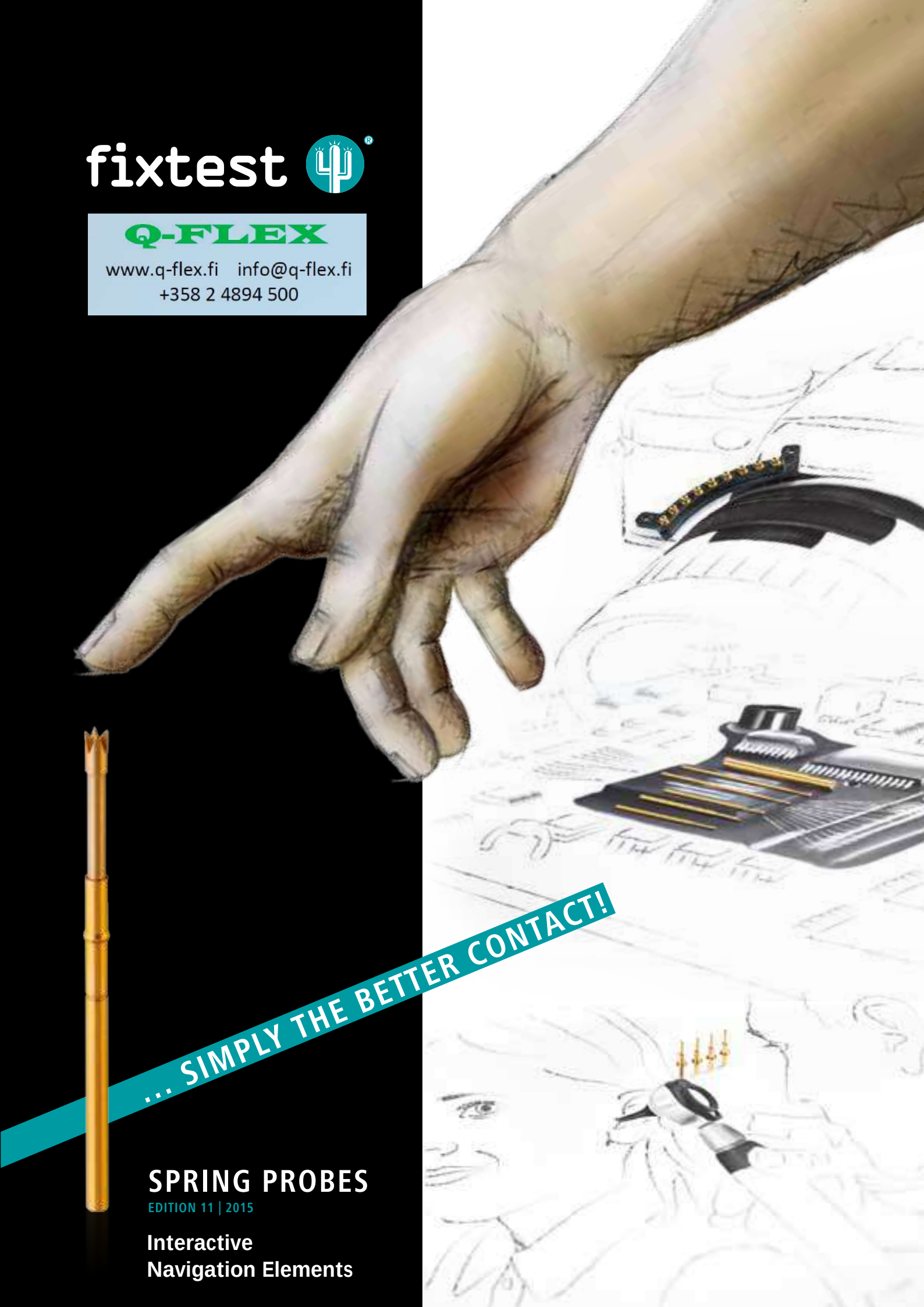
fixtest

Q-FLEX
www.q-flex.fi info@q-flex.fi
+358 2 4894 500



... SIMPLY THE BETTER CONTACT!

SPRING PROBES

EDITION 11 | 2015

Interactive Navigation Elements

OVERVIEW

This PDF contains interactive controls. Using the two buttons on the top of each page you can either jump back to the previous page or jump to this table of contents. Additionally, all tables of contents and cross-references in texts contain clickable hyperlinks.

Series	min. pitch	Page

ICT / FCT TEST PROBES IMPERIAL TYPES

107	1,00 mm	18
108	1,00 mm	18
07	1,27 mm	19
071	1,27 mm	20
141	1,27 mm	21
14	1,27 mm	22
15	1,27 mm	23
115	1,27 mm	24
151	1,27 mm	24
18	1,90 mm	26
75	1,90 mm	27
751	1,90 mm	28
752	1,90 mm	29
754	1,90 mm	29
21	2,54 mm	31
29	2,54 mm	32
100	2,54 mm	33
101	2,54 mm	35
125	2,54 mm	35
26	3,18 mm	36
27	3,96 mm	37
28	4,80 mm	38
V75X	1,27 mm	39
V100X	2,54 mm	39

ICT / FCT TEST PROBES METRIC TYPES

30	2,54 mm	43
31	2,54 mm	44
40	2,54 mm	45
41	2,54 mm	46
42	2,54 mm	46
44	2,54 mm	47
49	2,54 mm	47
50	3,80 mm	50
150	3,80 mm	50
154	3,80 mm	51
155	3,80 mm	51
51	3,80 mm	52
60	4,50 mm	53

INTERFACE CONTACTS

GR1-GR4	2,54 mm	56
20.08.23Z050T310		56
211	2,54 mm	57
FK-069		58
FK-011		58
FK-011-F		58
FK-627		58
FK-520		58
FK-069-80		58
FK-657		58
FK-726		58
FK-090		59
FK-190		59
FK-521		59
FK-507		59
FK-411		59
FK-488		59
FK-745		59
FK-026		60
FK-027		60
FK-027-E12		60
FK-352		60
FK-374		60
FK-458		60
FK-465		60
FK-500		60
FK-535		61
FK-650		61
FK-526		61
FK-386		61
FK-595		61
FK-596		61

FINEPITCH CONTACTS

µHelix 200	254 µm	66
µHelix 300	363 µm	67
µHelix 400	477 µm	68/69
µHelix 500	592 µm	69-71
105	1,00 mm	72
106	1,00 mm	73
700	1,27 mm	74
701	0,50 mm	75
702	0,70 mm	76
703	0,80 mm	77
704	0,80 mm	78
705	1,00 mm	79
706	1,00 mm	80
708	0,50 mm	81
707	1,27 mm	82/83
820	0,50 mm	84
825	0,70 mm	84
831	0,70 mm	85
835	0,70 mm	85
838	0,80 mm	86
840	0,80 mm	86
848	1,00 mm	87
858	1,00 mm	87
872	1,27 mm	88
KJS-030-001W1	0,30 mm	89
KJS-030-002NW2	0,30 mm	89
KB1-026Q/W-02	0,40 mm	90
KHS-040-009W1	0,40 mm	90
KHS-040-010NW2	0,40 mm	90
KHS-050-011W1	0,50 mm	90
KHS-050-012NW2	0,50 mm	90
KHS-017-001CP	0,17 mm	91
KHS-017-002RP	0,17 mm	91
KHS-025-001CP	0,25 mm	92
KHS-025-002RP	0,30 mm	92
KHW-030-001C2	0,30 mm	92
KHW-030-002R1	0,30 mm	92
KHW-035-001C2	0,35 mm	92
KHW-035-002C2	0,35 mm	92
KHW-035-003R1	0,35 mm	92
KGW-040-001CP	0,40 mm	93
KHW-040-002C2	0,40 mm	93
KHW-040-001R2	0,40 mm	93
KHW-040-004CP	0,40 mm	93
KHW-040-003C2	0,40 mm	93
KHW-040-005R2	0,40 mm	93
KHW-040-006CP	0,40 mm	93
KHW-040-008C2	0,40 mm	93
KHW-040-007R2	0,40 mm	93
KHW-050-003CP	0,50 mm	94
KHW-050-001C2	0,50 mm	94
KHW-050-001C2	0,50 mm	94
KHW-050-002R2	0,50 mm	94
KGW-050-002CP	0,50 mm	94
KHW-050-104C2	0,50 mm	94
KHW-050-105R2	0,50 mm	94
KHW-050-006CP	0,50 mm	94
KHW-050-007C2	0,50 mm	94
KHW-050-008R2	0,50 mm	94
KHS-080-001CA	0,80 mm	95
KGS-080-001CA	0,80 mm	95
KHS-080-002RA	0,80 mm	95
KJW-050-003CG	0,50 mm	95
KJW-050-002RG	0,50 mm	95

BATTERY PROBES

FK-480	4,30 mm	100
FK-554	5,30 mm	100
FK-381	5,72 mm	100
FK-598	4,45 mm	100
FK-382	7,00 mm	100
FK-519	7,00 mm	100
FK-575-WL	5,56 mm	100
FK-441	8,22 mm	100
FK-674	5,85 mm	101
FK-492	8,60 mm	101
FK-555	5,30 mm	101
FK-466 / FK-664	7,80 mm	101
FK-757	4,70 mm	101
FK-516 / FK-516-08	10,50 mm	101
FK-717 / FK-717-05	5,60 mm	101
FK-640	11,50 mm	101
FK-459	10,00 mm	101
FK-576	4,20 mm	102
FK-460 / FK-460-08	4,10 mm	102
FK-744	2,70 mm	102
FK-540 / FK-540-15	3,70 mm	102
FK-648	2,00 mm	102
FK-715	2,90 mm	102
FK-663	2,10 mm	103
FK-499	2,00 mm	103
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FK-691 / FK-691-06	2,54 mm	103
FK-741-HT	2,80 mm	103
FK-754	2,54 mm	103
FK-454	2,70 mm	103
FK-565	2,54 mm	103
FK-566	2,54 mm	103
FK-566-GF	2,54 mm	103
FK-515	3,18 mm	104
FK-586	2,54 mm	104
FK-606	2,54 mm	104
FK-576	2,54 mm	104
FK-694-S	2,80 mm	104
FK-725	3,50 mm	104
365	6,50 mm	105
509E	3,60 mm	105

HIGH CURRENT CONTACTS

120	2,54 mm	108
126	3,20 mm	109
226	3,20 mm	109
127	4,00 mm	110
128	4,75 mm	110
FK-133		111
FK-052		111
FK-679		111

KELVIN CONTACTS

BA10	3,00 mm	115
CA20	2,80 mm	115

COAX / RF CONTACTS

10103	118
10105	118
10107.001D	119
10114.001C	119
FK-661	119
FK-652	119
FK-651	119

CABLE HARNESS TEST

70	2,54 mm	122
71	2,54 mm	123
72	4,00 mm	124
172	4,00 mm	125
73	2,54 mm	126
265E	3,50 mm	127

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Mega FINN™	131
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Illustration: Part of the FIXTEST Team

Dear customers and readers,

with the release of the latest edition no. 11 of our catalogue a special year for us has just ended: in 2014, we celebrated our 30th anniversary.
Our team experienced one or the other change and expansion, new products have been developed and put into production, new applications and markets are served.
Market requirements and your wishes moved us to redesign the catalog at some points: Case studies from different fields of use typically show how numerous the applications for spring contacts are and can be. For you as user of these versatile products these examples shall demonstrate which solutions are possible and how much easier and simplified some complex tasks can be that you face every day in your work life. If we succeed in the idea to stimulate your imagination and arouse your interest in our products and services, we have achieved our first goal and are very happy about that.

Do you also have tasks in the field of contacting? With the entire team of creative FIXTEST designers we look forward to your challenges and new exciting goals.
And we would be delighted to be continuously your fixed partner for all questions around Testing and Contacting.

Yours sincerely

Rainer M. Rothe
Managing Director

Deutsche Zertifizierungsgesellschaft Mittelstand GmbH certified according to

DIN EN ISO 9001:2008
DIN EN ISO 14001:2009

FIXTEST - THE ENTERPRISE

FIXTEST didn't invent the spring contact probe – it already existed some decades before our company was founded. But throughout more than 30 years being in business we added many new ideas and solutions to our industry. Since our early days it has been clear for us: mass products – that's the business of others.
Our company motto "... simply the better contact!" literally stands for our claim to an excellent customer relationship: We want to deliver more than just good products. FIXTEST's customers can always count on friendly, qualified, and reliable services. Their requirements form the basis of our future success.

LOCAL FOCUS

It's our aim to cooperate with business partners and suppliers from our local region whenever possible. We put emphasis on short distances and personal contact.

SOPHISTICATED TECHNOLOGIES

It is one of our core objectives: to innovate by turning new ideas of a motivated team into products and solutions – to use fantasy, strong will, and latest technology while considering our internal guidelines concerning the environment.

Innovative solutions, developed according to the needs of our customers, continuously accompany our corporate history. We have been first in Europe to use deep-drawn barrels and since then our customers benefit from increased reliability of spring contact probes. Just another example of customer-oriented developments is our patented switching probe with LED status indicator, used for testing multi-pin plugs, not to mention the new nano-coating for contact surfaces with improved characteristics.
Countless projects have been successfully implemented combining customer requirements with our ideas and long-term experience. The open-minded, straightforward and friendly contact with customers and interested parties, which repeatedly comes up with suggestions and advancements, is our daily business.

QUALITY

To meet your and our expectations we put considerable emphasis on the quality of our products. Fields of application like medical engineering place high demands on material quality, service life time, and reliability of the contact probes. Long-term partnerships with our suppliers raises trust and experience for both parties.
Certification according to ISO 9001:2008 and our comprehensive quality management system make sure that highest-level quality guidelines are met.

ENVIRONMENT

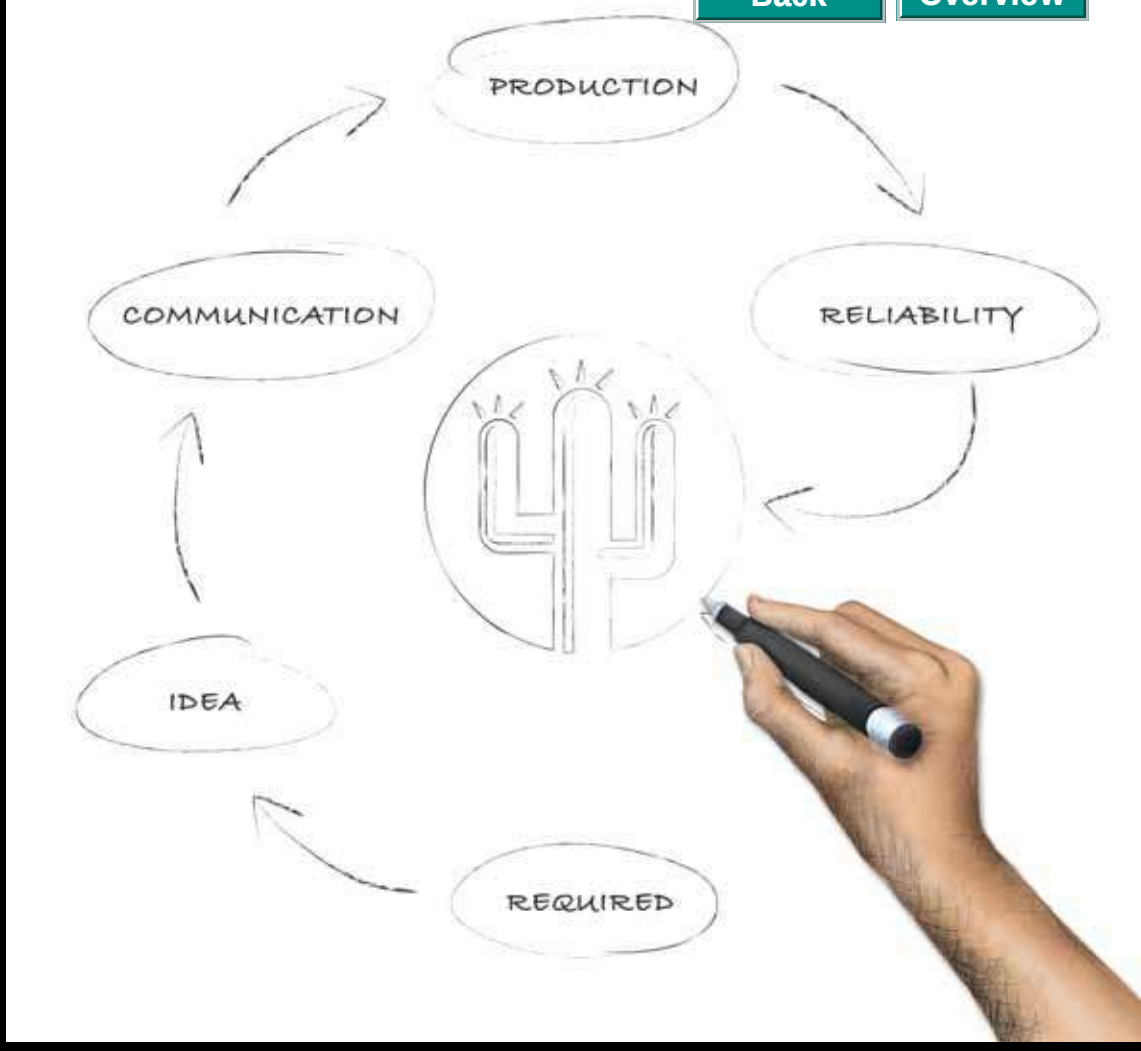
The prospect of our company building illustrates our values regarding environment: Preserving environment is often in the forefront of our decision making. During the planning period of our corporate building which we took over in 2007, we have put some extra focus on resource-conserving and environmental aspects. We utilise the power of the sun to heat building and water. Modern construction materials – mainly from renewable resources – assure efficient thermal insulation and a geothermics-based ventilation installation with heat exchanger provides a comfortable indoor climate.
Our certification according to ISO 14001:2009 emphasises our efforts to permanently check and improve the environmental performance of our enterprise.
Participating in the Dual System "Der Grüne Punkt" we make sure that our packaging materials will be fed into recycling systems. Thus raw materials and resources are conserved and the emission of greenhouse gases is reduced.

Our nano technology based surface coating XXLonglife has been specially developed for the requirements of lead-free soldering, enabling our customers to trouble-free use this environmentally friendly production technology.

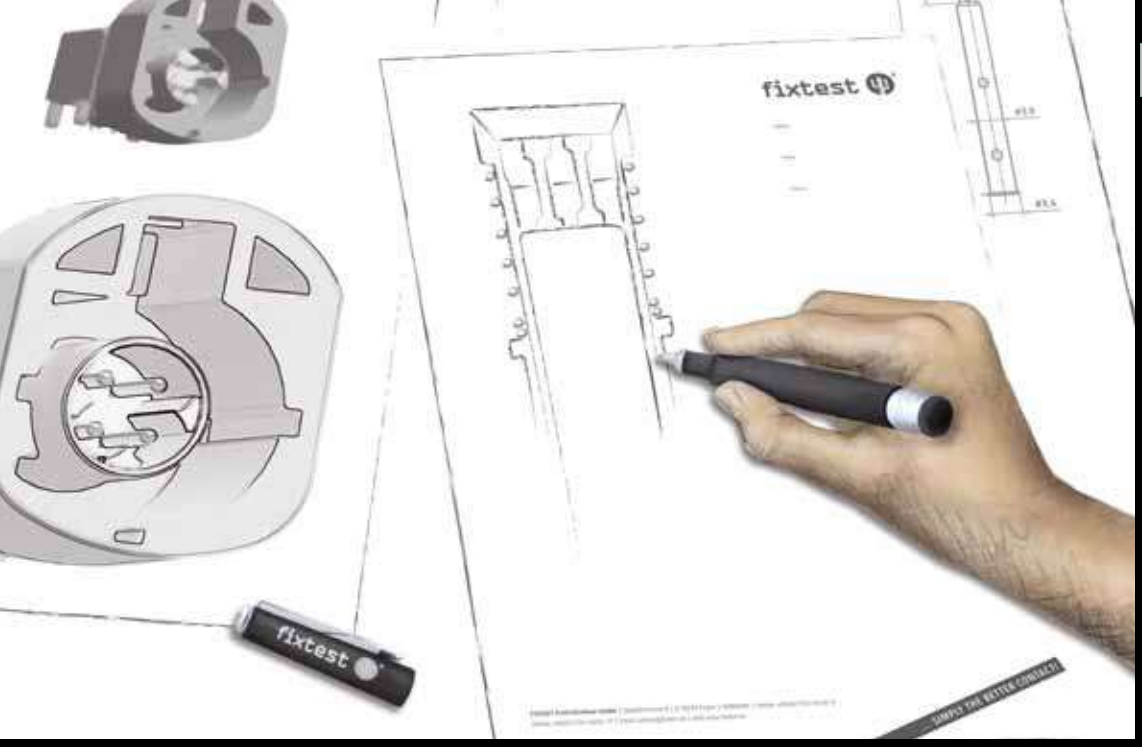
SAFETY AND SECURITY

Apart from the sectors QUALITY and ENVIRONMENT, FIXTESTs combined management system also covers the SAFETY aspect with emphasis on the current topics of secured supply chain. We continuously forge ahead and dynamically extend our comprehensive management handbook with new topics to become part of our daily business life.

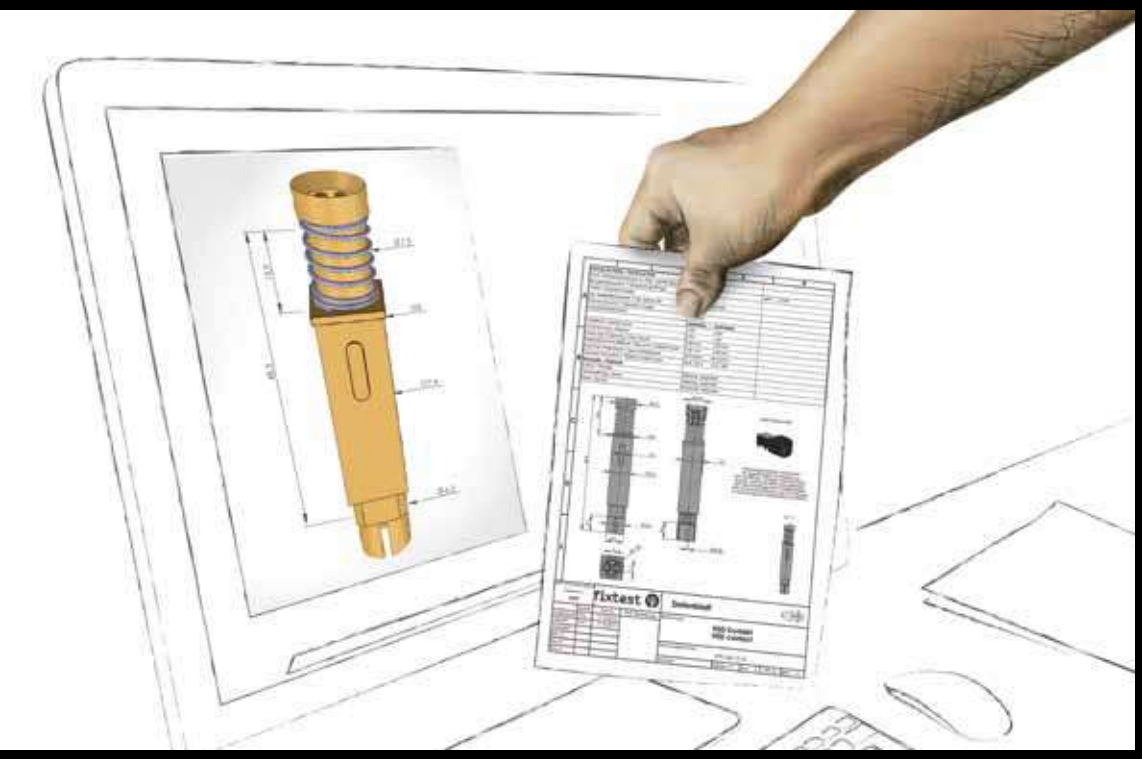
The milestones of a successful project: Our know-how, our creativity and our service ensure the reliability of our, and thus your products.



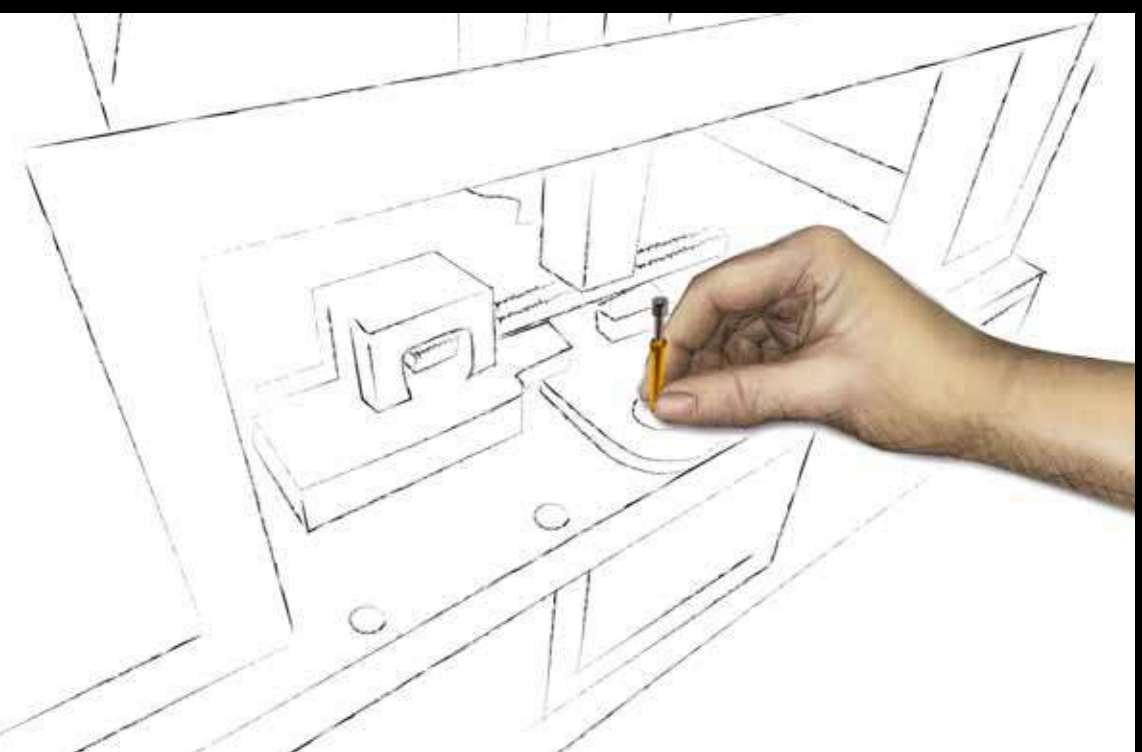
Good advice and reliable agreements are the basic requirements that you as a customer - regardless of what sector of the electronics industry to come - expect from us. We will not disappoint you! Call us at +49 7733 5056-0



You name the task - we provide the solution! The design and development is always at the beginning of each new project. Experience from 30 years of successful business development coupled with the use of modern technologies provide the basis for innovation.



Design, construction, documentation - the close contact with our customers and suppliers allows us fast development times.



Personal service is our pursuit, variety and market proximity our trademark. Semi-automated production processes allow us a high degree of flexibility to adapt to your test application.

SPRING CONTACT PROBES

FIXTEST offers a comprehensive product range of spring loaded contact connections. The traditional focus is on test engineering. For this field of application we offer contact probes for the following subcategories:

- Test contacts for bare-board and loaded board test (ICT/FCT)
- Rigid interface-pins and pin blocks
- Fine-pitch contacts for hybrids and semiconductors
- Switch probes and pneumatically actuated contacts
- High-current probes
- Threaded spring contact probes, for instance used in cable harness test
- Coaxial and radio-frequency (RF) spring contacts

SPECIAL INTERCONNECTING SOLUTIONS

- Battery probes used in battery chargers, docking stations or interface solutions for mobile devices
- Kelvin contacts for four-wire resistance measurement

In addition, we provide accessories and tools for spring contacts and test engineering.

CUSTOM-MADE PRODUCTS

Custom-made articles and new products are designed and manufactured in close cooperation with our customers. Our technical staff will be glad to advise you in a personal conversation. Our service does not necessarily stop after the spring probe itself. We would also be happy to be at your service with design, manufacture and assembly of complete contact fixtures. Confront us with your entire problem before running into a headache for singular solutions.

TESTING DEVICES

In the area of test engineering we develop and assemble test setups and test fixtures and interfaces tailor-made for your applications. Particularly when the area of standard solutions is left behind we like to come into play. Be it a high voltage test jig, a workpiece support system with integrated contacting or a test socket for smallest fine pitch terminals - call our consultancy team today!

SERVICES

FIXTEST offers additional services for the manufacture of test subassemblies and entire test rigs:

- Drilling and milling on specialized machinery
- Prototyping
- Placement, soldering, and assembly of spring contacts or sub-assemblies
- Measurements and quality checks with measuring microscopes

MAINTENANCE PRODUCTS

We supply care and cleaning products from CAIG Laboratories, Inc. which protect the surface of contacts and reliably improve signal transmission. Contaminations and oxides will be removed, cleaned surfaces will be long-term protected.

LED COLOUR VERIFICATION

For testing of LEDs on board assemblies we offer the FINN™ LED sensors from Test Coach Corp. You can use different types of FINN™ sensors for fast and easy checks of hue and value of your assembled LEDs.

PRODUCT CODE

THE STRUCTURE OF FIXTEST ARTICLE NUMBERS

How to select the right probe for your application:

Step 1:
Determine the ideal contact diameter based on the test point pitch of the points you want to probe. Often the total length and/or the travel of the probe is of importance. Rule of thumb: Always select the maximum diameter for the contact probe.

Step 2:
Decide whether you will use metric or imperial sized contact probes. Consider the probe travel requirements of your test fixture or jig, when selecting the contact probe. The metric types provide a fixed stop which is less error-prone during maintenance work. The imperial types are more flexible during installation. This could be regarded as advantage – or disadvantage. If you seek advice – just call us. We will be glad to assist you any time.

Step 3:
Use the summary table to select the probe series that best suits your criteria. From the catalogue page of the chosen series you can select head style and spring force. Application examples on page 11 might be helpful to make your decision. If you feel lost due to the enormous type variety: we will be glad to give advise. We can also "translate" the code numbers of compatible brands for you. Those codes could be found e.g. on the spare parts list of your test equipment.

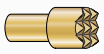
Step 4:
The corresponding code number can be found besides each head style illustration. The code numbers end in a "xx" wildcard. Often you can chose among different spring forces.
Replace "xx" with the code of the selected force.

If additional options are available for the respective series, they will be described and can be chosen by adding the option code to the code number.

Don't forget to chose the optional **XXLonglife-Nano-Coating** which we offer for many products. Contacts with this option have much longer service life and – in the long run – provide more reliable contacting than conventional products. Add a capital „**X**" directly after the "series" part of the code number to select this option.

Step 5:
Choose the appropriate receptacle. Normally test probes are inserted into receptacles which are wired by soldering, crimping, or wire-wrapping. Benefit: The wiring stays untouched when a spring probe must be replaced. Finally choose your preferred wiring technique.

EXAMPLE FOR THE COMPOSITION OF THE ORDER CODE NUMBER



Ø 1,50	100	X.	08.	15.	xx	SP
	a.		b.	c.	d.	e.
Head style illustration	Head diameter	Series	XXLonglife-Option	Head style code number	Head diameter (rounded value)	Rated Spring force in dN	Additional option, if available

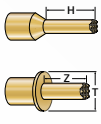
EXPLANATIONS AND NOTES

This order number coding system doesn't apply for all articles. e.g. battery probes with FK numbers are excluded.

b. Head styles made of steel start with an extra leading „1". Example: Serrated, CuBe: 08; Serrated, steel: 108

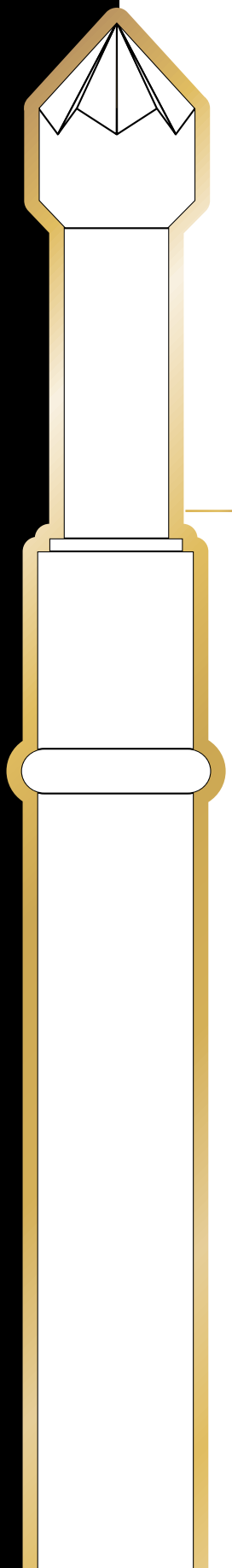
d. Select desired spring force and replace „**xx**" by the value from the selection table.

e. Extra Option
Some series offer additional options which are described in the explanatory text of the series. Add this code here.



The values for **H**, **Z** and **T** are given in the product numbers in hundredths of a millimeter.

Example: **20.08.23Z050T310**
Z = 0,50 mm; **T** = 3,10 mm



XXLONGLIFE-NANO-COATING.
OUR SPECIALTY.

Contamination, wear, and corrosion are serious problems for the use of contacts in various electronic devices or for test purposes of assemblies and components.

Particularly the in-circuit-test of board assemblies is faced with problems which arise mainly from tin or tin oxide particles which tend to adhere to the contact probe. Lots of contact malfunctions (false alarms) and a reduced service life of the test probes are direct consequences.
To solve this problem for our customers, we partnered with an institute for nano technology to create the contact surface coating XXLonglife.

The XXLonglife advantage: Compared with conventional contacts, corrosion and wear are avoided or at least massively delayed. Service life of the spring contacts is largely extended. Annoying and costly maintenance work can be reduced. Production expenses are lowered and downtime of the test equipment is significantly reduced.
The XXLonglife coating is available for many of our products. Information is provided on the respective product pages.

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CONVINCING FEATURES OF OUR NANO-COATING FOR CONTACT SURFACES

Our nano-coating is the ultimate solution to provide the spring contact head with a dirt-repellent and hardened surface. Further more, friction is reduced and wear is lowered.

- Prolonged service lifetime of the contacts
- Reduced production costs for in-circuit-test
- Prolonged maintenance intervals of test jigs and inline systems
- Increased first pass yield rate
- Contacting malfunction is avoided
- Increased service life – lower costs

To specify the XXLonglife coating in your purchase order, simply add a capital „X“ after the series code segment.

Example:

75.07.12.15 > 75X.07.12.15

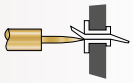
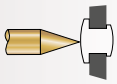
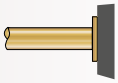
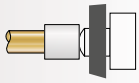
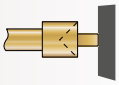
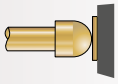
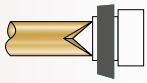
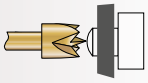
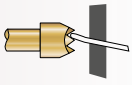
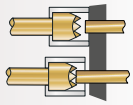
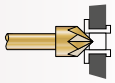
HEAD STYLES

HEAD STYLES FOR SPRING PROBES
FIELDS OF APPLICATION

The illustrated typical application examples shall assist you in making your selection. The numerical codes near the head style descriptions are the same as used in the order number codes which you will find on the following product pages.

Spring contact probes are being used mainly for the test of loaded or unloaded boards in electronics (bare board test, MDA test, In-Circuit-Test, Functional Test).

Selection of the best suiting head style depends on several factors. Particularly the use of lead-free solder products imposes high requirement levels on the contact elements for testing board assemblies. Flux residues or other contaminations on the device under test impede reliable contacting with traditional methods. Special head styles or application specific contact probes can lead a way out

No.	Head Style		Main field of application
101	**Flex-Needle** Steel		Long, cut, irregular shaped component pins. Highly resistant against radial force. Aggressive and flexible, penetrates insulating coatings.
102	**Sharp Tip** Steel		Similar range of application compared with the flex needle, but not flexible and with better electrical characteristics.
(1)03	**Flat**		For sensitive contact surfaces (gold plated pads), edge connectors, and clean surfaces which must not be damaged (indented). Easy to clean.
203	**Plastic Flat Head** non-conductive		Mainly used for switch probes and seating pins which have only mechanical modes of operation and should be non-conductive.
04	**Concave Head** Cup		Connector pins, wire-wrap posts, long component terminals. Self-centering.
05	**Spherical Round**		Gold plated pads, edge connectors. Leaves no marks or indentations.
06	**4-point Crown**		Convex solder pads, short component leads, solder points, general purpose areas. Universal use.
07	**Crown with Centre Tip** Centre Tip is protruding		Component leads, wire-wrap posts, solder points of any shape. Universal use.
08	**Serrated Tip** typically composed of nine pyramids		Component leads, terminal strips, screw heads, general purpose areas.
308	**Serrated** with protruding plastic sleeve		Detecting the presence of component leads. Missing pins or too short pins are not contacted.
09	**6-sided Chisel 90°**		Open vias (plated through holes), breaks through contaminations. Certain terminal strips.

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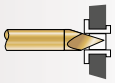
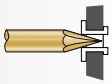
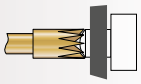
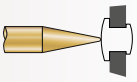
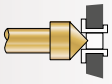
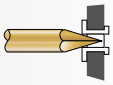
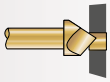
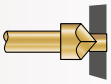
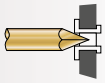
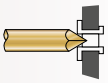
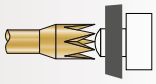
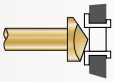
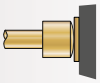
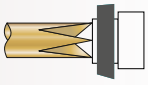
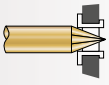
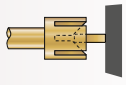
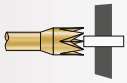
10	**3-sided Chisel 30°** Tip shows up with 30° when rotated		Open vias on bare boards and loaded boards. Interface contacts.
12	**6-sided Dagger**		Heavily flux-contaminated pads (long time after soldering), soldered or open vias.
13	**8-point Crown** self cleaning		Good self-centering, for heavily contaminated component leads (after wave soldering) and pads of suitable size.
14	**Rounded Sharp Tip 60°**		Similar to Sharp Tip, but with less penetration and indentation marks. Concentrates the contact force on a point.
15	**Conical Tip 90°**		Open, clean vias, doesn't leave marks or indentations. Partly suitable for female connector contacts.
118	**Dagger** also called Spear, 4-sided		Heavily flux-contaminated pads (long time after soldering), soldered or open vias. This is the most common head-style in ICT fixtures.
20	**3- sided Chisel** Tip shows up with 90° when rotated		Open vias, applications similar to style 15, but with three edges. Good contact quality in interfaces with hollow counter-parts. Self-centering.
22	**4-sided Chisel**		Open vias, applications similar to style 20, however with four edges.
24	**Spade** also called passive dagger		Open vias (plated through holes), breaks through contaminations. Less aggressive than style 118.
26	**Spade** also called passive dagger		Open vias (plated through holes), breaks through contaminations. Certain terminal strips. Similar to type 24, but more obtuse angle.
27	**Crown with Centre Tip** Centre Tip has same length		Component leads, wire-wrap posts, solder points of any shape. Universal use. Similar to type 07, centre-tip has same length as crown tips around.
30	**3-sided Chisel** Tip shows up with 106° when rotated		Large open vias in Bare Board Test. Only available in series 29.
35	**Lentil Head**		Surface protecting contact on pads and foil. Very common on Battery Probes and slip ring contacts.
46	**Self cleaning 4-point Crown**		Convex solder pads, short component leads, solder points, general purpose areas. Universal use. Similar to type 06, but self cleaning.
49	**6-sided Chisel with Collar**		Open vias (plated through holes), breaks through contaminations. Certain terminal strips
61	**Cross-slotted Concave Head** self cleaning		Connector pins, wire-wrap posts, long component terminals. Self-centering. Similar to type 04, but more aggressive because of additional inner edges and self-cleaning by removal ducts.
162	**5-point Crown** Steel		Universal shape. Due to odd-numbered points at least one point makes contact, even with bar-shaped contacts.

In addition to the above mentioned examples a broad range of special head styles is available. We will be happy to assist you in selecting the suitable head style for your application. Many head styles are optionally available as steel type. In such cases the code number begins with a 1, for instance 146 instead of 46.

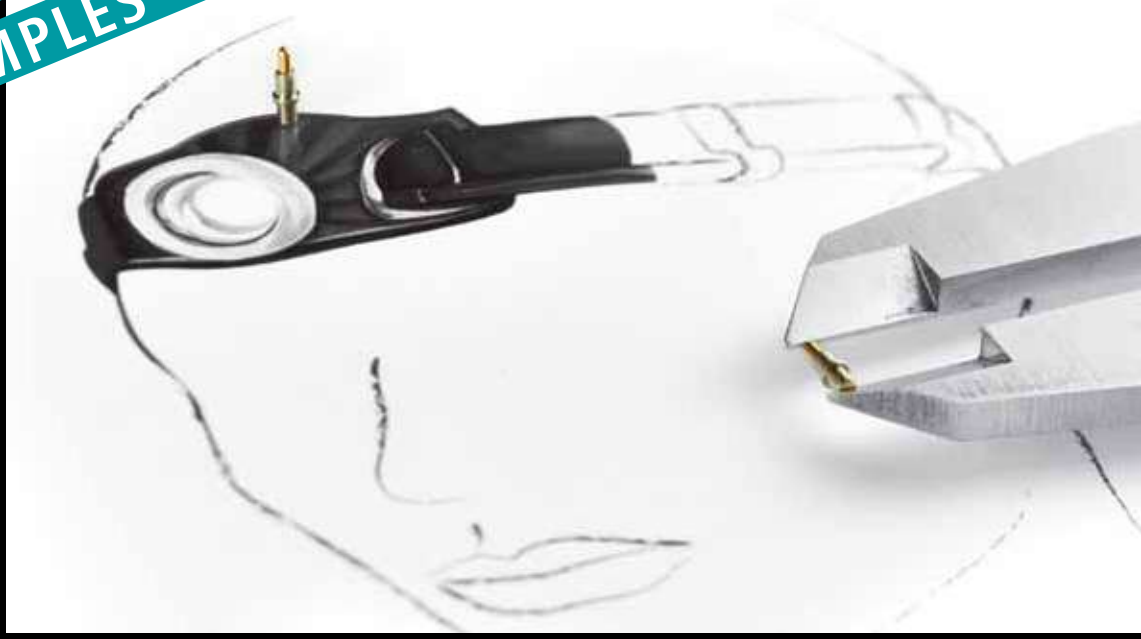
ICT / FCT

The fields of In-Circuit Test and Functional Test is the origin of the spring contact technology for almost 50 years - and still an important part of what we do.
We offer international standards of great diversity.
But also for special solutions, we are open and happy to help you!

AUTOMATION

Whether as a connecting element in the interface of changeable robot grippers or in the power of supply rail-guided transport systems and workpiece carriers - the spring contact impresses with its simple and insensitive handling.

APPLICATION EXAMPLES



SPORTS AND LEISURE

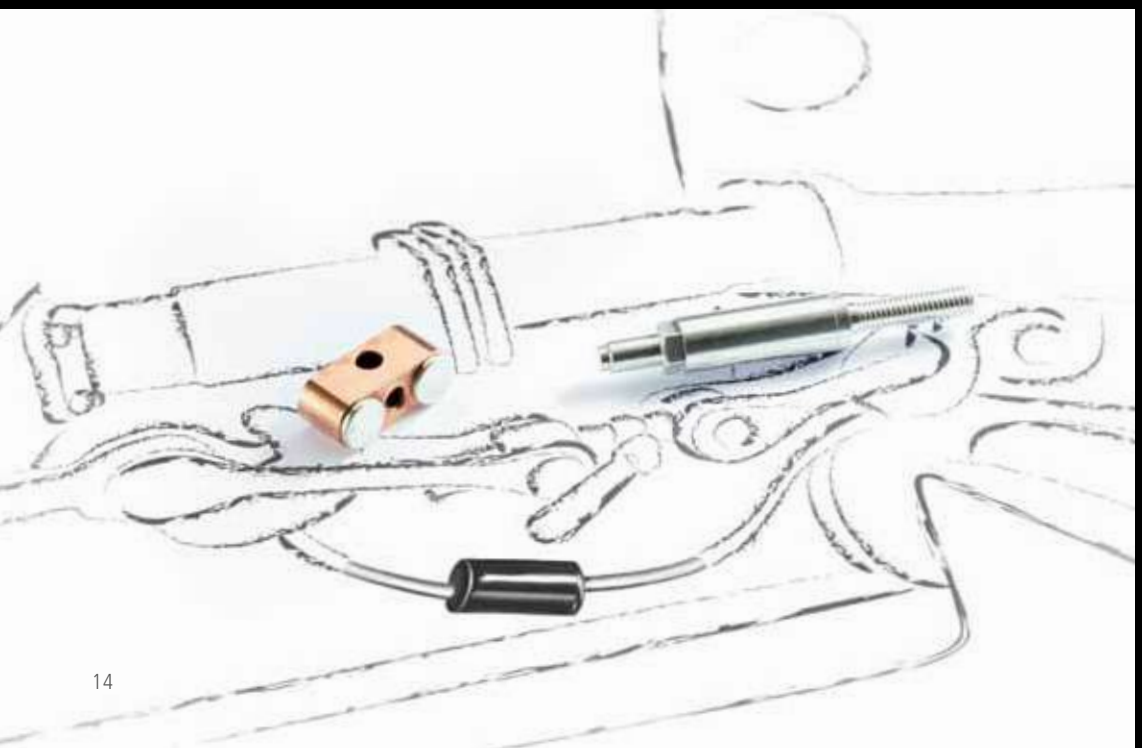
Modern battery technologies enable more and more mobile devices for sports and leisure. The use of high-performance LEDs is just one of many examples of spring contacts in outdoor equipment, where for the charging interface our products come into play.

RADIO AND TELE-COMMUNICATIONS

In mobile communications, in addition to the power supply and signal transmission RF antenna terminals are relevant.

MEDICAL TECHNOLOGY
Wireless mobile devices are used more and more in medical practice and the operating room. The power supply of appliances and instruments reliably works with our spring contacts.

ELECTRICAL APPLIANCES
Household appliances, white goods, but also cameras and gadgets are typical application areas for our resilient contacts „Made in Germany".



HIGH CURRENT
Where really high current flows accordingly durable contact solutions are demanded. Our high-power department will be waiting for with compelling products.

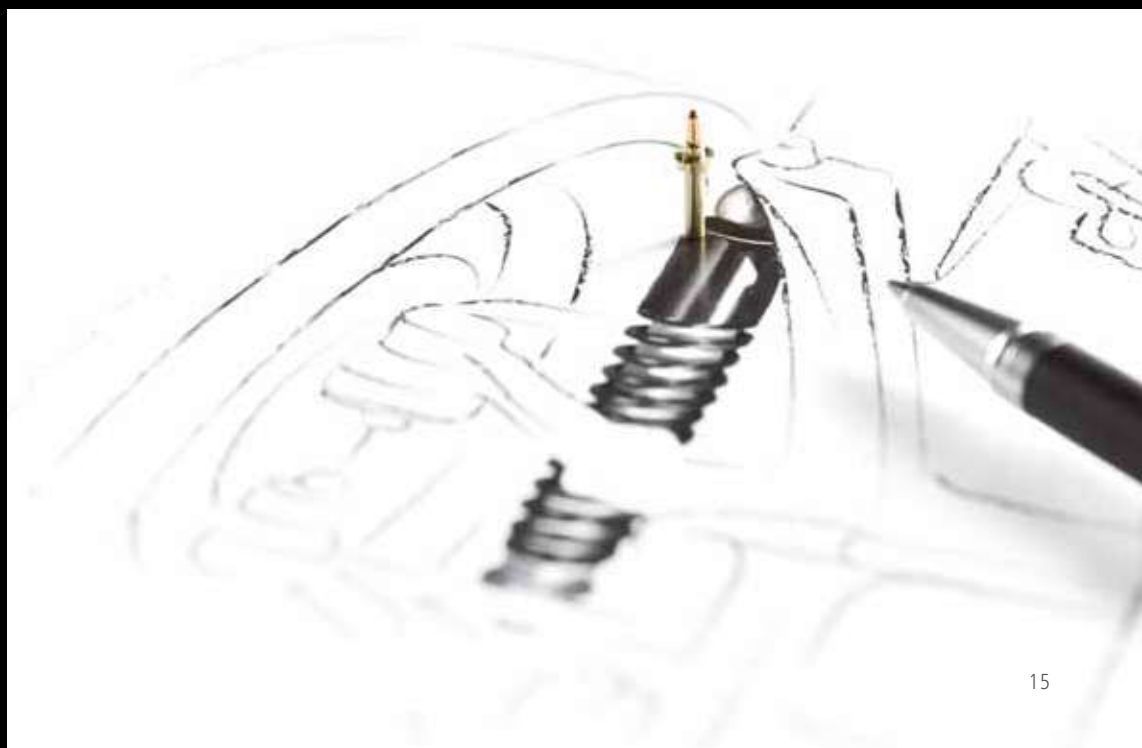
APPLICATION EXAMPLES

VEHICLES AND MOBILITY

Electric mobility is the magic word of this decade. The spectrum of electrically operated vehicles ranges from the car over Pedelecs and e-bikes up to the wheelchair with electric power assistance. In the battery box our contacts care for durable and reliable operationduring the move.

AUTOMOTIVE

Sometimes amazing where spring contacts are found throughout the vehicle. Latest technologies are changing the future - and with it the spring contacts of FIXTEST.



ICT / FCT TEST PROBES

ICT / FCT TEST PROBES

In-circuit-test (ICT), manufacturing defects analysis (MDA), and functional test (FCT) are the most widely used test methods for testing electronic board assemblies. Each of these test methods has its own limits regarding test coverage and fault detection/diagnosis. Therefore it makes sense to combine different test methods. In all cases a test jig or fixture is required which uses spring contact probes to connect the unit under test (UUT) or device under test (DUT) with the test equipment.
In this chapter you will find the most common series/styles for this field of application. In most cases, they will be compatible in size with spring contacts from other manufacturers on the international market. We would be glad to assist you in translating other manufacturer's order codes into compatible FIXTEST codes.

Imperially sized test probes (inch-types)
Grid spacing (centre-pitch) in board design – and therefore also in test engineering – is widely dominated by the inch based imperial measurement unit system. So US manufacturers have developed sizes for contact series which are oriented towards common standard sizes of drill bits and other tools in the United States. Many of these designs are spread around the world today and have also become standard in Europe. We have been offering imperial sized series for a long time and continuously broaden the range. However, there are arguments for the selection of the best suiting measurement system which should be considered. See a detailed discussion of the topic "imperial or metric" in the handbook that you find on our website.

