

# Spring Contact Probes

## GENERAL CATALOGUE 2014



**FEINMETALL**  
Contact Technologies



# FEINMETALL Spring Contact Probes

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## Competence and Quality

FEINMETALL is your partner for the reliable contacting of electronic components. The wide range of applications for spring contact probes includes board tests with fine centers up to wire harness and connector test with individual and intelligent solutions.



### Broad Competence In-house

The development and manufacturing of spring contact probes, test fixtures and wafer probe cards at one company is a wide basis for our competence in precision technology and micromechanics. This combination is unique at the market and represents "German Technology" at its best.



## Innovative Capacity

Since many years FEINMETALL is standing for a high level of innovation. Many patent-registered solutions have been milestones in the world of test engineering.

### International Customer Service

Our products are present globally. A network of experts and local service centers guarantee a competent consulting and high delivery performance.

### Traceability of Probes

FEINMETALL contact probes are marked by laser. This enables the traceability of each single contact probe and the correlation to the exact production lot. Additionally the laser marking guarantees the use of "the original".

### Quality Management

Quality and reliability of our products are a substantial success factor and therefore our highest priority.

FEINMETALL is certified to DIN ISO 9001:2008, the contact probe division additionally to the German automotive standard VDA 6.1.



### Environment and Health Protection

FEINMETALL is committed to the goals of the up to date legislation regarding environment and health protection and to conformance to all necessary measures. If you are interested in the current statements regarding the various European regulations, please do not hesitate to contact us!



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### Note:

The catalogue includes the most important probes. Further probe types or versions as well as step-files for your CAD design program are available on our homepage [www.feinmetall.com](http://www.feinmetall.com).



## Life Cycle Test of Contact Probes

The life cycle of spring contact probes is depending on the design of the probes as well as on the operating conditions in the field. High lateral forces, high current load and contamination may lead to a significantly reduced lifetime of the probes. For us as manufacturer of these probes, it is vital to permanently control and review the quality parameters and to analyse the lifetime performance of our products. In our own laboratory we have various test and measurement setups for quality control and for the determination of technical parameters during research and development. One important subject is the life cycle test, conducted with seven autonomous stress stages. The test conditions provide an internal standard



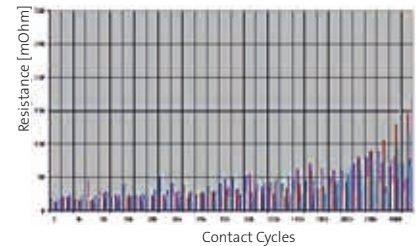
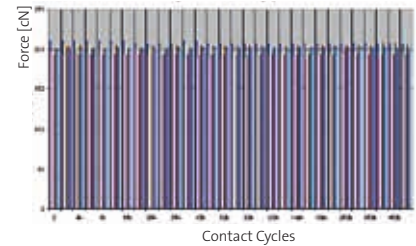
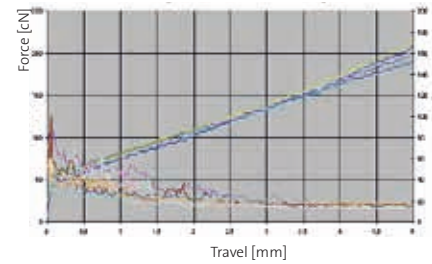
reference that allows competent statements regarding the life cycles of our probes.

Life cycle tests are performed under the following conditions:

- Ambient Temperature: +20°C to +30°C
- Relative Humidity: 40 to 60%
- Dust free environment

For the life cycle test up to 10 sample probes are mounted in a stress stage and then pressed with a stroke frequency of 5 to 6 strokes per second.

In predetermined steps (e.g. after 2000 strokes) the probes are analysed in a separate test station and the spring force and the contact resistance of each probe are measured as a function of the spring travel (see picture right on the top). Later the test results are combined in a diagram, showing the whole life cycle of the probe (up to more than a million strokes). The diagrams show typical life cycle test results of spring force and resistance.



## Pointing Accuracy and Radial Tolerance



The pointing accuracy of a spring contact probe is determined by many factors, for example by manufacturing tolerances, by the length of the plungers and by the type of plunger guiding. Further factors that are independent of the contact probe have to be considered, for example the receptacles and the mounting of the test fixture or module.

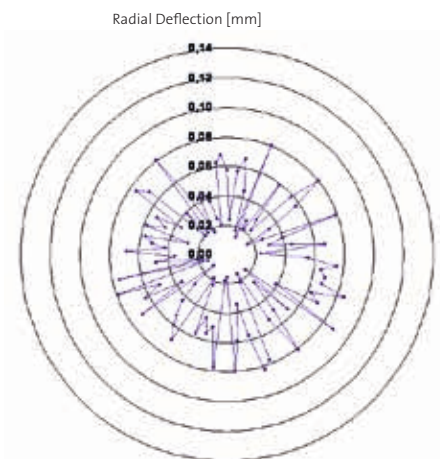
To optimize the pointing accuracy especially in applications with small centers additional guiding plates in the fixture can be used.

There is always a radial tolerance between plunger and barrel of a spring

contact probe. This leads to a certain deflection of the plunger tip. The guide clearance is necessary and if ideally designed, it guarantees a low abrasion and a reduction of lateral forces.

The know-how to produce a good functioning and still long living spring contact probe lies in the definition of the optimum tolerances of plunger and barrel.

The most important factor for the pointing accuracy is the radial deflection of the tip compared to the central axis of the probe at the moment of contacting. The specific pointing accuracy in the technical specifications of the probes is approximately corresponding with the maximum radial deflection. The radial deflection can be shown in a diagram.







## Different Types of Spring Contact Probes

Contact Probes are available for various applications. Here is a brief overview of the most important types.

### ICT/FCT probes for test fixtures

At test fixtures for In-Circuit-Test (ICT) und Functional Test (FCT) mainly standard probes for the centers 50mil, 75mil und 100mil are used.

### Short Travel Probes

Short travel probes are compact probes with a limited travel. They are frequently used as battery or charge contact. Additionally, short travel probes can be integrated in end user products whenever low-wear electrical contacts are demanded.

### Interface Probes

The interface between test fixture and test system is usually realized by interface probes which are specifically standardized for each test system.

### Probes with rolling ball

For side contacts with laterally moved test items FEINMETALL has developed a special contact probe series with a rolling ball as contact element. These probes are less sensitive to lateral forces and have a remarkably higher durability compared to standard probes with only round tip styles.

### Pneumatic Probes

For selective contacting of single test points or for contacting test points with limited access, it can be helpful to use pneumatic probes, operated by compressed air.

### Threaded Probes

Contact probes with thread are mainly used in modules for the test of wire harnesses and connectors. The advantage is that even under difficult conditions the probes do not move out of the receptacle and so a secure seat in the module or fixture is guaranteed.

### High Current Probes

For high current applications spring contact probes need to be designed for a very small probe resistance. High current probes are available in different versions. You will find a detailed description of the different designs in the chapter „High Current Probes“.

### Switch Probes

Special probes with integrated switch element are mainly used for presence tests. Switch probes close or open an electric circuit after a defined travel of the plunger (switch travel). For non-conductive contacting switch probes are available with various insulated tips.

### Push Back Probes

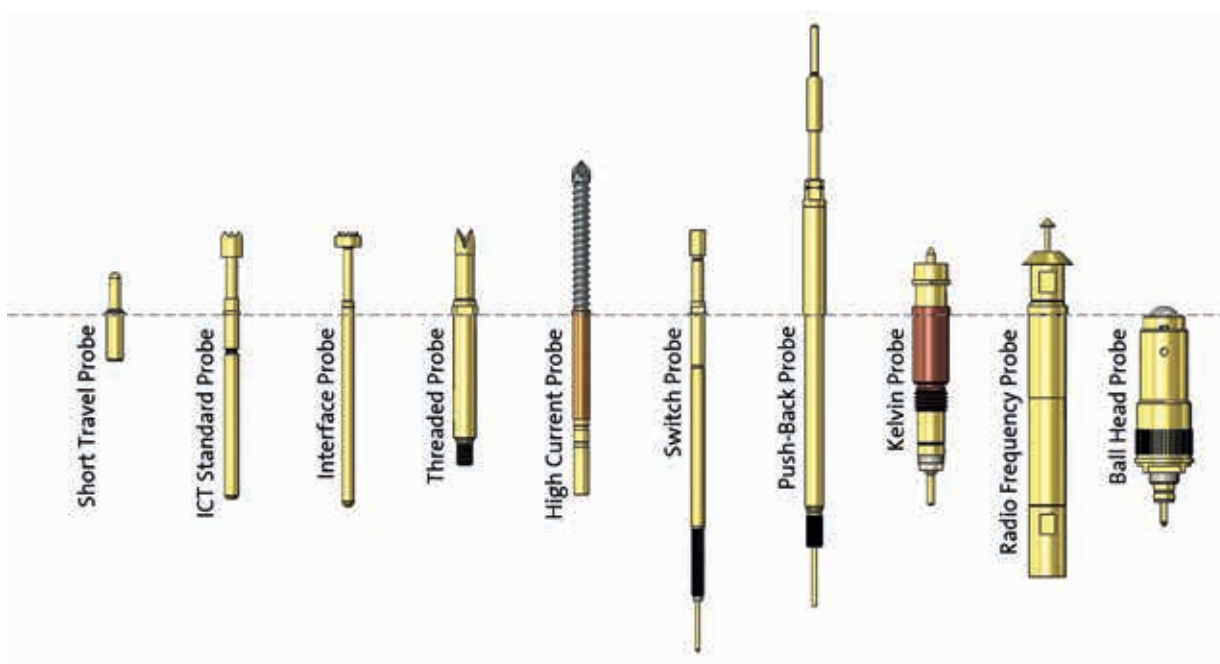
During the push back test of connectors the tight seat of the connector elements is verified. For this application contact probes with very high spring forces are used.

### Kelvin Probes











Very low resistances of components are measured by the „Kelvin 4-wire measurement“. For this application the connection of the current source and the voltmeter need to be very close to the component because otherwise the resistance of the conductors are leading to false results. These connections can be realized by special coaxial probes (Kelvin Probes), using the outer conductor for the constant current and the inner conductor for measuring the drop in voltage.

### Radio Frequency Probes








In many test applications, like testing RF-connectors, high frequency signals need to be transmitted. To carry these signals special coaxial contact probes are used. RF-probes have an inner conductor for the transmission of the signal and an outer conductor for the electromagnetic shielding.



# Tip Styles

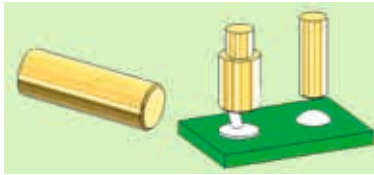
|   |   |   |   |  |   |   |
|---|---|---|---|--|---|---|
|    |    |    |    |    |    |    |
| 01  | 02  | 03  | 04  | 05   | 06  | 07  |
| Conical Shaft 90°   | Conical Head 90°  | Conical Shaft 60°   | Conical Head 60°  | Concave  | Serrated Head   | Hexagonal Head 90°  |
|    |    |    |    |    |    |    |
| 08  | 09  | 10  | 11  | 12   | 14  | 15  |
| Hexagonal Head 60°  | Inverted Hexagonal Crown 120°   | Flexible Needle   | Spherical Shaft   | Spherical Head   | 4-Point Crown Head (self cleaning)  | Triangular Head 45°   |
|    |    |    |    |    |    |    |
| 16  | 17  | 18  | 19  | 20   | 21  | 27  |
| Flat Shaft  | Flat Head   | Conical Shaft 30°   | Hexagonal Shaft 90°   | 4-Point Crown Head (tapered)   | 4-Point Crown Shaft (self cleaning)   | Conical Head 120°   |
|    |    |    |    |    |    |    |
| 28  | 29  | 30  | 31  | 32   | 33  | 34  |
| 4-Point Crown Head  | 4-Point Crown Shaft   | Triangular Shaft 45°  | 6-Point Crown 120°  | Rigid Needle 10°   | Lance Shaft 38°   | Rigid Needle Head 15°   |
|  |  |  |  |  |  |  |
| 35  | 36  | 37  | 38  | 39   | 40  | 41  |
| 3-Point-Crown (tapered)   | Tulip Head  | 4-Point Crown (tapered)   | Lance Shaft 140°  | Conical Shaft 30° (flat)   | 6-Point Crown Shaft   | 6-Point Crown Head (self cleaning)  |
|  |  |  |  |  |  |  |
| 42  | 43  | 45  | 46  | 50   | 55  | 60  |
| 5-Point Crown Head  | Lance Shaft 90°   | Conical Head 120° (with eccentric cut)  | W-Profile   | Concave Head (with drill hole)   | Concave (self cleaning)   | 3-Point Crown (reduced)   |
|  |  |  |  |  |  |  |
| 61  | 62  | 63  | 64  | 65   | 80  | 81  |
| Head for Multipoint Connectors (female)   | Triangular Shaft 30°  | 8-Point Crown Head (self cleaning)  | Serrated Head (reduced)   | Reduced Rigid Needle   | Reduced Spade   | Reduced Spad (tapered)  |
|  |  |  |  |  |  |  |
| 82  | 83  | 84  | 85  | 86   | 89  | 90  |
| Spade Shaft   | Spade Head  | Spade Head (tapered)  | Square Spade  | Asymmetric Spade   | Special Spade Variant   | Ball Head   |

## Special Versions

|   |   |   |   |  |   |   |
|---|---|---|---|--|---|---|
|  |  |  |  |  |  |  |
| (17)H   | (17)T   | C   | SP  | PT   | IK  | IP  |
| H = Synthetic Head with Ring  | T = Insulated BeCu Head   | C = High Current (Groove Mark)  | SP = Step Probe   | PT = Position Test   | IK = Insulating Cap   | IP = Insulated Pin  |



## Typical Tip Styles and Applications



### Flat

Suitable for solder pads and contact pins.



### Spherical

For testing clean contact surfaces, does not leave marks or scratches.



### Conical

Universal tip style with different angles of 10°, 15°, 30°, 60°, 90° or 120° for contacting solder pads and holes.



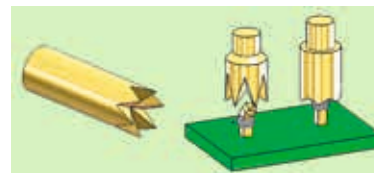
### Multipoint connectors

This probe tip was designed for contacting multipoint connectors.



### 4-Point Crown

For pad surfaces and soldered pins. The sharp edges penetrate flux residues and oxide layers.



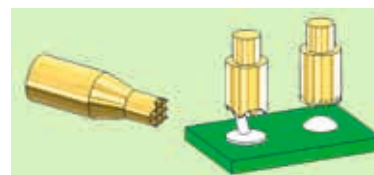
### Crown

For wire wrap posts, even if the contacts are bent or twisted.



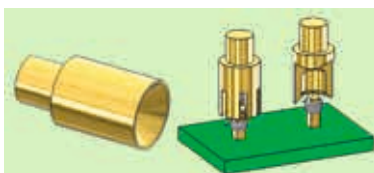
### Star

For testing plated through holes and pads. The sharp edges penetrate contamination and oxide layers.



### Serrated

Universal tip style for wires, contact pins and wire wrap posts, even for bent component leads.



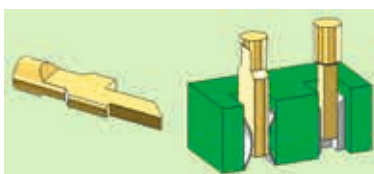
### Concave

For a smooth contact of pins and wire wrap posts. The risk of contamination can be minimized by using a self cleaning version of this tip style.



### Tulip

Used for severe contacting of plated or filled through holes.



### Spade

For twist proof contacting of connector elements.



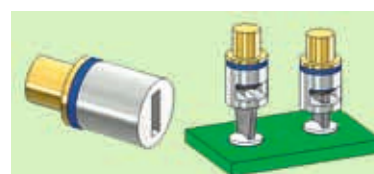
### Step Probes

For position and presence tests of connectors.



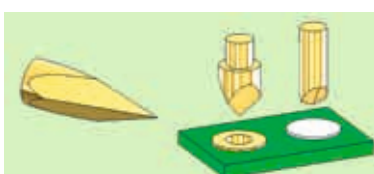
### Insulating Cap

For detecting the correct length and straightness of pins.



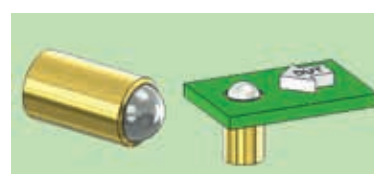
### Insulating Cap, slotted

For detecting the correct length and straightness of flat pins.



### Multi-sided

For via holes and solder pads. The sharp edges penetrate flux residues and oxide layers.



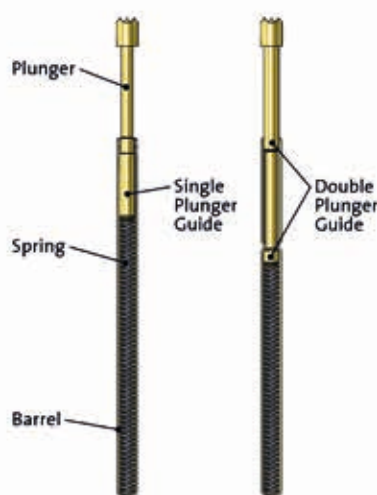
### Rolling ball

For side contacts with lateral movements of the test item. The contact element is a rolling ball.



## Design of a Spring Contact Probe

Spring contact probes are typically made of a plunger, a barrel and a spring. FEINMETALL is producing contact probes with single plunger guide and with double plunger guide. Probes with single guide are built with a crimped flange at the top of the barrel. These probes are regarded as international standard for ICT/FCT probes. Spring contact probes with double guide are built with a crimped flange in the upper third of the barrel. Thereby the plunger is guided at the flange and additionally at the end of the barrel.



### Plunger

FEINMETALL manufactures plungers with many different tip styles, suitable for a large variety of applications (see pages 6 and 7). Plungers are generally made from beryllium copper (BeCu) or steel. Aggressive tip styles are made by a special grinding process for ultra sharp edges. Optimized turning and plating processes are resulting in an outstanding straightness and exactness of the plunger surface, the base for a long lifetime.

### Barrel

FEINMETALL barrels are made of nickel-silver, bronze or brass. Nickelsilver barrels are deep-drawn whereas barrels made of bronze are turned or deep-drawn and barrels of brass are turned. All barrels are usually silver or gold plated. A small hole in the bottom permits the barrels to be thoroughly cleaned during manufacturing and ensures continuous wetting in the plating process.

### Spring

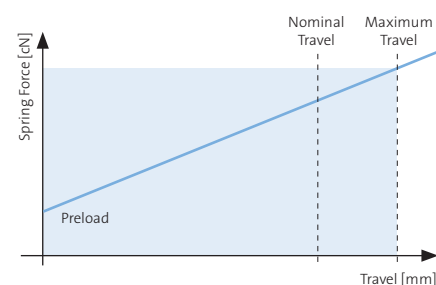
During the early years FEINMETALL developed long-life springs for the clock industry and subsequently made use of this knowledge in the manufacturing of spring contact probes. Compression springs are normally made of silver plated music wire or stainless steel, for some special applications also of non-magnetic beryllium copper. Springs made of music wire have a working temperature up to a maximum of 80°C (176°F) while stainless steel springs can be operated up to 250°C (482°F) and springs made of BeCu up to 200°C (392°F).

### Spring Force

The selection of the spring force mainly depends on the application. On the one hand the spring force needs to ensure the quality of the electrical contact and the penetration of contaminations or oxide layers. On the other hand it should not lead to any damages on the contacting surface or on the board. It needs to be taken into consideration that the same spring force with one sharp tip has four times the force as a tip style with a four point crown head with four contact points. In test fixtures (especially vacuum fixtures) the sum of all spring forces has to be observed in order to close the fixture and the contacts without problems.

### Spring Travel

The spring force increases proportional to the spring travel. This linear function is shown in the force-travel-diagram. During the assembly of the probe the spring is already compressed by a certain travel. The resulting spring force is called preload. The preload makes sure that there is a certain force right from the beginning of the contacting process. Also it makes sure that the plunger is completely pushed back after the contacting. The nominal spring force is the spring force at the recommended working travel. The recommended working travel should not be exceeded significantly, because otherwise the life time of the probe could be considerably reduced.



