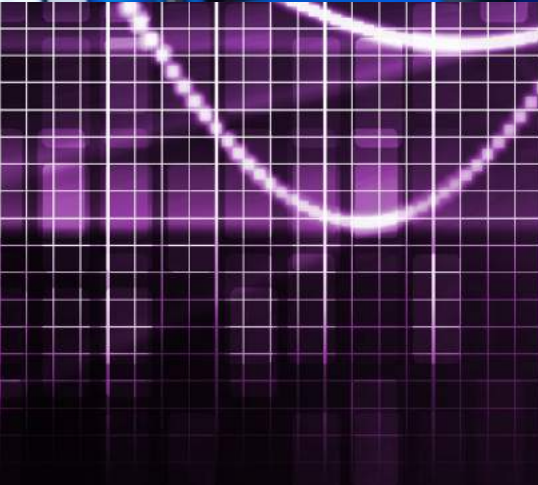




# Diba

Fluid Intelligence

## OEM Capabilities



# Improve the Performance of your Instrument

A HALMA COMPANY

# Connection Systems

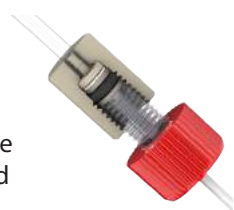
## Click-N-Seal® Fittings

Diba's Click-N-Seal® fittings are the only multi-use finger-tight fittings that cannot be over-tightened. The Click-N-Seal® family of connectors are available in Polycarbonate, Polyoxymethylene (POM) or PEEK and accommodate flares, ferrules or barbs. The Diba Click-N-Seal® Micro 6-40 fitting, ferrule and flare solutions quickly and easily connect 1/16" tube into 6-40 threaded ports, making them ideal for systems that require smaller fluid connections. In addition, the PEEK Click-N-Seal® Ultra fittings are compatible with both flat bottom and HPLC 10-32 "cone tip" ports, with pressure rating up to 2,500 psi (180 bar). Click-N-Seal® offers a unique system for hand-tight fittings. As the fitting is tightened, the resistance of the cap increases until the correct torque is reached at which point the cap clicks. The user is able to hand-tighten the fittings without tools or guesswork and be confident that the fitting is properly seated, creating a secure seal. The fitting can be unscrewed and reused. Hand-tight fittings without the guesswork!



## Microbarb®

The MicroBarb is designed to provide a low-carryover connection between flexible pump tubing and semi-rigid fluoropolymer tubing.



## 6-40 PEEK Fittings

6-40 PEEK fittings offer ferrule options for flat-bottom taper ports and are also compatible with Lee Minstac fittings.



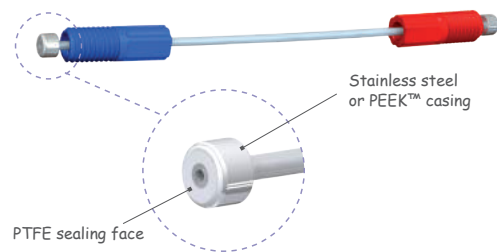
## Flares

Diba has developed a proprietary way to form plastic tubing such as PTFE, FEP, LDPE or PEEK, which creates a seal against a flat bottom port. Typical port sizes for which Diba flares tubing are 1/4-28, 10-32, M6 and 6-40. A seal is created by compressing the flared portion of the tube against the flat bottom of the port with a plastic or stainless steel nut. This type of connection is often used for precision fluid lines that handle samples and reagents in analyzers. Flares ensure that the very low volume connection is leak-free and also minimizes carryover.



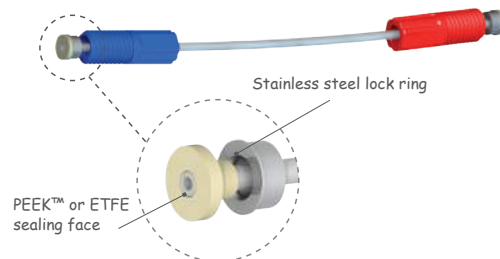
## Type P Ferrule System

Chemically inert flangeless fitting with permanently attached PTFE ferrules. Ideal for repeated connect/disconnect.