Imperial Series	Page
07	19
14	22
15	23
18	26
21	31
26	36
27	37
28	38
29	32
071	20
75	27
100	33
101	35
107	18
108	18
125	35
141	21
115	24
151	24
751	28
752	29
754	29
V75X	39
V100X	39

Metric series
starting at page 40

Back

Overview

Series 107 / 108

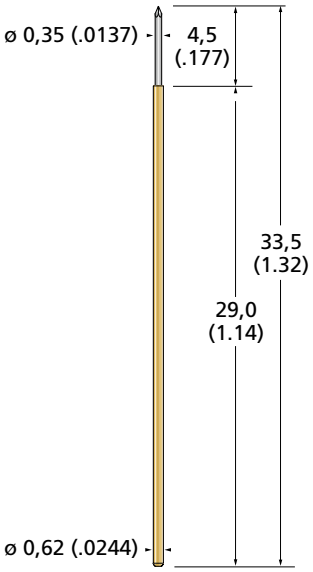
Technical Data

Overall Length	33,5 / 35,90 mm
Minimum Centre Spacing	1,00 mm
Maximum Travel	4,50 / 6,90 mm
Working Travel	2,20 / 4,60 mm
Temperature Range from	–45°C
Up to	+120°C
Typical Resistance	50 mΩ
Current Load rated/max.	1,0 / 1,5 A

Materials

Plunger	Steel, gold plated
Barrel	Brass, gold plated
Spring	Music wire, gold plated

Series 107



Spring Force (xx)

Preload	Rated Force	Code xx
0,4 N	0,9 N	09

Ø 0,35	107.123.04.09
Ø 0,35	108.123.04.09
Ø 0,35	107.126.04.09
Ø 0,35	108.126.04.09
Ø 0,60	107.126.06.09
Ø 0,60	108.126.06.09

For XXLonglife-Nanocoating order as 107X / 108X

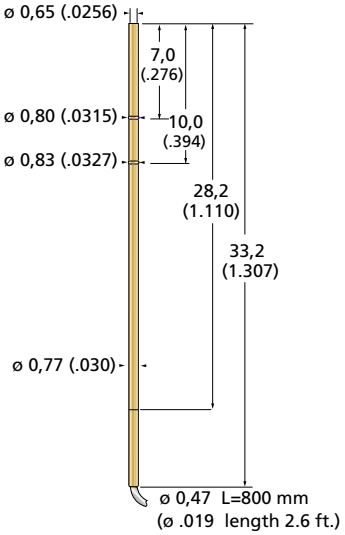
The Series 107 and 108 use the receptacles of the series 108.

Series 107 is shorter and has a better pointing accuracy, suitable even for small test pads ≥ 0.6 mm. The Series 108 can be combined with other standard series for larger grid which have the same stroke length. Test pads with min. ≥ 0.70 mm in diameter are recommended.

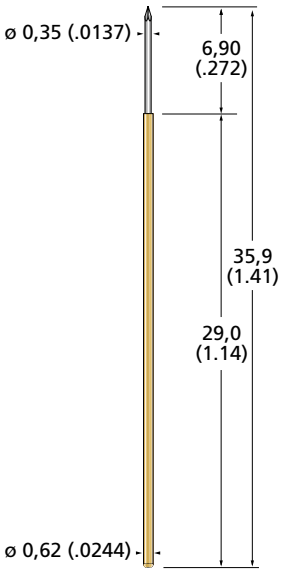
More head style variants available on request.

S 108.02-CD

AWG30 wire pre-attached

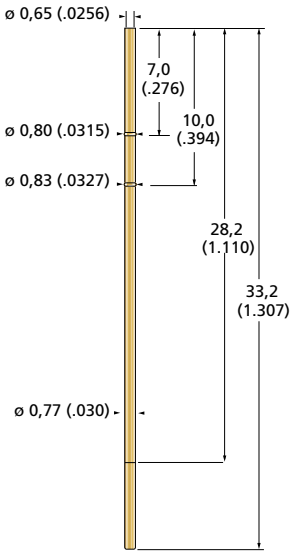


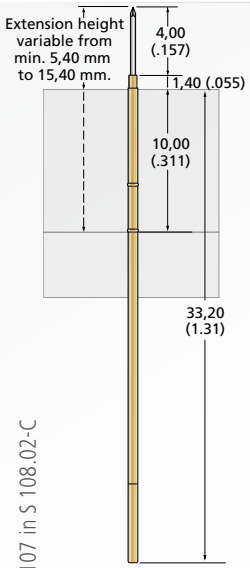
Series 108



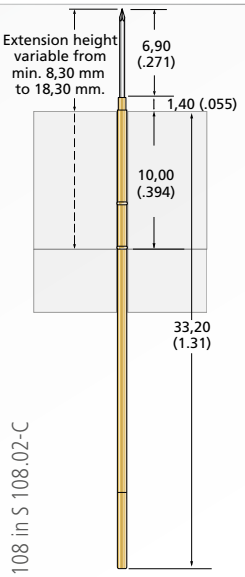
S 108.02-C

Open Crimp End





Series 107 in S 108.02-C



Series 108 in S 108.02-C

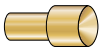
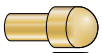
FIXTURING EXAMPLE

ICT/FCT TEST PROBES SERIES 107 / 108

Pitch	Max. Travel	Working Travel	Overall Length	Max. Current Load
≥ 1,00 mm ≥ 39 mil	4,50 / 6,90 mm	2,20 / 4,60 mm	33,50 / 35,90 mm	1,5 A

Spring Force (xx)

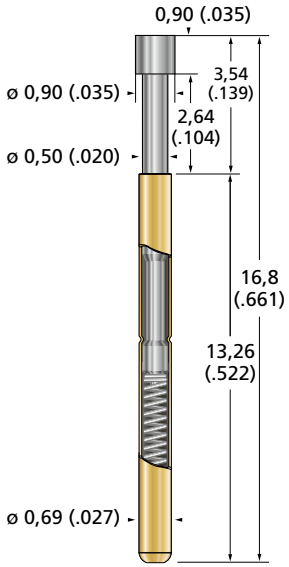
Preload	Rated Force	Code xx
0,15 N	0,6 N	06
0,30 N	1,0 N	10

	Ø 0,50	07.02.05.xx
	Ø 0,50	07.04.05.xx
	Ø 0,90	07.04.09.xx
	Ø 1,40	07.04.14.xx
	Ø 0,50	07.05.05.xx
	Ø 0,90	07.05.09.xx
	Ø 0,90	07.08.09.xx
	Ø 0,90	07.15.09.xx
	Ø 0,90	07.20.09.xx

For XXLonglife-Nanocoating order as 07X

More head style variants available on request.

Series 07



Series 07

Technical Data

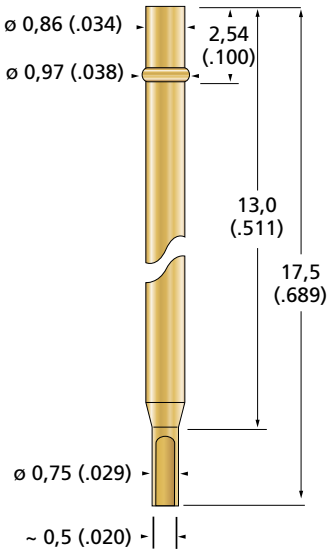
Overall Length	16,8 mm
Minimum Centre Spacing	1,27 mm
Maximum Travel	2,54 mm
Working Travel	1,70 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	25 mΩ
Current Load rated/max.	2,0 / 3,0 A

Materials

Plunger	CuBe hardened, gold plated
Barrel	Cu-alloy, gold plated
Spring	Music wire, gold plated or silver plated

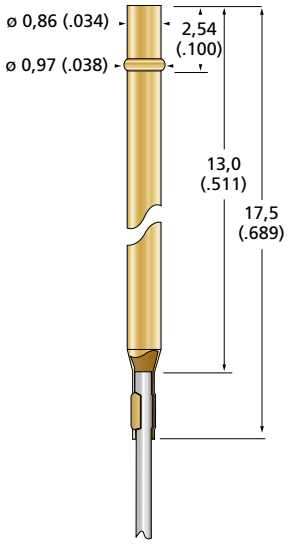
S 07.00-L

Solder Cup



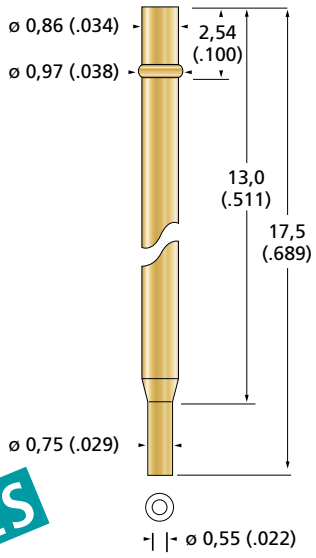
S 07.00-CD

Pre-attached Wire

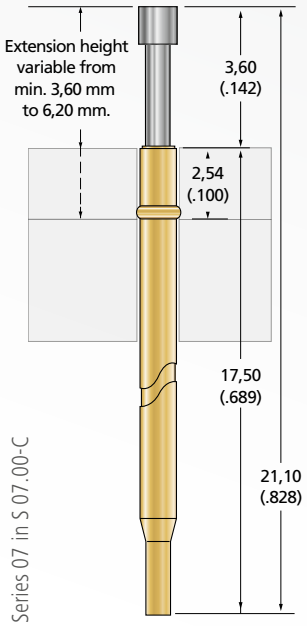


S 07.00-C

Open Crimp End



FIXTURING EXAMPLE



Series 07 in S 07.00-C

ICT / FCT TEST PROBES

Max. Current Load 3,0 A
Overall Length 16,80 mm
Working Travel 1,70 mm
Max. Travel 2,54 mm
Pitch ≥ 1,27 mm ≥ 50 mil

Series 071

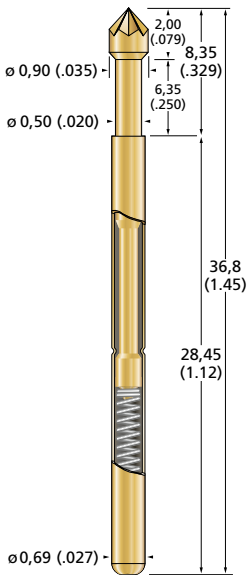
Technical Data

Overall Length	36,8 mm
Minimum Centre Spacing	1,27 mm
Maximum Travel	6,35 mm
Working Travel	4,20 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	25 mΩ
Current Load rated/max.	2,0 / 3,0 A

Materials

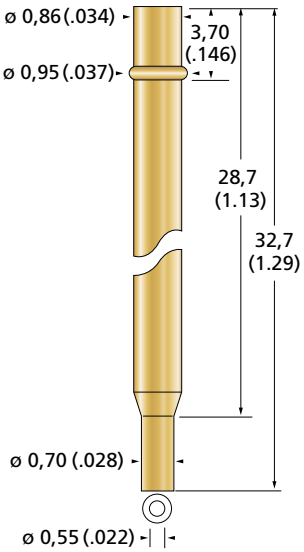
Plunger	CuBe hardened, gold plated
Barrel	Cu-alloy, gold plated
Spring	Music wire, gold plated

Series 071



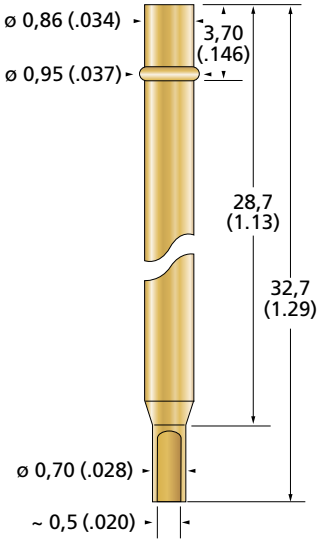
S 071.00-C

Open Crimp End



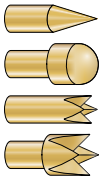
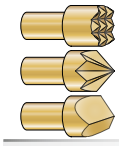
S 071.00-L

Solder Cup



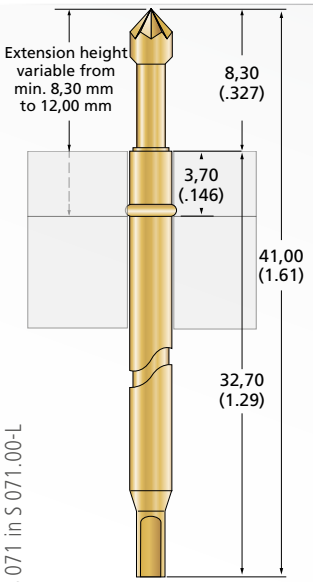
Spring Force (xx)

Preload	Rated Force	Code xx
0,2 N	0,6 N	06
0,3 N	1,0 N	10

	Ø 0,50	071.02.05.xx
	Ø 0,90	071.05.09.xx
	Ø 0,50	071.06.05.xx
	Ø 0,90	071.06.09.xx
	Ø 0,90	071.106.09.xx
	Ø 0,90	071.08.09.xx
	Ø 0,90	071.09.09.xx
	Ø 0,90	071.20.09.xx

For XXLonglife-Nanocoating order as 071X

Having the same length and travel the series 071 can be used in combination with the series 100 (for 2.54 mm pitch) and 75 (for 1,90 mm pitch).



Series 071 in S 071.00-L

FIXTURING EXAMPLE

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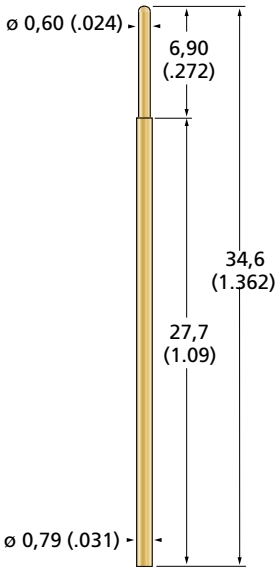
Spring Force (xx)

Preload	Rated Force	Code xx
0,4 N	1,0 N	10
0,4 N	1,5 N	15
0,45 N	2,0 N	20

	Ø 0,60	141.102.06.10
	Ø 0,60	141.05.06.10

For XXLonglife-Nanocoating order as 141X

Series 141



Series 141

Technical Data

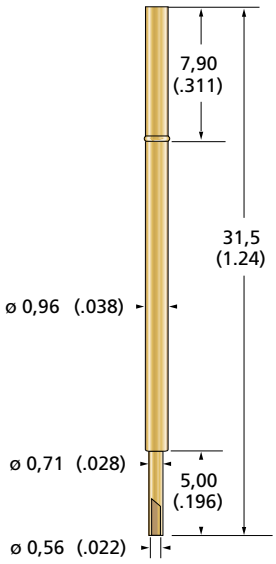
Overall Length	34,6 mm
Minimum Centre Spacing	1,27 mm
Maximum Travel	6,35 mm
Working Travel	4,20 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	25 mΩ
Current Load rated/max.	2,0 / 3,0 A

Materials

Plunger	CuBe or steel, gold plated
Barrel	Cu-alloy, gold plated
Spring	Music wire, gold plated or silver plated

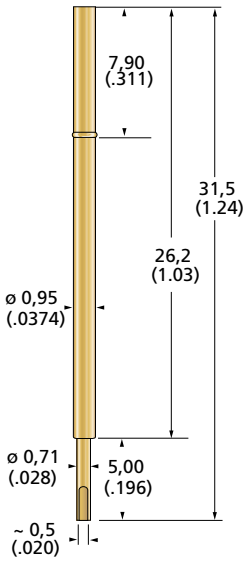
S 141.00-C

Open Crimp End



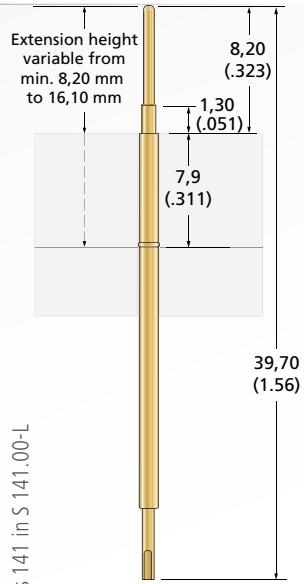
S 141.00-L

Solder Cup



FIXTURING EXAMPLE

Series 141 in S 141.00-L



Max. Current Load	3,0 A
Overall Length	34,60 mm
Working Travel	4,20 mm
Max. Travel	6,35 mm
Pitch	≥ 1,27 mm ≥ 50 mil

Series 14

Technical Data

Overall Length	40,3 mm
Minimum Centre Spacing	1,27 mm
Maximum Travel	3,50 mm
Working Travel	1,40 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	25 mΩ
Current Load rated/max.	2,0 / 3,0 A

Materials

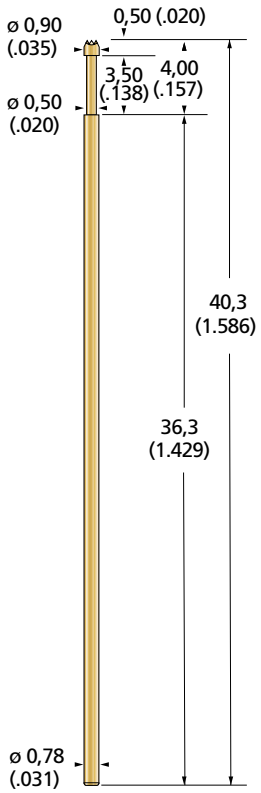
Plunger	CuBe or steel, gold plated
Barrel	Cu-alloy, gold plated
Spring	Stainless steel / Music wire, gold plated

The Series 14 and 15 are nearly identical and differ only in Overall Length and travel. This will affect the combinations with other series for larger grid of mixed-equipped adapters. The Series 14 combined with Series 751 (for 1,90 mm pitch) and Series 21 (for 2.54 mm pitch).

The Series 14 used Receptacles Series 15.

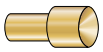
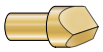
An overview of the receptacles and installation examples you find on page 25.

Series 14

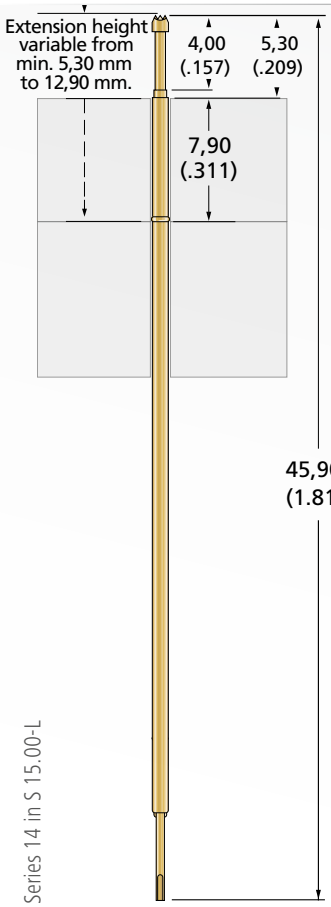


Spring Force (xx)

Preload	Rated Force	Code xx
0,25 N	1,0 N	10
0,38 N	1,5 N	15
0,45 N	2,0 N	20

	Ø 0,50	14.102.05.xx
	Ø 0,90	14.04.09.xx
	Ø 0,50	14.05.05.xx
	Ø 0,50	14.106.05.xx
	Ø 0,90	14.08.09.xx
	Ø 0,50	14.10.05.xx
	Ø 0,90	14.10.09.xx
	Ø 0,50	14.118.05.xx
	Ø 0,50	14.123.05.xx
	Ø 0,50	14.126.05.xx
	Ø 0,50	14.165.05.xx

For XXLonglife-Nanocoating order as 14X



Series 14 in S 15.00-L

FIXTURING EXAMPLE

ICT/FCT TEST PROBES
SERIES 14

Max. Current Load	3,0 A
Overall Length	40,30 mm
Working Travel	1,40 mm
Max. Travel	4,00 mm
Pitch	≥ 1,27 mm ≥ 50 mil

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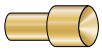
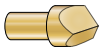
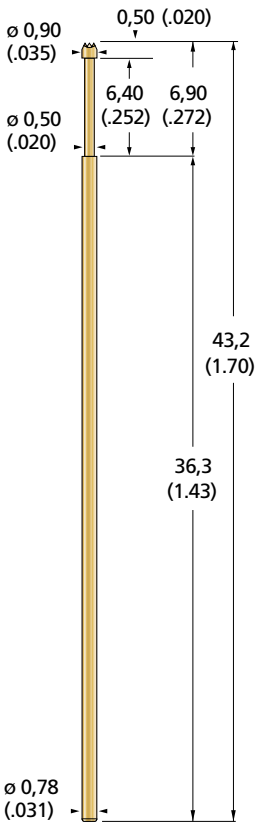
Spring Force (xx)

Preload	Rated Force	Code xx
0,15 N	0,6 N	06
0,25 N	1,0 N	10
0,38 N	1,5 N	15
0,45 N	2,0 N	20

	Ø 0,50	15.102.05.xx
	Ø 0,90	15.04.09.xx
	Ø 0,50	15.05.05.xx
	Ø 0,50	15.106.05.xx
	Ø 0,90	15.08.09.xx
	Ø 0,50	15.10.05.xx
	Ø 0,90	15.10.09.xx
	Ø 0,50	15.118.05.xx
	Ø 0,50	15.123.05.xx
	Ø 0,50	15.126.05.xx
	Ø 0,50	15.165.05.xx

For XXLonglife-Nanocoating order as 15X

Series 15



Series 15

Technical Data

Overall Length	43,2 mm
Minimum Centre Spacing	1,27 mm
Maximum Travel	6,40 mm
Working Travel	4,30 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	25 mΩ
Current Load rated/max.	2,5 / 3,0 A

Materials

Plunger	CuBe or steel, gold plated
Barrel	Cu-alloy, gold plated
Spring	Stainless steel / Music wire, gold plated

The Series 14 and 15 are nearly identical and differ only in Overall Length and travel. This will affect the combinations with other series for larger grid of mixed-equipped adapters. The Series 15 combined with Series 75 (for 1,90 mm pitch) and Series 100 (for 2.54 mm pitch).

An overview of the receptacles and installation examples you find on page 25.

Series 115

Technical Data

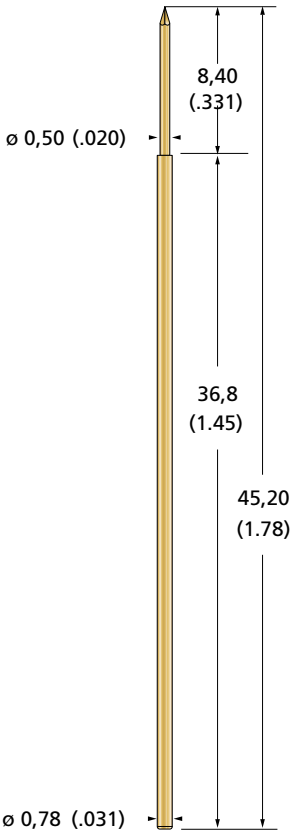
Overall Length	45,2 mm
Minimum Centre Spacing	1,27 mm
Maximum Travel	6,35 mm
Working Travel	4,30 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	25 mΩ
Current Load rated/max.	2,5 / 3,0 A

Materials

Plunger	Cu-alloy or steel, gold plated
Barrel	Cu-alloy, gold plated
Spring	Stainless steel / Music wire, gold plated

The Series 115 has an excess length of 2 mm in comparison with the standard series 15, which can compensate differences in the height profile of test points on a p.c.b. Both series use the same plug-in receptacles of Series 15. An overview is given on page 25.

Series 115



Spring Force (xx)

Preload	Rated Force	Code xx
0,25 N	1,0 N	10
0,38 N	1,5 N	15
0,45 N	2,0 N	20

	Ø 0,50	115.118.05.xx
	Ø 0,90	115.20.09.xx

For XXLonglife-Nanocoating order as 115X

Series 151

Technical Data

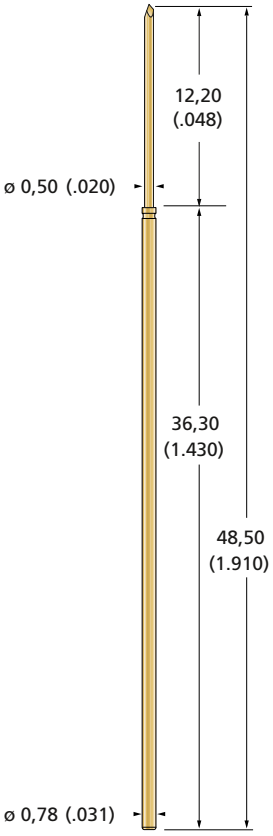
Overall Length	48,50 mm
Minimum Centre Spacing	1,27 mm
Maximum Travel	10,00 mm
Working Travel	8,00 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	20 mΩ
Current Load rated/max.	2,0 / 3,0 A

Materials

Plunger	CuBe or steel, gold plated
Barrel	Brass, gold plated
Spring	Music wire, gold plated

Long stroke type for two-stage adapters. The Series 151 uses receptacles of Series 15. For an overview, see page 25.

Series 151



Spring Force (xx)

Preload	Rated Force	Code xx
0,5 N	1,5 N	15

	Ø 0,50	151.106.05.xx
	Ø 0,50	151.110.05.xx

For XXLonglife-Nanocoating order as 151X

Max. Current Load 3,0 A
Overall Length 45,20 / 48,50 mm
Working Travel 4,30 / 8,00 mm
Max. Travel 6,35 / 10,00 mm
Pitch ≥ 1,27 mm ≥ 50 mil

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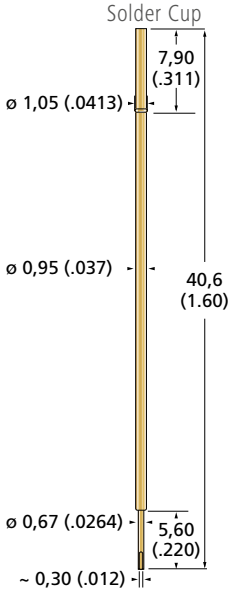
RECEPTACLES SERIES 14 / 15 / 115 / 151

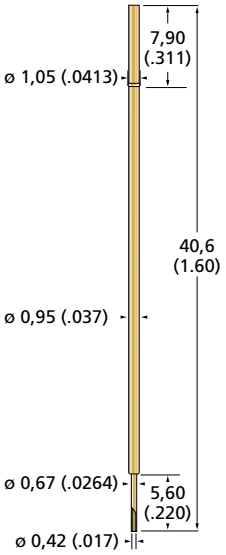
Receptacles of **SERIES 15** are also used for **SERIEN 14, 115** and **151**.

Receptacle verions **S 15.02-C** and **S 15.02-CD** feature two press-rings to improve straight alignment of the receptacles in the bore hole and thus optimize pointing accuracy of the spring contact tip. „CD" receptacle versions have pre-attached wire (standard length appr. 800 mm).

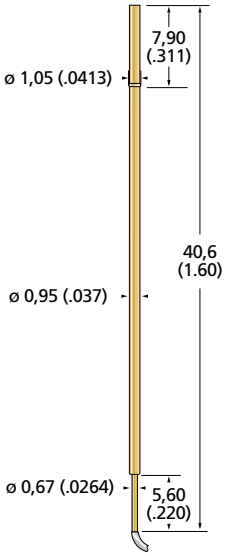
S 15.00-L
Solder Cup



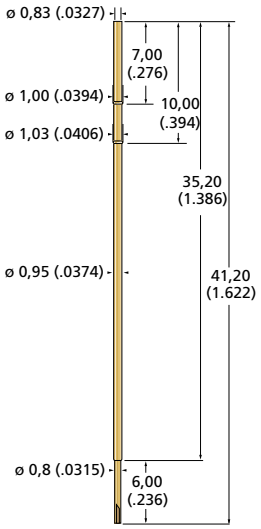
S 15.00-C
Open Crimp End

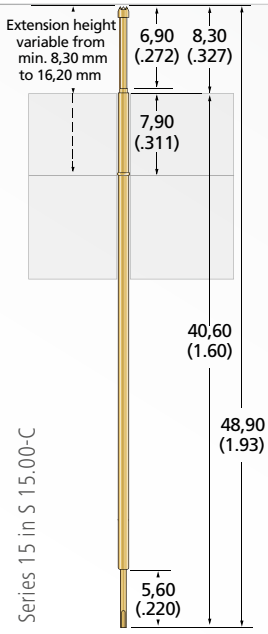


S 15.00-CD
Pre-attached Wire

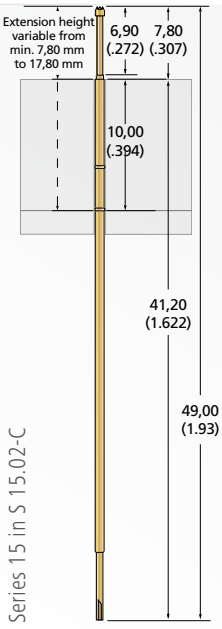


S 15.02-C
Open Crimp End



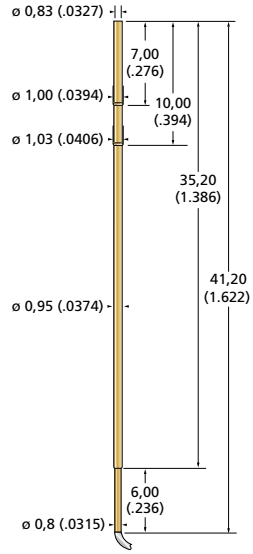


Series 15 in S 15.00-C



Series 15 in S 15.02-C

S 15.02-CD
Pre-attached Wire



FIXTURING EXAMPLE

Pitch ≥ 1,27 mm ≥ 50 mil

Series 18

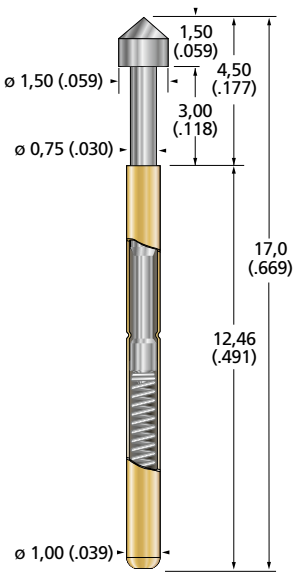
Technical Data

Overall Length	17,0 mm
Minimum Centre Spacing	1,90 mm
Maximum Travel	3,00 mm
Working Travel	2,00 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	30 mΩ
Current Load rated/max.	2,5 / 3,5 A

Materials

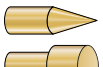
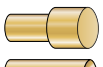
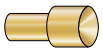
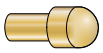
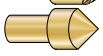
Plunger	Cu-alloy, gold plated
Barrel	Cu-alloy, gold plated
Spring	Music wire, gold plated or silver plated

Series 18



Spring Force (xx)

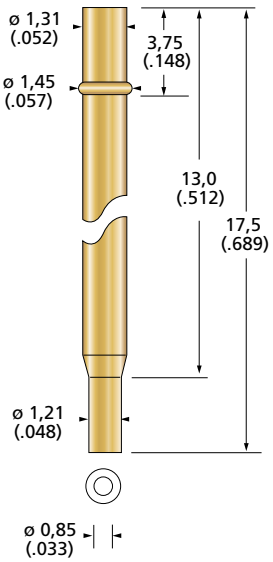
Preload	Rated Force	Code xx
0,3 N	0,8 N	08
0,4 N	1,4 N	14

	Ø 0,75	18.02.08.xx
	Ø 1,50	18.03.15.xx
	Ø 0,75	18.04.08.xx
	Ø 1,50	18.04.15.xx
	Ø 0,75	18.05.08.xx
	Ø 1,00	18.05.10.xx
	Ø 1,50	18.05.15.xx
	Ø 1,50	18.106.15.xx
	Ø 1,50	18.08.15.xx
	Ø 1,50	18.15.15.xx
	Ø 1,50	18.20.15.xx

For XXLonglife-Nanocoating order as 18X

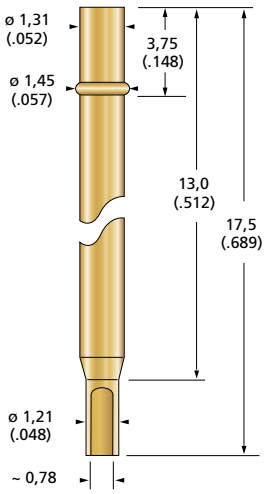
S 18.00-C

Open Crimp End



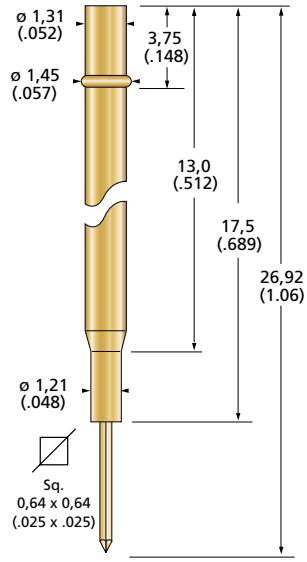
S 18.00-L

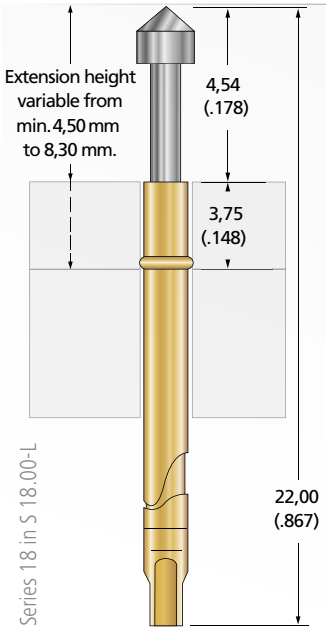
Solder Cup



S 18.00-W

Wire-Wrap-Post





Series 18 in S 18.00-L

FIXTURING EXAMPLE

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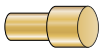
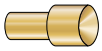
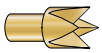
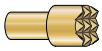
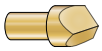
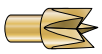
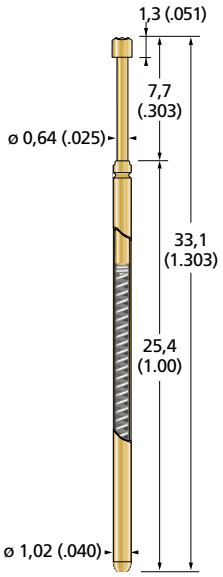
Spring Force (xx)

Preload	Rated Force	Code xx
0,3 N	1,0 N	10
0,4 N	1,5 N	15
0,8 N	2,0 N	20
0,7 N	2,5 N	25
0,8 N	3,0 N	30

	Ø 0,50	75.101.05.xx
	Ø 0,64	75.102.06.xx
	Ø 0,90	75.103.09.xx
	Ø 1,20	75.103.12.xx
	Ø 1,20	75.04.12.xx
	Ø 0,64	75.05.06.xx
	Ø 0,64	75.106.06.xx
	Ø 1,00	75.106.10.xx
	Ø 1,20	75.106.12.xx
	Ø 1,40	75.106.14.xx
	Ø 1,30	75.07.13.xx
	Ø 0,64	75.08.06.xx
	Ø 1,00	75.08.10.xx
	Ø 1,20	75.08.12.xx
	Ø 1,40	75.08.14.xx
	Ø 2,00	75.308.20.xx
	Ø 1,20	75.109.12.xx
	Ø 1,40	75.109.14.xx
	Ø 0,64	75.112.06.xx
	Ø 0,90	75.112.09.xx
	Ø 1,20	75.112.12.xx
	Ø 1,40	75.112.14.xx
	Ø 1,20	75.113.12.xx
	Ø 0,64	75.118.06.xx
	Ø 1,20	75.20.12.xx
	Ø 1,30	75.20.13.xx
	Ø 1,60	75.20.16.xx
	Ø 0,64	75.123.06.xx
	Ø 0,64	75.124.06.xx
	Ø 0,64	75.126.06.xx
	Ø 1,20	75.162.12.xx
	Ø 0,50	75.166.05.xx

For XXLonglife-Nanocoating order as 75X

Series 75



Series 75

Technical Data

Overall Length	33,1 mm
Minimum Centre Spacing	1,90 mm
Maximum Travel	6,40 mm
Working Travel	4,20 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	20 mΩ
Current Load rated/max.	2,5 / 3,5 A

Materials

Plunger	Cu-alloy or steel hardened, gold plated
Barrel	Cu-alloy, gold plated
Spring	Music wire, gold plated or silver plated

Series 75 is the standard series for 1.9 mm (75 mil) pitch, and combined with the series 100 (for 2.54 mm) and 071 (for 1.27 mm) by the same length and travel.

An overview of the receptacles on page 30.

Series 751

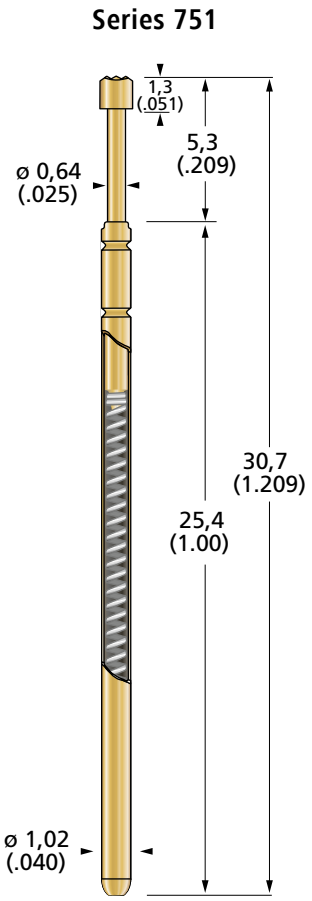
Technical Data

Overall Length	30,70 mm
Minimum Centre Spacing	1,90 mm
Maximum Travel	5,30 mm
Working Travel	2,70 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	20 mΩ
Current Load rated/max.	2,5 / 3,5 A

Materials

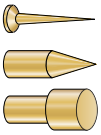
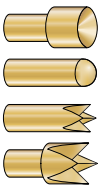
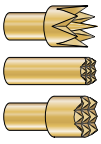
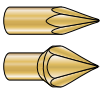
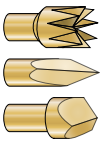
Plunger	CuBe or steel, gold plated
Barrel	Cu-alloy, gold plated
Spring	Music wire, gold plated

75 mil type with reduced stroke. Combined with the Series 21 (for 2.54 mm pitch) and Series 14 (for 1.27 mm pitch) by similar length and travel. Use receptacle types S 75, shown on page 30, as well as some examples of installation.



Spring Force (xx)

Preload	Rated Force	Code xx
0,3 N	1,0 N	10
0,4 N	1,5 N	15
0,8 N	2,0 N	20
0,7 N	2,5 N	25

	Ø 0,50	751.101.05.xx
	Ø 0,64	751.102.06.xx
	Ø 0,90	751.103.09.xx
	Ø 1,20	751.103.12.xx
	Ø 1,20	751.04.12.xx
	Ø 0,64	751.05.06.xx
	Ø 0,64	751.106.06.xx
	Ø 1,00	751.106.10.xx
	Ø 1,20	751.106.12.xx
	Ø 1,40	751.106.14.xx
	Ø 1,30	751.07.13.xx
	Ø 0,64	751.08.06.xx
	Ø 1,00	751.08.10.xx
	Ø 1,20	751.08.12.xx
	Ø 1,40	751.08.14.xx
	Ø 2,00	751.308.20.xx
	Ø 1,20	751.109.12.xx
	Ø 1,40	751.109.14.xx
	Ø 0,64	751.112.06.xx
	Ø 0,90	751.112.09.xx
	Ø 1,20	751.112.12.xx
	Ø 1,40	751.112.14.xx
	Ø 1,20	751.113.12.xx
	Ø 0,64	751.118.06.xx
	Ø 1,20	751.20.12.xx
	Ø 1,30	751.20.13.xx
	Ø 1,60	751.20.16.xx
	Ø 0,64	751.123.06.xx
	Ø 0,64	751.124.06.xx
	Ø 0,64	751.126.06.xx
	Ø 1,20	751.162.12.xx
	Ø 0,50	751.166.05.xx

For XXLonglife-Nanocoating order as 751X

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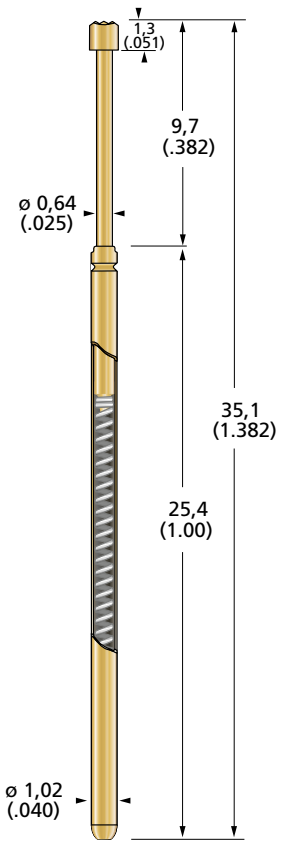
Spring Force (xx)

Preload	Rated Force	Code xx
0,3 N	1,0 N	10
0,4 N	1,5 N	15
0,8 N	2,0 N	20
0,7 N	2,5 N	25

	Ø 0,64	752.02.06.xx
	Ø 1,00	752.08.10.xx
	Ø 0,64	752.118.06.xx

For XXLonglife-Nanocoating order as 752X

Series 752



Series 752

Technical Data

Overall Length	35,10 mm
Minimum Centre Spacing	1,90 mm
Maximum Travel	8,40 mm
Working Travel	4,30 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	20 mΩ
Current Load rated/max.	2,5 / 3,5 A

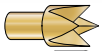
Materials

Plunger	Cu-alloy or steel hardened, gold plated
Barrel	Cu-alloy, gold plated
Spring	Music wire, gold plated

Compared with the standard Series 75 the series 752 has an excess length of 2 mm, which compensates differences in the height profile of the test points on a UUT (Unit under Test). Both series use the same receptacles types S 75, where an overview is given on page 30.

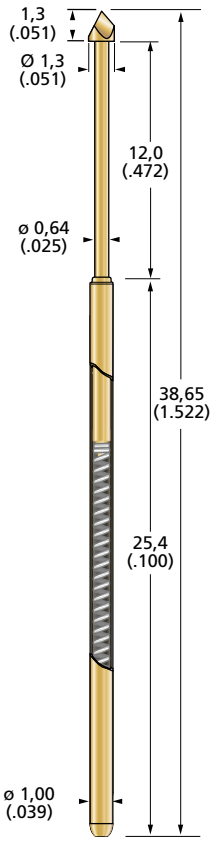
Spring Force (xx)

Preload	Rated Force	Code xx
0,15 N	1,5 N	15

	Ø 1,10	754.106.11.15
	Ø 1,10	754.08.11.15
	Ø 0,64	754.118.06.15
	Ø 1,30	754.20.13.15

For XXLonglife-Nanocoating order as 754X

Series 754



Series 754

Technical Data

Overall Length	38,65 mm
Minimum Centre Spacing	1,90 mm
Maximum Travel	12,00 mm
Working Travel	8,00 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	20 mΩ
Current Load rated/max.	2,5 / 3,5 A

Materials

Plunger	CuBe, gold plated
Barrel	Cu-alloy, gold plated
Spring	Music wire, gold plated

The matching receptacles of series 75 can be found on the following page .

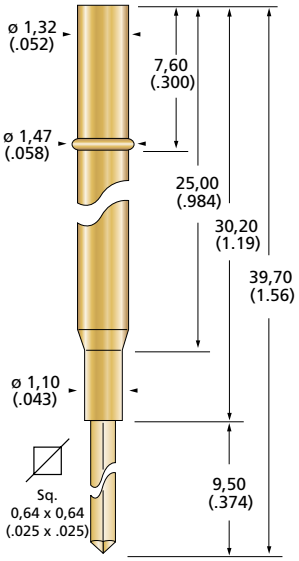
Max. Current Load	3,5 A
Overall Length	35,10 / 38,65 mm
Working Travel	4,30 / 8,00 mm
Max. Travel	8,40 / 12,00 mm
Pitch	≥ 1,90 mm ≥ 75 mil

RECEPTACLES FOR SERIES 75 / 751 / 752 / 754

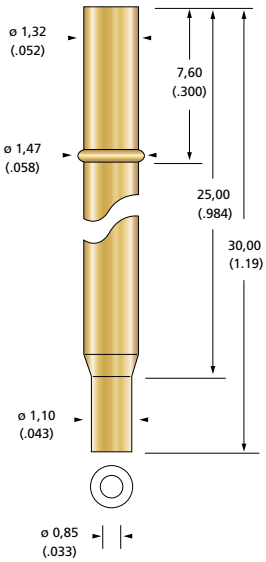
Receptacles of **SERIES 75** are also used for the **SERIES 751, 752** and **754**.

Receptacle version **S 75.02-W** features two press-rings to improve alignment of the receptacles in the mounting hole and thus to optimize pointing accuracy of the spring contact tip. The S 75.00-CD version has pre-attached wire (standard length appr. 800 mm) and is available on demand.

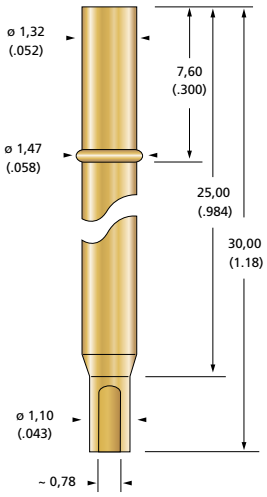
S 75.00-W
Wire-Wrap-Post



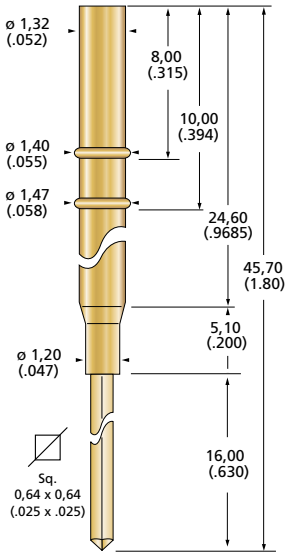
S 75.00-C
Open Crimp End

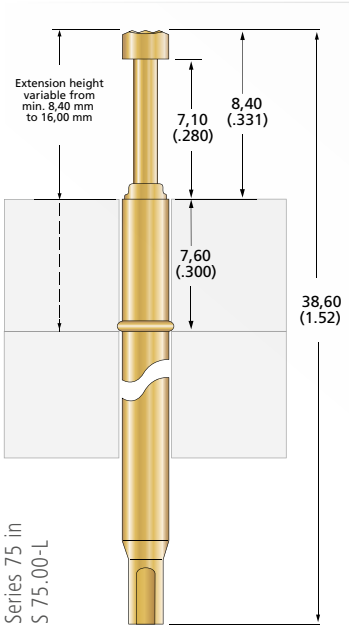


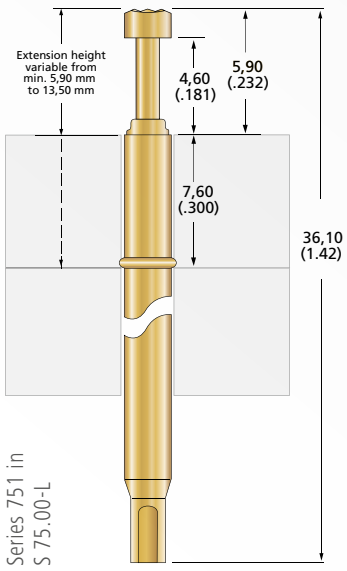
S 75.00-L
Solder Cup

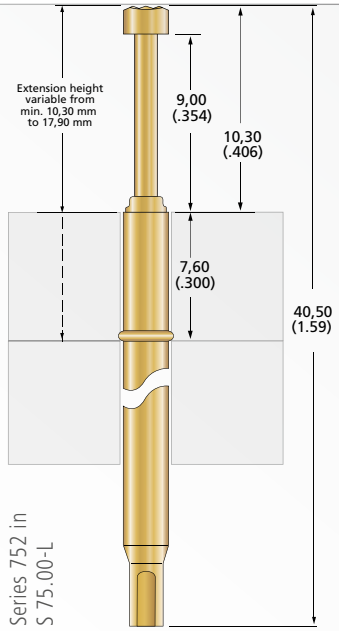


S 75.02-W
Wire-Wrap-Post









FIXTURING EXAMPLE

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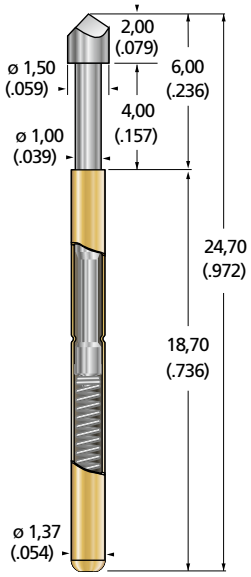
Spring Force (xx)

Preload	Rated Force	Code xx
0,3 N	1,0 N	10
0,8 N	1,8 N	18
1,2 N	2,5 N	25

	Ø 1,00	21.102.10.xx
	Ø 1,00	21.03.10.xx
	Ø 1,50	21.03.15.xx
	Ø 1,80	21.03.18.xx
	Ø 1,80	21.103.18.xx
	Ø 1,00	21.04.10.xx
	Ø 1,50	21.04.15.xx
	Ø 1,80	21.04.18.xx
	Ø 0,60	21.05.06H600.xx
	Ø 0,80	21.05.08H600.xx
	Ø 1,00	21.05.10.xx
	Ø 1,20	21.05.12.xx
	Ø 1,50	21.05.15.xx
	Ø 1,80	21.05.18.xx
	Ø 1,00	21.06.10.xx
	Ø 1,50	21.06.15.xx
	Ø 1,50	21.08.15.xx
	Ø 1,80	21.08.18.xx
	Ø 1,90	21.08.19.xx
	Ø 1,50	21.09.15.xx
	Ø 1,80	21.09.18.xx
	Ø 1,50	21.15.15.xx
	Ø 1,50	21.20.15.xx
	Ø 1,80	21.20.18.xx
	Ø 0,50	21.166.05.xx

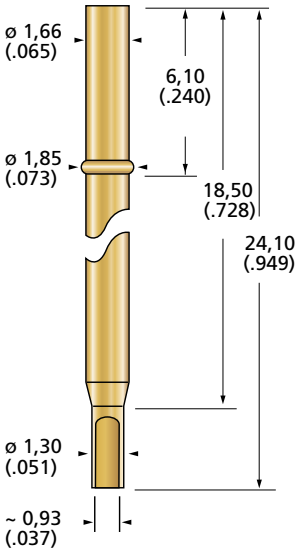
For XXLonglife-Nanocoating order as 21X

Series 21



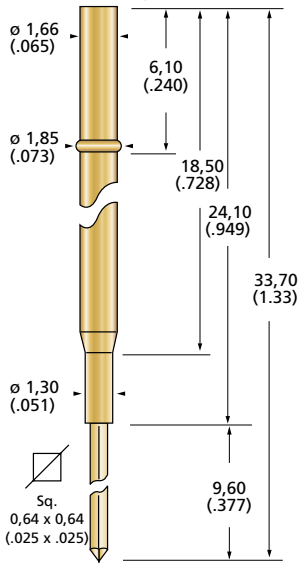
S 21.00-L

Solder Cup



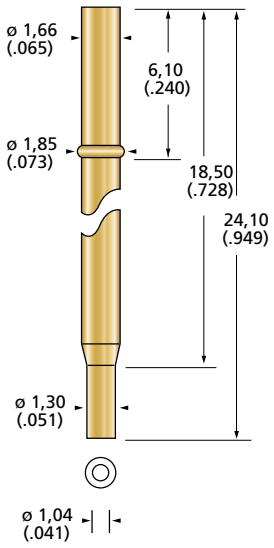
S 21.00-W

Wire-Wrap-Post



S 21.00-C

Open Crimp End



Series 21

Technical Data

Overall Length	24,70 mm
Minimum Centre Spacing	2,54 mm
Maximum Travel	4,00 mm
Working Travel	2,70 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	25 mΩ
Current Load rated/max.	3,0 / 4,0 A

Materials

Plunger	CuBe hardened or steel, gold plated
Barrel	Cu-alloy, gold plated
Spring	Music wire, gold plated or silver plated

Version for 2.54 mm (100 mils) in reduced length design. Combined with the Series 14 and 751 for the 1.27 mm and 1.90 mm pitches (50 and 75 mils). At the same „family" includes the interface contacts GR1-GR4 which can be found on page 60.