## Materials and Plating

The optimum performance of a spring contact probe is significantly depending on the selection and combination of materials and plating. Developing, testing and qualifying of materials for the various applications is an important aspect of our research and development efforts.



## Basic Materials

For choosing the optimum basic material for barrel, plunger, spring and receptacle of spring contact probes different aspects need to be considered. Besides the technical applicability also machining and economical facts are relevant for this decision.

### Beryllium-Copper (BeCu)

combines outstanding mechanical properties with a high electrical conductivity. It is used for plungers or contact elements in a great variety of products, especially in the field of standard- and high current probes. Also springs can be made of BeCu.

### Steel

is significantly harder than BeCu and is used for plungers with aggressive tip styles or the requirement of extremely long durability.

### Nickel Silver

is very resistant to corrosion and is well suitable for machining. Barrels and receptacles made of nickel silver can be deep drawn economically.

### Bronze

is characterized by a combination of good wear resistance, cold formability and high electrical conductivity. It is used for barrels and receptacles.

### Brass

is an extremely high quality material with very high electrical conductivity, a good wear resistance and the suitability for different ways of machining. It is used for barrels, receptacles and for special shapes.

## Plating Material

Typically the surfaces of all elements of spring contact probes are galvanically plated in order to protect the basic material against corrosion. At the assembled spring contact probe the plating also reduces friction and thereby leads to low abrasion and low contact resistances. FEINMETALL plating materials are basically galvanic nickel, chemical nickel, gold, rhodium or silver. To achieve the maximum performance the ideal selection and combination of coating materials, coating thickness, coating alloys as well as various boundary processes have to be made.

### Galvanic Nickel

has a good chemical durability and hardness. It is not brittle and adheres well to the base material. Nickel also prevents the base material from migrating into the precious metal surface and contaminating it.

### Chemical Nickel

has a very good chemical durability and a hardness of at least 700HV ('60HRC). Chemical nickel is most appropriate for aggressive tip styles, because it has a good contouring capability and wear resistance as well as high ductility.

### Gold

guarantees the best chemical durability, but its hardness is 150-200HV ('85HRB) only. Gold considerably improves the contact resistance.

### Silver

is used as a bearing surface and as corrosion protection for barrels and springs. The hardness of the silver layer is 60HV ('70HRB) only, but it adheres very

well to the base material, improving the electrical conductivity.

### Rhodium

is extremely resistant to wear and abrasion. Due to its hardness of 600 to 1000HV ('55 to 70HRB) it is plated on plungers which are used in very rough applications.

### FM Longtime Gold

is a special gold plating for steel plungers developed by FEINMETALL. The combination of steel and FM Longtime Gold results in a high performance and a long lifetime, even at heavy load applications.

### Progressive Coating

is a new coating for contacting lead-free soldering pads and other contaminated or oxidized surfaces. This coating is characterized by very low contamination of the tip and thereby it leads to a very long lifetime of the probes.

### Electrical Specifications

In a contact probe the primary current flow is typically through the plunger, the barrel and the receptacle.

A secondary current flow is through the plunger, the spring and the barrel.

This leads to transfer resistances at the transition points that are influenced by the following factors:

- conductivity of the base material
- conductivity of the plating material
- condition of the surface of the probe
- size of the contact surface
- contact forces at the transition points

FEINMETALL is taking measures to guarantee a constant low contact resistance during the whole lifetime of the probes.

|                   | Basic Materials   | Plating   |
|-------------------|---|---|
| <b>Barrel</b>     | Nickel silver (deep-drawn)<br>Bronze (turned or deep-drawn)<br>Brass (turned)             | Silver<br>Gold  |
| <b>Plunger</b>    | Beryllium-Copper (BeCu)<br>Steel<br>Synthetic Material                                    | Chemical Nickel<br>Gold<br>FM Longtime Gold<br>Rhodium<br>Progressive Coating |
| <b>Spring</b>     | Music Wire (max. 80°C)<br>Stainless Steel (max. 250°C)<br>BeCu (non magnetic, max. 200°C) | Silver<br>Gold  |
| <b>Receptacle</b> | Nickel Silver<br>Bronze<br>Brass  | Gold  |

# Receptacles and Assembly

## Receptacles for Spring Contact Probes

For simple replacement spring contact probes are typically mounted into receptacles. The probes are either plugged-in or screwed into the receptacle, depending on the type of contact probe. Receptacles are available with different types of electrical connection.

### Mounting

Receptacles with collar on top have a fixed projection height and guarantee the tightest seat with very low tolerances. Receptacles with press ring can be used in two ways. Either the press ring is used as dead stop or it is inserted into the mounting plate, which results in a variable projection height. For receptacle insertion into the mounting plate, a special insertion tool is necessary.

### Connection of Receptacles

Almost all receptacles are available with solder or crimp connection. Wire wrap connections are frequently used for test fixture manufacturing, because they can be wired automatically. Some receptacles (especially those with very small diameters) are available with preassembled cables. Additionally, for example to connect coaxial probes, special connecting elements can be used.

## Types of Receptacles

At ICT/FCT test fixtures mainly plug-in probes are used. However, in some applications, particularly at modules for wire harness and connector tests, threaded probes are used, which are screwed into the receptacles. Threaded probes guarantee a secure seat because they do not move out of the receptacle even under difficult conditions. Knurled receptacles ensure a firm seat of the receptacle in the drill hole. For switch probes and coaxial probes, FEINMETALL has developed special receptacles called „combi-receptacles“, which enable a solder free exchange of these probes. Further receptacles with integrated switch function are available, that are frequently used in combination with twist proof probes.

### Drilling Recommendations

Mounting the receptacle into the mounting plate demands special precision. Various parameters like rotating speed, feed, helical groove length, material and plate thickness are influencing the drilling results. Therefore it is very important to make drilling tests in order to ensure that the receptacles have a proper seat in the mounting plate. The drilling recommendations in the technical specifications of the probes are guideline values only as a basis for your own drilling trials.

## Spacers

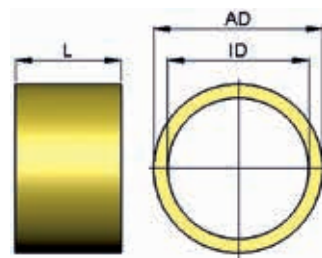
For height adjustment and balancing of tolerances.

### Spacers H773 for 138 mil Probes

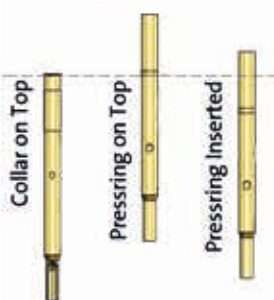
| Order Code | OuterØ | InnerØ | Length |
|------------|--------|--------|--------|
| H773DS/01  | 3,2    | 2,7    | 0,1    |
| H773DS/05  | 3,2    | 2,7    | 0,5    |
| H773DS/10  | 3,2    | 2,7    | 1,0    |
| H773DS/20  | 3,2    | 2,7    | 2,0    |
| H773DS/30  | 3,2    | 2,7    | 3,0    |
| H773DS/50  | 3,2    | 2,7    | 5,0    |

### Spacers H772 for 100 mil Probes

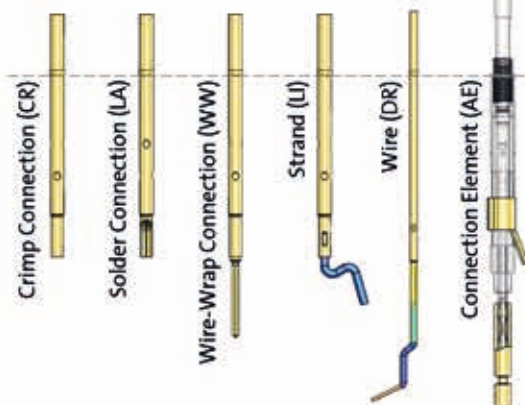
| Order Code | OuterØ | InnerØ | Length |
|------------|--------|--------|--------|
| H772DS/10  | 2,2    | 1,7    | 1,0    |
| H772DS/20  | 2,2    | 1,7    | 2,0    |
| H772DS/30  | 2,2    | 1,7    | 3,0    |
| H772DS/50  | 2,2    | 1,7    | 5,0    |



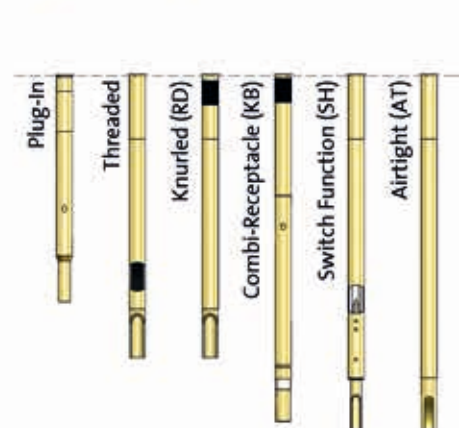
### Mounting



### Types of Connections



### Types of Receptacles







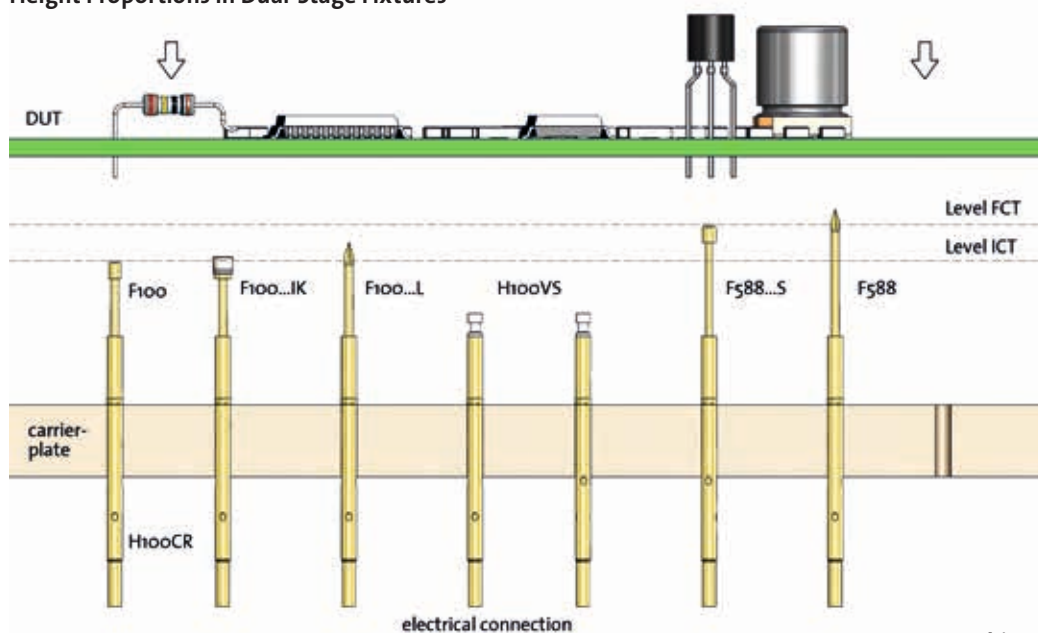
# Probes for In-Circuit and Functional Test

For in-circuit and functional test of boards standard probes in the centers 50 mil, 75 mil and 100 mil are used. In these applications long lifetime and reliable contacts are essential. These factors can be optimized by the design of spring contact probes, like e.g. the „progressive series“.

|      |    |
|------|----|
| F111 | 15 |
| F112 | 16 |
| F768 | 17 |
| F767 | 18 |
| F050 | 19 |
| F788 | 20 |
| F051 | 21 |
| F701 | 22 |
| F075 | 23 |
| F793 | 24 |
| F703 | 26 |
| F585 | 27 |
| F562 | 28 |
| F771 | 29 |
| F100 | 31 |
| F588 | 33 |
| F772 | 34 |
| F786 | 35 |
| F797 | 36 |
| F563 | 37 |
| F564 | 38 |
| F773 | 39 |
| F796 | 40 |
| F785 | 41 |
| F566 | 42 |

## Probes for In-Circuit-Test (ICT) und Functional Test (FCT)

### Height Proportions in Dual-Stage Fixtures



In-circuit test (ICT) and functional test (FCT) very often are performed in two steps in the same test fixture. The first step is the in-circuit test. At this level all installed probes are contacting the board. For the following functional test the travel of the fixture is reduced. Only the long travel probes are contacting the DUT.

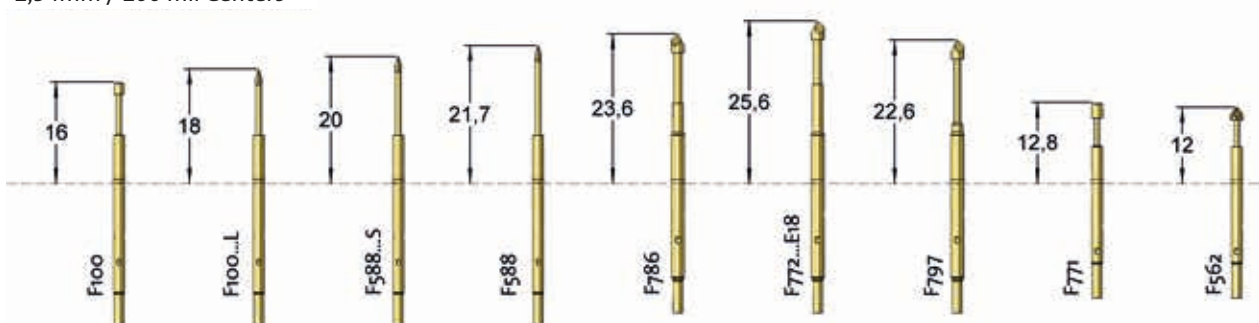
The small difference in height between wired components and PCB pads can be compensated by contacting with probes of different lengths (standard length or L-version).

### Combination of probes for dual-stage fixtures

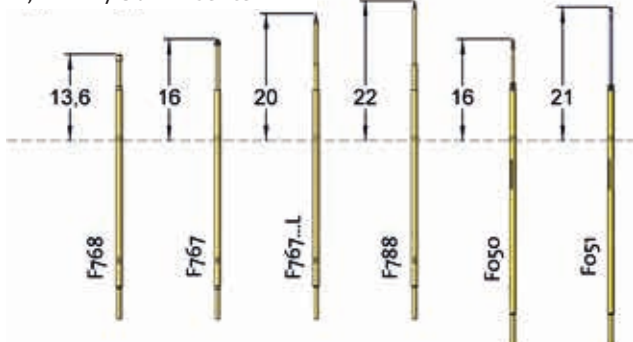
|         | ICT       | FCT  |
|---------|-----------|------|
| 50 mil  | F050      | F051 |
| 50 mil  | F767      | F788 |
| 75 mil  | F075/F703 | F793 |
| 100 mil | F100/F585 | F588 |

## The most important probes at a glance:

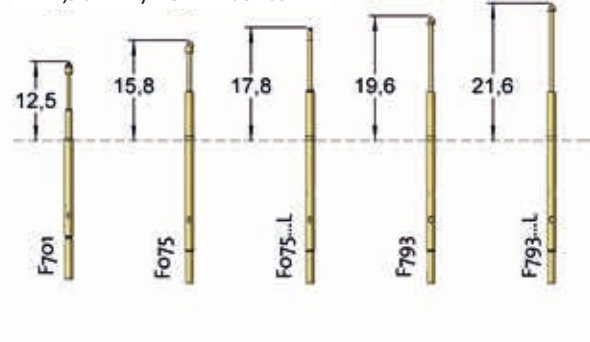
2,54mm / 100 mil Centers



1,27mm / 50 mil Center



1,90mm / 75 mil Center



# Progressive Series

## Contact Probes for difficult conditions



For contacting lead free solder pads or very oxidized or contaminated PCBs FEINMETALL has developed a special probe series. Probes of this Progressive Series penetrate even viscous flux residues. Additionally, they are less sensitive for contaminations. These characteristics provide reliable contacts and a long life cycle.

For contacting OSP coated boards the very pointed tip style 32 in Progressive Series version is well established. This version reliably penetrates the coating and leads to good contacts and long life cycles.



## Three decisive advantages of the Progressive Series

### 1. Aggressive tip style

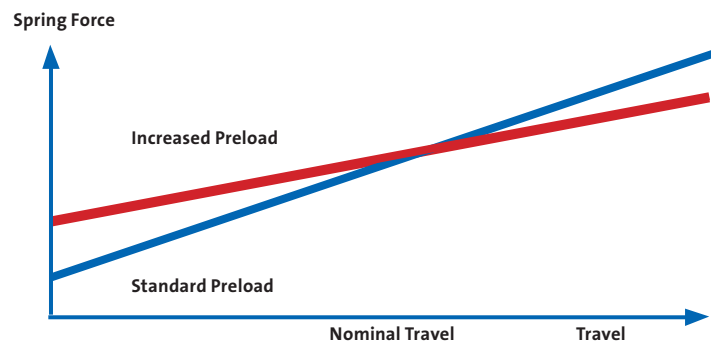
A specific FEINMETALL longitudinal grind, the concave geometry and ultra sharp edges lead to increased penetration at the contact surface.

### 2. Functional coating

The new progressive functional coating is three times harder than standard coatings. It reduces the contamination of the contact tips and provides a remarkably longer life cycle of the probes, leading to an increased FPY (first pass yield).

### 3. High Preload

A higher preload of the probes leads to an optimized force already at the beginning of the contacting process. This leads to a better penetration of contaminations. The force at the nominal travel is still the nominal force, so the overall load on the test item is not increased.

































