CONTACT PRODUCTS

EVERETT CHARLES TECHNOLOGIES

A Cohu Company

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POGO® CONTACT SOLUTIONS

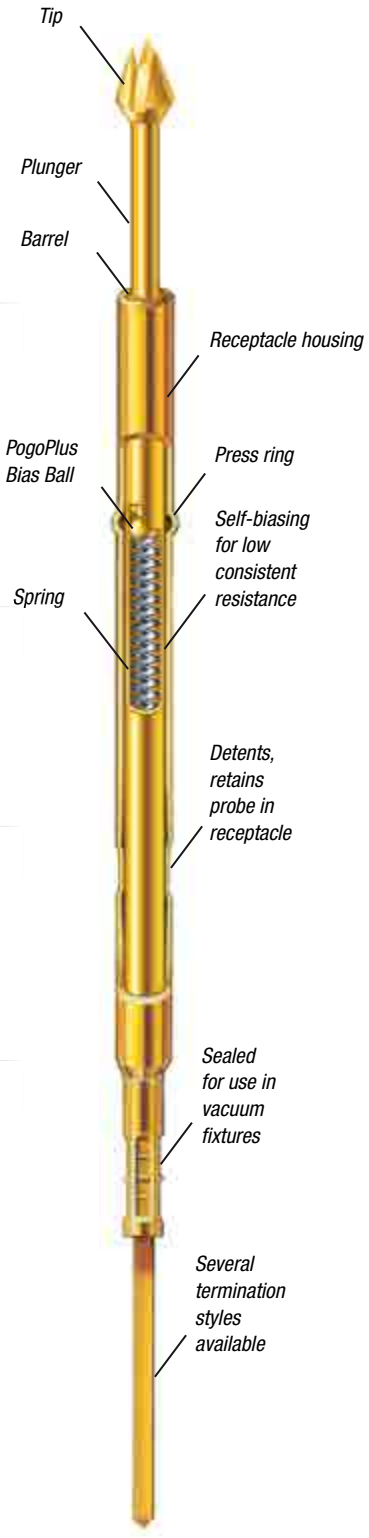
- ICT/FCT
- GENERAL PURPOSE
- HIGH CURRENT
- HIGH FREQUENCY
- SWITCH PROBE
- STEP PROBE
- BATTERY CONTACT
- SEMICONDUCTOR

Electrical Current Path

The primary current path in a probe is through the contact junction of the plunger with the barrel and the barrel with the receptacle. Secondary paths include the contact junction between the spring and plunger and the spring and barrel.

Electrical Probe Resistance

Resistance is dependent on several factors: conductivity of base metals and plating material, resistance at points of contact between components (which is affected by surface condition), area of contact, force applied at contact junctions, and probe design. For applications requiring very low and consistent resistance, such as loaded-board test, ECT's PogoPlus® probes feature an enhanced bias ball design that maintains electrical contact between the plunger and the sidewall at all times. ECT probes are self-biasing, resulting in maximum metal-to-metal contact between components at critical contact junctions. Electrical resistance is included among probe specifications on each data page.



Travel

Most probes are rated with a working travel and a full travel position. Full travel is the maximum travel the probe is able to make, before either the plunger recessed into the barrel or the spring bottoms out at full deflection and becomes solid. Full travel causes springs to wear more quickly; therefore we specify a working travel position which is typical 2/3 of the full travel position. This will prevent the probe from bottoming out and extend the life of the spring.

Force

Force values are provided throughout this catalog in both "oz. and (grams)". Conversion from ounce-force to gram-force: 1.00 oz = 28.35 grams. Conversion from ounce-force to newtons: 1.00 oz = 0.28 newtons.

Plunger

Plungers are generally manufactured from BeCu (Beryllium Copper), then heat-treated and plated with gold or other plating materials. Some tip styles requiring extended tip life, are made from stainless steel, then heat-treated and plated.

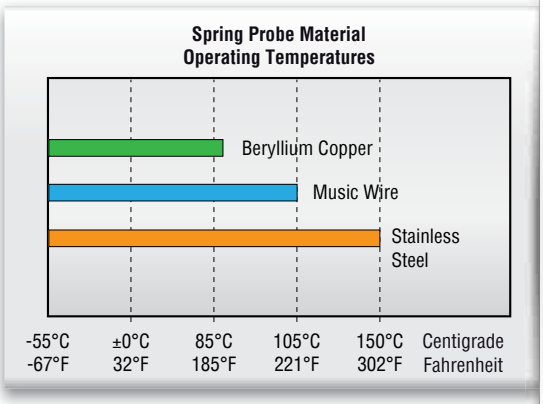
Spring

The spring provides the required compliant force at the plunger tip, and the contact force between the barrel and the plunger. Several spring materials are offered, depending on probe size, spring force and application requirement. Spring material may also be plated with precious metals to improve electrical performance and prevent corrosion.

Higher spring forces will provide you with a more effective penetration through contamination contact points, but also leaving heavier witness marks on the test point. Lower spring forces might be used where witness marks must be avoided or to prevent board flexing on higher pin count applications.

Typical spring force tolerance is ± 20%. A tighter tolerance range can be achieved if required.

- **BeCu** is the weakest of the spring materials. However due to its electrical performance, it is used on low-resistance applications.
- **Music Wire** is a high carbon steel wire chosen for its consistency and strength.
- **Stainless Steel** is very strong and typically used on high temperature applications or in corrosive environments.

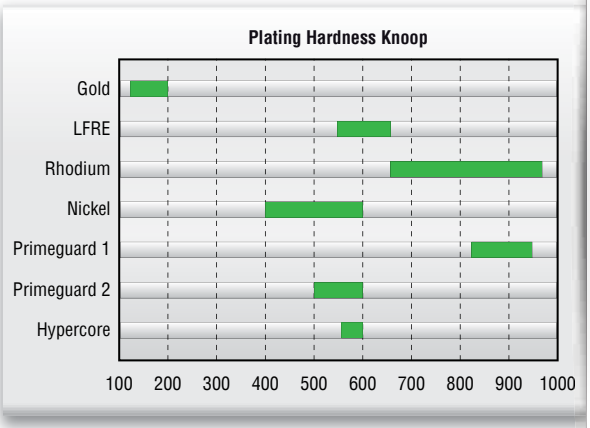


Base Materials

- **BeCu** is used because it is an excellent electrical conductor and is easily machined and hardened.
- **Stainless Steel** provides a much harder base material and is mainly used on medium to aggressive tips styles to provide longer lifetime.
- **Phosphor Bronze** is a choice for barrel material due to its excellent wear property.
- **Brass** is a very good electrical conductor, easy to machine and will accept all plating types.
- **Nickel Silver** is a good electrical conductor and provides excellent dimensional repeatability.
- **HyperCore™** is a new base material which provides longer life and does not require plating. Only used on Semiconductor probes.

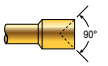
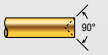
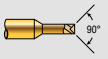
Plating

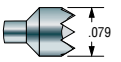
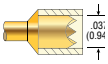
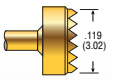
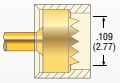
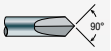
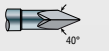
- **Gold** provides excellent electrical performance for low-resistance applications.
- **LFRE** is a proprietary hard plating alloy. Used on lead-free (RoHS) PCB boards and contact points. Approx. 5 times harder than gold plating to extend tip lifetime. Less prone for solder transfer on 100% tin applications.
- **Rhodium** is very hard corrosion resistant, and typical preferred when maximum tip life is preferred.
- **Nickel** provides relatively hard plating and is used mainly on probes for its very good chemical resistance.
- **Primeguard** is a very hard plating option only used on Semiconductor probes to extend life and cleaning cycles on 100% tin or palladium based applications.
- **HyperCore™** is a new base material which provides longer life and does not require plating. Only used on Semiconductor probes.



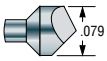
Tip Geometry

Everett Charles Technologies, Ostby Barton, and Pylon offer a large variety of different tip geometries. Here are is a list of tip geometries that you will find throughout the catalog on various probe series. Most tips are shown with gold plating, however on several probe series the same tip styles are available with different plating material.

Tip Style		
	**A** **Pylon: V**	**Cup** Headed concave 90°/120°
	**B** **Pylon: C**	**Point** Straight Shaft Spear 30°/34°/60°/90°/120°
	**C...** **Pylon: F**	**Flat** Straight Shaft Flat
	**C30**	**Flat** Reduced Flat
	**D** **Pylon: 2R**	**Radius** Headed Bullet Nose
	**E** **Pylon: P**	**Conical** Headed Convex 90°/106°
	**F**	**Flat** Headed Flat
	**FP**	**Flat Star** Straight Shaft 6 Point Star
	**G...**	**Cup** Straight Shaft concave
	**G12**	**Cup** Reduced concave
	**G30**	**Cup** Reduced concave
	**H** **Pylon: W**	**Serrated** Headed multiple Point waffle

Tip Style		
	**H-79**	**Serrated** Headed multiple Point waffle
	**H-INS**	**Insulated** Headed serrated with isolating ring
	**HM**	**Serrated** Oversized multiple Point waffle
	**HM-INS**	**Insulated** Oversized serrated with isolating ring
	**I...**	**Blade** Straight Shaft Lance 90°
	**I15**	**Blade** Straight Shaft Lance 155°
	**I35**	**Blade** Straight Shaft Lance 35°
	**I40**	**Blade** Straight Shaft Lance with facet 40°
	J **Pylon: R**	**Radius** Straight Shaft Bullet Nose
	J40 **Pylon: R**	**Radius** Straight Shaft Bullet Nose, Ø.040
	**J30** **Pylon: J**	**Radius** Reduced Bullet Nose, Ø.030
	**L** **Pylon: Q**	**Crown** Headed 4-Point Crown

Tip Style		
	**L18**	**Crown** Reduced 4-Point Crown
	**L24**	**Crown** Straight Shaft 4-Point Crown
	**L36** **Pylon: Q**	**Crown** Straight Shaft 4-Point Crown
	**P**	**Star** Headed 6-Sided hexagon Star
	**T**	**Pyramid** Headed 3-Sided Chisel 30°
	**T1**	**Pyramid** Reduced 3-Sided Chisel 10°
	**T10**	**Pyramid** Straight Shaft 3-Sided Chisel 10°/15°
	**T20**	**Pyramid** Straight Shaft 3-Sided Chisel 30°
	**T24**	**Pyramid** Straight Shaft 3-Sided Chisel 10°/15°
	**T30**	**Pyramid** Straight Shaft 3-Sided Chisel 30°
	**T36**	**Pyramid** Straight Shaft 3-Sided Chisel 10°/15°
	**T38**	**Pyramid** Headed 3-Sided Chisel 30°

Tip Style		
	**T67**	**Pyramid** Headed 3-Sided Chisel 30°
	**T79**	**Pyramid** Headed Shaft 3-Sided Chisel
	**TJ**	**Test Jet** Special tip for Open Test Product Probes
	**U**	**Crown** Reduced 3-Point Crown
	**UN**	**Trident** Headed 3-Spike Triad
	**V**	**Tulip** Headed 7-Point Crown
	**X**	**Tapered Crown** Headed 4-Point Crown
	**Z**	**Crown** Oversized 8-Point Crown
	**Z1**	**Crown** Headed 8-Point Crown
	HC	**Serrated** Straight Shaft microstructured Bead
	**HF**	**Serrated** Headed microstructured Bead
	**HL**	**Serrated** Oversized microstructured Bead

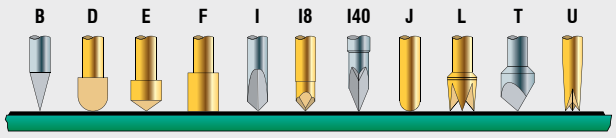
Tip Selection

Most tip styles can be used for a variety of different applications. Use the following chart to select appropriate tips for the feature type (pad, via, etc.) you are testing. Several tip styles will probably work for a given application, so experiment with several tips until you find one that provides the best performance. For testing loaded boards, tip selection factors to consider are lead length (bent or straight), surface cleanliness, and pad size. In general, tips with sharp points and internal cutting edges which trap leads (such as the Trident or crown tip) are excellent choices for most loaded board requirements. In bare board applications, tips with sharp external cutting edges (such as fluted and pyramid tips) are usually best for penetrating through contamination, but these may leave marks on the contact surface. For applications where marking is undesirable, bullet nose or conical tips may be used on clean boards.

Tip selection is crucial when selecting a probe, so please feel free to contact your nearest ECT facility. We are more than happy to assist you with your tip selection.

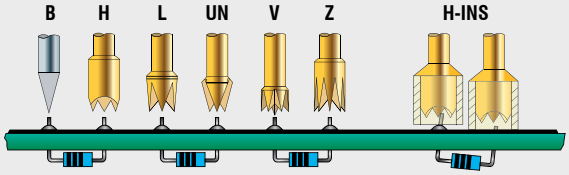
Pads

Some applications require a non aggressive tip like the D,J or F type tip. These tips leave no marks or footprints on the test pads.
Other applications may need to break through oxide layers, OSP or other contaminations. For these test points the B,E,I,L,T and U Tip with their medium to very aggressive geometry penetrate through the contaminations and offer best first pass contact.



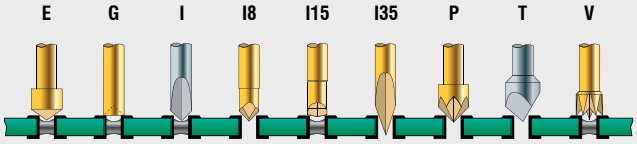
Solder Pads, Solder Balls

Over time solder build up oxide layers, therefore medium to very aggressive tip geometries are used. H-INS or HM-INS Tip – The tip geometry is designed with a pin present detection. If a component lead is not soldered correctly and fully into the PCB board, the insulating ring around the H tip will act as a collar, preventing the conductive probe tip from making contact with the faulty test point.



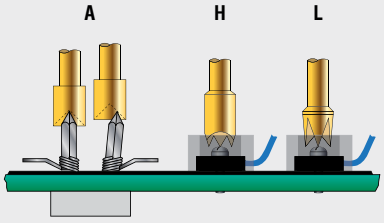
Vias

Typical tips are used that center themself into the via hole. ECT offers a variety of different I tip angles, which are used to accommodate through-hole vias as well as solder filled holes. Other Tips like the G or V tip are suited to contact only the outer ring of the vias on the board surface.



Posts, Pins and Screws

For other applications like posts, pins or screws are more unpredictable and therefore more challenging to select the best tip style. Posts and pins are captured with tips like the A, H or L Tip. Other applications depending on material, size, shape, access or clearance, contamination and so on may require other tips.



Termination Types

Several receptacle termination styles are available to choose from as listed on this page. Some styles are only available in certain sizes; please see the specific probe series page for details. Within the tool section you will find insertion and extraction tools offered by ECT as well as installation tips for receptacles.

Crimp

This reliable connection is used primarily on smaller probe sizes in high density applications where wire wrap is not available or in situations where probe plate thickness inhibits the use of wire wrapping. Push-on terminals can also be used and are commercially available from most connector manufacturers.

Solder

This termination provides excellent electrical integrity for high reliability applications. It is used primarily in low density situations.

Wire Wrap

These terminations are strong and provide excellent electrical integrity. It is the most common termination used in ATE fixturing. Connections can be made quickly by skilled technicians. Push-on terminals which fit the standard .025" (0.64 mm) square post can also be used.

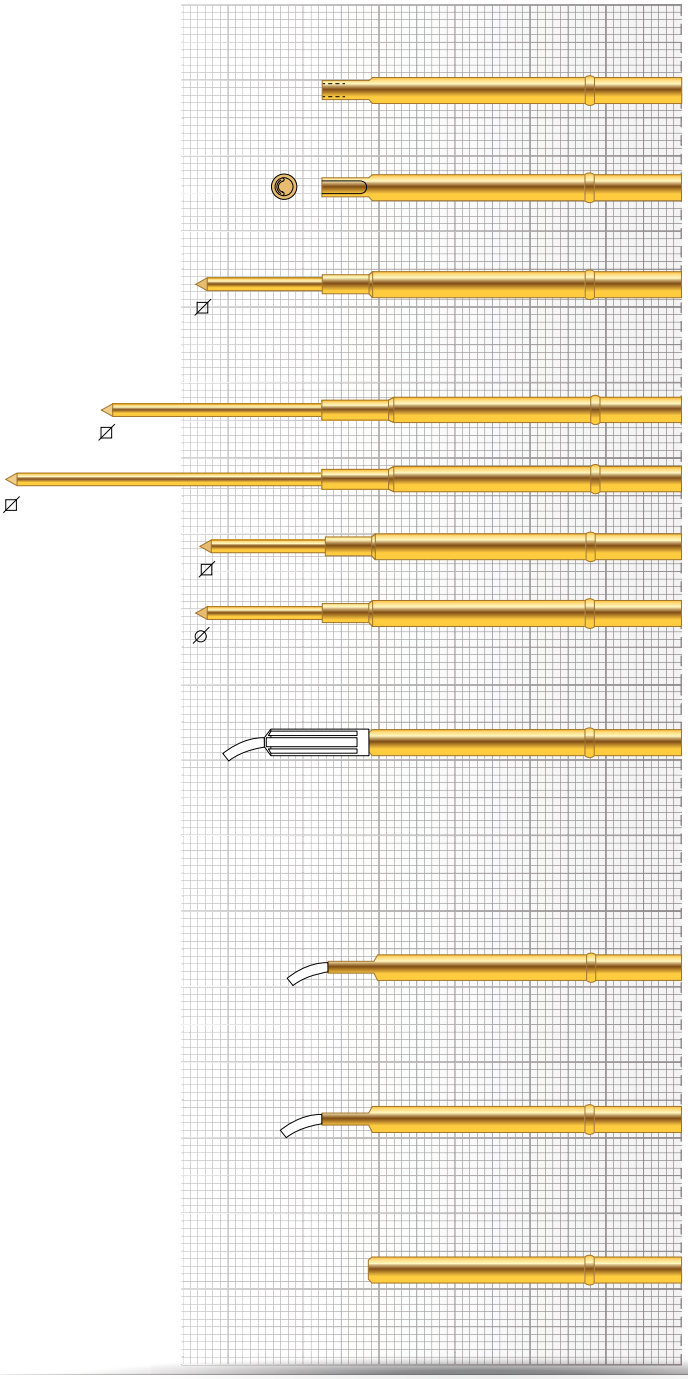
Round Post

Round Post receptacles with .025" (0.64 mm) diameter posts are used with .100" (2.54 mm) center connectors and/or ribbon cable assemblies for mass termination.

Fastite®

Fastite® or Quick Connect™ termination provides exceptional contact integrity and is available only on SMT receptacles. Connections can be made quickly and wiring mistakes can be corrected easily without damaging the receptacles.