Max. Current Load 4,0 A
Overall Length 24,70 mm
Working Travel 2,70 mm
Max. Travel 4,00 mm
Pitch ≥ 2,54 mm ≥ 100 mil

ICT / FCT TEST PROBES

Series 29

Technical Data

Overall Length	variable, see table
Minimum Centre Spacing	2,54 mm
Maximum Travel	1,52 mm
Working Travel	1,27 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	20 mΩ
Current Load rated/max.	3,0 / 4,0 A

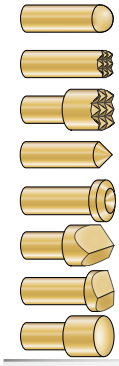
Materials

Plunger	CuBe hardened, gold plated
Barrel	Nickel silver, gold plated
Spring	Stainless steel / Music wire, gold plated

In Series 29 the different head shapes have different lengths, so that the protrusion of the complete probe varies. The values are listed in the table on the right hand side. The dimensions given do not includethe build-up of the socket receptacle.

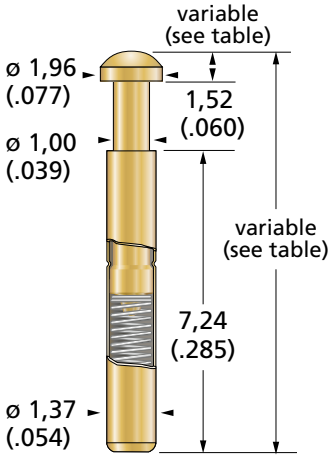
Spring Force (xx)

Preload	Rated Force	Code xx
0,5 N	1,0 N	10
0,6 N	2,0 N	20

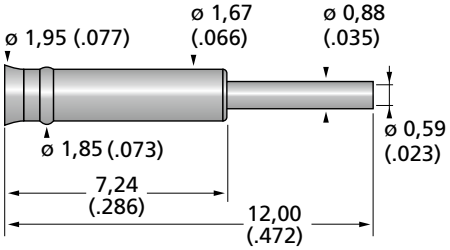
			Head length mm	Extension height mm	Overall Length mm
	Ø 1,00	**29.05.10.xx**	-	2,24	9,48
	Ø 1,00	**29.08.10.xx**	-	2,92	10,16
	Ø 1,91	**29.08.19.xx**	1,55	3,07	10,31
	Ø 1,10	**29.15.11.xx**	-	2,50	9,74
	Ø 1,90	**29.19.19.xx**	0,75	2,20	9,44
	Ø 1,91	**29.20.19.xx**	1,27	2,79	10,03
	Ø 1,96	**29.30.20.xx**	0,95	2,47	9,71
	Ø 1,96	**29.35.20.xx**	0,75	2,27	9,51

For XXLonglife-Nanocoating order as 29X

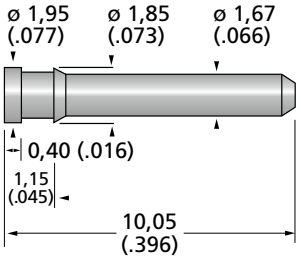
Series 29



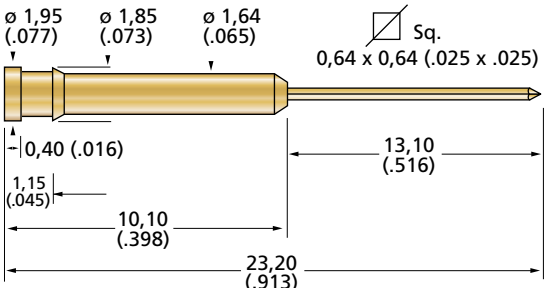
S 29.00-C
Open Crimp End



S 29.00-NT
Closed bottom end, good for soldering,
Nickel silver unplated

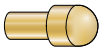
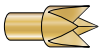
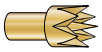
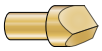


S 29.00-W
Wire-Wrap-Post

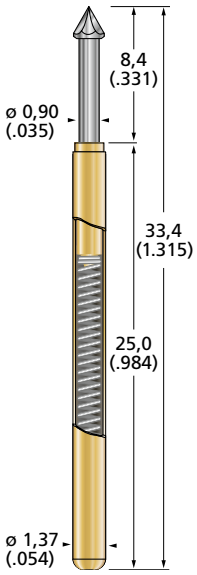


Spring Force (xx)

Preload	Rated Force	Code xx
0,3 N	1,0 N	10
0,35 N	1,5 N	15
0,4 N	2,0 N	20
0,5 N	2,5 N	25
0,8 N	3,0 N	30

	Ø 0,60	100.101.06.xx
	Ø 0,90	100.102.09.xx
	Ø 1,50	100.03.15.xx
	Ø 2,30	100.203.23.xx
	Ø 1,50	100.04.15.xx
	Ø 2,00	100.04.20.xx
	Ø 2,10	100.304.21.xx
	Ø 0,90	100.05.09.xx
	Ø 1,30	100.05.13.xx
	Ø 1,50	100.05.15.xx
	Ø 1,00	100.106.10.xx
	Ø 1,30	100.106.13.xx
	Ø 1,50	100.06.15.xx
	Ø 1,40	100.07.14.xx
	Ø 0,90	100.08.09.xx
	Ø 1,30	100.08.13.xx
	Ø 1,50	100.08.15.xx
	Ø 1,50	100.108.15.xx
	Ø 2,00	100.08.20.xx
	Ø 2,50	100.08.25.xx
	Ø 3,00	100.08.30.xx
	Ø 3,20	100.08.32.xx
	Ø 2,30 / 1,50	100.308.23.xx
	Ø 3,20 / 2,70	100.308.32.xx
	Ø 3,90 / 3,30	100.308.39.xx
	Ø 4,10 / 3,00	100.308.41.xx
	Ø 0,90	100.112.09.xx
	Ø 1,50	100.112.15.xx
	Ø 1,70	100.112.17.xx
	Ø 1,50	100.113.15.xx
	Ø 0,90	100.118.09.xx
	Ø 1,50	100.118.15.xx
	Ø 0,90	100.120.09.xx
	Ø 1,50	100.20.15.xx
	Ø 2,00	100.20.20.xx
	Ø 0,90	100.123.09.xx

Series 100



Series 100

Technical Data

Overall Length	33,40 mm
Minimum Centre Spacing	2,54 mm
Maximum Travel	6,40 mm
Working Travel	4,20 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	20 mΩ
Current Load rated/max.	3,0 / 4,0 A

Materials

Plunger	CuBe or steel, gold plated
Barrel	Nickel silver, gold plated
Spring	Music wire, gold plated

The 100 Series is THE international standard type for the 2.54 mm (100 mils). The list of head styles is extended continuously, so please ask our sales team! We design and produce tailor-made extras on demand!

Combined with probes series for larger and smaller grid spacing but with the same stroke length:
Series 071 for 1.27 mm pitch,
Series 75 for 1.9 mm pitch,
Series 26, 27 and 28 for the centre spcaces of 3.20 mm, 4.00 mm and 4.80 mm.

An overview of available receptacles you find on page 34.

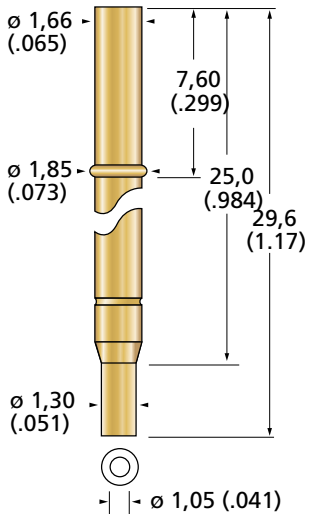
	Ø 0,90	100.124.09.xx
	Ø 0,90	100.126.09.xx
	Ø 1,50	100.162.15.xx
	Ø 0,50	100.66.05.xx
	Ø 0,80	100.166.08.xx

For XXLonglife-Nanocoating order as 100X

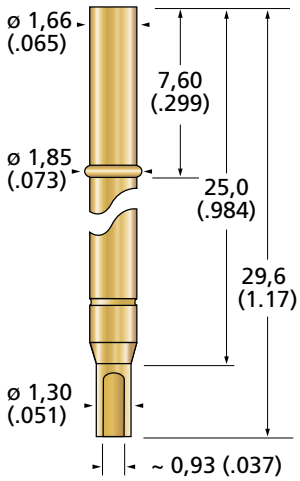
RECEPTACLES SERIES 100 / 101 / 125

SERIES 100 receptacles are used as well for **SERIES 101** and **125**. Further types with other terminations and press-ring locations available on request.

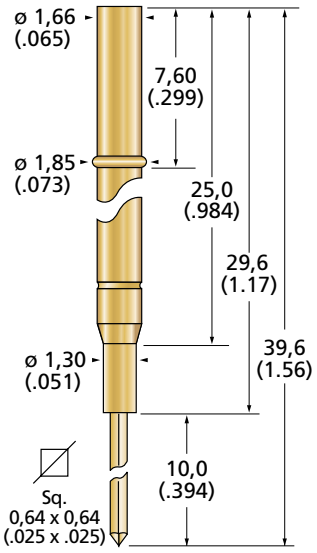
S 100.00-C
Open Crimp End



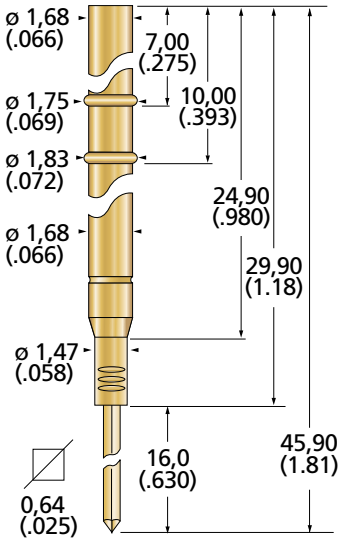
S 100.00-L
Solder Cup



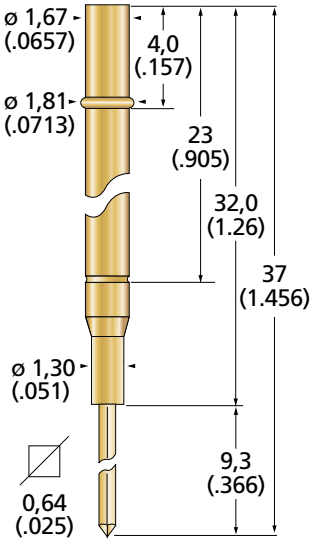
S 100.00-W
Wire-Wrap-Post



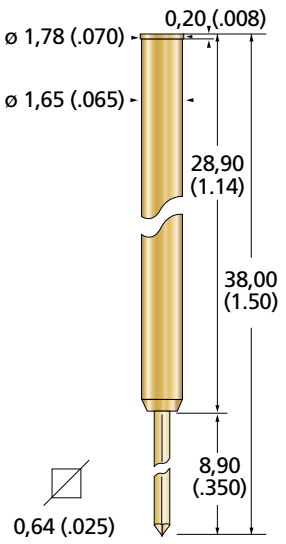
S 100.10-W
Wire-Wrap-Post

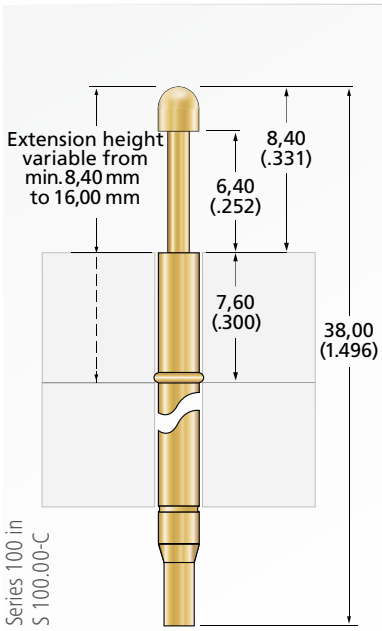


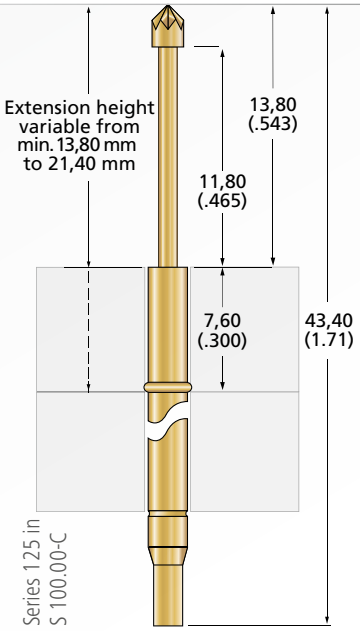
S 100.04-WI
Wire-Wrap-Post



S 100.05-WI
Wire-Wrap-Post







FIXTURING EXAMPLE

Pitch ≥ 2,54 mm ≥ 100 mil

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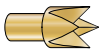
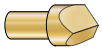
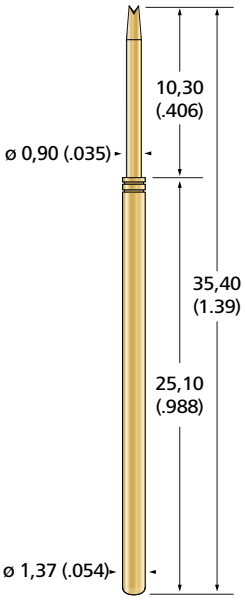
Spring Force (xx)

Preload	Rated Force	Code xx
0,3 N	1,0 N	10
0,35 N	1,5 N	15
0,4 N	2,0 N	20
0,5 N	2,5 N	25
0,8 N	3,0 N	30

	Ø 0,90	**101.05.09.xx**
	Ø 1,30	**101.106.13.xx**
	Ø 0,90	**101.08.09.xx**
	Ø 0,90	**101.118.09.xx**
	Ø 1,50	**101.20.15.xx**
	Ø 0,50	**101.166.05.xx**

For XXLonglife-Nanocoating order as 101X

Series 101



Series 101

Technical Data

Overall Length	35,40 mm
Minimum Centre Spacing	2,54 mm
Maximum Travel	9,40 mm
Working Travel	4,20 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	20 mΩ
Current Load rated/max.	3,0 / 4,0 A

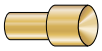
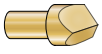
Materials

Plunger	CuBe or steel, gold plated
Barrel	Cu-alloy, gold plated
Spring	Music wire, silver plated

Compared with the standard 100 series the Series 101 and 22 have an over-length which compensates heigth differences in the test point level on a p.c.b.
Receptacles are shown on page 34.
All variants with a head larger than the shaft have a reduced max. travelof 8.5 mm.

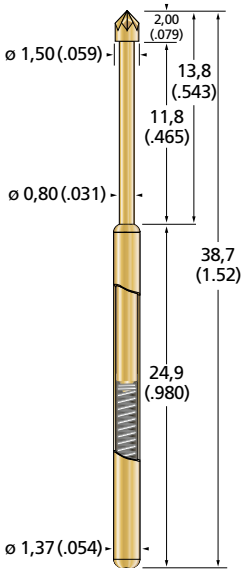
Spring Force (xx)

Preload	Rated Force	Code xx
0,3 N	1,5 N	15
0,3 N	2,0 N	20

	Ø 0,80	**125.02.08.xx**
	Ø 1,50	**125.04.15.xx**
	Ø 0,50	**125.05.05.xx**
	Ø 1,00	**125.06.10.xx**
	Ø 1,20	**125.06.12.xx**
	Ø 1,50	**125.06.15.xx**
	Ø 1,50	**125.08.15.xx**
	Ø 0,80	**125.09.08.xx**
	Ø 1,50	**125.09.15.xx**
	Ø 0,90	**125.118.09.xx**
	Ø 1,50	**125.20.15.xx**
	Ø 0,80	**125.23.08.xx**
	Ø 1,50	**125.162.15.xx**

For XXLonglife-Nanocoating order as 125X

Series 125



Combineable series are:

Pitch	Series	Max. Travel
1,27 mm	071	6,40 mm
1,27 mm	151	10,00 mm
1,90 mm	75	6,40 mm
1,90 mm	754	12,00 mm
2,54 mm	100	6,40 mm

plus all types with extra length to compensate for the test-point height profile (series 115, 752 and 101).
125 Series probes use Series 100 Receptacles (see page 34).

Series 125

Technical Data

Overall Length	38,70 mm
Minimum Centre Spacing	2,54 mm
Maximum Travel	11,80 mm
Working Travel	9,00 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	20 mΩ
Current Load rated/max.	3,0 / 4,0 A

Materials

Plunger	CuBe hardened or steel, gold plated
Barrel	Cu-alloy, gold plated
Spring	Music wire, gold plated

The 125 Series is used in the so-called two stage or dual-level fixtures where ICT and FCT are performed in the same jig. The long reach needles 125 touch the functional test points, while the shorter series 100 pins do the In-Circuirt-Test.

Series 26

Technical Data

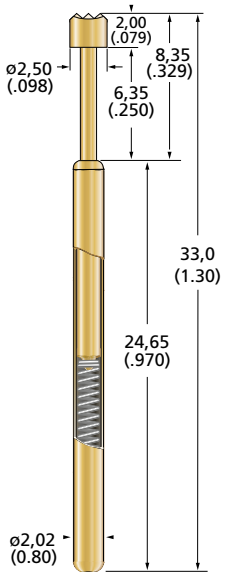
Overall Length	33,00 mm
Minimum Centre Spacing	3,18 mm
Maximum Travel	6,35 mm
Working Travel	4,20 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	15 mΩ
Current Load rated/max.	4,0 / 5,0 A

Materials

Plunger	Cu-alloy, gold plated
Barrel	Cu-alloy, gold plated
Spring	Music wire, gold plated

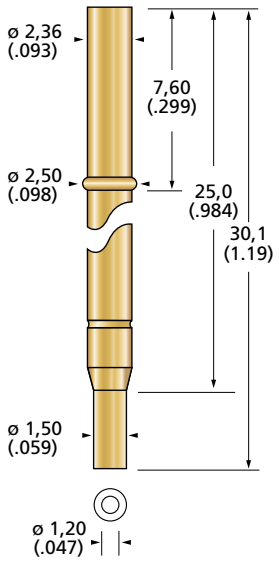
The Series 26 includes the previously available 262 series types.

Series 26



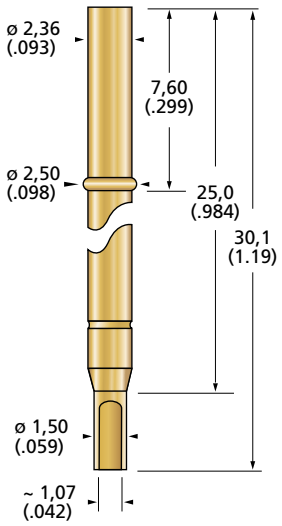
S 26.00-C

Open Crimp End



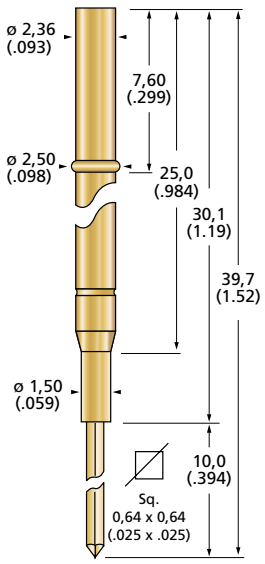
S 26.00-L

Solder Cup



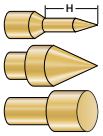
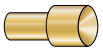
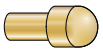
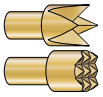
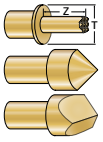
S 26.00-W

Wire-Wrap-Post



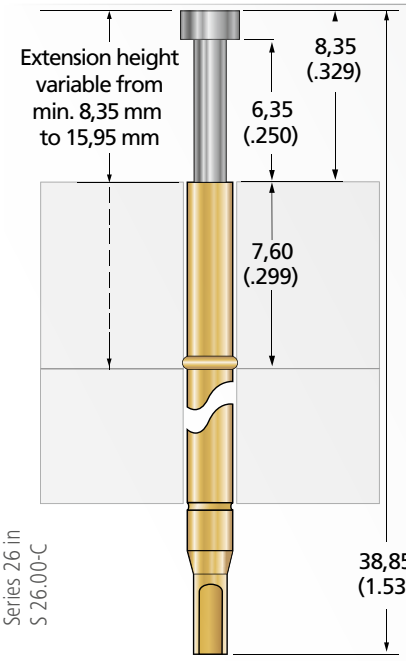
Spring Force (xx)

Preload	Rated Force	Code xx
0,4 N	1,2 N	12
0,6 N	1,8 N	18
0,8 N	2,5 N	25
1,5 N	4,4 N	44

	Ø 0,70	26.02.07H500.xx
	Ø 1,70	26.02.17.xx
	Ø 1,70	26.03.17.xx
	Ø 2,50	26.03.25.xx
	Ø 1,70	26.04.17.xx
	Ø 2,50	26.04.25.xx
	Ø 1,70	26.05.17.xx
	Ø 2,50	26.05.25.xx
	Ø 2,00	26.06.20.xx
	Ø 1,70	26.08.17.xx
	Ø 2,50	26.08.25.xx
	Ø 1,20	26.08.12Z300T250.xx
	Ø 2,50	26.15.25.xx
	Ø 3,00	26.20.30.xx
	Ø 4,00	26.20.40.xx

For XXLonglife-Nanocoating order as 26X

In the series 26, we offer you even more head shapes. For an overview of all available versions download the data sheet from the Internet at www.fixtest.de.

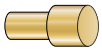
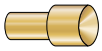
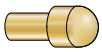


Series 26 in S 26.00-C

FIXTURING EXAMPLE

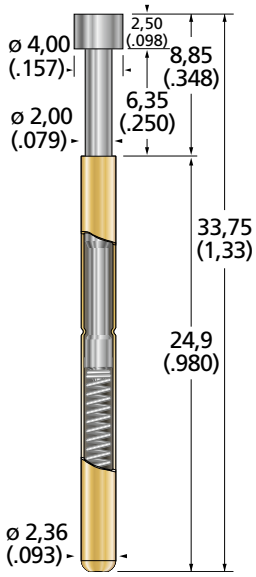
Spring Force (xx)

Preload	Rated Force	Code xx
0,6 N	1,3 N	13
0,8 N	1,9 N	19
1,2 N	3,0 N	30

	Ø 2,00	27.02.20.xx
	Ø 2,00	27.03.20.xx
	Ø 4,00	27.03.40.xx
	Ø 2,00	27.04.20.xx
	Ø 4,00	27.04.40.xx
	Ø 1,50	27.05.15.xx
	Ø 2,00	27.05.20.xx
	Ø 2,30	27.05.23.xx
	Ø 4,00	27.05.40.xx
	Ø 3,00	27.08.30.xx
	Ø 4,00	27.08.40.xx
	Ø 4,00	27.15.40.xx

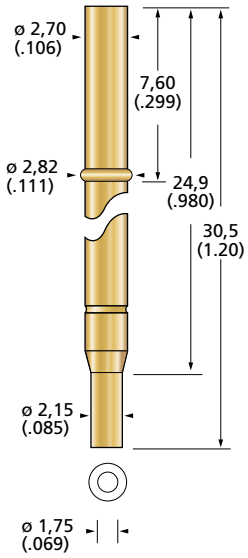
For XXLonglife-Nanocoating order as 27X

Series 27



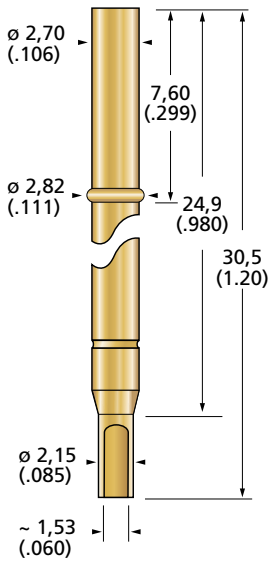
S 27.00-C

Open Crimp End



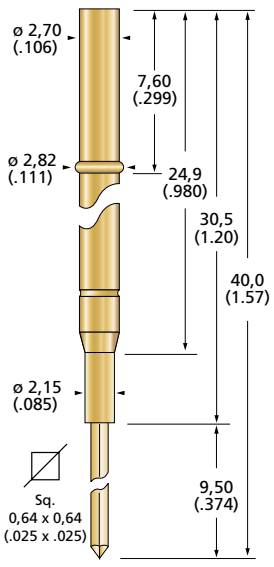
S 27.00-L

Solder Cup



S 27.00-W

Wire-Wrap-Post



Series 27

Technical Data

Overall Length	33,75 mm
Minimum Centre Spacing	4,00 mm
Maximum Travel	6,35 mm
Working Travel	4,20 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	20 mΩ
Current Load rated/max.	4,0 / 5,0 A

Materials

Plunger	CuBe hardened, gold plated
Barrel	Cu-alloy, gold plated
Spring	Music wire, gold plated

In terms of length, travel and protrusion the Series 27 - as well as the series 26 on the left hand page - can be combined with the international standard series 100.
According to the rule „always use the largest possible spring contact size“ the series 27 is ideal where the distance between the test points is 4 mm or more. Here, the robust design brings reliable contact and long service life as well as higher current load. For all types with a head diameter ≥ 4 mm, the specification of the minimum grid spacing of 4 mm is of course no more applicable.
Even bigger in diameter but with the same body length is our series 28, while the Series 26 is located in size between the Series 100 and Series 27.

Series 28

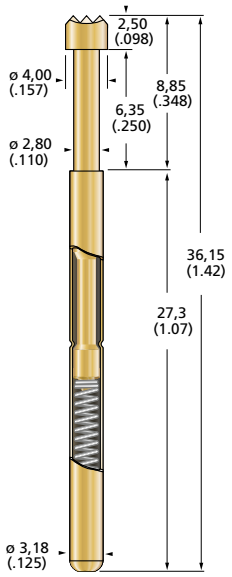
Technical Data

Overall Length	36,15 mm
Minimum Centre Spacing	4,80 mm
Maximum Travel	6,35 mm
Working Travel	4,20 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	20 mΩ
Current Load rated/max.	5,0 / 6,0 A

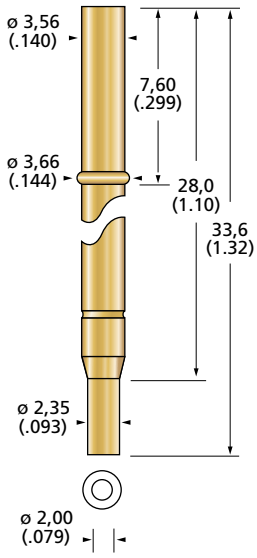
Materials

Plunger	CuBe hardened, gold plated
Barrel	Nickel silver, gold plated
Spring	Stainless steel / Music wire, silver plated

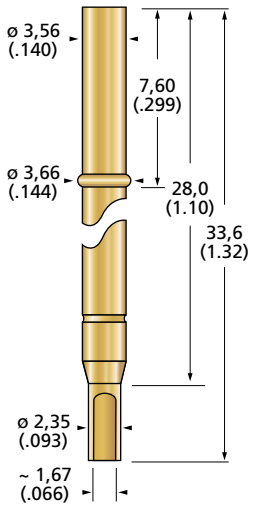
Series 28



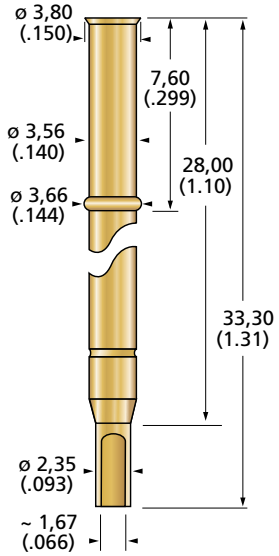
S 28.00-C
Open Crimp End



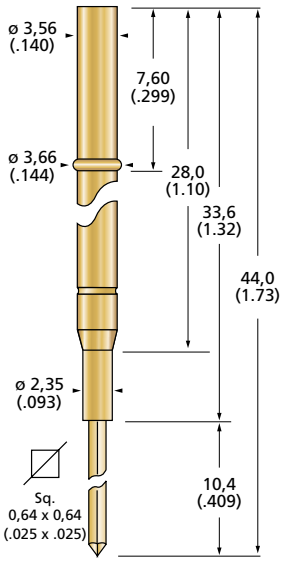
S 28.00-L
Solder Cup



S 28.00-LC
Wire-Wrap-Post

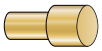
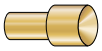


S 28.00-W
Wire-Wrap-Post



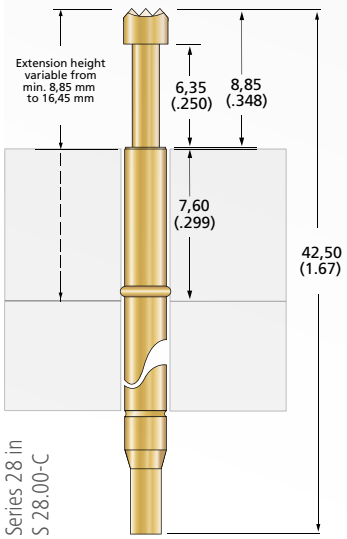
Spring Force (xx)

Preload	Rated Force	Code xx
0,8 N	1,9 N	19
0,8 N	2,3 N	23
1,5 N	4,0 N	40

	Ø 2,80	28.02.28.xx
	Ø 2,80	28.03.28.xx
	Ø 4,00	28.03.40.xx
	Ø 2,80	28.04.28.xx
	Ø 4,00	28.04.40.xx
	Ø 2,03	28.05.20.xx
	Ø 4,00	28.05.40.xx
	Ø 3,00	28.06.30.xx
	Ø 2,80	28.08.28.xx
	Ø 4,00	28.08.40.xx
	Ø 4,00	28.15.40.xx

For XXLonglife-Nanocoating order as 28X

In terms of length, travel and protrusion the Series 28 can be combined with the international standard series 100. According to the rule „always use the largest possible spring contact size" the series 28 is ideal where the distance between the test points is 4.75 mm or more.
Typical applications are: connector test, terminal blocks, cable harness test.
With identical sizes but for higher current loads available as series 128 (see the chapter „high current contacts").



Series 28 in S 28.00-C

FIXTURING EXAMPLE

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SERIES V75X / V100X HIGHER PRELOAD

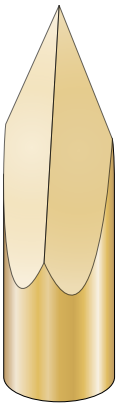
INCREASED SPRING PRELOAD

Flux residues and contaminations on solder joints often complicate an error-free test contact. The FIXTEST series V75X and V100X for the 75 mil and 100 mil pitches offer higher preloaded springs and selected aggressive head shapes. Even at short travel a high impact force and optimum penetration of insulating layers is ensured.

XXLONGLIFE-NANOCOATING

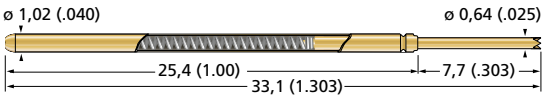
In addition ti increased preload our V-types have **XXLonglife-Nano-Coating**.
XXLonglife prolongs the life and enhances the contact quality by:

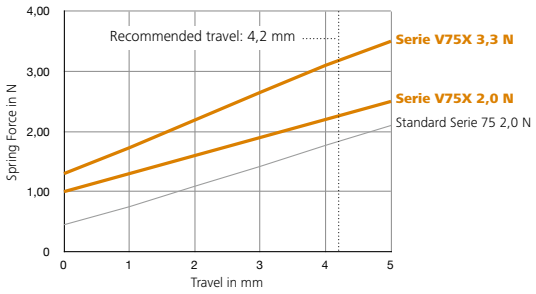
- Protection against pollution / dirt pick-up
- hardening of the surface
- Reduction of frictional resistance



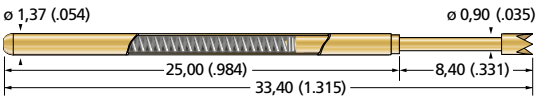
HE PERFECT SOLUTION FOR CONTACT PROBLEMS THROUGH FLUX RESIDUES

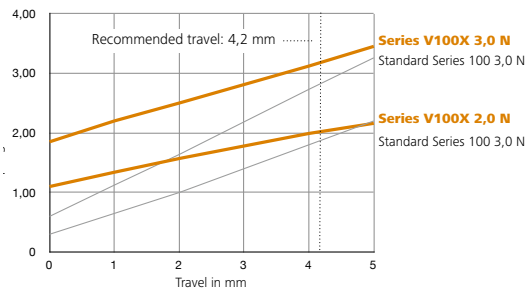
Series V75X





Series V100X





Spring Force V75X (xx)

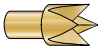
Preload	Rated Force	Code xx
1,0 N	2,0 N	20
1,2 N	3,3 N	33

	Ø 0,64	V75X.106.06.xx
	Ø 0,64	V75X.118.06.xx

More head styles available on request

Spring Force V100X (xx)

Preload	Rated Force	Code xx
1,1 N	2,0 N	20
1,8 N	3,0 N	30

	Ø 1,30	V100X.106.13.xx
	Ø 0,90	V100X.118.09.xx

ICT / FCT TEST PROBES

Metric Size Test Probes

Metric pins have against the imperial contacts two main differences: Firstly, the alignment at the metric unit system, ie, the holes for the installation of sockets to be drilled with conventional drilling diameters such as 2.0 mm. On the other hand in the metric sizes have both, the contacts and the receptacles, a fixed stop collar, which guarantee exact positioning of the pins in the vertical axis. In order to achieve variable installation heights, our metric series have different collar options. In addition, spacers can be placed between receptacle and probe collar. Hints about this installation method are shown in the particular installation examples for each type.

The **SERIES 30** is the basic form of the metric series for 2.54 mm pitch. The **SERIES 31, 40, 41, 42, 44** and **49** offer variations in the collar heights, lengths and the piston stroke. In combination with the illustrated spacers very variable installation heights (or so called protrusion heights) can be realized. For larger grid spacing the **SERIES 50, 51, 150, 154, 155** and **60** are available, where some of them have the same mounting heights like the smaller sizes. More metric designs for the grid ≥ 2.54 mm are available on request.

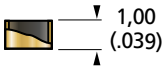
TRIC TYPES

Metric Series	Page
30	43
31	44
40	45
41	46
42	46
44	47
49	47
50	50
51	52
60	53
150	50
154	51
155	51

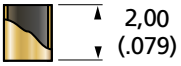
Imperial Series starting at page 16

RECEPTACLES SERIES 30 / 31 / 40 / 41 / 42 / 44 / 49

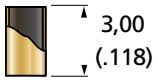
D 30.01
Spacer tube 1 mm



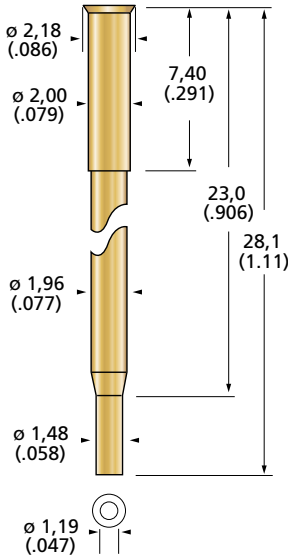
D 30.02
Spacer tube 2 mm



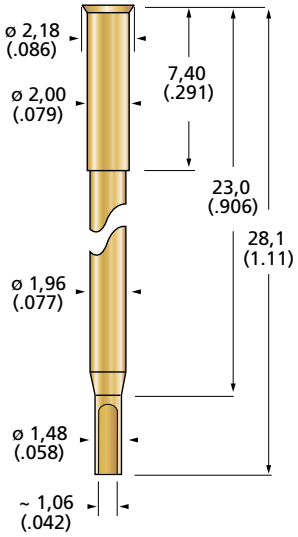
D 30.03
Spacer tube 3 mm



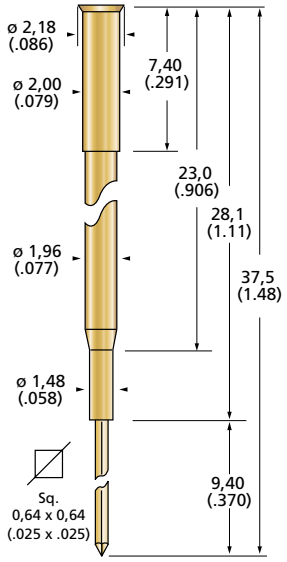
S 30.00-C
Open Crimp End

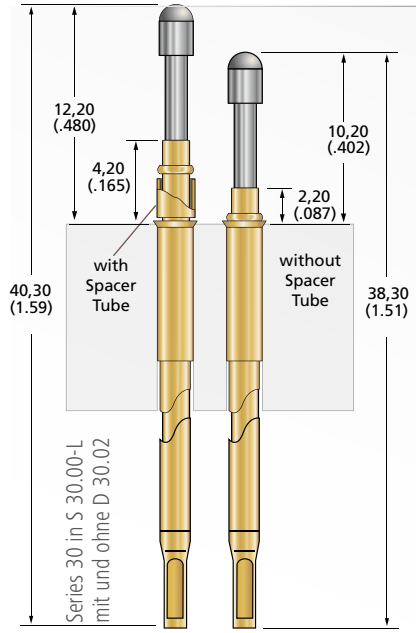


S 30.00-L
Solder Cup



S 30.00-W
Wire-Wrap-Post





FIXTURING EXAMPLE

Pitch ≥ 2,54 mm ≥ 100 mil

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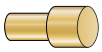
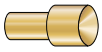
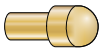
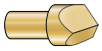
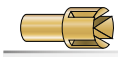
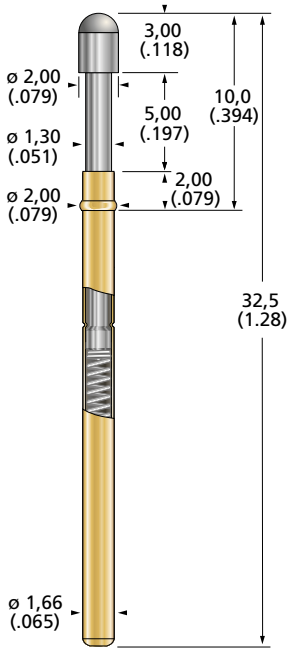
Spring Force (xx)

Preload	Rated Force	Code xx
0,3 N	0,8 N	08
0,9 N	1,5 N	15
1,5 N	3,0 N	30
2,0 N	5,0 N	50

	Ø 0,70	30.102.07.xx
	Ø 1,30	30.102.13.xx
	Ø 1,30	30.103.13.xx
	Ø 2,00	30.103.20.xx
	Ø 3,00	30.03.30.xx
	Ø 1,90	30.104.19.xx
	Ø 1,30	30.05.13.xx
	Ø 1,50	30.05.15.xx
	Ø 2,00	30.05.20.xx
	Ø 1,30	30.06.13.xx
	Ø 1,60	30.106.16.xx
	Ø 2,00	30.106.20.xx
	Ø 1,30	30.107.13.xx
	Ø 1,30	30.108.13.xx
	Ø 2,00	30.108.20.xx
	Ø 2,70 / 2,30	30.308.27.xx
	Ø 1,30	30.10.13.xx
	Ø 1,80	30.10.18.xx
	Ø 1,30	30.118.13.xx
	Ø 2,00	30.61.20.xx

For XXLonglife-Nanocoating order as 30X

Series 30



Series 30

Technical Data

Overall Length	32,50mm
Minimum Centre Spacing	2,54 mm
Maximum Travel	5,00 mm
Working Travel	3,30 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	20 mΩ
Current Load rated/max.	3,0 / 4,0 A

Materials

Plunger	CuBe or steel, gold plated
Barrel	Nickel silver, gold plated
Spring	Music wire, silver plated

The standard metric series for many applications such as manual handling adapter, connector test heads etc. For matching receptacles, see page 42.

Series 31

Technical Data

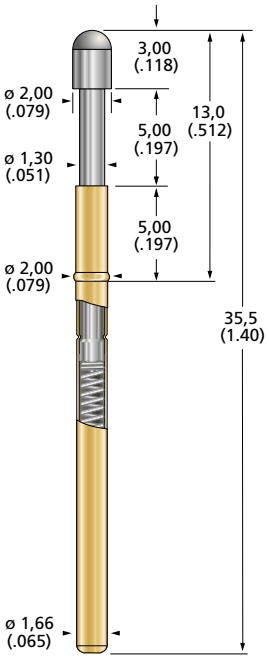
Overall Length	35,50 mm
Minimum Centre Spacing	2,54 mm
Maximum Travel	5,00 mm
Working Travel	3,30 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	20 mΩ
Current Load rated/max.	3,0 / 4,0 A

Materials

Plunger	CuBe or steel, gold plated
Barrel	Nickel silver, gold plated
Spring	Music wire, silver plated

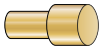
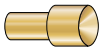
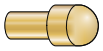
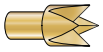
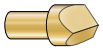
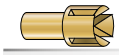
Compared to the standard 30 the Series 31 has a collar elongated by 3 mm and thus a correspondingly larger installation height.
The 31 series uses the receptacles of the series 30 shown on page 42.

Series 31



Spring Force (xx)

Preload	Rated Force	Code xx
0,3 N	0,8 N	08
0,9 N	1,5 N	15
1,5 N	3,0 N	30
2,0 N	5,0 N	50

	Ø 0,70	31.102.07.xx
	Ø 1,30	31.102.13.xx
	Ø 1,30	31.103.13.xx
	Ø 2,00	31.103.20.xx
	Ø 3,00	31.03.30.xx
	Ø 1,90	31.104.19.xx
	Ø 1,30	31.05.13.xx
	Ø 1,50	31.05.15.xx
	Ø 2,00	31.05.20.xx
	Ø 1,30	31.06.13.xx
	Ø 1,60	31.106.16.xx
	Ø 2,00	31.106.20.xx
	Ø 1,30	31.107.13.xx
	Ø 1,30	31.108.13.xx
	Ø 2,00	31.108.20.xx
	Ø 2,70	31.308.27.xx
	Ø 1,30	31.10.13.xx
	Ø 1,80	31.10.18.xx
	Ø 1,30	31.118.13.xx
	Ø 2,00	31.61.20.xx

For XXLonglife-Nanocoating order as 31X

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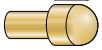
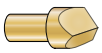
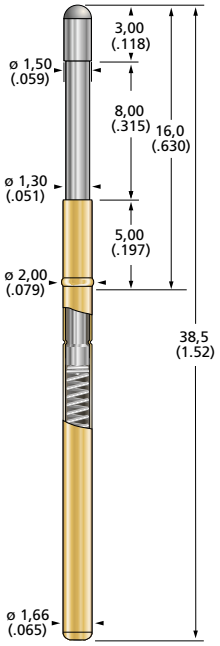
Spring Force (xx)

Preload	Rated Force	Code xx
0,3 N	0,8 N	08
0,9 N	1,5 N	15
1,0 N	2,2 N	22
1,2 N	3,0 N	30
2,0 N	5,0 N	50

	Ø 0,70	40.102.07.xx
	Ø 1,30	40.102.13.xx
	Ø 1,30	40.103.13.xx
	Ø 1,90	40.104.19.xx
	Ø 1,50	40.05.15.xx
	Ø 1,30	40.08.13.xx
	Ø 1,60	40.08.16.xx
	Ø 2,00	40.108.20.xx
	Ø 1,30	40.10.13.xx
	Ø 1,80	40.10.18.xx
	Ø 1,30	40.118.13.xx
	Ø 1,30	40.146.13.xx
	Ø 1,60	40.146.16.xx
	Ø 1,50	40.174.15.xx

For XXLonglife-Nanocoating order as 40X

Series 40



Series 40

Technical Data

Overall Length	38,50 mm
Minimum Centre Spacing	2,54 mm
Maximum Travel	8,00 mm
Working Travel	5,30 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	20 mΩ
Current Load rated/max.	3,0 / 4,0 A

Materials

Plunger	CuBe or steel, gold plated
Barrel	Nickel silver, gold plated
Spring	Music wire, silver plated

Longer standard series with 8 mm max. travel and 16 mm extension height. These dimensions are common standard in many test fixtures from different manufacturers.
The Series 40 uses the receptacles of the series 30 on page 42. Further head styles available on request.

Max. Current Load 4,0 A
Overall Length 38,50 mm
Working Travel 5,30 mm
Max. Travel 8,00 mm
Pitch ≥ 2,54 mm ≥ 100 mil

Series 41

Technical Data

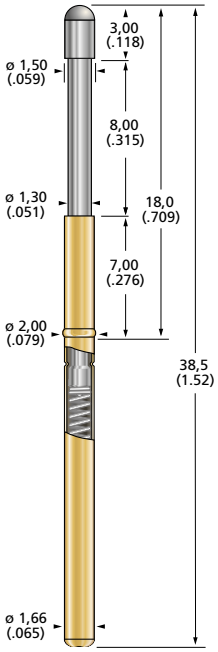
Overall Length	38,50 mm
Minimum Centre Spacing	2,54 mm
Maximum Travel	8,00 mm
Working Travel	5,30 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	20 mΩ
Current Load rated/max.	3,0 / 4,0 A

Materials

Plunger	CuBe or steel, gold plated
Barrel	Nickel silver, gold plated
Spring	Music wire, silver plated

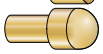
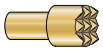
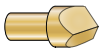
The series 41 has compared to the Series 40 a prolonged collar height of 7 mm. Use the receptacles of Series 30 shown on page 42.

Series 41



Spring Force (xx)

Preload	Rated Force	Code xx
0,3 N	0,8 N	08
0,9 N	1,5 N	15
1,0 N	2,2 N	22
1,2 N	3,0 N	30
2,0 N	5,0 N	50

	Ø 0,70	41.102.07.xx
	Ø 1,30	41.102.13.xx
	Ø 1,30	41.103.13.xx
	Ø 1,90	41.104.19.xx
	Ø 1,50	41.05.15.xx
	Ø 1,30	41.08.13.xx
	Ø 1,60	41.08.16.xx
	Ø 2,00	41.108.20.xx
	Ø 1,30	41.10.13.xx
	Ø 1,80	41.10.18.xx
	Ø 1,30	41.118.13.xx
	Ø 1,30	41.146.13.xx
	Ø 1,60	41.146.16.xx
	Ø 1,50	41.174.15.xx

For XXLonglife-Nanocoating order as 41X

Series 42

Technical Data

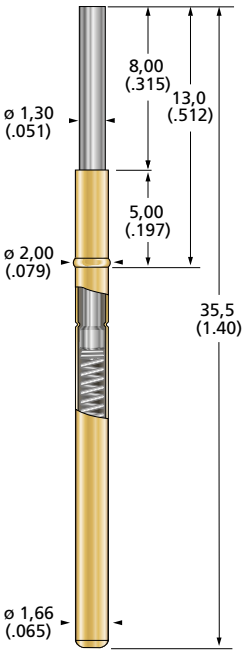
Overall Length	35,50 mm
Minimum Centre Spacing	2,54 mm
Maximum Travel	8,00 mm
Working Travel	5,30 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	20 mΩ
Current Load rated/max.	3,0 / 4,0 A

Materials

Plunger	CuBe or steel, gold plated
Barrel	Nickel silver, gold plated
Spring	Music wire, silver plated

The plunger of the 42 series can be completely deflected flush with the barrel. Therefore we offer in this series only stem types without a head larger than the shaft. Receptacles of Series 30 shown on page 42.

Series 42



Spring Force (xx)

Preload	Rated Force	Code xx
0,9 N	1,5 N	15
1,2 N	3,0 N	30

	Ø 0,70	42.102.07.xx
	Ø 1,30	42.102.13.xx
	Ø 1,30	42.103.13.xx
	Ø 1,30	42.08.13.xx
	Ø 1,30	42.10.13.xx
	Ø 1,30	42.118.13.xx
	Ø 1,30	42.146.13.xx

For XXLonglife-Nanocoating order as 42X

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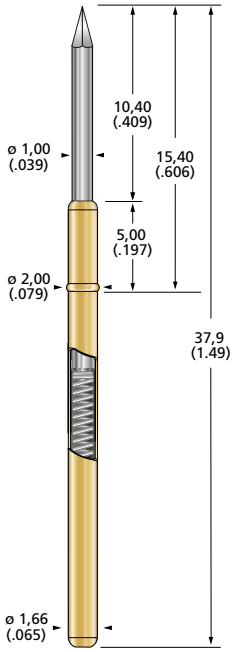
Spring Force (xx)

Preload	Rated Force	Code xx
0,9 N	1,5 N	15
1,2 N	3,0 N	30

	Ø 1,00	44.118.10.xx
	Ø 1,00	44.46.10.xx
	For XXLonglife-Nanocoating order as 44X	

Series 44



Series 44

Technical Data

Overall Length	37,90 mm
Minimum Centre Spacing	2,54 mm
Maximum Travel	10,40 mm
Working Travel	7,00 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	20 mΩ
Current Load rated/max.	3,0 / 4,0 A

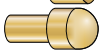
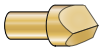
Materials

Plunger	CuBe or steel, gold plated
Barrel	Nickel silver, gold plated
Spring	Music wire, silver plated

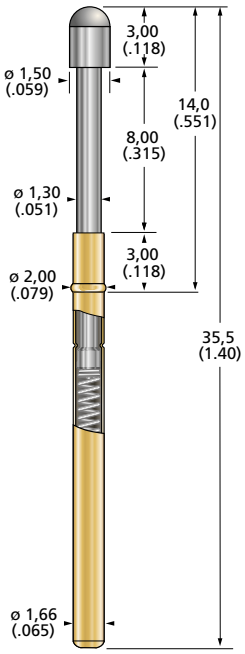
Like in series 42, the series 44 probe pistons 44 can be deflected flush with the barrel. Compared to the other metric types the plunger shaft has a diameter of 1mm istead of 1.3 mm. The Series 44 uses receptacles of Series 30 shown on page 42.