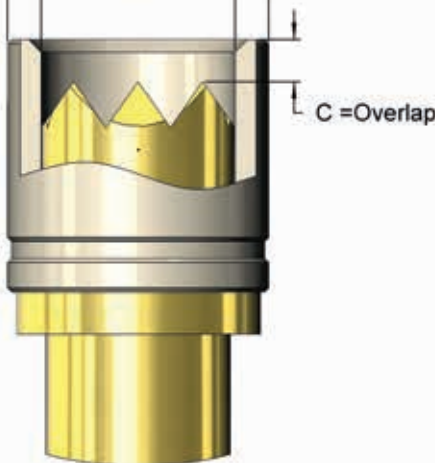
### Progressive Series variants are available for the following probe types

| Centers | Type | Application                              |
|---------|------|--|
| 50 mil  | F050 | ICT/FCT probe for 50mil centers          |
| 75 mil  | F075 | ICT/FCT probe for 75 mil centers         |
| 75 mil  | F793 | Long travel probe for F075               |
| 100 mil | F100 | ICT/FCT probe for 100 mil centers        |
| 100 mil | F588 | Long travel probe for F100               |
| 100 mil | F772 | Robust ICT/FCT probe for 100 mil centers |
| 100 mil | F786 | Long travel probe for F772               |
| 125 mil | F563 | ICT/FCT probe for strong mechanical load |

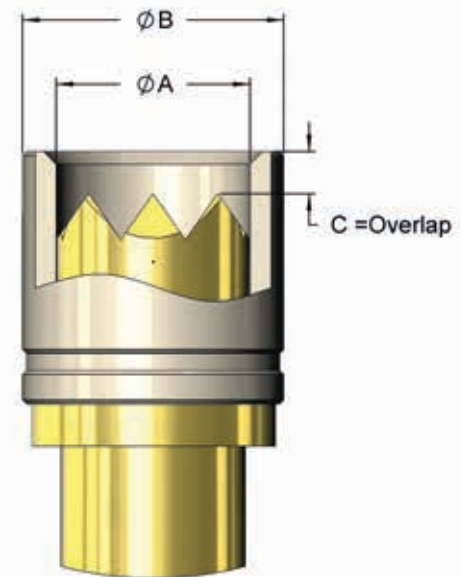


## Insulating Caps Overview

|      |  |   |   |  |   |  |  |  |   |  |   |
|------|--|---|---|--|---|--|--|--|---|--|---|
| F075 | Order Example<br>Spring Force<br>Inner-Ø A<br>Outer-Ø B<br>Overlap C | F07506B130G200IK04<br>200 cN<br>Ø 1,3 mm<br>Ø 1,7 mm<br>0,4 mm        |    |  |   |  |  |  |   |  |   |
| F875 | Order Example<br>Spring Force<br>Inner-Ø A<br>Outer-Ø B<br>Overlap C | F87506B100G135IK05<br>135 cN<br>Ø 1,0 mm<br>Ø 1,9 mm<br>0,5 mm        |    |  |   |  |  |  |   |  |   |
| F832 | Order Example<br>Spring Force<br>Inner-Ø A<br>Outer-Ø B<br>Overlap C | F83205S0008L650IK10<br>650 cN<br>Ø 0,8 mm<br>Ø 2,0 mm<br>1,0 mm       |    |  |   |  |  |  |   |  |   |
| F822 | Order Example<br>Spring Force<br>Inner-Ø A<br>Outer-Ø B<br>Overlap C | FF82205S0007L650IK15<br>650 cN<br>Ø 0,8 mm<br>Ø 2,0 mm<br>1,5 mm      |    | F82205S0007L650IK25<br>650 cN<br>Ø 0,8 mm<br>Ø 2,0 mm<br>2,5 mm                |    | F82205S0008L650IK10<br>650 cN<br>Ø 0,8 mm<br>Ø 2,0 mm<br>1,0 mm        |    |  |   |  |   |
| F733 | Order Example<br>Spring Force<br>Inner-Ø A<br>Outer-Ø B<br>Overlap C | F73306B180G150IK05<br>150 cN, 300cN<br>Ø 1,8 mm<br>Ø 2,6 mm<br>0,5 mm |  | F73306B230G150IK05<br>150 cN<br>Ø 2,3 mm<br>Ø 3,1 mm<br>0,5 mm                 |  | F73306B300G300IK05<br>300 cN<br>Ø 3,0 mm<br>Ø 3,8 mm<br>0,5 mm         |  | F73306B300G300IK87<br>300 cN<br>Ø 3,0 mm<br>Ø 5,45 mm<br>8,7 mm        |  |  |   |
| F732 | Order Example<br>Spring Force<br>Inner-Ø A<br>Outer-Ø B<br>Overlap C | F73206B120GxxxIK05<br>150 cN, 300cN<br>Ø 1,2 mm<br>Ø 2,0 mm<br>0,5 mm |  | F73206B120G150IK60<br>150 cN<br>Ø 1,2 mm<br>Ø 2,0 mm<br>6,0 mm                 |  | F73206B130G150IK05<br>150 cN<br>Ø 1,5 mm<br>Ø 2,2 mm<br>0,5 mm         |  | F73206B180G150IK05<br>150 cN<br>Ø 1,8 mm<br>Ø 2,6 mm<br>0,5 mm         |  | F73206B200G150IK60<br>150 cN<br>Ø 1,8 mm<br>Ø 2,6 mm<br>6,0 mm |  |
| F100 | Order Example<br>Spring Force<br>Inner-Ø A<br>Outer-Ø B<br>Overlap C | F10005B150GxxxIK04<br>100 cN<br>Ø 1,5 mm<br>Ø 2,2 mm<br>0,4 mm        |  | F10006B150GxxxIK04<br>100 cN, 200 cN, 300 cN<br>Ø 1,5 mm<br>Ø 2,2 mm<br>0,4 mm |  | F10006B200GxxxIK04<br>200 cN, 300 cN<br>Ø 2,0 mm<br>Ø 3,2 mm<br>0,4 mm |  | F10006B350GxxxIK04<br>200 cN, 300 cN<br>Ø 3,5 mm<br>Ø 4,0 mm<br>0,4 mm |  |  |   |
| F100 | Order Example<br>Spring Force<br>Inner-Ø A<br>Outer-Ø B<br>Overlap C | F10006B350G300IK10<br>300 cN<br>Ø 3,5 mm<br>Ø 4,2 mm<br>1,0 mm        |  | F10006B370G300IK36<br>300 cN<br>Ø 3,7 mm<br>Ø 4,4 mm<br>3,6 mm                 |  | F10017B150G200IK04<br>200 cN<br>Ø 1,5 mm<br>Ø 2,2 mm<br>0,4 mm         |  | F10041B150GxxxIK04<br>200 cN, 300 cN<br>Ø 1,5 mm<br>Ø 2,2 mm<br>0,4 mm |  |  |   |
| F588 | Order Example<br>Spring Force<br>Inner-Ø A<br>Outer-Ø B<br>Overlap C | F58841B150G300IK<br>300 cN<br>Ø 1,5 mm<br>Ø 2,2 mm<br>0,4 mm          |  | F58841B150G300IK045<br>300 cN<br>Ø 1,5 mm<br>Ø 2,2 mm<br>0,4 mm                |  |  |  |  |   |  |   |
| F772 | Order Example<br>Spring Force<br>Inner-Ø A<br>Outer-Ø B<br>Overlap C | F77206B120G150IK05<br>150 cN<br>Ø 1,2 mm<br>Ø 2,0 mm<br>0,5 mm        |  | F77206B180G150IK08<br>150 cN<br>Ø 1,8 mm<br>Ø 2,6 mm<br>0,8 mm                 |  | F77206B200G150IK05<br>150 cN<br>Ø 2,0 mm<br>Ø 2,8 mm<br>0,5 mm         |  |  |   |  |   |
| F786 | Order Example<br>Spring Force<br>Inner-Ø A<br>Outer-Ø B<br>Overlap C | F78606B400G300IK06<br>300 cN<br>Ø 4,0 mm<br>Ø 4,8 mm<br>0,6 mm        |  | F78606B400G300IK17<br>300 cN<br>Ø 4,0 mm<br>Ø 4,8 mm<br>1,7 mm                 |  |  |  |  |   |  |   |



C = Overlap





## Probe 50 mil

### F111

|                         |                                    |
|-------------------------|------------------------------------|
| <b>Centers (mm/mil)</b> | 1,27 / 50                          |
| <b>Current</b>          | 3,0 A                              |
| <b>Temperature</b>      | -20°C...+80°C,<br>-40°C...+250°C H |
| <b>R typically</b>      | 65 mOhm                            |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 20      | 40            |
| 33      | 70            |
| 20      | 85            |
| 40      | 95            |

#### Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 2,0               | 2,8      |
| Pointing Accuracy | ±0,09 mm |

#### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Bronze, gold plated       |
| Spring     | Music wire, silver plated |
| Receptacle | Bronze, Gold plated       |

#### Accessories

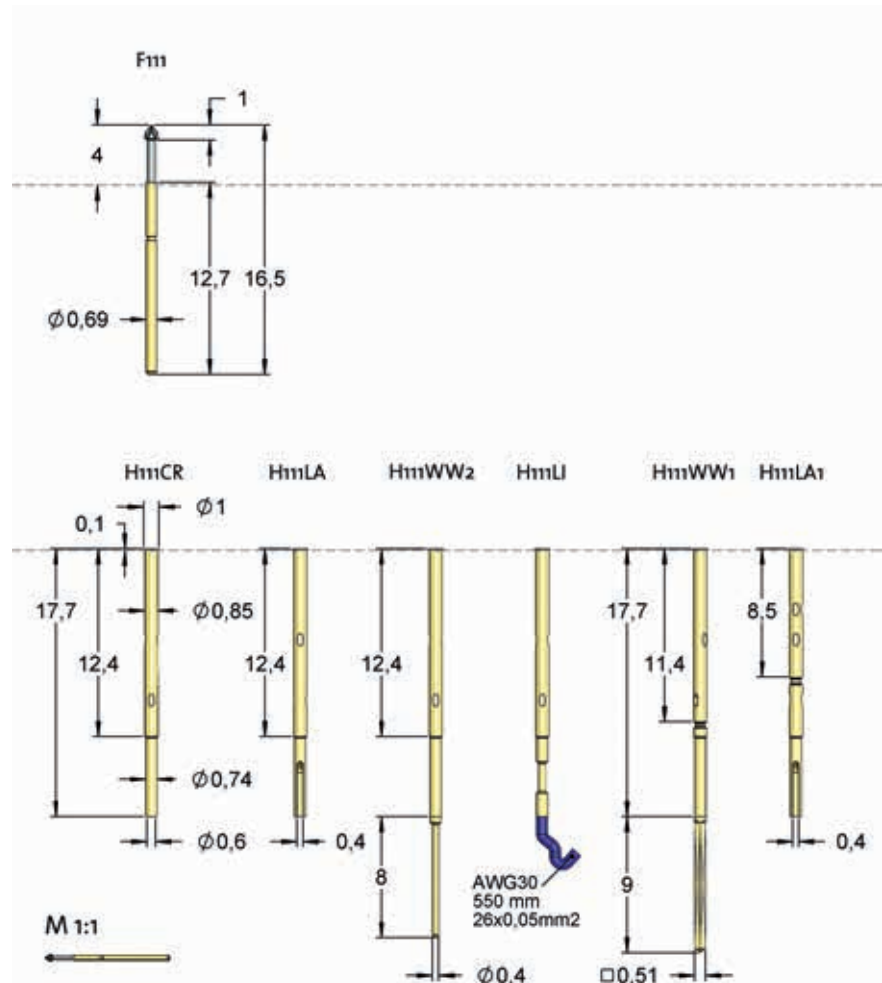
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-511E0 |
| Insertion tool probe      | FDWZ-050   |

#### Drill Size [mm]

|                        |             |
|------------------------|-------------|
| Receptacle with collar | 0,83 - 0,84 |
|------------------------|-------------|

#### Projection Height

|                          |     |
|--------------------------|-----|
| H111CR / H111LA / H111WW | 4,0 |
| H111WW2 / H111LI         | 4,0 |
| H111WW1                  | 5,0 |
| H111LA2                  | 6,0 |
| H111LA1                  | 8,0 |



High temperature versions available on request. Special version „E05“ has a projection height of 5.0 mm.

| Type             | Tip-Ø   | Spring Force  |
|------------------|---|---------------|
| F 111            | 18  | S 053 L 095 H |
| Tip Style        | Material  | Finish        |
| Material:        | B = BeCu, S = Steel   |               |
| Tip-Ø:           | 053 = 0,53 mm (e.g.)  |               |
| Finish:          | G = Gold, L = Longtime Gold plated, N = Nickel, R = Rhodium |               |
| Special Version: | H = High Temperatur, E05 = Projection Height 5 mm           |               |
| Receptacle:      | Order Code according drawing                                |               |

ORDER EXAMPLE

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 01     | S        | N       | 0,53    | -       |
|           | 03     | S        | N       | 0,53    | -       |
|           | 05     | S        | L       | 0,9     | -       |
|           | 05     | S        | L       | 1,5     | -       |
|           | 06     | B        | G       | 0,9     | -       |
|           | 07     | S        | N       | 0,9     | -       |
|           | 09     | S        | N       | 0,9     | -       |
|           | 12     | S        | L       | 0,9     | -       |
|           | 14     | S        | N       | 0,9     | -       |
|           | 18     | S        | N       | 0,53    | -       |
|           | 18     | S        | R       | 0,53    | -       |
|           | 21     | S        | N       | 0,53    | -       |

Non-magnetic Probe 50 mil  
F112

|                  |               |
|------------------|---------------|
| Centers (mm/mil) | 1,27 / 50     |
| Current          | 3,0 A         |
| Temperature      | -20°C...+80°C |
| R typically      | 35 mOhm       |

Spring Force (cN ±20%)

|         |               |
|---------|---------------|
| Preload | Nominal Force |
| 6       | 40            |

Travel (mm)

|                   |          |
|-------------------|----------|
| Nominal           | Maximum  |
| 2,0               | 2,8      |
| Pointing Accuracy | ±0,09 mm |

Materials and Plating

|            |                     |
|------------|---------------------|
| Plunger    | see Tip Style       |
| Barrel     | Bronze, gold plated |
| Spring     | BeCu, gold plated   |
| Receptacle | Bronze, Gold plated |

Accessories

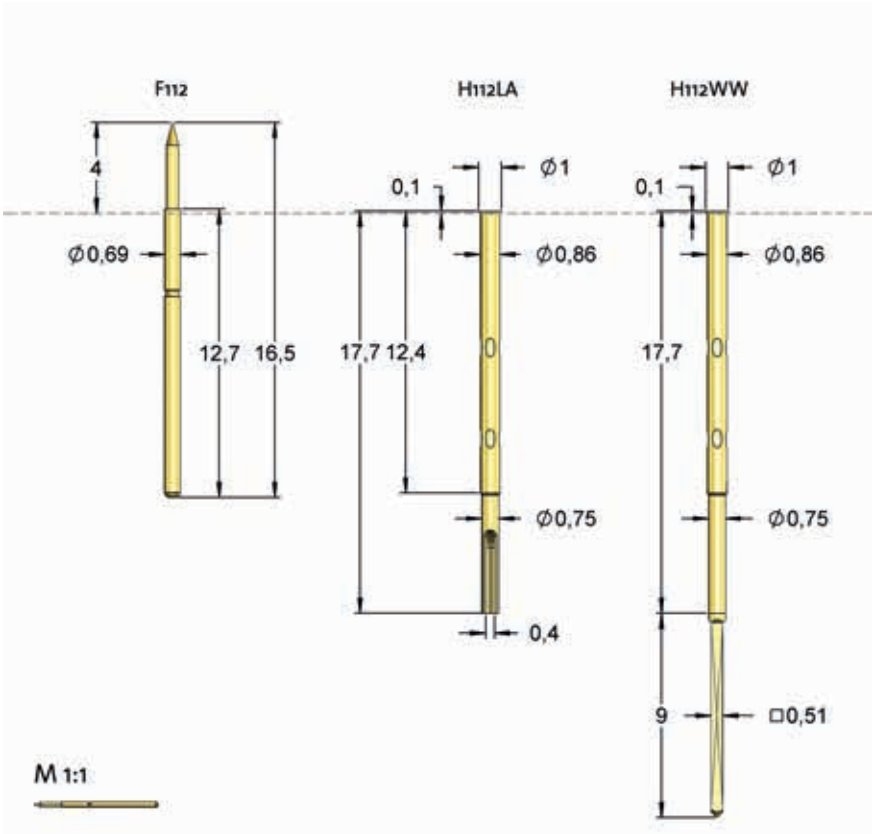
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-511E0 |
| Insertion tool probe      | FDWZ-050   |

Drill Size [mm]

|                        |             |
|------------------------|-------------|
| Receptacle with collar | 0,83 - 0,84 |
|------------------------|-------------|

Projection Height

|                          |     |
|--------------------------|-----|
| H111CR / H111LA / H111WW | 4,0 |
| H111LI / H111WW2         | 4,0 |
| H111WW1                  | 5,0 |
| H111LA2                  | 6,0 |
| H111LA1                  | 8,0 |



| Type                 | Tip-Ø                        | Spring Force |
|----------------------|------------------------------|--------------|
| F 112 18 B 053 G 040 |                              |              |
| Tip Style            | Material                     | Finish       |
| Material:            | B = BeCu                     |              |
| Tip-Ø:               | 053 = 0,53 mm (e.g.)         |              |
| Finish:              | G = Gold                     |              |
| Receptacle:          | Order Code according drawing |              |
| ORDER EXAMPLE        |                              |              |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 05     | B        | G       | 0,90    | -       |
|           | 12     | B        | G       | 0,90    | -       |
|           | 18     | B        | G       | 0,53    | -       |





## Probe 50 mil

### F768

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 1,27 / 50     |
| <b>Current</b>          | 3,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 20 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 50      | 130           |

#### Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 3,2               | 4,0      |
| Pointing Accuracy | ±0,07 mm |

#### Materials and Plating

|            |                            |
|------------|----------------------------|
| Plunger    | see Tip Style              |
| Barrel     | Bronze, gold plated        |
| Spring     | Music wire, silver plated  |
| Receptacle | Nickel silver, Gold plated |

#### Accessories

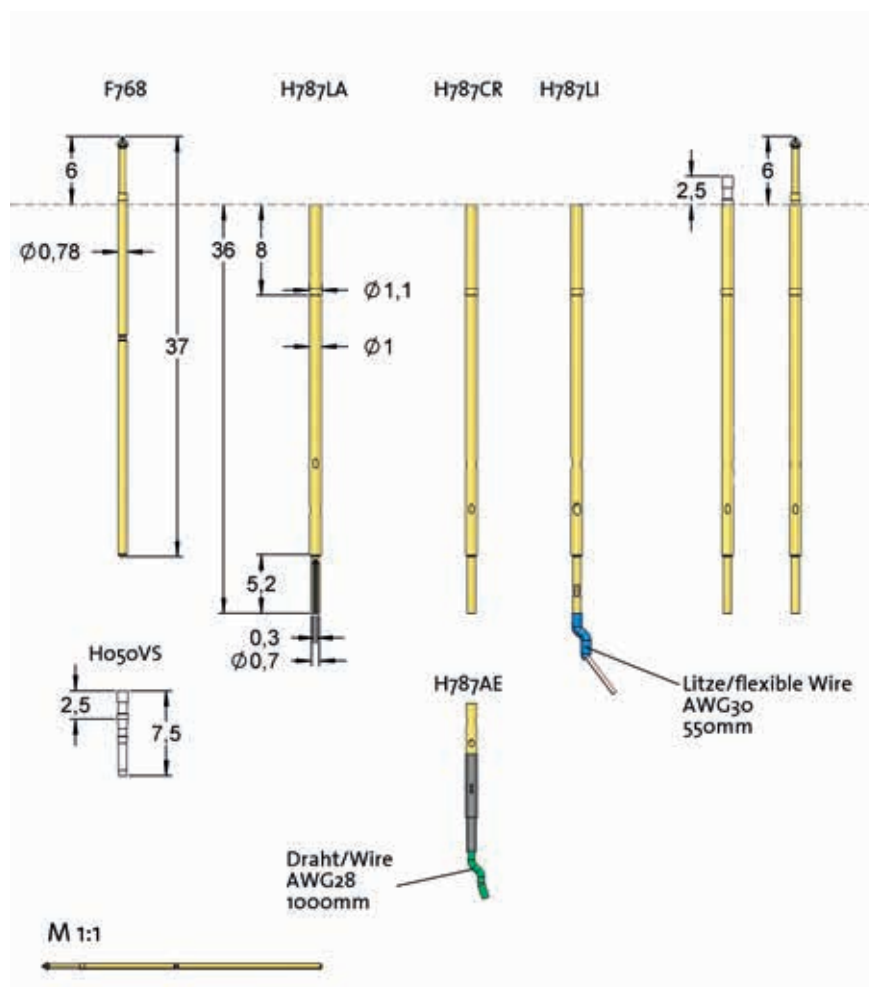
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-050EV |
| Insertion tool receptacle | FEWZ-050E0 |
| Insertion tool probe      | FDWZ-050   |
| Plug lock                 | H050VS     |

#### Drill Size [mm]

|                     |             |
|---------------------|-------------|
| Press ring as stop  | 0,99 - 1,00 |
| Press ring inserted | 1,05 - 1,07 |

#### Projection Height

|         |            |
|---------|------------|
| H787... | 6,0 - 14,0 |
|---------|------------|



| Type                 | Tip-Ø                              |        | Spring Force    |
|----------------------|------------------------------------|--------|-----------------|
| F 768 06 B 090 G 130 |                                    |        |                 |
| Tip Style            | Material                           | Finish | Special Version |
| Material:            | B = BeCu, S = Steel                |        |                 |
| Tip-Ø:               | 090 = 0,9 mm (e.g.)                |        |                 |
| Finish:              | G = Gold, L = Longtime Gold plated |        |                 |
| Receptacle:          | Order Code according drawing       |        |                 |
| ORDER EXAMPLE        |                                    |        |                 |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 03     | B        | G       | 0,6     | -       |
|           | 06     | B        | G       | 0,9     | -       |
|           | 07     | S        | L       | 0,9     | -       |
|           | 11     | B        | G       | 0,6     | -       |
|           | 18     | B        | G       | 0,6     | -       |
|           | 21     | S        | L       | 0,6     | -       |
|           | 28     | B        | G       | 0,9     | -       |
|           | 29     | B        | G       | 0,4     | -       |
|           | 33     | S        | L       | 0,6     | -       |

