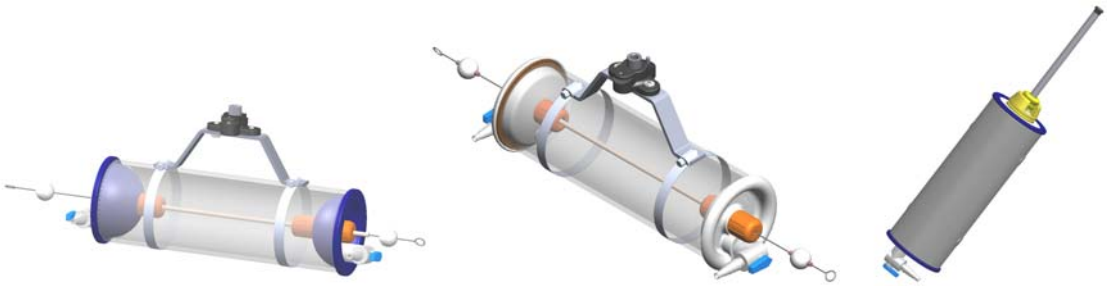
Wildlife Supply Company®



A Comprehensive Guide to Wildco® Water Bottle Samplers

Table of Contents:

INTRODUCTION TO WILDCO

Wildlife Supply Company was established in 1938 by the Trippensee brothers, Dr. Rueben and Herbert. Dr. Rueben was a professor at the University of Massachusetts for 30 years. His two published texts on wildlife management have long served as references in their field. The company remained in the Trippensee family for over 60 years.

The company changed hands in 2000, when it was purchased by the Bell family.

Wildco has always been a family business, whether the family is the Trippensees or the Bells. Because of this, the owners think long term. You can count on sturdy, reliable products that give you the ability to compare your samples to data of past decades.

INTRODUCTION TO WATER SAMPLE BOTTLES:

Wildco water sample bottles are designed for grabbing a sample of water at a known depth. This is why they are referred to as *in situ* water samplers or discrete depth water samplers.

These sampling devices are Messenger operated. They are lowered into a body of water in the open position. When the bottle reaches a desired depth, a weight, or Messenger, is slid down the line until it hits a trigger device on the bottle, known as a trip head. This causes the bottle to close.

Wildco Messenger

Alpha and Beta bottles are available with either transparent acrylic or opaque PVC bodies. They can be either vertical or horizontal with relation to the substrate. Kemmerer bottles are vertical and can have transparent acrylic, opaque PVC, stainless steel or PTFE bodies. Van Dorn style bottles can be horizontal or vertical. Both types of bottles serve the same function, but they have different trip heads and end seals.

All bottles are available in a kit, containing the bottle, line, a messenger, and carry case.

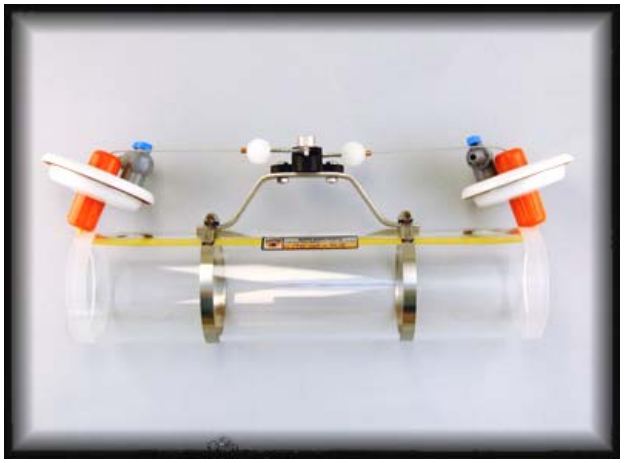
HOW TO CHOOSE THE RIGHT BOTTLE:

Van Dorn style sample bottles are well suited for general purpose sampling at any depth. Available with clear acrylic or opaque PVC bodies, they can be had in both **horizontal and vertical** configurations, with relation to the substrate. **Vertical** bottles allow a free flow of water through the bottle as it moves down the water column. **Horizontal** bottles tend to fill at the surface and should be tugged sideways at the desired depth to obtain a good sample. For both style of bottles, the end seals are off to the side of the bottle body when set open.

Two types of the Horizontal and Vertical Van Dorn style bottles are available:
Alpha bottles are best for general purpose sampling. The Alpha bottle is very sturdy, but is unsuitable for chemical sampling.

Horizontal Alpha Bottle

Beta style bottles are ideal for trace metals and chemical sampling.



Horizontal Beta Bottle

Kemmerer bottles come in a variety of configurations for specialized sampling. They are vertical only. They have fewer working parts than the Van Dorn style. The Kemmerer design assures flushing of the bottle as it descends through the water, and it closes with much less agitation and disturbance. Kemmerer bodies are available in acrylic, PVC, stainless steel, and PTFE. The end seals are in line with the bottle body when set open.

Kemmerer Bottle

Representative example situations:
Below are some common sampling situations and suggestions for appropriate samplers.

Plankton – The wide mouth of the Alpha and Beta bottles allows little restriction of flow through the bottle as it moves down the water column. Therefore, they are preferred for sampling standing crops, primary productivity and other quantitative measures, because they allow free water flow throughout the bottle. Because they collect whole water samples, all size classes of plankton are obtained. They are sometimes used for sampling nanoplankton and picoplankton, which can pass through most nets due to their extremely small size. The larger bottles, 6.2 or 8.2 liter, are good for this purpose.

For larger types of plankton, Wildco makes a variety of high quality plankton nets as well as the Schindler-Patalas Plankton Trap, which combines a large sampling box with a net for filtering out the plankton.

Trace Organics – Most water sampling bottles are made with plastics, and are generally unsuitable for trace organic sampling. Wildco® makes two Kemmerer bottles which are suitable: 1295-B32 is all Teflon, while 1200-G32 has a stainless steel body with Teflon seals. Since there is a possibility of contaminants in the bottle, **Wildco® recommends running a blank to get a baseline before doing organic sampling.**

Trace Metals, Metallic Ion Avoidance – Beta bottles, all plastic Kemmerer bottles with silicone seals, and the all PTFE Kemmerer bottle are recommended. The blue polyurethane end seals on the Alpha bottles and some Kemmerer bottles may leach mercury into the water, at concentrations of 20-450 ng/L. They may also leach

phosphorus and other chemicals in small amounts. Since there is a possibility of contaminants in the bottle, Wildco® recommends to run a blank to get a baseline before doing trace metal sampling.

Large Volume – If a larger volume of water is needed in one haul, several options are available. Alpha and Beta bottles come in 6.2 and 8.2 liter sizes, the 1260-E32 and1560 series Kemmerer bottles hold 6.2 liters and the 1580 series Kemmerer bottles hold 8.2L. For plankton, the 12 liter or 30 liter Schindler Patalas trap can be used.

Wells – The Kemmerer Well sampler is long and thin and fits easily into a 2-inch pipe. It can sample at any depth. 1280-A12 has polyurethane seals, and 1280-B22 has silicone seals. A 45-B40 messenger shock absorber may be needed, as it will help to protect the trip mechanism if there is a long air drop before the messenger reaches the bottle.

Narrow Opening – In this case defined as a hole in ice, drum sampling, or confined space sampling. The Kemmerer well sampler is ideal for this, fitting into a two inch pipe. The Teflon Kemmerer has a 2-7/8" outside diameter, and the 0.4 and 1.2 liter versions of the stainless steel Kemmerer have 2-5/8" outside diameters. A 45-B40 messenger shock absorber may be needed, as it will help to protect the trip mechanism if there is a long air drop before the messenger reaches the bottle.

Thermocline/Stratified Lakes – horizontal Alpha and Beta bottles are mostly used for discrete point sampling at a given depth, which makes them ideal for sampling the water column in a stratified lake. Lakes often develop a layer of warm water on top of cold water, due to the fact that warm water is less dense than cold. In large bodies of water, the layer between these regions can be very distinct. This area, called the thermocline, can be very narrow, with the temperature changing rapidly with depth. The lake environment is very different above and below the thermocline. A horizontal bottle can get fairly accurate samples above, below and right at the area where the water mixes.

Series – This is sampling at multiple depths. To sample with multiple bottles on one line, Wildco makes the Series Sampling Bottle. Up to five of these Beta style bottles can be placed on the same line, each with a messenger above its trip. After a messenger is dropped on the top bottle, all the bottles will close in rapid succession.

Severe Environment – Sampling environments such as industrial solvents, strong acids and bases, corrosive chemicals, and temperatures up to 440 degrees. Wildco® makes two Kemmerer bottles suitable for this purpose: 1295-B32 is all Teflon, and 1200-G32 has a stainless steel body with Teflon seals.

Need a sterile bottle? Autoclaving is the best way to sterilize a sampler. Wildco® makes two bottles which can be autoclaved: 1295-B32 is all Teflon, and 1200-G32 has a stainless steel body with Teflon seals.

Shallow Water – Horizontal Alpha and Beta bottles are mostly used for discrete point sampling at a given depth, and are the best for very shallow water. For long air drops, consider using a 45-B40 messenger shock absorber to help protect the trip head.

Just Above the Substrate – Horizontal Alpha and Beta bottles are often used for this purpose. The tube itself lies parallel to the lake bed, allowing for close up sampling.

Composite Samples – Samples can be taken with the same bottle at different depths and the contents combined, or samples can be pooled from the same depth.

Water Temperature at the Time of Sampling - A thermometer can be mounted on the inside of most clear acrylic Van Dorn or Kemmerer Bottles. This is done at the factory before shipping. The bottle should be left at the desired depth long enough for the thermometer to stabilize. When the sample is retrieved, the reading should be taken immediately for better accuracy.

Rough Conditions - The 2.2 Liter PVC Alpha Bottle (1120-H42) is very sturdy and the least likely to break. The PVC Beta Bottles are slightly less sturdy than the Alpha due to their silicone gasket. Kemmerer bottles tend to be more delicate. Care should be taken to avoid problems such as hitting a rock or the side of a boat with any bottle. The trigger mechanisms on the bottles are, by design, very sensitive and may trip early if they hit the surface of the water too hard. Acrylic bottles afford a view of the contents, but may shatter if dropped on one end.

Opaque vs. Transparent - Clear acrylic bottles allow a full view of the contents during your fieldwork, but chemical changes and effects on plankton may occur when exposed to sunlight. Opaque bottles prevent sunlight from affecting the sample. The opaque bottles are made from PVC, which tends to be cheaper and more crack resistant than acrylic.

TIPS FOR TRACE METAL SAMPLING

1. All samplers contaminate or distort in some way.
    - Plastics may leach metals from ultraviolet inhibitors, metal-organic plasticizers, and (rarely) metal catalysts.
    - PTFE has a rough porous surface that traps ions and fine charged particles. Errors may occur in your first sample.
    - Metal and glass may dissolve into the sample, usually at the nanogram/ liter level.
    - Sample may react with the sampler, causing errors.

2. Are you using the right sampler? Is the sampler clean? Have you run a test blank?

3. Selecting a particular sampler may depend upon the material(s) sought or environment being sampled.

4. Alconox is suggested to remove oil and most soils. Rinse. A 3% acid solution (HCl or HNO_3) will remove detergent. Rinse with distilled water. Air dry.