Spring Force (xx)

Preload	Rated Force	Code xx
0,3 N	0,8 N	08
0,9 N	1,5 N	15
1,0 N	2,2 N	22
1,2 N	3,0 N	30
2,0 N	5,0 N	50

	Ø 0,70	49.102.07.xx
	Ø 1,30	49.102.13.xx
	Ø 1,30	49.103.13.xx
	Ø 1,90	49.104.19.xx
	Ø 1,50	49.05.15.xx
	Ø 1,30	49.08.13.xx
	Ø 1,60	49.08.16.xx
	Ø 2,00	49.108.20.xx
	Ø 1,30	49.10.13.xx
	Ø 1,80	49.10.18.xx
	Ø 1,30	49.118.13.xx
	Ø 1,30	49.146.13.xx
	Ø 1,60	49.146.16.xx
	Ø 1,50	49.174.15.xx
	For XXLonglife-Nanocoating order as 49X	

Series 49



Series 49

Technical Data

Overall Length	35,50 mm
Minimum Centre Spacing	2,54 mm
Maximum Travel	8,00 mm
Working Travel	5,30 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	20 mΩ
Current Load rated/max.	3,0 / 4,0 A

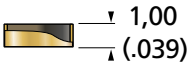
Materials

Plunger	CuBe or steel, gold plated
Barrel	Nickel silver, gold plated
Spring	Music wire, silver plated

The Series 49 uses receptacles of Series 30 shown on page 42.

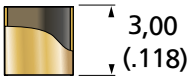
Max. Current Load	4,0 A
Overall Length	37,90 / 35,50 mm
Working Travel	7,00 / 5,30 mm
Max. Travel	10,40 / 8,00 mm
Pitch	≥ 2,54 mm ≥ 100 mil

D 50.01
Spacer tube 1 mm

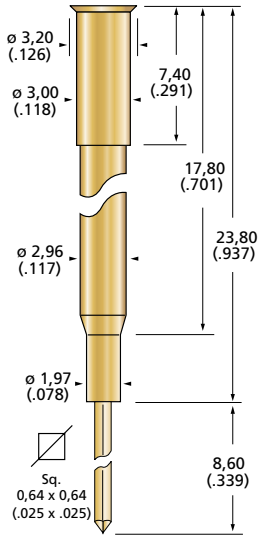


D 50.02
Spacer tube 2 mm

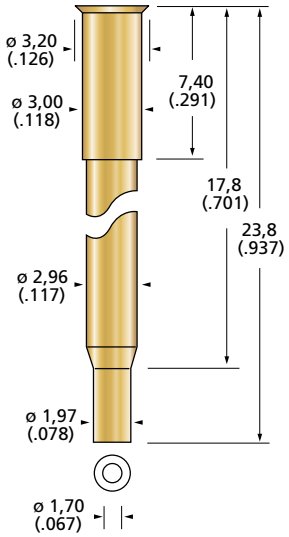
D 50.03
Spacer tube 3 mm



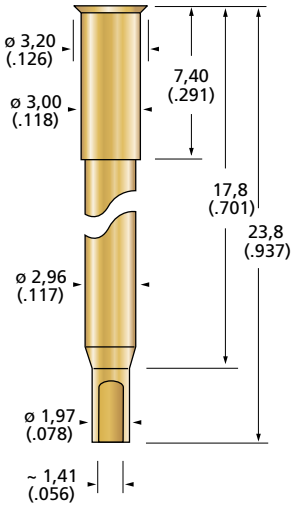
S 50.00-W
Wire-Wrap-Post without snap groove



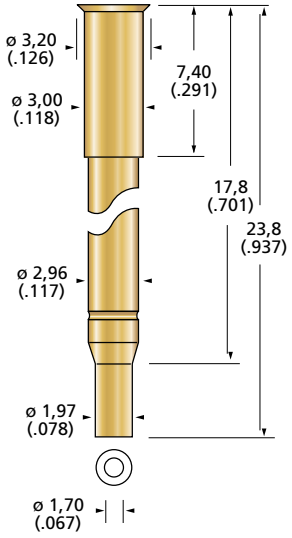
S 50.00-C
Open Crimp End
without snap groove



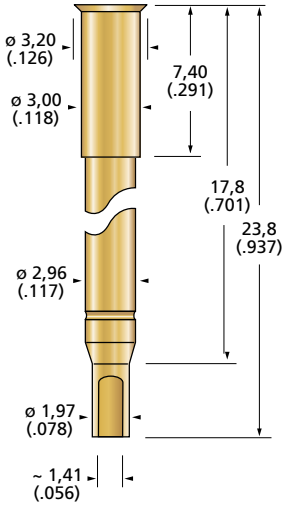
S 50.00-L
Solder Cup without snap groove



S 150.00-C
Open Crimp End
with snap groove



S 150.00-L
Solder Cup with snap groove



Pitch ≥ 3,80 mm ≥ 150 mil

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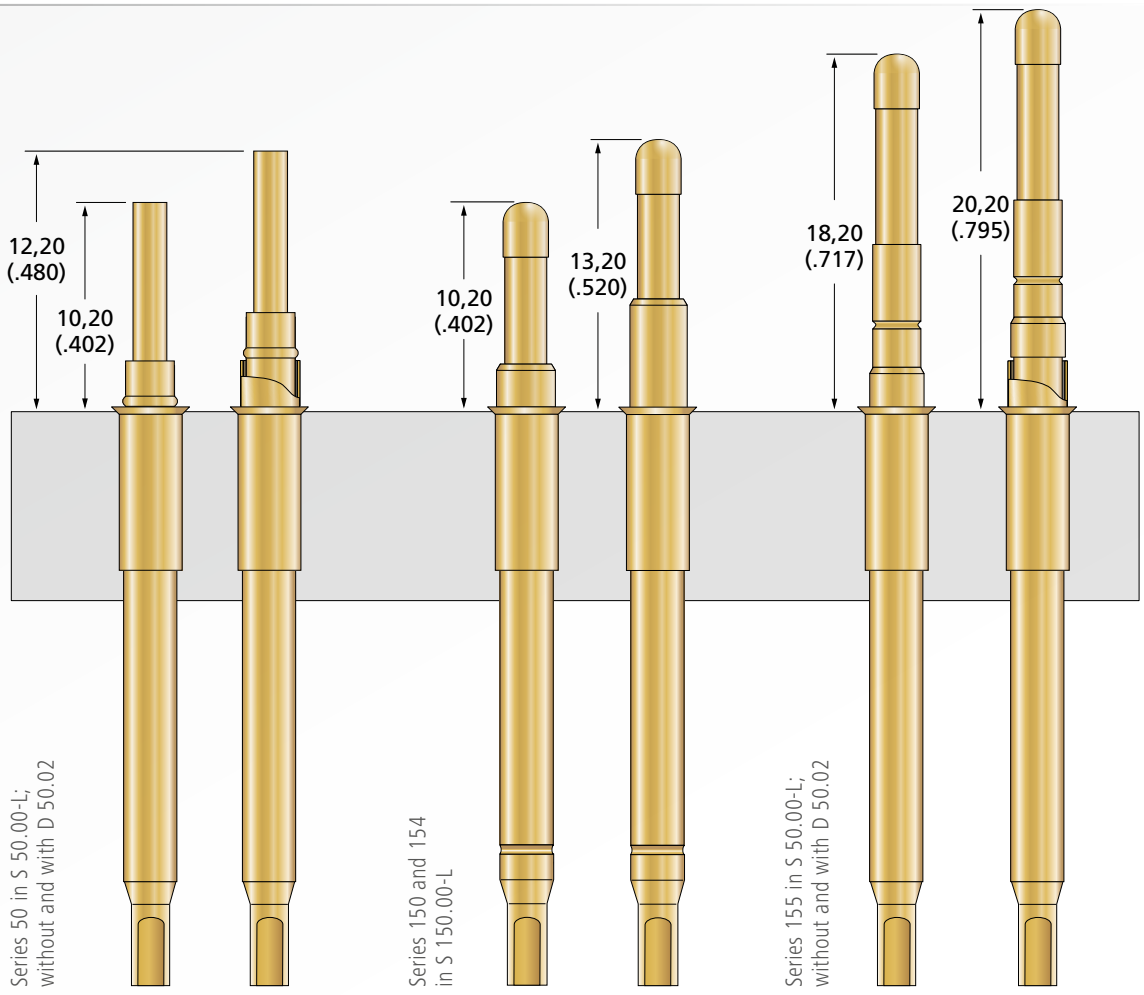
RECEPTACLES SERIES 50 / 150 / 154 / 155

The **SERIES 50**, together with its variants **150, 154** and **155**, offer a multitude of combination options. The metric series for pitch ≥ 3.80 mm, like the series for pitch ≥ 2.54 mm, features a fixed stop ring that, if combined with spacer tubes, allows for extremly variable installation height values. Additionally, some series and receptacles have a „snap groove" that provides a higher retention force for the contact probe in the receptacle. This option is widely used in the filed of cable harness test. Please note: when using spacer tubes, this feature won't work due to the raised position of the spring contact probe in the receptacle.

FIXTURING EXAMPLE



Pitch ≥ 3,80 mm ≥ 150 mil

Series 50

Technical Data

Overall Length	24,80mm
Minimum Centre Spacing	3,80 mm
Maximum Travel	5,00 mm
Working Travel	3,40 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	20 mΩ
Current Load rated/max.	4,0 / 5,5 A

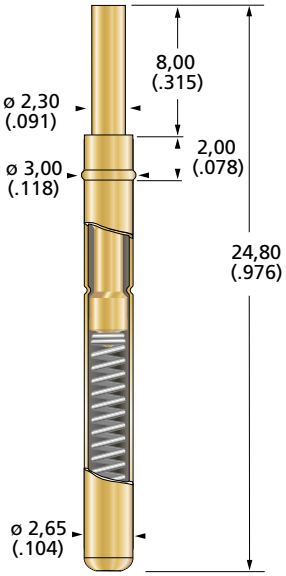
Materials

Plunger	CuBe or steel, gold plated
Barrel	Nickel silver or brass, gold plated
Spring	Music wire, silver plated

For XXLonglife-Nanocoating order as 50X

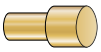
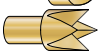
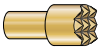
Receptacles shown on page 48.

Series 50



Spring Force (xx)

Preload	Rated Force	Code xx
0,8 N	1,5 N	15
1,0 N	2,0 N	20
1,2 N	3,0 N	30
3,0 N	5,0 N	50

	Ø 2,30	50.102.23.xx
	Ø 2,30	50.03.23.xx
	Ø 2,50	50.103.25.xx
	Ø 6,00	50.03.60.xx
	Ø 2,50	50.104.25.xx
	Ø 2,50	50.105.25.xx
	Ø 2,50	50.06.25.xx
	Ø 4,00	50.106.40.xx
	Ø 2,50	50.08.25.xx
	Ø 3,00	50.108.30.xx
	Ø 4,00	50.08.40.xx
	Ø 2,50	50.110.25.xx
	Ø 2,50	50.122.25.xx
	Ø 2,50	50.35.25.xx

Series 150

Technical Data

Overall Length	27,00 mm
Minimum Centre Spacing	3,80 mm
Maximum Travel	5,00 mm
Working Travel	3,40 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	20 mΩ
Current Load rated/max.	4,0 / 5,5 A

Materials

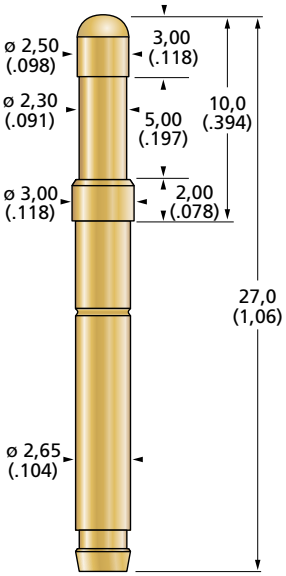
Plunger	CuBe or steel, gold plated
Barrel	Brass, gold plated
Spring	Music wire, silver plated

For XXLonglife-Nanocoating order as 150X

The Series 150 has a barrel with snap groove. Please note that if you use one of the spacers, the function of the locking groove is no longer present.

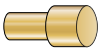
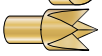
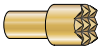
Receptacles shown on page 48.

Series 150



Spring Force (xx)

Preload	Rated Force	Code xx
0,8 N	1,5 N	15
1,0 N	2,0 N	20
1,2 N	3,0 N	30
3,0 N	5,0 N	50

	Ø 2,30	150.102.23.xx
	Ø 2,30	150.03.23.xx
	Ø 2,50	150.103.25.xx
	Ø 6,00	150.03.60.xx
	Ø 2,50	150.104.25.xx
	Ø 2,50	150.105.25.xx
	Ø 2,50	150.06.25.xx
	Ø 4,00	150.106.40.xx
	Ø 2,50	150.08.25.xx
	Ø 3,00	150.108.30.xx
	Ø 4,00	150.08.40.xx
	Ø 2,50	150.110.25.xx
	Ø 2,50	150.122.25.xx
	Ø 2,50	150.35.25.xx

Pitch ≥ 3,80 mm | Max. Travel ≥ 150 mil 5,00 mm | Working Travel 3,40 mm | Overall Length 24,80 / 27,00 mm | Max. Current Load 5,5 A

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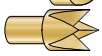
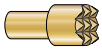
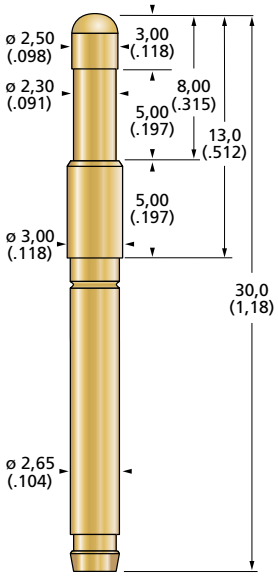
Spring Force (xx)

Preload	Rated Force	Code xx
0,8 N	1,5 N	15
1,0 N	2,0 N	20
1,2 N	3,0 N	30
3,0 N	5,0 N	50

	Ø 2,30	154.102.23.xx
	Ø 2,30	154.03.23.xx
	Ø 2,50	154.103.25.xx
	Ø 6,00	154.03.60.xx
	Ø 2,50	154.104.25.xx
	Ø 2,50	154.105.25.xx
	Ø 2,50	154.06.25.xx
	Ø 4,00	154.106.40.xx
	Ø 2,50	154.08.25.xx
	Ø 3,00	154.108.30.xx
	Ø 4,00	154.08.40.xx
	Ø 2,50	154.110.25.xx
	Ø 2,50	154.122.25.xx
	Ø 2,50	154.35.25.xx

Series 154



Series 154

Technical Data

Overall Length	30,00 mm
Minimum Centre Spacing	3,80 mm
Maximum Travel	5,00 mm
Working Travel	3,40 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	20 mΩ
Current Load rated/max.	4,0 / 5,5 A

Materials

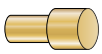
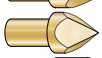
Plunger	CuBe or steel, gold plated
Barrel	Brass, gold plated
Spring	Music wire, silver plated

For XXLonglife-Nanocoating order as 154X

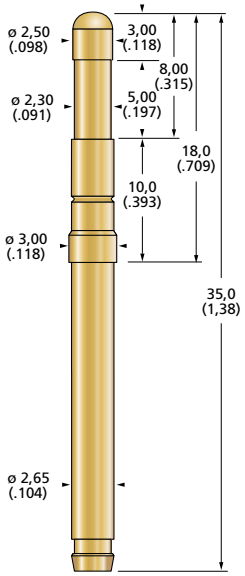
The Series 154 has a barrel with snap groove. Please note that if you use one of the spacers, the function of the locking groove is no longer present. Receptacles shown on page 48.

Spring Force (xx)

Preload	Rated Force	Code xx
0,8 N	1,5 N	15
1,0 N	2,0 N	20
1,2 N	3,0 N	30
3,0 N	5,0 N	50
3,2 N	8,0 N	80

	Ø 2,30	155.102.23.xx
	Ø 2,30	155.03.23.xx
	Ø 2,50	155.103.25.xx
	Ø 6,00	155.03.60.xx
	Ø 2,50	155.104.25.xx
	Ø 2,50	155.105.25.xx
	Ø 2,50	155.06.25.xx
	Ø 4,00	155.106.40.xx
	Ø 2,50	155.08.25.xx
	Ø 3,00	155.108.30.xx
	Ø 4,00	155.08.40.xx
	Ø 2,50	155.110.25.xx
	Ø 2,50	155.122.25.xx
	Ø 2,50	155.35.25.xx

Series 155



Series 155

Technical Data

Overall Length	35,00 mm
Minimum Centre Spacing	3,80 mm
Maximum Travel	5,00 mm
Working Travel	3,40 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	20 mΩ
Current Load rated/max.	4,0 / 5,5 A

Materials

Plunger	CuBe or steel, gold plated
Barrel	Brass, gold plated
Spring	Music wire, silver plated

For XXLonglife-Nanocoating order as 155X

The Series 155 has a barrel with snap groove. Please note that if you use one of the spacers, the function of the locking groove is no longer present. Receptacles shown on page 48.

Max. Current Load	5,5 A
Overall Length	30,00 / 35,00 mm
Working Travel	3,40 mm
Max. Travel	5,00 mm
Pitch	≥ 150 mil ≥ 3,80 mm

Series 51

Technical Data

Overall Length	34,10 mm
Minimum Centre Spacing	3,80 mm
Maximum Travel	5,00 mm
Working Travel	3,40 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	5 mΩ
Current Load rated/max.	8,0 / 10,0 A

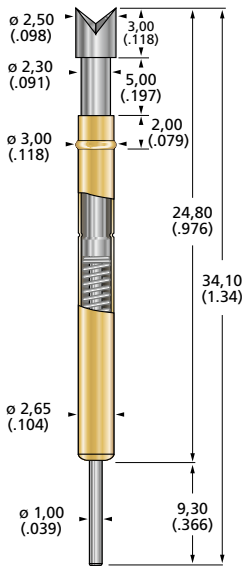
Materials

Plunger	CuBe or steel, gold plated
Barrel	Nickel silver or brass, gold plated
Spring	Music wire, silver plated

The special feature of this design is that the piston is brought out at the lower end (connection with 1 mm diameter). As a result the electrical current is passed directly over the piston and not, as in the classical case common to have a „parallel" of compression spring and housing cover. The current carrying capacity is correspondingly higher and also the transition resistance behaves according to low and constant. The connection pin which protrudes from the housing bottom, is moved during compression of the contact. We recommend to use highly flexible cable for the connection wiring. On request we can supply matching connectors for this pin with pre-attached wire. For further questions, please contact our office.

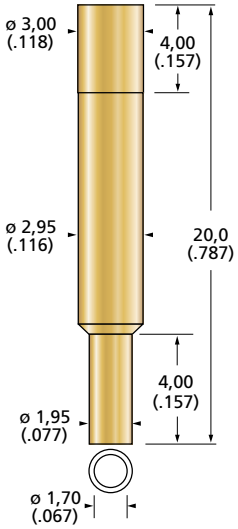
The socket S 51.00-C has in this series no electrical function but merely ensures easy installation and interchangeability. Since the terminal pin should be freely sticking out, only the Type S 51.00-C with open end can be used here.

Series 51



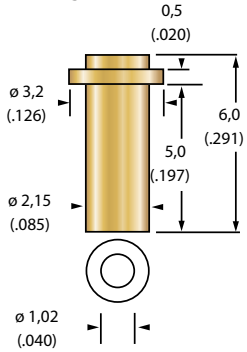
S 51.00-C

Open end for continuous plunger



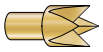
FK-541

Plug-On-Terminal



Spring Force (xx)

Preload	Rated Force	Code xx
0,8 N	1,5 N	15
1,0 N	2,0 N	20
1,2 N	3,0 N	30
3,0 N	5,0 N	50

	Ø 2,50	51.103.25.xx
	Ø 2,50	51.106.25.xx
	Ø 4,00	51.106.40.xx
	Ø 2,50	51.08.25.xx

For XXLonglife-Nanocoating order as 51X

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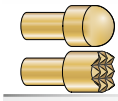
Spring Force (xx)

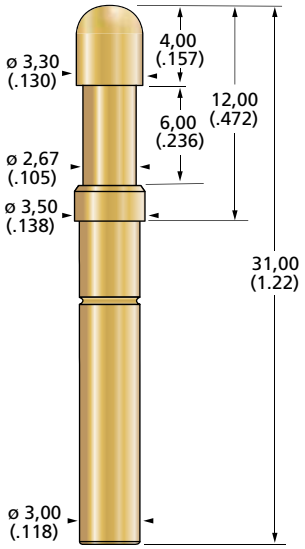
Preload	Rated Force	Code xx
1,0 N	1,5 N	15
1,2 N	3,0 N	30
3,0 N	5,0 N	50



Ø 3,30	60.05.33.xx
Ø 4,00	60.08.40.xx

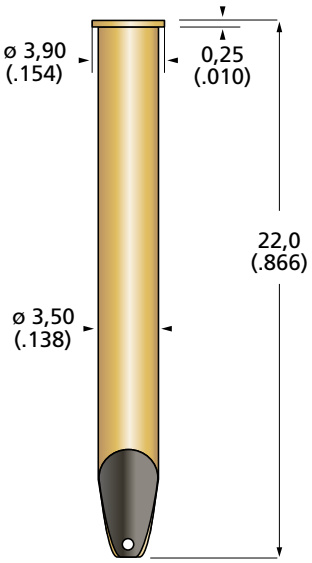
For XXLonglife-Nanocoating order as 60X

Series 60



S 60.00-LO

Open end with solder tail



Series 60

Technical Data

Overall Length	31,00 mm
Minimum Centre Spacing	4,50 mm
Maximum Travel	6,00 mm
Working Travel	4,00 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	20 mΩ
Current Load rated/max.	4,0 / 5,0 A

Materials

Plunger	CuBe hardened, gold plated
Barrel	Brass, gold plated
Spring	Music wire, silver plated

Similar as the series 51, shown on the page before, the series 60 is also available with a pass-through-plunger design named series 61.
We make that only on demand, so please contact us when you need that.

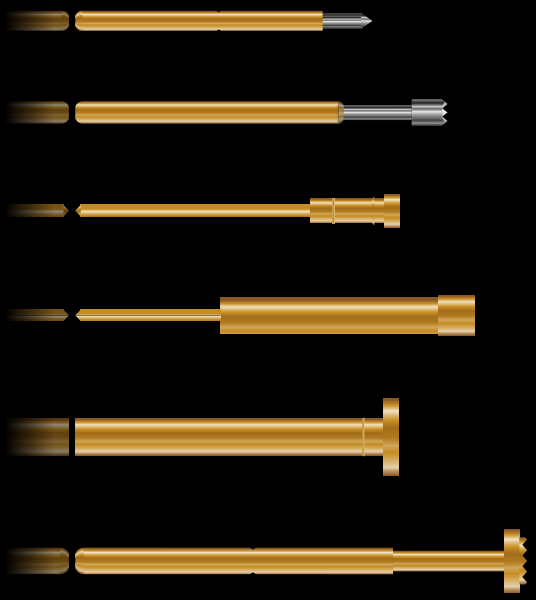
Max. Current Load	5,0 A
Overall Length	31,00 mm
Working Travel	4,00 /mm
Max. Travel	6,00 mm
Pitch	≥ 177 mil ≥ 4,50 mm

INTERFACE CONTACTS

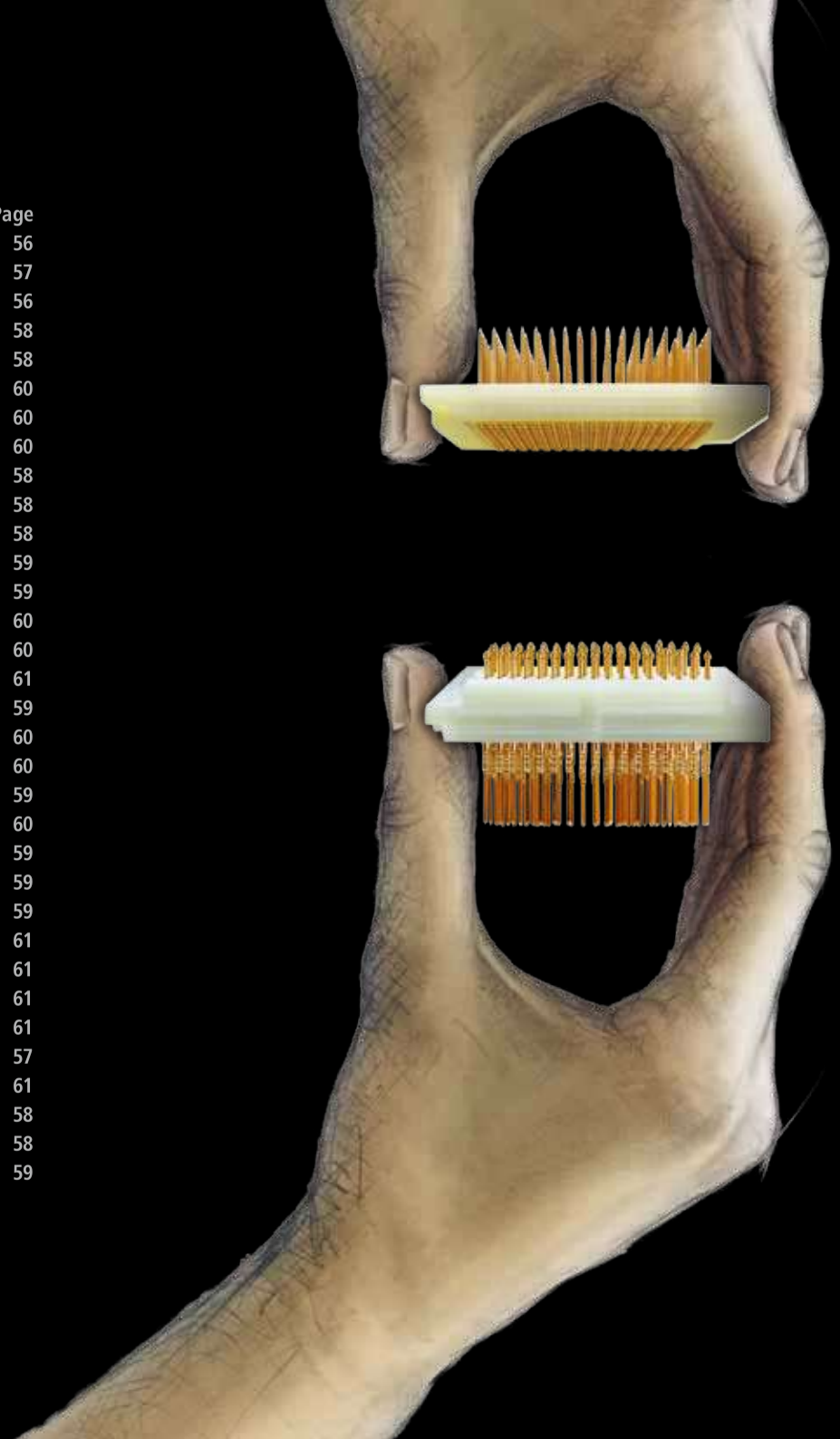
INTERFACE CONTACTS

Interface contacts are usually a pair consisting of a rigid mating contact matching to a spring-loaded pin. They are suitable for use in various standard interfaces, interface blocks and interchangeable adapters, but also in workpiece carriers or pallets, if the inserted products must be supplied with electrical power. Its purpose is to easily and thereby reliable and fast to connect electrically to a base station or unit test adapter or changing cartridges in in-line systems - thus temporarily to dock.

Sometimes in addition to the normal electrical connections for signals and power also connections for RF-techniques or for media such as compressed air or hydraulics must be coupled.
FIXTEST offers under the product line of Interface contacts not only rigid pins, but also sprung. They are fundamentally not much different from normal test probes, but because of their outer structure they are mainly used for this purpose or even standardized for specific systems. Above all, a short design and a short strokeare the decisive factors here, but in addition also the current carrying capacity and a constant low resistance value.
Completely assembled interface blocks, we have also in numerous variations. A separate brochure is available for you to download on our site. And of course, we will gladly customize your own variants and special forms for you.



Interface contacts	Page
20.08.23Z070T310	56
211	57
GR1 - GR4	56
FK-011	58
FK-011-F	58
FK-026	60
FK-027	60
FK-027-E12	60
FK-069	58
FK-069-80	58
FK-070	58
FK-090	59
FK-190	59
FK-352	60
FK-374	60
FK-386	61
FK-411	59
FK-458	60
FK-465	60
FK-488	59
FK-500	60
FK-507	59
FK-520	59
FK-521	59
FK-526	61
FK-535	61
FK-595	61
FK-596	61
FK-627	57
FK-650	61
FK-657	58
FK-726	58
FK-745	59



Series GR1 - GR4

Technical Data

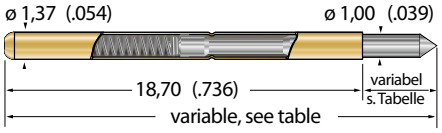
Overall Length	see Table
Minimum Centre Spacing	2,54 mm
Maximum Travel	see Table
Working Travel	see Table
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	25 mΩ
Current Load rated/max.	2,0 / 3,0 A

Materials

Plunger	CuBe hardened, gold plated
Barrel	Cu-alloy, gold plated
Spring	Music wire, gold plated or silver plated

			Extension height mm	Maximum Travel mm	Working Travel mm	Overall Length mm	Spring Force N
	Ø 1,00	**GR1.02.10.11**	3,20	3,20	2,00	21,90	1,1
	Ø 1,00	**GR2.02.10.10**	3,60	2,60	2,20	22,30	1,0
	Ø 1,00	**GR3.02.10.10**	3,80	2,60	2,20	22,50	1,0
	Ø 1,00	**GR4.02.10.10**	3,90	2,60	2,20	22,60	1,0

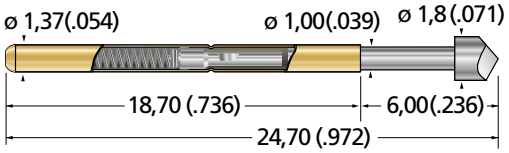
GR1 - GR4



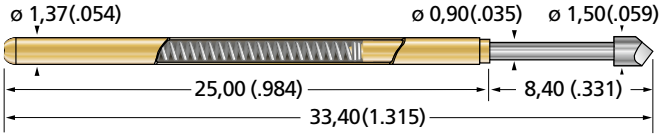
Interface Contacts for Test Platforms:

GR1 -GR4	GenRad
21.20.18.xx	Factron 300/700
100.20.15.xx	Teradyne 800/1800
20.08.23Z050T310.xx	HP 3070 MINT

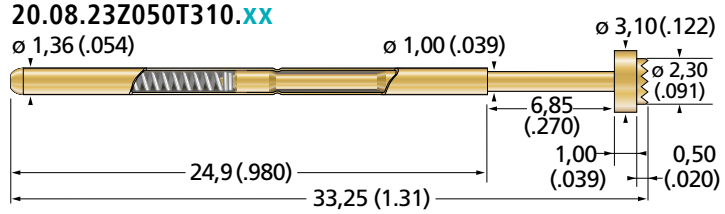
21.20.18.xx



100.20.15.xx



20.08.23Z050T310.xx



Spring Force (xx)

Preload	Rated Force	Code xx
21.20.18.xx		
0,3 N	1,0 N	10
0,8 N	1,8 N	18
1,2 N	2,5 N	25
100.20.15.xx		
0,3 N	1,0 N	10
0,35 N	1,5 N	15
0,4 N	2,0 N	20
0,5 N	2,5 N	25
0,8 N	3,0 N	30
20.08.23Z050T310.xx		
0,3 N	1,0 N	10
0,4 N	1,2 N	12
0,5 N	1,6 N	16
0,6 N	1,8 N	18
0,8 N	2,5 N	25
1,0 N	3,0 N	30

Max. Current Load 3,0 A
Overall Length 21,90 / 22,30 mm
Working Travel 2,00 / 2,20 mm
Max. Travel 3,20 / 2,60 mm
Pitch ≥ 2,54 mm ≥ 100 mil

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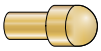
Spring Force (xx)

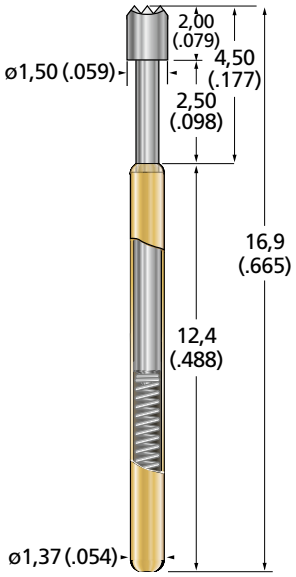
Preload	Rated Force	Code xx
0,3 N	1,2 N	12
0,4 N	1,8 N	18
0,6 N	2,1 N	21

	Ø 0,80	211.02.08.xx
	Ø 0,80	211.05.08.xx
	Ø 1,50	211.05.15.xx
	Ø 1,00	211.06.10.xx
	Ø 1,50	211.08.15.xx
	Ø 2,50	211.08.25.xx

For XXLonglife-Nanocoating order as 221X

This series is designed for a ≥ 2.54 mm pitch and is in length and travel almost identical to the 07 series, which is used in 1.27 mm pitch.

Series 211



Series 211

Technical Data

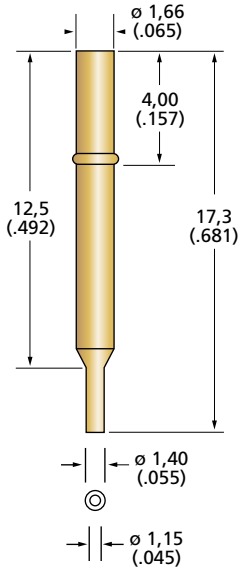
Overall Length	16,90 mm
Minimum Centre Spacing	2,54 mm
Maximum Travel	2,50 mm
Working Travel	1,70 mm
Temperature Range from	-55°C
Up to	+120°C
Typical Resistance	25 mΩ
Current Load rated/max.	3,0 / 4,0 A

Materials

Plunger	Cu-alloy, gold plated
Barrel	Cu-alloy, gold plated
Spring	Music wire, gold plated

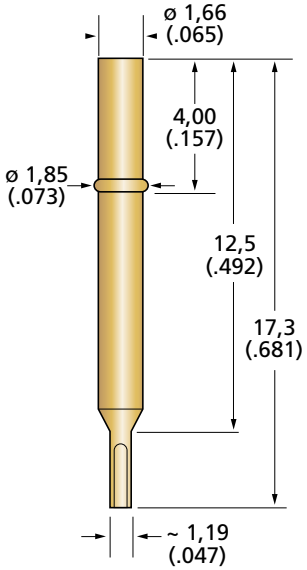
S 211.00-C

Open Crimp End

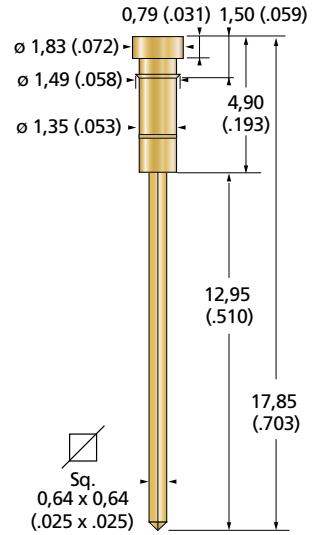


S 211.00-L

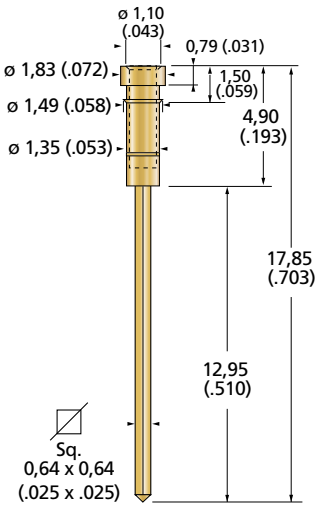
Solder Cup



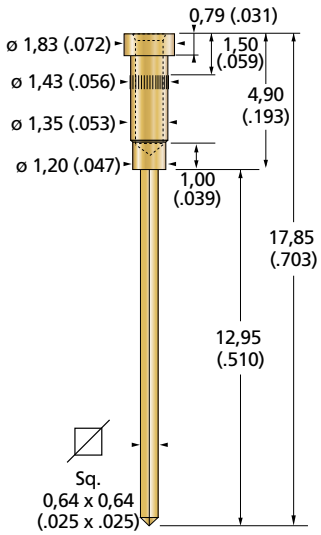
FK-069
Flat Front
Fish Hook



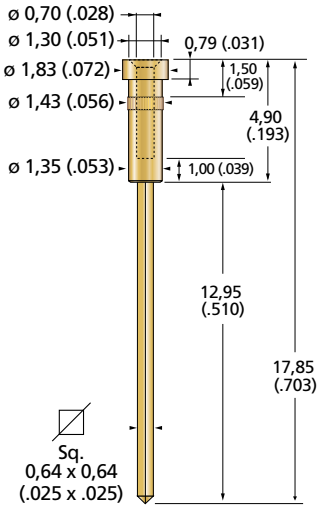
FK-070
Hollow Pin
Fish Hook



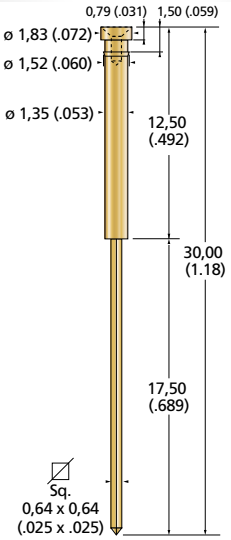
FK-011
Knurled and Hollow



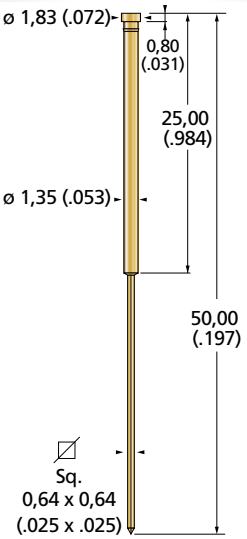
FK-011-F
Hollow pin with contact slip



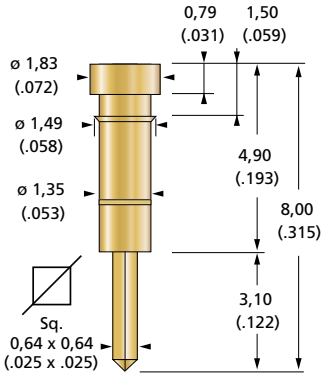
FK-627
Fish Hook



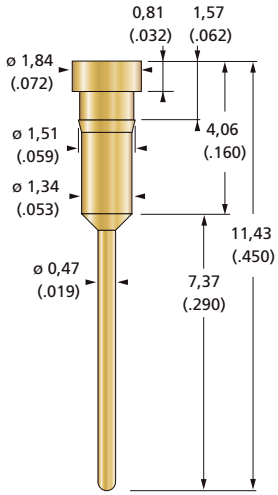
FK-520
Fish Hook



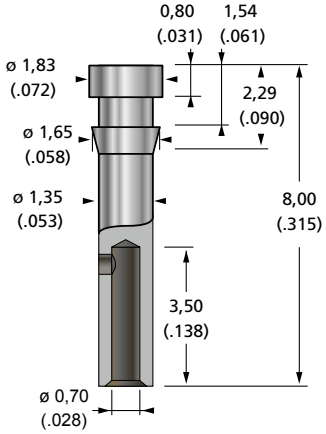
FK-069-80
Fish Hook



FK-657
Fish Hook



FK-726
Sliver alloy



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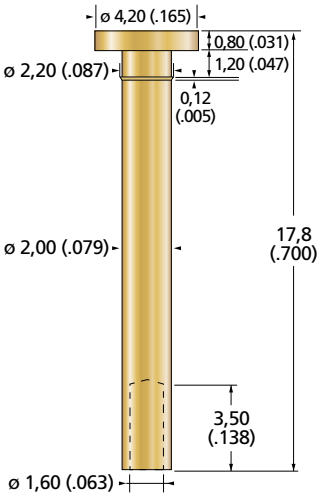
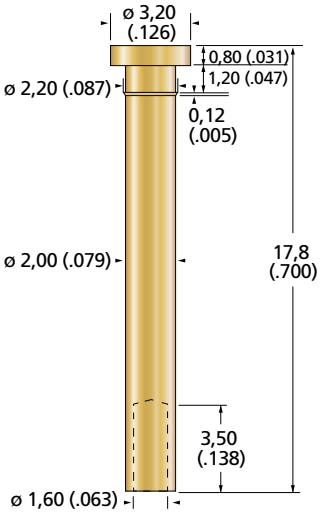
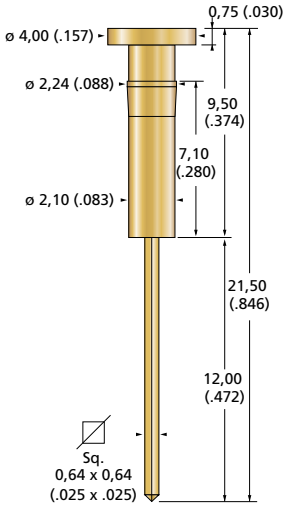
FK-090
Flat Front
Fish Hook



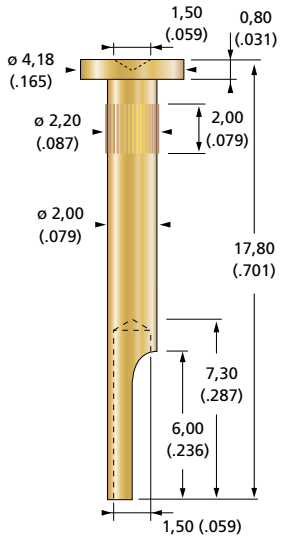
FK-190
Fish Hook



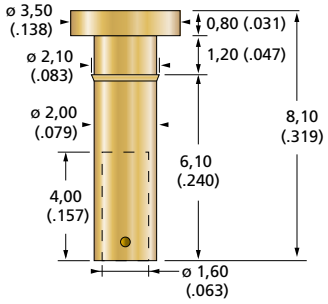
FK-521
Fish Hook



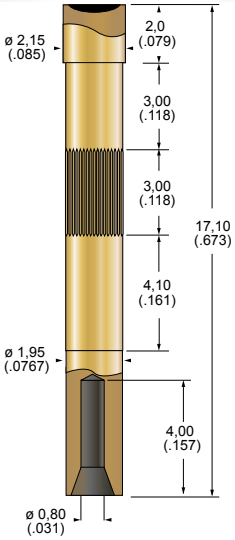
FK-507
Press fit knurl



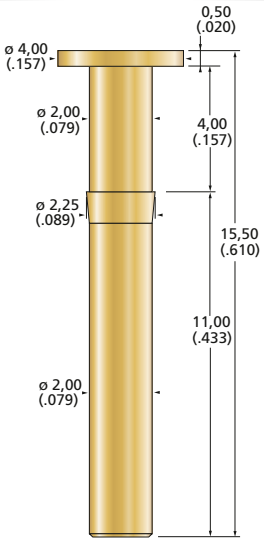
FK-411
Fish Hook



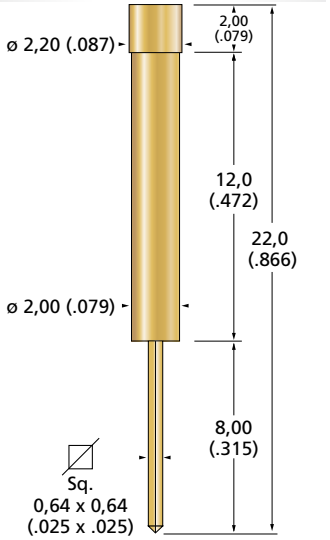
FK-488
Press fit knurl



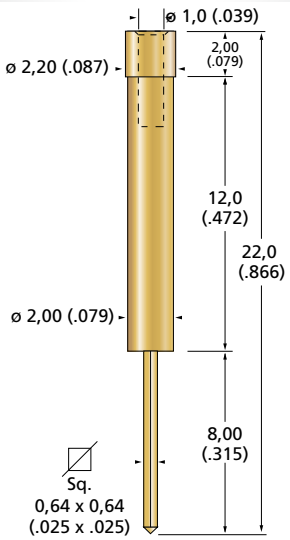
FK-745
Fish-Hook



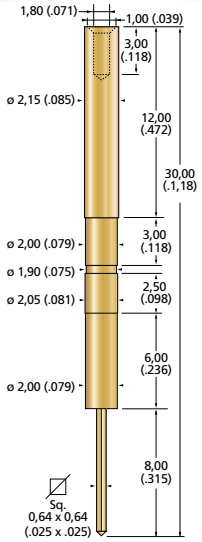
FK-026
Flat Front
Press fit shaft



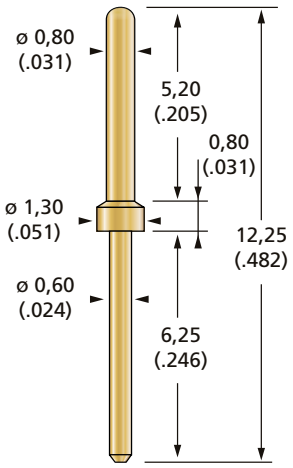
FK-027
Hollow Pin
Press fit shaft



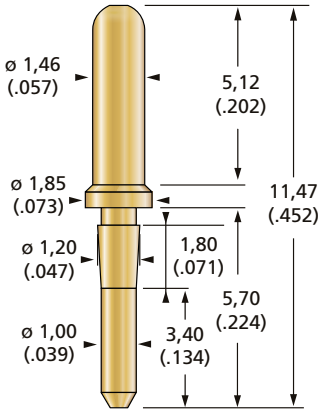
FK-027-E12



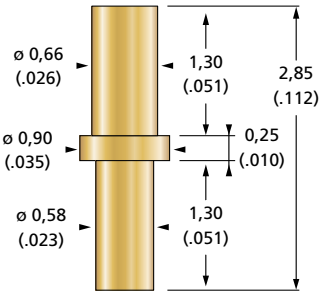
FK-352



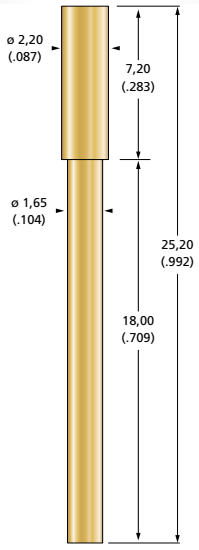
FK-374
Fish Hook



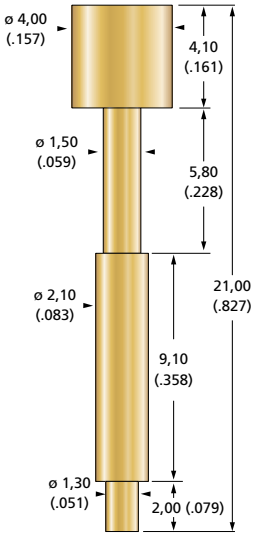
FK-458



FK-465



FK-500



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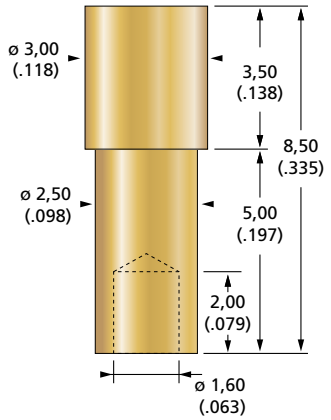
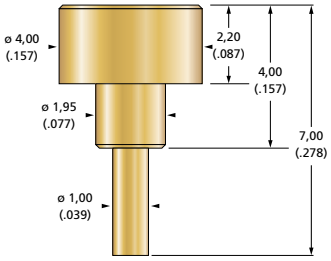
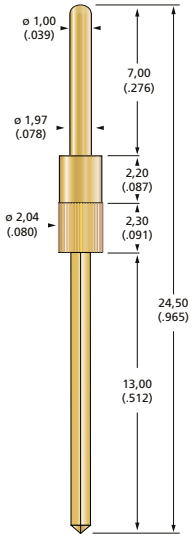
FK-535



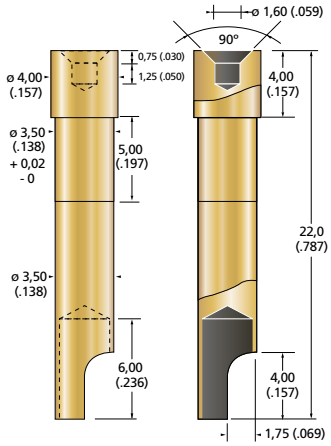
FK-650



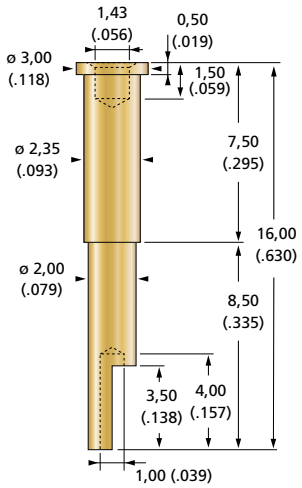
FK-526



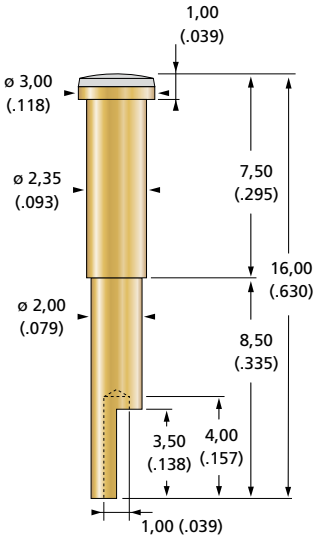
FK-386
Hollow Pin
Press fit shaft



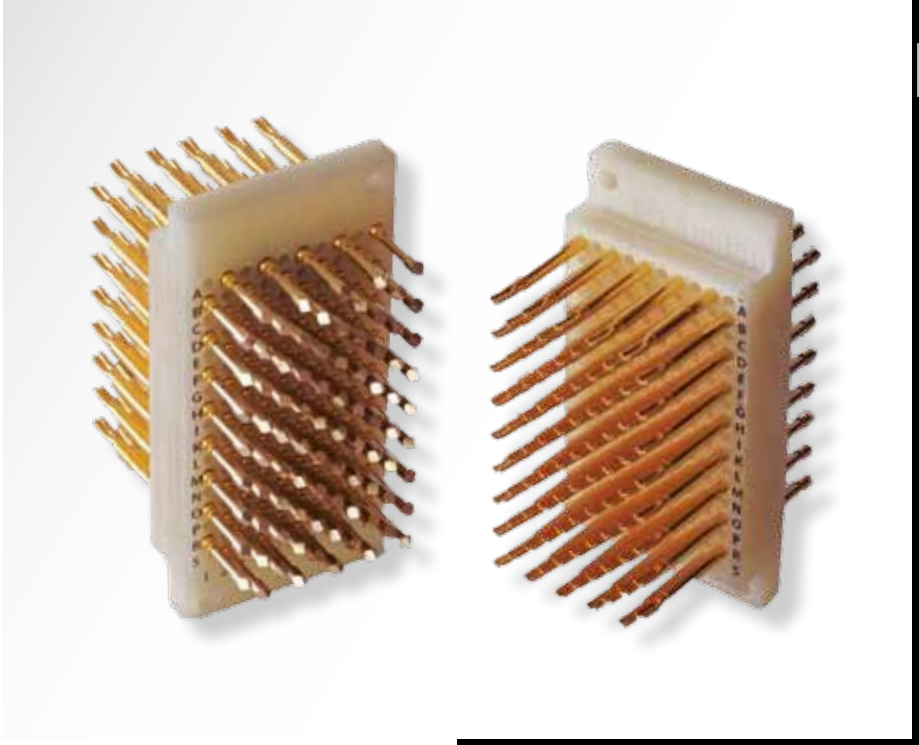
FK-595



FK-596
Silver cap



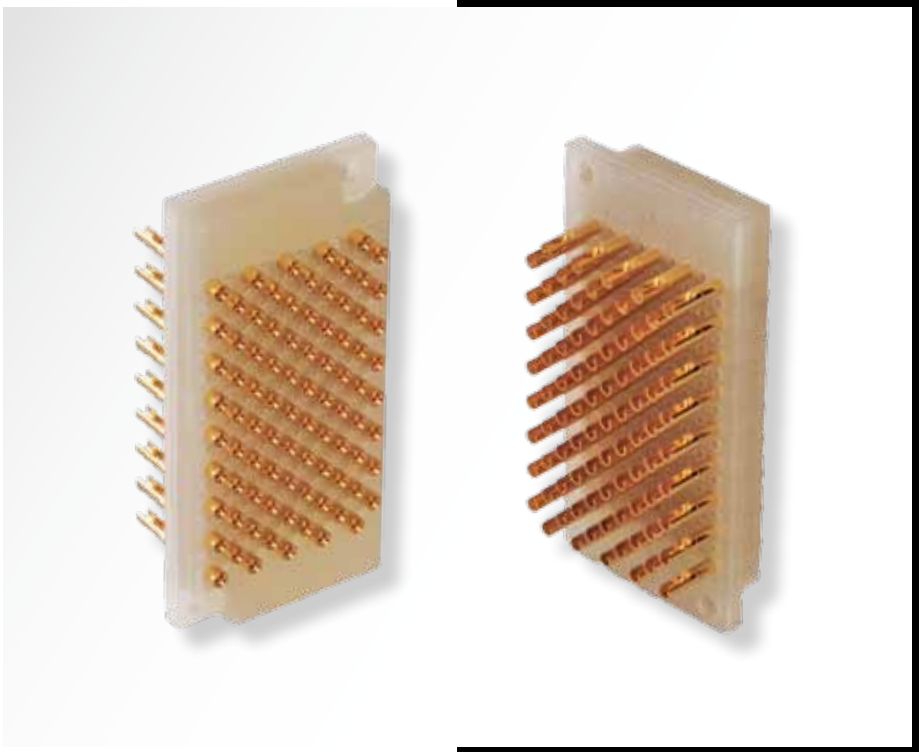
RIGID
INTERFACE CONTACTS



85-pin

with spring loaded contacts

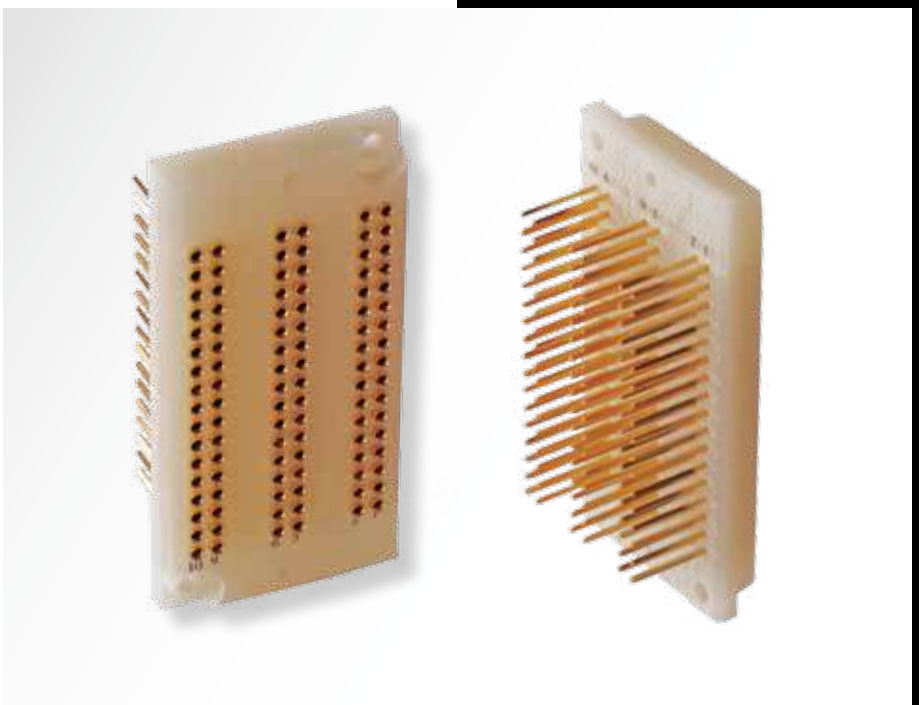
solder cup connection



85-pin

with rigid interface pins

solder cup connection



102-pin

with rigid interface pins

wire-wrap-connection

INTERFACE BLOCKS

INTERFACE BLOCKS

The exemplary pictures here on the left show only a small part of the many variants of interface components, which FIXTEST produces. Most types are based on the same carrier plate size, but there may be system-specific deviations. Also, the assembly can vary, both in terms of the number of poles, but also with respect to the connecting elements. So there are interface blocks with a combined placement of signal and power contacts, and others with compressed air connectors for applications in which to both electrical and pneumatic connections have to be supplied. Various test system manufacturers have committed themselves to various standards, and some manufacturer of inline inspection systems dock their exchange units on the base unit via standardized interface blocks. Even those components you will find at FIXTEST, and we are always openfor special orders according to your wishes.