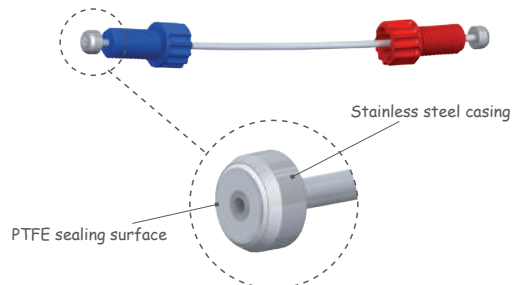
## Type S Ferrule System

Chemically inert with permanently attached PEEK or ETFE ferrules. Ideal for repeated connect/disconnect.



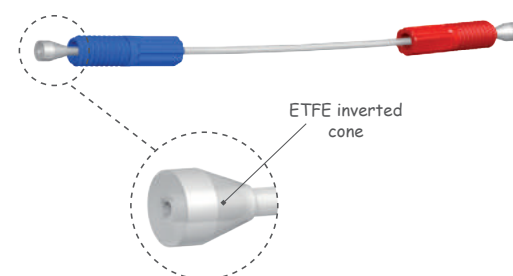
## Gripper Fittings System

Chemically inert flangeless fitting with permanently attached PTFE ferrules. Ideal for repeated connect/disconnect.



## Inverted Cone System

Removable and reusable system for quick and convenient low-pressure connections.



# Tubing Assemblies

## Standard Tubing Assemblies

Diba's offerings of in-stock standard tubing assemblies are ideal for OEMs and engineers interested in high quality, quick-turnaround components to accelerate the design phase of projects. The standard tubing assemblies feature Diba's proprietary flared ends to minimize dead volume and Click-N-Seal fittings for secure, torque-adjusted connections every time. By using Diba standard tubing assemblies, you can:

- Accelerate bread boarding or prototyping
- Eliminate the lead time normally required for custom assemblies
- Reduce the cost of custom parts in small quantities
- Eliminate the risk of over- or under-torquing the fitting
- Ensure quality connections throughout the design phase

## Custom Tubing Assemblies

Diba Industries manufactures over 5,000 unique tubing assembly part numbers annually, each designed per customer's specification. These tubing assemblies generally fall into two categories: precision, chemically inert tubing assemblies for the sample side of an instrument, and soft tubing assemblies for the wash & waste side of an instrument.

These tubing assemblies usually carry multiple sample and reagent fluids. In most cases, precision tubing assemblies must be chemically inert and properly designed to avoid dead volume areas in the flow path. Dead volume can lead to carryover, due to residual material in the flow path that carries over to the next test sample.



## Ordering Information


### Standard Tubing Assemblies

DESCRIPTION	PART NUMBER	TUBING	ID / OD	LENGTH
6-40 Fitting with Flare	DB200-15046	PTFE	.031" x .062"	12"
CNS PLUS with Flare & washer on either end	DB200-15047	FEP	.030" x .062"	24"
CNS PLUS with Flare & washer on either end	DB200-15048	FEP	.062" x .125"	24"
CNS PLUS with Flare & washer on either end	DB200-15049	PTFE	.031" x .062"	24"
CNS PLUS with Flare & washer on either end	DB200-15050	PTFE	.062" x .125"	24"
CNS PLUS with gripper Ferrule	DB200-15051	PTFE	.031" x .062"	24"
CNS Regular with Flare & washer on either end	DB200-15052	PTFE	.031" x .062"	24"
CNS Regular with Flare & washer on either end	DB200-15053	PTFE	.062" x .125"	24"
CNS ULTRA with Flare	DB200-15054	PTFE	.031" x .062"	24"
CNS ULTRA with Flare	DB200-15055	PTFE	.062" x .125"	24"
Microbarb with soft tubing	DB200-15056	SILICONE	.030" x .093"	3"

## Print on Tubing

Diba has the capability to laser etch text on semi-rigid plastic tubes such as PTFE, FEP, and LDPE. The text is permanent and can be used when heatshrink or simple wire type labels cannot withstand harsh environments where this tubing is used. It is also used when the end user must be able to see through tubing to ensure sample /fluid transfer is free of air bubbles. Diba can also print on soft plastic tubing using an ink-jet printer. Tubing materials include PVC, Tygon, Silicone, etc.

