION!

*The **Fisherbrand®** Finnpiquette II Multichannell is designed to allow easy in-lab service. If you would prefer to have us or your local representative service your pipette, please make sure that the pipette has been decontaminated before you send it to us. Please note that the postal authorities in your country may prohibit or restrict the shipment of contaminated material by mail.*

TROUBLE SHOOTING

The table below lists possible problems and their solutions.

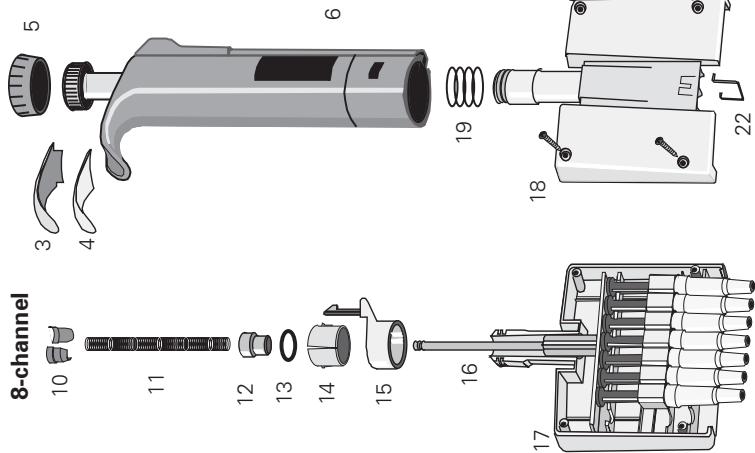
Defect	Possible reason	Solution
Leakage	Tip incorrectly attached Foreign particles between tip and tip cone Foreign particles between the piston, the O-ring and the cylinder Insufficient amount of grease on cylinder and O-ring O-ring damaged	Attach firmly Clean tip cones attach new tips Clean and grease O-ring and cylinder. Grease accordingly Change the O-ring
Inaccurate dispensing	Incorrect operation Tip incorrectly attached Calibration altered: caused by misuse, for example	Follow instructions carefully Attach firmly Recalibrate according to instructions
Inaccurate dispensing with certain liquids	Unsuitable calibration. High viscosity liquids may require recalibration.	Recalibrate with the liquids in question.

PACKAGE

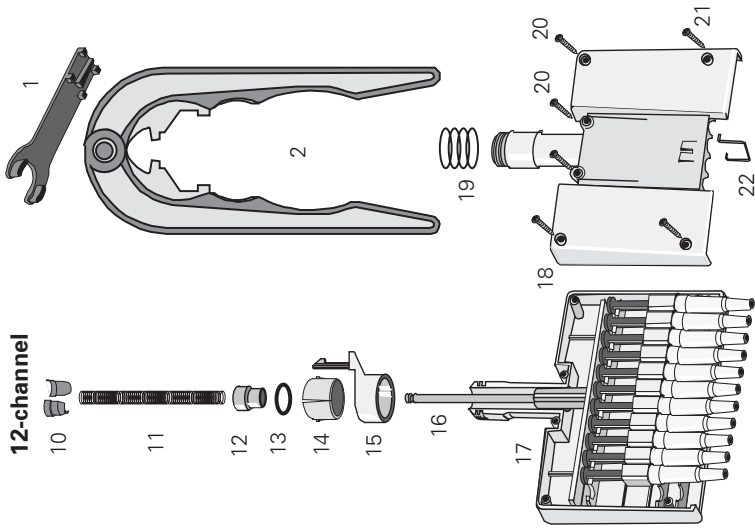
The **Fisherbrand**[®] Finnpiquette II Multichannell is shipped in a specially designed package containing the following items:

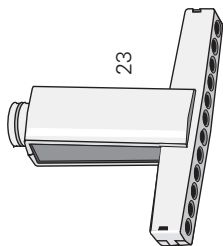
1. The Finnpiquette II
2. Service tool
3. Maintenance pliers
4. Tube of grease
5. Instruction manual
6. Calibration certificate
7. Shelf hanger
8. Two stickers

8-channel



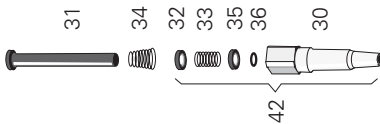
12-channel



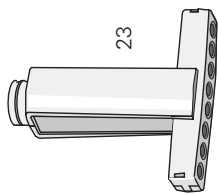
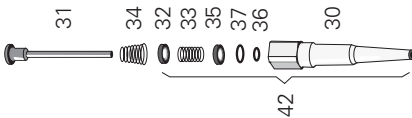