For a full list of available types which are available on request - please contact us.

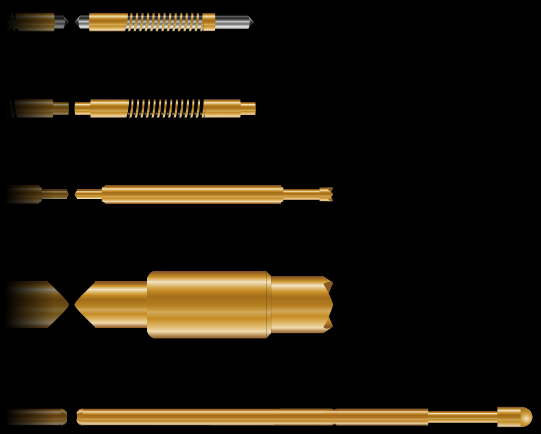
Part No.	Pin Count	Receiver side	Fixture side	Contact	Working Travel	Termination
600-070	85	✓		21.20.15.10	2,70 mm	Wire-Wrap
600-074	85	✓		GR2.02.10.10	2,20 mm	Solder Cup
2690-0020	102	✓		21.20.18.10	2,70 mm	Solder Cup
2690-0022	102	✓		21.20.15.10	2,70 mm	Wire-Wrap
600-001	128	✓		30.10.18.10	3,30 mm	Solder Cup
600-023	170	✓		21.20.15.10	2,70 mm	Solder Cup
600-011	170	✓		21.20.18.10	2,70 mm	Wire-Wrap
600-071	85		✓	FK-011	rigid	Wire-Wrap
600-072	85		✓	FK-666	rigid	Solder Cup
2690-0010	102		✓	FK-011	rigid	Wire-Wrap
600-000	128		✓	FK-666	rigid	Solder Cup
600-013	128		✓	FK-070	rigid	Wire-Wrap
600-022	170		✓	FK-666	rigid	Solder Cup
600-010	170		✓	FK-026	rigid	Wire-Wrap
600-015	170		✓	FK-011	rigid	Wire-Wrap
600-024	170		✓	FK-666 50 pcs. FK-070 120 pcs.	rigid	Solder Cup Wire-Wrap

FINEPITCH CONTACTS

FINEPITCH PROBES

For applications in semiconductor test sockets and similar areas we offer in our category fine pitch pins for centre pitches below 0.8 mm. The thinnest spring contacts in our program have a diameter of only 0.11 mm. You can also find Kelvin contacts here for 0.4 mm pitch and many other specialties in extremely small sizes.
Another special feature is the range of MARATHON probes made by our partner KITA in Japan. These usually have sprung contacts on both sides, and - as the name suggests - a long life-cycle time, high current capability and low resistance values. KITA also specializes in customer or application-specific designs. Especially socket manufacturers across the globe preferably use KITA products, as they have obtained a very good reputation due to their durability and reliability. The product variety is so extensive that it can't be listed in a catalog. Therefore, please ask us for assistance, where the first selecting criteria is the minimum centre pitch of the contact array. Next are still important: single-end or double-end spring loaded plungers? Overall Length? Contact stroke and force? Temperature range, humidity? We have extensive product lists and provide you with information on request.

FIXTEST is the responsible distribution partner of KITA Mfg. Co. in Europe and your competent partner in all matters relating to fine pitch. We help you also in questions around socket design and manufacturing.



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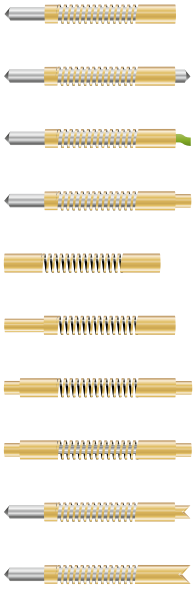
FINEPITCH KELVIN	89/90
MARATHON	91-95

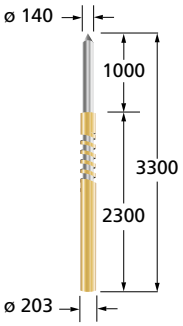
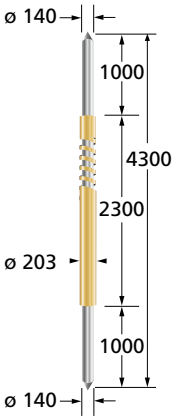
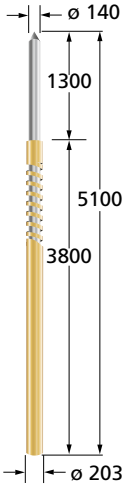
OVERVIEW µHELIX 200

µHELIX-PROBES

The unusual design of the µHelix contacts immediately catches the eye. In contrast to conventional spring contacts the µHelix fine pitch contacts do not have an internal coil spring - their „spring" is instead directly integrated into the housing sleeve, or in other words, the sleeve is also spring. The special design has enormous benefits: The electrical properties are excellent, a particularly relevant factor for RF transmissions or the use of relatively high currents.

Also for burn-in applications µHelix contacts are ideally suited, as the materials used are very temperature resistant. Due to their design µHelix contactshave an extremely long service life: Over 5 million load cycles were achieved in laboratory tests with no apparent change of spring force or electrical resistance. Important is the correct installation of the contacts that



S200-2300	S200-2300-P2	S200-3800
		

Technical Data	S200-2300	S200-2300-P2	S200-3800
Overall Length	3300 µm	4300 µm	5100 µm
Tube part length	2300 µm	2300 µm	3800 µm
Minimum Centre Spacing	254 µm	254 µm	254 µm
Spring Force	30 g (0,3 N) / 40 g (0,4 N)	30 g (0,3 N)	30 g (0,3 N) / 60 g (0,6 N)
Maximum Travel	300 µm / 250 µm	300 µm	700 µm / 600 µm
Working Travel	150 µm / 125 µm	150 µm	350 µm / 300 µm
Temperature Range from	–40°C	–40°C	–40°C
Up to	+150°C	+150°C	+150°C
Typical Resistance	≤ 100 mΩ	≤ 130 mΩ	≤ 150 mΩ
Current rating	0,5 A	0,5 A	0,5 A

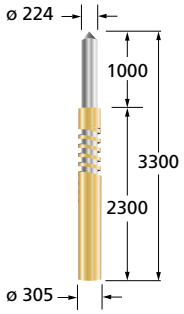
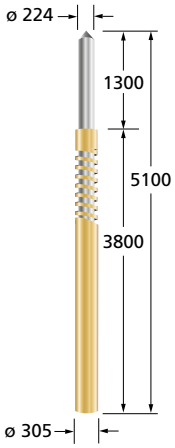
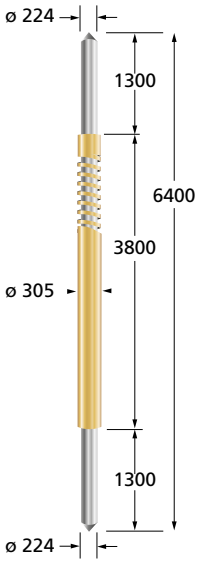
Materials

Plunger	CuBe or steel, gold plated
Spring	304 Stainless steel

µHelix Finepitch contacts for pitch ≥ 254 µm. *All dimensions in µm.*

provides reliable protection against exceeding of the specified nominal stroke. In addition to the standard types shown here, there are many other versions with different head shapes and types of connection. For more information about the large range of µHelix contacts, please visit: **www.fixtest.de/en/helix**

Please Note: The dimensions in the catalog drawings showing µHelix contacts are given in thousandths of a millimeter (micrometers)! The type number tells you the outside diameter of the tube, for example S300 stands for 300 micrometers.

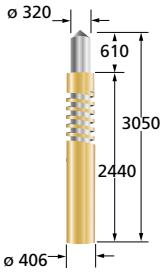
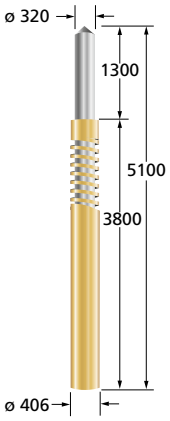
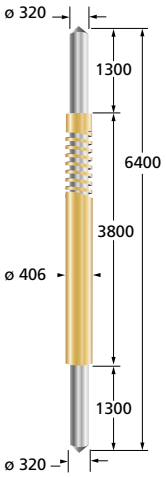
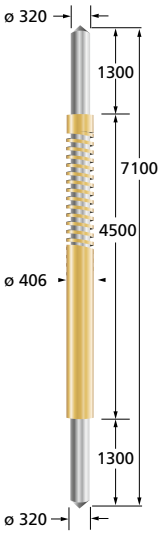
S300-2300	S300-3800	S300-3800-P2
		

Technical Data	**S300-2300**	**S300-3800**	**S300-3800-P2**
Overall Length	3300 µm	5100 µm	6400 µm
Tube part length	2300 µm	3800 µm	3800 µm
Minimum Centre Spacing	363 µm	363 µm	363 µm
Spring Force	30 g (0,3 N) / 60 g (0,6 N)	30 g (0,3 N) / 60 g (0,6 N)	30 g (0,3 N)
Maximum Travel	300 µm / 250 µm	700 µm / 600 µm	700 µm
Working Travel	150 µm / 125 µm	350 µm / 300 µm	350 µm
Temperature Range from	–40°C	–40°C	–40°C
Up to	+150°C	+150°C	+150°C
Typical Resistance	≤ 70 mΩ	≤ 70 mΩ	≤ 80 mΩ
Current rating	1,5 A	1,5 A	1,5 A

Materials

Plunger	CuBe or steel, gold plated
Spring	304 Stainless steel
	µHelix Finepitch contacts for pitch ≥ 363 µm. *All dimensions in µm.*

OVERVIEW µHELIX 400

	S400-2440	S400-3800	S400-3800-P2	S400-4500-P2
				
Technical Data	**S400-2440**	**S400-3800**	**S400-3800-P2**	**S400-4500-P2**
Overall Length	3050 µm	5100 µm	6400 µm	7100 µm
Tube part length	2440 µm	3800 µm	3800 µm	4500 µm
Minimum Centre Spacing	477 µm	477 µm	477 µm	477 µm
Spring Force	30 g (0,3 N)	30 g (0,3 N) / 80 g (0,8 N)	30 g (0,3 N) / 80 g (0,8 N)	30 g (0,3 N) /80 g (0,8 N)
Maximum Travel	400 µm	900 µm / 625 µm	900 µm / 625 µm	900 µm
Working Travel	200 µm	450 µm / 350 µm	450 µm / 350 µm	450 µm
Temperature Range from	–40°C	–40°C	–40°C	–40°C
Up to	+150°C	+150°C	+150°C	+150°C
Typical Resistance	≤ 60 mΩ	≤ 60 mΩ	≤ 80 mΩ	≤ 80 mΩ
Current rating	2,0 A	2,0 A	2,0 A	2,0 A

Materials

Plunger	CuBe or steel, gold plated
Spring	304 Stainless steel
	µHelix Finepitch contacts for pitch ≥ 477 µm. *All dimensions in µm.*

Alongside the series and types illustrated in this catalogue are additional versions and modified types with different terminations.

Find more information on our website: **www.fixtest.de/en/helix**

Current rating 2,0 A
Overall Length 3050 – 7100 µm
Working Travel 200 – 450 µm
Max. Travel 400 – 900 µm
Pitch ≥ 477 µm

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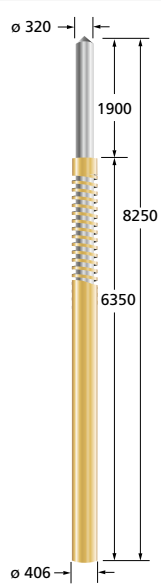
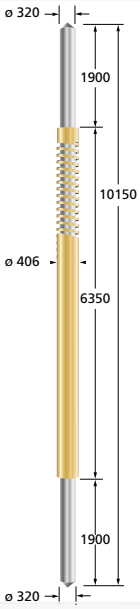
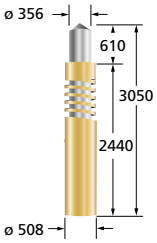
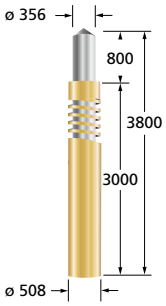
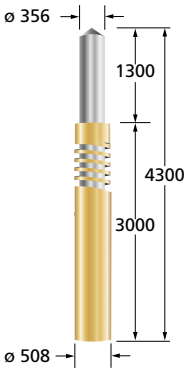
S400-6350	S400-6350-P2	S500- 2440	S500-3000-800	S500-3000-1300
				
S400-6350	**S400-6350-P2**	**S500- 2440**	**S500-3000-800**	**S500-3000-1300**
8250 µm	10150 µm	3050 µm	3800 µm	4300 µm
6350 µm	6350 µm	2440 µm	3000 µm	3000 µm
477 µm	477 µm	592 µm	592 µm	592 µm
30 g (0,3 N) / 60 g (0,6 N)	30 g (0,3 N) / 60 g (0,6 N)	30 g (0,3 N)	30 g (0,3 N)	30 g (0,3 N)
1500 µm / 1200 µm	1500 µm / 1200 µm	400 µm	650 µm	650 µm
750 µm / 600 µm	750 µm / 600 µm	200 µm	325 µm	325 µm
–40°C	–40°C	–40°C	–40°C	–40°C
+150°C	+150°C	+150°C	+150°C	+150°C
≤ 60 mΩ	≤ 100 mΩ	≤ 30 mΩ	≤ 30 mΩ	≤ 30 mΩ
2,0 A	2,0 A	2,0 A	2,0 A	2,0 A

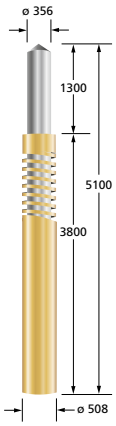
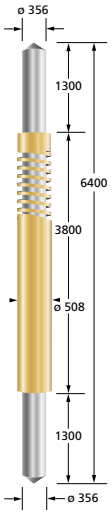
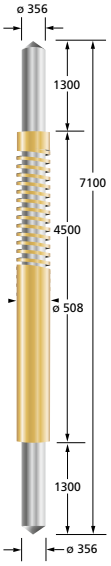
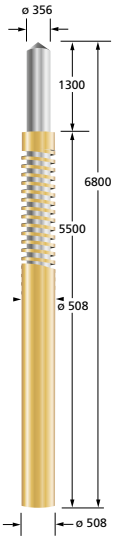
Materials

Plunger	CuBe or steel, gold plated
Spring	304 Stainless steel

µHelix Finepitch contacts for pitch ≥ 254 µm and 592 µm. *All dimensions in µm.*

Pitch ≥ 477 / 592 µm
Max. Travel 1500 / 650 µm
Working Travel 750 / 325 µm
Overall Length 10150 / 4300 µm
Current rating 2,0 A

OVERVIEW µHELIX 500

	S500-3800	S500-3800-P2	S500-4500-P2	S500-5500
				
Technical Data	**S500-3800**	**S500-3800-P2**	**S500-4500-P2**	**S500-5500**
Overall Length	5100 µm	6400 µm	7100 µm	6800 µm
Tube part length	3800 µm	3800 µm	4500 µm	5500 µm
Minimum Centre Spacing	592 µm	592 µm	592 µm	592 µm
Spring Force	30 g (0,3 N) / 90 g (0,9 N)	30 g (0,3 N) / 90 g (0,9 N)	30 g (0,3 N)	30 g (0,3 N)
Maximum Travel	900 µm / 700 µm	500 µm	900 µm	900 µm
Working Travel	450 µm / 350 µm	350 µm	450 µm	450 µm
Temperature Range from	–40°C	–40°C	–40°C	–40°C
Up to	+150°C	+150°C	+150°C	+150°C
Typical Resistance	≤ 30 mΩ	≤ 30 mΩ	≤ 100 mΩ	≤ 115 mΩ
Current rating	2,0 A	2,0 A	2,0 A	2,0 A

Materials

Plunger	CuBe or steel, gold plated
Spring	304 Stainless steel
	µHelix Finepitch contacts for pitch ≥ 592 µm. *All dimensions in µm.*

Alongside the series and types illustrated in this catalogue are additional versions and modified types with different terminations.

Find more information on our website: **www.fixtest.de/en/helix**

Current rating 2,0 A
Overall Length 3050 – 10400 µm
Working Travel 250 – 750 µm
Max. Travel 400 – 1500 µm
Pitch ≥ 592 µm

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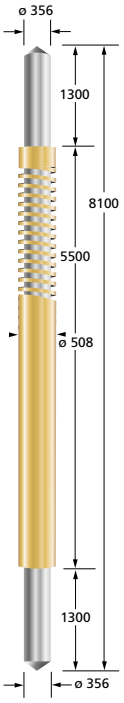
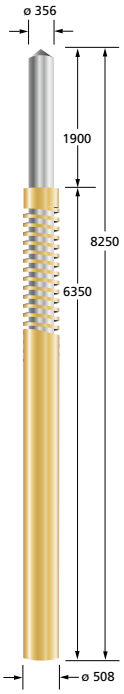
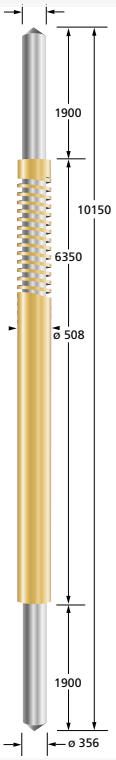
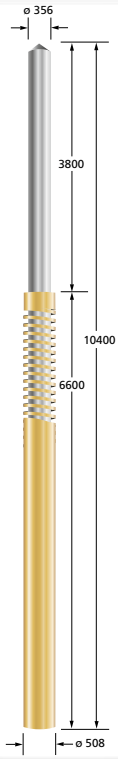
OVERVIEW µHELIX 500

S500-5500-P2	S500-6350	S500-6350-P2	S500-6600
			
S500-5500-P2	**S500-6350**	**S500-6350-P2**	**S500-6600**
8100 µm	8250 µm	10150 µm	10400 µm
5500 µm	6350 µm	6350 µm	6600 µm
592 µm	592 µm	592 µm	592 µm
30 g (0,3 N)	30 g (0,3 N) / 90 g (0,9 N)	30 g (0,3 N) / 90 g (0,9 N)	30 g (0,3 N)
900 µm	1500 µm / 1200 µm	1500 µm / 1200 µm	1500 µm
450 µm	750 µm / 600 µm	750 µm / 600 µm	750 µm
–40°C	–40°C	–40°C	–40°C
+150°C	+150°C	+150°C	+150°C
≤ 125 mΩ	≤ 50 mΩ	≤ 60 mΩ	≤ 70 mΩ
2,0 A	2,0 A	2,0 A	2,0 A

Materials

Plunger	CuBe or steel, gold plated
Spring	304 Stainless steel

µHelix Finepitch contacts for pitch ≥ 592 µm. *All dimensions in µm.*

FINEPITCH CONTACTS

Series 105

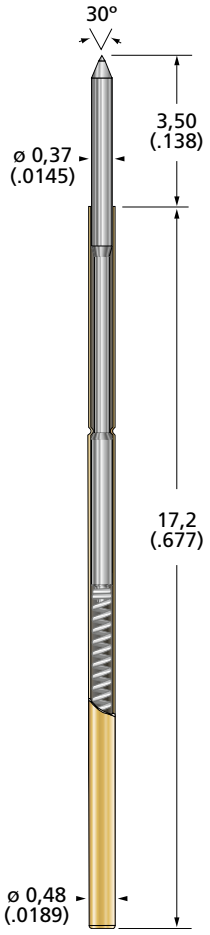
Technical Data

Overall Length	20,70 mm
Minimum Centre Spacing	1,00 mm
Typical Spring Force	0,75 N
Maximum Travel	3,50 mm
Working Travel	2,00 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	50 mΩ
Current Load rated/max.	1,0 / 1,5 A

Materials

Plunger	Steel, gold plated
Barrel	Brass, gold plated
Spring	Music wire or Stainless steel, gold plated

Series 105



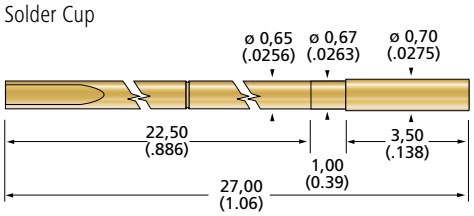
Spring Force (xx)

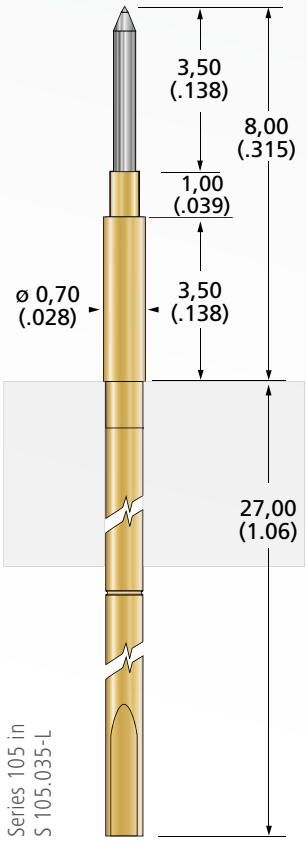
Rated Force	Code xx
0,75 N	08

Ø 0,37 **105.102.04.08**

For XXLonglife-Nanocoating order as 105X

S 105.035-L
Solder Cup





Series 105 in S 105.035-L

FIXTURING EXAMPLE

FINEPITCH CONTACTS SERIES 105

Pitch ≥ 1,00 mm
Max. Travel 3,50 mm
Working Travel 2,00 mm
Overall Length 20,70 mm
Max. Current Load 1,5 A

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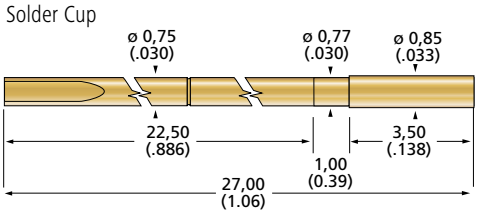
Spring Force (xx)

Rated Force	Code xx
1,0 N	10

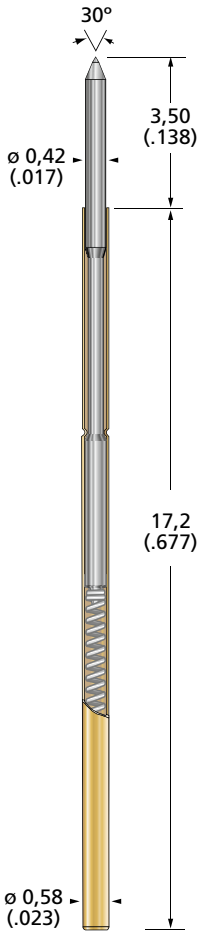
	Ø 0,42	106.02.04.10
	Ø 0,42	106.102.04.10

For XXLonglife-Nanocoating order as 106X

S 106.035-L
Solder Cup



Series 106



Series 106

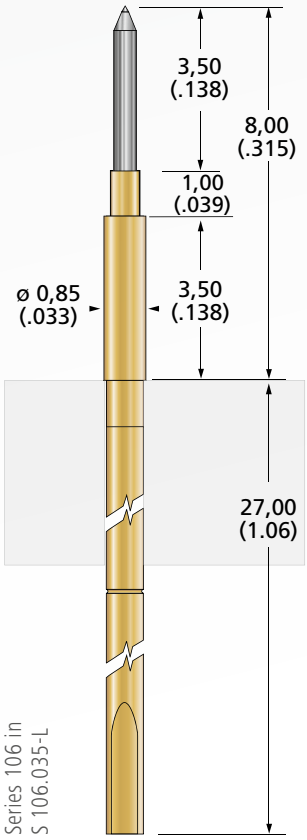
Technical Data

Overall Length	20,70 mm
Minimum Centre Spacing	1,00 mm
Typical Spring Force	1,0 N
Maximum Travel	3,50 mm
Working Travel	2,00 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	50 mΩ
Current Load rated/max.	1,0 / 2,0 A

Materials

Plunger	Steel, gold plated
Barrel	Brass, gold plated
Spring	Music wire or Stainless steel, gold plated

FIXTURING EXAMPLE



Series 700

Technical Data

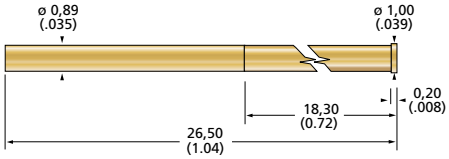
Overall Length	22,80 mm
Minimum Centre Spacing	1,27 mm
Typical Spring Force	0,80 N
Maximum Travel	3,00 mm
Working Travel	2,00 mm
Temperature Range from	–45°C
Up to	+125°C
Typical Resistance	50 mΩ
Current rating	1,0 A

Materials

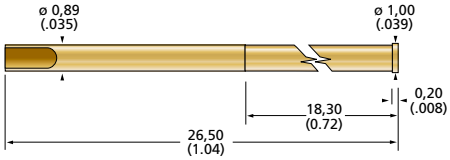
Plunger	Steel, gold plated
Barrel	Phosphor bronze, gold plated
Spring	Music wire, silver plated

For XXLonglife-Nano-coating order as 700X

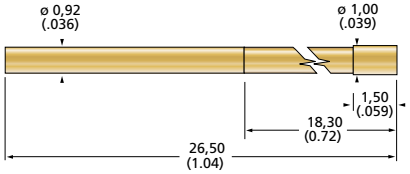
S 700.00-C



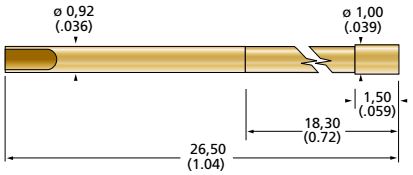
S 700.00-L



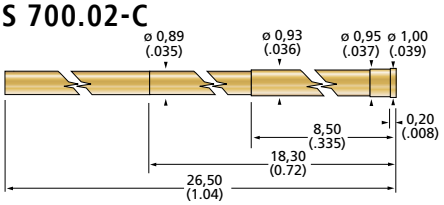
S 700.01-C



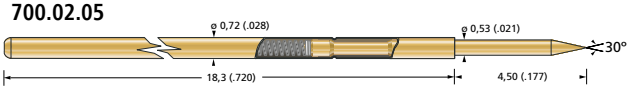
S 700.01-L



S 700.02-C



700.02.05



700.03.10K15

700.04.05

700.04.10K15

700.05.10K15

700.06.50

700.14.10K15

700.15.10K15

700.66.05

700.66.10K15

Current rating 1,0 A
Overall Length 22,80 mm
Working Travel 2,00 mm
Max. Travel 3,00 mm
Pitch ≥ 1,27 mm

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Series 701

Technical Data

Overall Length	12,00 - 14,50 mm
Minimum Centre Spacing	0,50 mm
Typical Spring Force	0,16 N
Maximum Travel	2,00 mm
Working Travel	1,33 mm
Temperature Range from	–45°C
Up to	+125°C
Typical Resistance	250 mΩ
Current rating	0,2 A

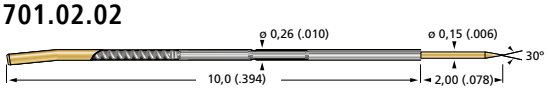
Materials

Plunger	Steel, gold plated
Barrel	Phosphor bronze, gold plated
Spring	Music wire, silver plated

For XXLonglife-Nano-coating order as 071X

Finepitch series for pitch ≥ 0,70 mm.

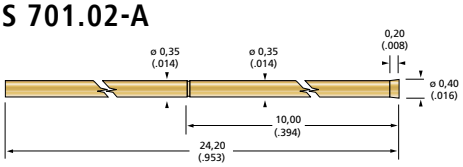
701.02.02



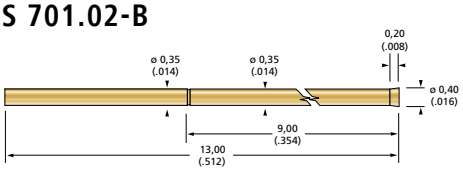
701.66.03K25

701.15.03

S 701.02-A



S 701.02-B



Series 702

Technical Data

Overall Length	11,00 - 14,50 mm
Minimum Centre Spacing	0,70 mm
Typical Spring Force	0,22 N
Maximum Travel	2,00 mm
Working Travel	1,33 mm
Temperature Range from	–45°C
Up to	+125°C
Typical Resistance	180 mΩ
Current rating	1,0 A

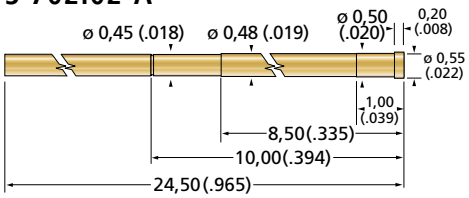
Materials

Plunger	Steel, gold plated
Barrel	Phosphor bronze, gold plated
Spring	Music wire, silver plated

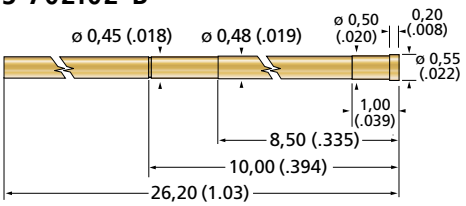
For XXLonglife-Nano-coating order as 702X

Finepitch series for pitch ≥ 0,70 mm.

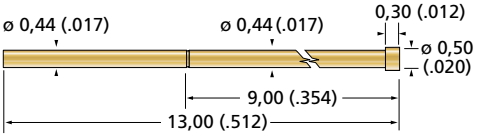
S 702.02-A



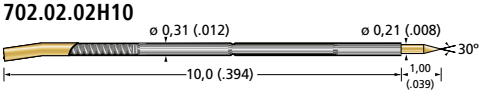
S 702.02-B



S 702.03



702.02.02H10



702.02.02H20

702.04.02

702.04.03K25

702.05.02

702.05.03K25

702.06.02

702.15.03K25

702.66.02

702.66.03K25

Series 703

Technical Data

Overall Length	11,00 - 14,50 mm
Minimum Centre Spacing	0,80mm
Typical Spring Force	0,35 N
Maximum Travel	2,00 mm
Working Travel	1,33 mm
Temperature Range from	–45°C
Up to	+125°C
Typical Resistance	180 mΩ
Current rating	1,0 A

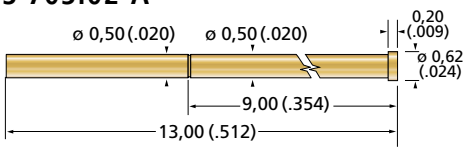
Materials

Plunger	Steel, gold plated
Barrel	Phosphor bronze, gold plated
Spring	Music wire, silver plated

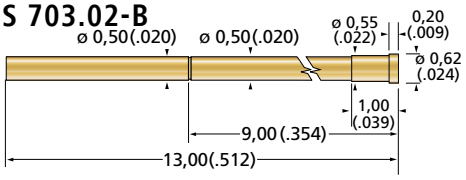
For XXLonglife-Nano-coating order as 703X

Finepitch series for pitch ≥ 0,80 mm.

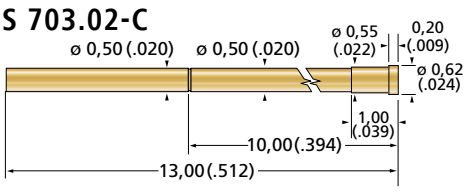
S 703.02-A



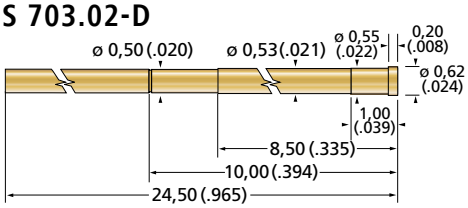
S 703.02-B



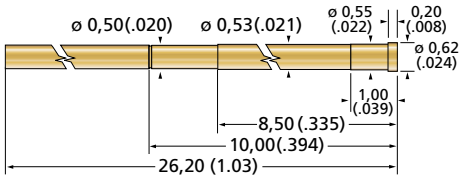
S 703.02-C



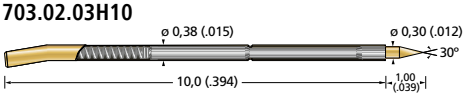
S 703.02-D



S 703.02-E



703.02.03H10



703.02.03

703.03.04K25

703.04.03

703.04.04K25

703.05.03

703.05.04K25

703.06.03

703.15.04

703.66.03

703.66.04K25

Current rating 1,0 A
Overall Length 11,50 - 14,50 mm
Working Travel 1,33 mm
Max. Travel 2,00 mm
Pitch ≥ 0,80 mm

Series 704

Technical Data

Overall Length	19,00 mm
Minimum Centre Spacing	0,80 mm
Typical Spring Force	0,50 N
Maximum Travel	2,00 mm
Working Travel	1,33 mm
Temperature Range from	–45°C
Up to	+125°C
Typical Resistance	100 mΩ
Current rating	1,0 A

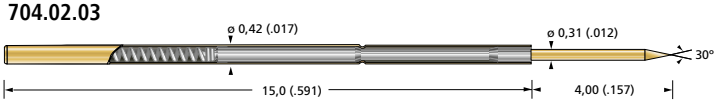
Materials

Plunger	Steel, gold plated
Barrel	Phosphor bronze, gold plated
Spring	Music wire, silver plated

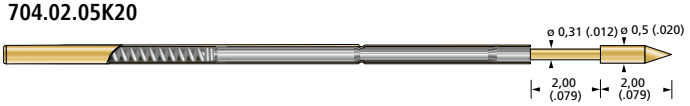
For XXLonglife-Nano-coating order as 704X

Finepitch series for pitch ≥ 0,80 mm.

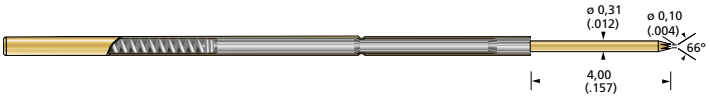
704.02.03



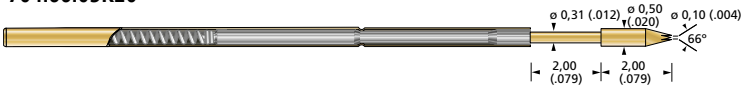
704.02.05K20



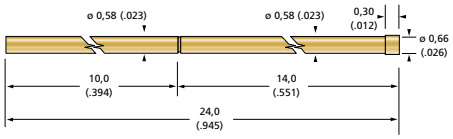
704.66.03



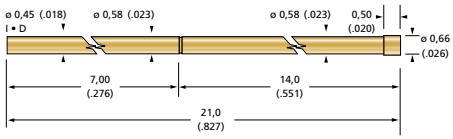
704.66.05K20



S 704.03-N



S 704.05-N



Current rating 1,0 A
Overall Length 19,00 mm
Working Travel 1,33 mm
Max. Travel 2,00 mm
Pitch ≥ 0,80 mm

FINEPITCH CONTACTS

Series 705

Technical Data

Overall Length	17,00 - 19,00 mm
Minimum Centre Spacing	1,00 mm
Typical Spring Force	0,50 N
Maximum Travel	2,00 mm
Working Travel	1,33 mm
Temperature Range from	–45°C
Up to	+125°C
Typical Resistance	100 mΩ
Current rating	1,0 A

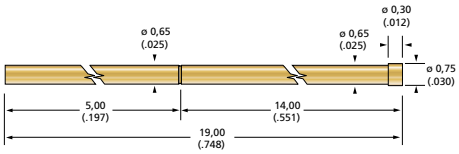
Materials

Plunger	Steel, gold plated
Barrel	Phosphor bronze, gold plated
Spring	Music wire, silver plated

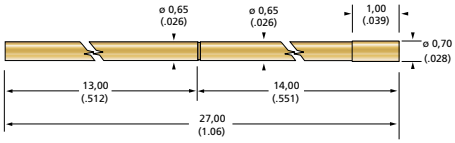
For XXLonglife-Nano-coating order as 705X

More receptacles available on request.

S 705.03-A



S 705.10



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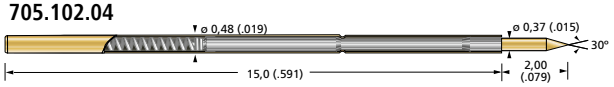

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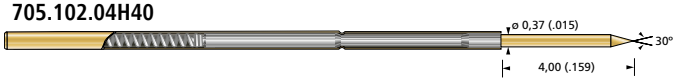

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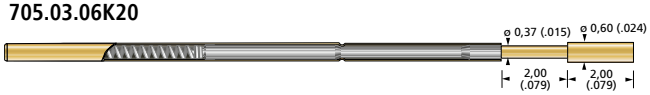

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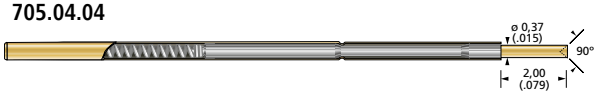

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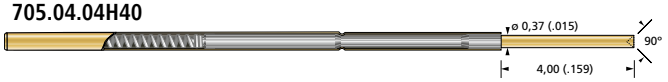

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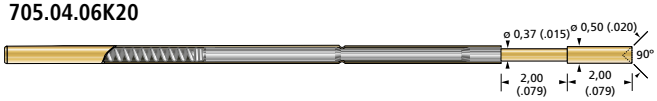

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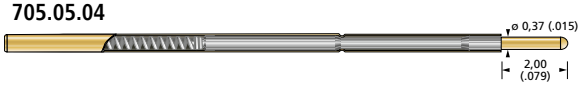

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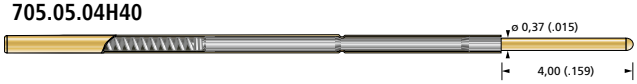

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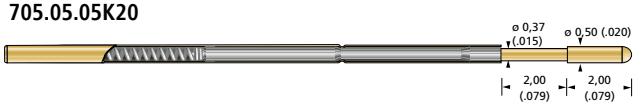

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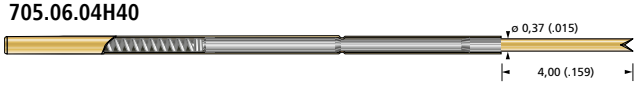

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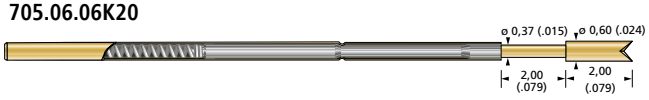

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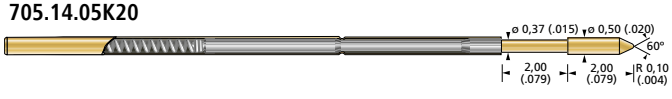

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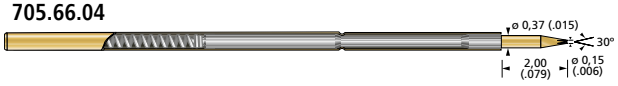

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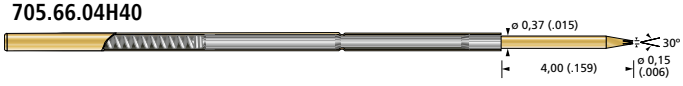

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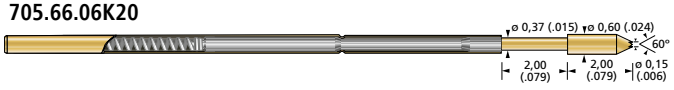


Current rating 1,0 A
Overall Length 17,00 - 19,00 mm
Working Travel 1,33 mm
Max. Travel 2,00 mm
Pitch 1,00 mm

Series 706

Technical Data

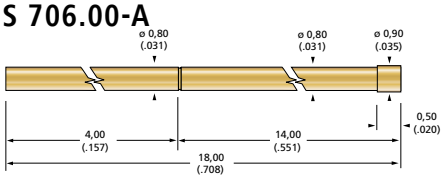
Overall Length	16,00 - 18,50 mm
Minimum Centre Spacing	1,00 mm
Typical Spring Force	0,50 N
Maximum Travel	2,00 mm
Working Travel	1,33 mm
Temperature Range from	–45°C
Up to	+125°C
Typical Resistance	60 mΩ
Current rating	1,0 A

Materials

Plunger	Stel, gold plated
Barrel	Phosphor bronze, gold plated
Spring	Music wire, silver plated

For XXLonglife-Nano-coating order as 706X

S 706.00-A



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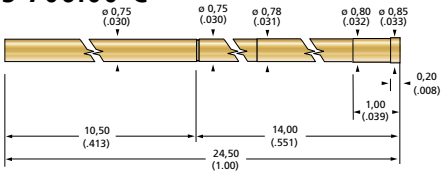

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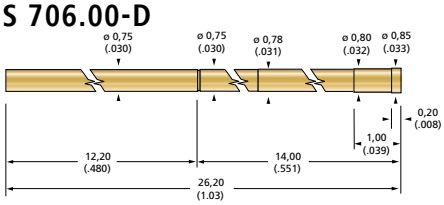
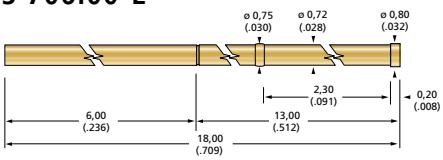
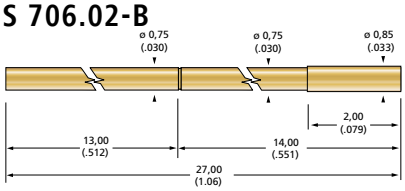


S 706.00-E



S 706.02-B



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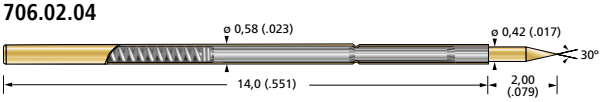

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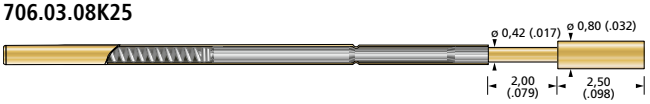

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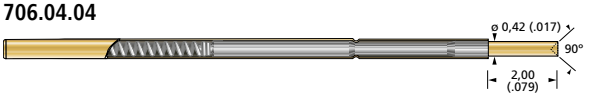

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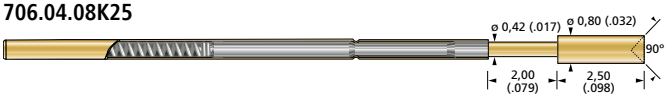

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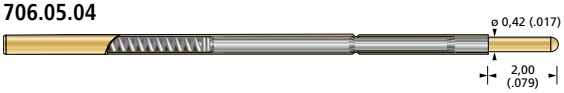

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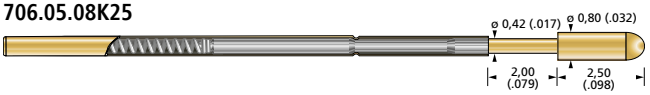

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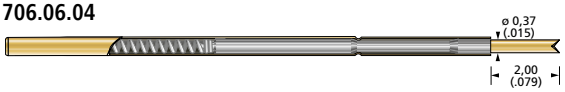

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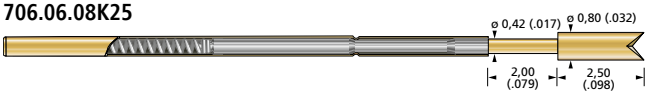

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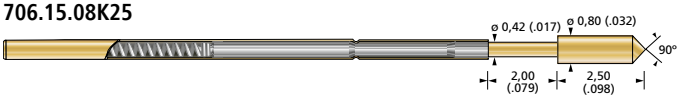

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Series 708

Technical Data

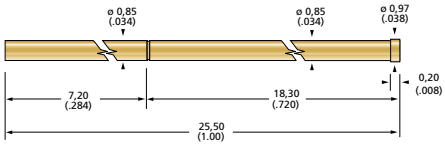
Overall Length	24,60 mm
Minimum Centre Spacing	1,27 mm
Typical Spring Force	0,8 N
Maximum Travel	4,30 mm
Working Travel	3,00 mm
Temperature Range from	–45°C
Up to	+125°C
Typical Resistance	60 mΩ
Current rating	1,0 A

Materials

Plunger	Steel, gold plated
Barrel	Phosphor bronze, gold plated
Spring	Music wire, silver plated

For XXLonglife-Nano-coating order as 708X

S 708.00-W



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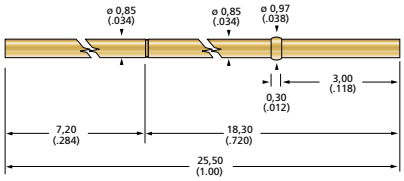
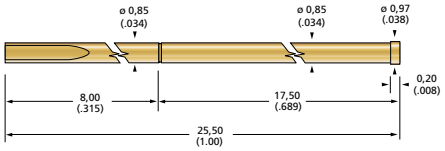