5. Run a test blank by filling the sampler with distilled water, holding for at least as long as the sample will be held in the sampler, and running test analysis.

NOTES ABOUT CONTAMINATION:

Blue end seals may leach small amounts of mercury and phosphorus, and thus are not recommended for chemical sampling. Make sure you have the right bottle, one with silicone seals.
Avoid cross contamination by thoroughly cleaning your equipment after each use.

TEST BEFORE YOU SAMPLE:

We recommend that any new sampler be thoroughly cleaned prior to any sampling.
If you are performing metal or chemical sampling, run a blank before using the bottle. Fill the instrument with distilled, contaminant free water, and test to determine what contaminants may be present in the sample.

We also recommend that this procedure be repeated throughout the sampling season.

PREPARING WATER SAMPLERS FOR USE

1. General cleaning
   a. For most sampling, soak in mild detergent and warm water (to 150° F/ 65° C). Rinse with tap, then distilled water.
   b. Soak in mild laboratory detergent such as Alconox and warm water. Rinse with distilled water, rinse again with 3% HCl or HNO_3, then with triple distilled water. Repeat. Store when completely dry in clean, sealed plastic bag.

2. Trace level decontamination for plastic samplers
   a. Clean as above, then soak up to 8 hours in warm 1N HCl solution (3 N maximum), then rinse in distilled water. **Do not use alcohol, ketones or chloroform on acrylic**.

3. Removing grease and oils
   a. Wash with mild detergent to remove grease and oil. **Do not use solvents on acrylic.** Use **alcohol only** on Lexan, PVC and CPVC.

4. Sterilizing samplers
   a. Autoclaving: Clean and rinse with distilled water before autoclaving to prevent baking contaminants.
   b. Metal, glass, Teflon™, polycarbonate may be autoclaved. **Do not** autoclave polyurethane, PVC, CPVC, acrylic, CAB.
   c. Gas sterilization: The above materials can be gas sterilized using formaldehyde gas or ethylene oxide.

d. Chemical sterilization: In general all the above can be sterilized with commonly used disinfectants.

5. Trace metal or organic measurements
   a. Fill sampler with distilled water for same length of time you would fill with sample. Analyze the distilled water.

6. Rust stains on stainless steel
   a. *All stainless steel devices should be rinsed at once with fresh water* after removal from salt water.
   b. To remove rust, soak in concentrated HNO_3 for 3-4 hours.

7. Storage of samplers
   a. To avoid mildew, corrosion, and odors, samplers should not be stored in foam-lined cases unless very dry.

PERSONAL SAFETY:

The trigger mechanisms on bottles of this type are very sensitive by design. To prevent injury, keep your hands clear of the main tube when the bottle is in the open position. The end seals close with surprising force. **Do not operate out of water!**

BOTTLE SAFETY AND CARE:

Wildco recommends an 11 ounce messenger (such as 45-B10), unless there is a very long air drop and the bottle is close to the surface of the water, in which case a lighter messenger may be used. Under these conditions, a messenger shock absorber (45-B40) may also be used to help protect the trip mechanism. Do not use a messenger heavier than 11 ounces, as this may damage the trip mechanism.
Perform a preliminary inspection prior to using the bottle. Make sure the line and cable are tightly connected. Guard the sampler from blows to the cylinder ends. This may knock them out of round, which could cause leakage during sampling. Dropping or impacting the sampler can crack the main tube. A blow to an acrylic body can cause it to crack or shatter.
Always lower the bottle slowly, without dropping it.
To avoid damage during use, the sampler should always be transported in a carry case.

MAINTENANCE AND CLEANING:

Storing bottles with the valves closed may cause them to "set" tightly in the end of the bottle, resulting in damage when pried open. Store the bottle so the end seals do not touch the cylinder.
After sampling, rinse the sampler in fresh, clean water. Allow the sampler and case to completely dry.

Do not store the sampler when wet, damp, or dirty. This can cause mold, mildew, metal corrosion, or plastic surface deterioration.
The foam interior of the case may deteriorate or be damaged if the product is not dried after use.
When fully dry, store the sampler in its case, or in a dark, cool shelf or cabinet.

RECOMMENDED ACCESSORIES:

3001-B15 Thermometer.
3001-A10 Thermometer mount.
62-C15 3/16" Polyester line, 100ft.
61-B14 1/8" diameter steel Aircraft Cable, 100ft.
45-B10 Split Messenger, 11 ounce.
45-B40 Messenger Shock Absorber.
66-A50 Hand Winding Reel.
Plastic Carry Case.

INTRODUCTION TO VAN DORN STYLE BOTTLES (ALPHA AND BETA):

Dr. William G. Van Dorn of the Scripps Institute of Oceanography designed his original bottle in 1956. Wildco's Alpha and Beta bottles are based on his design. This style is well suited for discrete sampling at any depth.

All Wildco® Van Dorn Sample Bottles feature a stainless steel trip head mechanism for durability and high performance. They also feature a nylon safety line connecting the end seals, so if the latex tubing breaks, it is less likely that the end seals will be lost. These bottles are operated with an 11 ounce messenger.

Each end seal has a valve so air can be let in and water let out into a sample container. Custom bottles can be made without valves in the end seals. Call us for more details.

Kits are available, which contain the Van Dorn Bottle, 100 feet of polyester line, an 11 oz. split messenger, and a carry case. The bottles may be purchased separately, but a messenger will still be needed for operation.

Van Dorns are available in a range of sizes: 2.2, 3.2, 4.2, 6.2, and 8.2 liters.

Alpha Bottles are sturdy, general purpose samplers that can be used at any depth. They are not suitable for chemical or trace metal sampling, but are commonly used for biological sampling. More information can be found on page 14.

Beta Bottles can be used in a variety of field conditions and at any depth. They can be used for general sampling, and are ideal for trace metal and chemical sampling. For more details, turn to page 22.

The **horizontal** versions are best for shallow water, sampling just above bottom sediments, or in stratified lakes. They are ideal for sampling in stratified conditions, especially narrow layers or at the thermocline. They must fill with water at the top of the water column in order to sink, and thus should be tugged about one yard sideways before closing the seals. This ensures trapping a true sample.

The **vertical** bottles have a wide open mouth when deployed, allowing smooth flow of water through the bottle. This will prevent entrapment of water from other levels as the sampler is lowered.

Acrylic bottle bodies allow you to view your sample as soon as you obtain it. However, there may be biological or chemical changes in the sample if it is exposed to sunlight. Also, acrylic is more likely to crack or shatter if it is dropped or knocked. Thermometers can be installed inside acrylic bottles at the time of purchase.

PVC bottle bodies are sturdier, less costly, and stand up better to rough conditions than acrylic. However, they are opaque.

The Wildco **Series Sampler** is a Beta-style bottle that can be placed on a line with other series samplers. Up to 5 bottles can be placed on the same line and set to sample one after the other in rapid succession.

Parts are available for all bottles and are easily installed by the user. Parts are listed for each sampler in this manual. If your bottle was purchased before the year 2000, be advised that the current parts may not work. We still make parts for many older bottles, call for more information.

It is strongly recommended that you run a **blank** on any sampler when it is first purchased and during each sampling season.

OPERATING INSTRUCTIONS FOR ALPHA AND BETA BOTTLES

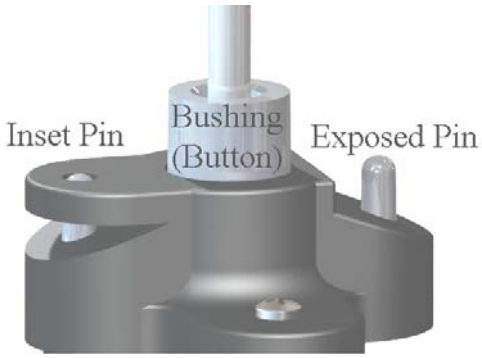
1. We recommend that all samplers be thoroughly cleaned prior to any sampling.

2. If you are performing chemical sampling, it is a good idea to run a blank on the bottle prior to sampling.

3. Run a line or cable through the hole in the trip assembly and knot the line or secure the cable so it cannot pull back through the hole. It must be securely fastened and able to hold the weight of the bottle when filled with sample. Always check the knot before sampling.

4. Close the valves.

5. Place the bottle so that the bushing (button) on top of the Twin Pin trip mechanism is on top of the handle.



Twin Pin Trip Head

6. Find the two stainless steel pins in the trip assembly. Both pins are roughly 1/16" above the plastic trip assembly. One is inset and one is exposed.

7. Grasp the round white balls on the inset pin side of the cable assembly. Pull the attached end seal out of the end of the main tube. Press down on the bushing (button) to expose the inset pin. Hoop the cable loop on the inset pin and release the bushing (button). On larger bottles, the end seals may be difficult to pull out using the cables. They may have to be pried out by hand.

8. Pull the other end seal out of the main tube and hook the cable loop on the exposed pin. The bottle is now in the "set" position.

9. Slowly lower the bottle to the desired depth in the water, keeping the line taut.

10. If you are using a horizontal bottle, pull it about one yard sideways to get a true sample at that depth.

11. If using a solid messenger, thread it on the end of the line. If you are using a split messenger, attach it to the top of the line above the water surface.

12. Keeping the line as taut and straight as possible, drop the messenger down the line. It will strike the trip mechanism, causing the cables to release and the end seals to close. This traps the sample inside the tube.

13. If using a thermometer, keep the bottle at the sampling depth long enough for the thermometer to record the temperature. It is best to wait a few minutes.

14. Pull the bottle up slowly and steadily, taking care not to knock it against any thing, such as the side of your boat.

15. If a thermometer has been installed, read the temperature immediately after retrieving the bottle.

16. Open one valve and allow air to enter the sampler. Open the other valve to drain the contents of the bottle into a clean sample container.

17. After sampling, thoroughly clean the bottle to avoid cross contamination with new samples or other water bodies.

18. Allow the sampler to air dry before storing it.

ALPHA BOTTLES: Styles and specific information

Alpha Bottles are well suited to general purpose sampling at any depth. They are very sturdy and can be used for general biological and other studies.

Alpha bottles feature a stainless steel trip head mechanism to close the bottle. When tripped by a messenger, the plunger-like blue polyurethane end seals snap tightly onto each end of the cylinder, producing an almost leak proof seal. A small amount of sample is always lost until a slight vacuum forms inside the sampler as it is lifted out of the water. The bottles are pulled closed by black latex tubing, which resists decay in sunlight and in water. There is a nylon safety line connecting the end seals to prevent their loss if the latex tubing breaks.