ECT



W **Crimp**
Typically used to attach a wire by mechanical crimping

W-1 **Solder Cup**
Typically used to attach a wire by soldering

W-2 **Wire Wrap Post**
Square post ⧄ .025 (0.64)
Vacuum leak rate not to exceed 1x10-4 CFM@15psi

W-2L **Wire Wrap Post - long**

W-2LL **Wire Wrap Post - extra long**

W-2M **Wire Wrap Post - short**

W-3 **Connector Pin/Round Post**
Round post Ø .025 (0.64)
Vacuum leak rate not to exceed 1x10-4 CFM@15psi

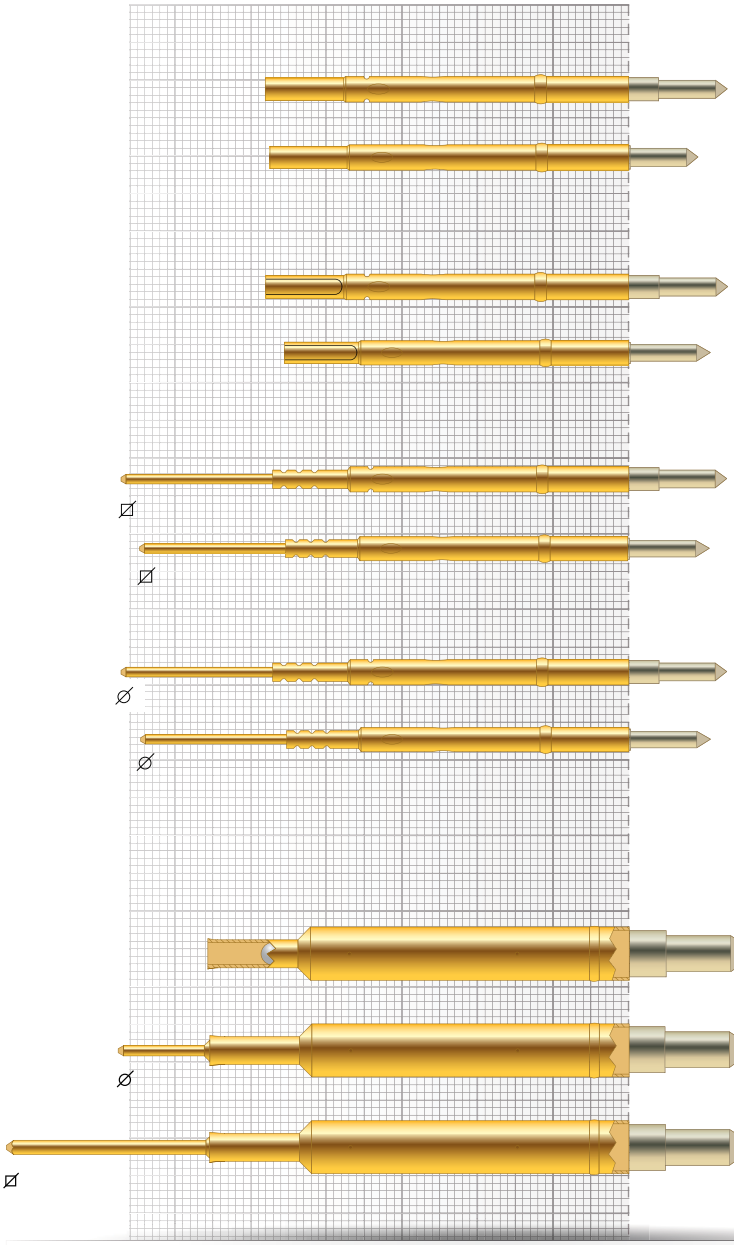
W-4 **Fastite®**
Wire termination (30 AWG only)
Maximum wire insulation diameter = .019 (0.48)
Wire strip length = .125 (3.20)
DS-62-1 Insulation sleeve is included
Recommended maximum current 1.0A DC
Maximum temperature may not exceed 105°

W-28 **Prewired**
Crimp with 30" of 28 AWG wire attached
Maximum temperature not to exceed 105°C
Recommended maximum current 1.5A DC

W-30 **Prewired**
Crimp with 30" of 30 AWG wire attached
Maximum temperature not to exceed 105°C
Recommended maximum current 1.0A DC

Y **Push on**
Push on termination

OB - Pylon



0 **Crimp - Collar Height**

0F **Crimp - Flush Mount**

Typically used to attach a wire by mechanical crimping

1 **Solder - Collar Height**

1F **Solder - Flush Mount**

Typically used to attach a wire by soldering

2 **Wire Wrap - Collar Height**

2F **Wire Wrap - Flush Mount**

Square post ⧄ .025 (0.64)

3 **Round Post - Collar Height**

3F **Round Post - Flush Mount**

Round post Ø .025 (0.64)

ED **Crimp - Collar Height**

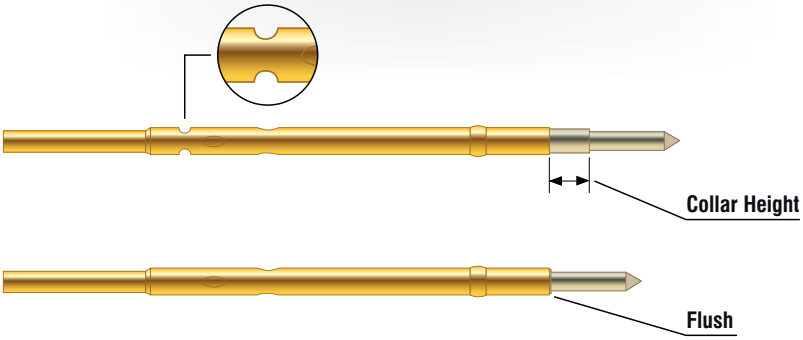
Typically used to attach a wire by mechanical crimping

ETD **Round - Collar Height**

Round post Ø .026 (0.66)

EWWD **Wire Wrap - Collar Height**

Square post ⧄ .025 (0.64)



Collar Height

Most of the Ostby Barton / Pylon receptacle series offer a collar height option. A collar will raise the probe out of the receptacle by the mentioned height as shown in the illustration.

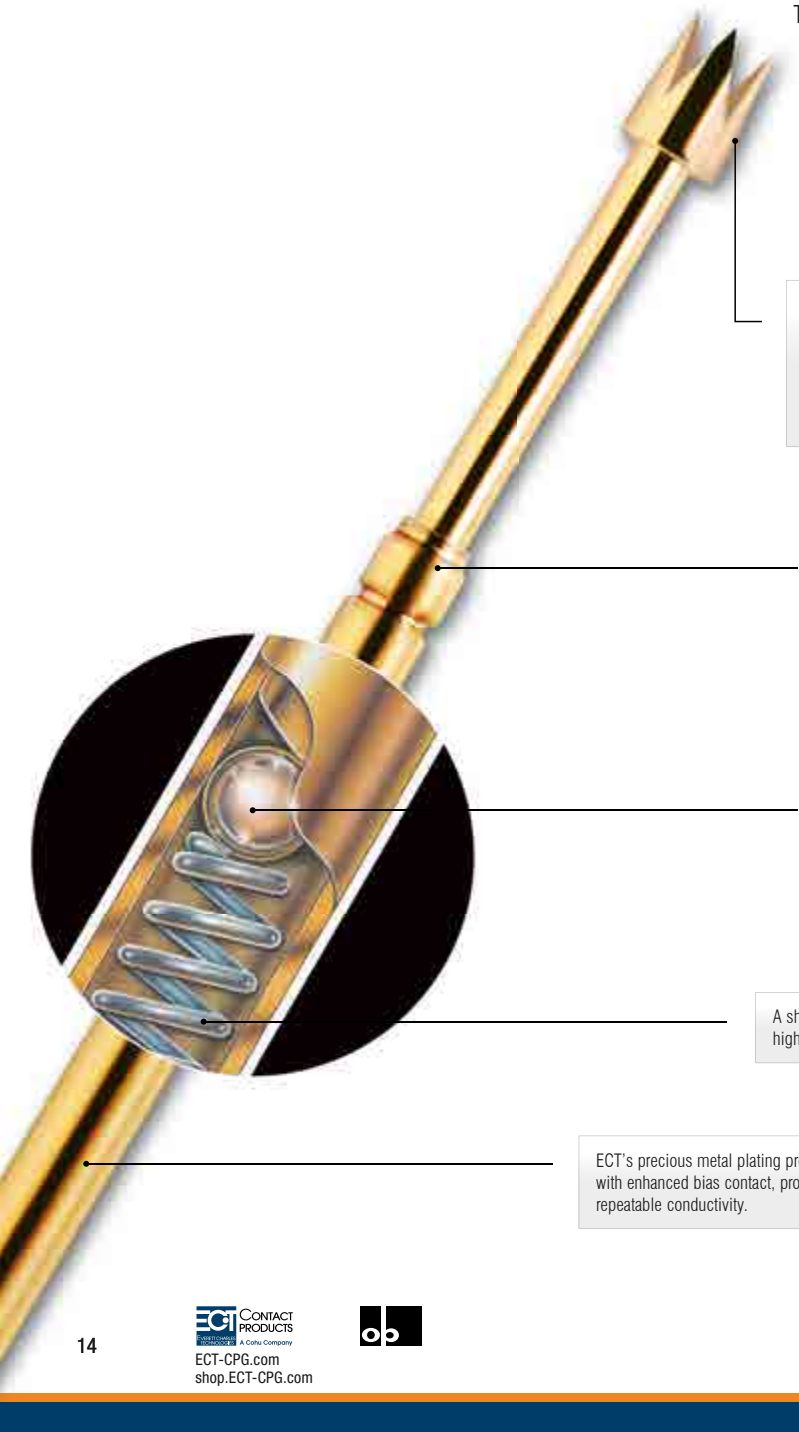
Probe Advantage

PogoPlus® Series probes

Conventional bias-type probes are susceptible to false opens — that is, transient electrical discontinuities that cause good products to "fail" during test. Revolutionary PogoPlus probes eliminate probe-induced false opens, saving you the time, money, and needless product retesting.

The unrivaled electrical performance of the PogoPlus is due to the interaction between the spring, captured ball, and plunger, which forces the plunger into continuous contact with the barrel wall at all times. The result is uninterrupted electrical continuity and low overall resistance that can't be equaled by any other "high performance" probe.

The PogoPlus® is also designed to be the world's most durable probe with features like optional stainless-steel MicroSharp™ tips, a larger spring volume, and enhanced pointing precision.



Available steel tips, manufactured with ECT's MicroSharp™ technology, offer the ultimate in long-lasting tip sharpness and contact integrity.

A variety of innovative tip styles give you the flexibility to match the PogoPlus® to your specific test application.

A double-roll close offers the industry's best pointing accuracy that helps you hit the smallest test targets with high repeatability.

Interaction of the captured ball, bias-cut plunger end and applied spring force guarantees uninterrupted electrical contact with the probe barrel sidewall, virtually eliminating probe related false opens.

A shorter plunger permits more spring volume, higher spring force and longer spring life.

ECT's precious metal plating process, together with enhanced bias contact, provides highly repeatable conductivity.

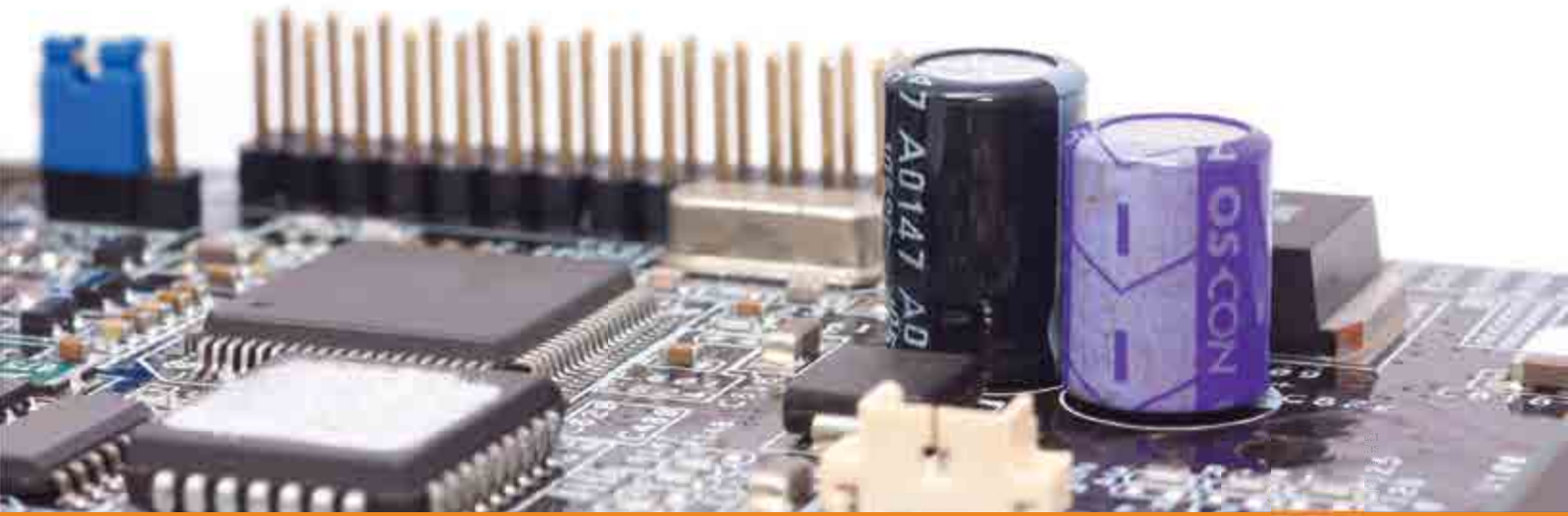
Loaded PCB Test Probes / Functional

The ICT / FCT product lines, which include the LFRE and PogoPlus® Series, address the unique demands of loaded board and vacuum fixture applications. Most probes feature an enhanced version of the legendary bias-ball design to virtually eliminate "false opens", proprietary metal plating processes for higher conductivity, and precision MicroSharp™ steel tips for long-lasting durability. A full range of sizes accommodates applications with mixed test center requirements.

Mixed Test Centers

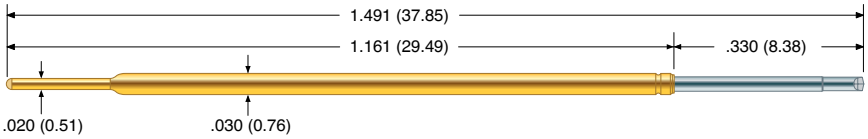
In loaded board applications, probes are designed for use on 0.039, 0.050, 0.075 and 0.100 inch test centers. They can also be mixed in single or dual-stage fixtures, even those with minor variations in plunger travel. When mounted correctly, probe plunger tips will align when compressed to recommended working travel. This ensures contact integrity between the tip and test pad. Minor adjustments may be required to compensate for variations in accessing component leads, flat test pads, or through-holes.

- **LFRE:** The solution for your RoHS complaint boards and lead-free solder test points.
- **POGO:** High performance ICT / FCT probes similar to the LFRE probe, but with gold plated tips. Features the legendary PogoPlus® Bias Ball design.
- **METRIX:** Probe series for smallest test centers down to .039 inch or 1.00 mm.
- **LTP/LFLT:** High performance ICT/FCT long probes for dual-stage fixtures.



MTX-39

39 mil (1.00 mm)



Mechanical

Recommended Travel:	.167 (4.24)
Full Travel:	.250 (6.35)
Operating Temperature	
• Standard Spring:	-55°C to +105°C
• Alternate Spring:	-55°C to +150°C
• Elevated Spring:	-55°C to +105°C

Spring Force in oz. (grams)

	Order Code	Preload	Rec. Travel
Standard	- 4	1.02 (29)	4.0 (113)
Alternate	- 6	2.15 (61)	6.0 (170)
Elevated	- 7	1.17 (33)	7.0 (198)

Electrical (Static Conditions)

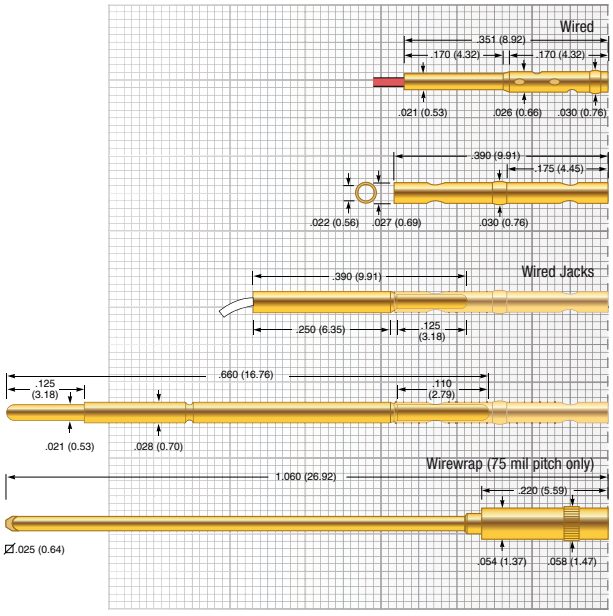
Current Rating:	3 amps
Average Probe Resistance:	<15 mOhms

Materials and Finishes

Plunger:	High performance alloy LFRE proprietary plating
Barrel:	BeCu, Gold plated over hard Nickel
Spring	
• Standard:	Music Wire
• Alternate:	Stainless Steel
• Elevated:	Music Wire
Ball:	Stainless Steel

Receptacle

Hole diameter:	Ø .028 (0.70)
Suggested drill:	#70 or 0.70 mm
Recommended wire gauge:	28-30 AWG
Material Housing	
• HPR-40T:	Work-hardened Nickel Silver, Gold plated over hard Nickel
• HPR-40W:	Work-hardened Nickel Silver, Gold plated over hard Nickel
• STT:	Work-hardened BeCu, Gold plated over hard Nickel



STT-80W
(Pre-wired versions -28, -30)

HPR-40W

HPR-40T with HPR-40W

HPA-40 with HPR-40W

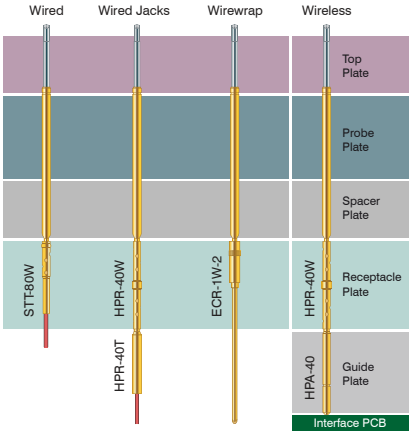
ECR-1W-2

Tip Style

H	HC	HF	I	I8	I15	I40
Ø .035 (0.89)	Ø .024 (0.56)	Ø .035 (0.89)	Ø .019 (0.48)	Ø .017 (0.43)	Ø .017 (0.43)	Ø .017 (0.43)
						

J	T1	T20	T38	U
Ø .017 (0.43)	Ø .019 (0.48)	Ø .019 (0.48)	Ø .038 (0.97)	Ø .019 (0.48)
				

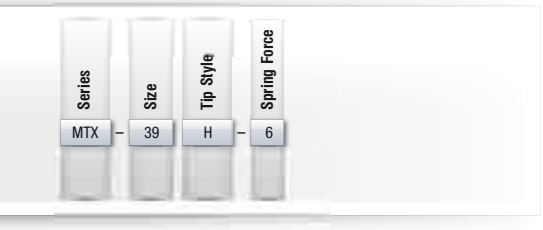
Termination Example



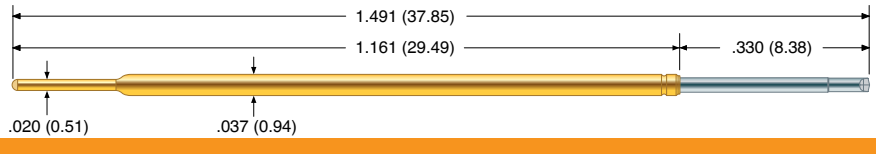
Metrix™

Metrix Summary

- Unified receptacles across all test center spacing
- Large variety of tips and receptacles
- Proprietary LFRE plunger platting
- Bias ball design

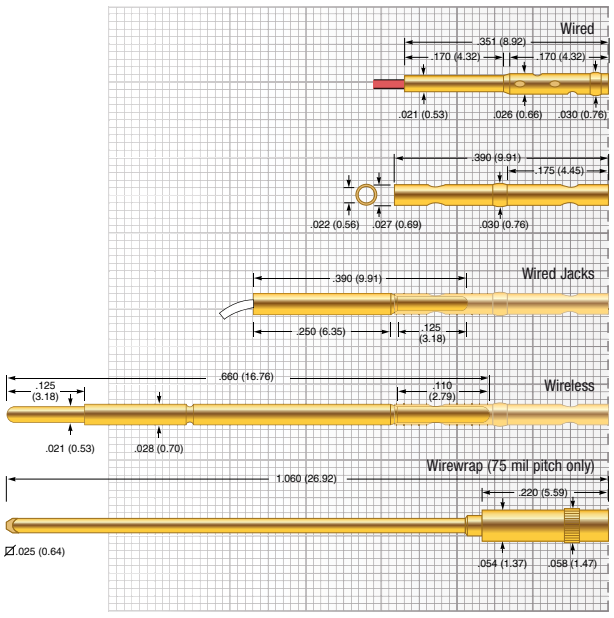


Dimensions in inches (millimeters). Specifications subject to change without notice.
Consult factory for other temperature requirements, and applications below -40°C.
Stocking Disclaimer: Stocking levels for part numbers listed in this catalog are subject to change.
Availability is based on current levels of usage and demand.



MTX-50

50 mil (1.27 mm)



STT-80W
(Pre-wired versions -28, -30)

HPR-40W

HPR-40T with HPR-40W

HPA-40 with HPR-40W

ECR-1W-2

Tip Style

H	I	I8	I15	I35	I40	J
Ø .047 (1.19)	Ø .022 (0.56)	Ø .020 (0.51)	Ø .021 (0.53)	Ø .022 (0.56)	Ø .022 (0.56)	Ø .022 (0.56)
						

L	L18	T	T1	T24	T30	T67
Ø .040 (1.02)	Ø .018 (0.46)	Ø .047 (1.19)	Ø .020 (0.51)	Ø .022 (0.56)	Ø .022 (0.56)	Ø .067 (1.70)
						

Z	Z1
Ø .047 (1.19)	Ø .038 (0.97)
	

Mechanical

Recommended Travel:	.167 (4.24)
Full Travel:	.250 (6.35)
Operating Temperature:	-55°C to +150°C

Spring Force in oz. (grams)

	Order Code	Preload	Rec. Travel
Standard	- 4	0.72 (20)	4.0 (113)
Alternate	- 6	2.39 (68)	6.0 (170)
Elevated	- 7	1.68 (48)	7.0 (198)
High	- 8	1.73 (49)	8.0 (227)
Ultra High	-10	2.84 (81)	10.0 (283)

Electrical (Static Conditions)

Current Rating:	6 amps
Average Probe Resistance:	<10 mOhms

Materials and Finishes

Plunger:	High performance alloy LFRE proprietary plating
Barrel:	BeCu, Gold plated over hard Nickel
Spring:	Stainless Steel
Ball:	Stainless Steel

Receptacle

Hole diameter:	Ø .028 (0.70)
Suggested drill:	#70 or 0.70 mm
Recommended wire gauge:	28-30 AWG

Material Housing

- HPR-40T: Work-hardened Nickel Silver, Gold plated over hard Nickel
- HPR-40W: Work-hardened Nickel Silver, Gold plated over hard Nickel
- STT: Work-hardened BeCu, Gold plated over hard Nickel

Metrix™

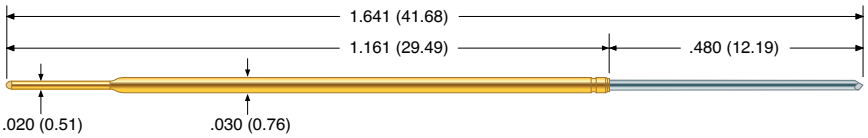
Metrix Introduction

For test center spacing below 50mil, conventional ICT Probes reach their limits. ECT Metrix Probes overcome this issue by providing test center spacing as low as 39mil. In a conventional probe/receptacle design, the pitch is limited by the largest diameter, which typically is the diameter of the receptacle. The Metrix probe has a stepped down diameter tail. This allows the probe to be plugged into a receptacle sitting underneath the probe. Now, since the probe is placed above the receptacle, it allows you to use a receptacle with the same or lesser diameter as the probe. Valuable space is saved between the two adjacent probes which now can be placed in a tighter spacing.