S 708.08-L



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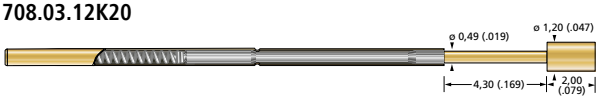

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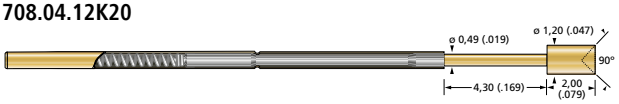


708.05.05

708.05.12K20

708.06.05

708.08.12K20

708.15.12K20

Series 707

Technical Data

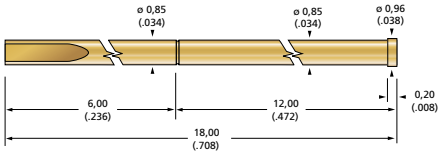
Overall Length	15,20 - 17,70 mm
Minimum Centre Spacing	1,27 mm
Typical Spring Force	0,70 N
Maximum Travel	3,30 mm
Working Travel	2,20 mm
Temperature Range from	–45°C
Up to	+125°C
Typical Resistance	60 mΩ
Current rating	1,0 A

Materials

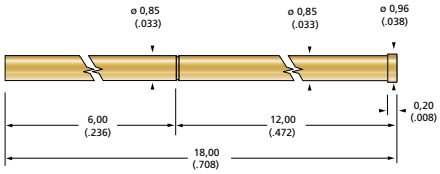
Plunger	Steel, gold plated
Barrel	Phosphor bronze, gold plated
Spring	Music wire, silver plated

For XXLonglife-Nano-coating order as 707X

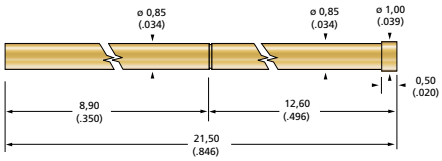
S 707.00-L18



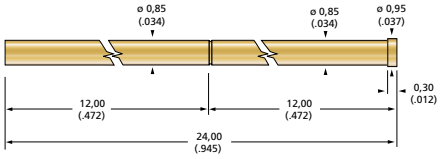
S 707.00-N18



S 707.00-N22



S 707.00-N24



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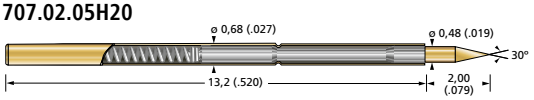

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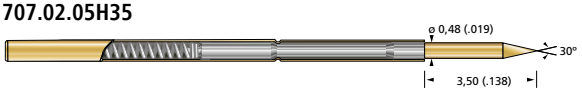

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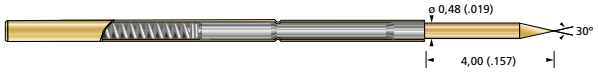

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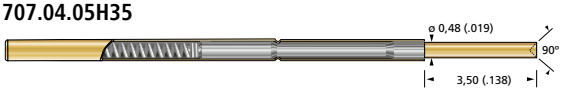

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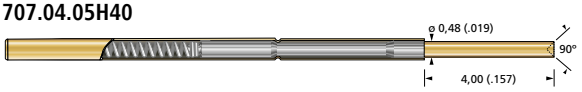

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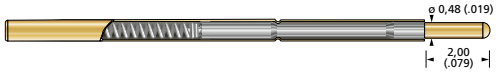

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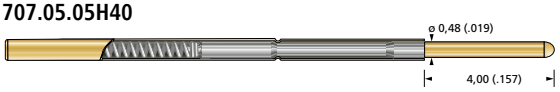

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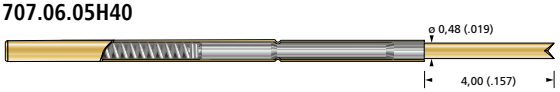

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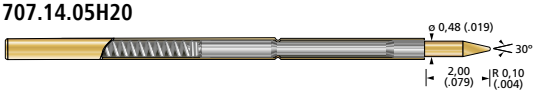

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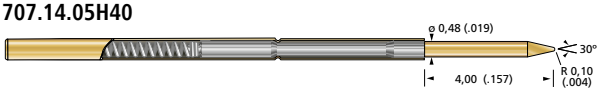
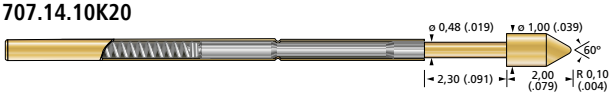


707.14.10K20



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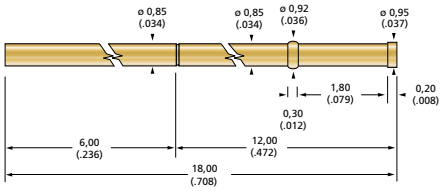
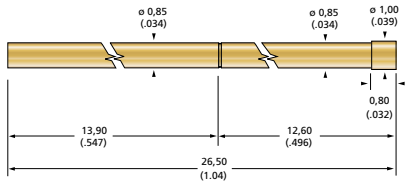
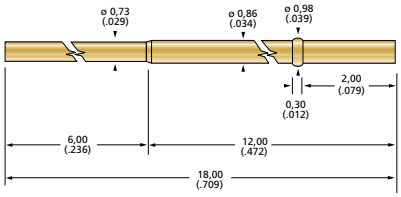
S 707.01-N18



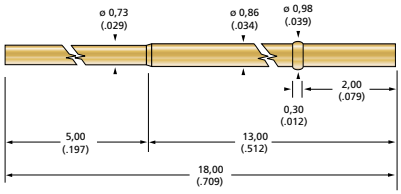
S 707.01-N27



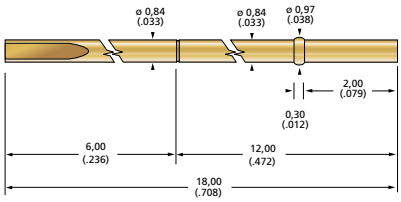
S 707.02-C12



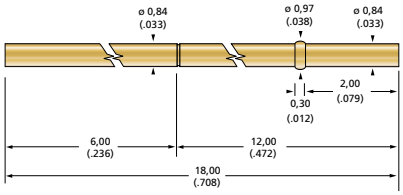
S 707.02-C13



S 707.02-L18



S 707.02-N18



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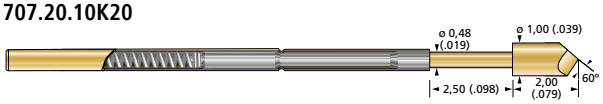
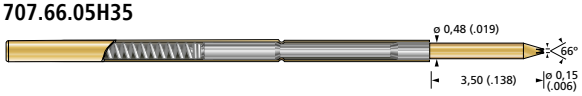
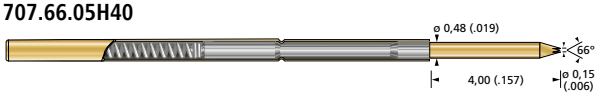


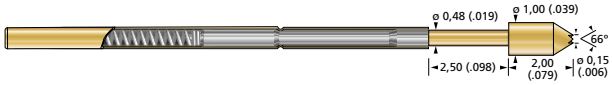
707.66.05H35



707.66.05H40



707.66.10K10



Current rating 1,0 A
Overall Length 15,20 - 17,70 mm
Working Travel 2,20 mm
Max. Travel 3,30 mm
Pitch ≥ 1,27 mm

Series 820

Technical Data

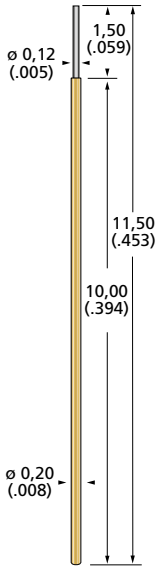
Overall Length	11,50 mm
Minimum Centre Spacing	0,50 mm
Typical Spring Force	0,15 N
Maximum Travel	1,50 mm
Working Travel	1,00 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	100 mΩ
Current Load rated/max.	0,5 / 0,7 A

Materials

Plunger	Steel, rhodium plated or gold plated
Barrel	Phosphor bronze, gold plated
Spring	Music wire or Stainless steel, gold plated

Finepitch series for pitch ≥ 0,50 mm.

Series 820



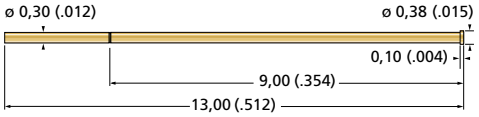
Spring Force (xx)

Rated Force	Code xxx
0,15 N	015

Ø 0,12	820.02.01.015
Ø 0,12	820.03.01.015
Ø 0,12	820.05.01.015

For XXLonglife-Nanocoating order as 820X

S 820-FM



Series 825

Technical Data

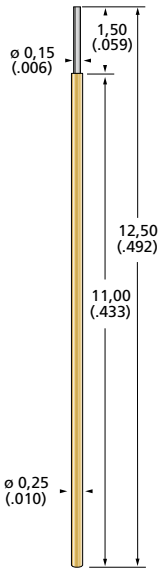
Overall Length	12,50 mm
Minimum Centre Spacing	0,70 mm
Typical Spring Force	0,15 N
Maximum Travel	1,50 mm
Working Travel	1,00 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	100 mΩ
Current Load rated/max.	0,5 / 0,7 A

Materials

Plunger	Steel, rhodium plated or gold plated
Barrel	Phosphor bronze, gold plated
Spring	Music wire or Stainless steel, gold plated

Finepitch series for pitch ≥ 0,70 mm

Series 825



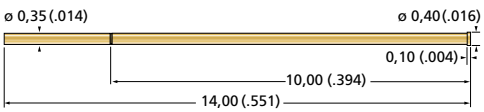
Spring Force (xx)

Rated Force	Code xxx
0,15 N	015

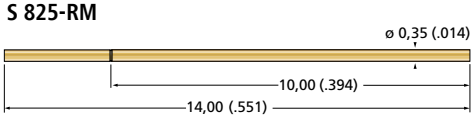
Ø 0,15	825.02.01.015
Ø 0,15	825.03.01.015
Ø 0,15	825.05.01.015

For XXLonglife-Nanocoating order as 825X

S 825-FM



S 825-RM



Pitch ≥ 0,50 mm / ≥ 0,70 mm
Max. Travel 1,50 mm
Working Travel 1,00 mm
Overall Length 11,50 / 12,50 mm
Max. Current Load 0,7 A

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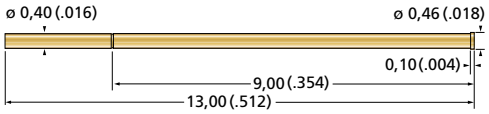
Spring Force (xx)

Rated Force	Code xxx
0,24 N	024

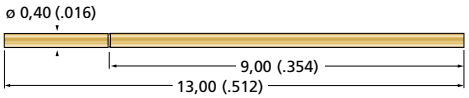
	Ø 0,22	831.02.02.024
	Ø 0,22	831.03.02.024
	Ø 0,22	831.05.02.024
	Ø 0,22	831.06.02.024

For XXLonglife-Nanocoating order as 831X

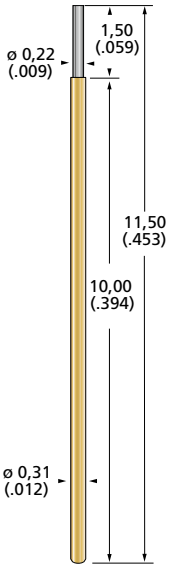
S 831-FM



S 831-RM



Series 831



Series 831

Technical Data

Overall Length	11,50 mm
Minimum Centre Spacing	0,70 mm
Typical Spring Force	0,24 N
Maximum Travel	1,50 mm
Working Travel	1,00 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	100 mΩ
Current Load rated/max.	0,6 / 0,8 A

Materials

Plunger	Steel, rhodium plated or gold plated
Barrel	Phosphor bronze, gold plated
Spring	Music wire or Stainless steel, gold plated

Finepitch series for pitch ≥ 0,70 mm.

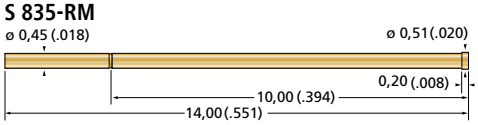
Spring Force (xx)

Rated Force	Code xxx
0,45 N	046

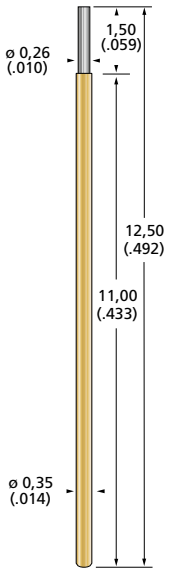
	Ø 0,26	835.05.03.046

For XXLonglife-Nanocoating order as 835X

S 835-RM



Series 835



Series 835

Technical Data

Overall Length	12,50 mm
Minimum Centre Spacing	0,70 mm
Typical Spring Force	0,46 N
Maximum Travel	1,50 mm
Working Travel	1,00 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	100 mΩ
Current Load rated/max.	0,6 / 0,8 A

Materials

Plunger	Steel, rhodium plated or gold plated
Barrel	Phosphor bronze, gold plated
Spring	Music wire or Stainless steel, gold plated

Finepitch series for pitch ≥ 0,70 mm.

Series 838

Technical Data

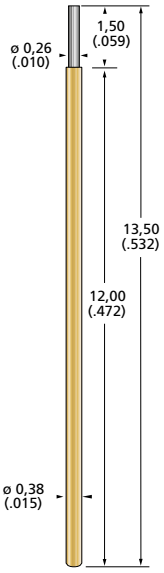
Overall Length	13,50 mm
Minimum Centre Spacing	0,80 mm
Typical Spring Force	0,36 N
Maximum Travel	1,50 mm
Working Travel	1,00 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	80 mΩ
Current Load rated/max.	0,6 / 0,8 A

Materials

Plunger	Steel, rhodium plated or gold plated
Barrel	Phosphor bronze, gold plated
Spring	Music wire or Stainless steel, gold plated

Finepitch series for pitch ≥ 0,70 mm.

Series 838



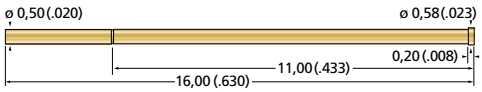
Spring Force (xx)

Rated Force	Code xxx
0,36 N	036

	Ø 0,26	838.02.03.036
	Ø 0,26	838.03.03.036
	Ø 0,26	838.05.03.036
	Ø 0,26	838.06.03.036

For XXLonglife-Nanocoating order as 838X

S 838-RM



Series 840

Technical Data

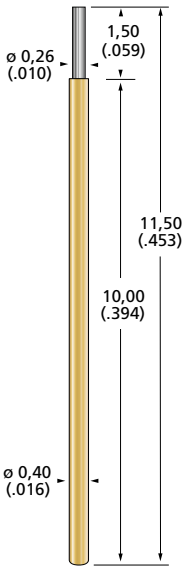
Overall Length	11,50 mm
Minimum Centre Spacing	0,80 mm
Typical Spring Force	0,36 N
Maximum Travel	1,50 mm
Working Travel	1,00 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	80 mΩ
Current Load rated/max.	0,6 / 0,8 A

Materials

Plunger	Steel, rhodium plated or gold plated
Barrel	Phosphor bronze, gold plated
Spring	Music wire or Stainless steel, gold plated

Finepitch series for pitch ≥ 0,80 mm.

Series 840



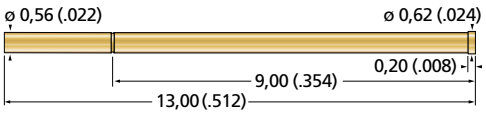
Spring Force (xx)

Rated Force	Code xxx
0,36 N	036

	Ø 0,26	840.02.03.036
	Ø 0,26	840.03.03.036
	Ø 0,26	840.05.03.036
	Ø 0,26	840.06.03.036

For XXLonglife-Nanocoating order as 840X

S 840-RM



Max. Current Load	0,8 A
Overall Length	13,50 / 11,50 mm
Working Travel	1,00 mm
Max. Travel	1,50 mm
Pitch	≥ 0,70 / ≥ 0,80 mm

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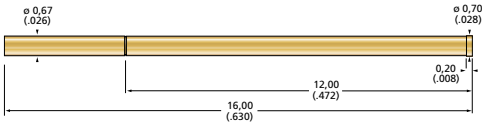
Spring Force (xx)

Rated Force	Code xxx
0,41 N	041

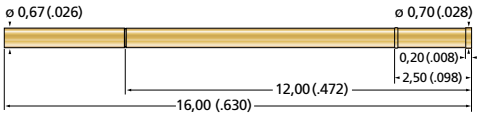
	Ø 0,30	848.02.03.041
	Ø 0,30	848.03.03.041
	Ø 0,30	848.05.03.041
	Ø 0,30	848.06.03.041

For XXLonglife-Nanocoating order as 848X

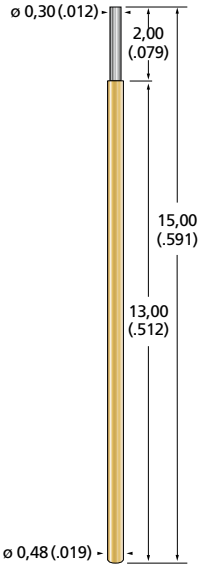
S 848-FM-I



S 848-FM-II



Series 848



Series 848

Technical Data

Overall Length	15,00 mm
Minimum Centre Spacing	1,00 mm
Typical Spring Force	0,41 N
Maximum Travel	2,00 mm
Working Travel	1,33 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	80 mΩ
Current Load rated/max.	0,8 / 1,0 A

Materials

Plunger	Steel, rhodium plated or gold plated
Barrel	Phosphor bronze, gold plated
Spring	Music wire or Stainless steel, gold plated

Finepitch series for pitch ≥ 1,00 mm.

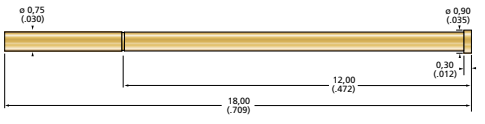
Spring Force (xx)

Rated Force	Code xxx
0,41 N	041

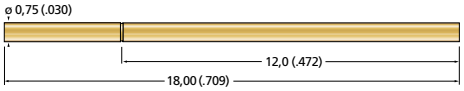
	Ø 0,38	858.02.04.041
	Ø 0,38	858.03.04.041
	Ø 0,38	858.05.04.041
	Ø 0,38	858.06.04.041

For XXLonglife-Nanocoating order as 858X

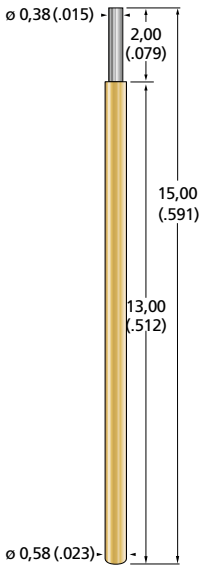
S 858-FM



S 858-RM



Series 858



Series 858

Technical Data

Overall Length	15,00 mm
Minimum Centre Spacing	1,00 mm
Typical Spring Force	0,41 N
Maximum Travel	2,00 mm
Working Travel	1,33 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	70 mΩ
Current Load rated/max.	1,0 / 1,2 A

Materials

Plunger	Steel, rhodium plated or gold plated
Barrel	Brass, gold plated
Spring	Music wire or Stainless steel, gold plated

Finepitch series for pitch ≥ 1,00 mm.

Max. Current Load 1,0 / 1,2 A
Overall Length 15,00 mm
Working Travel 1,33 mm
Max. Travel 2,00 mm
Pitch ≥ 1,00 mm

FINEPITCH CONTACTS

Series 872

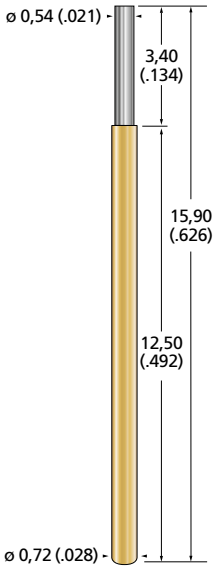
Technical Data

Overall Length	15,90 mm
Minimum Centre Spacing	1,27 mm
Typical Spring Force	0,92 N
Maximum Travel	3,40 mm
Working Travel	2,30 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	50 mΩ
Current Load rated/max.	1,0 / 1,2 A

Materials

Plunger	Steel, rhodium plated or gold plated
Barrel	Brass, gold plated
Spring	Music wire or Stainless steel, gold plated

Series 872



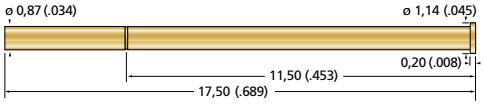
Spring Force (xx)

Rated Force	Code xxx
0,92 N	092

	Ø 0,54	872.02.05.092
	Ø 0,54	872.03.05.092
	Ø 0,54	872.05.05.092
	Ø 0,54	872.06.05.092

For XXLonglife-Nanocoating order as 872X

S 872-FM I



Current rating 1,2 A
Overall Length 15,90 mm
Working Travel 2,30 mm
Max. Travel 3,40 mm
Pitch ≥ 1,27 mm

FINEPITCH CONTACTS

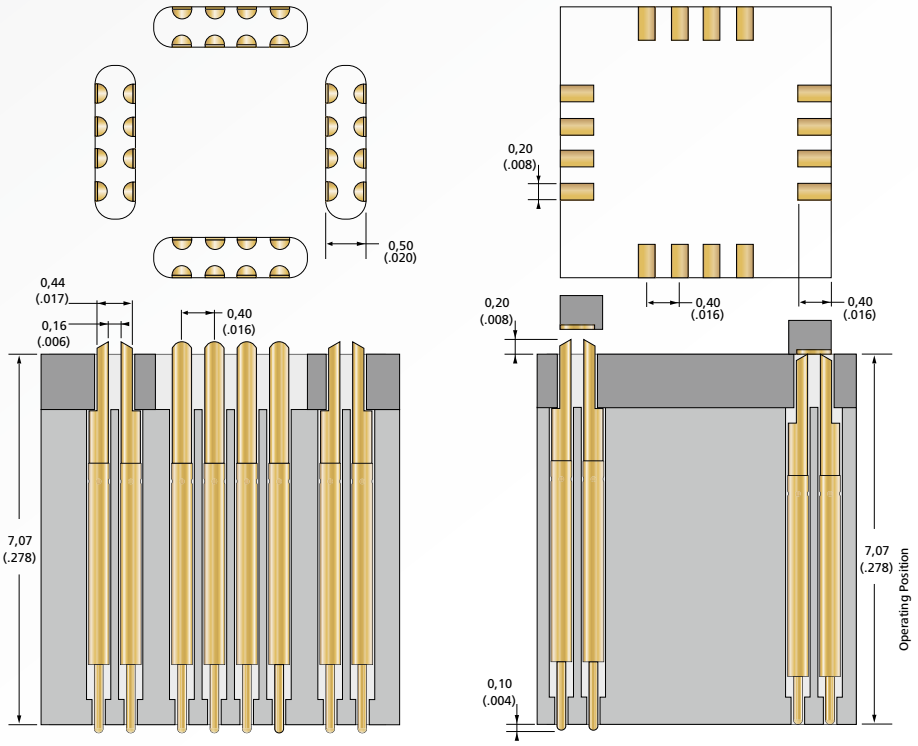
FINEPITCH KELVIN CONTACTS

The „real" Kelvin measurement - also referred to as four-wire measurement - requires that each test point on the UUT is scanned with two insulated contacts in the shortest possible distance from each other. Not an easy task when the pads are at very small grid spacing and/or offer only very small test land size. A typical application is QFN devices.

The designs presented on the following pages do that job masterfully from 0.4 mm pitch distance and higher. Design and production of the necessary bases are not easy ... we're glad to help on your request.

FIXTURING EXAMPLE

KB1-026Q/W-02



Spring Force Profile

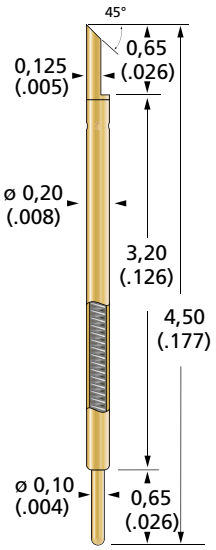
Free	Set @ 0,10 mm	Test @ 0,30 mm
		0,15 N

	Ø 0,20	**KJS-030-001W1**
	Ø 0,20	**KJS-030-002NW2**

Head style W for Pads (QFN, DFN, etc.)
Head style NW for Solder balls (BGA)

Minimum array pitch: 0,50 mm

4,50 mm



0,30 mm Pitch

Technische Daten

Overall Length	4,50 mm
Minimum Centre Spacing	0,30 mm
Typical Spring Force	0,15 N
Working Travel	0,30 mm
Temperature Range from	–40°C
Up to	+120°C
Typical Resistance	50 mΩ
Current rating	0,7 A

Materials

Upper Plunger	Hardened CuBe, gold plated
Bottom Plunger	HrdenedCuBe, gold plated
Barrel	Alloy, gold plated
Spring	Music wire, gold plated

0,40 mm Pitch

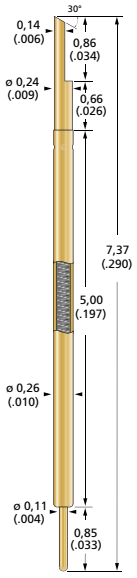
Technical Data

Overall Length	7,37 mm
Minimum Centre Spacing	0,40 mm
Typical Spring Force	0,16 N
Maximum Travel	0,60 mm
Working Travel	0,30 mm
Temperature Range from	–45°C
Up to	+125°C
Typical Resistance	50 mΩ
Current Load rated/max.	1,0 / 1,5 A

Materials

Upper Plunger	Steel, gold plated
Bottom Plunger	CuBe, gold plated
Barrel	Au Clad
Spring	Stainless steel, gold plated

7,37 mm



Spring Force Profile

Free	Set @ 0,10 mm	Test @ 0,3 mm
		0,16 N

	Ø 0,24	**KB1-026Q/W-02**

0,40 mm Pitch

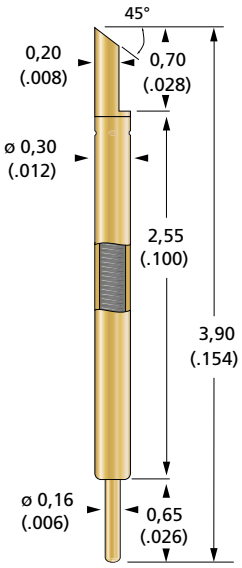
Technical Data

Overall Length	3,90 mm
Minimum Centre Spacing	0,40 mm
Typical Spring Force	0,22 N
Working Travel	0,45 mm
Temperature Range from	–40°C
Up to	+120°C
Typical Resistance	100 mΩ
Current rating	1,5 A

Materials

Upper Plunger	CuBe, gold plated
Bottom Plunger	CuBe, gold plated
Barrel	Alloy, gold plated
Spring	Music wire, gold plated

3,90 mm



Spring Force Profile

Free	Set @ 0,15 mm	Test @ 0,45 mm
		0,22 N

	Ø 0,30	**KHS-040-009W1**
	Ø 0,30	**KHS-040-010NW2**

Head style W for Pads (QFN, DFN, etc.)
Head style NW for Solder balls (BGA)

Minimum array pitch: 0,65 mm

0,50 mm Pitch

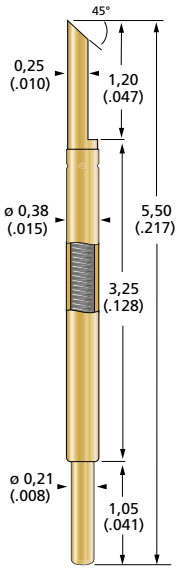
Technical Data

Overall Length	5,50 mm
Minimum Centre Spacing	0,50 mm
Typical Spring Force	0,31 N
Working Travel	0,45 mm
Temperature Range from	–40°C
Up to	+140°C
Typical Resistance	≤50 mΩ
Current rating	1,7 A

Materials

Upper Plunger	CuBe, gold plated
Bottom Plunger	CuBe, gold plated
Barrel	Alloy, gold plated
Spring	Stainless steel, gold plated

5,50 mm



Spring Force Profile

Free	Set @ 0,15 mm	Test @ 0,45 mm
		0,31 N

	Ø 0,38	**KHS-050-011W1**
	Ø 0,38	**KHS-050-012NW2**

Head style W for Pads (QFN, DFN, etc.)
Head style NW for Solder balls (BGA)

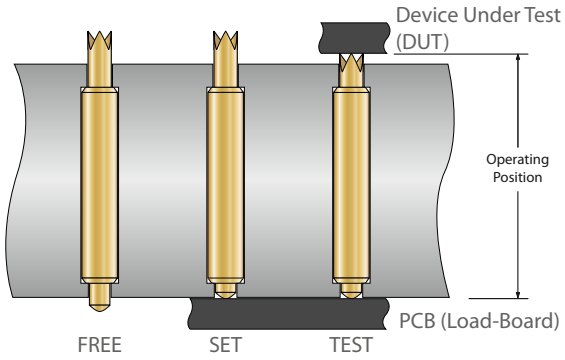
Minimum array pitch: 0,80 mm

KITA MARATHON

KITA MARATHON PINS

The contact pins of the MARATHON series of KITA are, as the name suggests, true endurance athletes. The bilateral sprung contacts for use in test sockets with grid spacings in the fine pitch range have lifetimes of up to 1 million strokes and feature high current capability and low resistance values.

The grid spacing of Marathon types start from 0.2 mm and reach up to 0.80 mm. At the end of this section you will find two special types: For applications in strong magnetic fields and / or near the absolute zero (superconductivity) the KHW 050-009RG is suitable due to its use of materials. The KHW 050-010C1 is, however, for high temperature applications up to 200 ° C.



INSTALLATION INSTRUCTIONS

The double-end spring-loaded contact pins are made for installation in test sockets which usually have a sandwich-layer design.
In the tables showing the graphs of the spring forces the probe is shown in its 3 standard stages of condition:

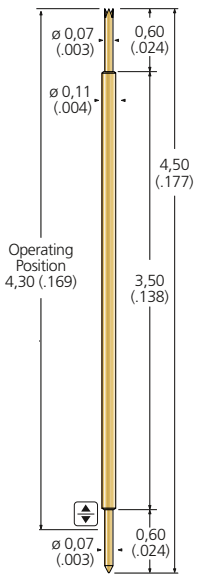
FREE: Own preload of the inner spring, no contact on either side
SET: The test-socket is mounted onto the Load Board, the lower piston springs are compressed somewhat
TEST: DUT is installed, Spring Probe force and travel in nominal position. This situation is also called „operating position".

Spring Force Profile

Free	Set @ 0,15 mm	Test @ 0,40 mm
0,02 N	0,03 N	0,06 N

	Ø 0,07	**KHS-017-001CP**
	Ø 0,07	**KHS-017-002RP**

4,70 mm



0,17 mm Pitch

Technical Data

Overall Length	4,50 mm
Minimum Centre Spacing	0,17 mm
Maximum Travel	0,50 mm
Working Travel	0,40 mm
Temperature Range from	–40°C
Up to	+120°C
Typical Resistance	≤500 mΩ
Current rating	0,31 A

Materials

Upper Plunger	Palladium alloy
Bottom Plunger	Palladium alloy
Barrel	Alloy
Spring	Music wire, gold plated

0,25 mm Pitch

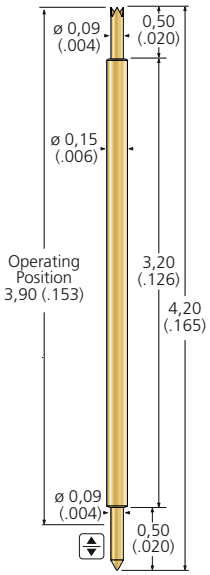
Technical Data

Overall Length	4,20 mm
Minimum Centre Spacing	0,25 mm
Maximum Travel	0,40 mm
Working Travel	0,30 mm
Temperature Range from	–40°C
Up to	+120°C
Typical Resistance	≤500 mΩ
Current rating	0,35 A

Materials

Upper Plunger	Palladium alloy
Bottom Plunger	Steel, gold plated
Barrel	Alloy
Spring	Music wire, gold plated

4,20 mm



Spring Force Profile

Free	Set @ 0,10 mm	Test @ 0,30 mm
0,05 N	0,08 N	0,14 N

	Ø 0,09	**KHS-025-001CP**
	Ø 0,09	**KHS-025-002RP**

0,30 mm Pitch

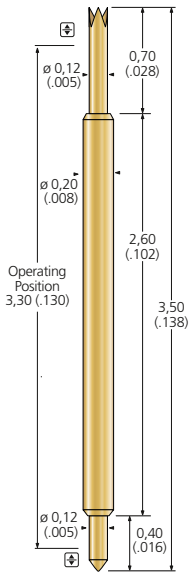
Technical Data

Overall Length	3,50 mm
Minimum Centre Spacing	0,30 mm
Maximum Travel	0,55 mm
Working Travel	0,40 mm
Temperature Range from	–40°C
Up to	+120°C
Typical Resistance	≤100 mΩ
Current rating	0,85 A

Materials

Plunger	CuBe hardened, gold plated
Barrel	Alloy, gold plated
Spring	Music wire, gold plated

3,70 mm



Spring Force Profile

Free	Set @ 0,15 mm	Test @ 0,40 mm
0,07 N	0,11 N	0,17 N

	Ø 0,12	**KHW-030-001C2**
	Ø 0,12	**KHW-030-002R1**

0,35 mm Pitch

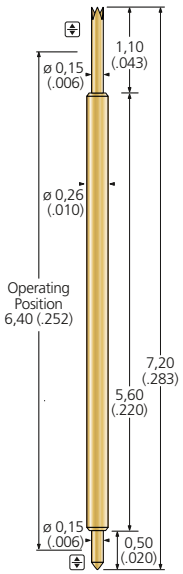
Technical Data

Overall Length	7,20 mm
Minimum Centre Spacing	0,35 mm
Maximum Travel	1,00 mm
Working Travel	0,80 mm
Temperature Range from	–40°C
Up to	+140°C
Typical Resistance	≤100 mΩ
Current rating	2,0 A

Materials

Plunger	CuBe hardened, gold plated
Barrel	Alloy, gold plated
Spring	Stainless steel,gold plated

7,20 mm



Spring Force Profile

Free	Set @ 0,25 mm	Test @ 0,80 mm
0,05 N	0,11 N	0,25 N

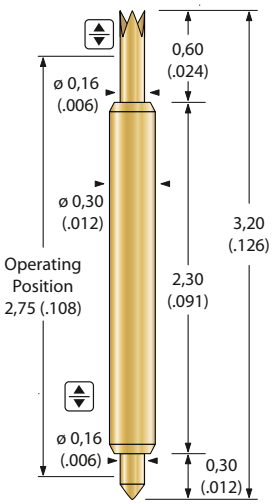
	Ø 0,15	**KHW-035-001C2**
	Ø 0,15	**KHW-035-002C2**
	Ø 0,15	**KHW-035-003R1**

Spring Force Profile

Free	Set @ 0,15 mm	Test @ 0,45 mm
0,08 N	0,1 N	0,21 N

Ø 0,16	**KGW-040-001CA**
Ø 0,16	**KHW-040-002C2**
Ø 0,16	**KHW-040-001R2**

3,20 mm



0,40 mm Pitch

Technical Data

Overall Length	3,20 mm
Minimum Centre Spacing	0,40 mm
Maximum Travel	0,60 mm
Working Travel	0,45 mm
Temperature Range from	–40°C
Up to	+120°C
Typical Resistance	48 mΩ
Current rating	1,5 A

Materials

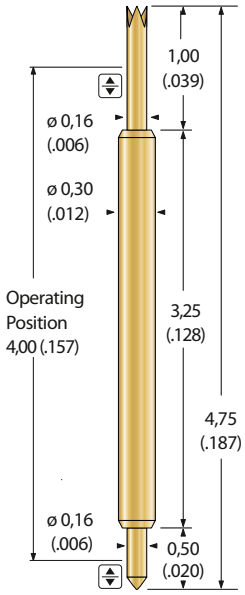
Plunger	CuBe hardened, gold plated
Barrel	Au-Clad
Spring	Music wire, gold plated

Spring Force Profile

Free	Set @ 0,25 mm	Test @ 0,75 mm
0,06 N	0,11 N	0,22 N

Ø 0,15	**KHW-040-004C2**
Ø 0,15	**KHW-040-003C2**
Ø 0,15	**KHW-040-005R2**

4,75 mm



0,40 mm Pitch

Technical Data

Overall Length	4,75 mm
Minimum Centre Spacing	0,40 mm
Maximum Travel	1,10 mm
Working Travel	0,75 mm
Temperature Range from	–40°C
Up to	+120°C
Typical Resistance	45 mΩ
Current rating	0,95 A

Materials

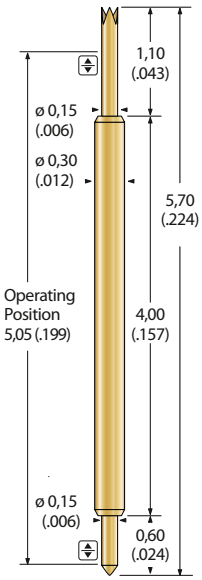
Plunger	CuBe hardened, gold plated
Barrel	Alloy, gold plated
Spring	Music wire, gold plated

Spring Force Profile

Free	Set @ 0,20 mm	Test @ 0,65 mm
0,09 N	0,15 N	0,3 N

Ø 0,15	**KHW-040-006CA**
Ø 0,15	**KHW-040-008C2**
Ø 0,15	**KHW-040-007R2**

5,70 mm



0,40 mm Pitch

Technical Data

Overall Length	5,70 mm
Minimum Centre Spacing	0,40 mm
Maximum Travel	0,80 mm
Working Travel	0,65 mm
Temperature Range from	–40°C
Up to	+120°C
Typical Resistance	51 mΩ
Current rating	1,4 A

Materials

Plunger	CuBe hardened, gold plated
Barrel	Alloy, gold plated
Spring	Music wire, gold plated

KITA MARATHON PINS

0,50 mm Pitch

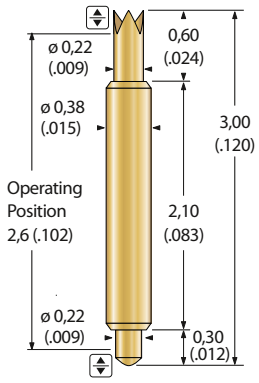
Technical Data

Overall Length	3,00 mm
Minimum Centre Spacing	0,50 mm
Maximum Travel	0,50 mm
Working Travel	0,40 mm
Temperature Range from	–40°C
Up to	+120°C
Typical Resistance	32 mΩ
Current rating	1,52 A

Materials

Plunger	CuBe hardened, gold plated
Barrel	Alloy, gold plated
Spring	Music wire, gold plated

3,00 mm



Spring Force Profile

Free	Set @ 0,15 mm	Test @ 0,40 mm
0,09 N	0,15 N	0,25 N

	Ø 0,22	KHW-050-003C2
	Ø 0,22	KHW-050-001C2
	Ø 0,22	KHW-050-002R2

0,50 mm Pitch

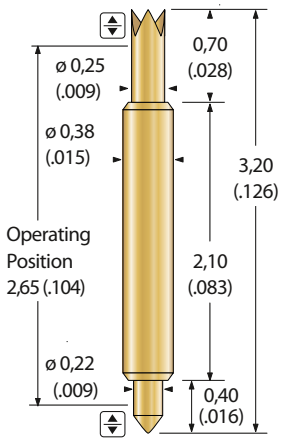
Technical Data

Overall Length	3,20 mm
Minimum Centre Spacing	0,50 mm
Maximum Travel	0,70 mm
Working Travel	0,55 mm
Temperature Range from	–40°C
Up to	+120°C
Typical Resistance	42 mΩ
Current rating	1,7 A

Materials

Plunger	CuBe hardened, gold plated
Barrel	Au-Clad, gold plated
Spring	Music wire, gold plated

3,20 mm



Spring Force Profile

Free	Set @ 0,20 mm	Test @ 0,55 mm
0,07 N	0,12 N	0,26 N

	Ø 0,25	KGW-050-002CA
	Ø 0,25	KHW-050-004C2
	Ø 0,25	KHW-050-005R2

0,50 mm Pitch

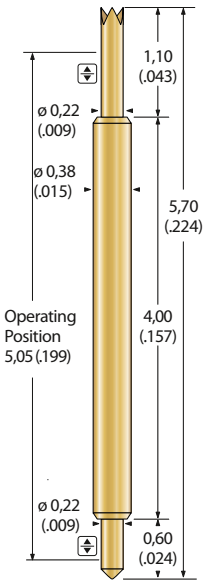
Technical Data

Overall Length	5,70 mm
Minimum Centre Spacing	0,50 mm
Maximum Travel	0,80 mm
Working Travel	0,65 mm
Temperature Range from	–40°C
Up to	+120°C
Typical Resistance	42 mΩ
Current rating	2,6 A

Materials

Plunger	CuBe hardened, gold plated
Barrel	Alloy, gold plated
Spring	Stainless steel,gold plated

5,70 mm



Spring Force Profile

Free	Set @ 0,20 mm	Test @ 0,65 mm
0,08 N	0,12 N	0,27 N

	Ø 0,22	KHW-050-006CG
	Ø 0,22	KHW-050-007C2
	Ø 0,22	KHW-050-008R2

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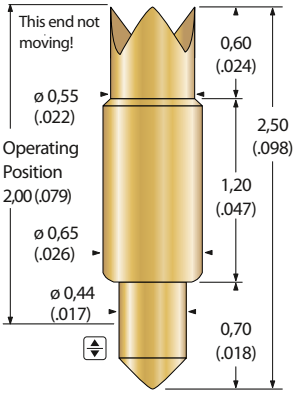
Spring Force Profile

Free	Set @ 0,15 mm	Test @ 0,50 mm
0,06 N	0,1 N	0,20 N

	Ø 0,55	KHS-080-001CA
	Ø 0,55	KGS-080-001CA
	Ø 0,55	KHS-080-002RA

2,50 mm



0,80 mm Pitch

Technical Data

Overall Length	2,50 mm
Minimum Centre Spacing	0,80 mm
Maximum Travel	0,70 mm
Working Travel	0,50 mm
Temperature Range from	–40°C
Up to	+120°C
Typical Resistance	38 mΩ
Current rating	2,2 A

Materials

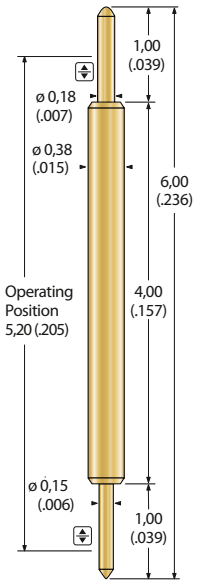
Plunger	CuBe hardened, gold plated
Barrel	CuBe hardened, gold plated
Spring	Music wire, gold plated

Spring Force Profile

Free	Set @ 0,25 mm	Test @ 0,80 mm
0,04 N	0,11 N	0,14 N

	Ø 0,18	KHW-050-009RG

KHW-050-009RG



0,50 mm Pitch

Technical Data

Overall Length	6,00 mm
Minimum Centre Spacing	0,50 mm
Maximum Travel	1,00 mm
Working Travel	0,80 mm
Temperature Range from	-265°C
Up to	+80°C
Typical Resistance	30 mΩ
Current rating	3,0 A
Magnetic Field	7 T
Vacuum Pressure	10-8 Pa

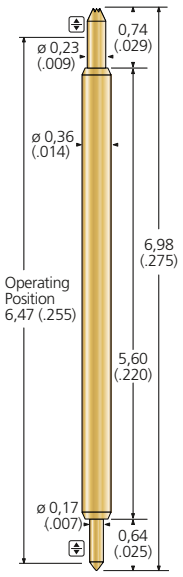
Non-magnetic contact for supercon-ductivity applications below 10K.

Spring Force Profile

Free	Set @ 0,15 mm	Test @ 0,51 mm
0,13 N	0,17 N	0,28 N

	Ø 0,23	KHW-050-010C1

KHW-050-010C1



0,50 mm Pitch

Technical Data

Overall Length	6,98 mm
Minimum Centre Spacing	0,50 mm
Maximum Travel	0,64 mm
Working Travel	0,51 mm
Temperature Range from	–40°C
Up to	+200°C
Typical Resistance	54 mΩ
Current rating	3,5 A

Materials

Plunger	CuBe hardened, gold plated
Barrel	Brass, gold plated
Spring	Stainless steel,gold plated

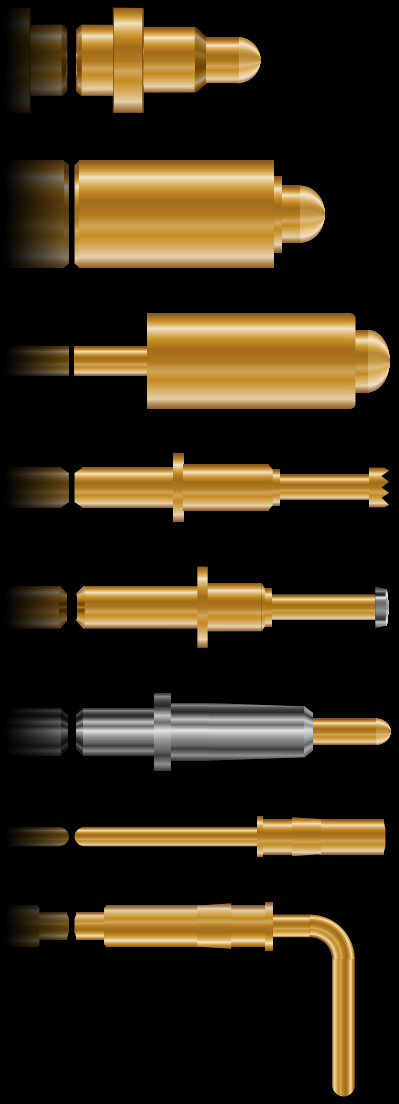
For high temperature applications up to 200°C.

KITA MARATHON PINS

BATTERY PROBES

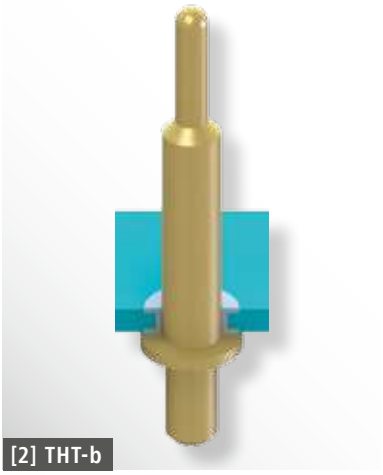
BATTERY PROBES

It is not only in test applications where spring contacts are being used. For the pure transmission of power supply or LF and HF we at FIXTEST speak about BATTERY PROBES. Many mobile devices of daily life today are powered by batteries, which of course need to be recharged. Or additional accessories need to be connected to the devices, ... but how? Our battery contacts make those connections reliable and easy to use. They are found in appliances for example in medical, communications equipment or bicycle lights. The number of possible applications is virtually unlimited.
In the following section you will find our standard range of battery contacts. Very often, there are also custom modifications of standard contacts or new developments according to your wishes. Talk to us!

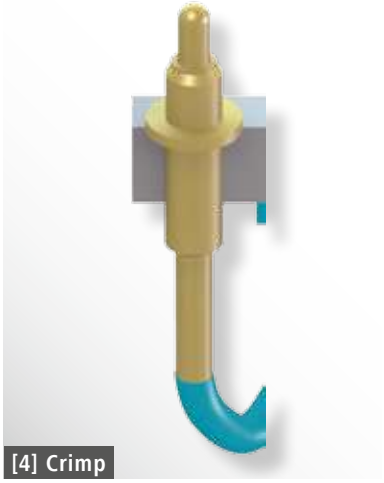


Battery Probes	Page
365	105
FK-381	100
FK-382	100
FK-441	100
FK-460 / FK-460-08	102
FK-446 / FK-664	101
FK-454	103
FK-459	101
FK-480	100
FK-492	101
FK-499	103
FK-515	104
FK-516 / FK-516-08	101
FK-519	100
FK-540 / FK-540-15	102
FK-554	100
FK-555	101
FK-565	103
FK-566	103
FK-566-GF	103
FK-586	104
FK-598	100
FK-575-WL	100
FK-576	102
FK-606	104
FK-640	101
FK-648	102
FK-674	101
FK-663	103
FK-691/FK-691-06	103
FK-694-S	104
FK-714 / FK-714-06	103
FK-715	102
FK-717 / FK-717-05	101
FK-725	104
FK-741-HT	103
FK-744	102
FK-754	103
FK-756	104
FK-757	101
509E.35.36.20	105

[1] THT-t


[2] THT-b

[3] SMT


[4] Crimp

The stated extension dimension "E" has been derived from the typical style of the respective series. If you use a non-standard installation of the battery probes you can derive the resulting extension dimension "E" from the scaled drawing of the respective type.
Typical styles and types of connection:

THT-t | Through hole technology, insertion from top
With this technique the battery probes are directly soldered to plated through holes of a printed board. The contacts are inserted from top and soldered from the bottom side. Pin-in-paste technology (reflow soldering) is also possible (see figure 1).

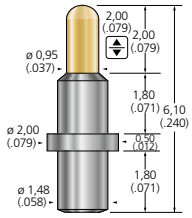
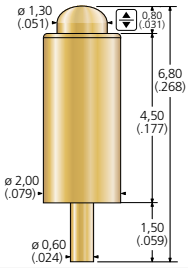
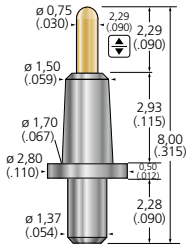
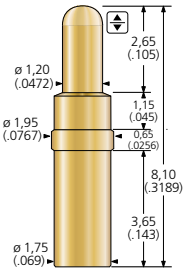
THT-b | Through hole technology, insertion from bottom side
Again, probes are installed in plated through holes but inserted from the bottom side. Soldering is from top or bottom side (see figure 2).

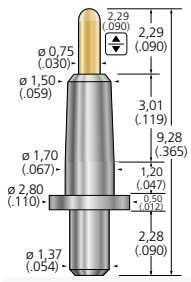
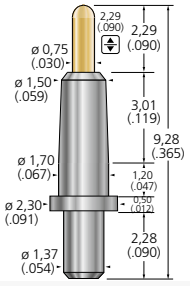
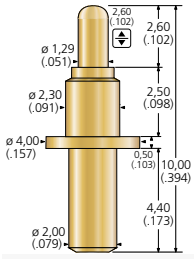
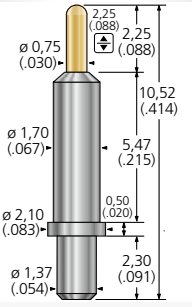
SMT | Surface mount assembly
Contacts with SMT marking are directly soldered to board pads using standard surface mount technology. They are heat-resistant to withstand standard reflow methods. Please note: Some types feature a small drill hole in the bottom section to ensure proper gold plating on the inside of the barrel. Soldering tests have shown that no damage of the contacts will occur due to penetrating solder. However SMT pins could float on lead-free solder paste during reflow. We recommend pre-assembly in plastic carriers or use of pin-in-paste (PiP) versions (see THT-t group). Delivery in reel-tapes or trays for automated pick&place assembly available on request.