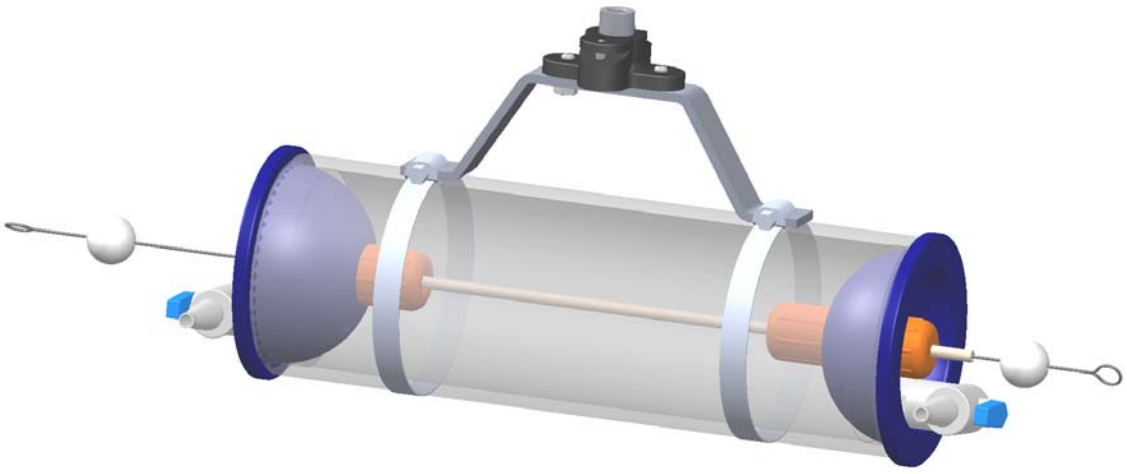
Alpha Bottles are not suitable for chemical or trace metal sampling. The end seals may leach small amounts or mercury into the sample, in the range of 20-450 ng/L (nanograms per liter). The may also leach phosphorus and other potential contaminants in small amounts.

Alpha bottles cannot be used for series sampling. Please see page 42 for more information on Wildco **Series Samplers**.

Warning: The end seals close with considerable force and could cause injury. Do not operate out of water!

Horizontal Alpha Bottle Armed Position

ALPHA BOTTLES 2.2-4.2 LITERS (1120-1140)



Kits contain Alpha Bottle, polyester line, messenger, and a carry case. Bottles sold separately need an 11 ounce messenger to operate.

1120-1140 Horizontal Bottles & Kits:

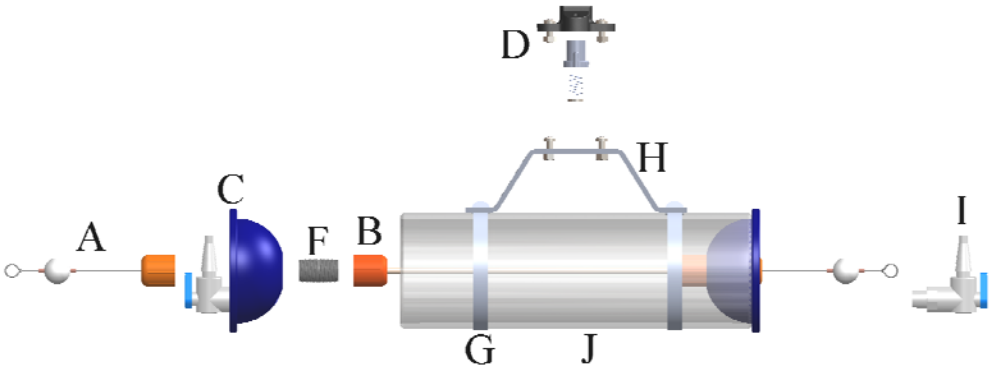
Catalog #	Type	Tube diameter, length
1120-G42	2.2L Acrylic	4.5” x 13.5”
1130-G42	3.2L Acrylic	4.5” x 18.5”
1140-G42	4.2L Acrylic	4.5” x 22-5/8”
1120-H42	2.2L PVC	4.5” x 13.5”
1130-H42	3.2L PVC	4.5” x 18.5”
1140-H42	4.2L PVC	4.5” x 22-5/8

1120-1140 Vertical Bottles & Kits:

Catalog #	Type	Tube diameter, length
1120-C42	2.2L Acrylic	4.5” x 13.5”
1130-C42	3.2L Acrylic	4.5” x 18.5”
1140-C42	4.2L Acrylic	4.5” x 22-5/8”
1120-D42	2.2L PVC	4.5” x 13.5”
1130-D42	3.2L PVC	4.5” x 18.5”
1140-D42	4.2L PVC	4.5” x 22-5/8”

1120-1140 Alpha Bottle Replacement Parts and Accessories:
Parts are available for all bottles and are easily installed by the user. **Note:** If your bottle was purchased before the year 2000, the current parts may not work. However, we still make parts for many older bottles. Please call us for more information.

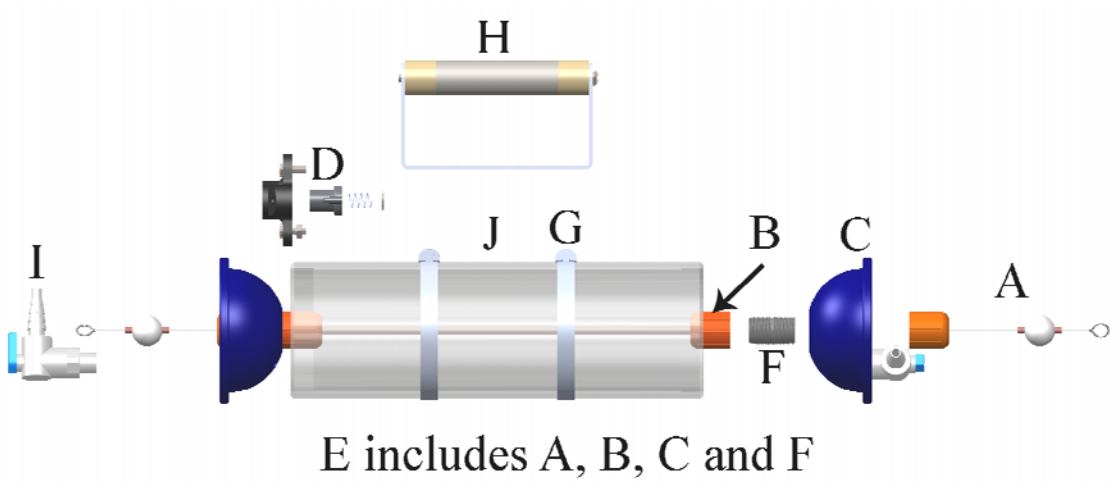
1120-1140 <u>Horizontal</u> Alpha Bottle Replacement Parts:



E includes A, B, C and F

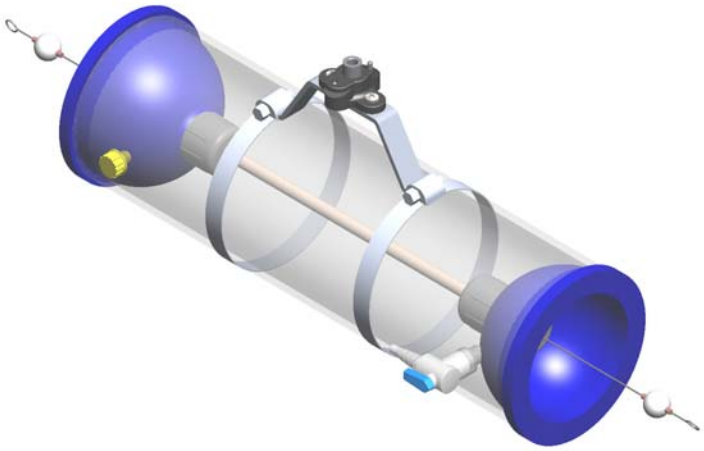
	Description	2.2L part #	3.2L part #	4.2L part #
A	Cable assembly, 2 pack	1120-L30	1130-L30	1140-L30
B	Tubing Assembly	1120-L33	1130-L33	1140-L33
C	Seals with valves, 2 pack	1120-L105	1120-L105	1120-L105
D	Trip Assembly	1120-L40	1120-L40	1120-L40
E	Center assembly with cable, tubing, seals.	1120-L135	1130-L135	1140-L135
F	Connectors, 2 pack	1120-L112	1120-L112	1120-L112
G	Clamps, 2 pack	1120-L17	1120-L17	1120-L17
H	Bail (Handle)	1120-L28	1120-L28	1120-L28
I	Drain valve/nipple, 2 pack	1120-L140	1120-L140	1120-L140
J	Main Tube, Acrylic	1120-L118	1130-L118	1140-L118
J	Main Tube, PVC	1120-L120	1140-L120	1160-L120

1120-1140 Vertical Alpha Bottle Replacement Parts:



	Description	2.2L part #	3.2L part #	4.2L part #
A	Cable assembly, 2 pack	1120-L125	1130-L125	1140-L125
B	Tubing Assembly	1120-L33	1130-L33	1140-L33
C	Seals with valves, 2 pack	1120-L105	1120-L105	1120-L105
D	Trip Assembly	1120-L130	1120-L130	1120-L130
E	Center assembly with cable, tubing, seals.	1120-L137	1130-L137	1140-L137
F	Connectors, 2 pack	1120-L112	1120-L112	1120-L112
G	Clamps, 2 pack	1120-L17	1120-L17	1120-L17
H	Handle	1120-L122	1120-L122	1120-L122
I	Drain valve/nipple, 2 pack	1120-L140	1120-L140	1120-L140
J	Main Tube, Acrylic	1120-L118	1140-L118	1160-L118
J	Main Tube, PVC	1120-L120	1140-L120	1160-L120

ALPHA BOTTLES 6.2-8.2 LITERS (1160 & 1180)



Kits contain Alpha Bottle, polyester line, messenger, and a carry case. Bottles sold separately need an 11 ounce messenger to operate.

Horizontal Bottles & Kits:

Catalog #	Type	Tube diameter, length
1160-G42	6.2L Acrylic	6.5” x 17.5”
1180-G42	8.2L Acrylic	6.5” x 22”
1160-H42*	6.2L PVC	6.5” x 17.5”
1180-H42*	8.2L PVC	6.5” x 22”

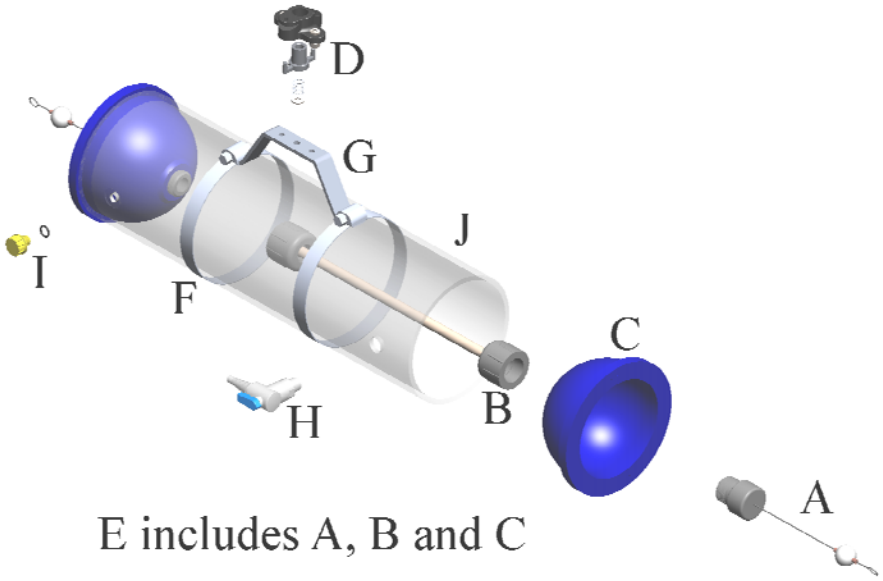
Vertical Bottles & Kits:

Catalog #	Type	Tube diameter, length
1160-C42	6.2L Acrylic	6.5” x 17.5”
1180-C42	8.2L Acrylic	6.5” x 22”
1160-D42*	6.2L PVC	6.5” x 17.5”
1180-D42*	8.2L PVC	6.5” x 22”

*** NOTE:** 6.2L and 8.2L PVC bottles are no longer available however replacement parts are still available for purchase.