Probe 50 mil  
F767

|                  |               |
|------------------|---------------|
| Centers (mm/mil) | 1,27 / 50     |
| Current          | 3,0 A         |
| Temperature      | -20°C...+80°C |
| R typically      | 20 mOhm       |

Spring Force (cN ±20%)

|         |               |
|---------|---------------|
| Preload | Nominal Force |
| 35      | 165           |

Travel (mm)

|                   |          |
|-------------------|----------|
| Nominal           | Maximum  |
| 6,4               | 8,0      |
| Pointing Accuracy | ±0,05 mm |

Materials and Plating

|            |                            |
|------------|----------------------------|
| Plunger    | see Tip Style              |
| Barrel     | Bronze, gold plated        |
| Spring     | Music wire, silver plated  |
| Receptacle | Nickel silver, Gold plated |

Accessories

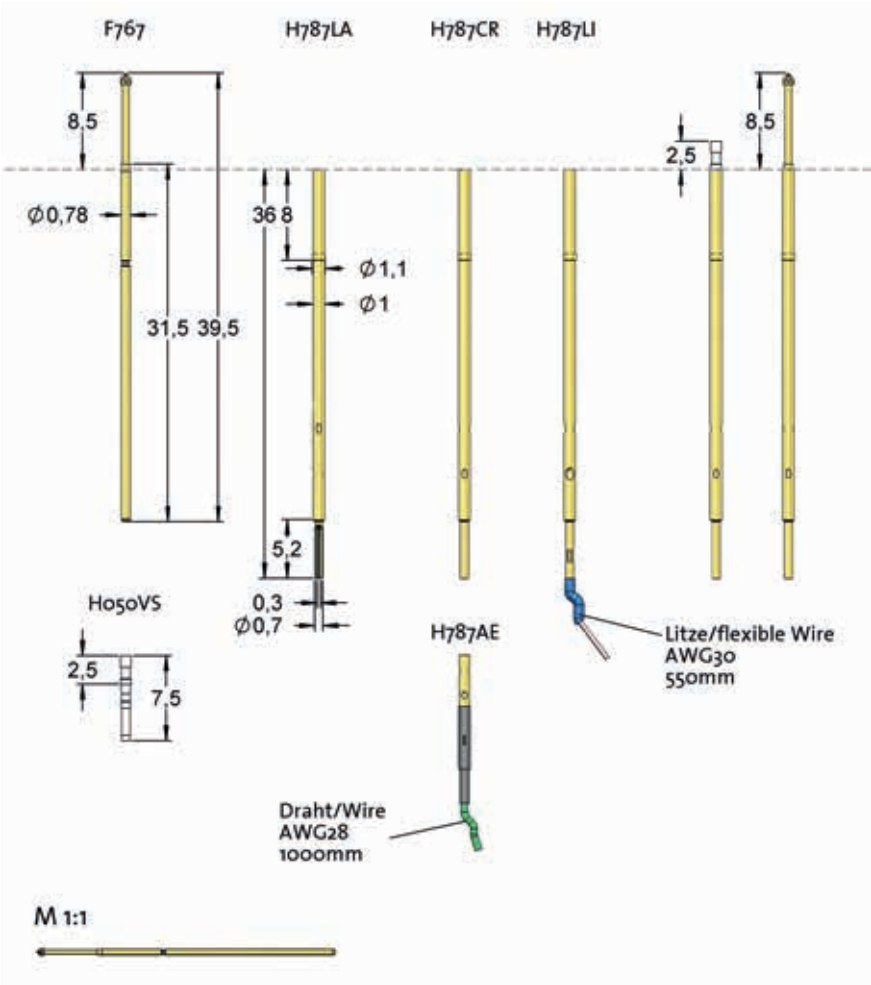
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-050EV |
| Insertion tool receptacle | FEWZ-050E0 |
| Insertion tool probe      | FDWZ-050   |
| Plug lock                 | H050VS     |

Drill Size [mm]

|                     |             |
|---------------------|-------------|
| Press ring as stop  | 0,99 - 1,00 |
| Press ring inserted | 1,05 - 1,07 |

Projection Height

|         |            |
|---------|------------|
| H787... | 8,5 - 16,5 |
|---------|------------|



| Type                 | Tip-Ø                                 | Spring Force |
|----------------------|---------------------------------------|--------------|
| F 767 33 S 060 L 165 |                                       |              |
| Tip Style            | Material                              | Finish       |
| Material:            | B = BeCu, S = Steel                   |              |
| Tip-Ø:               | 050 = 0,5 mm (e.g.)                   |              |
| Finish:              | G = Gold, L = Longtime Gold plated    |              |
| Special Version:     | L = Long Version, H = High Temperatur |              |
| Receptacle:          | Order Code according drawing          |              |
| ORDER EXAMPLE        |                                       |              |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 07     | S        | L       | 0,9     | -       |
|           | 21     | S        | L       | 0,6     | -       |
|           | 33     | S        | L       | 0,6     | -       |
|           | 38     | S        | L       | 0,6     | -       |



## Standard Probe 50 mil

### F050

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 1,27 / 50     |
| <b>Current</b>          | 3,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 20 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 80      | 130 HP        |
| 60      | 150           |
| 125     | 200 HP        |
| 90      | 200           |

#### Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 4,3               | 6,4      |
| Pointing Accuracy | ±0,05 mm |

#### Materials and Plating

|            |                         |
|------------|-------------------------|
| Plunger    | see Tip Style           |
| Barrel     | Bronze, gold plated     |
| Spring     | Music wire, gold plated |
| Receptacle | Bronze, Gold plated     |

#### Accessories

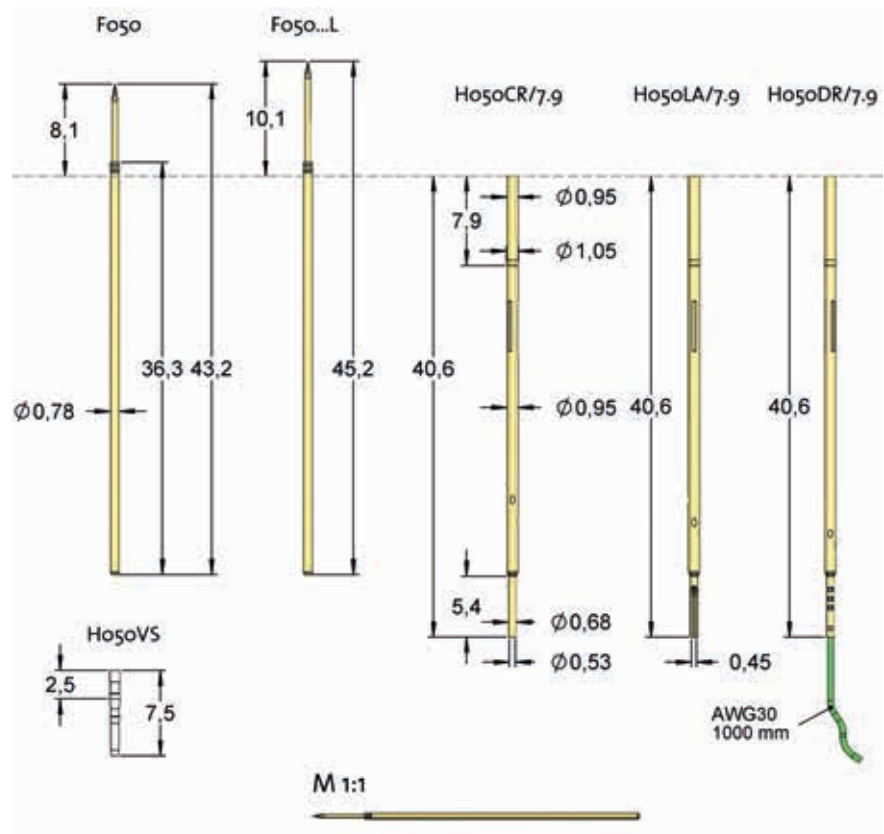
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-050EV |
| Insertion tool receptacle | FEWZ-050E0 |
| Insertion tool probe      | FDWZ-050   |
| Plug lock                 | H050VS     |

#### Drill Size [mm]

|                     |             |
|---------------------|-------------|
| Press ring as stop  | 0,96 - 0,98 |
| Press ring inserted | 0,98 - 1,01 |

#### Projection Height

|                        |             |
|------------------------|-------------|
| (F050) H050.../7.9     | 8,1 - 16,0  |
| (F050...L) H050.../7.9 | 10,1 - 18,0 |



Due to the higher preload the Progressive Series versions only allow a maximum travel of 5.0 mm. The receptacle H050WL11/7.6 is also available with a spring loaded end. This is suitable for contacting conductor paths.

| Type             | Tip-Ø  | Spring Force |
|------------------|--|--------------|
| F 050            | 33   | S            |
|                  | 050  | P            |
|                  |  | 130          |
|                  |  | HP           |
| Tip Style        | Material   | Finish       |
| Material:        | B = BeCu, S = Steel  |              |
| Tip-Ø:           | 050 = 0,5 mm (e.g.)  |              |
| Finish:          | G = Gold, L = Longtime Gold plated, P = Functional coating |              |
| Special Version: | HP = Progressive Series                                    |              |
| Receptacle:      | Order Code according drawing                               |              |

ORDER EXAMPLE

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 05     | B        | G       | 0,90    | -       |
|           | 06     | B        | G       | 0,90    | -       |
|           | 11     | B        | G       | 0,50    | -       |
|           | 21     | S        | L       | 0,50    | -       |
|           | 21     | S        | P       | 0,50    | HP      |
|           | 33     | S        | L       | 0,50    | -       |
|           | 33     | S        | L       | 0,50    | L       |
|           | 33     | S        | P       | 0,50    | HP      |
|           | 43     | S        | L       | 0,50    | -       |
|           | 43     | S        | P       | 0,50    | HP      |
|           | 62     | S        | P       | 0,50    | HP      |

### Long Travel Probe 50 mil

## F788

|                              |               |
|------------------------------|---------------|
| <b>Centers (mm/mil)</b>      | 1,27 / 50     |
| <b>Current</b>               | 2,0 A         |
| <b>Temperature</b>           | -20°C...+80°C |
| <b>R<sub>typically</sub></b> | 20 mOhm       |

**Spring Force (cN  $\pm 20\%$ )**

| Preload | Nominal Force |
|---------|---------------|
| 30      | 165           |
| 30      | 180           |

## Travel (mm)

| Nominal           | Maximum |
|-------------------|---------|
| 6,4               | 7,0     |
| Pointing Accuracy | ±0,1 mm |

## Materials and Plating

|            |                            |
|------------|----------------------------|
| Plunger    | see Tip Style              |
| Barrel     | Bronze, gold plated        |
| Spring     | Music wire, silver plated  |
| Receptable | Nickel silver, Gold plated |

## Accessories

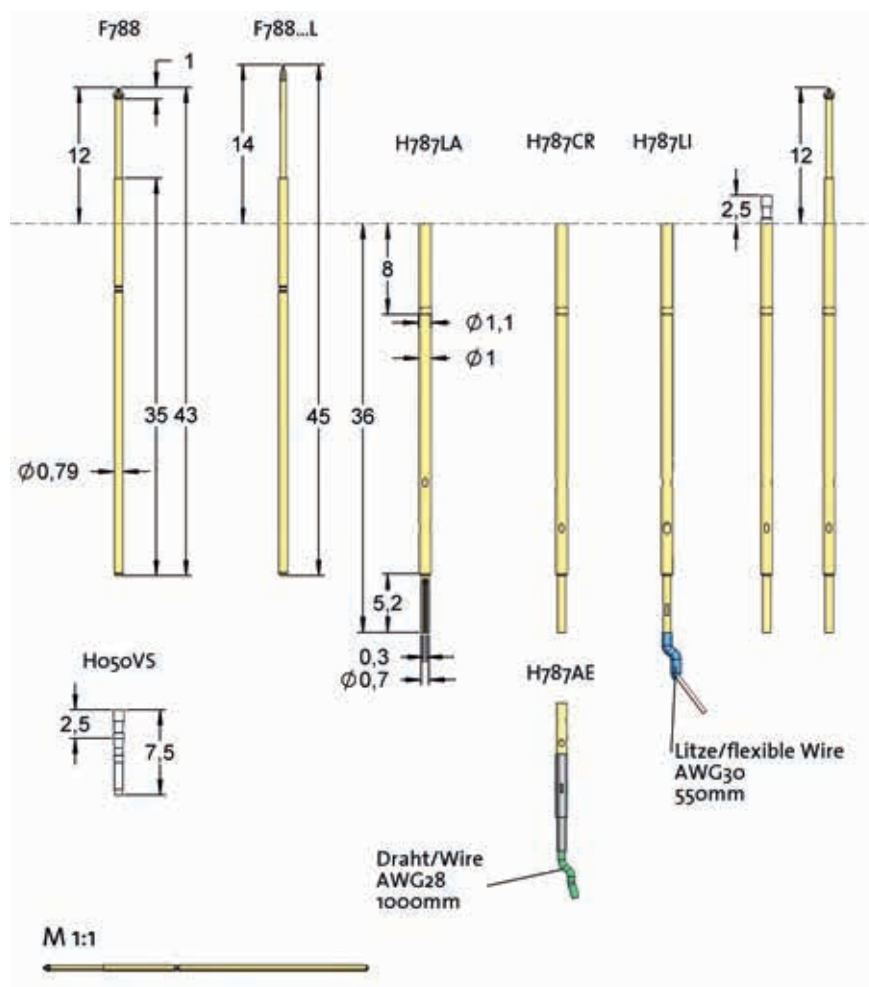
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-050EV |
| Insertion tool receptacle | FEWZ-050E0 |
| Insertion tool probe      | FDWZ-050   |
| Plug lock                 | H050VS     |

## Drill Size [mm]

|                     |             |
|---------------------|-------------|
| Press ring as stop  | 0,99 - 1,00 |
| Press ring inserted | 1,05 - 1,07 |

### Projection Height











|                    |             |
|--------------------|-------------|
| (F788) H787...     | 12,0 - 20,0 |
| (F788...L) H787... | 14,0 - 22,0 |



The F788 is the long travel version of the F767. These probes can be combined well in dual stage fixtures. The receptacle H050WL11/7.6 is also available with a spring loaded end. This is suitable for contacting conductor paths.

| Type             | Tip-Ø                                  | Spring Force           |
|------------------|--|------------------------|
| F 788 33         | S 050                                  | L 165 L                |
| Tip Style        | Material                               | Finish Special Version |
| Material:        | B = BeCu, S = Steel                    |                        |
| Tip-Ø:           | 050 = 0,5mm (e.g.)                     |                        |
| Finish:          | G = Gold, L = Longtime Gold plated     |                        |
| Special Version: | L = Long Version, H = High Temperature |                        |
| Receptacle:      | Order Code according drawing           |                        |

ORDER EXAMPLE

| Tip Style   | Number | Material | Plating | Ø in mm | Version |
|---|--------|----------|---------|---------|---------|
|  | 05     | B        | G       | 0,9     | -       |
|  | 06     | B        | G       | 0,9     | -       |
|  | 07     | S        | L       | 0,9     | -       |
|  | 11     | B        | G       | 0,6     | -       |
|  | 18     | B        | G       | 0,6     | -       |
|  | 21     | S        | L       | 0,6     | -       |
|  | 29     | B        | G       | 0,6     | -       |
|  | 33     | S        | L       | 0,5     | L       |
|  | 33     | S        | L       | 0,6     | -       |
|  | 43     | S        | L       | 0,5     | -       |





## Long Travel Probe 50 mil

### F051

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 1,27 / 50     |
| <b>Current</b>          | 3,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 20 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 35      | 150           |

#### Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 8,0               | 10,0     |
| Pointing Accuracy | ±0,05 mm |

#### Materials and Plating

|            |                         |
|------------|-------------------------|
| Plunger    | see Tip Style           |
| Barrel     | Bronze, gold plated     |
| Spring     | Music wire, gold plated |
| Receptacle | Bronze, Gold plated     |

#### Accessories

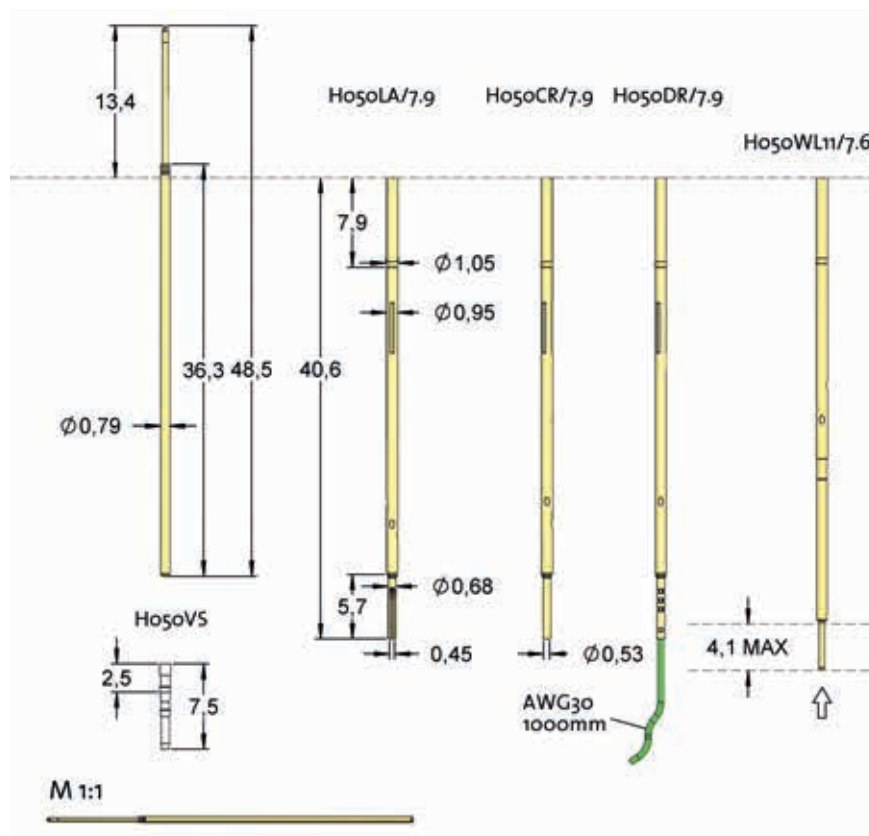
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-050EV |
| Insertion tool receptacle | FEWZ-050E0 |
| Insertion tool probe      | FDWZ-050   |
| Plug lock                 | H050VS     |

#### Drill Size [mm]

|                     |             |
|---------------------|-------------|
| Press ring as stop  | 0,99 - 1,00 |
| Press ring inserted | 1,05 - 1,07 |

#### Projection Height

|             |             |
|-------------|-------------|
| H050.../7.9 | 13,4 - 21,3 |
| H787...     | 17,5 - 25,5 |



The F051 is the long travel version of the F050. These probes can be combined well in dual stage fixtures. The receptacle H050WL11/7.6 is also available with a spring loaded end. This is suitable for contacting conductor paths.

| Type          | Tip-Ø                        | Spring Force |
|---------------|------------------------------|--------------|
| F 051         | 43                           | S 050 L 150  |
| Tip Style     | Material                     | Finish       |
| Material:     | S = Steel                    |              |
| Tip-Ø:        | 050 = 0,5 mm (e.g.)          |              |
| Finish:       | L = Longtime Gold plated,    |              |
|               | P = Functional coating       |              |
| Receptacle:   | Order Code according drawing |              |
| ORDER EXAMPLE |                              |              |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 43     | S        | L       | 0,5     | -       |
|           | 43     | S        | P       | 0,5     | -       |

## Probe 75 mil Short Version **F701**

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 1,90 / 75     |
| <b>Current</b>          | 4,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 20 mOhm       |

### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 40      | 70            |
| 30      | 150           |

### Travel (mm)

| Nominal           | Maximum |
|-------------------|---------|
| 4,0               | 5,0     |
| Pointing Accuracy | ±0,1 mm |

### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Bronze, gold plated       |
| Spring     | Music wire, silver plated |
| Receptacle | Bronze, Gold plated       |