Crimp | For direct connection to stranded wire
Contacts for this wiring technique provide an open I/O end which is suitable for crimping or soldering of flexible stranded wire (see figure 4).

Some types are designed for use in contact strips or blocks. Electrical connection is possible via board or wire. On request, we develop and supply the entire solution for you, whether in machined or injection molded version. Please contact us!

Battery Probe	Overall Length (mm)	Pitch (mm)	Extension Height (mm)	Maximum Travel (mm)	Installation Type | Termination				Page
					THT-t	THT-b	SMT	Crimp	
FK-480	6,10	2,30	4,30	2,00	✓				100
FK-554	6,80	2,20	5,30	0,80	✓				100
FK-381	8,00	3,00	5,72	2,29	✓				100
FK-598	8,10	2,20	4,45	2,65	✓				100
FK-382	9,28	3,00	7,00	2,29	✓				100
FK-519	9,28	2,54	7,00	2,29	✓				100
FK-575-WL	10,04	4,20	5,56	2,29	✓				100
FK-441	10,52	2,30	8,22	2,25	✓				100
FK-674	10,55	2,70	5,85	2,80	✓				101
FK-492	10,88	2,20	8,60	2,18	✓				101
FK-555	11,30	2,70	5,30	3,00	✓				101
FK-446 / FK-664	11,80	4,10	7,80	2,50	✓				101
FK-757	11,80	2,80	4,70	2,60	✓				101
FK-516 / FK-516-08	13,00	2,70	10,50	2,80	✓				101
FK-717 / FK-717-05	14,10	3,00	5,60	5,20	✓				101
FK-640	15,00	2,70	11,50	2,80	✓				101
FK-459	15,00	4,10	10,00	2,54	✓				101
Series 365	15,00	6,50	6,00	4,00	✓				105
FK-576	17,15	4,20	5,66	2,29	✓			✓	102
FK-460 / FK-460-08	18,65	4,10	14,35	3,00	✓				102
FK-744	18,80	2,70	7,30	4,80	✓				102
FK-540 / FK-540-15	22,50	3,70	16,00	5,50	✓				102
FK-648	3,50	2,00	3,10	1,00		✓			102
FK-715	5,90	2,90	4,40	1,40		✓			102
FK-663	9,00	2,10	5,60	1,40		✓			103
FK-499	9,90	2,00	7,40	1,20		✓			103
FK-714 / FK-714-06	10,10	2,60	7,40	1,80		✓			103
FK-691 / FK-691-06	11,00	2,54	7,40	1,70		✓			103
FK-741-HT	11,00	2,80	variable	1,70		✓			103
FK-754	11,60	2,54	7,40	3,30		✓			103
FK-454	12,30	2,70	6,30	1,20		✓			103
FK-565	12,35	2,54	8,40	1,30		✓			103
FK-566	9,05	2,54	6,20	starr		✓			103
FK-566-GF	15,90	2,54	6,20	starr		✓			103
FK-515	6,65	3,18	6,65	1,00			✓		104
FK-586	8,50	2,54	8,50	2,00			✓		104
FK-606	8,50	2,54	8,50	2,00			✓		104
FK-756	8,50	2,54	8,50	2,40			✓		104
FK-694-S	11,27	2,80	11,27	2,25			✓		104
FK-725	11,30	3,50	11,30	3,90			✓		104
Serie 509	17,70	3,60	8,00	5,50	-	-	-	-	105

	FK-480	FK-554	FK-381	FK-598
				
Technical Data	**FK-480**	**FK-554**	**FK-381**	**FK-598**
Overall Length	6,10 mm	6,80 mm	8,00 mm	8,10 mm
Minimum Centre Spacing	2,30 mm	2,20 mm	3,00 mm	2,20 mm
Extension Height	4,30 mm	5,30 mm	5,72 mm	4,45 mm
Spring Force	0,6 N	0,3 N	0,8 N	0,8 N
Maximum Travel	2,00 mm	0,80 mm	2,29 mm	2,65 mm
Working Travel	1,70 mm	0,50 mm	1,52 mm	1,70 mm
Temperature Range from	–55°C	–55°C	–55°C	–55°C
Up to	+250°C	+250°C	+250°C	+250°C
Typical Resistance	80 mΩ	50 mΩ	50 mΩ	30 mΩ
Current rating	2,0 A	2,0 A	3,0 A	5,0 A
Materials				
Plunger	Cu-alloy, gold plated	Brass, gold plated	Cu-alloy, gold plated	Cu-alloy, gold plated
Barrel	Nickel silver	Brass, gold plated	Nickel silver	Nickel silver, gold plated
Spring	Stainless steel	Stainless steel	Stainless steel	Stainless steel, gold plated
Ball				

	FK-382	FK-519	FK-575-WL	FK-441
				
Technical Data	**FK-382**	**FK-519**	**FK-575-WL**	**FK-441**
Overall Length	9,28 mm	9,28 mm	10,04 mm	10,52 mm
Minimum Centre Spacing	3,00 mm	2,54 mm	4,20 mm	2,30 mm
Extension Height	7,00 mm	7,00 mm	5,66 mm	8,22 mm
Spring Force	0,8 N	0,8 N	2,0 N	0,8 N
Maximum Travel	2,29 mm	2,29 mm	2,29 mm	2,25 mm
Working Travel	1,52 mm	1,52 mm	1,52 mm	1,52 mm
Temperature Range from	–55°C	–55°C	–55°C	–55°C
Up to	+250°C	+250°C	+250°C	+250°C
Typical Resistance	50 mΩ	50 mΩ	20 mΩ	100 mΩ
Current rating	3,0 A	3,0 A	5,0 A	3,0 A
Materials				
Plunger	Cu-alloy, gold plated	Cu-alloy, gold plated	Brass, gold plated	Cu-alloy, gold plated
Barrel	Nickel silver	Nickel silver	Brass, gold plated	Nickel silver
Spring	Stainless steel	Stainless steel	Stainless steel	Stainless steel

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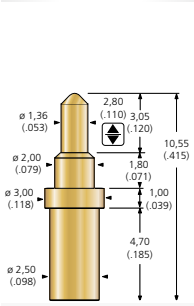
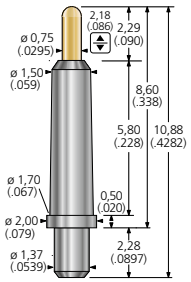
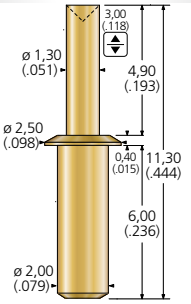
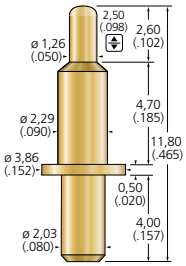
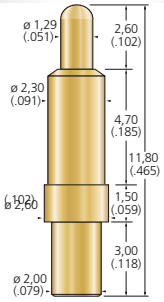
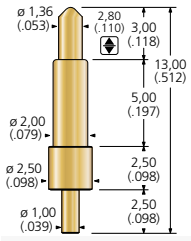
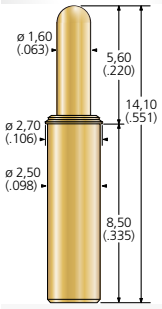
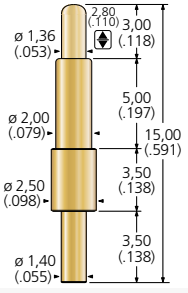
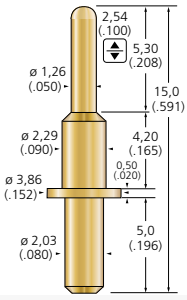
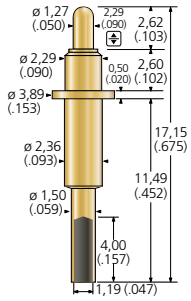
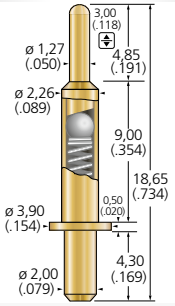
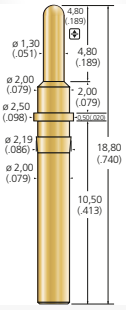
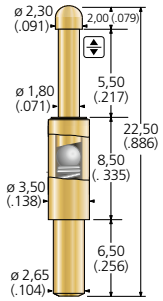
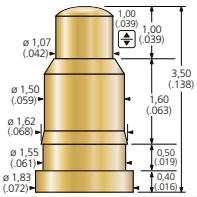
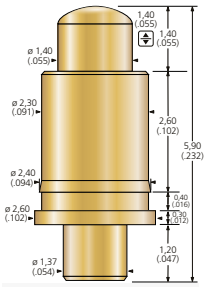
FK-674	FK-492	FK-555	FK-446 / FK-664	FK-757
				
FK-674	**FK-492**	**FK-555**	**FK-446 / FK-664**	**FK-757**
10,55 mm	10,88 mm	11,30 mm	11,80 mm	11,80 mm
2,70 mm	2,20 mm	2,70 mm	4,10 mm	2,80 mm
5,85 mm	8,60 mm	5,30 mm	7,80 mm	4,70 mm
0,3 N	0,9 N	2,0 N	3,0 / 1,2 N	1,5 N
2,80 mm	2,18 mm	3,00 mm	2,50 mm	2,60 mm
1,52 mm	1,45 mm	2,00 mm	1,70 mm	1,70 mm
–55°C	–55°C	–55°C	–55°C	–55°C
+125°C	+250°C	+125°C	+125°C	+200°C
30 mΩ	50 mΩ	50 mΩ	30 mΩ	30 mΩ
2,0 A	3,0 A	1,0 A	8,0 A	8,0 A
Brass, gold plated	Cu-alloy, gold plated	Brass, gold plated	Cu-alloy, gold plated	Cu-alloy, gold plated
Brass, gold plated	Nickel silver	Brass, gold plated	Nickel silver, gold plated	Brass, gold plated
Cu-alloy, gold plated	Stainless steel	Music wire	Music wire	Stainless steel
Stainless steel, gold plated				Stainless steel

FK-516 / FK-516-08	FK-717 / FK-717-05	FK-640	FK-459
			
FK-516 / FK-516-08	**FK-717 / FK-717-05**	**FK-640**	**FK-459**
13,00 mm	14,10 mm	15,00 mm	15,00 mm
2,70 mm	3,00 mm	2,70 mm	4,10 mm
10,50 mm	5,60 mm	11,50 mm	10,00 mm
0,3 / 0,8 N	2,0 / 0,5 N	0,8 N	0,4 N
2,80 mm	5,20 mm	2,80 mm	2,54 mm
1,52 mm	3,30 mm	1,52 mm	1,70 mm
–55°C	–55°C	–55°C	–55°C
+250°C	+250°C	+250°C	+250°C
30 mΩ	<50 mΩ	50 mΩ	30 mΩ
7,0 A	<3,0 A	4,0 A	2,0 A
Cu-alloy, gold plated	Cu-alloy, gold plated	Cu-alloy, gold plated	Cu-alloy, gold plated
Cu-alloy, gold plated	Brass, gold plated	Cu-alloy, gold plated	Nickel silver, gold plated
CuBe, gold plated	Stainless steel, gold plated	Stainless steel, gold plated	Stainless steel, silver plated

	FK-576	FK-460 / FK-460-08	FK-744	FK-540 / FK-540-15
				
Technical Data				
Overall Length	17,15 mm	18,65 mm	18,80 mm	22,50 mm
Minimum Centre Spacing	4,20 mm	4,10 mm	2,70 mm	3,70 mm
Extension Height	5,66 mm	14,35 mm	7,30 mm	16,00 mm
Spring Force	2,0 N	1,8 / 0,8 N	0,7 N	2,5 / 1,5 N
Maximum Travel	2,29 mm	3,00 mm	4,80 mm	5,50 mm
Working Travel	1,52 mm	2,00 mm	3,60 mm	3,67 mm
Temperature Range from	–55°C	–55°C	–55°C	–55°C
Up to	+250°C	+250°C	+250°C	+250°C
Typical Resistance	20 mΩ	30 mΩ	≤30 mΩ	20 mΩ
Current rating	5,0 A	3,0 A	≤5,0 A	5,0 A
Materials				
Plunger	Brass, gold plated	Cu-alloy, gold plated	Cu-alloy, gold plated	Cu-alloy, gold plated
Barrel	Brass, gold plated	Brass, gold plated	Brass, gold plated	Nickel silver, gold plated
Spring / Ball	Stainless steel	Stainless steel, gold plated / Stainless steel	Stainless steel, gold plated / Stainless steel	Stainless steel / Stainless steel

Connector Termination, e.g. STOCKO RFB 8121.020 R 2-1,5.
Mating contact FK-745 on page 59

	FK-648	FK-715
		
Technical Data		
Overall Length	3,50 mm	5,90 mm
Minimum Centre Spacing	2,00 mm	2,90 mm
Extension Height	3,10 mm	4,40 mm
Spring Force	0,95 N	0,5 N
Maximum Travel	1,00 mm	1,40 mm
Working Travel	0,70 mm	0,90 mm
Temperature Range from	–55°C	–55°C
Up to	+125°C	+250°C
Typical Resistance	30 mΩ	20 mΩ
Current rating	1,0 A	2,0 A
Materials		
Plunger	Brass, gold plated	Brass, gold plated
Barrel	Brass, gold plated	Brass, gold plated
Spring	Music wire, gold plated	Stainless steel
Ball		Stainless steel

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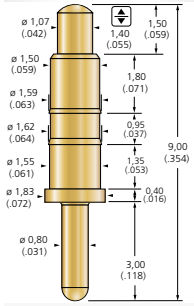
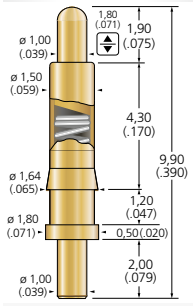
FK-663



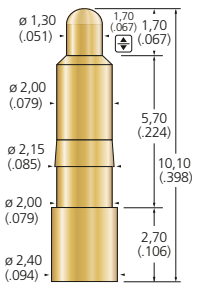
FK-663
9,00 mm
2,10 mm
5,60 mm
0,85 N
1,40 mm
0,70 mm
–25°C
+85°C
20 mΩ
2,0 A
Cu-alloy, gold plated
Cu-alloy, gold plated
Music wire, gold plated

FK-499



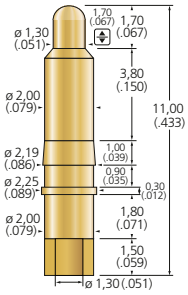
FK-499
9,90 mm
2,00 mm
7,40 mm
2,0 N
1,80 mm
1,20 mm
–55°C
+250°C
40 mΩ
3,0 A
Cu-alloy, gold plated
Brass, gold plated
Stainless steel, gold plated

FK-714 / FK-714-06



FK-714 / FK-714-06
10,10 mm
2,60 mm
7,40 mm
2,0 / 0,6 N
1,70 mm
1,00 mm
–55°C
+250°C
15 mΩ
5,0 A
Brass, gold plated
Brass, gold plated
Stainless steel / Stainless steel

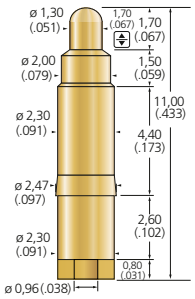
FK-691/FK-691-06



FK-691/FK-691-06
11,00 mm
2,54 mm
7,40 mm
1,0 / 0,6 N
1,70 mm
1,00 mm
–55°C
+250°C
≤30 mΩ
5,0 A
Brass, gold plated
Brass, gold plated
Stainless steel / Stainless steel

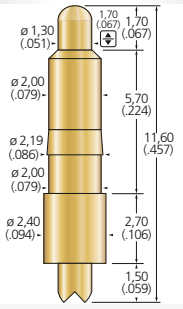
High-temp version
up to 300°C: **FK-691-HT**

FK-741-HT



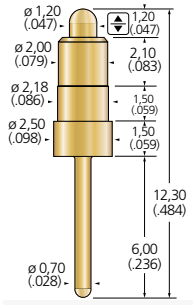
FK-741-HT
11,00 mm
2,80 mm
variabel
1,0 N
1,70 mm
1,00 mm
–55°C
+300°C
15 mΩ
5,0 A
Brass, gold plated
Brass, gold plated
Stainless steel, gold plated

FK-754



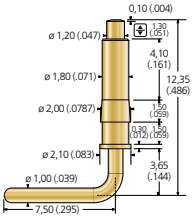
FK-754
11,60 mm
2,54 mm
7,40 mm
0,4 N
3,30 mm
1,50 mm
–55°C
+250°C
15 mΩ
5,0 A
Bronze & steel, gold plated
Brass, gold plated
Stainless steel

FK-454



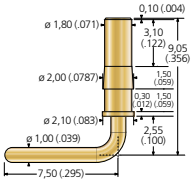
FK-454
12,30 mm
2,70 mm
6,30 mm
1,0 N
1,20 mm
0,80 mm
–55°C
+250°C
50 mΩ
3,0 A
Cu-alloy, gold plated
Nickel silver, gold plated
Stainless steel

FK-565



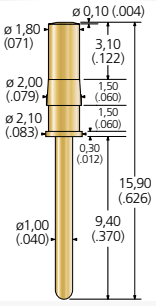
FK-565
12,35 mm
2,54 mm
8,40 mm
1,0 N
1,30 mm
0,80 mm
–55°C
+250°C
50 mΩ
3,0 A
Cu-alloy, gold plated
Brass, gold plated
Stainless steel, gold plated

FK-566

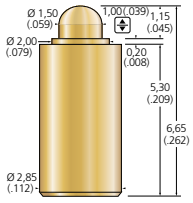
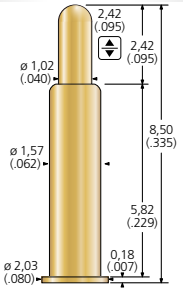
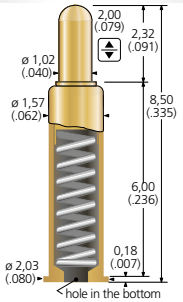


FK-566
9,05 mm
2,54 mm
6,20 mm
rigid contact
rigid contact
rigid contact
–55°C
+250°C
20 mΩ
3,0 A
Brass, gold plated

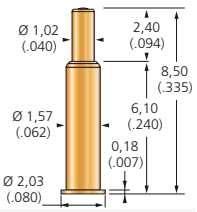
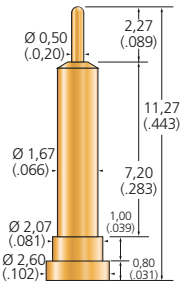
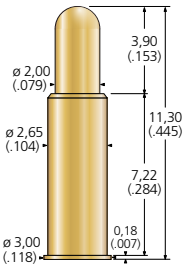
FK-566-GF



FK-566-GF
15,90 mm
2,54 mm
6,20 mm
rigid contact
rigid contact
rigid contact
–55°C
+250°C
20 mΩ
3,0 A
Brass, gold plated

	FK-515	FK-586	FK-606
			

Technical Data	FK-515	FK-586	FK-606
Overall Length	6,65 mm	8,50 mm	8,50 mm
Minimum Centre Spacing	3,18 mm	2,54 mm	2,54 mm
Extension Height	6,65 mm	8,50 mm	8,50 mm
Spring Force	0,8 N	0,5 N	1,0 N
Maximum Travel	1,00 mm	2,00 mm	2,00 mm
Working Travel	0,75 mm	1,33 mm	1,33 mm
Temperature Range from	–55°C	–55°C	–55°C
Up to	+200°C	+250°C	+250°C
Typical Resistance	40 mΩ	30 mΩ	30 mΩ
	7,0 A	1,0 A	3,0 A
Materials			
Plunger	Cu-alloy, gold plated	Cu-alloy, gold plated	Cu-alloy, gold plated
Barrel	Cu-alloy, gold plated	Brass, gold plated	Brass, gold plated
Spring	CuBe	Stainless steel, gold plated	Stainless steel, gold plated

	FK-756	FK-694-S	FK-725
			

Technical Data	FK-756	FK-694-S	FK-725
Overall Length	8,50 mm	11,27 mm	11,30 mm
Minimum Centre Spacing	2,54 mm	2,80 mm	3,50 mm
Extension Height	8,50 mm	11,27 mm	11,30 mm
Spring Force	0,5 N	1,0 N	0,7 N
Maximum Travel	2,40 mm	2,25 mm	3,90 mm
Working Travel	1,60 mm	1,50 mm	2,50 mm
Temperature Range from	–55°C	–55°C	–55°C
Up to	+250°C	+250°C	+250°C
Typical Resistance	10 mΩ	50 mΩ	<50 mΩ
Current rating	3,0 A	3,0 A	<3,0 A
Materials			
Plunger	Cu-alloy, gold plated	Steel, gold plated	Cu-alloy, gold plated
Barrel	Brass, gold plated	Brass, gold plated	Brass, gold plated
Spring	Stainless steel	Stainless steel	Stainless steel, gold plated
Ball	Stainless steel		

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Spring Force (xx)

Preload	Rated Force	Code xx
0,15 N	1,5 N	15
0,35 N	3,0 N	30
0,5 N	4,0 N	40

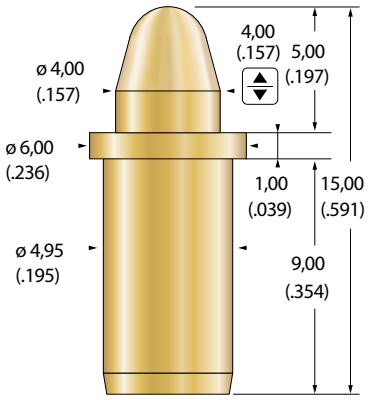
	Ø 4,00	365.106.40.xx
	Ø 4,00	365.14.40.xx
	Ø 4,00	* 365B.35.40.xx
	Ø 4,00	* 365C.35.40.xx

For XXLonglife-Nanocoating order as 365X

* 365B.35.40.xx Current rating: 15A

* 365C.35.40.xx: Plunger length: 4,00 mm
Overall Length: 14,00mm

Series 365



Series 365

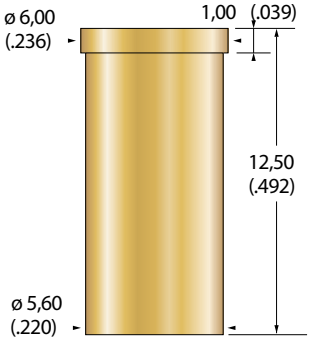
Technical Data

Overall Length	14,00 / 15,00 mm
Minimum Centre Spacing	6,50 mm
Maximum Travel	4,00 mm
Working Travel	2,70 / 3,00 mm
Temperature Range from	–55°C
Up to	+250°C
Typical Resistance	30 mΩ
Current rating	3,0 / 15,0 A

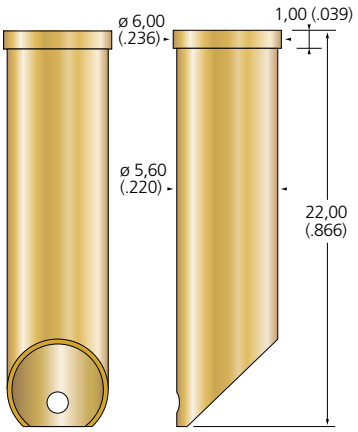
Materials

Plunger	CuBe, gold plated
Barrel	Cu-alloy, gold plated
Spring	Music wire, gold plated

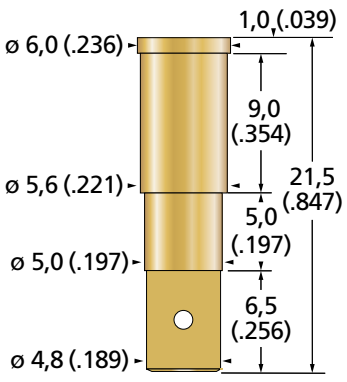
S 365.01



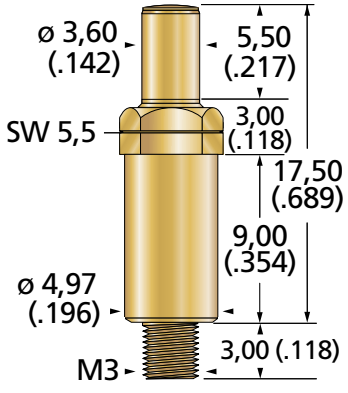
S 365.22



S 509.01-F



Series 509E.35.36.20



Series 509E.35.36.20

Technical Data

Overall Length	17,70 mm
Minimum Centre Spacing	3,60 mm
Maximum Travel	5,50 mm
Working Travel	3,60 mm
Temperature Range from	– 55°C
Up to	+105°C
Typical Resistance	20 mΩ
Current Load rated/max.	5,0 A

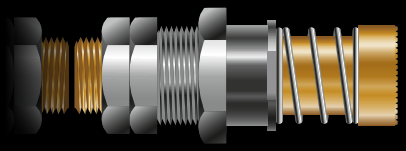
Materials

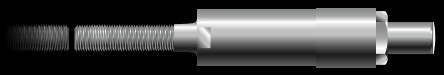
Plunger	Brass, gold plated
Barrel	Brass, gold plated
Spring	Stainless steel

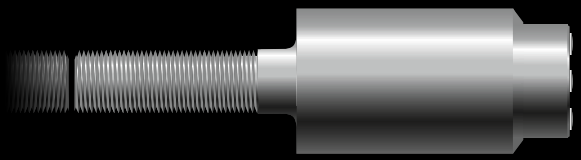
HIGH CURRENT CONTACTS

HIGH CURRENT CONTACTS

Test applications involving high currents increasingly grow in number and requirements. Actual Keywords are for instance electric mobility, hybrid drives or solar energy. The requirements for testing and coupling contacts increase from day to day. Special designs, materials and surfaces give us the necessary characteristics to ensure that contacts can cope with the enormous power loads reliably and sustainably.
In our Chapter Power Contacts, we explain which solutions we can offer you in this - of course always sprung - field of contact products. The selection here is not limited to the test area. Our JUMBO types can „put away" a lot, so they find applications even in harsh working environments.







Series	Page
120	108
126	109
127	110
128	110
226	109
FK-133	111
FK-050	111
FK-679	111

Series 120

Technical Data

Overall Length	33,25 mm
Minimum Centre Spacing	2,54 mm
Maximum Travel	6,35 mm
Working Travel	4,20 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	15 mΩ
Current Load rated/max.	8,0 / 10,0 A

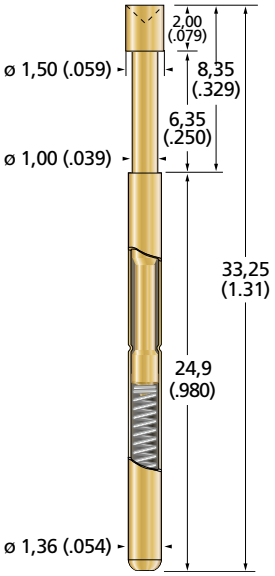
Materials

Plunger	Cu-alloy, gold plated
Barrel	Cu-alloy, gold plated
Spring	Music wire, gold plated

Regarding the geometric dimensions this design is similar to the standard 100 series, however, made for a higher current load. As with all high-voltage and high-power contact applications, cyclic cooling intervals should be provided between the load phases.
The data on current carrying capacity should not be construed here as a constant current load, as in the usual test applications there are intervals for the loading and unloading of the test apparatus. If you are looking for a high-current contact to be inserted under continuous load, we recommend to look through this chapter in detail. There is more on teh following pages!

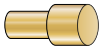
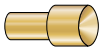
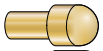
The matching receptacles of the 100 series you find on page 34.

Series 120



Spring Force (xx)

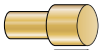
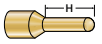
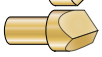
Preload	Rated Force	Code xx
0,3 N	1,1 N	11
0,6 N	1,8 N	18
1,0 N	2,5 N	25

	Ø 1,00	120.02.10.xx
	Ø 1,00	120.03.10.xx
	Ø 1,50	120.03.15.xx
	Ø 1,00	120.04.10.xx
	Ø 1,50	120.04.15.xx
	Ø 1,00	120.05.10.xx
	Ø 1,50	120.05.15.xx
	Ø 1,50	120.08.15.xx
	Ø 2,00	120.08.20.xx
	Ø 1,50	120.20.15.xx

For XXLonglife-Nanocoating order as 120X

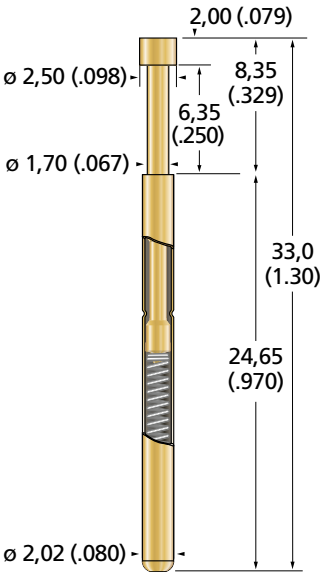
Spring Force (xx)

Preload	Rated Force	Code xx
0,6 N	1,8 N	18
1,0 N	2,5 N	25

	Ø 1,30	**126.02.13.xx**
	Ø 1,70	**126.02.17.xx**
	Ø 1,70	**126.03.17.xx**
	Ø 2,50	**126.03.25.xx**
	Ø 2,50	**126.04.25.xx**
	Ø 0,70	**126.05.07H500.xx**
	Ø 0,90	**126.05.09H500.xx**
	Ø 1,70	**126.05.17.xx**
	Ø 2,50	**126.05.25.xx**
	Ø 2,00	**126.06.20.xx**
	Ø 2,50	**126.06.25.xx**
	Ø 1,70	**126.08.17.xx**
	Ø 2,50	**126.08.25.xx**
	Ø 4,00	**126.08.40.xx**
	Ø 2,50	**126.15.25.xx**
	Ø 3,00	**126.20.30.xx**
	Ø 1,70	**126.49.17.xx**

For XXLonglife-Nanocoating order as 126X

Series 126



Series 126

Technical Data

Overall Length	33,00 mm
Minimum Centre Spacing	3,20 mm
Maximum Travel	6,35 mm
Working Travel	4,20 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	10 mΩ
Current Load rated/max.	8,0 / 20,0 A

Materials

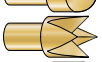
Plunger	CuBe hardened, gold plated
Barrel	Cu-alloy, gold plated
Spring	Music wire, silver plated

This high current version is identical to the Series 26 in the outer dimensions, but can take up higher current loads. For extremely demainding high current applications, we recommend the 226 series (below). This type has an especially complex design in the interior and can therefore transmit high continuous current without overheating.

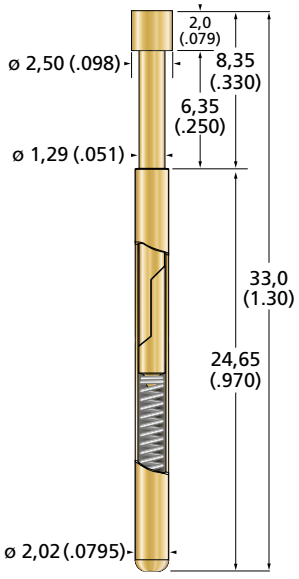
The Series 126 and 226 use the receptacles of the series 26 (see page 36).

Spring Force (xx)

Preload	Rated Force	Code xx
0,4 N	1,2 N	12
0,6 N	1,8 N	18
0,8 N	2,5 N	25
1,5 N	4,4 N	44

	Ø 2,50	**226.03.25.xx**
	Ø 2,50	**226.05.25.xx**
	Ø 2,50	**226.06.25.xx**
	Ø 2,50	**226.08.25.xx**

Series 226



Series 226

Technical Data

Overall Length	33,00 mm
Minimum Centre Spacing	3,20 mm
Maximum Travel	6,35 mm
Working Travel	4,20 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	10 mΩ
Current Load rated/max.	30,0 / 35,0 A

Materials

Plunger	CuBe hardened, gold plated
Barrel	Cu-alloy, gold plated
Spring	Music wire, gold plated

Features a split plunger to ensure a reliable current transmission.

Series 127

Technical Data

Overall Length	33,75 mm
Minimum Centre Spacing	4,00 mm
Maximum Travel	6,35 mm
Working Travel	4,20 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	10 mΩ
Current Load rated/max.	15,0 / 25,0 A

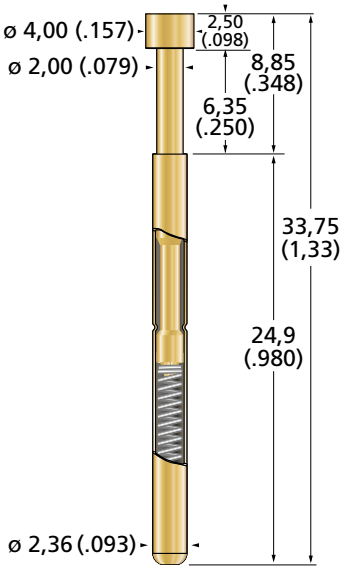
Materials

Plunger	CuBe hardened, gold plated
Barrel	Cu-alloy, gold plated
Spring	Music wire, silver plated

In the outer dimensions equal to the Series 27, but due to the different surface coatings more durable in high current use.

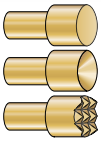
Receptacles see page 37.

Series 127



Spring Force (xx)

Preload	Rated Force	Code xx
0,8 N	1,9 N	19
0,8 N	3,0 N	30
1,5 N	5,0 N	50



Ø 4,00	127.03.40.xx
Ø 4,00	127.04.40.xx
Ø 3,00	127.08.30.xx
Ø 4,00	127.08.40.xx
Ø 4,00	127.15.40.xx

For XXLonglife-Nanocoating order as 127X

Series 128

Technical Data

Overall Length	36,15mm
Minimum Centre Spacing	4,75 mm
Maximum Travel	6,35 mm
Working Travel	4,20 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	10 mΩ
Current Load rated/max.	15,0 / 30,0 A

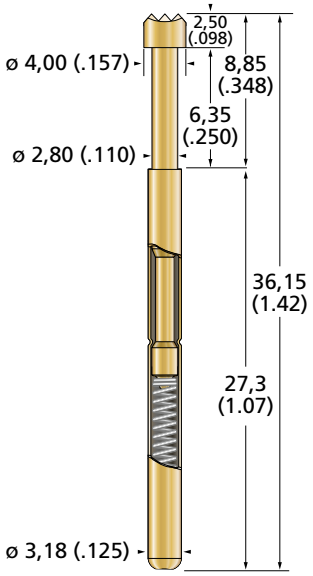
Materials

Plunger	CuBe hardened, gold plated
Barrel	Cu-alloy, gold plated
Spring	Stainless steel / Music wire, silver plated

In the outer dimensions equal to the Series 28, but due to the different surface coatings more durable in high current use.

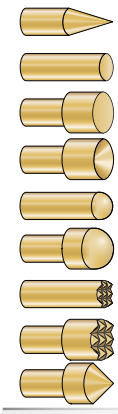
Receptacles see page 38.

Series 128



Spring Force (xx)

Preload	Rated Force	Code xx
0,8 N	1,9 N	19
0,8 N	2,3 N	23
1,5 N	4,0 N	40



Ø 2,80	128.02.28.xx
Ø 2,80	128.03.28.xx
Ø 4,00	128.03.40.xx
Ø 4,00	128.04.40.xx
Ø 2,00	128.05.20.xx
Ø 4,00	128.05.40.xx
Ø 2,80	128.08.28.xx
Ø 4,00	128.08.40.xx
Ø 4,00	128.15.40.xx

For XXLonglife-Nanocoating order as 128X

Max. Current Load 25,0 / 30,0 A
Overall Length 33,75 / 36,15 mm
Working Travel 4,20 mm
Max. Travel 6,35 mm
Pitch ≥4,0 / 4,75 mm ≥ 187mil

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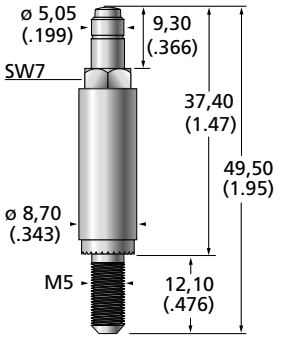
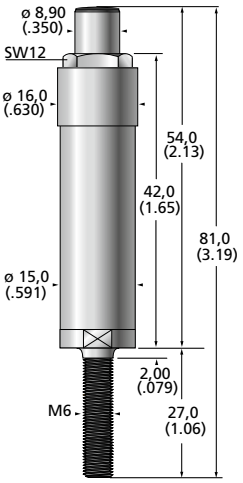
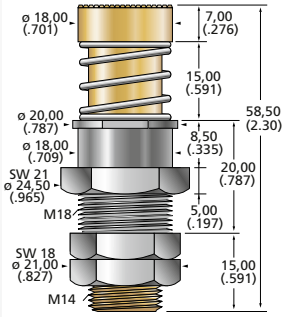
HIGH CURRENT CONTACTS
FK-133 / 052 / 679

	FK-133	FK-052	FK-679
			
Technical Data	**FK-133**	**FK-052**	**FK-679**
Overall Length	49,50 mm	81,00 mm	58,50 mm
Spring Force	10,0 N	17,0 N	48,50 N
Spring preload	5,0 N	6,0 N	29,0 N
Maximum Travel	8,30 mm	12,10 mm	6,50 mm
Max. continuous current	25,0 A	100 A	≤ 220 A
Max. impulse current	1 kA	4 kA	300 A
Contact resistance	1,0 mΩ	≤ 1,0 mΩ	0,5 mΩ
Temperature up to	+125°C	+150°C	+100°C
Max. tightening torque	3,0 Nm	5,0 Nm	5,0 Nm
		Version FK-152 features a higher continuous current rating of 150 A.	Further variations with different diameters on request. Also available with additional sense-pin for kelvin measurement applications.

HIGH CURRENT „JUMBOS“

In addition to the high-current contacts for the test area we carry our „thick JUMBOS“ for applications with significantly higher current loads. By special inner design structures and the use of pure silver as the contact material load values of several hundred amps are possible. More designs and types are available on request.

HIGH CURRENT JUMBOS

KELVIN CONTACTS

KELVIN CONTACTS
SPARE PARTS FOR IC-HANDLERS

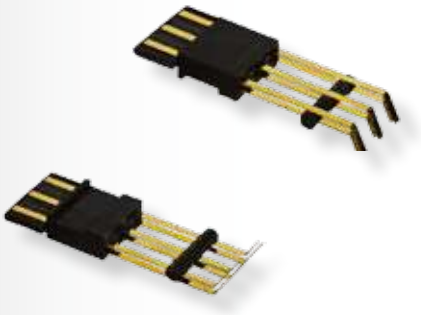
William Thomson, 1st Baron Kelvin (usually named as Lord Kelvin or Kelvin of Largs) is mainly known for his research on the thermodynamics and the Kelvin temperature scale named after him. In his work on electricity, he developed among others the Kelvin bridge and found the most accurate method to measure low resistances: the four-wire measurement, named after him as „Kelvin measurement".
In the following chapter, we show you how you can perform this test method as accurately as possible using our Kelvin contacts. Especially measurements in the low range (milliohms and µΩ) benefit from this. FoOr the Kelvin measurement it is important that each measuring point is contacted of two mutually insulated contacts, which are located as close as possible to each other.
Suitable and specially designed pins can be found here on the following pages.

Besides axially sprung contacts as they are mainly found in our catalog, there is a second technology group that brings great advantages for many applications: Projecting strip contacts, or in technical jargon so-called Cantilever Beam Contacts. In the differnt groups Standard, Kelvin, RF or customized we offer them down to the smallest grid spacing of 0.3 mm (0.4 mm for Kelvin).
Many automated IC handler systems are built on this technology - the appropriate spare parts can be found here - if not, please consult us.
Other applications include relay test (coil resistance measurement) or contacting other components with leads.

Series	Page
BA10	115
CA20	115

KELVIN CONTACTS

KELVIN UC-010A
2,54 mm pitch used for DIL-components. 2 x 5-way leads. Every single lead gets double contacts. CuBe-strips 0,20 mm thick.
(left photo)

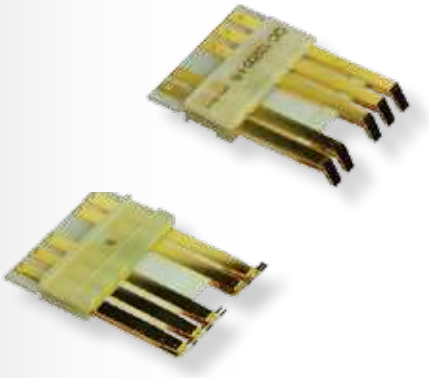


KELVIN UC-010A -S1
Variant of the UC-01A with some contacts left out. Pitch 5,08 mm. Further variants on request! CuBe-strips 0,20 mm thick.
(right photo)

KELVIN UC-012-A
2,54 mm pitch used for DIL-components. 2 x 6-way leads. Every single lead gets double contacts. CuBe-strips 0,20 mm thick.
(left photo)

KELVIN CC-012A
2,54 mm pitch used for DIL-components. 2 x 6-way leads. Every single lead gets double contacts. CuBe-strips 0,30 mm thick.
(left photo)

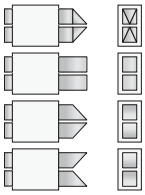
KELVIN CC-EX3
High current version. 2 x 3-way, pitch 5,08 mm (200mil). CuBe-strips 0,30 mm thick.
(left photo)



KELVIN CC-10200-L
Custom design type. Two separate contacts for every lead. CuBe-strips 0,30 mm thick.
(right photo)

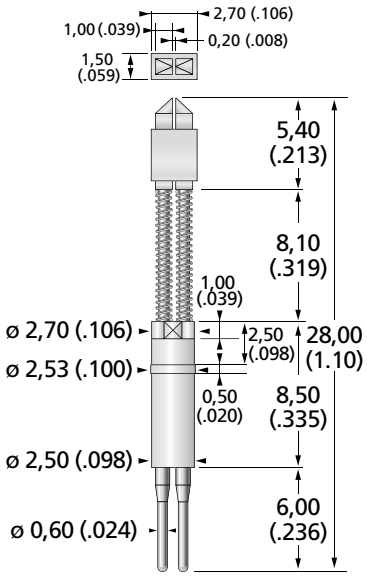
Spring Force (xx)

Preload	Rated Force	Code
0,20 N	0,50 N	SPL
0,35 N	0,76 N	SPS
0,50 N	1,20 N	SPH



BA10(1)-QAW
BA10(1)-QFW
BA10(1)-QNW
BA10(1)-QNW-R

BA10



BA10

Technical Data

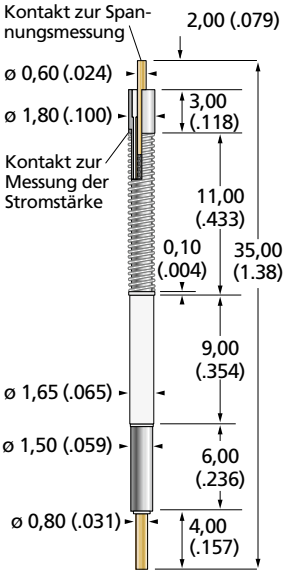
Overall Length	28,00 mm
Minimum Centre Spacing	3,00 mm
Spring Force	0,76 N
Maximum Travel	4,50 mm
Working Travel	3,00 mm
Up to	+60°C
Typical Resistance	20 mΩ
Current rating	2,0 A

Materials

Plunger	Steel, gold plated
Spring	Music wire, silver plated

Terminal for crimping or soldering available.

CA20



CA20

Technical Data

Overall Length	35,00 mm
Minimum Centre Spacing	2,80 mm
Spring Force	1,95 N
Maximum Travel	2,00 / 4,50 mm
Working Travel	0,70 / 3,00 mm
Up to	60°C
Typical Resistance	15 mΩ
Current rating	3,0 A

Materials

Plunger	Steel, gold plated
Spring	Music wire, silver plated

Further variations with different diameters available on request.

Kelvin contacts for fine pitch applications

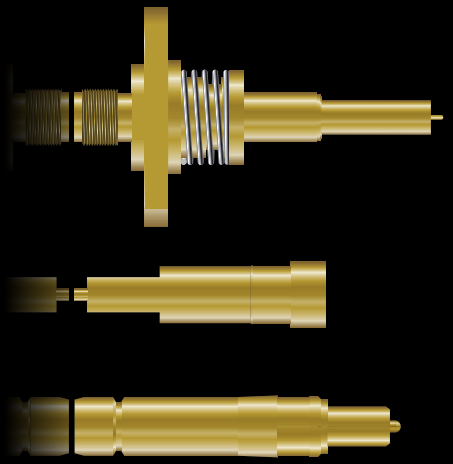
On page 97 you will find special finepitch kelvin contacts for applications with pitches of 0.40 mm and 0.50 mm.

Pitch	Max. Travel	Working Travel	Overall Length	Current rating
≥ 2,80 mm	2,00 / 4,50 mm	0,70 / 3,00 mm	35,00 / 28,00 mm	2,0 A

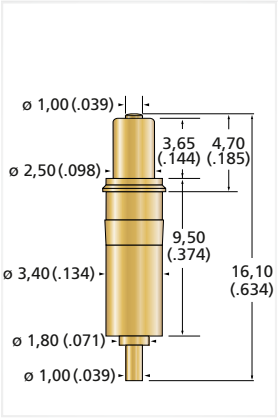
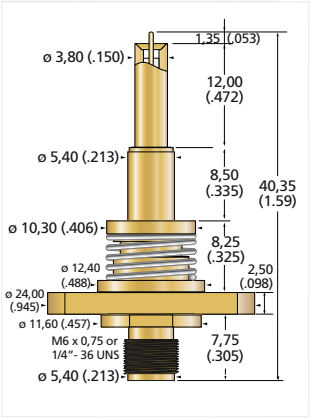
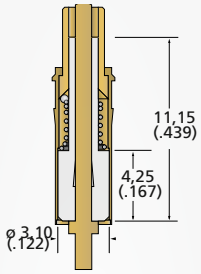
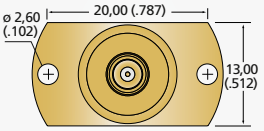
COAXIAL CONTACTS

COAXIAL CONTACTS

Of course the Coaxial RF-contacts from FIXTEST are spring loaded. This is our business and that's what we can. Normal antenna connections for plug- in or screw mount you will not find here.
Our coaxial spring contacts are mainly used in the testing during tha production of mobile radios, vehicle components or smartphones, but also in dock connectors which transmit RF signals (WLAN, GPRS, GPS, UMTS and so on).
These contacts we design and produce on a project basis and according to customer specifications, often adapted to the installation situation. From this point there is no real standard product line shown here in this category.
The items shown her represent case studies of some of our recent developments.
Does one of the examples fit to an application you are looking for? Or do you need a completely different solution? Please don't hesitate to contact us! We look forward to your inquiry!



Series	Page
10103	118
10105	118
10107.001D	119
10114.001C	119
FK-651	119
FK-652	119
FK-661	119

	10103	10105
		
		

Technical Data	10103	10105
Centre pin max. travel	–	3,00 mm
Centre pin working travel	–	2,00 mm
Centre pin spring force at working travel	rigid	0,8 N
Shield max. travel	1,60 mm	2,90 mm
Shield Working Travel	1,00 mm	1,90 mm
Shield spring force at working travel	1,5 N	2,3 N
Temperature range from	–40°C	–40°C
Up to	+90°C	+90°C
Wave impedance	50 Ω	50 Ω
Frequency range	–	–
Insertion Loss DC to 3 GHz	–	–
Insertion Loss 3 to 6 GHz	–	–
	Solder terminal (THT), developed for a docking system for digital radio TPH700 (external antenna).	SMA conversion adapter, floating installation, compatible with HRS MS-156-HRMJ-12, however with replaceable centre pin. Two versions available: a) M6 x 0.75 mm thread: 10105-M b)1/4"-36 UNS (SMA): 10105-U

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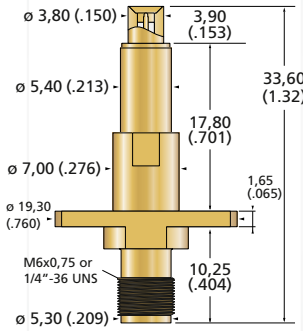
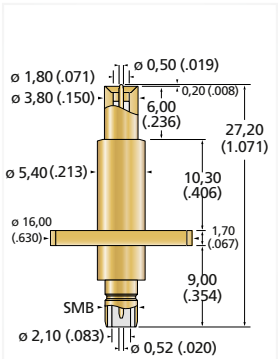
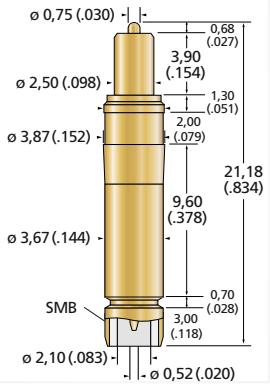
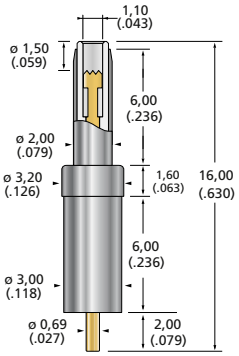
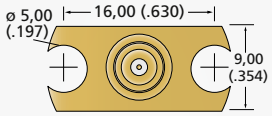
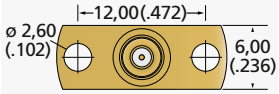
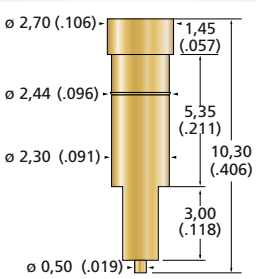
10107.001D	10114.001C	FK-661 / FK-652	FK-651
			
		FK-652 	
10107.001D	**10114.001C**	**FK-661 / FK-652**	**FK-651**
3,00 mm	2,90 mm	2,70 mm	1,50 mm
2,00 mm	1,40 mm	1,90 mm	1,00 mm
0,8 N	1,0 N	1,0 N	1,0 N
2,90 mm	1,70 mm	2,10 mm	
1,90 mm	1,20 mm	1,20 mm	
2,3 N	1,2 N	2,0 N	1,0 N
–40°C	–40°C	–40°C	–55°C
+90°C	+90°C	+90°C	+120°C
50 Ω	50 Ω	50 Ω	25 mΩ
DC to 6 GHz	DC to 6 GHz	DC to 6 GHz	
0.6 dB	0.6 dB	–	–
1.5 dB	1.5 dB	–	–
Compatible with muRata MM126036, however with replaceable centre pin. Two versions available: a) M6 x 0.75 mm thread: 10107.001D-M b) 1/4"-36 UNS (SMA): 10107.001D-U	Similar to type 10107.001D, however with threadless SMB plug connection.	SMB plug-in connection, developed for a docking system for different radio frequencies (WLAN, UMTS etc.). Suitable mating contact (rigid): FK-652.	Current Load rated / max. 2,0 / 3,0 A Suitable for Nokia DC-connections.