Dimensions in inches (millimeters). Specifications subject to change without notice.
Consult factory for other temperature requirements, and applications below -40°C.
Stocking Disclaimer: Stocking levels for part numbers listed in this catalog are subject to change.
Availability is based on current levels of usage and demand.

MXLT-39

39 mil (1.00 mm)



Mechanical

Recommended Travel:	.315 (8.00)
Full Travel:	.400 (10.16)
Operating Temperature	-55°C to +150°C

Spring Force in oz. (grams)

	Order Code	Preload	Rec. Travel
Standard	- 4.5	0.49 (14)	4.00 (113)

Electrical (Static Conditions)

Current Rating:	3 amps
Average Probe Resistance:	<15 mOhms

Materials and Finishes

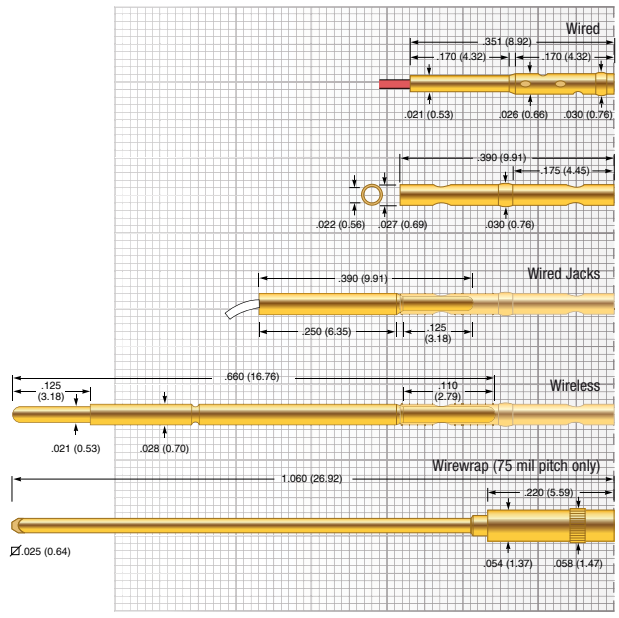
Plunger:	High performance alloy LFRE proprietary plating
Barrel:	BeCu, Gold plated over hard Nickel
Spring:	Stainless Steel
Ball:	Stainless Steel

Receptacle

Hole diameter:	Ø .028 (0.70)
Suggested drill:	#70 or 0.70 mm
Recommended wire gauge:	28-30 AWG

Material Housing

- HPR-40T: Work-hardened Nickel Silver, Gold plated over hard Nickel
- HPR-40W: Work-hardened Nickel Silver, Gold plated over hard Nickel
- STT: Work-hardened BeCu, Gold plated over hard Nickel



STT-80W
(Pre-wired versions -28, -30)

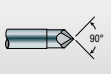
HPR-40W

HPR-40T with HPR-40W

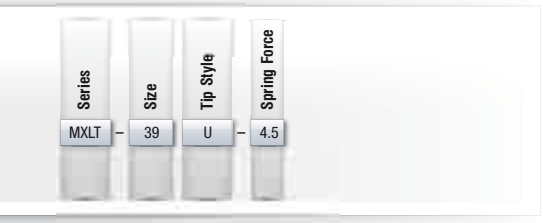
HPA-40 with HPR-40W

ECR-1W-2

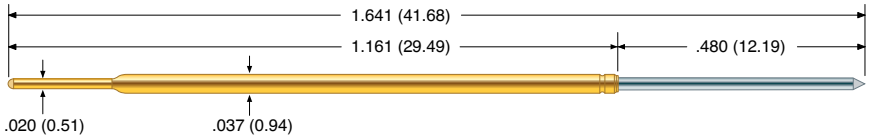
Tip Style

I8	I15	T20	U			
Ø .017 (0.43)	Ø .017 (0.43)	Ø .019 (0.48)	Ø .019 (0.48)			
						

Metrix™

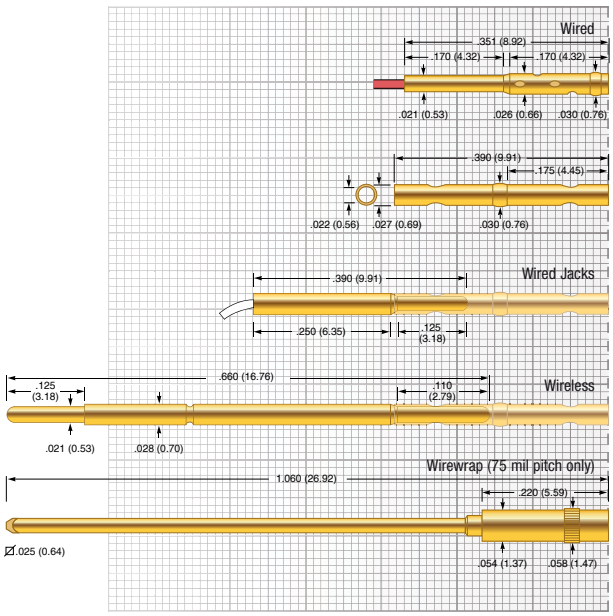


Dimensions in inches (millimeters). Specifications subject to change without notice.
Consult factory for other temperature requirements, and applications below -40°C.
Stocking Disclaimer: Stocking levels for part numbers listed in this catalog are subject to change.
Availability is based on current levels of usage and demand.



MXLT-50

50 mil (1.27 mm)



STT-80W
(Pre-wired versions -28, -30)

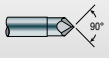
HPR-40W

HPR-40T with HPR-40W

HPA-40 with HPR-40W

ECR-1W-2

Tip Style

B	I8	I15	L	L24	T	T24
Ø .022 (0.56)	Ø .020 (0.51)	Ø .020 (0.51)	Ø .040 (1.02)	Ø .022 (0.56)	Ø .047 (1.19)	Ø .022 (0.56)
						

T30
Ø .022 (0.56)


Mechanical

Recommended Travel:	.315 (8.00)
Full Travel:	
• Standard Spring:	.400 (10.16)
• Alternate Spring:	.350 (8.89)
• High Spring:	.350 (8.89)
Operating Temperature:	-55°C to +105°C

Spring Force in oz. (grams)

	Order Code	Preload	Rec. Travel
Standard	- 4.5	1.09 (31)	4.5 (128)
Alternate	- 7	0.75 (21)	7.0 (198)
High	- 9.6	1.50 (43)	9.6 (272)

Electrical (Static Conditions)

Current Rating:	6 amps
Average Probe Resistance:	<10 mOhms

Materials and Finishes

Plunger:	High performance alloy LFRE proprietary plating
Barrel:	BeCu, Gold plated over hard Nickel
Spring	
Standard:	Music Wire
Alternate:	Music Wire
High:	Music Wire
Ball:	Stainless Steel

Receptacle

Hole diameter:	Ø .028 (0.70)
Suggested drill:	#70 or 0.70 mm
Recommended wire gauge:	28-30 AWG
Material Housing	
• HPR-40T:	Work-hardened Nickel Silver, Gold plated over hard Nickel
• HPR-40W:	Work-hardened Nickel Silver, Gold plated over hard Nickel
• STT:	Work-hardened BeCu, Gold plated over hard Nickel

Metrix™

Dimensions in inches (millimeters). Specifications subject to change without notice.
Consult factory for other temperature requirements, and applications below -40°C.
Stocking Disclaimer: Stocking levels for part numbers listed in this catalog are subject to change.
Availability is based on current levels of usage and demand.

ECT LFRE: Cleaner Probes, Cleaner Environment

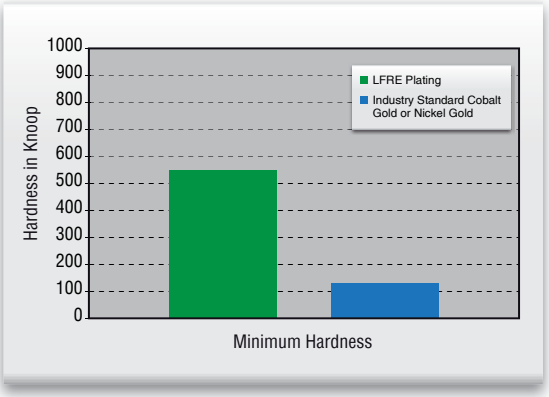
The Lead Free Challenge

Lead free solder can cause many problems during PCBA test. Lead free solder has a higher reflow temperature which can result in harder and stickier solder flux resin and a thicker, harder oxide layer. This thicker layer of resin and oxide is more difficult to penetrate and increases wear on the pogo pin. Lead free solder resin and oxides can also increase debris transfer to spring probes. These are many of the issues found in OSP and No-Clean applications. ECT's LFRE series of test probes were specifically designed to solve these challenges.

ECT Lead Free POGO® Series

ECT's LFRE probe line incorporates a number of features that will significantly reduce the issues that arise when switching to lead free solder as well as those contact issues that arise with OSP and No-Clean solder flux.

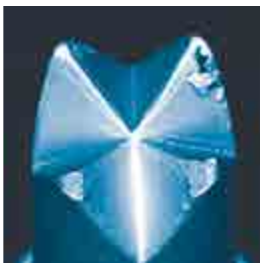
- **LFRE Plating**
  Our Lead Free probe incorporates a harder and slicker plating that not only resists wear but also reduces solder and debris transfer.
- **Higher Preload**
  All of our LFRE probes incorporate higher preloads. Higher preload reduces spring force variation with board flex and increases the initial impact penetration, resulting in higher first pass yields.
- **PogoPlus® Bias Ball Design**
  The PogoPlus internal bias ball design guarantees uninterrupted electrical contact with the probe sidewall virtually eliminating probe-related false opens.
- **Pointing Accuracy**
  ECT's LFRE and POGO probes incorporate a double roll close, which offers the industry's best pointing accuracy. Increased pointing accuracy means the probe is less likely to touch the edge of the pad where the solder flux accumulates, a great benefit when using Lead Free solder and/or No-Clean.



LFRE Plating vs. the Industry Standard Plating

The industry standard for plated POGO pins is gold electroplate alloyed either with cobalt or nickel to enhance its hardness. Hardness is increased from 90 Knoop for 99.7 % pure electroplated gold to 130 to 200 Knoop when alloyed with nickel or cobalt. ECT's LFRE plating is significantly harder than the industry's standard gold plating. Our new proprietary plating has a hardness range of 550 to 650 Knoop. This makes the probe tips more durable and less susceptible to solder and material transfer.

Plating



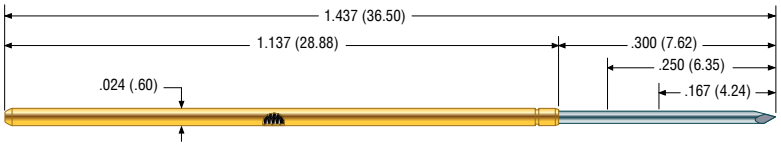
Industry Standard Gold

LFRE Plating

Contaminant Transfer

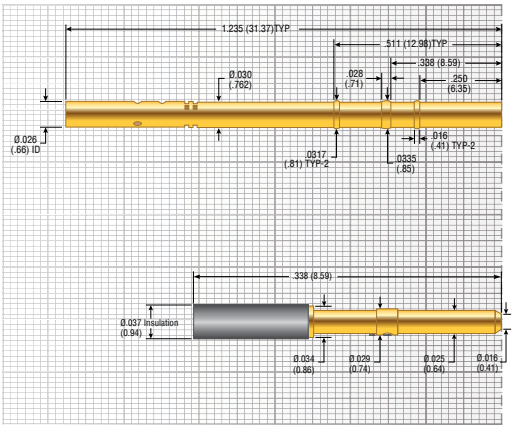
Industry Standard Gold

LFRE Plating



LFRE-39

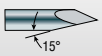
39 mil (1.0 mm)



SPR-39W-S

SPT-39T
Wire Jack

Tip Style (ADDITIONAL TIPS AVAILABLE)

H	I	I15	L15	T15		
Ø .028 (.711)	Ø .015 (0.38)	Ø .015 (0.38)	Ø .015 (0.38)	Ø .015 (0.38)		
						

Mechanical

Recommended Travel:	.167 (4.24)
Full Travel:	.250 (6.35)
Mechanical Life*:	50,000 cycles
Operating Temperature:	-55°C to +150°C

Spring Force in oz. (grams)

	Order Code	Preload	Rec. Travel
Standard	- 5.4	0.62 (18)	5.4 (153)

Electrical (Static Conditions)

Current Rating:	2 amps
Average Probe Resistance:	<50 mOhms average

Materials and Finishes

Plunger:	High performance alloy LFRE proprietary plating
Barrel:	Nickel Silver, Gold plated
Spring:	Stainless Steel

Receptacle

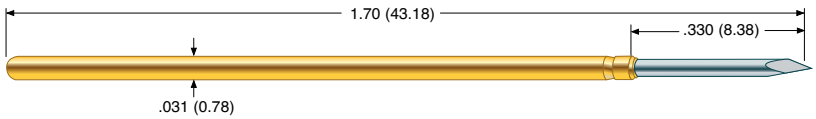
Hole diameter:	Ø .0307 to .0317 (.77 to .80)
Suggested drill:	1/32" or .8 mm
SPR Housing:	Work-hardened BeCu, Gold plated over hard Nickel
SPT Housing:	Work-hardened Brass, Gold plated over hard Nickel with nylon insulator

* Life specifications are based on lab results but are dependent on cleaning frequency and the specific customer application, including DUT materials, handler kit, maintenance, etc.

Dimensions in inches (millimeters). Specifications subject to change without notice.
Consult factory for other temperature requirements, and applications below -40°C.
Stocking Disclaimer: Stocking levels for part numbers listed in this catalog are subject to change.
Availability is based on current levels of usage and demand.

LFRE-72

50 mil (1.27 mm)



Mechanical

Recommended Travel:	.167 (4.24)
Full Travel:	.250 (6.35)
Operating Temperature:	-55°C to 150°C

Spring Force in oz. (grams)

	Order Code	Preload	Rec. Travel
Light	- 2	0.60 (17)	2.0 (57)
Standard	- 4	1.53 (43)	4.0 (113)
Alternate	- 6	2.14 (61)	6.0 (170)
Elevated	- 7	2.67 (76)	7.0 (198)
High	- 8	3.12 (88)	8.0 (227)
Ultra High	-10	3.83 (109)	10.0 (283)

Electrical (Static Conditions)

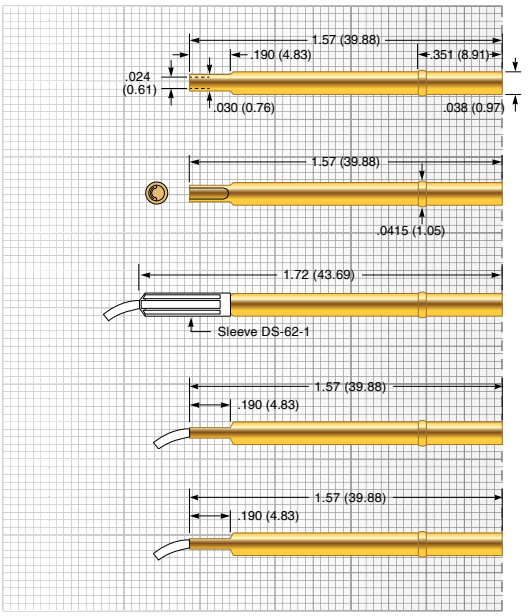
Current Rating:	3 amps
Average Probe Resistance:	<15 mOhms

Materials and Finishes

Plunger:	High performance alloy LFRE proprietary plating
Barrel:	Work hardened BeCu, Gold plated over hard Nickel
Spring:	Stainless Steel
Ball:	Stainless Steel

Receptacle

Hole diameter:	Ø .039 (0.99)
Suggested drill:	#61 or 0.99 mm
Material Housing:	Hardened BeCu, Gold plated



HPR-72W

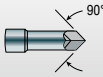
HPR-72W-1

HPR-72W-4
FASTITE® Insertion

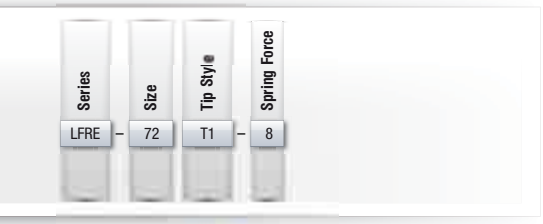
HPR-72W-28

HPR-72W-30

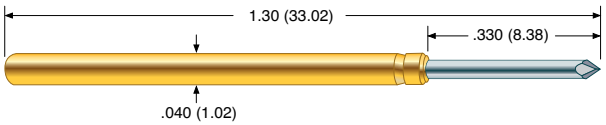
Tip Style (ADDITIONAL TIPS AVAILABLE)

H	I	I8	I15	I40	J	T1
Ø .035 (0.89)	Ø .017 (0.43)	Ø .017 (0.43)	Ø .017 (0.43)	Ø .017 (0.43)	Ø .020 (0.51)	Ø .019 (0.48)
						

T20	T38	U
Ø .019 (0.48)	Ø .038 (0.97)	Ø .019 (0.48)
		

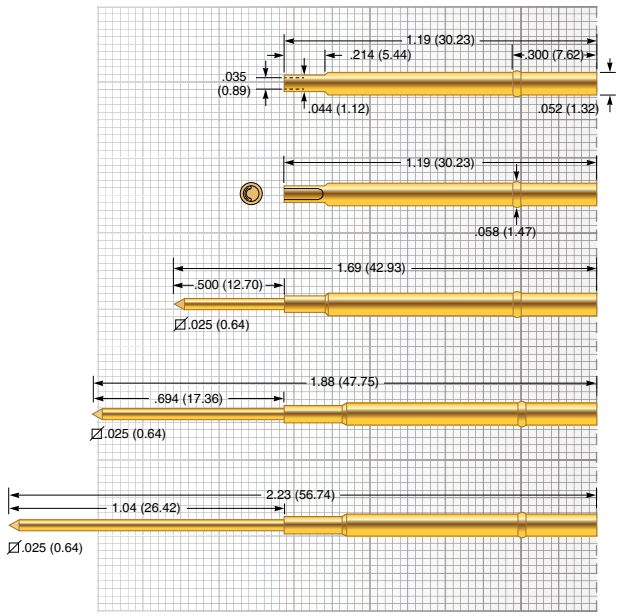


Dimensions in inches (millimeters). Specifications subject to change without notice.
Consult factory for other temperature requirements, and applications below -40°C.
Stocking Disclaimer: Stocking levels for part numbers listed in this catalog are subject to change.
Availability is based on current levels of usage and demand.