## Connector Options *(shown at actual size)*

Click-N-Seal® Regular	Click-N-Seal® Plus	Click-N-Seal® Ultra	Click-N-Seal® 6-40	6-40 PEEK Fitting	Microbarb®
 <ul style="list-style-type: none"> <li>• Eliminates over-and under-torquing</li> <li>• No tools required</li> <li>• Made of polycarbonate &amp; acetal</li> <li>• Can be reused up to 100 times</li> </ul>	 <ul style="list-style-type: none"> <li>• Eliminates over-and under-torquing</li> <li>• No tools required</li> <li>• Made of acetal</li> <li>• Slim profile</li> <li>• Can be reused up to 25 times</li> </ul>	 <ul style="list-style-type: none"> <li>• Eliminates over-and under-torquing</li> <li>• No tools required</li> <li>• Made of PEEK</li> <li>• Slim profile</li> <li>• Works well with aggressive chemistries</li> <li>• Can be reused up to 40 times</li> </ul>	 <ul style="list-style-type: none"> <li>• Eliminates over-and under-torquing</li> <li>• No tools required</li> <li>• Made of PEEK</li> <li>• Works well with aggressive chemistries</li> </ul>	 <ul style="list-style-type: none"> <li>• No tools required</li> <li>• Made of PEEK &amp; stainless steel</li> <li>• Slim profile</li> <li>• Works well with aggressive chemistries</li> <li>• Can fit into very tight spaces</li> </ul>	 <ul style="list-style-type: none"> <li>• Made of PEEK</li> <li>• Works well with small ID and soft tubing</li> <li>• Low carryover connection</li> <li>• Typically used with peristaltic pumps or pinch valves</li> </ul>



# Probes

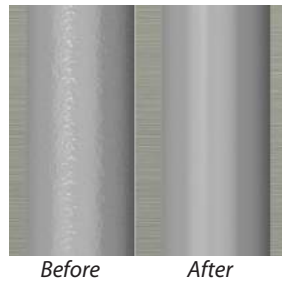
## Standard Probes

Diba's line of standard probes are ideal for OEMs and engineers interested in high quality, quick-turnaround components that can speed up the design phase of their projects and shorten the lead times normally associated with the manufacturing of custom probes. Device makers will also benefit by improved supply chain management, as Diba's standard probes are in stock and ready to ship. Key features include:

- 316 stainless steel construction for performance and durability
- Easily connects to Diba tubing assemblies with the use of a flare or a ferrule
- Increased dispense accuracy and minimized internal diameter (ID) roughness with a draw down reduced diameter tip
- 200 micro liter internal volume capacity
- 5.9 inch stroke length, capable of reaching the bottom of most sample tubes
- Additional carryover reduction can be achieved with fluoropolymer-based coatings on the outside diameter (OD) which is available upon request as a special order

## Standard Probe Types

**DP3** is Diba's proprietary polishing process which minimizes carryover by reducing ID roughness by a factor of 3 to 5. DP3 technology also improves wash characteristics and provides added durability.



**Draw down** probes feature a reduced diameter tip. The tip of the probe is reduced by a draw down process which ensures that the internal surface finish of the reduced section remains unaffected once the process is completed.

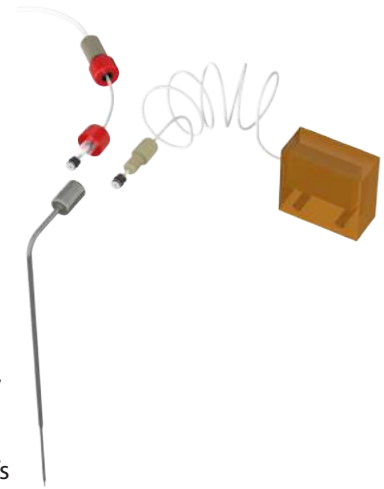


**PTFE lined** probes are made of 316 stainless steel and are lined with PTFE tubing. PTFE lined probes offer an unbroken fluid path with no joints back to the pump.



## Custom Probes

Diba manufactures custom precision probes for the most demanding micro-fluidic applications. Every Diba probe is designed per customer's specifications, and many probes include level sensing and fluid heating capabilities. Other custom capabilities include stainless steel, alloys and non metallic tubing, laser welding, custom points, thermoforming, venting, FEP-lining and specialty surface finishes including Diba's exclusive DP3 polishing process.



Custom probes can be made with any of these tips:



## Draw Down

Unlike swaging, draw down uses one die through which the tubing is pulled to reduce the diameter. This process is an ideal application for probes which require a very smooth finish on the ID and OD of the metal tube. Probes produced with this technology can then be polished to achieve a mirror smooth finish which results in probes that will perform better in the systems that have very stringent carryover requirements.