### Accessories

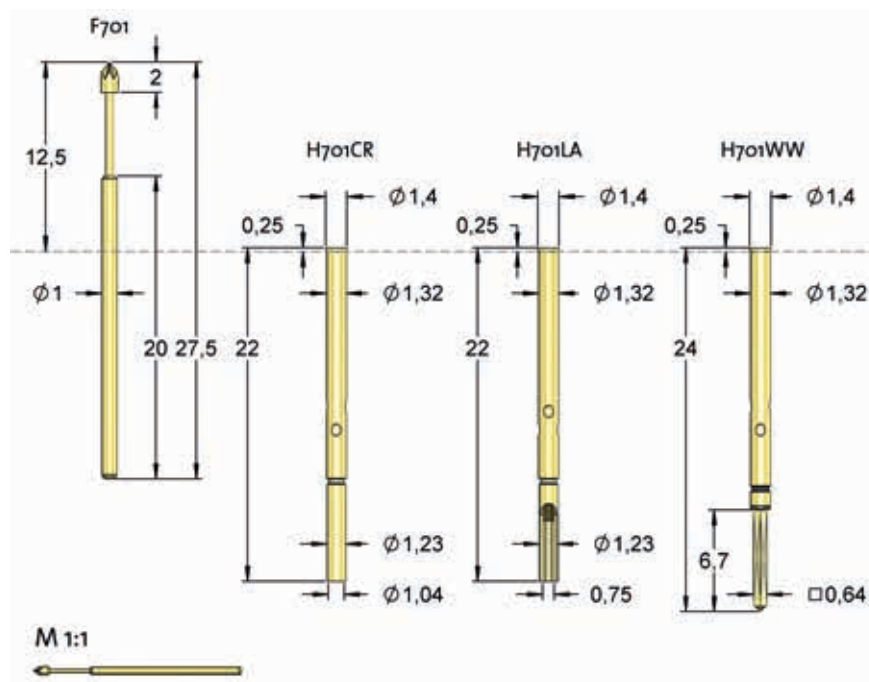
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-075EV |
| Insertion tool receptacle | FEWZ-075E0 |
| Insertion tool probe      | FDWZ-075   |
| Plug lock                 | H075VS     |

### Drill Size [mm]

|         |             |
|---------|-------------|
| H701... | 1,31 - 1,32 |
|---------|-------------|

### Projection Height

|             |      |
|-------------|------|
| H701CR / LA | 12,5 |
| H701WW      | 12,7 |



| Type                 | Tip-Ø                              | Spring Force           |
|----------------------|------------------------------------|------------------------|
| F 701 11 B 050 G 150 |                                    |                        |
| Tip Style            | Material                           | Finish Special Version |
| Material:            | B = BeCu, S = Steel                |                        |
| Tip-Ø:               | 050 = 0,5 mm (e.g.)                |                        |
| Finish:              | G = Gold, L = Longtime Gold plated |                        |
| Receptacle:          | Order Code according drawing       |                        |
| ORDER EXAMPLE        |                                    |                        |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 06     | B        | G       | 1,15    | -       |
|           | 07     | S        | L       | 1,15    | -       |
|           | 11     | B        | G       | 0,5     | -       |
|           | 14     | S        | L       | 1,15    | -       |
|           | 15     | B        | G       | 1,3     | -       |
|           | 18     | B        | G       | 0,5     | -       |
|           | 21     | S        | L       | 0,5     | -       |



## Standard Probe 75 mil

### F075

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 1,90 / 75     |
| <b>Current</b>          | 4,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 50 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 50      | 100           |
| 70      | 150           |
| 80      | 200           |
| 120     | 200 HP        |
| 130     | 250 HP        |
| 100     | 280           |

#### Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 4,3               | 6,4      |
| Pointing Accuracy | ±0,08 mm |

#### Materials and Plating

|            |                            |
|------------|----------------------------|
| Plunger    | see Tip Style              |
| Barrel     | Bronze, gold plated        |
| Spring     | Music wire, gold plated HP |
| Receptacle | Nickel silver, Gold plated |

#### Accessories

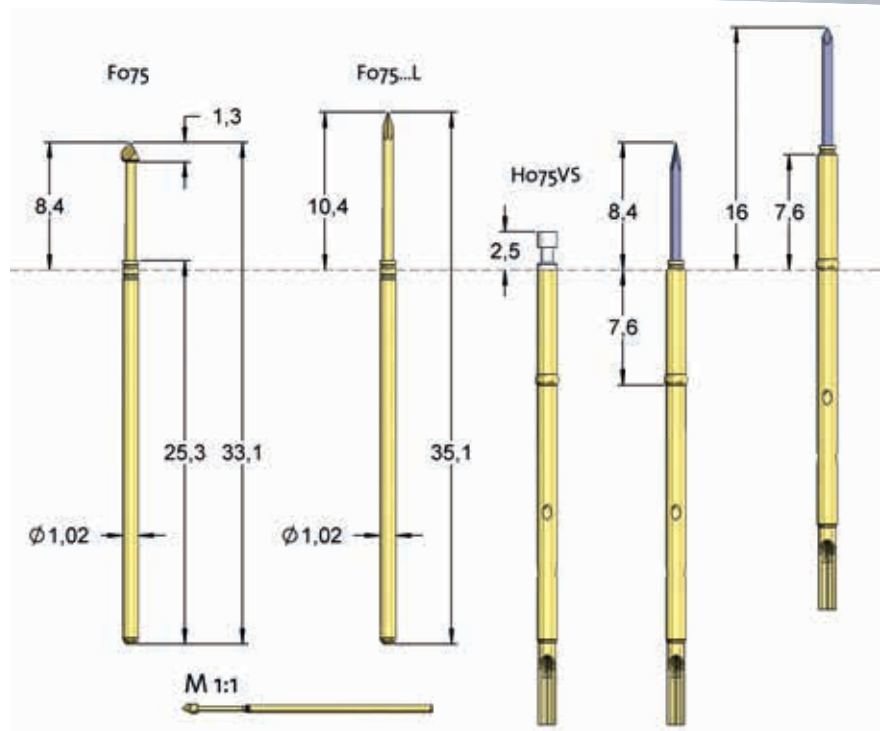
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-075EV |
| Insertion tool receptacle | FEWZ-075E0 |
| Insertion tool probe      | FDWZ-075   |
| Plug lock                 | H075VS     |

#### Projection Height

|                           |             |
|---------------------------|-------------|
| (F075) H075.../10.0       | 8,4 - 18,4  |
| (F075) H075.../7.6        | 8,4 - 16,0  |
| (F075) H075.../2.0        | 8,4 - 10,4  |
| (F075) H075WW10/2.0S1     | 11,6 - 13,6 |
| (F075) H075WW10/2.0S2     | 16,4 - 18,4 |
| (F075...L) H075.../10.0   | 10,4 - 20,4 |
| (F075...L) H075.../7.6    | 10,4 - 18,0 |
| (F075...L) H075.../2.0    | 10,4 - 12,4 |
| (F075...L) H075WW10/2.0S1 | 13,6 - 15,6 |
| (F075...L) H075WW10/2.0S2 | 18,4 - 20,4 |

| Type                    | Tip-Ø  | Spring Force |
|-------------------------|--|--------------|
| F 075 33 S 064 P 250 HP |  |              |
| Tip Style               | Material   | Finish       |
| Material:               | B = BeCu, S = Steel  |              |
| Tip-Ø:                  | 064 = 0,64 mm (e.g.)   |              |
| Finish:                 | G = Gold, L = Longtime Gold plated, P = Functional coating   |              |
| Special Version:        | L = Long Version, H = High Temperatur, HP = Progressive Series, IK = Insulating cap, RP = „Wobbling Plunger“ |              |
| Receptacle:             | Order Code according drawing   |              |

ORDER EXAMPLE



#### Drill Size [mm]

|                     |             |
|---------------------|-------------|
| Press ring as stop  | 1,29 - 1,30 |
| Press ring inserted | 1,36 - 1,40 |

The F075 is the most common probe for 75 mil applications. Further receptacles see „Receptacles H075“.

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 05     | B        | G       | 1,2     | -       |
|           | 06     | B        | G       | 1,2     | -       |
|           | 10     | S        | L       | 0,64    | -       |
|           | 11     | B        | G       | 0,64    | -       |
|           | 14     | S        | L       | 0,78    | -       |
|           | 15     | B        | G       | 1,2     | -       |
|           | 17     | B        | G       | 1,2     | -       |
|           | 18     | B        | G       | 0,78    | -       |
|           | 21     | S        | L       | 0,64    | L       |
|           | 21     | S        | P       | 0,64    | HP      |
|           | 21     | S        | L       | 0,64    | -       |
|           | 30     | S        | L       | 0,64    | -       |
|           | 32     | S        | P       | 0,64    | HP      |
|           | 32     | S        | P       | 0,64    | HPL     |
|           | 33     | S        | L       | 0,64    | L       |
|           | 33     | S        | L       | 0,64    | -       |
|           | 33     | S        | L       | 0,78    | -       |
|           | 36     | B        | G       | 1,2     | -       |
|           | 37     | B        | G       | 0,5     | L       |
|           | 37     | B        | G       | 0,5     | -       |
|           | 38     | S        | L       | 0,64    | L       |
|           | 38     | S        | L       | 0,64    | -       |
|           | 43     | S        | L       | 0,64    | -       |
|           | 63     | S        | L       | 1,2     | -       |

## Long Travel Probe 75 mil

### F793

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 1,90 / 75     |
| <b>Current</b>          | 4,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 20 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 20      | 120           |
| 70      | 250 HP        |

#### Travel (mm)

| Nominal           | Maximum |
|-------------------|---------|
| 8,0               | 10,0    |
| Pointing Accuracy | ±0,1 mm |

#### Materials and Plating

|            |                            |
|------------|----------------------------|
| Plunger    | see Tip Style              |
| Barrel     | Nickel silver, gold plated |
| Spring     | Music wire, gold plated    |
| Receptacle | Nickel silver, Gold plated |

#### Accessories

|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-075EV |
| Insertion tool receptacle | FEWZ-075E0 |
| Insertion tool probe      | FDWZ-075   |
| Plug lock                 | H075VS     |

#### Drill Size [mm]

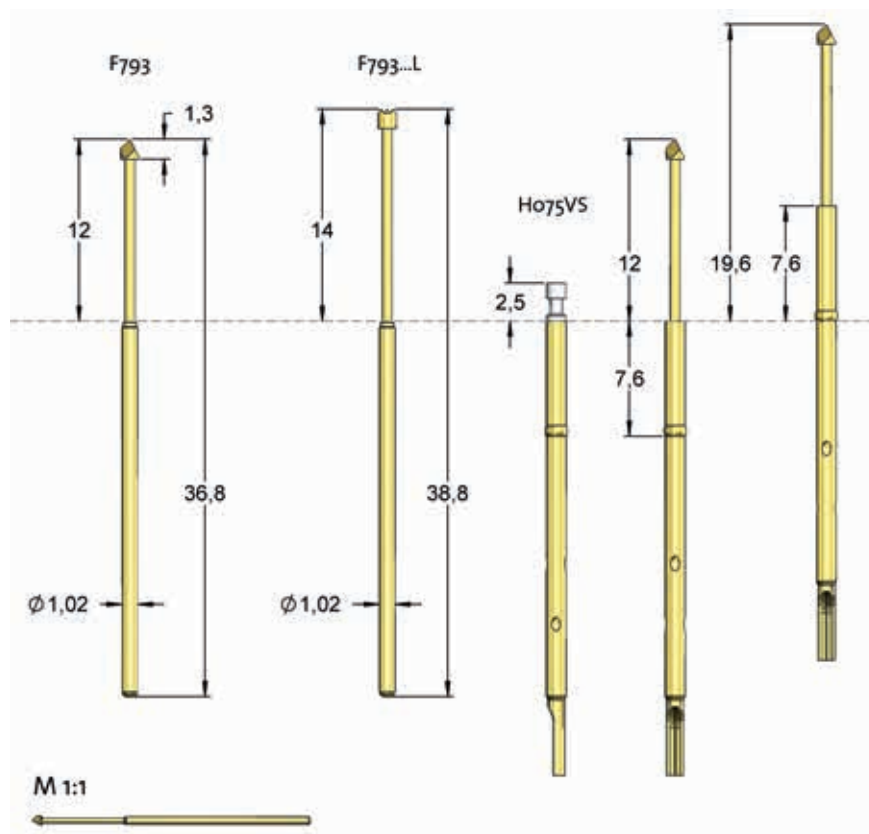
|                     |             |
|---------------------|-------------|
| Press ring as stop  | 1,29 - 1,30 |
| Press ring inserted | 1,36 - 1,40 |

#### Projection Height

|                           |             |
|---------------------------|-------------|
| (F793) H075.../10.0       | 12,0 - 22,0 |
| (F793) H075.../7.6        | 12,0 - 19,6 |
| (F793) H075.../2.0        | 12,0 - 14,0 |
| (F793) H075WW10/2.0S1     | 15,2 - 17,2 |
| (F793) H075WW10/2.0S2     | 20,0 - 22,0 |
| (F793...L) H075.../10.0   | 14,0 - 24,0 |
| (F793...L) H075.../7.6    | 14,0 - 21,6 |
| (F793...L) H075.../2.0    | 14,0 - 16,0 |
| (F793...L) H075WW10/2.0S1 | 17,2 - 19,2 |
| (F793...L) H075WW10/2.0S2 | 22,0 - 24,0 |

| Type                   | Tip-Ø  | Spring Force |
|------------------------|--|--------------|
| F 793 33 S 064 L 120 L |  |              |
| Tip Style              | Material   | Finish       |
| Material:              | B = BeCu, S = Steel  |              |
| Tip-Ø:                 | 064 = 0,64 mm (e.g.)                                       |              |
| Finish:                | G = Gold, L = Longtime Gold plated, P = Functional coating |              |
| Special Version:       | L = Long Version, HP = Progressive Series                  |              |
| Receptacle:            | Order Code according drawing                               |              |

ORDER EXAMPLE



The F793 is the long travel version of the F075 and F703. These probes can be combined well in dual stage fixtures. Further receptacles see „Receptacles H075“.

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 06     | B        | G       | 1,20    | -       |
|           | 06     | B        | G       | 1,20    | L       |
|           | 12     | B        | G       | 1,20    | -       |
|           | 12     | B        | G       | 1,20    | L       |
|           | 14     | B        | G       | 1,20    | -       |
|           | 14     | B        | G       | 1,20    | L       |
|           | 15     | B        | G       | 1,20    | L       |
|           | 15     | B        | G       | 1,20    | -       |
|           | 18     | B        | G       | 0,64    | -       |
|           | 21     | B        | G       | 0,64    | -       |
|           | 30     | S        | L       | 0,64    | -       |
|           | 33     | S        | L       | 0,64    | -       |
|           | 33     | S        | P       | 0,64    | HP      |
|           | 33     | S        | L       | 0,64    | L       |
|           | 38     | S        | L       | 0,64    | -       |





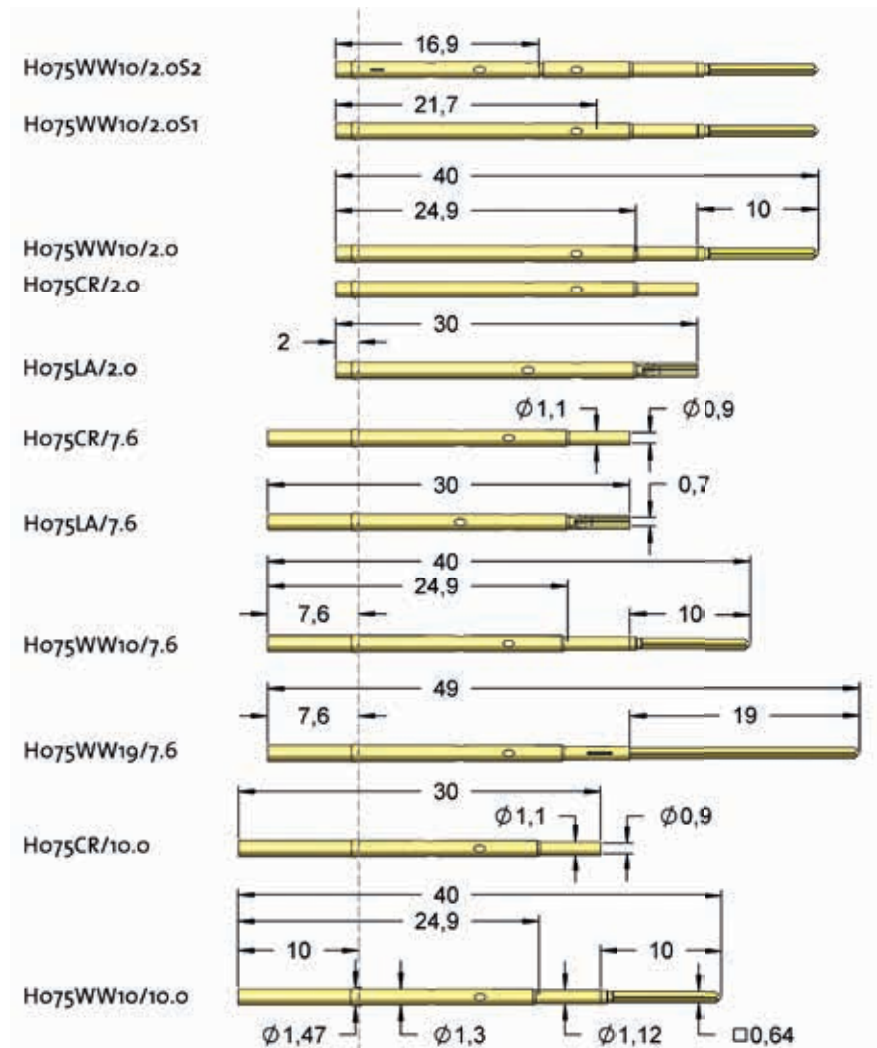
## Receptacles for 75 mil centers

### H075

For probes F075, F793 and F703 different receptacles are available with different connection types (e.g. LA, CR, WW), different press ring positions and different wire-wrap posts. Adequate insertion tools are available. The right tool for flush insertion is **FEWZ-703E0**. The tools for fix projection heights are **FEWZ-075Exx**. For variable projection heights the tool **FEWZ-075EV** is appropriate.

Plug locks **H075VS** can be used to close empty receptacles in order to prevent false assemblies and to avoid contamination.

A special receptacle with spring loaded contact pin (**H075WL11/7.6**) enables wireless contacting of conductor paths. Additionally a receptacle with preassembled wire AWG26 is available as H075LI/7.6.



### Material and Plating

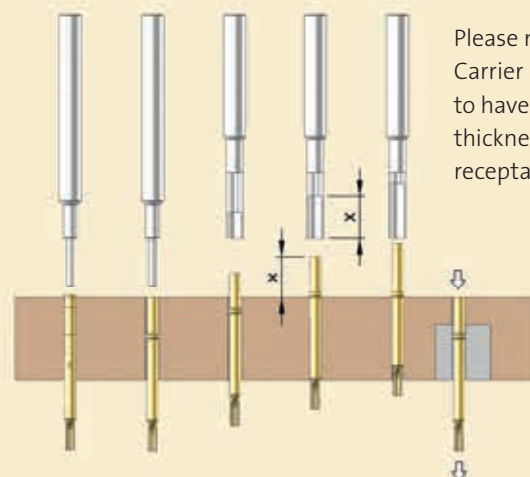
Nickel silver, gold plated

### Drill Size [mm]

|                     |             |
|---------------------|-------------|
| Press ring as stop  | 1,29 - 1,30 |
| Press ring inserted | 1,36 - 1,40 |

Appropriate tools are available for each type of receptacle.