LFRE-1

75 mil (1.91 mm)



LTR-1W

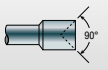
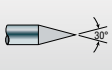
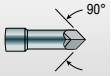
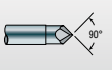
LTR-1W-1

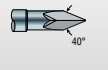
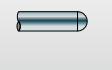
LTR-1W-2
ELTR-1W-2

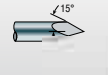
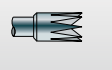
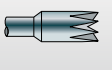
LTR-1W-2L
ELTR-1W-2L

LTR-1W-2LL
ELTR-1W-2LL

Tip Style (ADDITIONAL TIPS AVAILABLE)

A	B	H	I	I8	I15	I35
Ø .047 (1.19)	Ø .022 (0.56)	Ø .047 (1.19)	Ø .021 (0.51)	Ø .020 (0.51)	Ø .021 (0.53)	Ø .022 (0.56)
						

I40	J	L	L18	L24	T	T1
Ø .021 (0.53)	Ø .022 (0.56)	Ø .033 (0.84)	Ø .018 (0.46)	Ø .022 (0.56)	Ø .047 (1.19)	Ø .022 (0.56)
						

T24	T30	UN	V	Z	Z1
Ø .022 (0.56)	Ø .022 (0.56)	Ø .021 (0.53)	Ø .047 (1.19)	Ø .047 (1.19)	Ø .038 (0.97)
					

Mechanical

Recommended Travel:	.167 (4.24)
Full Travel:	.250 (6.35)
Operating Temperature:	-55°C to +150°C

Spring Force in oz. (grams)

	Order Code	Preload	Rec. Travel
Light	- 2	0.83 (24)	2.0 (57)
Standard	- 4	0.62 (18)	4.0 (113)
Alternate	- 6	2.39 (68)	6.0 (170)
Elevated	- 7	1.68 (48)	7.0 (198)
High	- 8	1.73 (49)	8.0 (227)
Ultra High	-10	2.84 (81)	10.0 (283)

Electrical (Static Conditions)

Current Rating:	6 amps
Average Probe Resistance:	<10 mOhms

Materials and Finishes

Plunger:	High performance alloy LFRE proprietary plating
Barrel:	Work hardened Phosphor Bronze, Gold plated over hard Nickel
Spring:	Stainless Steel
Ball:	Stainless Steel

Receptacle

Hole diameter:	Ø .053 to .055 (1.35 to 1.40)
Suggested drill:	#54 or 1.40 mm

Material

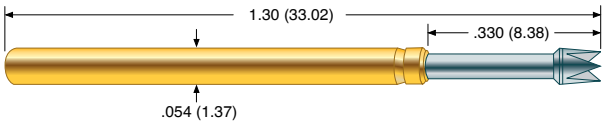
- LTR Housing: Work-hardened Nickel Silver, Gold plated over hard Nickel
- ELTR Housing: Work-hardened Nickel Silver, unplated

Post: Phosphorous Bronze, Gold plated

Dimensions in inches (millimeters). Specifications subject to change without notice.
Consult factory for other temperature requirements, and applications below -40°C.
Stocking Disclaimer: Stocking levels for part numbers listed in this catalog are subject to change.
Availability is based on current levels of usage and demand.

LFRE-25

100 mil (2.54 mm)



Mechanical

Recommended Travel:	.167 (4.24)
Full Travel:	.250 (6.35)
Operating Temperature:	-55°C to +150°C

Spring Force in oz. (grams)

	Order Code	Preload	Rec. Travel
Light	- 2	0.75 (21)	2.0 (57)
Standard	- 4	1.50 (43)	4.0 (113)
Alternate	- 6	2.58 (73)	6.0 (170)
Elevated	- 6.5	2.65 (75)	6.5 (184)
High	- 8	2.84 (81)	8.0 (227)
Ultra High	-10	1.77 (50)	10.0 (283)
Premium	-12	4.49 (127)	12.0 (340)
Super	-16	3.90 (111)	16.0 (454)

Electrical (Static Conditions)

Current Rating:	8 amps
Average Probe Resistance:	<8 mOhms

Materials and Finishes

Plunger:	High performance alloy LFRE proprietary plating
Barrel:	Work hardened Phosphor Bronze, Gold plated over hard Nickel
Spring:	Stainless Steel
Ball:	Stainless Steel

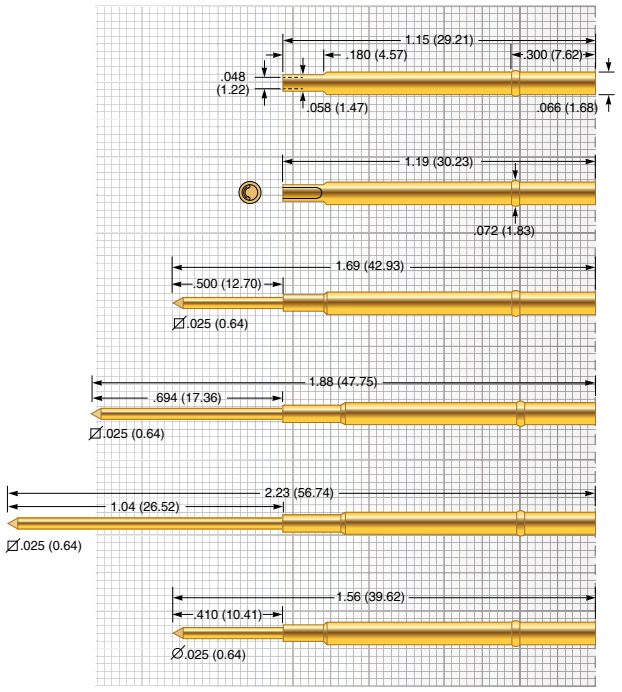
Receptacle

Hole diameter:	Ø .067 to .069 (1.70 to 1.75)
Suggested drill:	#51 or 1.75 mm

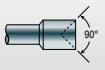
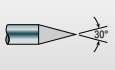
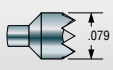
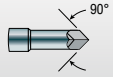
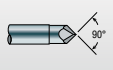
Material

- SPR Housing: Work-hardened Nickel Silver, Gold plated over hard Nickel
- EPR Housing: Nickel Silver, unplated

Post: Phosphorous Bronze, Gold plated

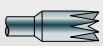


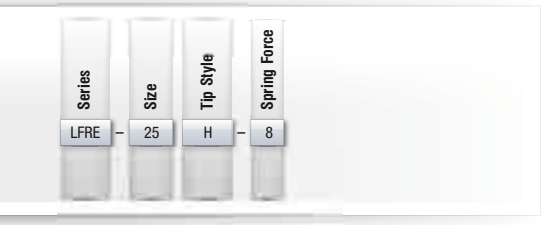
Tip Style (ADDITIONAL TIPS AVAILABLE)

A	B	H	H79	I	I8	I15
Ø .060 (1.52)	Ø .034 (0.86)	Ø .060 (1.52)	Ø .079 (2.01)	Ø .033 (0.84)	Ø .033 (0.84)	Ø .033 (0.84)
						

I35	I40	J	L	L18	L36	T
Ø .034 (0.86)	Ø .033 (0.84)	Ø .025 (0.64)	Ø .050 (1.27)	Ø .018 (0.46)	Ø .034 (0.86)	Ø .060 (1.52)
						

T1	T30	T36	T79	UN	V	Z
Ø .030 (0.74)	Ø .034 (0.86)	Ø .034 (0.86)	Ø .079 (2.01)	Ø .025 (0.64)	Ø .055 (1.40)	Ø .060 (1.52)
						

Z1
Ø .051 (1.30)




Dimensions in inches (millimeters). Specifications subject to change without notice.
Consult factory for other temperature requirements, and applications below -40°C.
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Availability is based on current levels of usage and demand.

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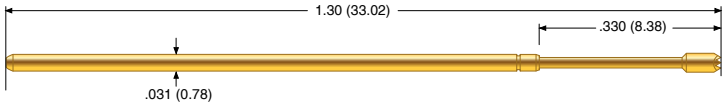
POGO-62

50 mil (1.27 mm)



Mechanical

Recommended Travel:	.167 (4.24)
Full Travel:	.250 (6.35)
Operating Temperature:	
• Light Spring:	-55°C to +105°C
• Standard Spring:	-55°C to +105°C
• Alternate Spring:	-55°C to +150°C

Spring Force in oz. (grams)

	Order Code	Preload	Rec. Travel
Light	- 2	0.48 (14)	2.0 (57)
Standard	- 4	1.02 (29)	4.0 (113)
Alternate	- 6	2.15 (61)	6.0 (170)

Electrical (Static Conditions)

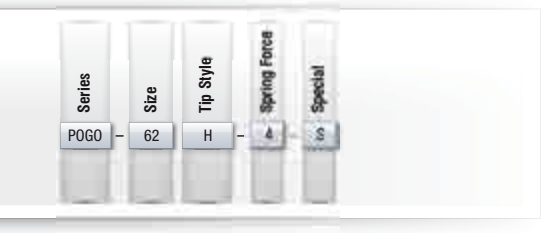
Current Rating:	3 amps
Average Probe Resistance:	<15 mOhms

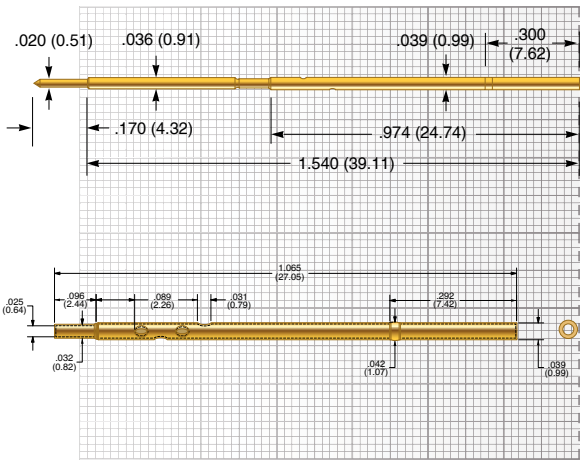
Materials and Finishes

Plunger:	Heat-treated tool Steel, Gold plated over hard Nickel
Barrel:	Work-hardened BeCu, Gold plated over hard Nickel
Spring:	
• Light:	Music Wire
• Standard:	Music Wire
• Alternate:	Stainless Steel
Ball:	Stainless Steel

Receptacle (DER-050)

Hole diameter:	Ø .038 to .039 (0.97 to 0.99)
Suggested drill:	#61 or 0.99 mm
Recommended Travel:	.130 (3.30)
Full Travel:	.160 (4.06)
Spring Force:	3.5 oz. (99 grams)
Material	
• Plunger:	BeCu, Gold plated over hard Nickel
• Barrel:	BeCu, Gold plated over hard Nickel
• Spring:	Steel alloy, Gold plated over hard Nickel





DER-050

HPR-62W-SS

Tip Style (ADDITIONAL TIPS AVAILABLE)

H...-S	I8...-S	J...-S	T1...-S	T20...-S	T38...-S	U...-S
Ø .035 (0.89)	Ø .017 (0.43)	Ø .020 (0.51)	Ø .019 (0.48)	Ø .019 (0.48)	Ø .038 (0.97)	Ø .019 (0.48)
						

PogoPlus Bias Ball Design

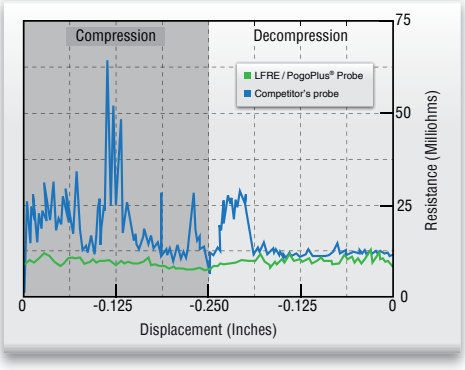
The PogoPlus internal bias ball design guarantees uninterrupted electrical contact with the probe sidewall virtually eliminating probe related false opens.

PogoPlus Bias Design

The enhanced bias-ball design forces contact between plunger and barrel wall at all times, virtually eliminating probe-related false opens.

Conventional Bias Design

Angle of spring coil end matches biased plunger end, compromising bias force and electrical contact



Benefit

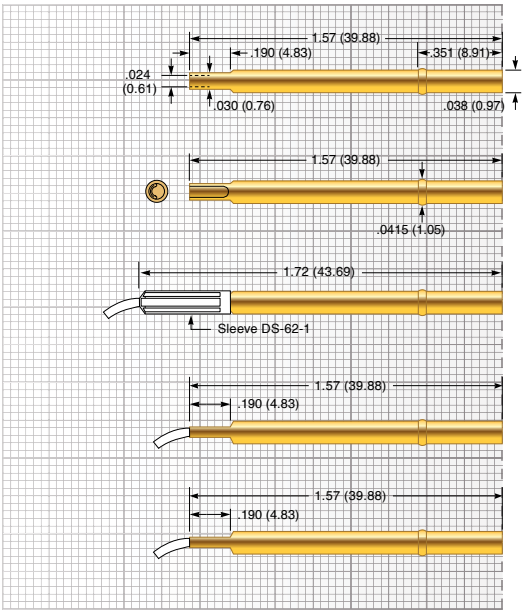
Resistance performance comparison of a PogoPlus® bias design to a conventional bias design, during the full compression / decompression cycle of the probe.

The resistance vs. displacement graph shows the LFRE / POGO® probe has a more consistent resistivity performance resulting in significantly fewer probe false opens and tighter control of the test process.

Dimensions in inches (millimeters). Specifications subject to change without notice.
Consult factory for other temperature requirements, and applications below -40°C.
Stocking Disclaimer: Stocking levels for part numbers listed in this catalog are subject to change.
Availability is based on current levels of usage and demand.

POGO-72

50 mil (1.27 mm)



HPR-72W
Crimp

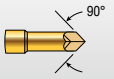
HPR-72W-1
Solder Cup

HPR-72W-4
FASTITE® Insertion

HPR-72W-28

HPR-72W-30

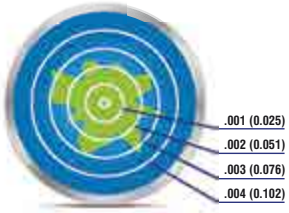
Tip Style (ADDITIONAL TIPS AVAILABLE)

H	I...-S	I8...-S	J	T1...-S	T20...-S	T38...-S
Ø .035 (0.89)	Ø .017 (0.43)	Ø .017 (0.43)	Ø .020 (0.51)	Ø .019 (0.48)	Ø .019 (0.48)	Ø .038 (0.97)
						

U
Ø .019 (0.48)


Tighter Pointing Tolerances

ECT Pogo contacts deliver superior pointing accuracy demonstrated by test results measuring sideload TIR.



Mechanical

Recommended Travel:	.167 (4.24)
Full Travel:	.250 (6.35)

Spring Force in oz. (grams)

	Order Code	Preload	Rec. Travel
Light	- 2	0.60 (17)	2.0 (57)
Standard	- 4	1.53 (43)	4.0 (113)
Alternate	- 6	2.14 (61)	6.0 (170)
Elevated	- 7	2.67 (76)	7.0 (198)
High	- 8	3.12 (89)	8.0 (227)
Ultra High	-10	3.38 (109)	10.0 (283)

Electrical (Static Conditions)

Current Rating:	3 amps
Average Probe Resistance:	<15 mOhms

Materials and Finishes

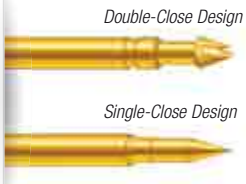
Plunger:	Heat-treated tool Steel or BeCu, Gold plated over hard Nickel
Barrel:	Work hardened BeCu, Gold plated over hard Nickel
Spring:	Stainless Steel
Ball:	Stainless Steel

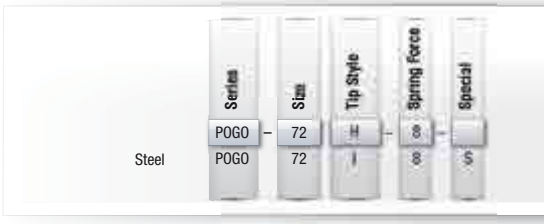
Receptacle

Hole diameter:	Ø .039 (0.99)
Suggested drill:	#61 or 0.99 mm
Material Housing:	Hardened BeCu, Gold plated

Double-Close Design

Conventional single-close probes provide marginal pointing accuracy. The double-close design of the LFRE / PogoPlus probe constrains the plunger to a tighter range of vertical motion for more accurate pointing precision.

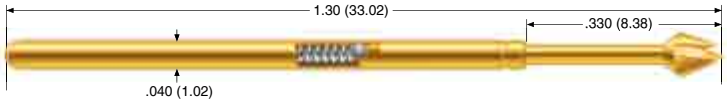




Dimensions in inches (millimeters). Specifications subject to change without notice.
Consult factory for other temperature requirements, and applications below -40°C.
Stocking Disclaimer: Stocking levels for part numbers listed in this catalog are subject to change.
Availability is based on current levels of usage and demand.

POGO-1

75 mil (1.91 mm)



Mechanical

Recommended Travel:	.167 (4.24)
Full Travel:	.250 (6.35)
Operating Temperature:	-55°C to +150°C

Spring Force in oz. (grams)

	Order Code	Preload	Rec. Travel
Light	- 2	0.83 (24)	2.0 (57)
Standard	- 4	0.62 (18)	4.0 (113)
Alternate	- 6	2.39 (68)	6.0 (170)
Elevated	- 7	1.68 (48)	7.0 (198)
High	- 8	1.73 (49)	8.0 (227)
Ultra High	-10	2.84 (81)	10.0 (283)

Electrical (Static Conditions)

Current Rating:	6 amps
Average Probe Resistance:	<10 mOhms

Materials and Finishes

Plunger:	Heat-treated tool Steel or BeCu, Gold plated over hard Nickel
Barrel:	Work hardened Phosphor Bronze, Gold plated over hard Nickel
Spring:	Stainless Steel
Ball:	Stainless Steel

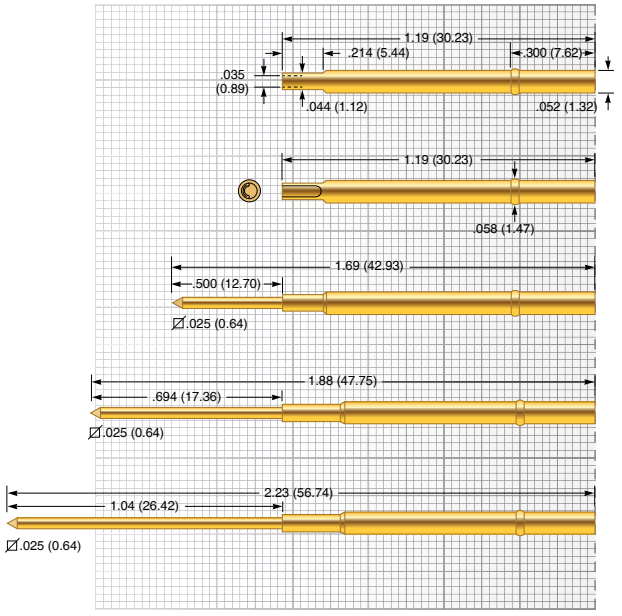
Receptacle

Hole diameter:	Ø .053 to .055 (1.35 to 1.40)
Suggested drill:	#54 or 1.40 mm

Material

- LTR Housing: Work-hardened Nickel Silver, Gold plated over hard Nickel
- ELTR Housing: Work-hardened Nickel Silver, unplated

Post: Phosphorous Bronze, Gold plated



LTR-1W

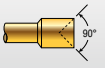
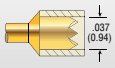
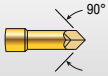
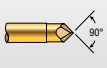
LTR-1W-1

LTR-1W-2
ELTR-1W-2

LTR-1W-2L
ELTR-1W-2L

LTR-1W-2LL
ELTR-1W-2LL

Tip Style (ADDITIONAL TIPS AVAILABLE)

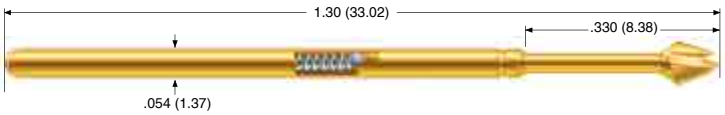
A	B...-S	H	H-INS	I...-S	I8...-S	I35...-S
Ø .047 (1.19)	Ø .022 (0.56)	Ø .047 (1.19)	Ø .060 (1.52)	Ø .020 (0.51)	Ø .020 (0.51)	Ø .022 (0.56)
						

J	L	L18	L24	P	T	T1...-S
Ø .022 (0.56)	Ø .033 (0.84)	Ø .018 (0.46)	Ø .022 (0.56)	Ø .047 (1.19)	Ø .047 (1.19)	Ø .020 (0.51)
						

T24...-S	T30...-S	UN	V	Z	Z1
Ø .022 (0.56)	Ø .022 (0.56)	Ø .021 (0.53)	Ø .047 (1.19)	Ø .047 (1.19)	Ø .038 (0.97)
					

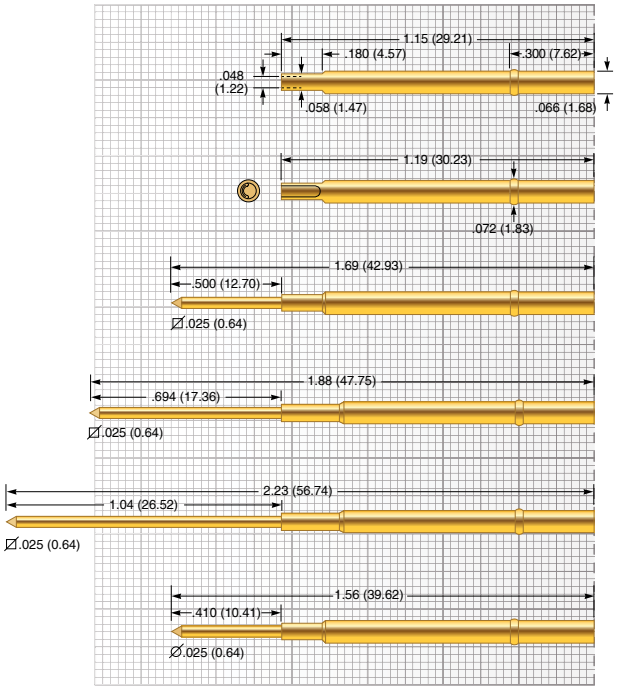
Pogo Plus®

Dimensions in inches (millimeters). Specifications subject to change without notice.
Consult factory for other temperature requirements, and applications below -40°C.
Stocking Disclaimer: Stocking levels for part numbers listed in this catalog are subject to change.
Availability is based on current levels of usage and demand.