23

50-300 μ l



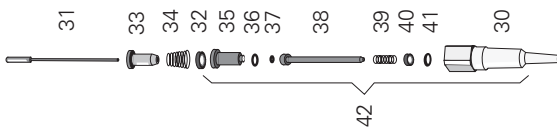
5-50 μ l



23

24

0,5-10 μ l



SPARE PARTS

14 Figure 14 lists spare parts and reorder numbers

All

1. 10593720
2. 2900580
3. 10593050
4. 1527200

0,5-10 μ l

5. 10592500
6. 2207370
11. 1131890
24. 10593230
30. 10593240
31. 2205860
32. 10589490
33. 10593510
34. 1131790
35. 10593280
36. 1030380
37. 1030060
38. 10593290
39. 1131900
40. 10593360
41. 1030170
42. 2205870
42. 2207910 **8 pcs**
42. 2207920 **12 pcs**

8-channel

10. 1058180
12. 10593260
13. 1030590
14. 10593750
15. 10593740
16. 2205970
17. 10594560
18. 10594550
19. 1131430
20. 0202040
21. 0202020
22. 1131930
23. 10594570

5-50 μ l

5. 10592510
6. 2207390
11. 1131890
30. 10589520
31. 2205950
32. 1061020
33. 1131400
34. 1131790
35. 10589500
36. 1030480
37. 1030160
42. 2208850
42. 2209080 **8 pcs**
42. 2209090 **12 pcs**

12-channel

10. 1058180
12. 10593260
13. 1030590
14. 10593750
15. 10593740
16. 2205980
17. 10594590
18. 10594580
19. 1131430
20. 0202040
21. 0202020
22. 1131930
23. 10594600

50-300 μ l

5. 10592520
6. 2207460
11. 1130720
30. 10589160
31. 2205960
32. 10589490
33. 1131400
34. 1131790
35. 10589510
36. 1030140
42. 2205270
42. 2207080 **8 pcs**
42. 2207090 **12 pcs**

Shelf hanger

- 2206740

Temperature °C	Air pressure hPA (mbar)					
	800	853	907	960	1013	1067
15	1.0018	1.0018	1.0019	1.0019	1.0020	1.0020
15.5	1.0018	1.0018	1.0019	1.0020	1.0020	1.0021
16	1.0019	1.0020	1.0020	1.0021	1.0021	1.0022
16.5	1.0020	1.0020	1.0021	1.0022	1.0022	1.0023
17	1.0021	1.0021	1.0022	1.0022	1.0023	1.0023
17.5	1.0022	1.0022	1.0023	1.0023	1.0024	1.0024
18	1.0022	1.0023	1.0024	1.0024	1.0025	1.0025
18.5	1.0023	1.0024	1.0025	1.0025	1.0026	1.0026
19	1.0024	1.0025	1.0025	1.0026	1.0027	1.0027
19.5	1.0025	1.0026	1.0026	1.0027	1.0028	1.0028
20	1.0026	1.0027	1.0027	1.0028	1.0029	1.0029
20.5	1.0027	1.0028	1.0028	1.0029	1.0030	1.0030
21	1.0028	1.0029	1.0030	1.0030	1.0031	1.0031
21.5	1.0030	1.0030	1.0031	1.0031	1.0032	1.0032
22	1.0031	1.0031	1.0032	1.0032	1.0033	1.0033
22.5	1.0032	1.0032	1.0033	1.0033	1.0034	1.0035
23	1.0033	1.0033	1.0034	1.0035	1.0035	1.0036
23.5	1.0034	1.0035	1.0035	1.0036	1.0036	1.0037
24	1.0035	1.0036	1.0036	1.0037	1.0038	1.0038
24.5	1.0037	1.0037	1.0038	1.0038	1.0039	1.0039
25	1.0038	1.0038	1.0039	1.0039	1.0040	1.0041
25.5	1.0039	1.0040	1.0040	1.0041	1.0041	1.0042
26	1.0040	1.0041	1.0042	1.0042	1.0043	1.0043
26.5	1.0042	1.0042	1.0043	1.0043	1.0044	1.0045
27	1.0043	1.0044	1.0044	1.0045	1.0045	1.0046
27.5	1.0044	1.0045	1.0046	1.0046	1.0047	1.0047
28	1.0046	1.0046	1.0047	1.0048	1.0048	1.0049
28.5	1.0047	1.0048	1.0048	1.0049	1.0050	1.0050
29	1.0049	1.0049	1.0050	1.0050	1.0051	1.0052
29.5	1.0050	1.0051	1.0051	1.0052	1.0052	1.0053
30	1.0052	1.0052	1.0053	1.0053	1.0054	1.0055



For customer service, call 1-800-766-7000.

To fax an order, use 1-800-926-1166.

To order online: www.fishersci.com

©2002 Fisher Scientific Litho in U.S.A. BN