Please note: Carrier plates need to have a certain thickness to hold receptacles tight.



| Type                     | Length of Wire Wrap Pin   |
|--------------------------|---|
| H075                     | WW 10 / 7.6   |
| Connection Type          | Press Ring Position   |
| Connection Type:         | CR = Crimp connection<br>LA = Solder connection<br>WW = Wire Wrap connection<br>LI = Stranded wire<br>WL = Spring loaded connection |
| Length of Wire Wrap Pin: | e.g. 10 = 10,0mm  |
| Press Ring Position:     | e.g. 7.6 = 7,6mm  |
| ORDER EXAMPLE            |   |

### Projection Height

|                     | H075.../10.0 | H075.../7.6 | H075.../2.0 | H075WW10/2.0S1 | H075WW10/2.0S2 |
|---------------------|--------------|-------------|-------------|----------------|----------------|
| F075 / F703         | 8,4 - 18,4   | 8,4 - 16,0  | 8,4 - 10,4  | 11,6 - 13,6    | 16,4 - 18,4    |
| F075...L / F703...L | 10,4 - 20,4  | 10,4 - 18,0 | 10,4 - 12,4 | 13,6 - 15,6    | 18,4 - 20,4    |
| F793                | 12,0 - 22,0  | 12,0 - 19,6 | 12,0 - 14,0 | 15,2 - 17,2    | 20,0 - 22,0    |
| F793...L            | 14,0 - 24,0  | 14,0 - 21,6 | 14,0 - 16,0 | 17,2 - 19,2    | 22,0 - 24,0    |

## Probe 75 mil

### F703

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 1,90 / 75     |
| <b>Current</b>          | 4,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 20 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 30      | 60            |
| 50      | 100           |
| 70      | 150           |

#### Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 4,3               | 6,4      |
| Pointing Accuracy | ±0,08 mm |

#### Materials and Plating

|            |                            |
|------------|----------------------------|
| Plunger    | see Tip Style              |
| Barrel     | Nickel silver, gold plated |
| Spring     | Music wire, silver plated  |
| Receptable | Nickel silver, Gold plated |

#### Accessories

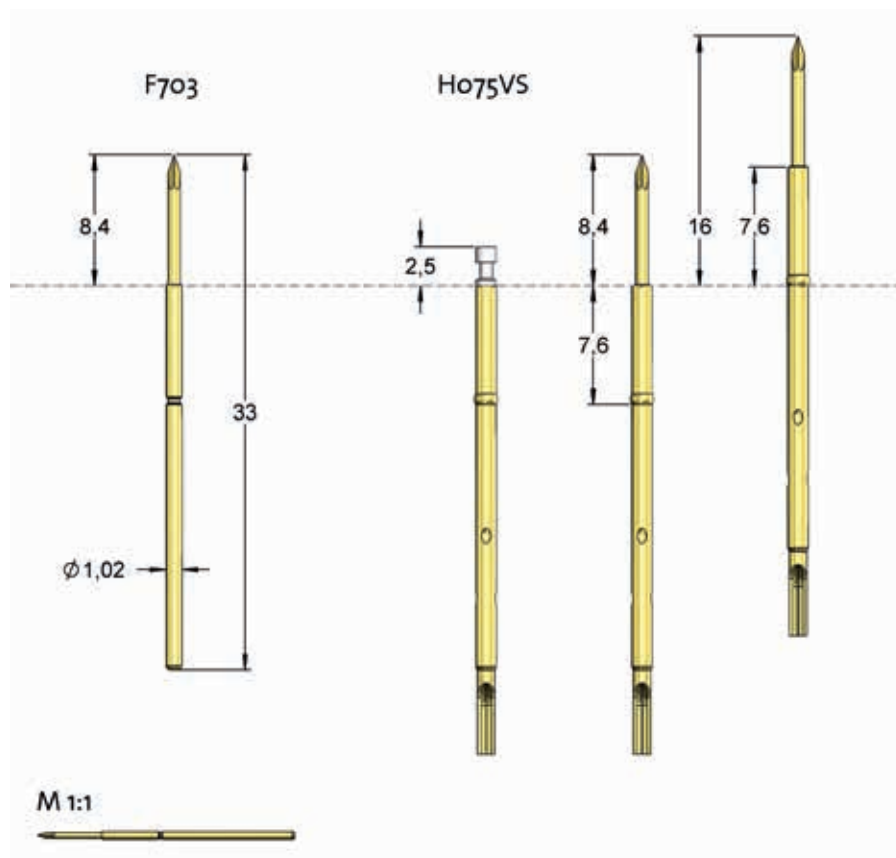
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-075EV |
| Insertion tool receptacle | FEWZ-075E0 |
| Insertion tool probe      | FDWZ-075   |
| Plug lock                 | H075VS     |

#### Drill Size [mm]

|                     |             |
|---------------------|-------------|
| Press ring as stop  | 1,29 - 1,30 |
| Press ring inserted | 1,36 - 1,40 |

#### Projection Height

|                |             |
|----------------|-------------|
| H075.../10.0   | 8,4 - 18,4  |
| H075.../7.6    | 8,4 - 16,0  |
| H075.../2.0    | 8,4 - 10,4  |
| H075WW10/2.0S1 | 11,6 - 13,6 |
| H075WW10/2.0S2 | 16,4 - 18,4 |



Further receptacles see „Receptacles H075“.

| Type                 | Tip-Ø                              | Spring Force |
|----------------------|------------------------------------|--------------|
| F 703 21 S 078 L 100 |                                    |              |
| Tip Style            | Material                           | Finish       |
| Material:            | B = BeCu, S = Steel                |              |
| Tip-Ø:               | 078 = 0,78 mm (e.g.)               |              |
| Finish:              | G = Gold, L = Longtime Gold plated |              |
| Receptacle:          | Order Code according drawing       |              |
| ORDER EXAMPLE        |                                    |              |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 18     | B        | G       | 0,78    | -       |
|           | 21     | S        | L       | 0,78    | -       |



## Probe 100 mil

### F585

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 2,54 / 100    |
| <b>Current</b>          | 5,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 20 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 80      | 200           |
| 50      | 300           |

#### Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 4,3               | 6,4      |
| Pointing Accuracy | ±0,08 mm |

#### Materials and Plating

|            |                            |
|------------|----------------------------|
| Plunger    | see Tip Style              |
| Barrel     | Nickel silver, gold plated |
| Spring     | Music wire, silver plated  |
| Receptacle | Nickel silver, Gold plated |

#### Accessories

|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-100EV |
| Insertion tool receptacle | FEWZ-100E0 |
| Insertion tool probe      | FDWZ-100   |
| Plug lock                 | H100VS     |

#### Drill Size [mm]

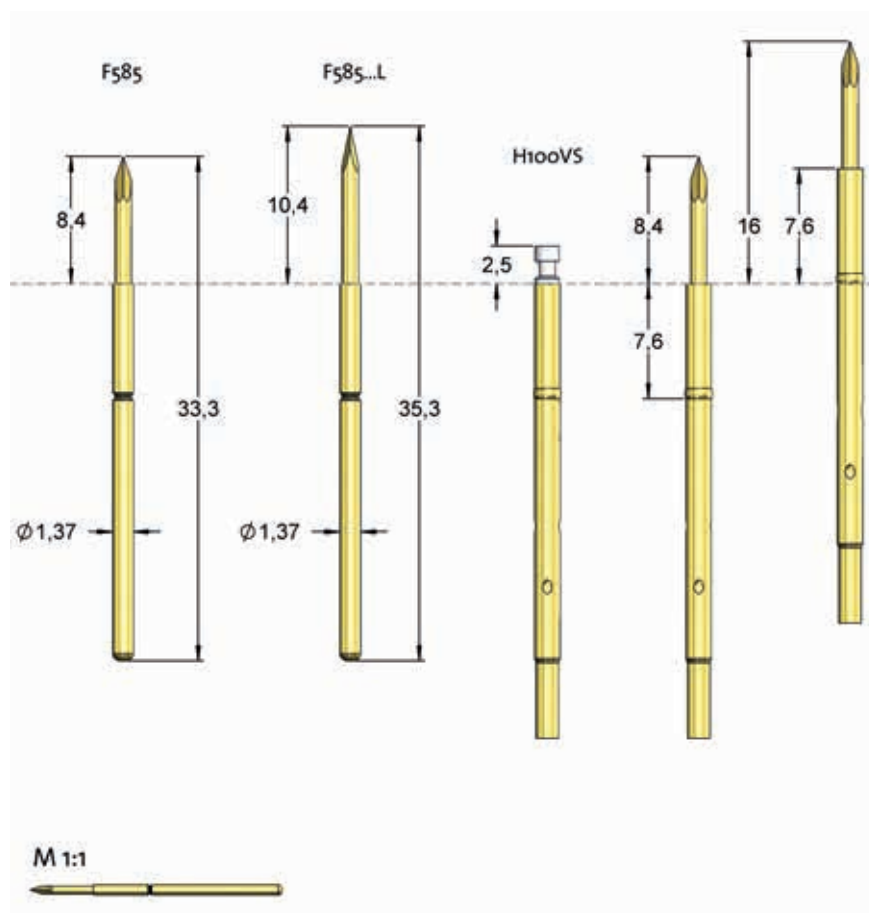
|                     |             |
|---------------------|-------------|
| Press ring as stop  | 1,67 - 1,69 |
| Press ring inserted | 1,70 - 1,75 |

#### Projection Height

|                           |             |
|---------------------------|-------------|
| (F585) H100.../10.0       | 8,4 - 18,4  |
| (F585) H100.../7.6        | 8,4 - 16,0  |
| (F585) H100.../2.0        | 8,4 - 10,4  |
| (F585) H100WW10/2.0S1     | 11,4 - 13,4 |
| (F585) H100WW10/2.0S2     | 16,4 - 18,4 |
| (F585...L) H100.../10.0   | 10,4 - 20,4 |
| (F585...L) H100.../7.6    | 10,4 - 18,0 |
| (F585...L) H100.../2.0    | 10,4 - 12,4 |
| (F585...L) H100WW10/2.0S1 | 13,4 - 15,4 |
| (F585...L) H100WW10/2.0S2 | 18,4 - 20,4 |

| Type                 | Tip-Ø                              | Spring Force |
|----------------------|------------------------------------|--------------|
| F 585 33 S 105 L 300 |                                    |              |
| Tip Style            | Material                           | Finish       |
| Material:            | B = BeCu, S = Steel                |              |
| Tip-Ø:               | 105 = 1,05 mm (e.g.)               |              |
| Finish:              | G = Gold, L = Longtime Gold plated |              |
| Special Version:     | L = Long Version                   |              |
| Receptacle:          | Order Code according drawing       |              |

ORDER EXAMPLE



Further receptacles see „Receptacles H100“.

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 11     | B        | G       | 1,05    | -       |
|           | 18     | S        | L       | 1,05    | -       |
|           | 21     | S        | L       | 1,05    | -       |
|           | 30     | B        | G       | 1,05    | -       |
|           | 33     | S        | L       | 1,05    | -       |
|           | 33     | S        | L       | 1,05    | L       |
|           | 62     | B        | G       | 1,05    | -       |
|           | 64     | B        | G       | 0,46    | -       |

## Probe 100 mil Short Version

### F562

|                  |               |
|------------------|---------------|
| Centers (mm/mil) | 2,54 / 100    |
| Current          | 5,0 A         |
| Temperature      | -20°C...+80°C |
| R typically      | 20 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 60      | 100           |
| 60      | 150           |
| 60      | 200           |
| 60      | 220           |

#### Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 2,7               | 4,1      |
| Pointing Accuracy | ±0,05 mm |

#### Materials and Plating

|            |                            |
|------------|----------------------------|
| Plunger    | see Tip Style              |
| Barrel     | Nickel silver, gold plated |
| Spring     | Music wire, silver plated  |
| Receptacle | Nickel silver, Gold plated |

#### Accessories

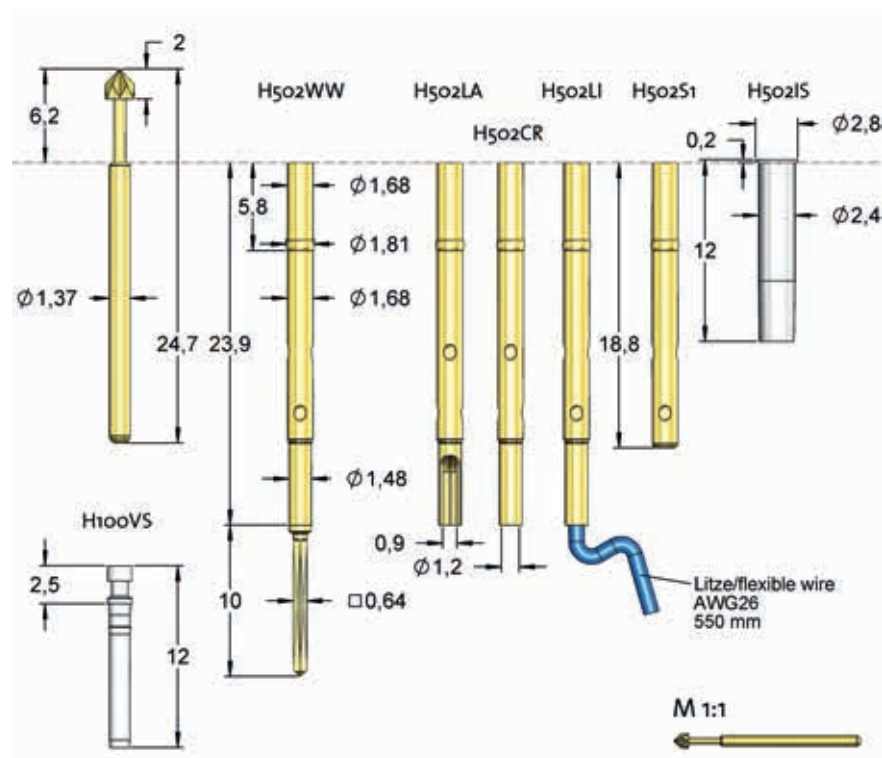
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-100EV |
| Insertion tool receptacle | FEWZ-100EV |
| Insertion tool probe      | FDWZ-100   |
| Plug lock                 | H100VS     |

#### Drill Size [mm]

|                     |             |
|---------------------|-------------|
| Press ring as stop  | 1,67 - 1,69 |
| Press ring inserted | 1,70 - 1,75 |

#### Projection Height

|         |            |
|---------|------------|
| H502... | 6,2 - 12,0 |
|---------|------------|



| Type                 | Tip-Ø                              | Spring Force |
|----------------------|------------------------------------|--------------|
| F 562 05 S 190 L 100 |                                    |              |
| Tip Style            | Material                           | Finish       |
| Material:            | B = BeCu, S = Steel                |              |
| Tip-Ø:               | 190 = 1,9 mm (e.g.)                |              |
| Finish:              | G = Gold, L = Longtime Gold plated |              |
| Receptacle:          | Order Code according drawing       |              |
| ORDER EXAMPLE        |                                    |              |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 04     | B        | G       | 1,9     | -       |
|           | 05     | S        | L       | 1,9     | -       |
|           | 06     | B        | G       | 1,9     | -       |
|           | 07     | S        | L       | 1,9     | -       |
|           | 14     | S        | L       | 1,9     | -       |
|           | 15     | B        | G       | 1,9     | -       |
|           | 18     | B        | G       | 0,76    | -       |
|           | 21     | S        | L       | 0,76    | -       |





## Probe 100 mil Short Version F771

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 2,54 / 100    |
| <b>Current</b>          | 5,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 20 mOhm       |

### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 60      | 150           |
| 100     | 300           |

### Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 3,5               | 4,4      |
| Pointing Accuracy | ±0,08 mm |

### Materials and Plating

|            |                            |
|------------|----------------------------|
| Plunger    | see Tip Style              |
| Barrel     | Nickel silver, gold plated |
| Spring     | Music wire, silver plated  |
| Receptacle | Nickel silver, Gold plated |

### Accessories

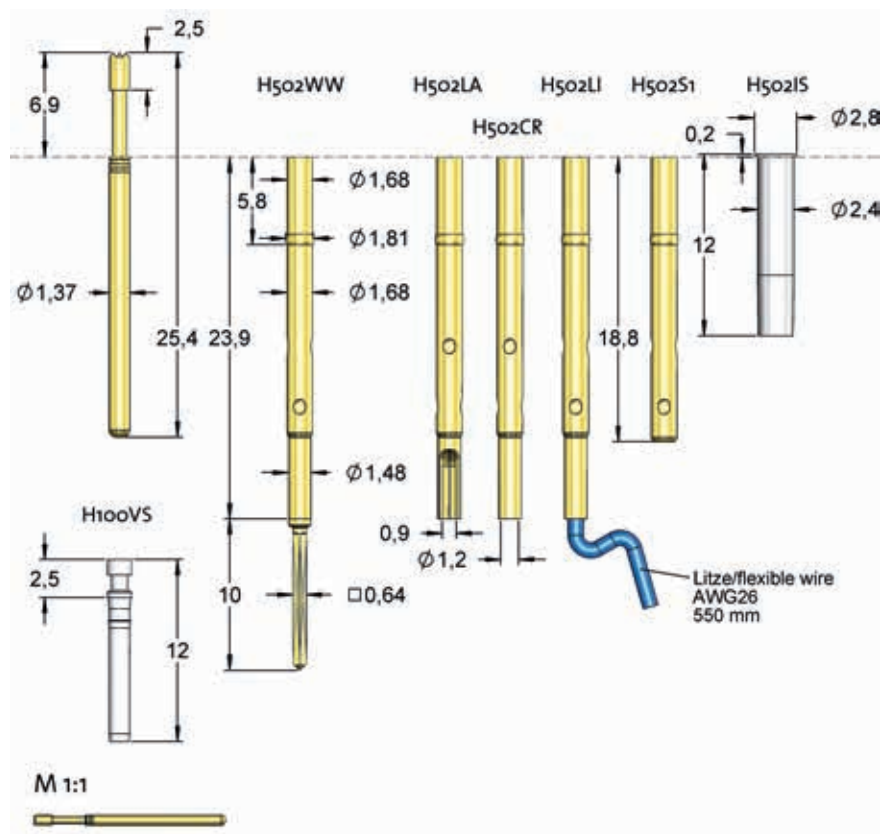
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-100EV |
| Insertion tool receptacle | FEWZ-100E0 |
| Insertion tool probe      | FDWZ-100   |
| Plug lock                 | H100VS     |

### Drill Size [mm]

|                     |             |
|---------------------|-------------|
| Press ring as stop  | 1,67 - 1,69 |
| Press ring inserted | 1,70 - 1,75 |

### Projection Height

|         |            |
|---------|------------|
| H502... | 6,9 - 12,7 |
|---------|------------|



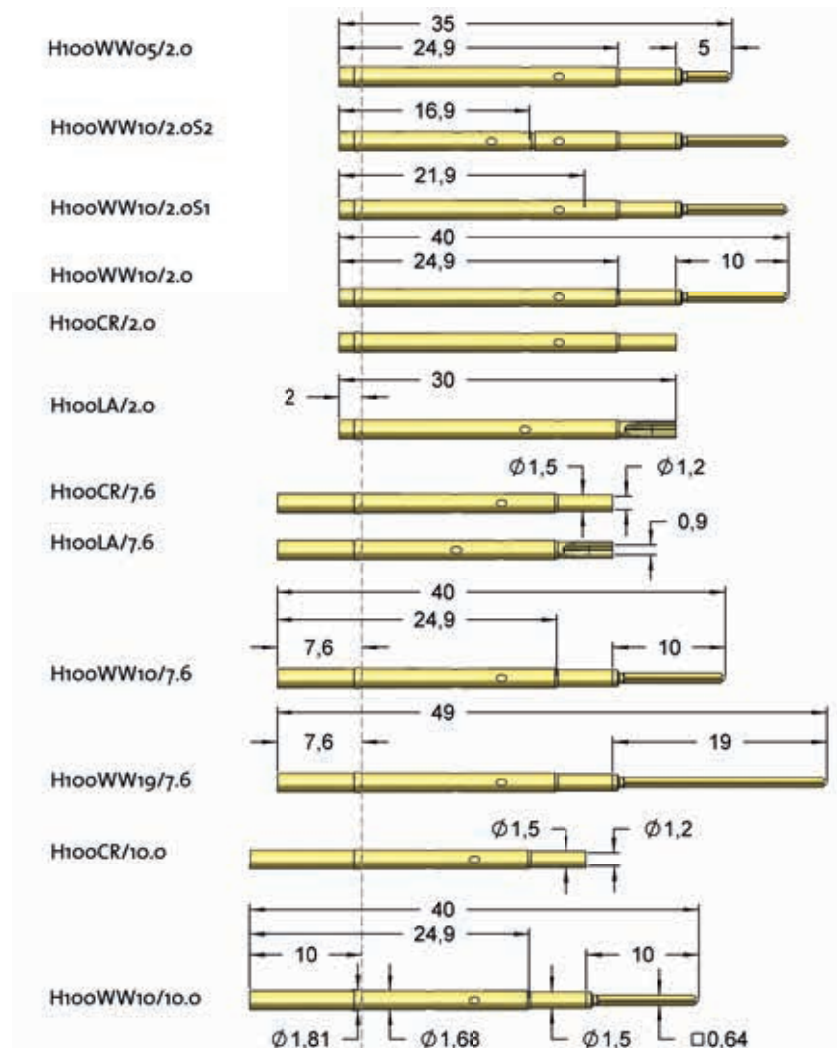
| Type                 | Tip-Ø                        | Spring Force |
|----------------------|------------------------------|--------------|
| F 771 06 B 180 G 150 |                              |              |
| Tip Style            | Material                     | Finish       |
| Material:            | B = BeCu                     |              |
| Tip-Ø:               | 180 = 1,8 mm (e.g.)          |              |
| Finish:              | G = Gold                     |              |
| Receptacle:          | Order Code according drawing |              |
| ORDER EXAMPLE        |                              |              |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 05     | B        | G       | 1,8     | -       |
|           | 06     | B        | G       | 1,3     | -       |
|           | 06     | B        | G       | 1,8     | -       |
|           | 11     | B        | G       | 0,65    | -       |
|           | 11     | B        | G       | 0,75    | -       |
|           | 14     | B        | G       | 1,8     | -       |
|           | 15     | B        | G       | 1,8     | -       |
|           | 17     | B        | G       | 1,8     | -       |

## Receptacles for 100 mil Centers

### H100

For probes F100, F588 and F585 different receptacles are available with different connection types (e.g. LA, CR, WW), different press ring positions and different wire-wrap posts. Adequate insertion tools are available. The right tool for flush insertion is **FEWZ-585E0**. The tools for fix projection heights are **FEWZ-100Exx**. For variable projection heights the tool **FEWZ-100EV** is appropriate. Plug locks **H100VS** can be used to close empty receptacles in order to prevent false assemblies and to avoid contamination. A special receptacle with spring loaded contact pin (**H100WL11/7.6**) enables wireless contacting of conductor paths. Additionally a receptacle with preassembled wire AWG26 is available as H100LI/7.6.