POGO-25

100 mil (2.54 mm)



SPR-25W

SPR-25W-1

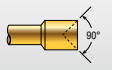
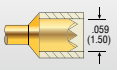
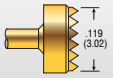
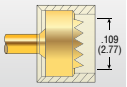
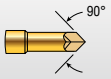
SPR-25W-2
EPR-25W-2

SPR-25W-2L
EPR-25W-2L

SPR-25W-2LL
EPR-25W-2LL

SPR-25W-3

Tip Style (ADDITIONAL TIPS AVAILABLE)

A	B...-S	H	H-INS	HM	HM-INS	I...-S
Ø .060 (1.52)	Ø .034 (0.86)	Ø .060 (1.52)	Ø .085 (2.16)	Ø .122 (3.10)	Ø .140 (3.56)	Ø .033 (0.84)
						

I8...-S	I15...-S	I35...-S	J	L	L18	L36
Ø .033 (0.84)	Ø .033 (0.84)	Ø .034 (0.86)	Ø .025 (0.64)	Ø .050 (1.27)	Ø .018 (0.46)	Ø .034 (0.86)
						

T	T10...-S	T1...-S	T30...-S	T36...-S	UN	V
Ø .060 (1.52)	Ø .034 (0.86)	Ø .030 (0.74)	Ø .034 (0.86)	Ø .034 (0.86)	Ø .025 (0.64)	Ø .055 (1.40)
						

Z	Z1
Ø .060 (1.52)	Ø .051 (1.30)
	

Pogo Plus®

Mechanical

Recommended Travel:	.167 (4.24)
Full Travel:	.250 (6.35)
Operating Temperature	-55°C to +150°C

Spring Force in oz. (grams)

	Order Code	Preload	Rec. Travel
Light	- 2	0.75 (21)	2.0 (57)
Standard	- 4	1.50 (43)	4.0 (113)
Alternate	- 6	2.58 (73)	6.0 (170)
Elevated	- 6.5	2.65 (75)	6.5 (184)
High	- 8	2.84 (81)	8.0 (227)
Ultra High	-10	1.77 (50)	10.0 (283)
Super	-16	3.93 (111)	16.0 (455)

Electrical (Static Conditions)

Current Rating:	8 amps
Average Probe Resistance:	<8 mOhms

Materials and Finishes

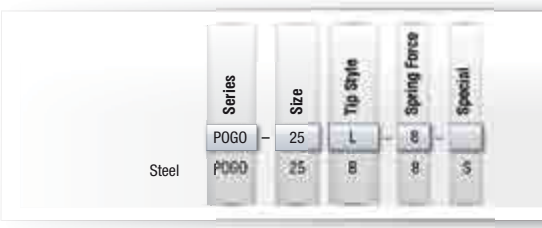
Plunger:	Heat-treated tool Steel or BeCu, Gold plated over hard Nickel
Barrel:	Work hardened Phosphor Bronze, Gold plated over hard Nickel
Spring:	Stainless Steel
Ball:	Stainless Steel

Receptacle

Hole diameter:	Ø .067 to .069 (1.70 to 1.75)
Suggested drill:	#51 or 1.75 mm

Material
- SPR Housing: Work-hardened Nickel Silver, Gold plated over hard Nickel
- EPR Housing: Nickel Silver, unplated

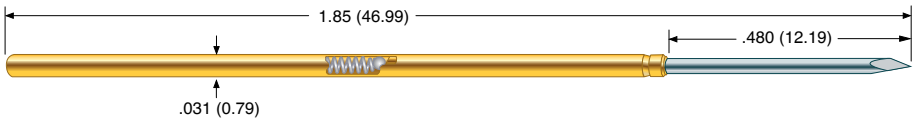
Post: Phosphorous Bronze, Gold plated



Dimensions in inches (millimeters). Specifications subject to change without notice.
Consult factory for other temperature requirements, and applications below -40°C.
Stocking Disclaimer: Stocking levels for part numbers listed in this catalog are subject to change.
Availability is based on current levels of usage and demand.

LFLT-72

50 mil (1.27 mm)



Mechanical

Recommended Travel:	.317 (8.05)
Full Travel:	
• Alternate Spring:	.400 (10.16)
• High Spring:	.350 (8.89)
Operating Temperature:	-55°C to +150°C

Spring Force in oz. (grams)

	Order Code	Preload	Rec. Travel
Alternate	- 6	1.85 (52)	6.0 (170)
High	- 9	1.90 (54)	9.0 (255)

Electrical (Static Conditions)

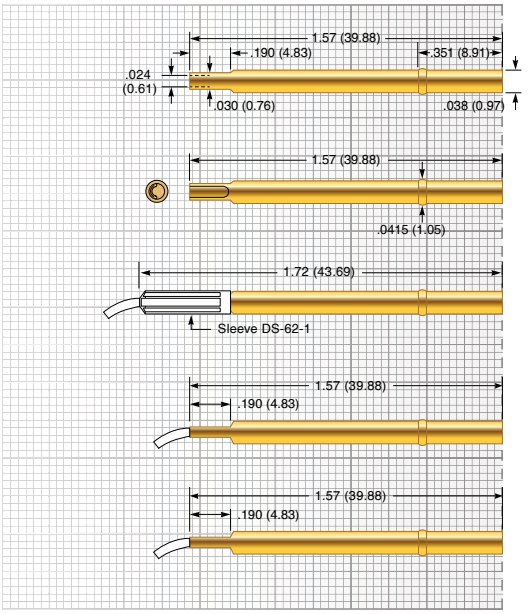
Current Rating:	6 amps
Average Probe Resistance:	<100 mOhms

Materials and Finishes

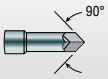
Plunger:	High performance alloy LFRE proprietary plating
Barrel:	Heat treated BeCu, Gold plated over hard Nickel
Spring:	Stainless Steel
Ball:	Stainless Steel

Receptacle

Hole diameter:	Ø .039 (0.99)
Suggested drill:	#61 or 0.99 mm
Material Housing:	Hardened BeCu, Gold plated



Tip Style (ADDITIONAL TIPS AVAILABLE)

H	I	I40	T38	U		
Ø .035 (0.89)	Ø .017 (0.43)	Ø .017 (0.43)	Ø .038 (0.97)	Ø .019 (0.48)		
						

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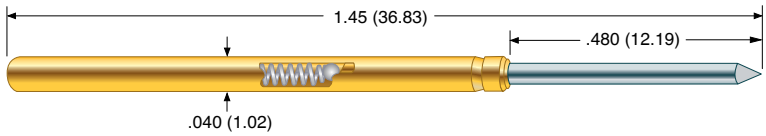
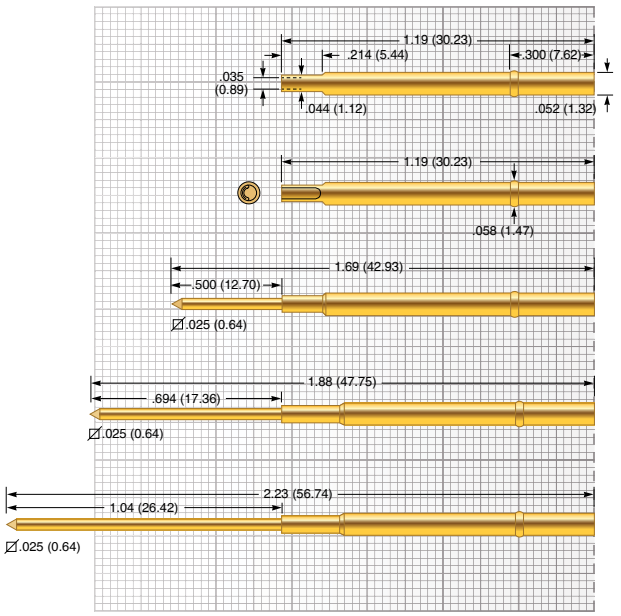
Dimensions in inches (millimeters). Specifications subject to change without notice.
Consult factory for other temperature requirements, and applications below -40°C.
Stocking Disclaimer: Stocking levels for part numbers listed in this catalog are subject to change.
Availability is based on current levels of usage and demand.



LFLT-1

75 mil (1.91 mm)



LTR-1W

LTR-1W-1

LTR-1W-2
ELTR-1W-2

LTR-1W-2L
ELTR-1W-2L

LTR-1W-2LL
ELTR-1W-2LL

Tip Style (ADDITIONAL TIPS AVAILABLE)

H	I15	I40	L	T		
Ø .047 (1.19)	Ø .021 (0.53)	Ø .021 (0.53)	Ø .033 (0.84)	Ø .047 (1.19)		
						

Mechanical

Recommended Travel:	.317 (8.05)
Full Travel:	
• Standard Spring:	.400 (10.16)
• Elevated Spring:	.350 (8.89)
• High Spring:	.350 (8.89)
Operating Temperature:	-55°C to +105°C

Spring Force in oz. (grams)

	Order Code	Preload	Rec. Travel
Standard	- 4.5	1.09 (31)	4.5 (128)
Elevated	- 7	0.75 (21)	7.0 (198)
High	- 9.6	1.51 (43)	9.6 (272)

Electrical (Static Conditions)

Current Rating:	6 amps
Average Probe Resistance:	<10 mOhms

Materials and Finishes

Plunger:	High performance alloy LFRE proprietary plating
Barrel:	Work hardened Phosphor Bronze, Gold plated over hard Nickel
Spring	
• Standard:	Music Wire
• Elevated:	Music Wire
• High:	Music Wire
Ball:	Stainless Steel

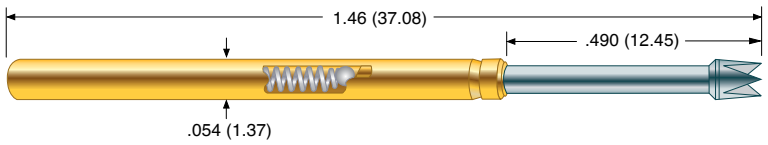
Receptacle

Hole diameter:	Ø .053 to .055 (1.35 to 1.40)
Suggested drill:	#54 or 1.40 mm
Material	
• LTR Housing:	Work-hardened Nickel Silver, Gold plated over hard Nickel
• ELTR Housing:	Work-hardened Nickel Silver, unplated
Post:	Phosphorous Bronze, Gold plated

Dimensions in inches (millimeters). Specifications subject to change without notice.
Consult factory for other temperature requirements, and applications below -40°C.
Stocking Disclaimer: Stocking levels for part numbers listed in this catalog are subject to change.
Availability is based on current levels of usage and demand.

LFLT-25

100 mil (2.54 mm)



Mechanical

Recommended Travel:	.315 (8.00)
Full Travel:	
• Standard Spring:	.400 (10.16)
• Alternate Spring:	.400 (10.16)
• High Spring:	.400 (10.16)
• Ultra High Spring:	.350 (8.89)
Operating Temperature	
• Standard Spring:	-55°C to +105°C
• Alternate Spring:	-55°C to +105°C
• High Spring:	-55°C to +105°C
• Ultra High Spring:	-55°C to +150°C

Spring Force in oz. (grams)

	Order Code	Preload	Rec. Travel
Standard	- 4	1.08 (31)	4.0 (113)
Alternate	- 6	0.99 (28)	6.0 (170)
High	- 8	0.75 (21)	8.0 (227)
Ultra High	- 9.7	1.16 (33)	9.7 (275)

Electrical (Static Conditions)

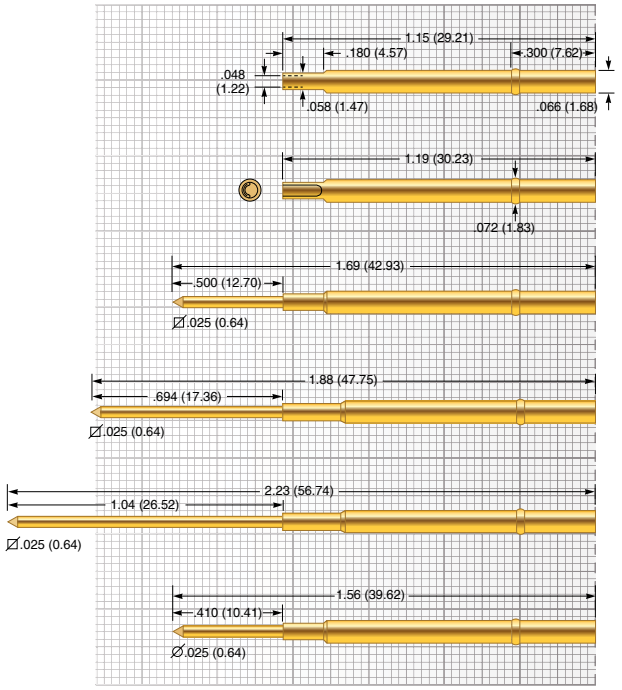
Current Rating:	8 amps
Average Probe Resistance:	<8 mOhms

Materials and Finishes

Plunger:	High performance alloy LFRE proprietary plating
Barrel:	Work hardened Phosphor Bronze, LFRE proprietary plating
Spring	
• Standard:	Music Wire
• Alternate:	Music Wire
• High:	Music Wire
• Ultra High:	Stainless Steel
Ball:	Stainless Steel

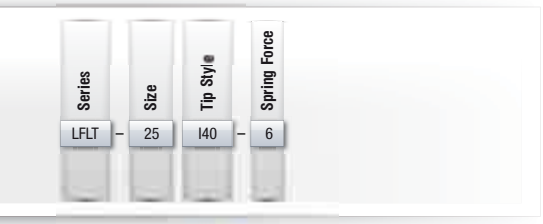
Receptacle

Hole diameter:	Ø .067 to .069 (1.70 to 1.75)
Suggested drill:	#51 or 1.75 mm
Material	
• SPR Housing:	Nickel Silver, Gold plated
• EPR Housing:	Nickel Silver, unplated
Post:	Phosphorous Bronze, Gold plated



Tip Style (ADDITIONAL TIPS AVAILABLE)

H	I15	I40	J	L	T	
H=.060(1.52)	I15=.033(0.84)	I40=.033 (0.84)	J= .034 (0.86)	L=.050 (1.27)	T=.060 (1.52)	
						



Dimensions in inches (millimeters). Specifications subject to change without notice.
Consult factory for other temperature requirements, and applications below -40°C.
Stocking Disclaimer: Stocking levels for part numbers listed in this catalog are subject to change.
Availability is based on current levels of usage and demand.

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LTP-72

50 mil (1.27 mm)

Mechanical

Recommended Travel: .317 (8.05)

Full Travel:
- Alternate Spring: .400 (10.16)
- High Spring: .350 (8.89)

Operating Temperature: -55°C to +150°C

Spring Force in oz. (grams)

	Order Code	Preload	Rec. Travel
Alternate	- 6	1.85 (52)	6.0 (170)
High	- 9	1.90 (54)	9.0 (255)

Electrical (Static Conditions)

Current Rating: 6 amps

Average Probe Resistance: <100 mOhms

Materials and Finishes

Plunger: Heat-treated tool Steel or BeCu, Gold plated over hard Nickel

Barrel: Work hardened Phosphor Bronze, Gold plated over hard Nickel

Spring: Stainless Steel

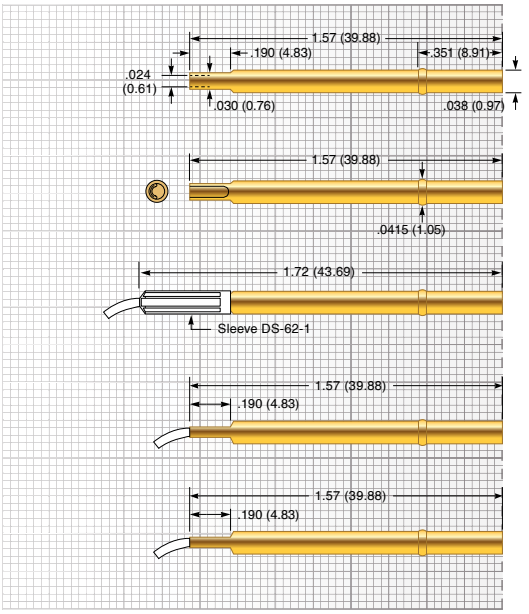
Ball: Stainless Steel

Receptacle

Hole diameter: Ø .039 (0.99)

Suggested drill: #61 or 0.99 mm

Material Housing: Work-hardened BeCu, Gold plated over hard Nickel



HPR-72W

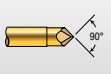
HPR-72W-1

HPR-72W-4
FASTITE® Insertion

HPR-72W-28

HPR-72W-30

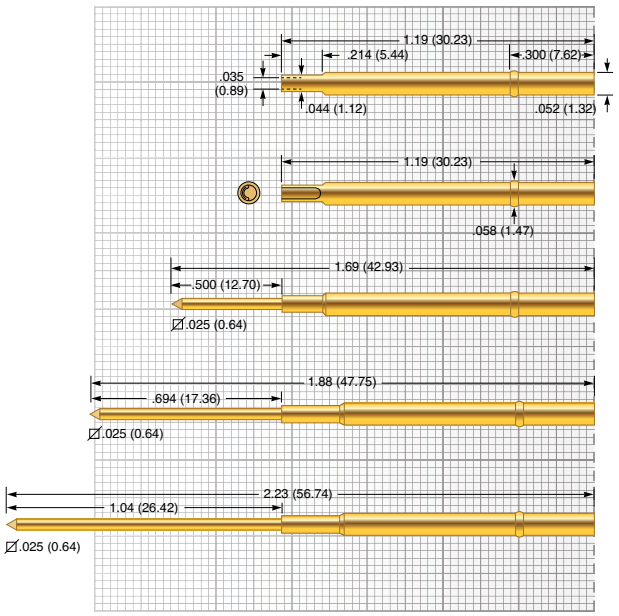
Tip Style (ADDITIONAL TIPS AVAILABLE)

I8	I15	T20	U			
Ø .017 (0.43)	Ø .017 (0.43)	Ø .019 (0.48)	Ø .019 (0.48)			
						

Dimensions in inches (millimeters). Specifications subject to change without notice.
Consult factory for other temperature requirements, and applications below -40°C.
Stocking Disclaimer: Stocking levels for part numbers listed in this catalog are subject to change.
Availability is based on current levels of usage and demand.

LTP-1

75 mil (1.91 mm)



LTR-1W

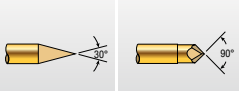
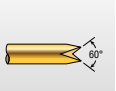
LTR-1W-1

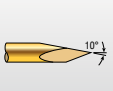
LTR-1W-2
ELTR-1W-2

LTR-1W-2L
ELTR-1W-2L

LTR-1W-2LL
ELTR-1W-2LL

Tip Style (ADDITIONAL TIPS AVAILABLE)

B	I8	I15	J	L	L24	T
Ø .022 (0.56)	Ø .020 (0.51)	Ø .020 (0.51)	Ø .022 (0.56)	Ø .033 (0.84)	Ø .022 (0.56)	Ø .047 (1.19)
						

T24	T30
Ø .022 (0.56)	Ø .022 (0.56)
	

Mechanical

Recommended Travel:	.317 (8.05)
Full Travel:	
• Standard Spring:	.400 (10.16)
• Elevated Spring:	.350 (8.89)
• High Spring:	.350 (8.89)
Operating Temperature:	-55°C to +105°C

Spring Force in oz. (grams)

	Order Code	Preload	Rec. Travel
Standard	- 4.5	1.09 (31)	4.5 (128)
Elevated	- 7	0.75 (21)	7.0 (198)
High	- 9.6	1.51 (43)	9.6 (272)

Electrical (Static Conditions)

Current Rating:	6 amps
Average Probe Resistance:	<10 mOhms

Materials and Finishes

Plunger:	Heat-treated tool Steel or BeCu, Gold plated over hard Nickel
Barrel:	Work hardened Phosphor Bronze, Gold plated over hard Nickel
Spring	
• Standard:	Music Wire
• Elevated:	Music Wire
• High:	Music Wire
Ball:	Stainless Steel

Receptacle

Hole diameter:	Ø .053 to .055 (1.35 to 1.40)
Suggested drill:	#54 or 1.40 mm
Material	
• LTR Housing:	Work-hardened Nickel Silver, Gold plated over hard Nickel
• ELTR Housing:	Work-hardened Nickel Silver, unplated
Post:	Phosphorous Bronze, Gold plated

Dimensions in inches (millimeters). Specifications subject to change without notice.
Consult factory for other temperature requirements, and applications below -40°C.
Stocking Disclaimer: Stocking levels for part numbers listed in this catalog are subject to change.
Availability is based on current levels of usage and demand.