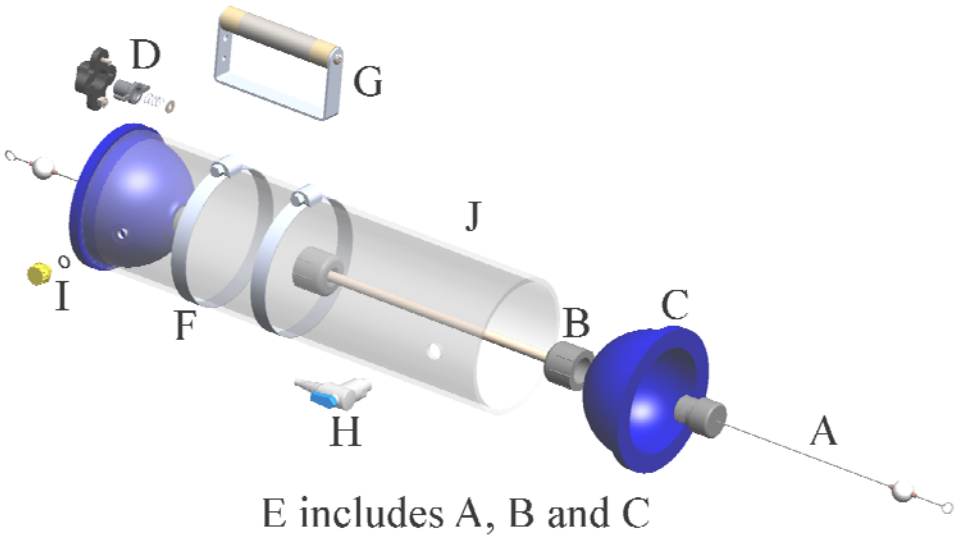
1160 & 1180 Alpha Bottle Replacement Parts and Accessories:
Parts are available for all bottles and are easily installed by the user. **Note:** If your bottle was purchased before the year 2000, the current parts may not work. However, we still make parts for many older bottles. Please call us for more information.

1160 & 1180 <u>Horizontal</u> Alpha Bottle Replacement Parts:



	Description	6.2L part #	8.2L part #
A	Cable assembly, 2 pack	1160-L30	1180-L30
B	Tubing Assembly	1160-L33	1180-L33
C	Seals, 2 pack	1160-L11	1160-L11
D	Trip Assembly	1120-L40	1120-L40
E	Center assembly with cable, tubing, seals.	1160-L42	1180-L42
F	Clamps, 2 pack	1160-L17	1160-L17
G	Bail (Handle)	1120-L28	1120-L28
H	Drain valve	1120-L37	1120-L37
I	Air vent, each	1120-L35	1120-L35
J	Main Tube, Acrylic	1160-L118	1180-L118
J	Main Tube, PVC	1160-L120	1180-L120

1160 & 1180 Vertical Alpha Bottle Replacement Parts:



	Description	6.2L part #	8.2L part #
A	Cable assembly, 2 pack	1160-L125	1180-L125
B	Tubing Assembly	1160-L33	1180-L33
C	Seals, 2 pack	1160-L11	1160-L11
D	Trip Assembly	1120-L130	1120-L130
E	Center assembly with cable, tubing, seals.	1160-L137	1180-L137
F	Clamps, 2 pack	1160-L17	1160-L17
G	Handle	1120-L122	1120-L122
H	Drain valve	1120-L37	1120-L37
I	Air vent, each	1120-L35	1120-L35
J	Main Tube, Acrylic	1160-L118	1180-L118
J	Main Tube, PVC	1160-L120	1180-L120

Alpha Bottle Parts Replacement Instructions

Changing Tubing or Cable Assemblies on 1100-1900 Water Samplers:

1. Lock tubing against the side of the sampler, holding it firmly to prevent it from snapping back.
2. Unscrew the gray, white, or orange cap with the cable coming out from the sampler. You may need **pliers.**
Warning: Using pliers will mar the surface of the cap.
3. Remove the cable assembly and seal.
4. Gently allow the tubing to contract to its rest length inside the bottle. Remove the other end seal (with the tubing attached) from the sampler.
5. Repeat **Step #2** for the second end seal.
6. There are two short threaded connectors (pipe nipples) that run from the cable assembly to the tubing assembly through the center hole in each end seal. Unscrew these connectors and screw them into each end of the new tubing assembly until they are snug. For vertical samplers, the shorter cable goes at the top of the sampler.
7. Replace the seal on one end of the tubing in the correct orientation and screw on the correct cable assembly until it is tight and flush against the seal. Do not over tighten.
8. Take the assembly made in **Step #7** and pull the tubing through the bottle, locking it against the top of the body so it cannot snap back.
9. Repeat **Step #7** for the other seal and cable.
10. Test your repaired bottle to make sure it does not leak around the caps that have just been replaced. Tighten the caps further if leaking occurs around the caps. Do not over tighten.
11. If cables do not work as expected, the hose clamps holding the trip assembly to the sampler may have shifted. If so, loosen the hose clamps and move the trip assembly slightly and retighten. Do not over tighten, as the sampler may break.

Warning: Do not over tighten. The caps may break.

Warning: Do not allow the tubing assembly to snap back inside the sampler. Personal injury and/or damage to the sampler or tubing assembly may result.

BETA BOTTLES: Styles and specific information

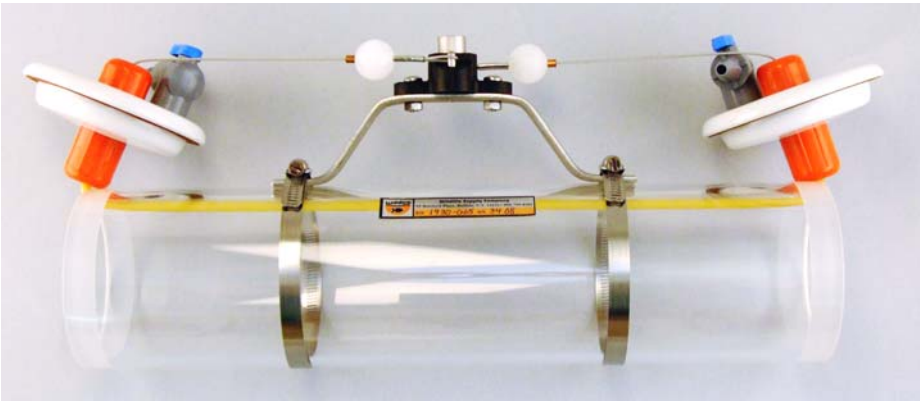
Beta Bottles are designed for trace metal and chemical sampling. They have an excellent track record in a variety of field conditions.

They feature a stainless steel trip head mechanism for durability and high performance. They also feature a nylon safety line connecting the end seals, so if the latex tubing breaks, it is less likely that the end seals will be lost. When tripped by a messenger, the end seals snap tightly onto each end of the cylinder, producing an almost leak proof seal. A small amount of sample is always lost until a slight vacuum forms inside the sampler as it is lifted out of the water.

The Beta end seals are made of rigid, inert, white ASA plastic. The bottle ends are machined to fit foam silicone gaskets which are attached to the end seals. Amber latex tubing is used to close the bottle because it leaches fewer contaminants than the black latex tubing used on the alpha bottles. This tubing does not leach measurable amounts of metal, but it is not as durable as the Alpha tubing. Since there are no metal parts to touch your sample, the Beta Bottle is excellent for trace metal sampling at least to the ng/L level.

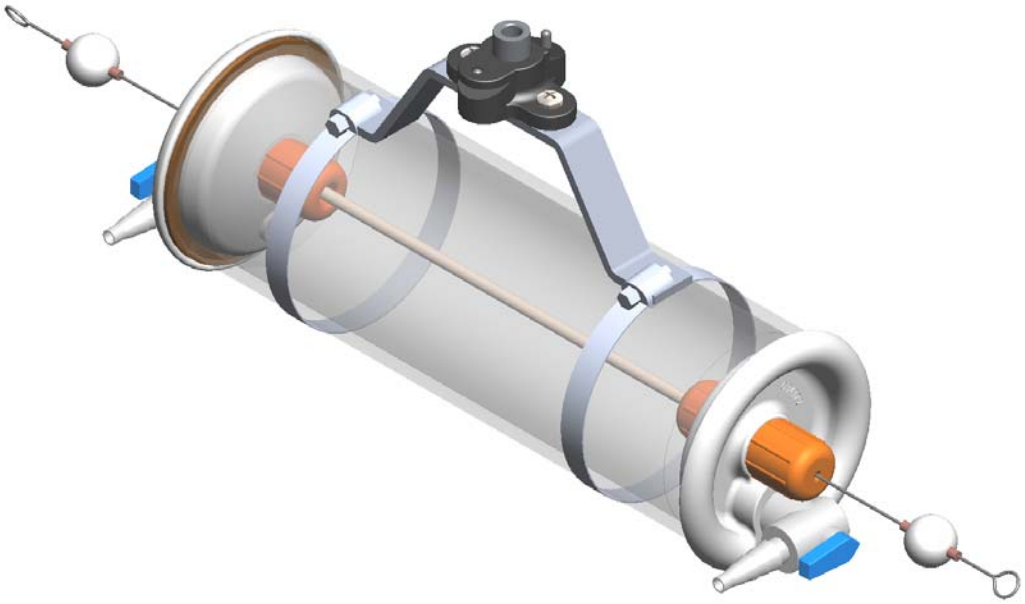
Beta Bottles can not be used for series sampling, which is more than one bottle mounted vertically on a line. Please see page 42 for more information on Wildco **Series Samplers**.

Warning: The end seals close with considerable force and could cause injury. Do not operate out of water!



Horizontal Beta Bottle

BETA BOTTLES 2.2-4.2 LITERS (1920-1940)



Kits contain Beta Bottle, polyester line, messenger, and a carry case. Bottles sold separately need an 11 ounce messenger to operate.