### Material and Plating

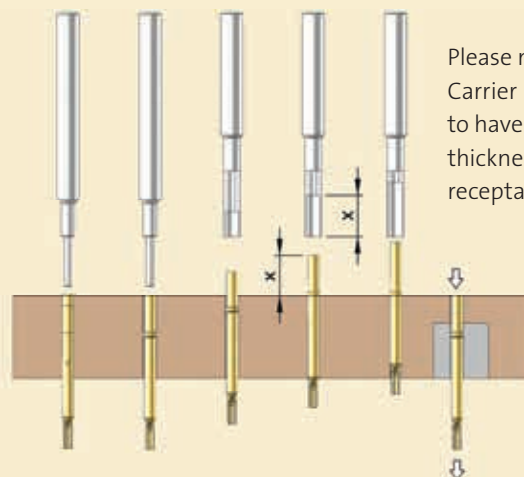
Nickel silver, gold plated

### Drill Size H100 (mm)

| Material                | press ring as stop | press ring inserted |
|-------------------------|--------------------|---------------------|
| EP 105 (CEM1, Trolitax) | 1,67-1,68          | 1,70-1,75           |
| HGW 2372.1 (FR4)        | 1,68-1,69          |                     |

Appropriate tools are available for each type of receptacle.

Please note: Carrier plates need to have a certain thickness to hold receptacles tight.



| Type                          | Length of Wire Wrap Pin |
|-------------------------------|-------------------------|
| H100                          | WW 10 / 7.6             |
| Connection Type:              | Press Ring Position     |
| CR = Crimp connection         |                         |
| LA = Solder connection        |                         |
| WW = Wire Wrap connection     |                         |
| LI = Stranded wire            |                         |
| WL = Spring loaded connection |                         |
| Length of Wire Wrap Pin:      | e.g. 10 = 10,0mm        |
| Press Ring Position:          | e.g. 7.6 = 7,6mm        |
| ORDER EXAMPLE                 |                         |

### Projection Height (mm)

|                     | H100.../10.0 | H100.../7.6 | H100.../2.0 | H100WW10/2.0S1 | H100WW10/2.0S2 |
|---------------------|--------------|-------------|-------------|----------------|----------------|
| F100 / F585         | 8,4 - 18,4   | 8,4 - 16,0  | 8,4 - 10,4  | 11,4 - 13,4    | 16,4 - 18,4    |
| F100...L / F585...L | 10,4 - 20,4  | 10,4 - 18,0 | 10,4 - 12,4 | 13,4 - 15,4    | 18,4 - 20,4    |
| F588...S            | 12,4 - 22,4  | 12,4 - 20,0 | 12,4 - 14,4 | 15,4 - 17,4    | 20,4 - 22,4    |
| F588                | 14,1 - 24,1  | 14,1 - 21,7 | 14,1 - 16,1 | 17,1 - 19,1    | 22,1 - 24,1    |



## Standard Probe 100 mil F100

|                         |                |
|-------------------------|----------------|
| <b>Centers (mm/mil)</b> | 2,54 / 100     |
| <b>Current</b>          | 5,0 A          |
| <b>Temperature</b>      | -20°C...+80°C, |
| <b>R typically</b>      | 30 mOhm        |

### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 30      | 60            |
| 80      | 100 HP        |
| 40      | 100           |
| 80      | 150           |
| 110     | 150 HP        |
| 80      | 200           |
| 130     | 200 HP        |
| 150     | 300           |
| 200     | 300 HP        |

### Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 4,3               | 6,4      |
| Pointing Accuracy | ±0,08 mm |

### Materials and Plating

|            |                            |
|------------|----------------------------|
| Plunger    | see Tip Style              |
| Barrel     | Nickel silver, gold plated |
| Spring     | Music wire, silver plated  |
| Receptacle | Nickel silver, Gold plated |

### Accessories

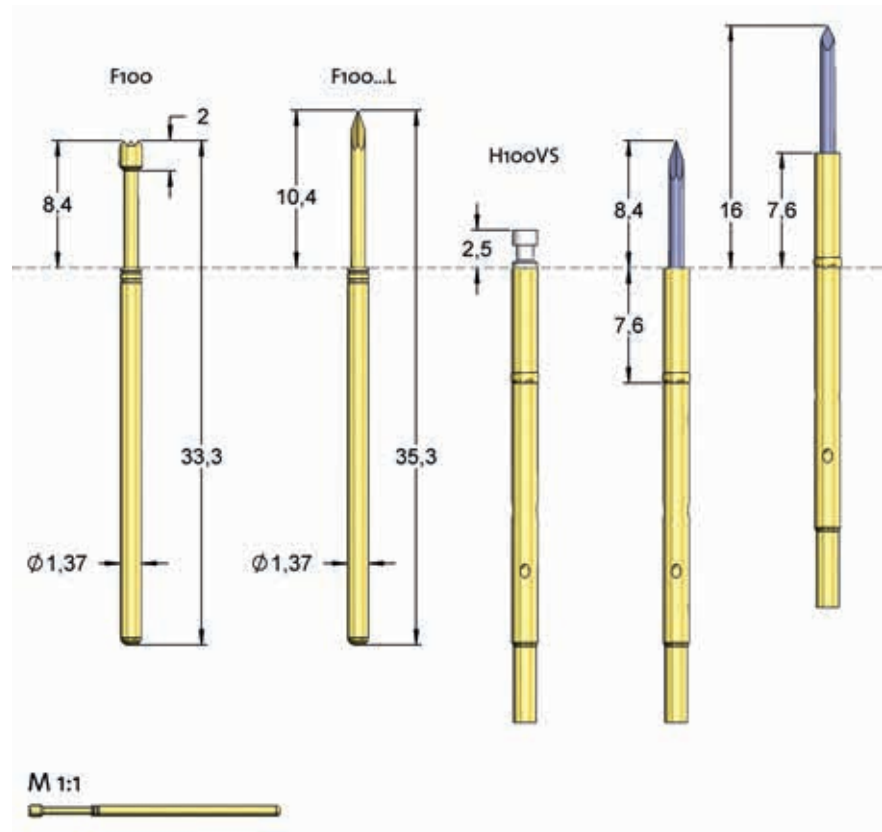
|                           |            |
|---------------------------|------------|
| Insertion tool probe      | FDWZ-100   |
| Insertion tool receptacle | FEWZ-100EV |
| Insertion tool receptacle | FEWZ-100E0 |
| Plug lock                 | H100VS     |

### Drill Size [mm]

|                     |             |
|---------------------|-------------|
| Press ring as stop  | 1,67 - 1,68 |
| Press ring inserted | 1,70 - 1,75 |

### Projection Height

|                           |             |
|---------------------------|-------------|
| (F100) H100.../10.0       | 8,4 - 18,4  |
| (F100) H100.../7.6        | 8,4 - 16,0  |
| (F100) H100.../2.0        | 8,4 - 10,4  |
| (F100) H100WW10/2.0S1     | 11,4 - 13,4 |
| (F100) H100WW10/2.0S2     | 16,4 - 18,4 |
| (F100...L) H100.../10.0   | 10,4 - 20,4 |
| (F100...L) H100.../7.6    | 10,4 - 18,0 |
| (F100...L) H100.../2.0    | 10,4 - 12,4 |
| (F100...L) H100WW10/2.0S1 | 13,4 - 15,4 |
| (F100...L) H100WW10/2.0S2 | 18,4 - 20,4 |



M 1:1



The F100 is the most common probe for 100 mil applications. Further receptacles see „Receptacles H100“. For contacting OSP coated boards the tip style 32 in Progressive Series version has been well established.

| Tip Style | Number | Material | Plating | Ø in mm | Version  |
|-----------|--------|----------|---------|---------|----------|
|           | 05     | B        | G       | 1,5     | -        |
|           | 06     | B        | G       | 1,5     | -        |
|           | 06     | B        | P       | 2,0     | HP       |
|           | 06     | B        | G       | 2,5     | -        |
|           | 06     | B        | G       | 3,1     | Mint-Pin |
|           | 07     | S        | L       | 1,5     | -        |
|           | 10     | S        | L       | 0,6     | RP       |
|           | 10     | S        | L       | 0,6     | -        |
|           | 10     | S        | P       | 0,6     | HPRP     |
|           | 11     | B        | G       | 0,5     | -        |
|           | 11     | B        | G       | 0,64    | -        |
|           | 11     | B        | G       | 0,9     | -        |
|           | 14     | B        | G       | 1,5     | -        |
|           | 14     | S        | L       | 1,3     | -        |
|           | 14     | S        | P       | 1,5     | HP / HPL |
|           | 15     | B        | G       | 1,9     | -        |
|           | 18     | B        | G       | 0,9     | -        |
|           | 21     | S        | L       | 0,9     | -        |
|           | 21     | S        | L       | 0,9     | L        |
|           | 21     | S        | P       | 0,9     | HP / HPL |

















## Standard Probe 100 mil

### F100

|                         |                |
|-------------------------|----------------|
| <b>Centers (mm/mil)</b> | 2,54 / 100     |
| <b>Current</b>          | 5,0 A          |
| <b>Temperature</b>      | -20°C...+80°C, |
| <b>R typically</b>      | 30 mOhm        |

| Type                    | Tip-Ø   | Spring Force           |
|-------------------------|---|------------------------|
| F 100 33 S 090 P 300 HP |   |                        |
| Tip Style               | Material  | Finish Special Version |
| Material:               | B = BeCu, S = Steel   |                        |
| Tip-Ø:                  | 090 = 0,9 mm (e.g.)   |                        |
| Finish:                 | G = Gold, L = Longtime Gold plated, P = Functional coating, N = Nickel, R = Rhodium   |                        |
| Special Version:        | B = „Banana Shaped“, H = High Temperatur, HP = Progressive Series, IK = Insulating cap, L = Long Version, RP = „Wobbling Plunger“ |                        |
| Switch Travel:          | 35 = 3,5 mm (deviating from standard)   |                        |
| Receptacle:             | Order Code according drawing  |                        |

ORDER EXAMPLE

| Tip Style   | Number | Material | Plating | Ø in mm | Version  |
|---|--------|----------|---------|---------|----------|
|  | 30     | B        | G       | 0,9     | -        |
|  | 32     | S        | P       | 0,9     | HP / HPL |
|  | 33     | S        | L       | 0,9     | L        |
|  | 33     | S        | P       | 0,9     | HP / HPL |
|  | 33     | S        | L       | 0,9     | -        |
|  | 35     | S        | L       | 1,5     | -        |
|  | 37     | S        | L       | 0,5     | -        |
|  | 37     | S        | L       | 0,5     | L        |
|  | 37     | S        | P       | 0,5     | HP       |
|  | 38     | S        | L       | 0,9     | -        |
|  | 38     | S        | L       | 0,9     | L        |
|  | 43     | S        | P       | 0,9     | HP / HPL |
|  | 43     | S        | L       | 0,9     | -        |
|  | 55     | B        | G       | 1,8     | -        |
|  | 62     | B        | G       | 0,9     | -        |
|  | 62     | S        | P       | 0,9     | HP / HPL |

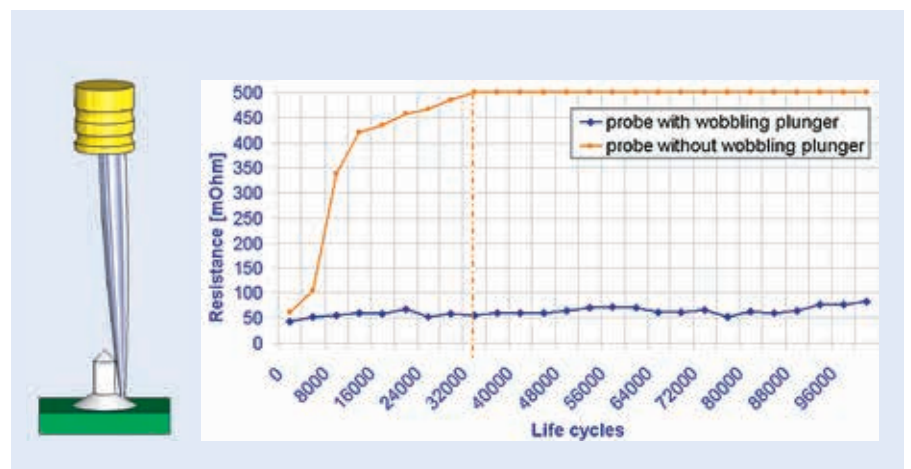
## Wobbling Plunger for Contacting Soldered Pins

### F100...RP

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 2,54 / 100    |
| <b>Current</b>          | 5,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 30 mOhm       |

| Type                      | Tip-Ø  | Spring Force           |
|---------------------------|--|------------------------|
| F 100 10 S 060 P 150 HPRP |  |                        |
| Tip Style                 | Material   | Finish Special Version |
| Material:                 | S = Steel  |                        |
| Tip-Ø:                    | 060 = 0,6 mm (e.g.)                              |                        |
| Finish:                   | L = Longtime Gold plated, P = Functional coating |                        |
| Special Version:          | RP = „Wobbling Plunger“, HP = Progressive Series |                        |

ORDER EXAMPLE



The deflection of a wobbling plunger substantially exceeds the function of the flexible needle. The special design of the plunger enables plunger deflections without notable abrasion. High level stress tests with plunger deflexion up to 0.8 mm have resulted in outstanding electrical performance and life time of the probe. The diagram shows the comparison to a conventional probe without wobbling plunger.





## Long Travel Probe 100 mil

### F588

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 2,54 / 100    |
| <b>Current</b>          | 5,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 50 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 80      | 180           |
| 110     | 300           |

#### Travel (mm)

| Nominal           | Maximum |
|-------------------|---------|
| 7,6               | 10,0    |
| 9,3               | 11,7    |
| Pointing Accuracy | ±0,1 mm |

#### Materials and Plating

|            |                            |
|------------|----------------------------|
| Plunger    | see Tip Style              |
| Barrel     | Nickel silver, gold plated |
| Spring     | Music wire, silver plated  |
| Receptacle | Nickel silver, Gold plated |

#### Accessories

|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-100EV |
| Insertion tool receptacle | FEWZ-100E0 |
| Insertion tool probe      | FDWZ-100   |
| Plug lock                 | H100VS     |

#### Drill Size [mm]

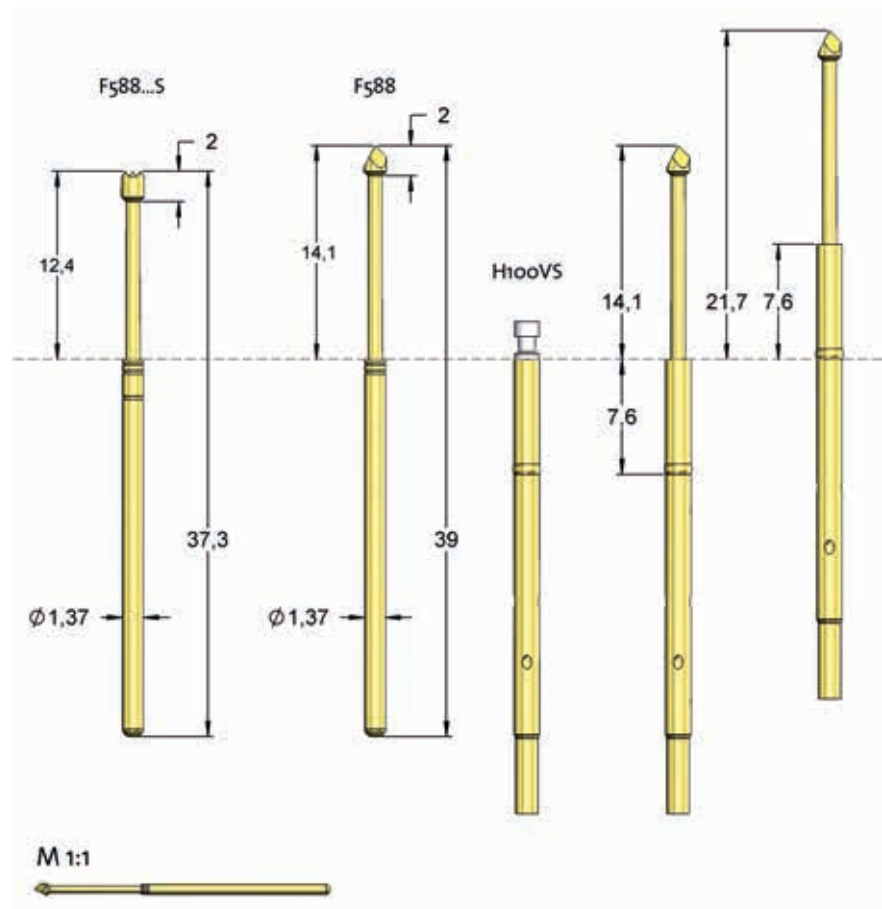
|                     |             |
|---------------------|-------------|
| Press ring as stop  | 1,67 - 1,69 |
| Press ring inserted | 1,70 - 1,75 |

#### Projection Height

|                           |             |
|---------------------------|-------------|
| (F588...S) H100.../10.0   | 12,4 - 22,4 |
| (F588...S) H100.../7.6    | 12,4 - 20,0 |
| (F588...S) H100.../2.0    | 12,4 - 14,4 |
| (F588...S) H100WW10/2.0S1 | 15,4 - 17,4 |
| (F588...S) H100WW10/2.0S2 | 20,4 - 22,4 |
| (F588) H100.../10.0       | 14,1 - 24,1 |
| (F588) H100.../7.6        | 14,1 - 21,7 |
| (F588) H100.../2.0        | 14,1 - 16,1 |
| (F588) H100WW10/2.0S1     | 17,1 - 19,1 |
| (F588) H100WW10/2.0S2     | 22,1 - 24,1 |

| Type                    | Tip-Ø   | Spring Force |
|-------------------------|---|--------------|
| F 588 33 S 090 P 300 HP |   |              |
| Tip Style               | Material  | Finish       |
| Material:               | B = BeCu, S = Steel   |              |
| Tip-Ø:                  | 090 = 0,9 mm (e.g.)   |              |
| Finish:                 | G = Gold, L = Longtime Gold plated, P = Functional coating      |              |
| Special Version:        | HP = Progressive Series, S = Short Version, IK = Insulating cap |              |
| Receptacle:             | Order Code according drawing                                    |              |

ORDER EXAMPLE



The F588 is the long travel version of the F100 and F585. These probes can be combined well in dual stage fixtures. Further receptacles see „Receptacles H100". All tip styles also available in short S-version with a slightly larger preload.