LTP-25

100 mil (2.54 mm)

Mechanical

Recommended Travel:	.315 (8.05)
Full Travel:	
• Standard Spring:	.400 (10.16)
• Alternate Spring:	.400 (10.16)
• High Spring:	.400 (10.16)
• Ultra High Spring:	.350 (8.89)
• Only LTP-25TJ	.340 (8.60)
Operating Temperature:	
• Standard Spring:	-55°C to +105°C
• Alternate Spring:	-55°C to +105°C
• High Spring:	-55°C to +105°C
• Ultra High Spring:	-55°C to +150°C

Spring Force in oz. (grams)

	Order Code	Preload	Rec. Travel
Standard	- 4	1.08 (31)	4.0 (113)
Alternate	- 6	0.99 (28)	6.0 (170)
High	- 8	0.75 (21)	8.0 (227)
Ultra High	- 9.7	2.3 (65)	9.7 (275)

Electrical (Static Conditions)

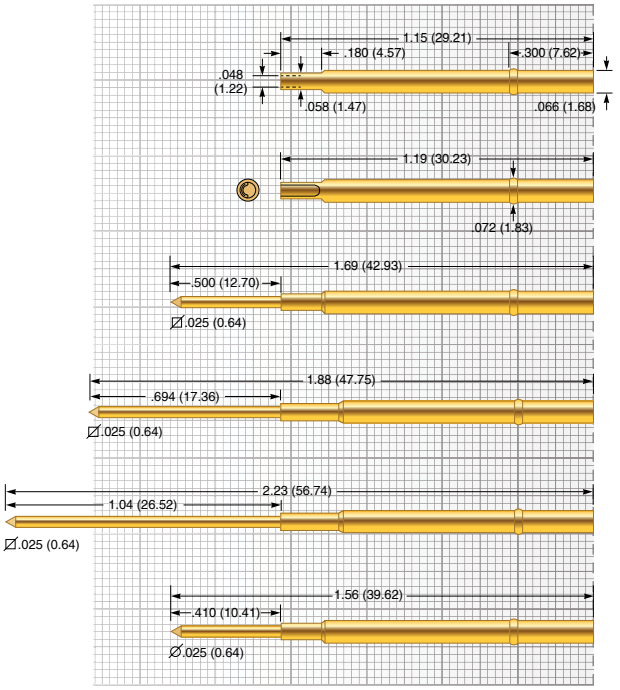
Current Rating:	8 amps
Average Probe Resistance:	<8 mOhms

Materials and Finishes

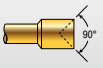
Plunger:	Heat-treated tool Steel or BeCu, Gold plated over hard Nickel
Barrel:	Work hardened Phosphor Bronze, Gold plated over hard Nickel
Spring	
• Standard:	Music Wire
• Alternate:	Music Wire
• High:	Music Wire
• Ultra High:	Stainless Steel
Ball:	Stainless Steel

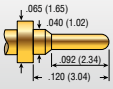
Receptacle

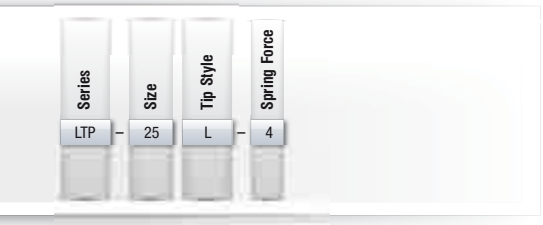
Hole diameter:	Ø .067 to .069 (1.70 to 1.75)
Suggested drill:	#51 or 1.75 mm
Material	
• SPR Housing:	Work-hardened Nickel Silver, Gold plated over hard Nickel
• EPR Housing:	Nickel Silver, unplated
Post:	Phosphorous Bronze, Gold plated



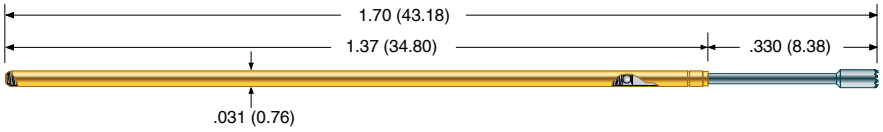
Tip Style (ADDITIONAL TIPS AVAILABLE)

A	H	I8	L	L36	T	T36
Ø .060 (1.52)	Ø .060 (1.52)	Ø .035 (0.89)	Ø .050 (1.27)	Ø .036 (0.91)	Ø .060 (1.52)	Ø .035 (0.89)
						

TJ	Z
Ø .025 (0.64)	Ø .060 (1.52)
	

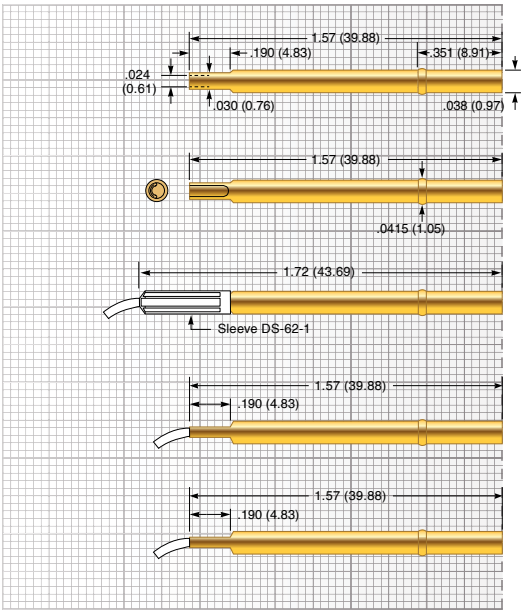


Dimensions in inches (millimeters). Specifications subject to change without notice.
Consult factory for other temperature requirements, and applications below -40°C.
Stocking Disclaimer: Stocking levels for part numbers listed in this catalog are subject to change.
Availability is based on current levels of usage and demand.



BTP-72

50 mil (1.27 mm)



HPR-72W

HPR-72W-1

HPR-72W-4
FASTITE® Insertion

HPR-72W-28

HPR-72W-30

Mechanical

Recommended Travel:	.167 (4.24)
Full Travel:	.250 (6.35)
Operating Temperature:	-55°C to +150°C

Spring Force in oz. (grams)

	Order Code	Preload	Rec. Travel
Light	- 2	0.60 (17)	2.0 (57)
Standard	- 4	1.53 (43)	4.0 (113)
Alternate	- 6	2.14 (61)	6.0 (170)
Elevated	- 7	2.67 (76)	7.0 (198)
High	- 8	3.12 (88)	8.0 (227)
Ultra High	-10	3.38 (96)	10.0 (283)

Electrical (Static Conditions)

Current Rating:	3 amps
Average Probe Resistance:	<15 mOhms

Materials and Finishes

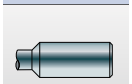
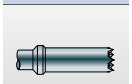
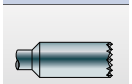
Plunger:	High performance alloy LFRE proprietary plating
Barrel:	Heat treated BeCu, Gold plated over hard Nickel
Spring:	Stainless Steel
Ball:	Stainless Steel

Receptacle

Hole diameter:	Ø .039 (0.99)
Suggested drill:	#61 or 0.99 mm

Material Housing: Hardened BeCu, Gold plated

Tip Style (ADDITIONAL TIPS AVAILABLE)

F	HC	HF				
Ø .035 (0.89)	Ø .024 (0.56)	Ø .035 (0.89)				
						

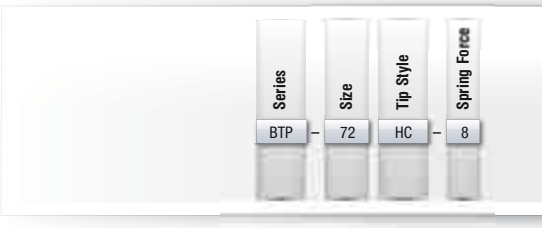
BTP SERIES Bead Target Probes

Introduction – What is Bead Probe technology?
ECT is supporting the development of the Keysight Technologies Medalist Bead Probe Technology with OEM's, contract manufacturers, and test fixture partners. Bead Probing is a methodology for placing test points directly on a PCB's copper traces, or top metal, thus forming a "Bead Probe". These Bead Probes are then contacted by "Bead Target Probes" during in-circuit testing for expanded test access.
For more information, visit Keysight website: www.keysight.com, search word bead probe. There is a flash demo on the Keysight website for your review.

Features

ECT has developed a series of probes specifically for Bead Probe applications featuring:

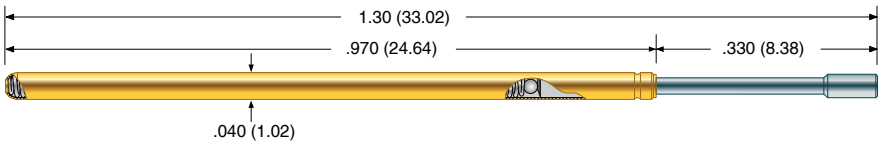
- Pogo Plus® Design
- LFRE Plating
- Flat and "Micro-Textured" Tips



Dimensions in inches (millimeters). Specifications subject to change without notice.
Consult factory for other temperature requirements, and applications below -40°C.
Stocking Disclaimer: Stocking levels for part numbers listed in this catalog are subject to change.
Availability is based on current levels of usage and demand.

BTP-1

75 mil (1.91 mm)



Mechanical

Recommended Travel:	.167 (4.24)
Full Travel:	.250 (6.35)
Operating Temperature:	-55°C to +150°C

Spring Force in oz. (grams)

	Order Code	Preload	Rec. Travel
Light	- 2	0.83 (24)	2.0 (57)
Standard	- 4	0.62 (18)	4.0 (113)
Alternate	- 6	2.39 (68)	6.0 (170)
Elevated	- 7	1.68 (48)	7.0 (198)
High	- 8	1.73 (49)	8.0 (227)

Electrical (Static Conditions)

Current Rating:	6 amps
Average Probe Resistance:	<10 mOhms

Materials and Finishes

Plunger:	High performance alloy LFRE proprietary plating
Barrel:	Work hardened Phosphor Bronze, Gold plated over hard Nickel
Spring:	Stainless Steel
Ball:	Stainless Steel

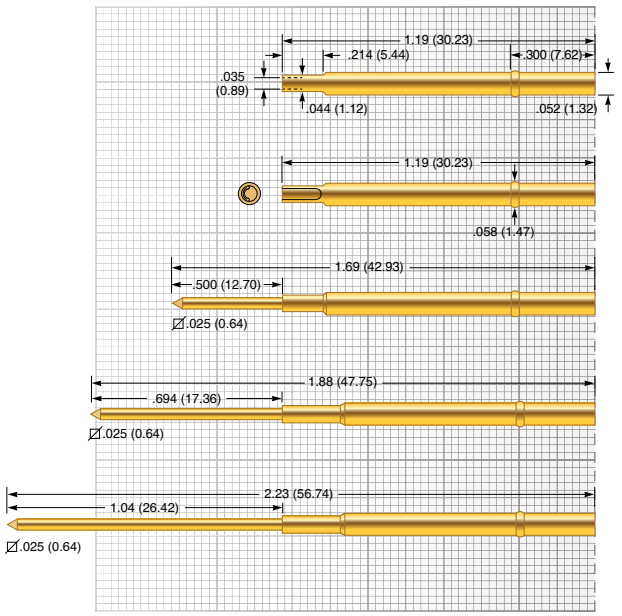
Receptacle

Hole diameter:	Ø .053 to .055 (1.35 to 1.40)
Suggested drill:	#54 or 1.40 mm

Material

- LTR Housing: Work-hardened Nickel Silver, Gold plated over hard Nickel
- ELTR Housing: Work-hardened Nickel Silver, unplated

Post: Phosphorous Bronze, Gold plated



Tip Style

C	F	HC	HF	HL		
Ø .035 (0.89)	Ø .047 (1.19)	Ø .022 (0.56)	Ø .035 (0.89)	Ø .047 (1.19)		
						

Micro Structured Tip

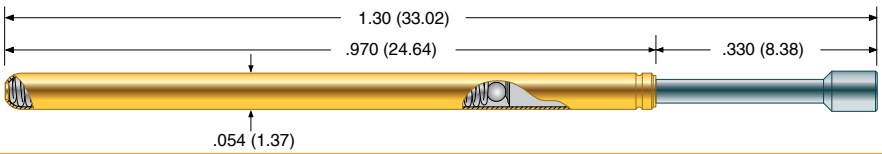
The hemi-ellipsoid shape of a Bead Probes presents a unique probing challenge in that standard serrated probes may fall into the valleys between serrations. ECT has developed a new textured tip face that is optimized for contact to the hemi-ellipsoid shape of Bead Probes as small as .004".

An innovative "Micro-Textured" tip incorporates closely spaced triangular pyramid shapes to form a textured surface. Perfect for contacting beads that are long yet have a small width when placed on a PCB trace.

Micro structured Tip

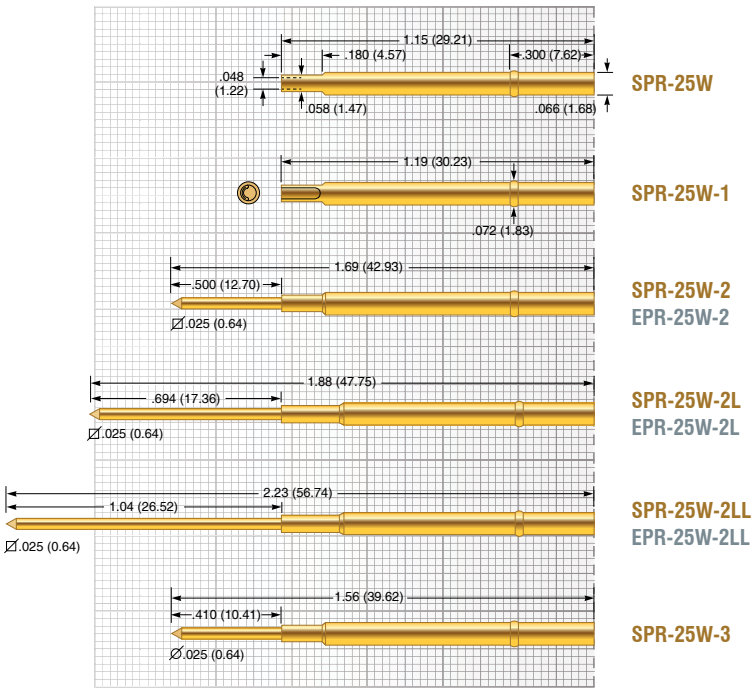
Standard serrated Tip

Dimensions in inches (millimeters). Specifications subject to change without notice.
Consult factory for other temperature requirements, and applications below -40°C.
Stocking Disclaimer: Stocking levels for part numbers listed in this catalog are subject to change.
Availability is based on current levels of usage and demand.



BTP-25

100 mil (2.54 mm)



SPR-25W

SPR-25W-1

SPR-25W-2
EPR-25W-2

SPR-25W-2L
EPR-25W-2L

SPR-25W-2LL
EPR-25W-2LL

SPR-25W-3

Tip Style

C	F	HF	HL			
Ø .035 (0.89)	Ø .060 (1.52)	Ø .035 (0.89)	Ø .060 (1.52)			
						

Mechanical

Recommended Travel:	.167 (4.24)
Full Travel:	.250 (6.35)
Operating Temperature:	-55°C to +150°C

Spring Force in oz. (grams)

	Order Code	Preload	Rec. Travel
Light	- 2	0.75 (21)	2.0 (57)
Standard	- 4	1.50 (43)	4.0 (113)
Alternate	- 6.5	2.65 (75)	6.5 (184)
High	- 8	2.84 (81)	8.0 (227)
Ultra High	- 10	1.77 (50)	10.0 (283)

Electrical (Static Conditions)

Current Rating:	8 amps
Average Probe Resistance:	<8 mOhms

Materials and Finishes

Plunger:	High performance alloy LFRE proprietary plating
Barrel:	Work hardened Phosphor Bronze, Gold plated over hard Nickel
Spring:	Stainless Steel
Ball:	Stainless Steel

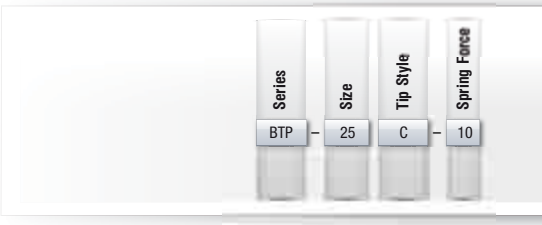
Receptacle

Hole diameter:	Ø .067 to .069 (1.70 to 1.75)
Suggested drill:	#51 or 1.75 mm

Material

- SPR Housing: Work-hardened Nickel Silver, Gold plated over hard Nickel
- EPR Housing: Nickel Silver, unplated

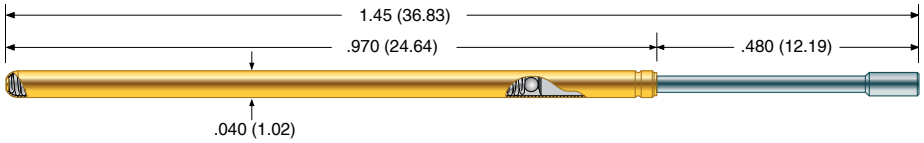
Post: Phosphorous Bronze, Gold plated



Dimensions in inches (millimeters). Specifications subject to change without notice.
Consult factory for other temperature requirements, and applications below -40°C.
Stocking Disclaimer: Stocking levels for part numbers listed in this catalog are subject to change.
Availability is based on current levels of usage and demand.

BPLT-1

75 mil (1.91 mm)



Mechanical

Recommended Travel:	.317 (8.05)
Full Travel:	.350 (8.89)
Operating Temperature:	-55°C to +105°C

Spring Force in oz. (grams)

	Order Code	Preload	Rec. Travel
Standard	- 4.5	1.09 (31)	4.5 (128)
High	- 9.6	1.50 (43)	9.6 (272)

Electrical (Static Conditions)

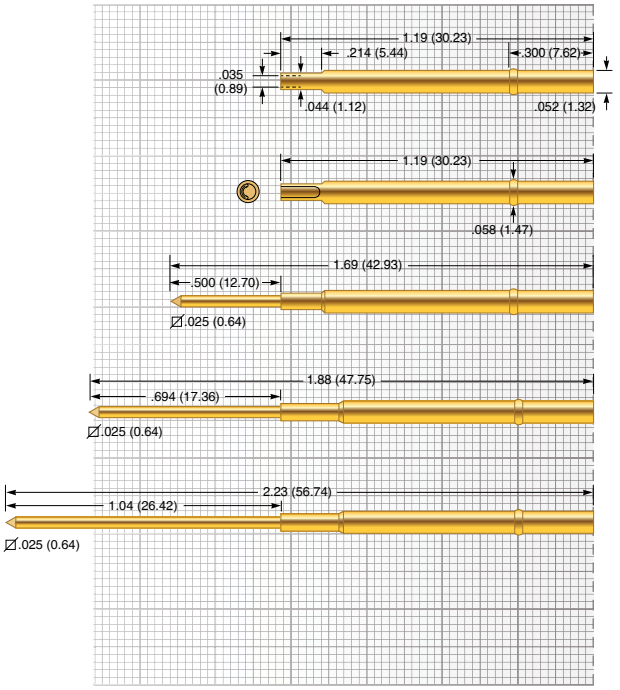
Current Rating:	6 amps
Average Probe Resistance:	<10 mOhms

Materials and Finishes

Plunger:	High performance alloy LFRE proprietary plating
Barrel:	Work hardened Phosphor Bronze, Gold plated over hard Nickel
Spring:	Music Wire
Ball:	Stainless Steel

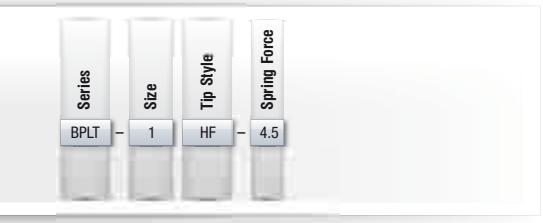
Receptacle

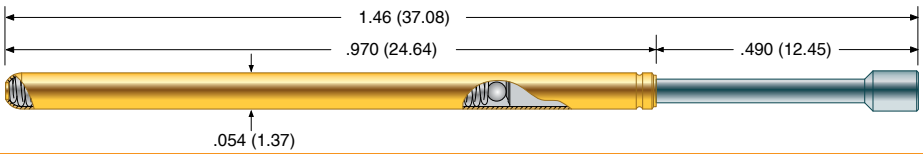
Hole diameter:	Ø .053 to .055 (1.35 to 1.40)
Suggested drill:	#54 or 1.40 mm
Material	
• LTR Housing:	Work-hardened Nickel Silver, Gold plated over hard Nickel
• ELTR Housing:	Work-hardened Nickel Silver, unplated
Post:	Phosphorous Bronze, Gold plated