1920-1940 Horizontal Bottles & Kits:

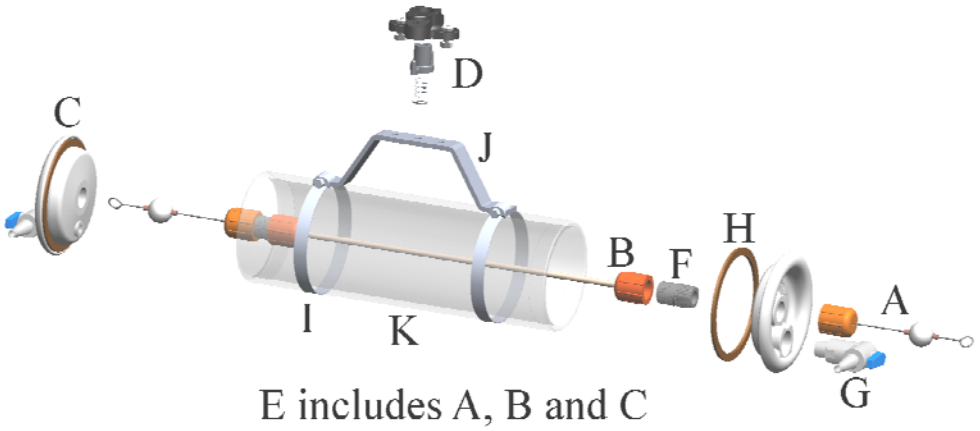
Catalog #	Type	Tube diameter, length
1920-G62	2.2L Acrylic	4.5” x 13.5”
1930-G62	3.2L Acrylic	4.5” x 18.5”
1940-G62	4.2L Acrylic	4.5” x 22-5/8”
1920-H62	2.2L PVC	4.5” x 13.5”
1930-H62	3.2L PVC	4.5” x 18.5”
1940-H62	4.2L PVC	4.5” x 22-5/8”

1920-1940 Vertical Bottles & Kits:

Catalog #	Type	Tube diameter, length
1920-G62	2.2L Acrylic	4.5” x 13.5”
1930-G62	3.2L Acrylic	4.5” x 18.5”
1940-G62	4.2L Acrylic	4.5” x 22-5/8”
1920-D62	2.2L PVC	4.5” x 13.5”
1930-D62	3.2L PVC	4.5” x 18.5”
1940-D62	4.2L PVC	4.5” x 22-5/8”

1920-1940 Beta Bottle Replacement Parts and Accessories:
Parts are available for all bottles and are easily installed by the user. **Note:** If your bottle was purchased before the year 2000, the current parts may not work. However, we still make parts for many older bottles. Please call us for more information.

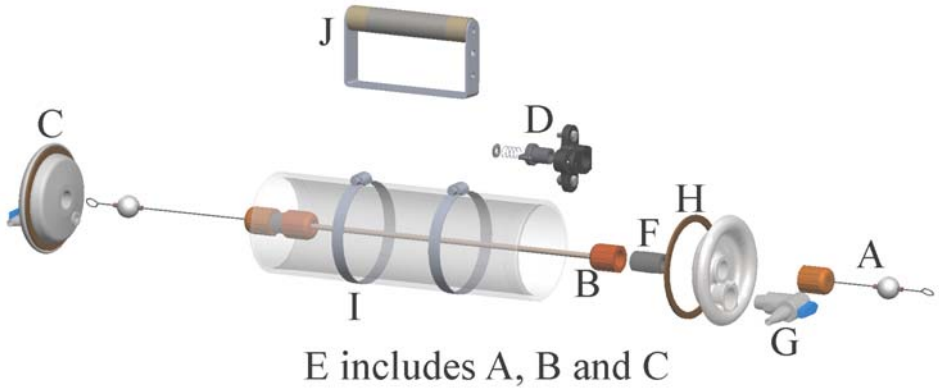
1920-1940 <u>Horizontal</u> Beta Bottle Replacement Parts:



E includes A, B and C

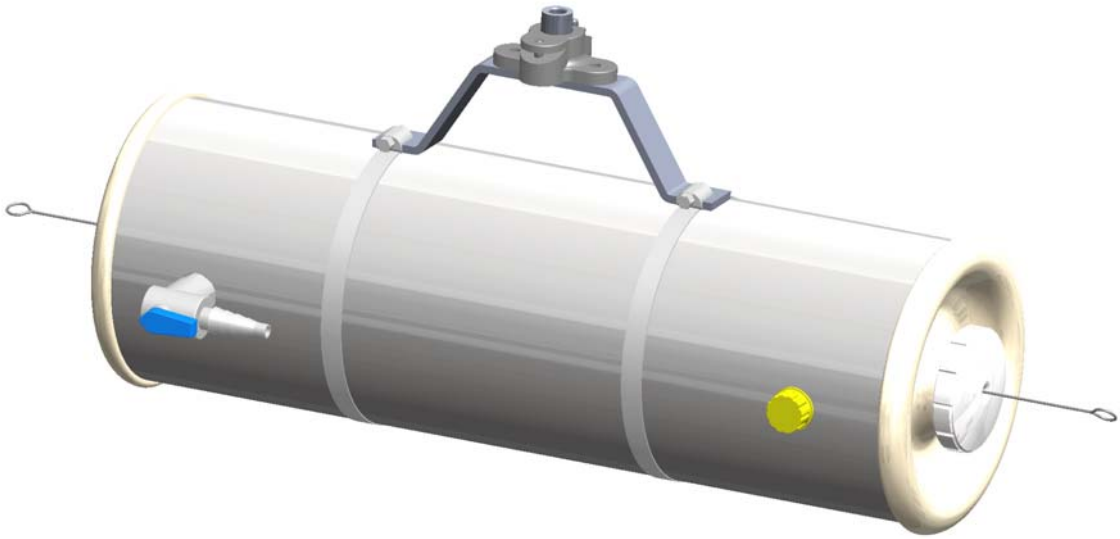
	Description	2.2L part #	3.2L part #	4.2L part #
A	Cable assembly, 2 pack	1920-L127	1930-L127	1940-L127
B	Tubing Assembly	1920-L130	1930-L30	1940-L130
C	Seals with valves, 2 pack	1920-L115	1920-L115	1920-L115
D	Trip Assembly	1120-L40	1120-L40	1120-L40
E	Center assembly with cable, tubing, seals.	1920-L135	1930-L135	1940-L135
F	Connectors, 2 pack	1120-L112	1120-L112	1120-L112
G	Air/drain valves, 2 pack	1920-L112	1920-L112	1920-L112
H	Gasket Kit, 2 pack	1920-L129	1920-L129	1920-L129
I	Clamps, 2 pack	1120-L17	1120-L17	1120-L17
J	Bail (Handle)	1120-L28	1120-L28	1120-L28
K	Main Tube, Acrylic	1920-L118	1930-L118	1940-L118
K	Main Tube, PVC	1920-L120	1930-L120	1940-L120

1920-1940 <u>Vertical</u> Beta Bottle Replacement Parts:



	Description	2.2L part #	3.2L part #	4.2L part #
A	Cable assembly, 2 pack	1920-L125	1930-L125	1940-L125
B	Tubing Assembly	1920-L130	1930-L130	1940-L130
C	Seals with valves, 2 pack	1920-L115	1920-L115	1920-L115
D	Trip Assembly	1120-L130	1120-L130	1120-L130
E	Center assembly with cable, tubing, seals.	1920-L137	1930-L127	1940-L137
F	Connectors, 2 pack	1120-L112	1120-L112	1120-L112
G	Air, drain valves, 2 pack	1920-L112	1920-L112	1920-L112
H	Gasket kit, 2 pack	1920-L129	1920-L129	1920-L129
I	Clamps, 2 pack	1120-L17	1120-L17	1120-L17
J	Handle	1120-L122	1120-L122	1120-L122
K	Main Tube, Acrylic	1920-L118	1930-L118	1940-L118
K	Main Tube, PVC	1920-L120	1930-L120	1940-L120

BETA BOTTLES 6.2-8.2 LITERS (1960 & 1980)



Kits contain Beta Bottle, polyester line, messenger, and a carry case. Bottles sold separately need an 11 ounce messenger to operate.

1960 & 1980 Horizontal Bottles & Kits:

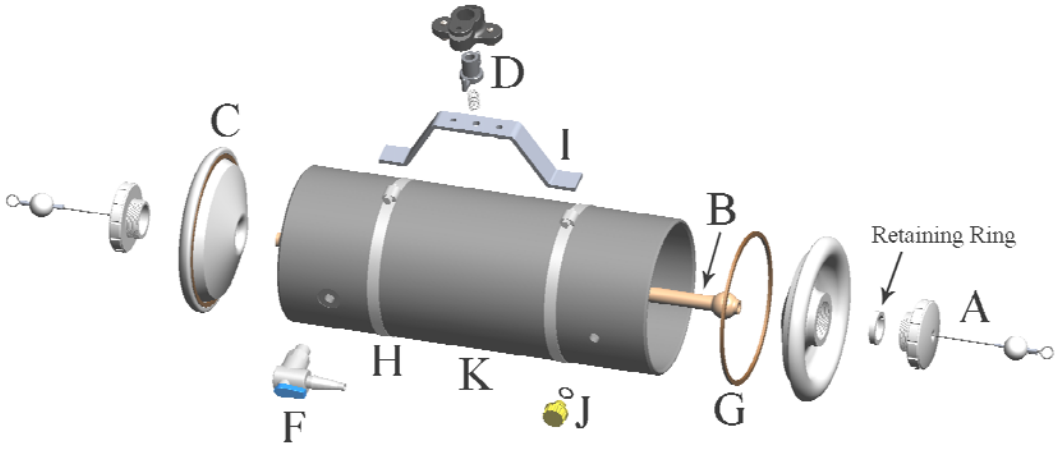
Catalog #	Type	Tube diameter, length
1960-G62	6.2L Acrylic	6.5” x 16”
1980-G62	8.2L Acrylic	6.5” x 19.5”
1960-H62	6.2L PVC	6.5” x 16”
1980-H62	8.2L PVC	6.5” x 19.5”

1960 & 1980 Vertical Bottles & Kits:

Catalog #	Type	Tube diameter, length
1960-C62	6.2L Acrylic	6.5” x 16”
1980-C62	8.2L Acrylic	6.5” x 19.5”
1960-D62	6.2L PVC	6.5” x 16”
1980-D62	8.2L PVC	6.5” x 19.5”

1960 & 1980 Beta Bottle Replacement Parts & Accessories:
Parts are available for all bottles and are easily installed by the user. **Note:** If your bottle was purchased before the year 2000, the current parts may not work. However, we still make parts for many older bottles. Please call us for more information.

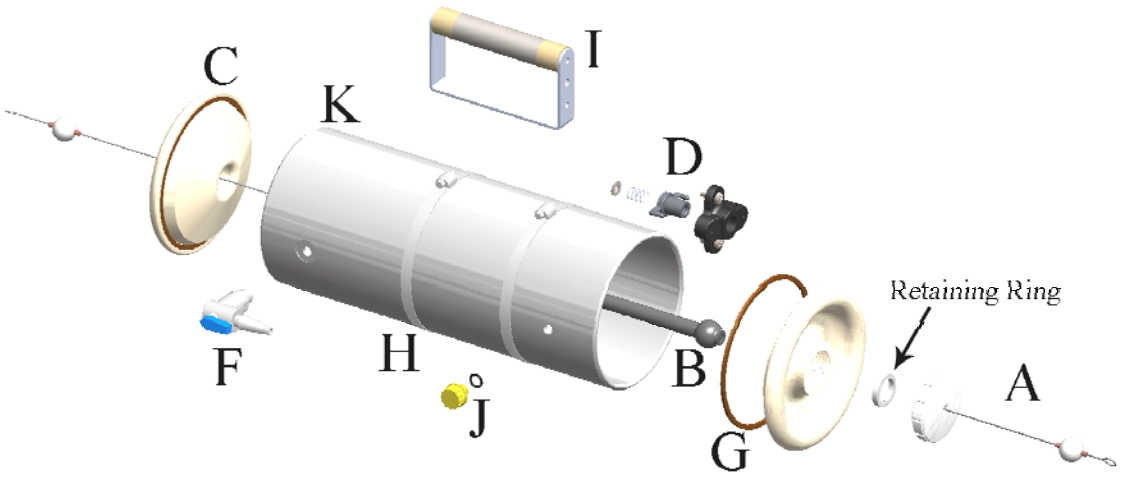
1960 & 1980 <u>Horizontal</u> Beta Bottle Replacement Parts:



E includes A, B and C as well as retaining rings

	Description	6.2L part #	8.2L part #
A	Cable assembly, 2 pack	1960-L30	1980-L30
B	Tubing Assembly	1960-L33	1980-L33
C	Seals, 2 pack	1960-L11	1960-L11
D	Trip Assembly	1120-L40	1120-L40
E	Center assembly with cable, tubing, seals.	1960-L45	1980-L45
F	Drain valve	1120-L37	1120-L37
G	Gasket Kit	1960-L32	1960-L32
H	Clamps, 2 pack	1160-L17	1160-L17
I	Bail	1120-L28	1120-L28
J	Air vent, each	1120-L35	1120-L35
K	Main Tube, Acrylic	1960-L118	1980-L118
K	Main Tube, PVC	1960-L120	1980-L120

1960 & 1980 Vertical Beta Bottle Replacement Parts:



E includes A, B and C as well as retaining ring

	Description	6.2L part #	8.2L part #
A	Cable assembly, 2 pack	1960-L125	1980-L125
B	Tubing Assembly	1960-L33	1980-L33
C	Seals, 2 pack	1960-L11	1960-L11
D	Trip Assembly	1120-L130	1120-L130
E	Center assembly with cable, tubing, seals.	1960-L137	1980-L137
F	Drain valve	1120-L37	1120-L37
G	Gasket kit	1960-L32	1960-L32
H	Clamps, 2	1160-L17	1160-L17
I	Handle	1120-L122	1120-L122
J	Air vent, each	1120-L35	1120-L35
K	Main Tube, Acrylic	1960-L118	1980-L118
K	Main Tube, PVC	1960-L120	1980-L120

Beta Bottle Parts Replacement Instructions

Replacing Gaskets on Beta™ Water Sampling Bottles

Introduction:

The replacement gaskets for the Beta™ bottles are made from a foam silicon material. This material does not glue well to other materials, so it comes with an adhesive material already applied to one side of it. This adhesive, however, is not sufficiently strong enough to adhere to the white end seal. In order for the foam gasket to properly adhere
to the white end seals, an additional adhesive must be used. The recommended adhesive would be any form of **super glue** (cyanoacrylate). Super glue is not included.

How To Install:

1. Remove any existing foam gasket material from the white Beta™ bottle end seals.

2. Roughen the surface of the white end seal where the foam gasket will be installed with coarse grit sandpaper. This will help the gasket adhere to the end seal better.

3. Apply a small amount of super glue to the entire area where the gasket will be applied.

4. Remove the backing from the foam gasket.

5. Install the foam gasket, adhesive side down, making sure that the ends of the gasket touch each other when completely installed.

Changing Tubing or Cable Assemblies on 1100-1900 Water Samplers:

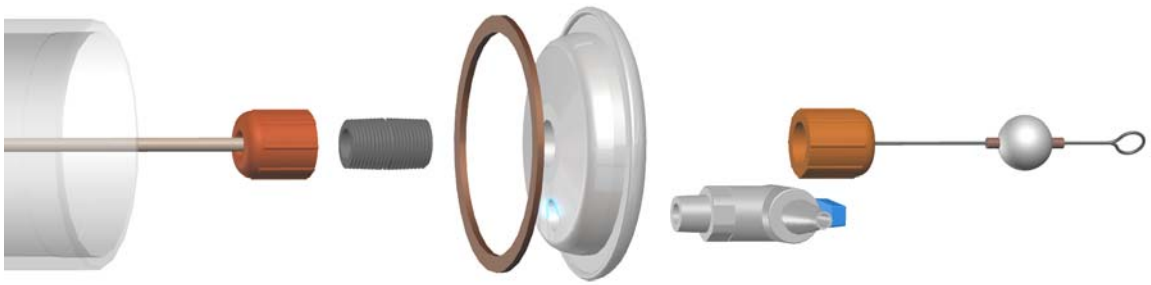
1. Lock tubing against the side of the sampler, holding it firmly to prevent it from snapping back.
2. Unscrew the gray, white, or orange cap with the cable coming out from the sampler. You may need **pliers.**

Warning: Using pliers will mar the surface of the cap.

3. Remove the cable assembly and seal.
4. Gently allow the tubing to contract to its rest length inside the bottle. Remove the other end seal (with the tubing attached) from the sampler.
5. Repeat **Step #2** for the second end seal.
6. There are two short threaded connectors (pipe nipples) that run from the cable assembly to the tubing assembly through the center hole in each end seal. Unscrew these connectors and screw them into each end of the new tubing assembly until they are snug. For vertical samplers, the shorter cable goes at the top of the sampler.
7. Replace the seal on one end of the tubing in the correct orientation and screw on the correct cable assembly until it is tight and flush against the seal. Do not over tighten.
8. Take the assembly made in **Step #7** and pull the tubing through the bottle, locking it against the top of the body so it cannot snap back.
9. Repeat **Step #7** for the other seal and cable.
10. Test your repaired bottle to make sure it does not leak around the caps that have just been replaced. Tighten the caps further if leaking occurs around the caps. Do not over tighten.
11. If cables do not work as expected, the hose clamps holding the trip assembly to the sampler may have shifted. If so, loosen the hose clamps and move the trip assembly slightly and retighten. Do not over tighten, as the sampler may break.

Warning: Do not over tighten. The caps may break.

Warning: Do not allow the tubing assembly to snap back inside the sampler. Personal injury and/or damage to the sampler or tubing assembly may result.



INTRODUCTION TO KEMMERER STYLE BOTTLES

Stainless steel Kemmerer

Based on a 1927 design by Dr. George Kemmerer at the University of Wisconsin, the Kemmerer has long been favored by limnologists and fishery biologists. With few moving parts and a error-proof trip, it offers a trouble free life.

Acrylic bodies have the advantage of being transparent, allowing you to view your sample before removal. You can also install thermometers inside acrylic bottles. However, acrylic scratches, so it is best to store your bottle in a padded case. Acrylic can also crack or shatter, so avoid knocking your bottle into anything. **Do not use alcohol to clean an acrylic Kemmerer. It can cause crazing, or fall apart.**

Kemmerers also come in stainless steel, unlike the Alpha and Beta bottles, which are plastic only. Stainless steel is very durable, but is heavy and more expensive.

A key feature in the Kemmerer is the automatic lock, which keeps stoppers open before the messenger is lowered. The seals close when the messenger strikes the trip head. When the sampler is closed, the entire weight of the sampler and its contents is carried on the lower end seal. This forces the lower end seal to sit securely in the sampler, preventing leakage. A drain in the stopper allows water to be drawn off.

The distinctive, patented trip head works reliably with air drops of 1m to 50m. We call it the All-Angle®, because, as the name implies, you can strike it at any angle up to 90º. It is particularly useful in fast flowing streams where the current may affect the position of the messenger. This trip works if the sampler is on a taut line; if the line is too loose, the messenger may not travel fast enough to close the bottle.

The All-Angle® trip head comes in four forms: our standard polyurethane, stainless steel, machined Teflon for our top of the line Teflon sampler, and a special size for well samplers. A special variant of the polyurethane

All-Angle® is used with our 1500 series Kemmerers. Delrin plastic fasteners and an O-ring replace the stainless steel garter spring in the trip head on these bottles.

The stainless steel or PTFE trips are used when solvents, high temperatures or other conditions preclude the use of a polyurethane trip. In these cases, you will also need silicone or PTFE seals to avoid organic compounds or withstand high temperatures. PTFE, for example, can be used in temperatures up to 230ºC (450º F)

The Kemmerer bottle sample method is effective for collecting at-depth grab samples from ponds, lakes, retention basins, and tanks. The sampler is comprised of a vertical sampling tube, center rod, head plug, and bottom plug. A line attached to the head of the sampler is used to lower the sampler to the desired sampling depth. The head plug and bottom plug are then tripped open by sliding a weight down the line. When the sampling tube is full of liquid, the sampler is retrieved.

This method is very effective in ponds, lakes, and tanks, which may contain vertically stratified contaminant layers. To characterize stratified conditions, the Kemmerer bottle can be used to collect samples from several discrete sections of the water column.

The Kemmerer can be used to collect depth and areal composite samples as well as integrated samples. A depth composite sample is acquired by compositing several grab samples, each representing a different depth in the water column. An areal composite sample is collected by compositing liquid samples from different locations, whereas an integrated sample is obtained by collecting from the same location several times over an extended period of time.

How do 1200 and 1500 series Kemmerers differ?

The 1200's are more durable because they have stainless steel parts and bodies. However, the 1500's are more versatile because there are no metal parts to touch the sample.
1500's come in acrylic and PVC; 1200's come in stainless steel only. Both come with silicone seals for trace metal sampling or polyurethane seals for general sampling.

How do I use my Kemmerer bottle?

1. Use the All-Angle® trip head to lock the seals open before lowering into the water.
2. Lower the bottle on a line to the desired depth.
3. In the open position, water flows smoothly around the bottom seal and into the cylinder, thereby obtaining an accurate and representative water sampler to the microgram level.
4. Drop a messenger on the All-Angle® trip head.
5. The two halves of the trip head separate and the top seal falls allowing the main tube to drop thereby closing both ends.

How do I select the right Kemmerer?

For general sampling:

- 1200, 1204, 1220, 1230, 1240, 1260 – E32 kits: these range from 0.4 – 6.2L, and are constructed of stainless steel with polyurethane seals.

For drum sampling and confined areas:

- 1204-E32, 1204-E42 kit: small and compact bottles only 7.4" in length, designed specifically to fit into small areas.

For trace organic sampling:

- 1204-E42, 1200-E42, 1200-G32, 1295-B32 kit: 1.2L stainless steel body with Teflon™ or silicone end seals; or all-PTFE bodies and seals. These can sample industrial solvents, strong acids or bases, and other corrosive chemicals at temperatures up to 450ºF.

How to maintain Kemmerer bottles:

1. To avoid damage, use the case during transport or storage.
2. Store hung from a hook in a vertical position with all end seals open. Storing the bottle while closed can damage the end seals or cause them to become locked in place.
3. Guard the sampler from blows on the cylinder ends, as this may cause them to be knocked out of round. This is a common cause of sampler leakage.
4. Leakage may also occur from a bent central shaft. When this happens, it is best to replace the shaft.
5. Worn or age hardened end seals should be replaced to prevent leakage. Never remove seals when dry. Moisten first, then grasp with a side-to-side motion. Never attempt to remove seal in wet or dry conditions with a direct pulling motion. This will shorten stopper life dramatically.

General descriptions of the different types of Kemmerers

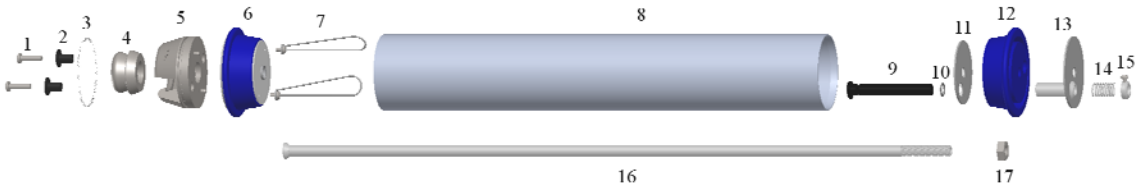
The **1200 stainless steel** series bottles are best used for general purpose sampling at a specified depth. In operation, the open sampler is lowered on a graduated line until it reaches the desired depth. Due to the vertical nature of the design, the bottle is continuously flushed as it drops down the water column. Both ends of the bottle are closed when the messenger strikes the All-Angle® trip head. Samples can be drawn off using a drain in the lower stopper. Constructed of a stainless steel sampling tube and polyurethane end seals, the Kemmerer is durable, has few moving parts, and needs little maintenance. Silicone seals are also available.