## Swaging

Swaging metal tubing such as 316 and 304 stainless steel is a mechanical process which uses rotating dies to reduce tubing size. Swaging is relatively easy and inexpensive way to produce probes and dispense needles. Swaging also allows for smaller tip geometry which facilitates better dispense characteristics of the probe or the needle tip in the system.

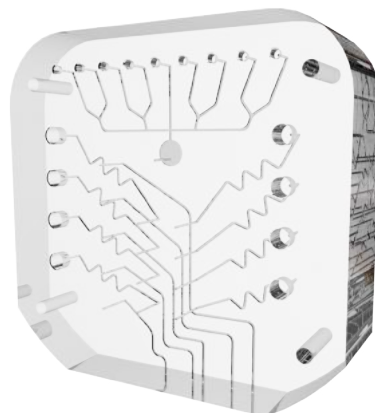
# Manifolds

Diba recently acquired VAS Integrated LLC, a designer and manufacturer of custom manifolds and fluidics assemblies for diagnostic and analytical instruments. VAS has a special emphasis on precision machined and thermally bonded acrylic or Ultem manifolds. VAS also offers OEMS integrated subassemblies, with pumps, valves, tubing and even sensors mounted on the manifold and tested prior to shipment.

## Why Choose a Manifold?

Manifolds simplify machine design and maintenance. Consider these benefits:

- More compact and elegant design
- Fewer tubing assemblies and connections to plumb and maintain
- Easier engineering, documentation and supply chain management
- Improved manufacturing consistency from instrument to instrument
- Visibility of fluid paths for enhanced maintenance and service
- Option for direct transducer interface
- Improved reliability and performance
- Reduced total cost



## Why Choose Diba as your Manifold Partner?

VAS Integrated has been providing precision manifolds to leading equipment manufacturers since 2008. Now as part of Diba, VAS is even better prepared to continue providing the service and technology leadership customers have come to appreciate well into the future. Consider these advantages of working with Diba:

- End-to-end project management, including CAD/CAM design, application support and manufacturing under one roof
- Rapid prototyping and design iteration with prompt turn times for series production
- Precision machining of multiple polymers in house
- Optimized processes for improved layering and diffusion bonding in house
- Redundant CNC milling/turning centers with spare capacity
- Optical Polishing – Diamond / Flame / Chemical – with optional coatings
- Integration of valves, pumps, tubing and sensors into a complete, tested subassembly
- Streamlined supply chain management and reduction of components and WIP
- Industry leading quality performance



Acrylic, 3 layer, 1.0 mm channels



Ultem, 3 layer, 0.15 & 0.50 mm channels



Machined part & molded cap assembly, 4-axis



Integrated assembly with SMC chemically inert solenoid valves

# Bottle Caps & Level Sensors

## Bottle Caps

Diba Industries manufactures bottle assemblies utilizing customer specified bottles. This open platform policy allows Diba to custom design bottle assemblies specific to each customer's application. Typical applications include swiveling cap inserts with integrated ports that allow the cap to be removed without disconnecting any fluid lines. Many bottle assemblies also incorporate level sensing capabilities; and Diba now offers private label bottle caps in 38mm, GL45 & 53B sizes that can be molded with the customer's logo in the top of the cap and in the customer's specified color.



## HydroPLUS™

Diba Industries manufactures custom liquid level sensors utilizing Diba's proprietary technologies including our new HydroPLUS™ continuous level sensor. Many of Diba's level sensors are also designed to be multifunctional as probes, straws and fluid heaters. Diba's HydroPLUS™ pressure level sensing technology offers continuous level sensing for non-volatile fluids in any vessel shape. The sensor can also be used concurrently as a diagnostic pressure monitor. HydroPLUS™ features integrated electronics and is compatible with existing containers.