Tip Style

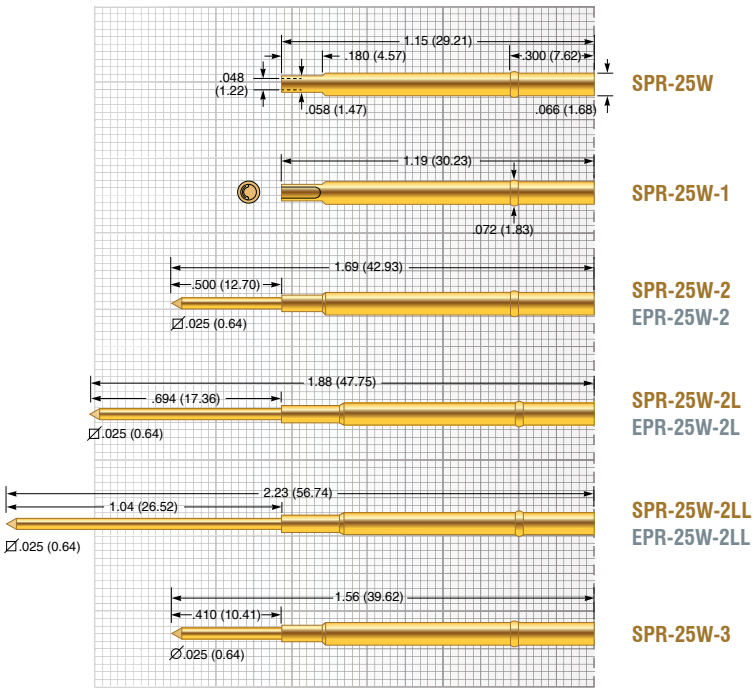
C	F	HF	HL			
Ø .035 (0.89)	Ø .047 (1.19)	Ø .035 (0.89)	Ø .047 (1.19)			
						





BPLT-25

100 mil (2.54 mm)



Tip Style

C	F	HF	HL			
Ø .035 (0.89)	Ø .060 (1.52)	Ø .035 (0.89)	Ø .060 (1.52)			
						

Mechanical

Recommended Travel:	.317 (8.05)
Full Travel:	.350 (8.89)
Operating Temperature:	
• Standard Spring:	-55°C to +105°C
• Alternate Spring:	-55°C to +105°C
• High Spring:	-55°C to +105°C
• Ultra High Spring:	-55°C to +150°C

Spring Force in oz. (grams)

	Order Code	Preload	Rec. Travel
Standard	- 4	1.08 (31)	4.0 (113)
Alternate	- 6	0.99 (28)	6.0 (170)
High	- 8	0.75 (21)	8.0 (227)
Ultra High	- 9.7	1.16 (33)	9.7 (275)

Electrical (Static Conditions)

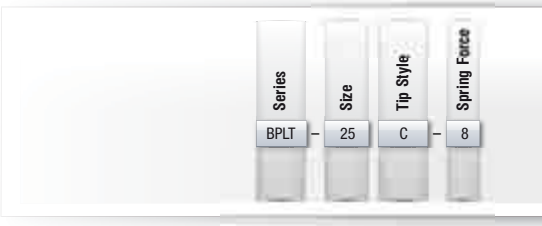
Current Rating:	8 amps
Average Probe Resistance:	<8 mOhms

Materials and Finishes

Plunger:	High performance alloy LFRE proprietary plating
Barrel:	Work hardened Phosphor Bronze, Gold plated over hard Nickel
Spring	
• Standard:	Music Wire
• Alternate:	Music Wire
• High:	Music Wire
• Ultra High:	Stainless Steel
Ball:	Stainless Steel

Receptacle

Hole diameter:	Ø .067 to .069 (1.70 to 1.75)
Suggested drill:	#51 or 1.75 mm
Material	
• SPR Housing:	Work-hardened Nickel Silver, Gold plated over hard Nickel
• EPR Housing:	Nickel Silver, unplated
Post:	Phosphorous Bronze, Gold plated



Dimensions in inches (millimeters). Specifications subject to change without notice.
Consult factory for other temperature requirements, and applications below -40°C.
Stocking Disclaimer: Stocking levels for part numbers listed in this catalog are subject to change.
Availability is based on current levels of usage and demand.

PP-3070

GSP-2B
GSP-2BL

ECT is your source for interface probes for all major brands of test systems, including Teradyne, GenRad and Hewlett-Packard. In fact, two of these companies specify ECT probes as original equipment.

If our standard products don't meet your requirements, contact Everett Charles Technologies for expert assistance in designing and manufacturing your custom interface probe.

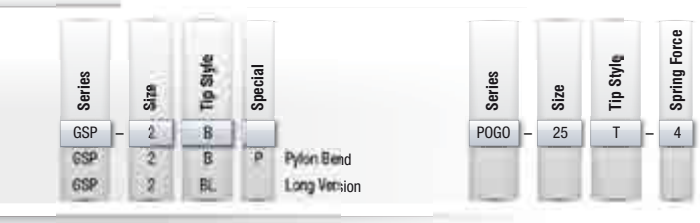
PP-3070

Personality Pins

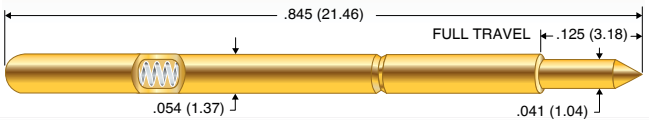
Part number: PP-3070-S
Keysight Part number: Mint Pins 44275P
Packing unit: 200 pieces (strip)

Application

Used on fixture interfaces as bottom transfer pins.



GSP-2B



Application GenRad 227x, Pylon, Rhode&Schwarz

Mechanical

Recommended Travel:	.125 (3.18)
Full Travel:	.125 (3.18)
Operating Temperature:	-55°C to +105°C

Spring Force in oz. (grams)

	Preload	Rec. Travel
Standard	2.5 (71)	4.5 (128)

Electrical (Static Conditions)

Current Rating:	5 amps
Average Probe Resistance:	<35 mOhms

Materials and Finishes

Plunger:	Heat-treated BeCu, Gold plated over hard Nickel
Barrel:	Work-hardened Nickel Silver, Gold plated over hard Nickel
Spring:	Music Wire, Gold plated

GSP-2BL

Application GenRad 227x, Pylon, Rhode&Schwarz

Mechanical

Recommended Travel:	.080 (2.03)
Full Travel:	.160 (4.10)
Operating Temperature:	-55°C to +105°C

Spring Force in oz. (grams)

	Preload	Rec. Travel
Long	2.5 (71)	4.5 (128)

Electrical (Static Conditions)

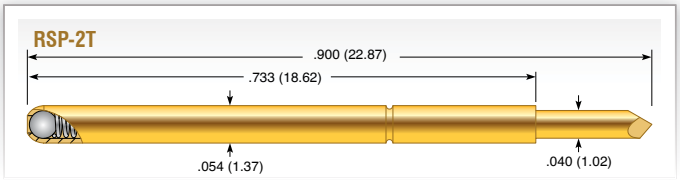
Current Rating:	5 amps
Average Probe Resistance:	<35 mOhms

Materials and Finishes

Plunger:	Heat-treated BeCu, Gold plated over hard Nickel
Barrel:	Work-hardened Nickel Silver, Gold plated over hard Nickel
Spring:	Music Wire, Gold plated

Dimensions in inches (millimeters). Specifications subject to change without notice.
Consult factory for other temperature requirements, and applications below -40°C.
Stocking Disclaimer: Stocking levels for part numbers listed in this catalog are subject to change.
Availability is based on current levels of usage and demand.

RSP-2T
FRP-25T



Application Rhode&Schwarz

Mechanical

Recommended Travel:	.079 (2.00)
Full Travel:	.167 (4.25)
Operating Temperature:	-55°C to +105°C

Spring Force in oz. (grams)

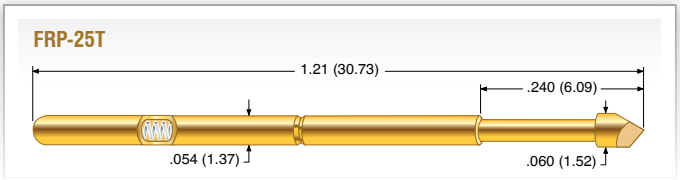
	Preload	Rec. Travel
Standard	1.44 (41)	3.6 (102)

Electrical (Static Conditions)

Current Rating:	5 amps
Average Probe Resistance:	<20 mOhms

Materials and Finishes

Plunger:	Heat-treated BeCu, Gold plated over hard Nickel
Barrel:	Nickel Silver, Gold plated
Spring:	Music Wire, Silver plated
Ball:	Stainless Steel



Application Schlumberger, Factron

Mechanical

Recommended Travel:	.120 (3.05)
Full Travel:	.160 (4.06)
Operating Temperature:	-55°C to +150°C

Spring Force in oz. (grams)

	Preload	Rec. Travel
Standard	0.92 (26)	4.0 (113)

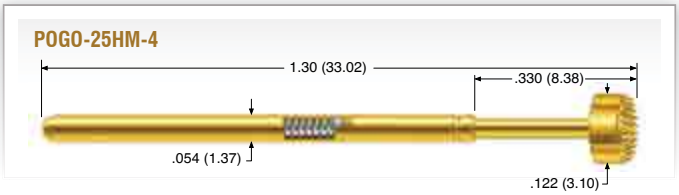
Electrical (Static Conditions)

Current Rating:	5 amps
Average Probe Resistance:	<35 mOhms

Materials and Finishes

Plunger:	Heat-treated BeCu, Gold plated over hard Nickel
Barrel:	Work-hardened Phosphor Bronze, Gold plated over hard Nickel
Spring:	Stainless Steel

POGO-25HM-4
POGO-25T-4



Application Keysight/Agilent / HP-3070

Mechanical

Recommended Travel:	.167 (4.24)
Full Travel:	.250 (6.35)
Operating Temperature:	-55°C to +150°C

Spring Force in oz. (grams)

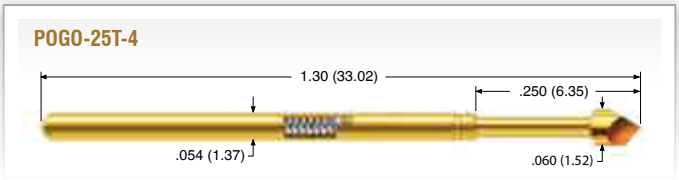
	Order Code	Preload	Rec. Travel
Standard	- 4	1.50 (43)	4.0 (113)

Electrical (Static Conditions)

Current Rating:	8 amps
Average Probe Resistance:	<8 mOhms

Materials and Finishes

Plunger:	Heat-treated BeCu, Gold plated over hard Nickel
Barrel:	Phosphor Bronze, Gold plated over hard Nickel
Spring:	Stainless Steel
Ball:	Stainless Steel



Application Teradyne 800 / 1800 / Spectrum
Teradyne #092-431-00

Mechanical

Recommended Travel:	.167 (4.24)
Full Travel:	.250 (6.35)
Operating Temperature:	-55°C to +150°C

Spring Force in oz. (grams)

	Order Code	Preload	Rec. Travel
Standard	- 4	1.50 (43)	4.0 (113)

Electrical (Static Conditions)

Current Rating:	8 amps
Average Probe Resistance:	<8 mOhms

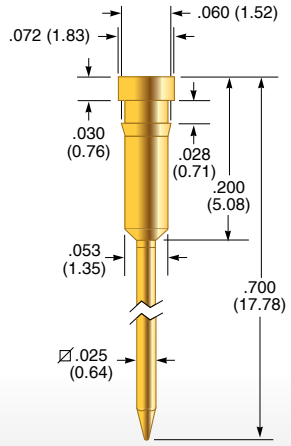
Materials and Finishes

Plunger:	Heat-treated BeCu, Gold plated over hard Nickel
Barrel:	Phosphor Bronze, Gold plated over hard Nickel
Spring:	Stainless Steel
Ball:	Stainless Steel

Dimensions in inches (millimeters). Specifications subject to change without notice.
Consult factory for other temperature requirements, and applications below -40°C.
Stocking Disclaimer: Stocking levels for part numbers listed in this catalog are subject to change.
Availability is based on current levels of usage and demand.

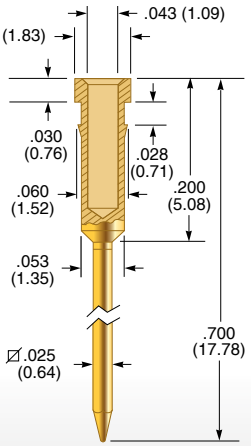
SIP-90
GPP-95

SIP-90-2



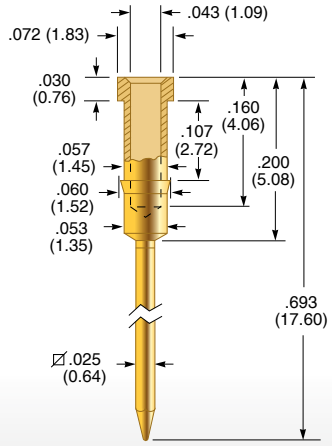
Application	GenRad
Material	Brass, Gold plated
Hole diameter	Ø .055 (1.40)
Suggested drill	#54 or 1.40 mm

SIP-90-3



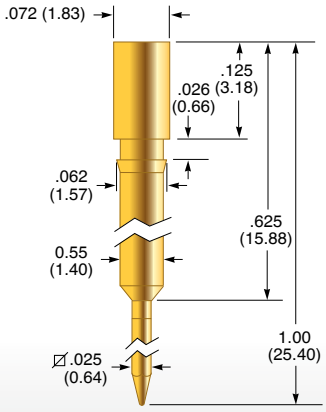
Application	Factron
Material	Brass, Gold plated
Hole diameter	Ø .055 (1.40)
Suggested drill	#54 or 1.40 mm

SIP-90-4



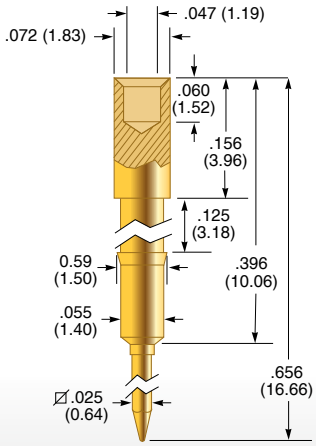
Application	General Interconnect
Material	Brass, Gold plated
Hole diameter	Ø .057 (1.45)
Suggested drill	1.45 mm

SIP-90-5



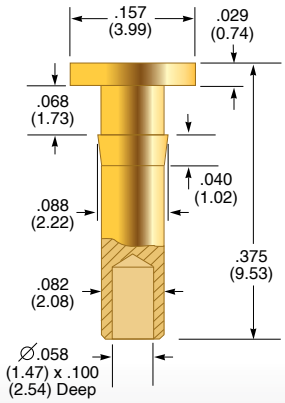
Application	Zehntel
Material	Brass, Gold plated
Hole diameter	Ø .055 (1.40)
Suggested drill	#54 or 1.40 mm

SIP-90-6



Application	General Interconnect
Material	Brass, Gold plated
Hole diameter	Ø .057 (1.45)
Suggested drill	1.45 mm

GPP-95-2



Application	GenRad
Material	Brass, Gold plated
Hole diameter	Ø .085 (2.15)
Suggested drill	#44 or 2.15 mm

Dimensions in inches (millimeters). Specifications subject to change without notice.
Consult factory for other temperature requirements, and applications below -40°C.
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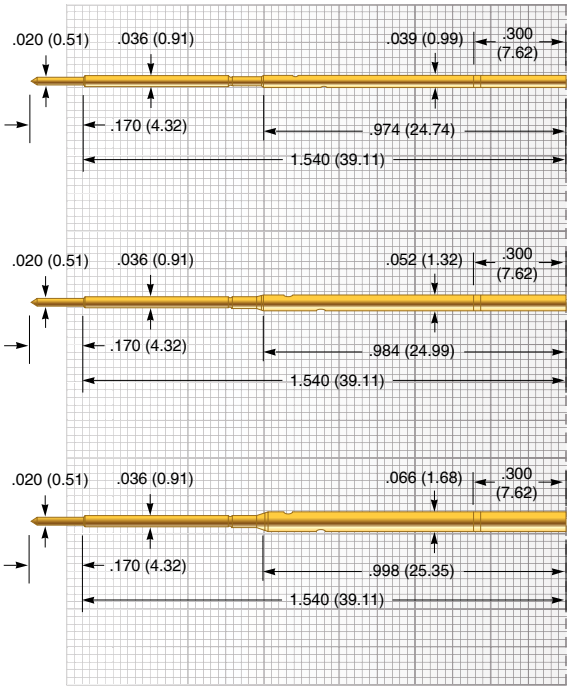
Availability is based on current levels of usage and demand.

DER



DER-050
50 mil

DER-075
75 mil

DER-100
100 mil

Tip Style

B	J	T				
Ø .020 (0.51)	Ø .020 (0.51)	Ø .020 (0.51)				
						

DER Series for wireless fixtures

The DER Series receptacle is used with a replacable POGO, LFRE, LFLT or LTP probe to build a doubled ended probe. ECT offers the DER series in all common used test center spacing.

Example showing receptacle and probe

Mechanical

Recommended Travel:	.130 (3.30)
Full Travel:	.160 (4.06)
Operating Temperature:	-55°C to +150°C

Spring Force in oz. (grams)

	Order Code	Preload	Rec. Travel
Standard	- 3.5	2.62 (74)	3.50 (99)

Electrical (Static Conditions)

Current Rating:	3 amps
Average Probe Resistance:	<15 mOhms

Materials and Finishes

Plunger:	Heat-treated BeCu alloy, plated with hard Gold over Nickel
Barrel:	Work-hardened Nickel Silver alloy, plated with hard Gold over Nickel
Spring:	Stainless Steel

DER-050

Hole diameter:	Ø .038 to .039 (0.97 to 0.99)
Suggested drill:	#61 or 0.99 mm
Probes (ordered separately):	POGO-62

DER-075

Hole diameter:	Ø .053 to .055 (1.35 to 1.40)
Suggested drill:	#54 or 1.40 mm
Probes (ordered separately):	LFRE-1 / POGO-1 LTP-1

DER-100

Hole diameter:	Ø .067 to .069 (1.70 to 1.75)
Suggested drill:	#51 or 1.75 mm
Probes (ordered separately):	LFRE-25 / POGO-25 LTP-25

Dimensions in inches (millimeters). Specifications subject to change without notice.
Consult factory for other temperature requirements, and applications below -40°C.
Stocking Disclaimer: Stocking levels for part numbers listed in this catalog are subject to change.
Availability is based on current levels of usage and demand.

BMP-1 / BMP-1-S / BMP-3

Mechanical

Recommended Travel:	.050 (1.27)
Full Travel:	.062 (1.57)
Direction of Rotation:	Counter clock wise
Scribed Diameter:	.050 (1.27)
Special diameters available.	

Spring Force in oz. (grams)

	Preload	Rec. Travel
Standard	4.41 (125)	5.19 (147)

Electrical (Static Conditions)

Current Rating:	50 mA
Voltage Rating:	15VDC
Recommended Duty Cycle:	1 sec. On (min.) 5 sec. Off

Materials and Finishes

Plunger Tip:	Carbide
Receptacle:	Stainless Steel

Mounting

BMP-1 / BMP-1-S

Hole diameter:	Ø .468 (11.89)
Suggested drill:	15/32 (in.) or 11.90 mm

BMP-3

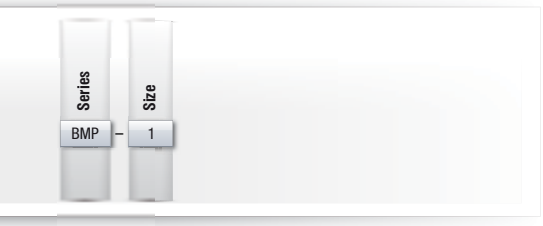
Hole diameter:	Ø .610 (15.50)
Suggested drill:	39/64 (in.) or 15.50 mm

Order Number

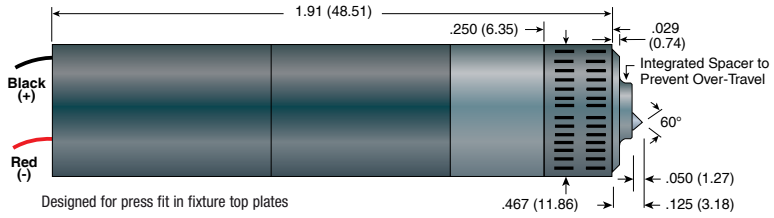
Board Marker:	BMP-1 BMP-1-S BMP-3
Spare Receptacle:	BMR-1 BMR-3
Repcalement Tip:	BMT-1

Tools

Insertion tool for BMR-1:	RIT-BMP
Extraction tool for BMR-1:	EXT-BMP

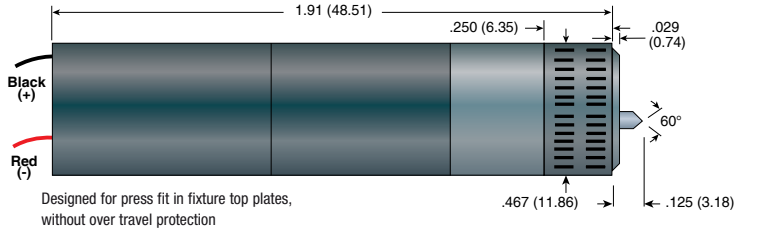


BMP-1



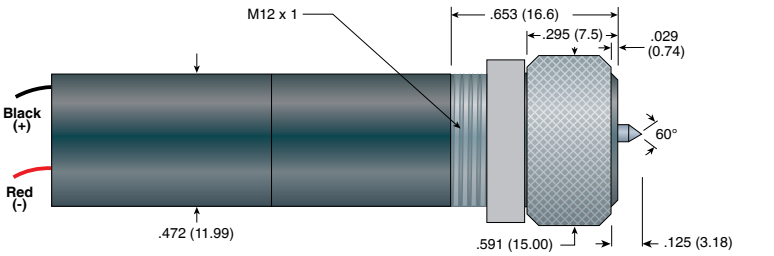
Designed for press fit in fixture top plates

BMP-1-S



Designed for press fit in fixture top plates,
without over travel protection

BMP-3



Designed for press fit in fixture top plates or other mounting plates
with adjustable BMP height range of up to 0.440 inch (11.2mm).