CABLE HARNESS TEST

CABLE HARNESS TEST

Special spring contacts for cable harness inspection in the automotive industry have an important common property: the probe and the socket must stay tightly together, so in many cases they are connected by threads.
The recurring withdrawal forces in the plug connector test may pull out the normal spring contact probe slowly from the receptacle - not so with the screw-fit types.

Our portfolio includes besides the normal spring contacts also switch contact pins, which establish the contact link only after a certain minimum stroke. Thus, the verification of correct installation dimensions or a query component can be easily realized.
Some spring contacts have a large, plate-like disc below the probe tip. This serves to determine or limitate the depth of penetration of the probe into the socket or the plug housing. As in other fields of applications also here some standardization has established over the years, which means that brand products of different manufacturers are interchangeable or compatible. Our cable testing products are compatible with those of other brands, and we will help you with the „translation" of the different item codes.

The necessary tools for screwing are available upon request.

Series	Page
70	122
71	123
72	124
73	125
172	126
265E	127

Series 70

Technical Data

Overall Length	27,90 mm
Minimum Centre Spacing	2,54 mm
Maximum Travel	4,40 mm
Working Travel	3,50 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	30 mΩ
Current Load rated/max.	3,0 / 3,5 A

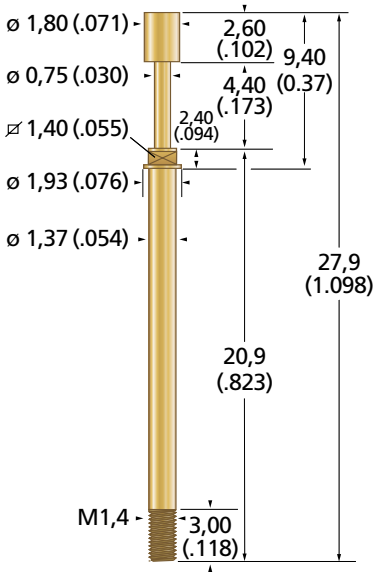
Materials

Plunger	CuBe, gold plated or rhodium plated
Barrel	Brass, gold plated
Spring	Stainless steel

Screwed spring contact probe for pitch ≥ 2.54 mm. Recommended torque 3 to 5 (max.) Ncm.

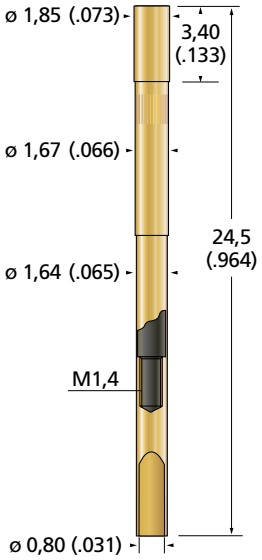
Screw-in-tool: IGL-TL-7 or IGL-TL-8.
List of all tools on page 137.

Series 70



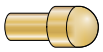
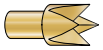
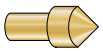
S 70.00-L

Solder Cup with internal thread



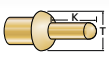
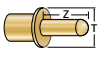
Spring Force (xx)

Preload	Rated Force	Code xx
0,4 N	1,0 N	10
0,4 N	1,5 N	15
0,7 N	2,5 N	25
0,7 N	3,0 N	30

	Ø 0,38	70.102.04.xx
	Ø 0,75	70.102.08.xx
	Ø 0,75	70.103.08.xx
	Ø 1,80	70.103.18.xx
	Ø 0,65	70.105.06.xx
	Ø 0,75	70.105.08.xx
	Ø 1,25	70.105.13.xx
	Ø 1,80	70.106.18.xx
	Ø 1,25	70.08.13.xx
	Ø 1,80	70.08.18.xx
	Ø 0,60	70.14.06.xx
	Ø 1,80	70.115.18.xx

For XXLonglife-Nanocoating order as 70X

Collar types with predefined penetration depth

	Ø mm	Code xx	Z-Wert mm	T- / K-Wert mm
	Ø 0,60	70.105.06Z340K150.xx	3,40	1,50
	Ø 0,60	70.105.06Z400K150.xx	4,00	1,50
	Ø 0,60	70.105.06Z400T150.xx	4,00	1,50
	Ø 0,60	70.105.06Z550T140.xx	5,50	1,40
	Ø 0,70	70.105.07Z200T150.xx	2,00	1,50
	Ø 0,70	70.105.07Z340T150.xx	3,40	1,50
	Ø 0,70	70.105.07Z350T150.xx	3,50	1,50

Further versions available on request.

For XXLonglife-Nanocoating order as 70X

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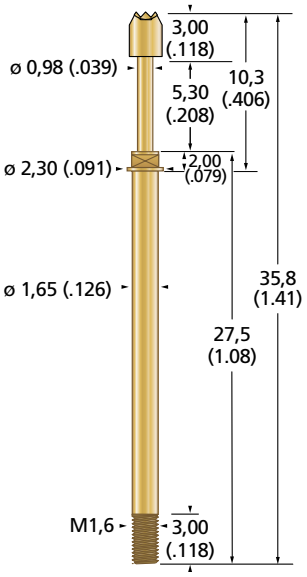
Spring Force (xx)

Preload	Rated Force	Code xx
0,3 N	0,80 N	08
0,5 N	1,50 N	15
0,5 N	2,25 N	23
0,8 N	3,00 N	30
1,0 N	5,00 N	50

Ø 0,60	71.101.06.xx
Ø 0,70	71.102.07.xx
Ø 1,30	71.102.13.xx
Ø 1,30	71.103.13.xx
Ø 2,00	71.103.20.xx
Ø 1,90	71.104.19.xx
Ø 1,30	71.105.13.xx
Ø 1,50	71.105.15.xx
Ø 2,00	71.105.20.xx
Ø 1,30	71.106.13.xx
Ø 2,00	71.106.20.xx
Ø 1,30	71.107.13.xx
Ø 1,30	71.108.13.xx
Ø 2,00	71.108.20.xx
Ø 1,30	71.10.13.xx
Ø 1,80	71.10.18.xx
Ø 1,30	71.118.13.xx
Ø 2,00	* 71.61A.20.xx
Ø 2,00	* 71.61B.20.xx

For XXLonglife-Nanocoating order as 71X

Series 71



Series 71

Technical Data

Overall Length	35,80 mm
Minimum Centre Spacing	2,54 mm
Maximum Travel	5,30 mm
Working Travel	4,00 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	25 mΩ
Current Load rated/max.	3,0 / 4,0 A

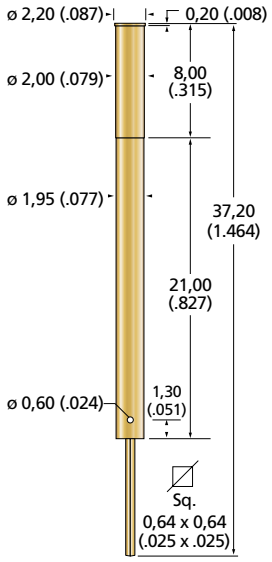
Materials

Plunger	Steel, gold plated or rhodium plated
Barrel	Brass, gold plated
Spring	Music wire, gold plated

Screwed spring contact probe for pitch ≥ 2.54 mm.

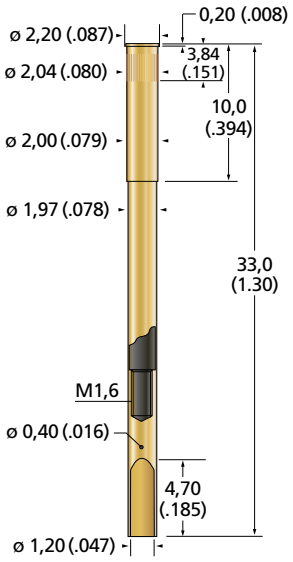
S 71.00-W

Wire-Wrap-Post with internal thread



S 71.00-L

Solder Cup with internal thread



Probes with reduced heads

Ø mm	Code xx	H-Wert mm
Ø 0,80	71.103.08H300.xx	3,00
Ø 0,60	71.105.06H500.xx	5,00
Ø 0,80	71.105.08H500.xx	5,00

* Version A: Slot width 0,40 mm
* Version B: Slot width 0,30 mm

Collar types with predefined penetration depth

Ø mm	Code xx	Z-Wert mm	T- / K-Wert mm
Ø 0,70	71.103.07Z200T180.xx	2,00	1,80
Ø 1,50	71.103.15Z250T300.xx	2,50	3,00
Ø 0,80	71.05.08Z450T180.xx	4,50	1,80
Ø 1,00	71.05.10Z150T180.xx	1,50	1,80
Ø 1,00	71.05.10Z180T180.xx	1,80	1,80
Ø 1,00	71.105.10Z200T180.xx	2,00	1,80
Ø 1,00	71.105.10Z260T250.xx	2,60	2,50

CABLE HARNESS TEST

Max. Current Load 4,0 A
Overall Length 35,80 mm
Working Travel 4,00 mm
Max. Travel 5,30 mm
Pitch ≥ 2,54 mm ≥ 100 mil

Series 72

Technical Data

Overall Length	28,50 mm
Minimum Centre Spacing	4,00 mm
Maximum Travel	5,50 mm
Working Travel	4,40 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	30 mΩ
Current Load rated/max.	5,0 / 6,0 A

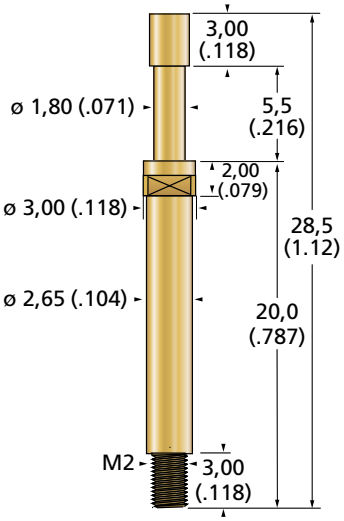
Materials

Plunger	Steel, gold plated or rhodium plated
Barrel	Brass, gold plated
Spring	Music wire, gold plated

Screwed spring contact probe for pitch ≥ 4.00 mm. Recommended torque 3 to 5 (max.) Ncm.

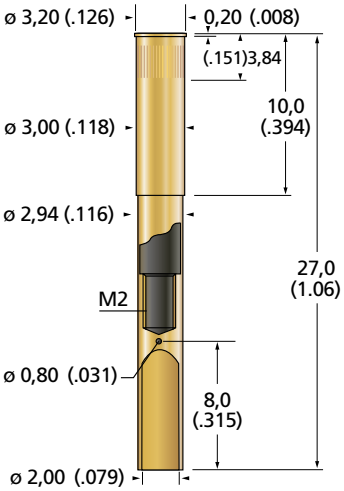
Screw-in-tool: IGL-TL-5 or IGL-TL-6.
List of all tools on page 137.

Series 72



S 72.00-L

Solder Cup with internal thread



Spring Force (xx)

Preload	Rated Force	Code xx
0,3 N	0,60 N	06
0,4 N	1,50 N	15
0,5 N	2,25 N	23
0,6 N	3,00 N	30
1,0 N	5,00 N	50

	Ø 1,80	72.102.18.xx
	Ø 1,00	72.03.10.xx
	Ø 1,00	72.103.10.xx
	Ø 1,40	72.03.14.xx
	Ø 1,80	72.103.18.xx
	Ø 2,30	72.103.23.xx
	Ø 3,00	72.103.30.xx
	Ø 4,00	72.103.40.xx
	Ø 2,50	72.104.25.xx
	Ø 4,00	72.104.40.xx
	Ø 0,80	72.105.08H500.xx
	Ø 1,40	72.105.14H500.xx
	Ø 2,30	72.105.23.xx
	Ø 2,50	72.105.25.xx
	Ø 3,00	72.105.30.xx
	Ø 1,00	72.105.10Z400T350.xx
	Ø 1,40	72.105.14Z240T350.xx
	Ø 1,80	72.106.18.xx
	Ø 2,30	72.106.23.xx
	Ø 4,00	72.106.40.xx
	Ø 1,80	72.108.18.xx
	Ø 2,30	72.108.23.xx
	Ø 2,50	72.08.25.xx
	Ø 3,00	72.108.30.xx
	Ø 4,00	72.108.40.xx
	Ø 6,00	72.08.60.xx
	Ø 1,80	72.14.18.xx
	Ø 2,50	72.120.25.xx
	Ø 3,00	72.120.30.xx

For XXLonglife-Nanocoating order as 72X

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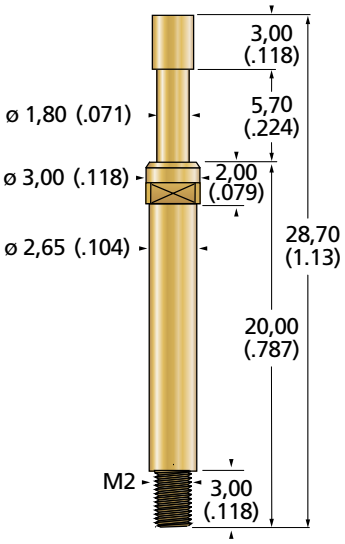
Spring Force (xx)

Preload	Rated Force	Code xx
0,7 N	3,0 N	30

	Ø 2,30	172.03.23.30
	Ø 4,00	172.03.40.30
	Ø 2,30	172.05.23.30
	Ø 2,30	172.08.23.30
	Ø 3,00	172.08.30.30
	Ø 4,00	172.08.40.30
	Ø 1,80	172.14.18.30

For XXLonglife-Nanocoating order as 172X

Series 172



Series 172

Technical Data

Overall Length	28,70 mm
Minimum Centre Spacing	4,00 mm
Maximum Travel	5,50 mm
Working Travel	4,40 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	5 mΩ
Current Load rated/max.	20,0 / 24,0 A

Materials

Plunger	CuBe, gold plated
Barrel	Brass, gold plated
Spring	Music wire, gold plated

Outer dimensions of series 172 are identical to series 72, however the interior construction differs widely: The split plunger ensures a reliable continuous current transmission with high performance potential.

Receptacles of series 72 can be used.

Screw-in-tool: IGL-TL-5 or IGL-TL-6.
List of all tools on page 137.

Max. Current Load 24,0 A
Overall Length 28,70 mm
Working Travel 4,40 mm
Max. Travel 5,50 mm
Pitch ≥ 4,00 mm ≥ 157 mil

Series 73

Technical Data

Overall Length	46,60 mm
Minimum Centre Spacing	2,54 mm
Maximum Travel	5,00 mm
Travel to switch point	1,50 mm
Temperature Range from	–25°C
Up to	+80°C
Typical Resistance	25 mΩ
Current Load rated/max.	2,0 / 3,0 A

Materials

Plunger	CuBe hardened, gold plated
Barrel	Brass, gold plated
Spring	Music wire, gold plated

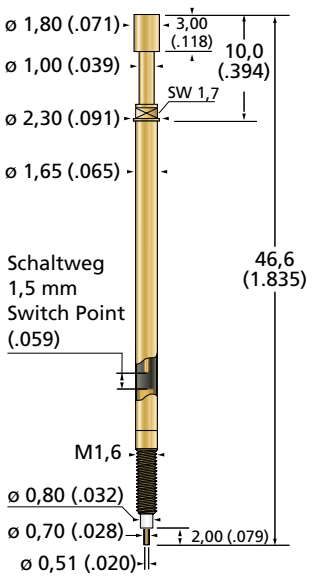
The Series 73 is a screw-fit Switch Probe. After a stroke of 1.5 mm, the piston reaches the switch point and the contact between connecting pin (which protrudes from the insulator below) and the housing is established.

Typical applications are: presence control of components, length control of connector pins and many more.

The indication of the preload spring force is the force at the switching point. The Rated Force is achieved at 80% of the maximum stroke, being 4.0 mm.

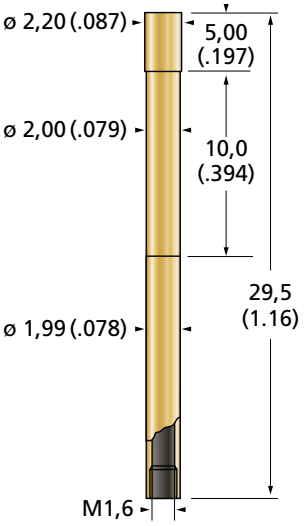
Screw-in Tools: IGL-TL-1, IGL-TL-1B, IGL-TL-2 or IGL-TL-3.
See descriptions on page 137.

Series 73



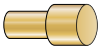
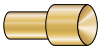
S 73.05-M

Open end with internal thread



Spring Force (xx)

Preload	Rated Force	Code xx
0,23 N	0,8 N	08
0,45 N	1,5 N	15
0,9 N	3,0 N	30

	Ø 1,00	73.103.10.xx
	Ø 1,80	73.03.18.xx
	Ø 1,80	73.203.18.xx
	Ø 1,80	73.04.18.xx
	Ø 1,00	73.05.10.xx
	Ø 1,80	73.108.18.xx

For XXLonglife-Nanocoating order as 73X

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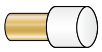
Spring Force (xx)

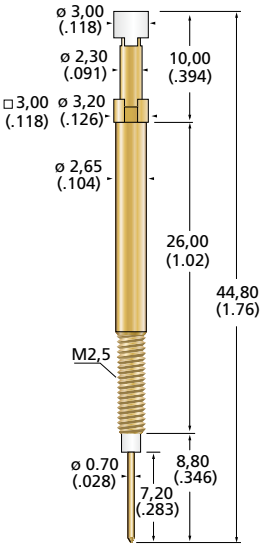
Preload	Rated Force	Code xx
1,4 N	2,0 N	20
2,1 N	3,5 N	35
4,3 N	9,0 N	90

	Ø 2,30	265E.03.23.xx
	Ø 3,00	265E.03.30.xx
	Ø 3,00	265E.03S.30.xx
	Ø 3,50	265E.03S.35.xx
	Ø 4,00	265E.103S.40.xx
	Ø 4,50	265E.103S.45.xx
	Ø 2,30	265E.203.23.xx
	Ø 3,00	265E.203.30.xx
	Ø 3,00	265E.203S.30.xx
	Ø 3,50	265E.203S.35.xx
	Ø 4,00	265E.203S.40.xx
	Ø 4,50	265E.203S.45.xx
	Ø 5,00	265E.203S.50.xx
	Ø 5,90	265E.203S.59.xx

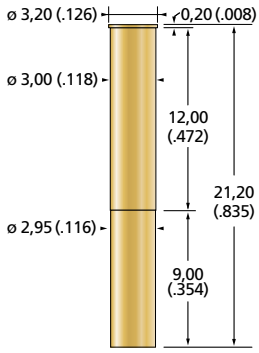
For XXLonglife-Nanocoating order as 265X

Versions with supplementary „S" feature a slotted head to screw in the probe using a screwdriver

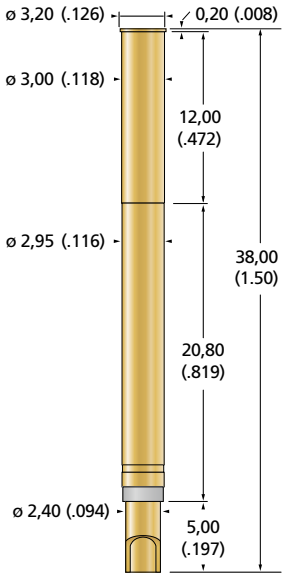
Series 265E



S 265.00-O



S 265.00-Q



Series 265E

Technical Data

Overall Length	44,60 mm
Minimum Centre Spacing	3,50 mm
Maximum Travel	5,30 mm
Travel to switch point	1,70 mm
Temperature Range from	–55°C
Up to	+120°C
Typical Resistance	30 mΩ
Current rating	3,0 A

Materials

Plunger	Steel, gold plated
Barrel	Brass, gold plated
Spring	Music wire, gold plated

The Series 265E is a screw-fit Switch Probe. After a stroke of 1.7 mm, the piston reaches the switch point and the contact between connecting pin (which protrudes from the insulator below) and the housing is established.

Typical applications are: presence control of components, length control of connector pins and many more.

The indication of the preload spring force is the force at the switching point. The Rated Force is achieved at 80% of the maximum stroke, being 4.2 mm.

Screw-in Tools: IGL-TL-14.
See descriptions on page 137.

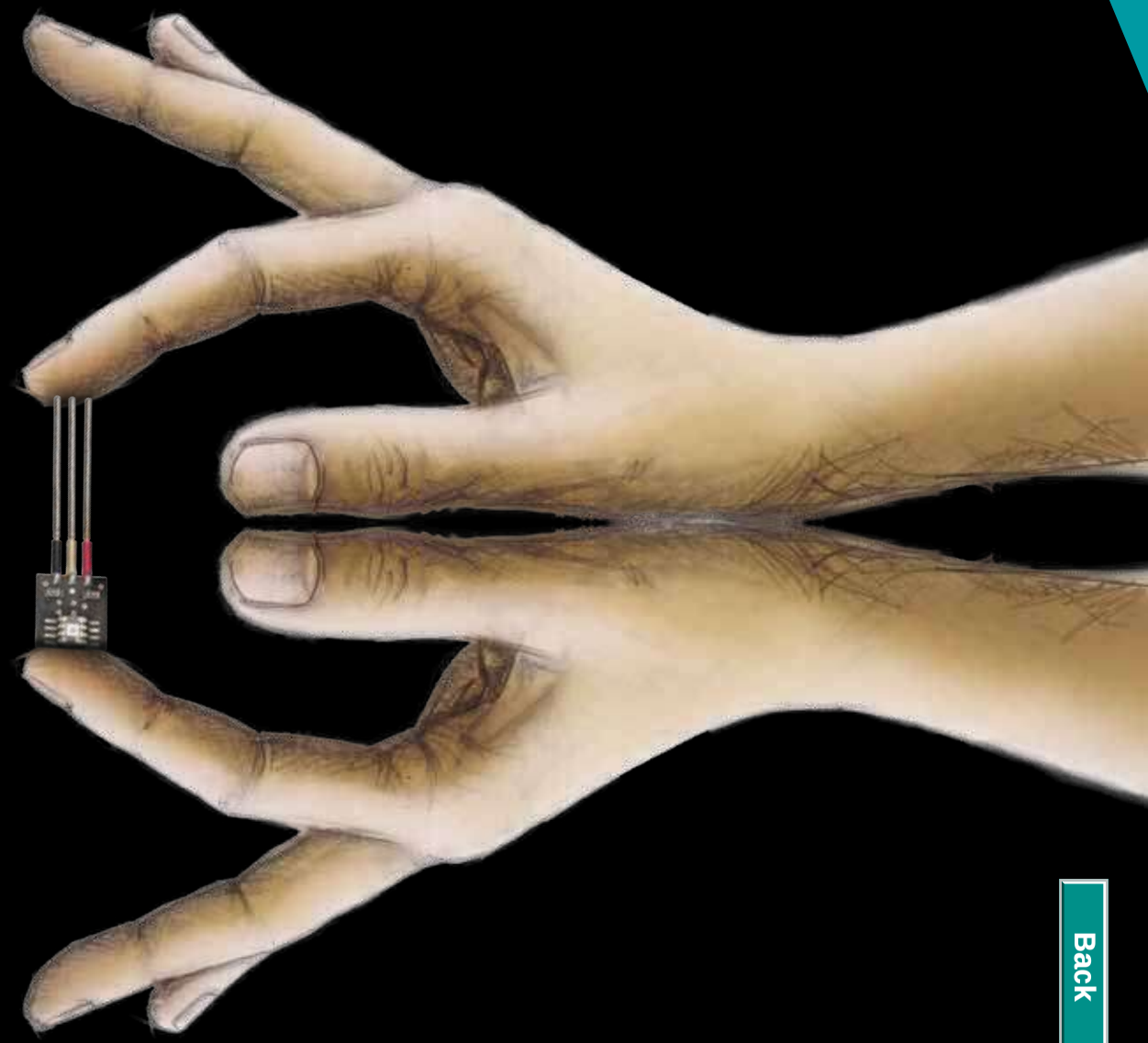
Current rating 3,0 A
Overall Length 44,60 mm
Switch point at 1,70 mm
Max. Travel 5,30 mm
Pitch ≥ 3,50 mm ≥ 138 mil

OPTICAL LED-CHECK

OPTICAL LED-CHECK

The FINN® sensors simplify the testing of LEDs enormously. Whether built in adapters for in-circuit test, MDA, or functional test - these modules allow you not only a function control of the LED, but also the verification of the correct color. The models Smart FINN® and Mega FINN ™ determi-ne beyond both the brightness of the LED and the color of the emitted light in one measurement.

Series	Page
FINN®	130
P-FINN®	130
Smart FINN®	131
Mega FINN™	131



LED-CHECK WITH FINN®-SENSORS

IMore and more electronic components using LEDs, and these need to be tested for function, brightness and correct color fast and reliably.
The obvious is to carry out the LED test during the in-circuit or functional test, which means to integrate the necessary sensors right to the test fixture.
The FINN sensors are especially suitable for this case and are ideal for fixture houses because they are extremely easy to use. Normally and different from other products, the FINN-sensors do not require additional optical fiber and can be installed directly in front of the LEDs on teh UUT. Fitted to connection pins which match to common standard receptacles teh FINN snesors make the installation and integration into a typical test fixture almost to a child's play.

THE PERFORMANCE CHARACTERISTICS OF FINN® SERIES AT A GLANCE:

The **Standard-FINN®s** allow the verification of a certain color value. Each sensor is calibrated to a specific color range (Green, Red, Blue, Clear, infrared) and gives as a result of measurement an output voltage which is easily interpreted as „Pass" or „No Pass".
Sensors of the **SMART FINN®** line - the name says it all - are more intelli-

FINN® - Colour Sensors

vertical	Colours	right angle
TC2901VP	green	**TC2901RP**
TC3001VP	red	**TC3001RP**
TC2801VP	blue	**TC2801RP**
TC2801VP	clear	**TC8704RP**
TC8708VP	infrared	**TC8708RP**

Easy installation in two 100 mil receptacles.

SMART FINN® - One Sensor, All Colours

vertical	Colours	right angle
TC11SF-V	all	**TC11SF-R**

Not only for color determination, but also to check the brightness of an LED. Extends across the entire color spectrum from infrared to ultraviolet. Easy installation in three standard receptacles for 100 MIL, as commonly in test fixtures.

SMART FINN® - For Plug Connectors

TC11SF-V	all	

3-Pin Header Connector Style

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gent. The **Smart FINN®** integrates four color sensors, thus covering the entire spectrum from infrared to Ultravialoett. In addition, the luminosity of the LED is measured. Both light values can be read from the same signal: the wavelength (color) as the frequency, and the brightness as the voltage of the signal. The **Smart FINN®** not only verifies a specific color, but „recognizes" the color value of an LED.
Equipped with the same general functions as the Smart FINN®, but faster, more compact in size and more precise: The **Mega FINN™**. The successor to the successful Ultra FINN reliably measures color and brightness values with unreached performance and precision, covering the entire color spectrum. With the included UF-SL and due to its extremely small size the installation of a **Mega FINN™** is done quick and easy. The **Mega FINN™** is the best solution for fast and safe test of your LEDs..

Not intended to test the LEDs light, but with the functional principle of the standard FINN®s the **P-FINN®** is made for contactless and mechanicless inspection of position, color and presence of components on printed circuit boards or other devices. The **P-FINN®** combines an LED as a light source and a FINN® sensor and has both on board. The sensor is placed close to the object to be tested, and the integrated LED spotlights the surface of it. The sensor part of the **P-FINN®** detects the appropriate color and brightness values of the reflected light, and from these values the presence, correct position and so forth can be determined.

Mega FINN® - Top-of-the-line

	Colors
TCMega200SL Set including sleeve UF-SL	all

The Mega FINN™ determines the color and brightness of the detected light. Its four colour sensors enable high resolution and accurate test results, even under problematic lighting conditions.

The installation is ultra-simple: prepare a single mounting hole, insert UF-SL socket and just plug in the Mega FINN™ sensor - done! For the wiring of the socket side it is equipped with 3 wire-wrap posts.

P-FINN® - Component Presence Detection

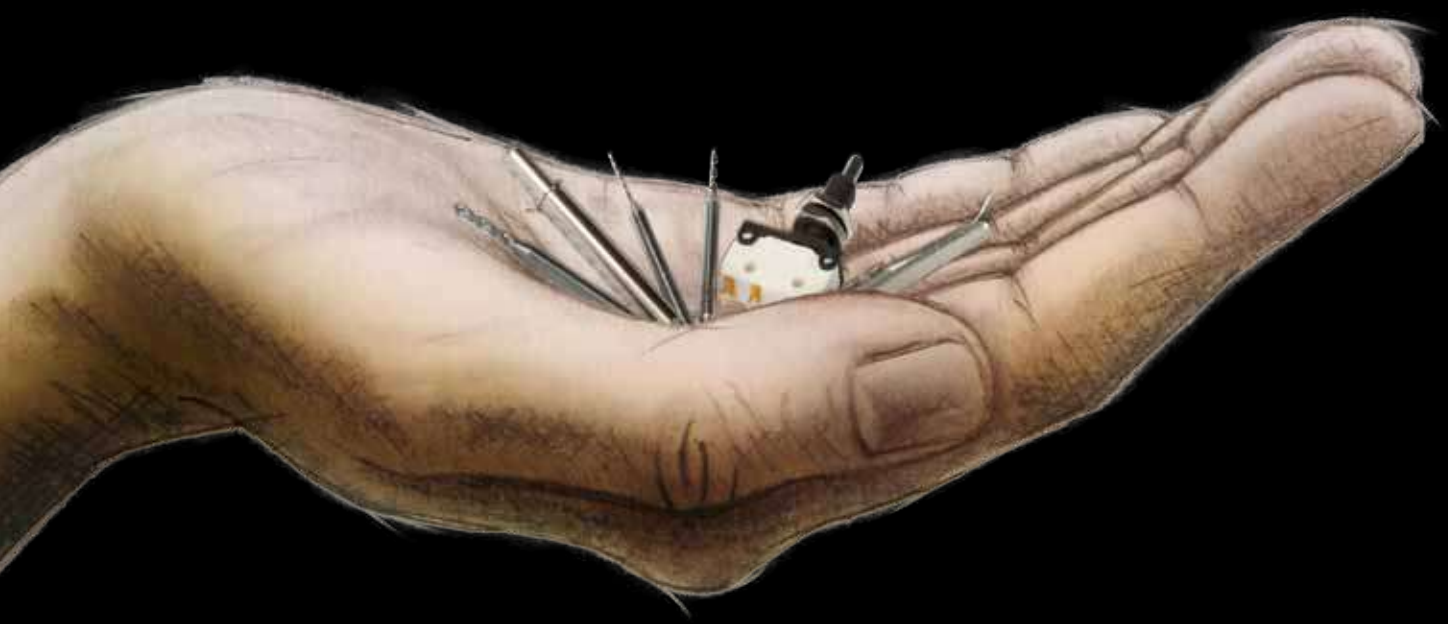
	Colours	
P-FINN®-R	red	with red light source
P-FINN®-G	green	with green light source
P-FINN®-B	blue	with blue light source

The P-FINN® detects presence, location and color of objects by it's reflected light. Light source and sensor in one component!

TOOLS & ACCESSORIES

TOOLS & ACCESSORIES FOR TEST APPLICATIONS

Starting with insertion tools for receptacles and spring contacts, carbide drills with ‚exotic' dimensions up to the spring force meter for checking the force of a test probe ... in our stock you can find lots of useful tools and accessories for the inspection and fixturing.
You look for adjustable tooling and positioning aid? Or are you looking for ergonomic insertion aid for manual loading od test jigs? Components of this kind can be found in this chapter. And as for the entire catalog also applies here: If you are looking for something that you can't find here, please ask us. Our product range is constantly expanding and therefore includes much of what is not shown here.



SOLID CARBIDE DRILLS

Accurate mounting holes for receptacles are the first requirement for a properly functioning test application. As a service to our customers, we deliver high-quality solid carbide drills that fit tou our spring contact types. On page 150 you'll find a summary list and further recommendations.

SPECIAL TOOLS

Receptacles and spring contacts require a careful use and handling over the whole process of fixture making. Special tools help you in this precision engineering work. You can find an overview of the insertion tools for contacts and receptacles on the pages 136 and 137.

ACCESSORIES FOR TEST FIXTURING

Your own in-house fixture department requires special aids and products that are not found in the normal tool dealers? Your search has a successful end here, and besides numerous products, you find also the necessary advice from us. Feel free to contact us!

SERVICES

DESIGN AND MAINTENANCE OF TEST FIXTURES

Many electronics manufacturers obtain their test fixtures from specialized providers; others buy only fixture kits and do the finishing in-house. For that reason they require specific components made for that task. Maybe repairs have to be done, or modifications due to changes on the tested product are in the pipeline. In all such cases, we are with help and advice at your side: on one hand with practical special products, on the other, with a rounded range of services specifically for the test area.

DRILLING AND MILLING

You need a quick and easy solution for a fixture plate, drilled precisely and with the receptacles already installed? Nothing is easier! Just send us your PCB data and, if desired, the plate material (you can choose if you want to consign the plate material, or whether we sahll support you with the full job just based on data). Within a few days you'll get the finished plate of us. You have all the options: as a fully assembled and wired unit, or just drilled and filled, but without wiring, or even drilled for self-assembly. Our service is tailored to your needs.

Of course, we can also offer milling and routing services - the selection of materials is large: from standards like glass fiber reinforced plastics such as FR4 (G10 and G11), followed by EP105 (epoxy laminated paper), over high-tech plastics such as PEEK or machinable ceramics to light and non-ferrous metals such as aluminum or brass we make parts that fit for your application.
Our strength lies in the field of precision mechanical parts, primarily for testing and/or in combination with our contact products. It is not our aim to compete with specialized service providers in the field of CNC milling technology - for this capacities are too precious. We focus on the work that make too much effort for the „normal" supplier in this field, often requiring very high spindle speeds and standing out from the usual type of parts.

MICRO ASSEMBLY

You have found in the catalog optimum fine pitch contact for your application? But you frighten back due to the complex task of processing these small parts? Our team of experienced assemblers has the appropriate procedures and the necessary skills that it takes to both precisely and inexpensive assemble for example, a test socket in the grid of 0.4 mm with several hundred contacts.
For our customers we provide services like re-loading, alterations and additions to existing contact arrays, as well as cleaning and maintenance jobs and so on.

TEST HEADS, TEST SOLUTIONS

The classic PCB Test Fixture - usually in the form of a vacuum adapter - is not our core business. This market is well staffed with capable providers, and some of them are among our valued customers for spring contacts.
But there are many testing tasks beyond this range, and very often these problems can be solved only by specially tailor-made or bespoke special contacts, produced and integrated into the overall solution. This can be, for example test heads that are integrated into an automated assembly line. Or socket-like fine-pitch test assemblies, integrated in a conventional test fixture but responsible for a dedicated area on the UUT. Or highly specialized devices for high voltage testing of electronic loads for determining the efficiency of solar cells and, and, and ...
Through the interaction of our own spring contact manufacturing, as well as our own special design-team supported by supplementing external partners, we were able to complete successfully a large number of complex projects for clients in the industry, university labs or research institutes.

We are curious about your specific requirements! Please send them to our technical team at:
Phone +49 (0) 7733.50 56-0
technical-support@fixtest.de

RECEPTACLE INSERTION TOOLS

INSERTION TOOLS FOR RECEPTACLES

For the press-fit insertion of receptacles we have appropriate setting tools for most of our series. With these tools you achieve better results with less risk of damaging the expensive drill plate.

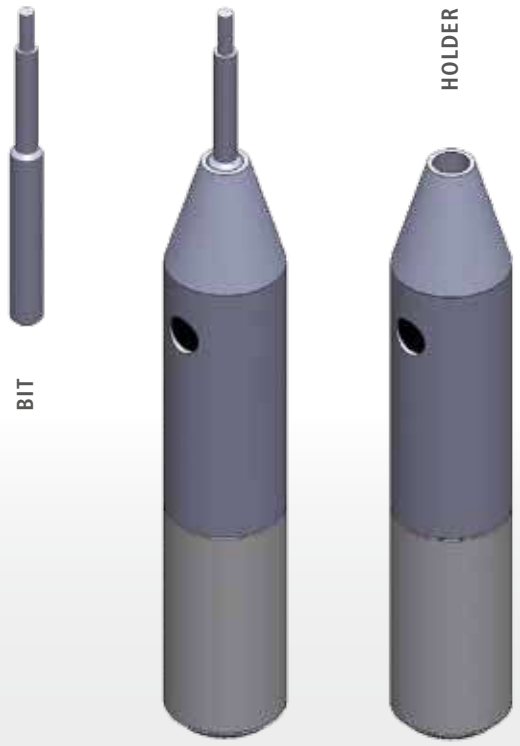
In addition to setting tools for individual series (table below), we also offer a tool with changeable bits. This consists of a holder and replaceable inserts (bits) for different inner diameter of the receptacles.

Changeable insertion tool system

Suitable for receptacle series	Tool-Ø (mm)	Part-No.
-	-	**SEW-Holder**
831 | 702 | 701	0,27	**SEW-831.027**
840 | 838 | 703 | 835	0,34	**SEW-838.034**
705 | 105 | 704	0,44	**SEW-848.044**
706 | 106 | 858 | 848	0,54	**SEW-106.054**
108	0,64	**SEW-107.064**
07 | 071 | 141 | 15 | 700 | 707 | 708 | 872	0,68	**SEW-07.068**
18 | 75	1,00	**SEW-75.100**
21 | 29 | 100 | 211	1,37	**SEW-100.137**

Single series tools

Suitable for receptacle series	Part-No.
26	**SEW-26**
27	**SEW-27**
30	**SEW-30**
50	**SEW-50**



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SCREW-IN-TOOLS FOR SCREWED PROBES

To screw in our screw-type pins, special tools are used.

Related to the series and the head-diameter of the probe several different screw-in tools are needed and available.

Suitable for series	Max. Head Ø (mm)	Tool type	Part-No.
70	1,50	SC	**IGL-TL-8**
70	2,00	SO	**IGL-TL-7**
71	1,80	SC	**IGL-TL-1**
71	2,00	SC	**IGL-TL-1B**
71	2,60	SO	**IGL-TL-2**
71	2,70	RS	**IGL-TL-3**
72 | 172	3,10	SC	**IGL-TL-6**
72 | 172	4,00	SO	**IGL-TL-5**
73	1,80	SC	**IGL-TL-1**
73	2,00	SC	**IGL-TL-1B**
73	2,60	SO	**IGL-TL-2**
73	2,70	RS	**IGL-TL-3**
265E	3,00	SC	**IGL-TL-14**

SO

SC

RS

CONTACT CLEANING

METHODS AND CLEANSING AGENTS FOR CLEANING AND MAINTENANCE OF CONTACTS

Physical and chemical alterations in the surface of electronic connectors are the major cause of reduced performance and equipment failures of components and devices. Contact surfaces that are constantly exposed to contaminants in the ambient atmosphere can form non-metallic films, which deteriorate the conductivity. Oxidation is the most common reaction that leads to formation of metal-oxides. Metals corrode due to aggressive components of air, forming chloride films. While private users can live with these problems for some time, even minor problems in industrial applications - or for example in aviation systems - are already unacceptable. Some of these films can be removed on the principle of „contact washing" with common detergents or alcohol. The oxides and sulphides, however, can not be removed by ordinary cleaning agents.

The most effective method for removing such films is the chemical activation. The DeoxIT series of CAIG Laboratories, Inc. dissolves oxides and sulfides formed on the metallic contact areas, and the causes of increased electrical resistance are thereby removed.
The signal integrity is restored, and at the same time DeoxIT leaves a thin organic layer which protects the metal. Special additives prevent that dissolved oxides set back to the surface. The unique properties of DeoxIT allow the use on fixed as well as on moving contacts, and connectors or switches with similar or dissimilar surface coatings can be treated. Even if a surface that is treated with DeoxIT contacts on an untreated surface, the active ingredient migrates self-acting and coats the other surface as well. If connections are separated, DeoxIT automatically wets the exposed surface areas.

All this is true, and even more in the area of testing. We have received reports of most extraordinary cleaning methods that test engineers came up with to make a failed adapter to get back to work. If the failure happened in the middle of the series production, haste is called for.
With a little luck this can also work - but this effect is usually of short duration and so you push the problem still ahead of it. We have addressed this issue and created a product kit optimized for the maintenance of test pins with contact cleaners. These products are also the only ones we allow in the sense of a warranty for our products. Usage is simple and safe, the effect in contrast strikingly clear.

If you have questions about contanc maintenance - especially in the area of testing - you can call us or send a mail. Do not wait until problems can already be seen, but do preventive steps before ... then you will see your production running smoothly and round!
contact@fixtest.de

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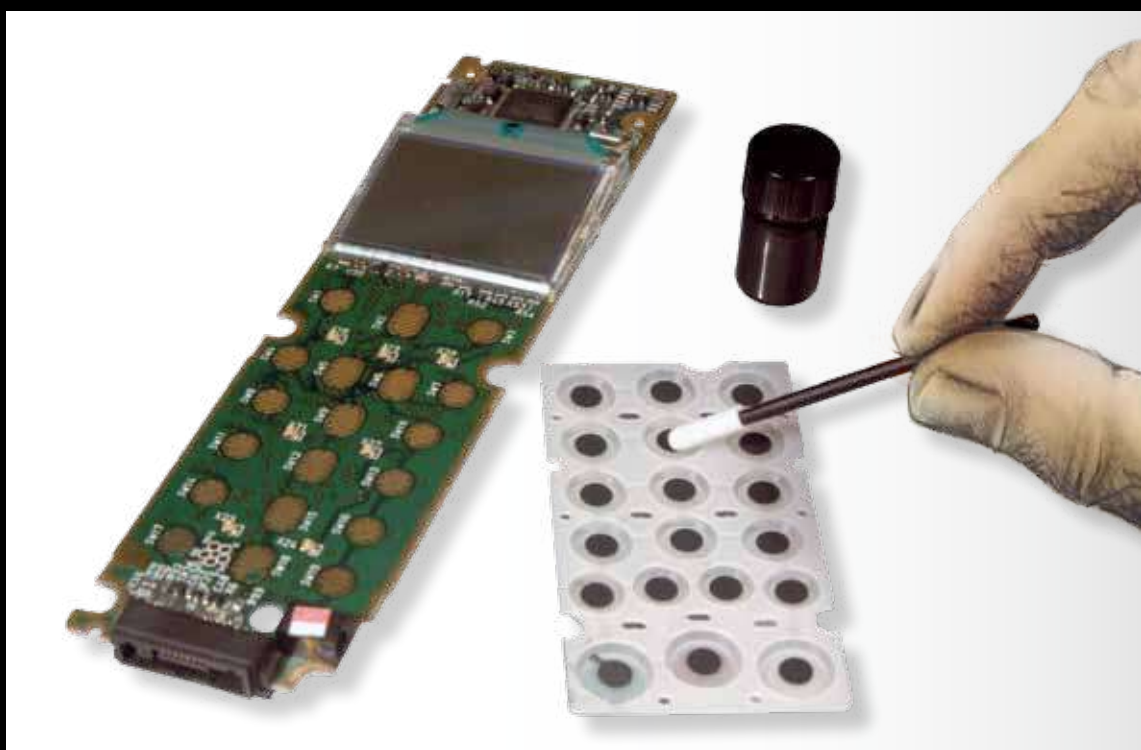
NANOTEK-BRUSHES

The Nanotek Brushes from KITA are a proven and highly valued tool in the semiconductor industry for years. Their extremely fine bristles made of stainless steel or brass remove dirt deposits from contact surfaces without damaging the gold and nickel layers deeply.

MAINTENANCE SUBSTANCES

The family of DeoxIT products with their practical applicators as an alternative to spray provides an optimal solution for every application. These care substances not only clean, but provide long-lasting protection of the treated contact surfaces. That's why we're not talking about contact cleaners, but contact enhancers and rejuvenating agents.



REGULAR CARE

Spring contact probes and other test contact assemblies not only last longer but also provide more reliable and accurate results when they are regularly maintained. We're glad to advice about the „how" and „by which".

DRILL SIZE TABLE

Series	Installation Method	Drill Size (mm) for FR4	Part-No.	Drill Size (mm) for CEM1	Part-No.
07	flush inserted	0,90	500-0090	0,90	500-0090
	stop ring	0,88	500-0088	0,87	500-0087
071	flush inserted	0,90	500-0090	0,90	500-0090
	stop ring	0,88	500-0088	0,87	500-0087
15	flush inserted	1,00	500-0100	0,99	500-0099
	stop ring	0,99	500-0099	0,99	500-0099
18	flush inserted	1,35	500-0135	1,35	500-0135
	stop ring	1,31	500-0131	1,31	500-0131
21	flush inserted	1,72	500-0172	1,72	500-0172
	stop ring	1,67	500-0167	1,67	500-0167
26	flush inserted	2,45	500-0245	2,40	500-0240
	stop ring	2,38	500-0238	2,38	500-0238
27	flush inserted	2,75	500-0275	2,75	500-0275
	stop ring	2,72	500-0272	2,72	500-0272
28	flush inserted	3,60	500-0360	3,60	500-0360
	stop ring	3,57	500-0357	3,57	500-0357
29	flush inserted	–	–	–	–
	stop ring	1,75	500-0175	1,72	500-0172
30	flush inserted	–	–	–	–
	stop ring	2,00	500-0200	2,00	500-0200
50	flush inserted	–	–	–	–
	stop ring	3,00	500-0300	3,00	500-0300
51	flush inserted	–	–	–	–
	stop ring	3,00	500-0300	3,00	500-0300
60	flush inserted	–	–	–	–
	stop ring	3,50	500-0350	3,50	500-0350
70	flush inserted	–	–	–	–
	stop ring	1,70	500-0170	1,69	500-0169
71	flush inserted	–	–	–	–
	stop ring	2,02	500-0202	2,00	500-0200
72	flush inserted	–	–	–	–
	stop ring	3,00	500-0300	3,00	500-0300
73	flush inserted	–	–	–	–
	stop ring	2,00	500-0200	2,00	500-0200
75	flush inserted	1,35	500-0135	1,35	500-0135
	stop ring	1,31	500-0131	1,31	500-0131
100	flush inserted	1,72	500-0172	1,72	500-0172
	stop ring	1,67	500-0167	1,67	500-0167
108	flush inserted	0,80	500-0080	0,79	500-0079
	stop ring	0,79	500-0079	0,78	500-0078
141	flush inserted	0,98	500-0098	0,98	500-0098
	stop ring	0,96	500-0096	0,96	500-0096
211	flush inserted	1,72	500-0172	1,72	500-0172
	stop ring	1,67	500-0167	1,67	500-0167

MATERIALS

Material Properties	FR4	CEM1
Density (g/cm³)	1,7 - 1,9	1,54
Moisture absorption (%)	0,15	0,15
Thermal conductivity (W/m K)	0,30	0,20
Operating temperature, long term (°C)	155	130
Surface resistance (Ω)	$5*10^{10}$	–

Diameter (mm)	Speed (RPM * 1000)		Feed rate (m/min)		Feed (mm PR)		Return Stroke rate (m/min)	
	FR4	CEM1	FR4	CEM1	FR4	CEM1	FR4	CEM1
0,10	80	80	0,6	0,6	0,007	0,007	2	2
0,15	80	80	0,8	0,8	0,011	0,011	4	4
0,20	80	80	1,1	1,1	0,014	0,014	6	6
0,25	80	80	1,4	1,4	0,018	0,018	8	8
0,30	80	80	1,7	1,7	0,021	0,021	10	10
0,35	80	80	2,0	2,0	0,025	0,025	12	12
0,40	80	80	2,2	2,2	0,028	0,028	14	14
0,45	80	80	2,5	2,5	0,032	0,032	16	16
0,50	80	80	2,8	2,8	0,035	0,035	18	18
0,55	80	72	3,1	2,8	0,039	0,039	20	20
0,60	80	66	3,4	2,8	0,042	0,042	25	25
0,65	80	61	3,6	2,8	0,046	0,046	25	25
0,70	80	57	3,9	2,8	0,049	0,049	25	25
0,75	74	53	3,9	2,8	0,053	0,053	25	25
0,80	70	50	3,9	2,8	0,056	0,056	25	25
0,85	66	47	3,9	2,8	0,060	0,060	25	25
0,90	62	44	3,9	2,8	0,063	0,063	25	25
0,95	59	42	3,9	2,8	0,066	0,066	25	25
1,00	56	40	3,9	2,8	0,070	0,070	25	25
1,10	51	36	3,9	2,8	0,077	0,077	25	25
1,20	46	33	3,9	2,8	0,084	0,084	25	25
1,30	43	31	3,9	2,8	0,091	0,091	25	25
1,40	40	28	3,9	2,8	0,098	0,098	25	25
1,50	37	27	3,7	2,7	0,100	0,100	25	25
1,60	35	25	3,5	2,5	0,100	0,100	25	25
1,70	33	23	3,3	2,3	0,100	0,100	25	25
1,80	31	22	3,1	2,2	0,100	0,100	25	25
1,90	29	21	2,9	2,1	0,100	0,100	25	25
2,00	28	20	2,8	2,0	0,100	0,100	25	25
2,10	27	19	2,7	1,9	0,100	0,100	25	25
2,20	25	18	2,5	1,8	0,100	0,100	25	25
2,30	24	17	2,4	1,7	0,100	0,100	25	25
2,40	23	17	2,3	1,7	0,100	0,100	25	25
2,50	22	16	2,2	1,6	0,100	0,100	25	25
2,60	21	15	2,1	1,5	0,100	0,100	25	25
2,70	21	15	2,1	1,5	0,100	0,100	25	25
2,80	20	14	2,0	1,4	0,100	0,100	25	25
2,90	19	14	1,9	1,4	0,100	0,100	25	25
3,00	19	13	1,9	1,3	0,100	0,100	25	25
3,10	18	13	1,8	1,3	0,100	0,100	25	25
3,175	18	13	1,8	1,3	0,100	0,100	25	25
3,20	17	12	1,7	1,2	0,100	0,100	25	25
3,30	17	12	1,7	1,2	0,100	0,100	25	25
3,40	16	12	1,6	1,2	0,100	0,100	25	25
3,50	16	11	1,6	1,1	0,100	0,100	25	25
3,60	15	11	1,5	1,1	0,100	0,100	25	25
3,70	15	11	1,5	1,1	0,100	0,100	25	25
3,80	15	10	1,5	1,0	0,100	0,100	25	25
3,90	14	10	1,4	1,0	0,100	0,100	25	25
4,00	14	10	1,4	1,0	0,100	0,100	25	25

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