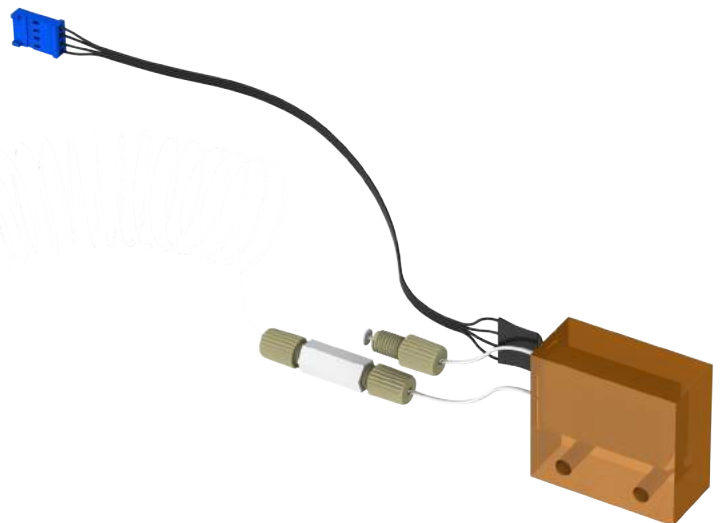


## Heaters

### Heaters

Diba Industries manufactures custom precision fluid heaters. Every Diba fluid heater is designed with a chemically inert fluid path, and many fluid heaters incorporate level sensing capabilities.

Fluid heaters generally fall into two categories: reservoir, where the fluid incubates for a certain period of time up to a specific temperature, and continuous, where the fluid is heated to a specific temperature over a constant flow rate.





# Added Capabilities

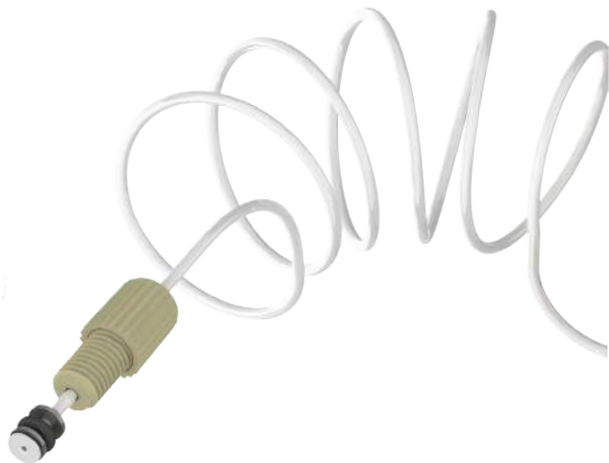
## Extrusion

Diba offers precision extrusion of fluoropolymer, PEEK and other high performance tubing. Diba extruded tubing is ideal for flaring due to very tight tolerances and our lead times are days, not months! By partnering with Diba for extruded tubing needs, customers receive:

- Precision, tight -tolerance micro bore and custom size tubing
- Real-time continuous Ultrasonic ID/OD/Wall/ Concentricity/Ovality measurement
- On line data acquisition and SPC process control reports
- Customized product design and development for a wide range of thermal, mechanical and electrical properties.
- Rapid response to R & D and process variation

## Thermoforming

Tight spaces in analytical instruments can often make it difficult to maintain consistent fluid paths in regular tubing. Thermoformed tubing assemblies from Diba Industries can be custom designed with precision bends and coils that fit neatly into instruments, preventing kinking and improper installation for problem-free processing. Available tubing materials include FEP, PTFE, PFA, ETFE, PVC, LDPE, PVDF, TPU, and PEEK. Assemblies can be custom labeled and packaged, with nine distinct fitting colors available, to speed instrument build cycle and field service times. Diba's technical staff is available to assist in specifying configurations suited to any application. Thermoformed coils take up the slack on moveable arms. The tubing design creates a one way fit, ensuring that assemblies can only be installed in the correct direction.



## Cleanroom

Diba offers dust-free manufacturing and packaging done in a class 10,000 cleanroom. The cleanroom is hard wall, 20' x 30', ISO class 7 single pass cleanroom with dual 36" pass-thru ports, and a 6' x 8' gowning room. It allows for up to 10 people to work comfortably wearing gowns, caps, booties and gloves to maintain product cleanliness.

A cleanroom is an environment, typically used in manufacturing or scientific research, that has a low level of environmental pollutants such as dust, airborne microbes, aerosol particles and chemical vapors. More precisely, a cleanroom has a controlled level of contamination that is specified by the number of particles per cubic meter at a specified particle size.



The air entering a cleanroom from outside is filtered to exclude dust, and the air inside is constantly recirculated through high efficiency particulate air (HEPA) and/or ultra low particulate air (ULPA) filters to remove internally generated contaminants. Staff enter and leave through airlocks.

Cleanrooms are not sterile (i.e., free of uncontrolled microbes) and more attention is given to airborne particles. Particle levels are usually tested using a particle counter.