Applications

The BMP Board Marker Probe patented design is for installation on bare board or loaded board test fixtures. When your tester is equipped with the appropriate electronics and software, the BMP scribes a permanent .050" circle on every "passed" PCB or device tested. Boards that fail the test are not marked. The risk of human error is eliminated in PCB testing and sorting.

The unit requires less than .500" of fixture area. It is designed to mark board areas of bare glass (FR4), solder mask over glass or copper, or bare tinned copper.

The BMP includes a mounting receptacle and a motor/transmission assembly. It can be easily removed from the receptacle for use in other fixtures. Spare receptacles and tip replacement assemblies are available. The thread between receptacle and housing is 7/16-20 UNF.

Application Examples

- Bare Board Test
- Loaded Board Test
- Connector / Wire Harness

Benefits

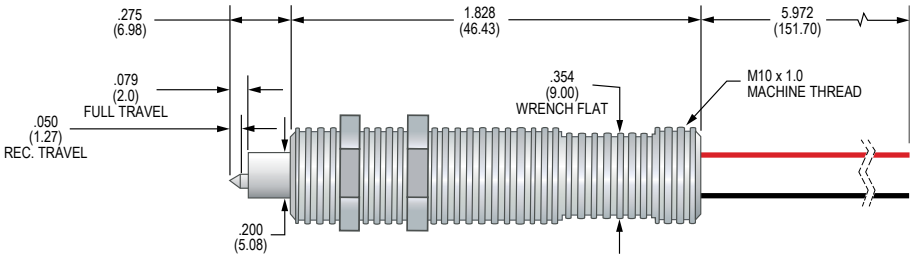
- Hands Free Operation
- No Hazardous Consumables
- Durable
- > 50,000 Cycles before Tip Replacement
- Easy to Fixture

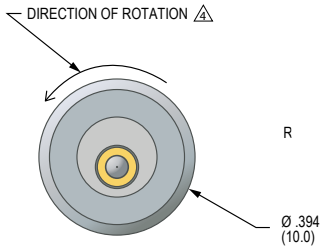
Features

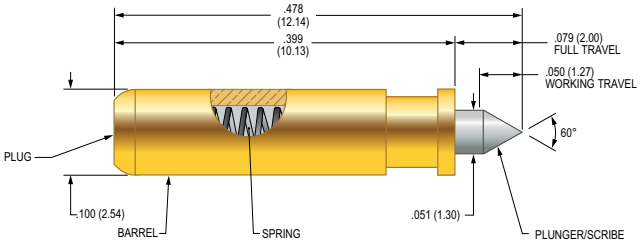
- Permanent Mark
- Controllable Mark Intensity
- Driven by Test Program
- MicroGrain Carbide Tip
- Replaceable Tip

Dimensions in inches (millimeters). Specifications subject to change without notice.
Consult factory for other temperature requirements, and applications below -40°C.
Stocking Disclaimer: Stocking levels for part numbers listed in this catalog are subject to change.
Availability is based on current levels of usage and demand.

BMP-4







BMT-4

Mechanical

Recommended Travel:	.050 (1.27)
Full Travel:	.079 (2.00)
Direction of Rotation:	Counter clock wise
Scribed Diameter:	.050 (1.27)

Spring Force in oz. (grams)

	Preload	Rec. Travel
Standard	2.43 (68.9)	5.0 (141.7)

Electrical (Static Conditions)

Current Rating:	20 mA
Voltage Rating:	12VDC
Recommended Duty Cycle:	2 sec. On (min.) 3 sec. Off

Materials and Finishes

Plunger Tip:	Carbide
Receptacle:	Stainless Steel

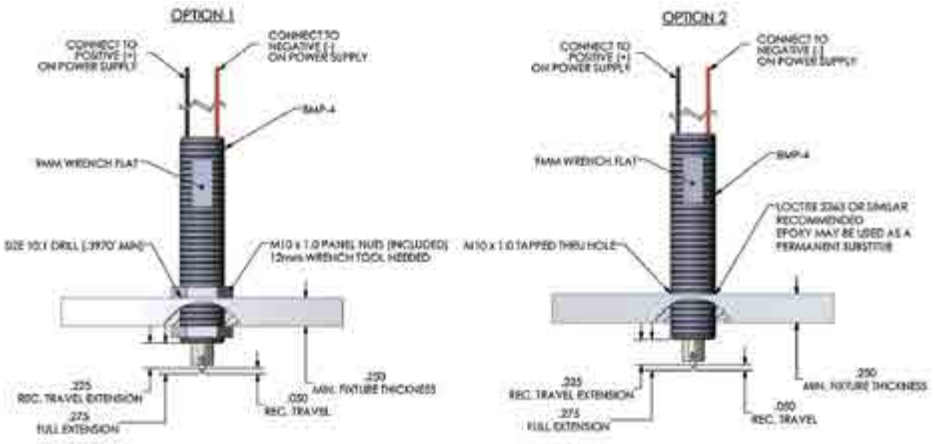
Mounting

	BMP-4
Hole diameter:	Ø .398 (10.1)
	or M10 x 1.0 threaded hole

Order Number

Board Marker:	BMP-4
Repcalement Tip kit:	BMT-4

Mounting Options



Dimensions in inches (millimeters). Specifications subject to change without notice.
Consult factory for other temperature requirements, and applications below -40°C.
Stocking Disclaimer: Stocking levels for part numbers listed in this catalog are subject to change.
Availability is based on current levels of usage and demand.

BMP-5

Mechanical

Recommended Travel:	.050 (1.27)
Full Travel:	.079 (2.00)
Direction of Rotation:	Counter clock wise
Scribed Diameter:	.050 (1.27)

Spring Force in oz. (grams)

	Preload	Rec. Travel
Standard	2.43 (68.9)	5.0 (141.7)

Electrical (Static Conditions)

Current Rating:	20 mA
Voltage Rating:	12VDC
Recommended Duty Cycle:	2 sec. On (min.) 3 sec. Off

Materials and Finishes

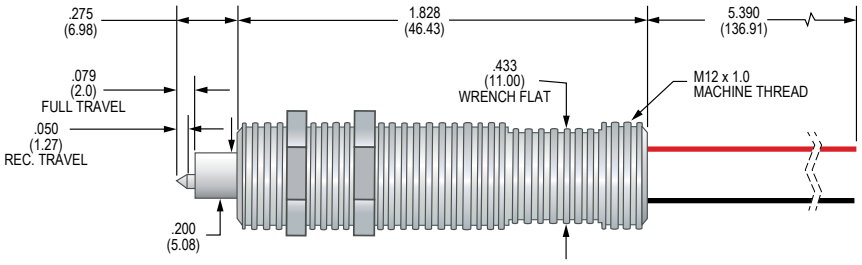
Plunger Tip:	Carbide
Receptacle:	Stainless Steel

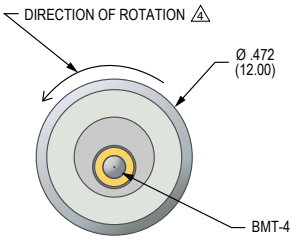
Mounting

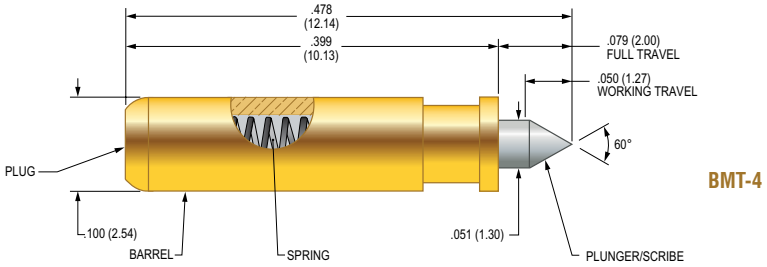
	BMP-5
Hole diameter:	Ø .472 (12.1)
	or M12 x 1.0 threaded hole

Order Number

Board Marker:	BMP-5
Repcalement Tip kit:	BMT-4

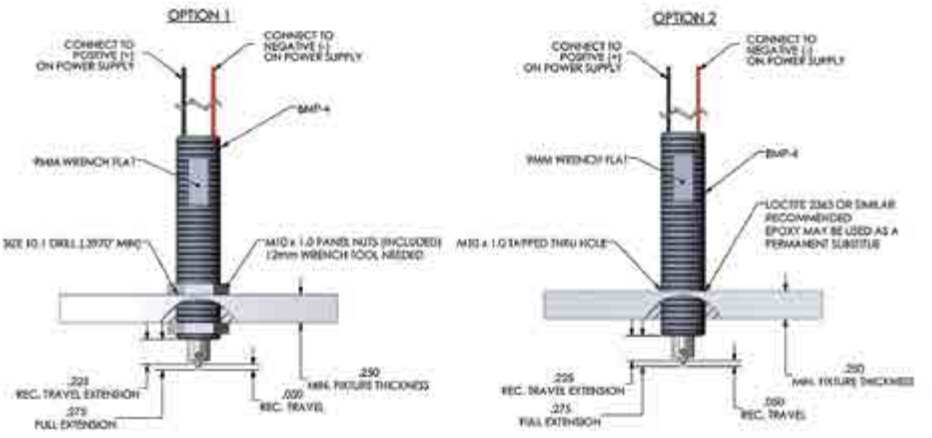






BMT-4

Mounting Options



Dimensions in inches (millimeters). Specifications subject to change without notice.
Consult factory for other temperature requirements, and applications below -40°C.
Stocking Disclaimer: Stocking levels for part numbers listed in this catalog are subject to change.
Availability is based on current levels of usage and demand.

Tools and Maintenance

ECT Probes *love* ECT Tools

On the following pages, we offer a variety of tools to insert or extract probes and receptacles. These tools are made from durable steel and other materials to ensure a long life.

You will also find probe handling and maintenance instructcions to help maximize the life of our products.

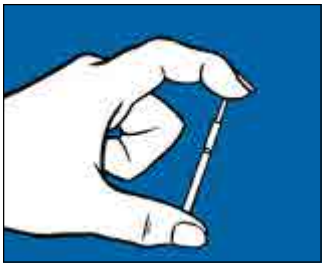
Probe Handling Instructions

Special care should be used when handling some small diameter probes such as the POGO-72. Their long length makes them more susceptible to bending than their 100 mil counterparts. It is recommended that the plunger not be deflected unless it is in its mating receptacle, which should be installed in a probe plate. If deflection is required prior to insertion into the mating receptacle, please follow these guidelines to reduce the possibility of damage.

1) Hold the top of the probe barrel firmly between the forefinger and thumb of one hand.

2) Using the forefinger of the opposite hand (or a wooden dowel if it is a pointed tip), deflect the plunger the required distance.

Correct



Incorrect

Board Marker Tools

Part No.	Description	Used on
RIT-BMP	Receptacle insertion tool	BMR-1
EXT-BMP	BMP insertion/extraction tool	BMP-1/BMP-3

MPB-02

MPB-01

MPB-03

Pogo® Maintenance

Generally, Pogo cleaning is not recommended. However, in some cases electrical conductivity can be improved if the spring probe tips are cleaned of any contaminants. Contaminants can form an insulation barrier on the probe tip, thus reducing contact integrity.

One of the most widely used methods for cleaning spring contact probes involves the use of brushes to clean the probe heads without probe removal from the test fixture. This technique allows for more frequent maintenance resulting in improved fixture reliability. After brushing contaminants free from the probes, the fixture should be vacuumed to ensure remaining particles do not create future problems.

Another cleaning method involves removal of probes from the test fixture, bundling them together, and submerging the probe tips in a shallow pan of safe solution such as alcohol or citric cleaner for five minutes. After soaking, the probe tips can be scrubbed with a soft bristle brush to remove any residue, then rinsed and dried. The probes can then be reinstalled in the test fixture. This method should be attempted only as a last resort, as cleaning fluids and solvents can wash contaminants into the probes as well as the fixture.

Maintenance Tools

Part No. ECT	Part No. OB	Description	Dimensions
MPB-01	MB-1	Brass bristle brush	4.25 x 2.50 (108 x 64)
MPB-02	MB-2	4 row brass brush	3.25 x 1.125 (83 x 29)
MPB-03	MB-3	Nylon brush	6.25 (159)

General Purpose-Replaceable Insertion Tools

Made from the highest quality stainless steel, these durable, corrosion-resistant tools are guaranteed to provide years of service. They are engineered for easy control and to fit comfortably in your hand for ease of use.

For receptacle installation, choose the RIT or ART tool that matches the receptacle and follow the Insertion Instructions. The press ring keeps the receptacle in place, so no glue is required. The spring probe can then be inserted into the receptacle to complete the installation.

The height of the probe can be changed by mounting the receptacle at different heights. For more information on receptacles, refer to the technical section of this catalog.

1. Insert receptacle into the drill hole.

2. Insert tip of RIT tool into the top of the receptacle and, with slight hand pressure, seat the receptacle into the drill hole until resistance is met.

3. Tap the top of the tool with a small plastic hammer until the receptacle is seated at the proper height. The press ring keeps the receptacle in place.

Receptacle Insertion Tools

Part No. ECT	Part No. OB	Mounting Height	Used on ECT	Used on OB
ARIT-1	ARIT40	Flush to .220 (5.59)	SPR-1/LTR-1	SR40/LR40
ARIT-1M	ARIT40M	Flush to .220 (5.59)	SPR-1/LTR-1	SR40/LR40
ARIT-25	ARIT54	Flush to .220 (5.59)	SPR-2/-25/-64	SR54/SR541
ARIT-25M	ARIT54M	Flush to .220 (5.59)	SPR-2/-25/-64	SR54/SR541
ART-62		Flush to .285 (7.24)	HPR-62	
ART-72	AT31	Flush to .220 (5.59)	HPR-72	HPR-72
RIT-0-0	T261-0	Flush	SPR-0	SR261
RIT-1-0		Flush	SPR-1/LTR-1	
RIT-3-0	T80-0	Flush	SPR-3	SR80
RIT-30-0	T20-0	Flush	HPR-30	SR20
RIT-4-0	T93-0	Flush	SPR-4	SR93
RIT-40-0	T27-0	Flush	HPR-40	SR27
RIT-5-0	T125-0	Flush	SPR-5	SR125
RIT-39		Flush	SPR-39	
RIT-64-005	MRT54-005	.005 (0.13)	SPR-64	MR54
RIT-74-005	MRT-554-005	.005 (0.13)	SPR-74	MR554
RIT-80-0		Flush	STT-80	

Crimp Plier

ECT crimping pliers make receptacle crimping fast and easy. The standard ratchet-action jaws are individually fitted and inspected to ensure quick insertion and removal of receptacles.

The tool features an internal high-tension coil spring for fatigue-free operation and a lifetime of dependable service. Vinyl cushion grips ensure a firm grip with minimum applied pressure. Instructions are provided with each tool purchased.

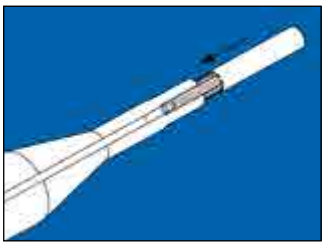
The 900 series crimp plier requires a corresponding crimp locator (DCL) in order to function properly. Example: To order a plier to crimp a SPR-1W, specify a 900 plier and a DCL-1 crimp locator. If you already have the 900 plier, order only the DCL for the specific receptacle series you require.

Part No. ECT	Part No. OB
900	Model #900

Interchangeable Crimp Plier Locators

Part No. ECT	Part No. OB	Receptacle ECT	Receptacle OB
DCL-0	CL261	SPR-0	SR261
DCL-1	CL40	SPR-1	SR40
DCL-2	CL541	SPR-2	SR541
DCL-3	CL80	SPR-3	SR80
DCL-20		MEP-20	
DCL-25	CL54	SPR-25	SR54
DCL-30	CL20	HPR-30	SR20
DCL-40	CL27	HPR-40	SR27
DCL-62		HPR-62	
DCL-72	CL31	HPR-72	HPR-72

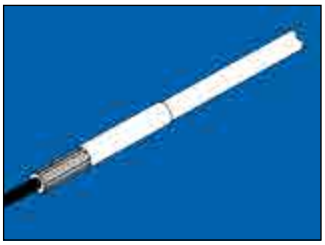
FASTITE® Insertion Instructions



1. *Insert insulator, knurled end first into tip of FIT tool*

2. *Insert prestripped wire into notch on FIT tool and slide until it protrudes approximately 1/8 inch from insulator.*

3. *Hold wire firmly against tool with forefinger. Insert protruding wire into termination end of W-4 receptacle. Release grasp on wire and push insulator onto end of receptacle, completing termination.*



4. *Complete termination.*

Probe/FASTITE® Insertion Tools

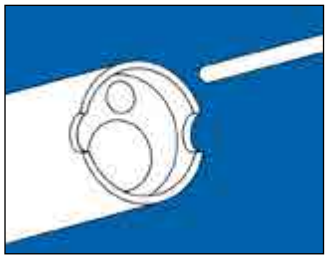
Part No. ECT	Part No. OB	Description	Used on ECT	Used on OB
PIT-0	PIT-261	Probe insertion tool	SPA-0/HPA-0/HPA-50	IP261
PIT-20		Probe insertion tool	MEP-20	
PIE-25	PIE-54	Probe insertion/ extraction tool	All 100mil probes	All 100mil probes
FIT-1	FIT-1	FASTITE® insertion tool	HPR-72W-4/SPR-0W-4 HPR-40T	SR28-4, SR31-4

FIT-1

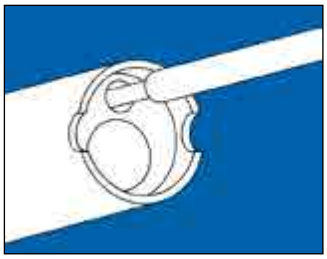
PIE-25

Wire Wrapping Tips

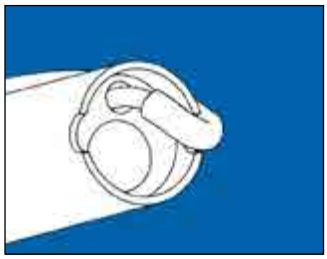
A wire-wrapped termination is made by coiling the wire around the sharp corners of a .025 (0.64) square receptacle post. By bending the wire around the sharp corner, the oxide layer of both surfaces is broken, revealing an oxide-free surface. This provides clean metal-to-metal contact between the wire and the post. The minimum number of turns is based on wire gauge and the type of wrap. A standard wrap coils only the bare wire around the post. A modified wrap coils the wire and a portion of the insulation. The modified wrap increases the ability to withstand vibration.



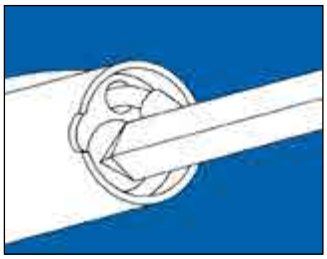
1. *Pre-stripped wire, bit and sleeve*



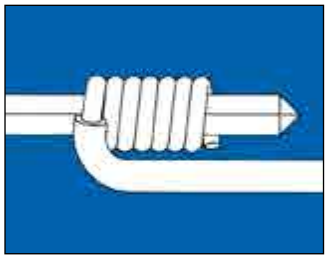
2. *Insert wire.*



3. *Secure wire.*



4. *Insert terminal, actuate wrapping gun.*



5. *Completed termination.*

Wire turns per MIL-STD-1130B

(on ⍁ .025 (0.64) WireWrap Post)

Wire Size	Diameter	Minimum Number of Turns Class A (Modified)	Class B (Standard)
30	.010 (0.25)	7 stripped turns plus 1/2 insulated	7 stripped turns
28	.0126 (0.32)	7 stripped turns plus 1/2 insulated	7 stripped turns
26	.0159 (0.40)	6 stripped turns plus 1/2 Insulated	6 stripped turns
24	.0201 (0.51)	5 stripped turns plus 1/2 insulated	5 stripped turns

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