The **1500 acrylic** series bottles fulfill a similar function to the 1200 series, but they are made of acrylic or PVC instead of stainless steel. Both of these plastics are lighter and cheaper than stainless steel, but these advantages have a few tradeoffs. Both of the plastic bodies are less durable and do not tolerate hostile environments as well as the stainless steel versions. Acrylic is transparent and allows you to view your sample immediately, but take care not to knock it against anything, as acrylic can crack or shatter. Silicone seals are also available. A plastic Kemmerer with silicone seals leaches no metals into the water, making it ideal for trace metal sampling.

If you require a bottle with high chemical and/or heat resistance then the best choice is the **PTFE coated Kemmerer (1295-B32).** This bottle is similar to the 1500 series except that every component (except the optional line adapter) is made from PTFE. To provide rigidity, the center shaft is a solid rod of PTFE, making it impossible to run a line through the bottle. To counteract this, a special bracket has been added. PTFE can withstand caustic chemicals, extremely corrosive environments, and temperatures of up to 450ºF. If you require a sample from an extreme environment, such as a geyser or industrial waste vat, the PTFE Kemmerer is your best bet. **A note about the All-PTFE Kemmerers:** They will almost always leak a little water due to the nature of PTFE as a complete seal is virtually impossible to make.

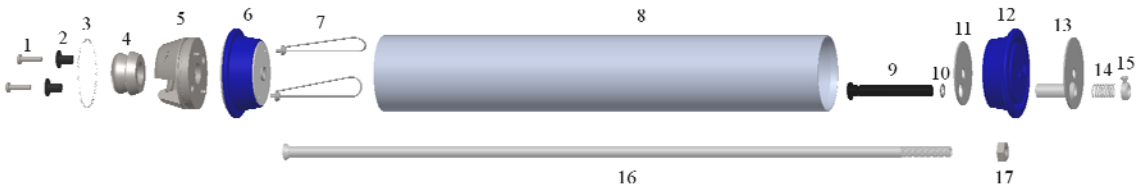
A specialized form of Kemmerer called the **well sampler** is also available (**1280-A12**). This instrument is long and thin, able to fit into a two inch diameter pipe. Some wells today can be quite deep, and the well sampler can sample at any depth, making it able to reach the bottom of most wells. The unit is made from stainless steel, with polyurethane seals. Silicone seals are available for trace sampling (1280-B22).

Kemmerer Replacement Parts 1200 Series



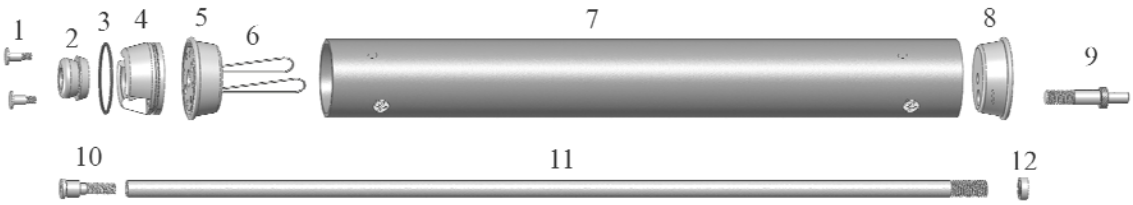
Part Description	Includes	1200 E part #	1204 E part #
Shaft Assembly	16 & 17	1200-L33	1204-L33
Trip Head Polyurethane (Yellow)	1-5	1270-L10	1270-L10
Trip Head Stainless Steel	1-5	1270-L14	1270-L14
Top Stopper Polyurethane (Blue)	6	1200-L11	1200-L11
Top Stopper, Silicone (White)	6	1200-L21	1200-L21
Main Tube Assembly SS	8	1200-L32	1204-L32
Cable Assembly	7	1200-L15	1200-L15
Drain Valve, Delrin	9, 10, 14 & 15	1270-L12	1270-L12
Drain Valve, Stainless Steel	9, 10, 14 & 15	1270-L13	1270-L13
Garter Springs, 3 Pack, for PU	3	1270-L82	1270-L82
Small Bottom Washer/Drain Sleeve	13	1200-L13	1200-L13
Bottom Stopper Polyurethane (Blue)	12	1200-L17	1200-L17
Bottom Stopper Silicone (White)	12	1200-L23	1200-L23
Large Bottom Washer	11	1200-L19	1200-L19
Part Description	**Includes**	**1220 E part #**	**1230 E part #**
Shaft Assembly	16 & 17	1220-L33	1230-L33
Trip Head Polyurethane (Yellow)	1-5	1270-L10	1270-L10
Trip Head Stainless Steel	1-5	1270-L14	1270-L14
Top Stopper Polyurethane (Blue)	6	1220-L11	1220-L11
Top Stopper, Silicone (White)	6	1220-L21	1220-L21
Main Tube Assembly SS	8	1220-L32	1230-L32
Cable Assembly	7	1220-L15	1220-L15
Drain Valve, Delrin	9, 10, 14 & 15	1270-L12	1270-L12
Drain Valve, Stainless Steel	9, 10, 14 & 15	1270-L13	1270-L13
Garter Springs, 3 Pack, for PU	3	1270-L82	1270-L82
Small Bottom Washer/Drain Sleeve	13	1200-L13	1200-L13
Bottom Stopper Polyurethane (Blue)	12	1220-L17	1220-L17
Bottom Stopper Silicone (White)	12	1220-L23	1220-L23
Large Bottom Washer	11	1200-L19	1200-L19

Kemmerer Replacement Parts 1200 Series (continued)



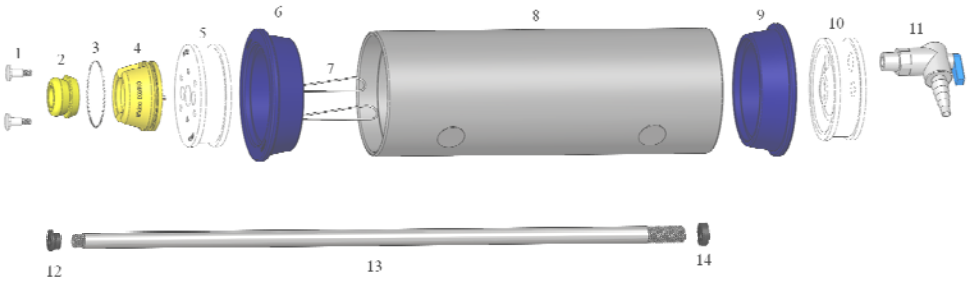
Part Description	Includes	1240 E part #	1260 E part #
Shaft Assembly	16 & 17	1240-L33	1260-L33
Trip Head Polyurethane (Yellow)	1-5	1270-L10	1270-L10
Trip Head Stainless Steel	1-5	1270-L14	1270-L14
Top Stopper Polyurethane (Blue)	6	1220-L11	1220-L11
Top Stopper, Silicone (White)	6	1220-L21	1220-L21
Main Tube Assembly SS	8	1240-L32	1260-L32
Cable Assembly	7	1220-L15	1220-L15
Drain Valve, Delrin	9, 10, 14 & 15	1270-L12	1270-L12
Drain Valve, Stainless Steel	9, 10, 14 & 15	1270-L13	1270-L13
Garter Springs, 3 Pack, for PU	3	1270-L82	1270-L82
Small Bottom Washer/Drain Sleeve	13	1200-L13	1200-L13
Bottom Stopper Polyurethane (Blue)	12	1220-L17	1220-L17
Bottom Stopper Silicone (White)	12	1220-L23	1220-L23
Large Bottom Washer	11	1200-L19	1200-L19

Kemmerer Replacement Parts 1295 Series ONLY



Part Description	Includes	Part #
Top Seal & Cables, PTFE	5 & 6	1295-L11
Top Seal & Cables, Silicon	5 & 6	1295-L12
Bottom Seal, PTFE	8	1295-L17
Bottom Seal, Silicon	8	1295-L18
.4L Main Tube	7	1295-L20
1.2L Main Tube	7	1295-L22
Cable Assembly	6	1295-L32
.4L Shaft Assembly	10, 11 & 12	1295-L33
1.2L Shaft Assembly	10, 11 & 12	1295-L35
Trip Head, PTFE	1 – 4 & 6	1295-L40
Line Adaptor, PTFE	10	1295-L50

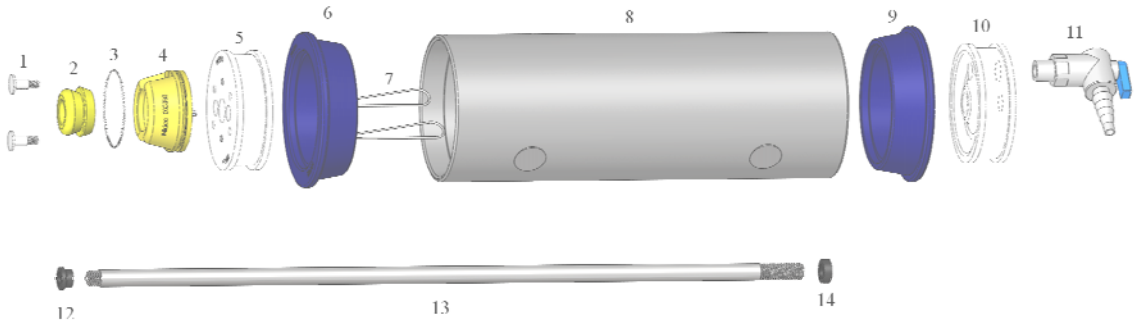
Kemmerer Replacement Parts 1510 & 1520 Series



1510 Kemmerers (1.2 L)	Includes	Part #
Shaft Assembly	12, 13 & 14	1510-L21
Trip head assembly, Blue PU	1 - 4	1590-L50
Main tube assembly, acrylic	8	1510-L25
Main tube assembly, PVC	8	1510-L26
Drain valve assembly	11	1510-L24
O-Ring, 3 pack	3	1510-L16
End seals polyurethane (set of 2)	6 & 9	1510-L11
End seals silicone (set of 2)	6 & 9	1510-L12
Top stopper	5	1510-L15
Cable set	7	1510-L17
Bottom stopper	10	1510-L19
Screws, Black (Bushings) for head (each)	1	030686
Shaft Top Cap	12	003075
Shaft Bottom Ring Nut	14	022150

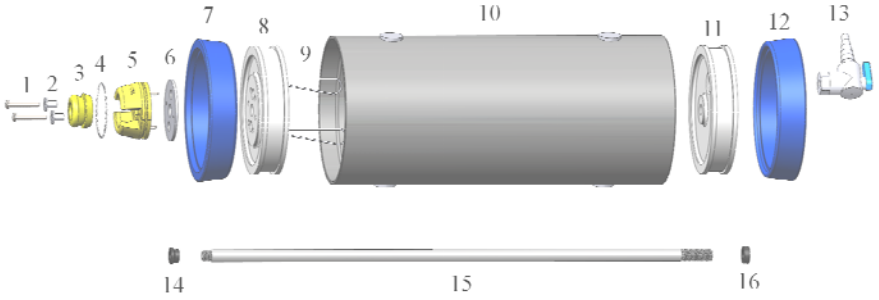
1520 Kemmerers (2.2 L)	Includes	Part #
Shaft Assembly	12, 13 & 14	1520-L21
Trip head assembly, Blue PU	1 - 4	1590-L50
Main tube assembly, Acrylic	8	1520-L25
Drain valve assembly	11	1510-L24
O-Ring, 3 pack	3	1510-L16
End seals polyurethane (set of 2)	6 & 9	1510-L11
End seals silicone (set of 2)	6 & 9	1510-L12
Top stopper	5	1510-L15
Cable set	7	1510-L17
Bottom stopper	10	1510-L19
Screws, Black (Bushings) for head (each)	1	030686
Shaft Top Cap	12	003075
Shaft Bottom Ring Nut	14	022150

Kemmerer Replacement Parts 1540 Series



1540 Kemmerers (4.2 L)	Includes	Part #
Shaft Assembly	12, 13 & 14	1540-L21
Trip head assembly, Blue PU	1 - 4	1590-L50
Main tube assembly, PVC	8	1540-L25
Drain valve assembly	11	1510-L24
O-Ring, 3 pack	3	1510-L16
End seals polyurethane (set of 2)	6 & 9	1510-L11
End seals silicone (set of 2)	6 & 9	1510-L12
Top stopper	5	1510-L15
Cable set	7	1510-L17
Bottom stopper	10	1510-L19
Screws, Black (Bushings) for head (each)	1	030686
Shaft Top Cap	12	003075
Shaft Bottom Ring Nut	14	022150

Kemmerer Replacement Parts 1560 & 1580 Series



1560 Kemmerers (6.2 L)	Includes	Part #
Shaft Assembly	14, 15 &16	1520-L21
Trip head assembly, Blue PU	1 - 5	1590-L51
Main tube assembly, PVC	10	1560-L25
Drain valve assembly	11	1270-L15
O-Ring, 3 pack	4	1270-L82
End seals polyurethane (set of 2)	7 &12	1560-L11
End seals silicone (set of 2)	7 & 12	1560-L12
Top stopper	8	1560-L15
Cable set	9	1560-L17
Bottom stopper	11	1560-L19
Top Washer	6	1560-L13
Shaft Top Cap	14	003075
Shaft Bottom Ring Nut	16	022150

1580 Kemmerers (8.2 L)	Includes	Part #
Shaft Assembly	14, 15 & 16	1540-L21
Trip head assembly, Blue PU	1 - 5	1590-L51
Main tube assembly, PVC	10	1580-L25
Drain valve assembly	11	1270-L15
O-Ring, 3 pack	4	1510-L16
End seals polyurethane (set of 2)	7 & 12	1560-L11
End seals silicone (set of 2)	7 & 12	1560-L12
Top stopper	8	1560-L15
Cable set	9	1560-L17
Bottom stopper	11	1560-L19
Top Washer	6	1560-L13
Shaft Top Cap	14	003075
Shaft Bottom Ring Nut	16	022150

THE WILDCO MESSENGER

The work horse of water sampling is the simple messenger, a bullet shaped weight which activates the trip mechanism. Send it down the line when you are ready to take your sample, you choose when and where. When you open your bottle and lower it into the water, it will stay open until you wish to close it. Drop the messenger down the line, hit the trip mechanism, and the bottle will close.

Messengers afford nearly error-proof operation. They are highly reliable due to their simple design. For this reason, they are included with most of our kits. Remember, a sampler is only useful if you have a messenger to activate it! For this reason, we recommend carrying a few spares to prevent lost opportunities.

Some heavy samplers do not need messengers; they close under their own weight when they strike the bottom. This design means that they can shut prematurely. If a cable goes slack, the sampler is shut.

Some water samplers need specialized messengers. For long air drops, a lighter messenger may be needed. Dropping a heavy messenger from a high height may damage your sampler. Whether you use an 8oz (46-D80) or 11oz (45-B10) messenger, the maximum recommended air drop is 50'. For long air drops, consider using a 45-B40 messenger shock absorber to help protect the trip head from damage.

Split messengers (45-B10) are composed of an inner and outer cylinder, held shut by a spring. When the two cylinders are twisted, an opening large enough for a line is revealed. Release the messenger, and it snaps shut. This design allows you to put your messenger anywhere on a line, instead of threading it from the end. Solid messengers are also available.

For those sampling in extreme environments or performing trace metal tests, a PTFE coated messenger (46-G10) is available. The coating only allows for a solid version of this messenger to be manufactured..

SERIES SAMPLING BOTTLE


Series Sampling Bottle

With this 2.2L sampler, you can collect liquids at several different depths almost simultaneously. Place up to five bottles on the same line, each with a messenger above its trip mechanism. The messengers are connected to the line via lanyards. A heavy weight should be attached to the bottom of the line to keep it taut. When you drop a messenger onto the top sampler, all the bottles will close in rapid succession.

The Series Sampler features a stainless steel trip mechanism for durability and high performance. It has a Rotating T release mechanism which causes the bottle to close and allows the next messenger to drop. It also has a nylon safety line connecting the end seals, so that if the latex tubing breaks, the end seals will not be lost. When tripped by a messenger, the end seals snap tightly onto the each end of the cylinder, producing an almost leak proof seal. A small amount of sample is always lost until a slight vacuum forms inside as the sampler is taken out of the water.

This Beta-style sampler can be used for general chemical and biological sampling, as well as for trace metal studies. It is made of plastic, so it may not be suitable for trace organics. The end seals are made from rigid, inert white ASA plastic. The bottle ends have been machined to fit foam silicone gaskets which are attached to the end seals. Amber latex tubing is used because it leaches fewer contaminants than the black tubing found on the Alpha bottles. This tubing does not leach measurable amounts of metal, but it is not as durable as the black tubing. Since there are no metal parts to touch your sample, the Series sampler can be used for trace metal studies down to the nanogram level.

The bottles are **vertical**, and have a wide open mouth when deployed, allowing a smooth flow of water through the bottle. This prevents entrapment of water from other levels as the sampler is lowered.

Acrylic bottle bodies allow you to view your sample immediately, since it is transparent. However, exposure to sunlight can cause biological or chemical changes in the sample. Also, acrylic scratches more easily than PVC and is more likely to crack or shatter if dropped. **Do not use alcohol to clean acrylic, as it may cause crazing or other damage.**

PVC bodies are sturdier, less costly, and can withstand rough conditions better than acrylic. The tradeoff is that they are opaque.

Thermometers can be mounted on the inside of acrylic bottles. This is done at the factory before shipping. The bottle should be left at the sample depth long enough for the thermometer to stabilize. Upon retrieving the sampler, read the temperature immediately.

Series samplers are available in a kit with the sample bottle, 100ft of line, an 11oz split messenger, and a carry case. Bottles can be purchased separately, but each one needs a messenger to function. Split messengers are recommended for easy use.

If you only need one bottle for sampling, we recommend you purchase a Beta style bottle. A single Beta Bottle is more economical than a single Series bottle.

Warning: When testing the Rotating T mechanism for operation, be extremely careful. Use a messenger dropped from a short distance, instead of your finger, to trip the mechanism. Make sure that people stay clear of the stoppers. The end seals close with considerable force and could cause injury.

Operating Instructions for Series Sampling Bottles

1. We recommend that samplers be thoroughly cleaned prior to any sampling.
2. If you are performing chemical or metals sampling, it is a good idea to run a blank before using the bottle. Fill the instrument with distilled, contaminant free water and test to determine what contaminants may be present in the bottle. I also recommend that this procedure be repeated throughout the sampling season.
3. Make a preliminary inspection of each sampler.

How to operate the Rotating T Release Mechanism

1. Hold the bottle so that the bushing (button) on top of the trip mechanism is on top of the handle.
2. To set the end seals in the open position, turn the Rotating T counterclockwise until the notch in the base of the T is engaged with the trip rod.
3. Attach the loop on the end seal's cable to the T arm furthest away from the end seal. Repeat this procedure for the other end seal.

How to Attach a Bottle to the Line

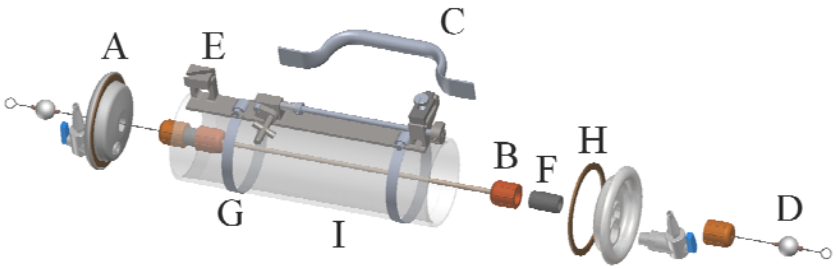
1. Loosen the large retaining nut on **top** of the release mechanism.
2. Attach a weight to the bottom of the line. The amount of weight depends on the number of samplers, currents, etc. Generally, more weight is better than less.
3. Set the first bottle in the open position as described above. Attach it to the line above the weight. This works best when one person holds up the line and the other person attaches the bottle.

4. Set the second bottle in the open position and attach it to the line above the first bottle at the distance required by your sampling protocol. Tie a lanyard to a split messenger. Attach this messenger on the line between the two bottles, above the first bottle. Hook the lanyard on the Rotating T of the second (upper) bottle where the bottom cable is attached. Repeat as needed. For ease of use, it is suggested you lower each bottle off the side of your boat when it is ready.
5. When the topmost bottle has been attached, lower the series samplers to the desired depth in the water.

How to Retrieve the Samples

1. Keeping the line as taut and vertical as possible, drop a messenger down the line to hit the strike pad of the top water sampler. This will cause the bottle to close and release the messenger for the next bottle, and so on and so forth.
2. If you are using thermometers, keep the bottles at the sampling depth long enough for the thermometers to record the temperature at each depth.
3. Pull the bottles up slowly and steadily, taking care not to knock them against anything, such as your boat.
4. If applicable, read temperatures immediately after retrieving the bottles.
5. To save the samples, open one valve to allow air to enter the sampler. Open the other valve to drain the contents into a clean sample container.
6. After sampling, thoroughly clean the bottle to avoid cross contamination with new samples and other water bodies.

Replacement parts for the Series Sampler



	Description	Part #
A	End seals with air drain/valve, 2 pack	1920-L115
B	Tubing assembly	1920-L130
C	Handle	1120-L29
D	Cable assembly, 2 pack	1920-L128
E	Trip assembly	1120-L39
F	Connector, 2 pack	1120-L13
G	Hose clamp, 2 pack	1120-l17
H	Gasket kit	1920-L136
I	Main tube, acrylic	1920-L118
I	Main tube PVC	1920-L120

Warranty and Parts:

We replace all defective or missing parts free of charge. Additional replacement parts may be ordered toll-free. We accept MasterCard, Visa, checks and School Po's. All products warranted to be free from defect for 90 days. Does not apply to accident, misuse or normal wear and tear. Intended for children 13 years of age and up. This item is not a toy. It may contain small parts that can be choking hazards. Adult supervision is required.