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 05     | B        | G       | 1,5     | -       |
|           | 06     | B        | G       | 1,5     | -       |
|           | 12     | B        | G       | 1,5     | -       |
|           | 15     | B        | G       | 1,5     | -       |
|           | 18     | B        | G       | 0,76    | -       |
|           | 21     | B        | L       | 0,9     | -       |
|           | 21     | S        | L       | 0,76    | -       |
|           | 21     | S        | L       | 0,9     | -       |
|           | 28     | B        | G       | 1,5     | -       |
|           | 30     | B        | G       | 0,76    | -       |
|           | 33     | S        | L       | 0,76    | -       |
|           | 33     | S        | L       | 0,9     | -       |
|           | 33     | S        | P       | 0,9     | HP      |
|           | 36     | S        | L       | 1,4     | -       |
|           | 38     | S        | L       | 0,9     | -       |
|           | 63     | B        | G       | 1,5     | -       |

## Standard Probe 100 mil Robust Version

### F772

|                         |                |
|-------------------------|----------------|
| <b>Centers (mm/mil)</b> | 2,54 / 100     |
| <b>Current</b>          | 5,0 A          |
| <b>Temperature</b>      | -20°C...+80°C, |
| <b>R typically</b>      | 25 mOhm        |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 60      | 150           |
| 60      | 220           |
| 60      | 300           |
| 200     | 300 HP        |

#### Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 4,0               | 5,0      |
| Pointing Accuracy | ±0,08 mm |

#### Materials and Plating

|            |                            |
|------------|----------------------------|
| Plunger    | see Tip Style              |
| Barrel     | Nickel silver, gold plated |
| Spring     | Music wire, silver plated  |
| Receptacle | Nickel silver, Gold plated |

#### Accessories

|                           |             |
|---------------------------|-------------|
| Insertion tool probe      | FDWZ-100    |
| Insertion tool receptacle | FEWZ-772EV  |
| Insertion tool receptacle | FEWZ-772E0  |
| Plug lock                 | H772VS      |
| Spacers                   | see page 10 |

#### Drill Size [mm]

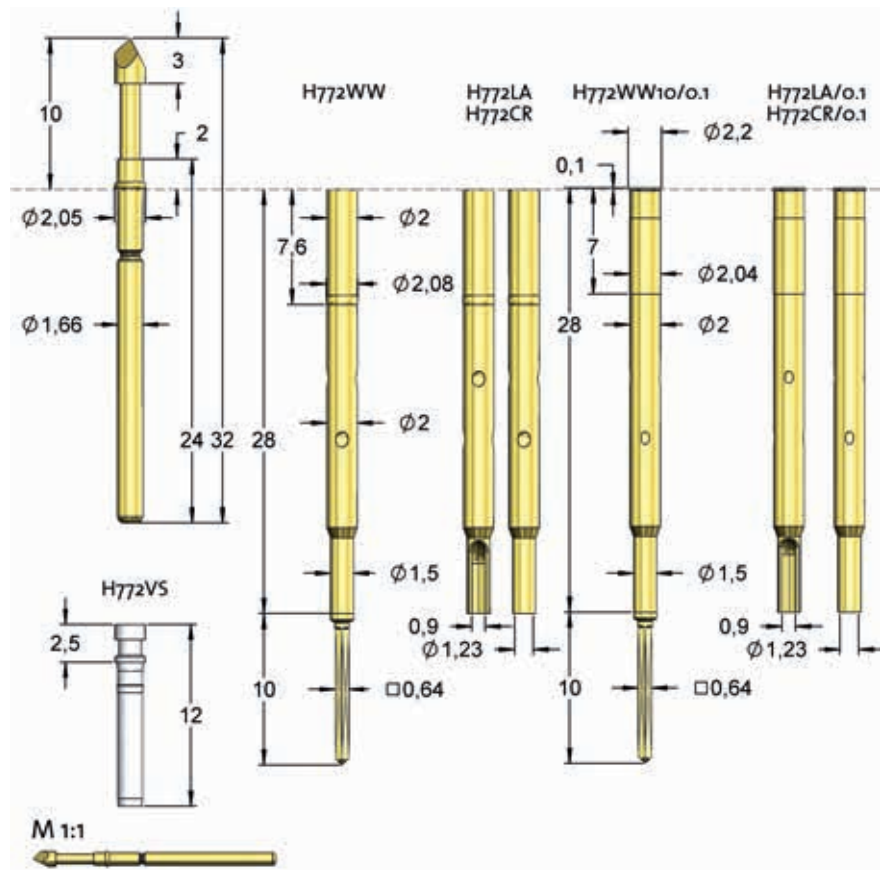
|                          |             |
|--------------------------|-------------|
| H772 Press ring as stop  | 1,99 - 2,00 |
| H772 Press ring inserted | 2,03 - 2,05 |
| H772 with collar         | 2,02 - 2,03 |

#### Projection Height

|             |             |
|-------------|-------------|
| H772...     | 10,0 - 17,6 |
| H772.../0.1 | 10,1        |

| Type             | Tip-Ø   | Spring Force |
|------------------|---|--------------|
| F772             | 33  | S            |
|                  | 130   | P            |
|                  |   | 300          |
|                  |   | HP           |
| Tip Style        | Material  | Finish       |
| Material:        | B = BeCu, S = Steel   |              |
| Tip-Ø:           | 090 = 0,9 mm (e.g.)   |              |
| Finish:          | G = Gold, L = Longtime Gold plated, P = Functional coating, R = Rhodium, N = Nickel                                   |              |
| Special Version: | B = „Banana Shaped“, H = High Temperatur, HP = Progressive Series, IK = Insulating cap, E13 = Projection Height 13 mm |              |
| Receptacle:      | Order Code according drawing  |              |

ORDER EXAMPLE



High temperature versions or further projection heights available on request.

| Tip Style | Number | Material | Plating | Ø in mm         | Version |
|-----------|--------|----------|---------|-----------------|---------|
|           | 03     | B        | G       | 1,3             | -       |
|           | 05     | B        | G       | 1,8 / 2,0 / 2,5 | -       |
|           | 06     | B        | G       | 3,0 / 4,0       | -       |
|           | 07     | B        | G       | 1,5/1,8/2,0/2,5 | -       |
|           | 10     | S        | L       | 1,75 / 2,0      | -       |
|           | 11     | S        | N       | 0,63            | -       |
|           | 12     | B        | G       | 0,7 / 1,3       | -       |
|           | 14     | B        | G       | 1,5 / 2,0       | -       |
|           | 15     | S        | L       | 2,0             | -       |
|           | 17     | B        | G       | 2,0             | -       |
|           | 18     | B        | G       | 2,0 / 3,0       | -       |
|           | 18     | B        | G       | 1,3             | -       |
|           | 18     | S        | N       | 0,8             | -       |
|           | 21     | S        | L       | 1,3             | -       |
|           | 28     | B        | G       | 2,0             | -       |
|           | 30     | B        | G       | 1,3             | -       |
|           | 32     | S        | N       | 0,8             | -       |
|           | 33     | S        | P       | 1,3             | HP      |
|           | 33     | S        | L       | 1,3             | -       |
|           | 33     | S        | R       | 1,3             | -       |



## Long Travel Probe 100 mil Robust Version

### F786

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 2,54 / 100    |
| <b>Current</b>          | 5,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 25 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 60      | 150           |
| 60      | 300           |
| 180     | 300 HP        |
| 180     | 500 HP        |

#### Travel (mm)

| Nominal           | Maximum |
|-------------------|---------|
| 6,4               | 8,0     |
| Pointing Accuracy | ±0,1 mm |

#### Materials and Plating

|            |                            |
|------------|----------------------------|
| Plunger    | see Tip Style              |
| Barrel     | Nickel silver, gold plated |
| Spring     | Music wire, silver plated  |
| Receptacle | Nickel silver, Gold plated |

#### Accessories

|                           |             |
|---------------------------|-------------|
| Insertion tool receptacle | FEWZ-772EV  |
| Insertion tool receptacle | FEWZ-772E0  |
| Insertion tool probe      | FDWZ-100    |
| Plug lock                 | H772VS      |
| Spacers                   | see page 10 |

#### Drill Size [mm]

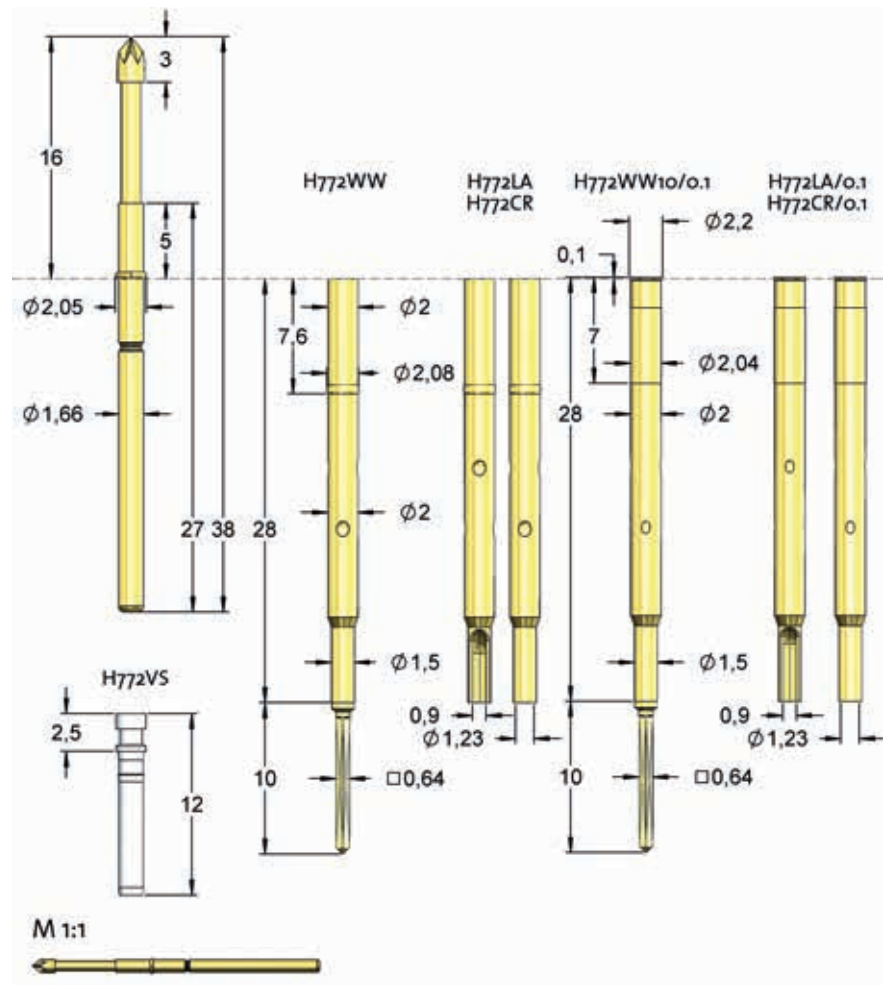
|                          |             |
|--------------------------|-------------|
| H772 Press ring as stop  | 1,99 - 2,00 |
| H772 Press ring inserted | 2,03 - 2,05 |
| H772 with collar         | 2,02 - 2,03 |

#### Projection Height

|             |             |
|-------------|-------------|
| H772...     | 16,0 - 23,6 |
| H772.../0.1 | 16,1        |

| Type                    | Tip-Ø  | Spring Force           |
|-------------------------|--|------------------------|
| F 786 33 S 130 P 300 HP |  |                        |
| Tip Style               | Material   | Finish Special Version |
| Material:               | B = BeCu, S = Steel, K = Synthetic   |                        |
| Tip-Ø:                  | 130 = 1,3 mm (e.g.)  |                        |
| Finish:                 | G = Gold, L = Longtime Gold plated, P = Functional coating, N = Nickel, U = Unplated |                        |
| Special Version:        | B = „Banana Shaped“, IK = Insulating cap, HP = Progressive Series                    |                        |
| Receptacle:             | Order Code according drawing   |                        |

ORDER EXAMPLE



The F786 is the long travel version of the F772. These probes can be combined well in dual stage fixtures.

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 04     | B        | G       | 2,0     | -       |
|           | 05     | B        | G       | 1,3     | -       |
|           | 06     | B        | G       | 2,0     | -       |
|           | 06     | B        | G       | 4,5     | -       |
|           | 07     | S        | L       | 1,8     | -       |
|           | 07     | S        | L       | 2,0     | -       |
|           | 11     | B        | G       | 1,3     | -       |
|           | 14     | S        | L       | 2,0     | -       |
|           | 15     | B        | G       | 2,0     | -       |
|           | 18     | B        | G       | 1,3     | -       |
|           | 21     | S        | L       | 1,3     | -       |
|           | 32     | S        | L       | 0,8     | -       |
|           | 32     | S        | N       | 0,8     | -       |
|           | 33     | S        | P       | 1,3     | HP      |
|           | 33     | S        | L       | 1,3     | -       |
|           | 38     | S        | L       | 1,3     | -       |
|           | 63     | S        | L       | 2,0     | -       |

## Long Travel Probe 100 mil Robust Version

F797

|                              |               |
|------------------------------|---------------|
| <b>Centers (mm/mil)</b>      | 2,54 / 100    |
| <b>Current</b>               | 5,0 A         |
| <b>Temperature</b>           | -20°C...+80°C |
| <b>R<sub>typically</sub></b> | 25 mOhm       |

**Spring Force (cN  $\pm 20\%$ )**

| Preload | Nominal Force |
|---------|---------------|
| 60      | 150           |
| 60      | 300           |

## Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 8,0               | 10,0     |
| Pointing Accuracy | ±0,18 mm |

## Materials and Plating

|            |                            |
|------------|----------------------------|
| Plunger    | see Tip Style              |
| Barrel     | Nickel silver, gold plated |
| Spring     | Music wire, silver plated  |
| Receptable | Nickel silver, Gold plated |

## Accessories

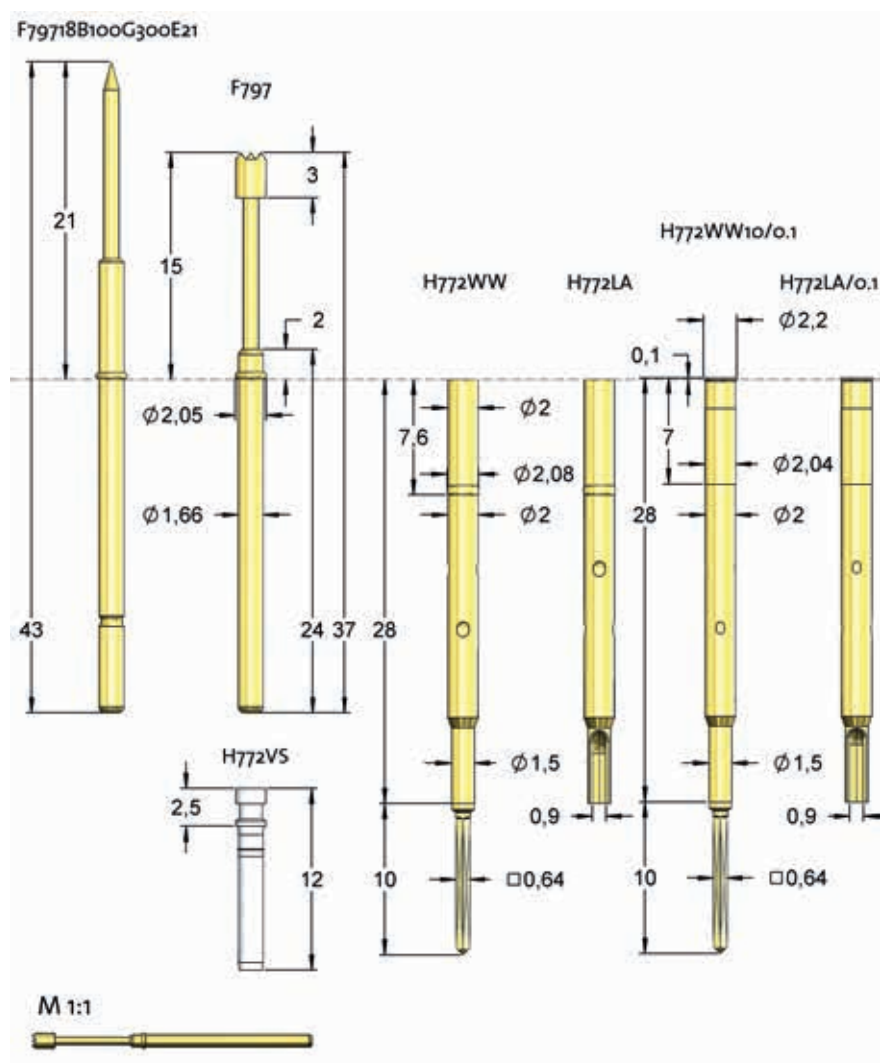
|                           |             |
|---------------------------|-------------|
| Insertion tool receptacle | FEWZ-772EV  |
| Insertion tool receptacle | FEWZ-772E0  |
| Insertion tool probe      | FDWZ-100    |
| Plug lock                 | H772VS      |
| Spacers                   | see page 10 |

## Drill Size [mm]

|                          |             |
|--------------------------|-------------|
| H772 Press ring as stop  | 1,99 - 2,00 |
| H772 Press ring inserted | 2,03 - 2,05 |
| H772 with collar         | 2,02 - 2,03 |

### Projection Height

|             |             |
|-------------|-------------|
| H772...     | 15,0 - 22,6 |
| H772.../0.1 | 15.1        |



The F797 is the long travel version of the F772. These probes can be combined well in dual stage fixtures.







| Type            | Tip-Ø    | Spring Force |
|-----------------|----------|--------------|
| F 797           | 18       | B            |
| 100             | G        | 300          |
| E21             |          |              |
| Tip Style       | Material | Finish       |
| Special Version |          |              |

|                  |   |
|------------------|---|
| Material:        | B = BeCu, S = Steel                                   |
| Tip-Ø:           | 100 = 1,0 mm (e.g.)                                   |
| Finish:          | G = Gold, L = Longtime Gold plated                    |
| Special Version: | IK = Insulating cap,<br>E21 = Projection Height 21 mm |
| Receptacle:      | Order Code according drawing                          |

## ORDER EXAMPLE

| Tip Style   | Number | Material | Plating | Ø in mm | Version |
|---|--------|----------|---------|---------|---------|
|  | 03     | B        | G       | 1,0     | -       |
|  | 06     | B        | G       | 2,0     | -       |
|  | 14     | S        | L       | 2,0     | -       |
|  | 15     | B        | G       | 2,0     | -       |
|  | 16     | B        | G       | 1,0     | -       |
|  | 18     | B        | G       | 1,0     | -       |
|  | 29     | B        | G       | 1,0     | -       |





## For Heavy Mechanical Load

### F563

|                         |                |
|-------------------------|----------------|
| <b>Centers (mm/mil)</b> | 3,18 / 125     |
| <b>Current</b>          | 6,0 A          |
| <b>Temperature</b>      | -40°C...+250°C |
| <b>R typically</b>      | 50 mOhm        |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 90      | 180           |
| 140     | 180 HP        |
| 130     | 250           |
| 180     | 300           |

#### Travel (mm)

| Nominal           | Maximum |
|-------------------|---------|
| 4,3               | 6,4     |
| Pointing Accuracy | ±0,1 mm |

#### Materials and Plating

|            |                            |
|------------|----------------------------|
| Plunger    | see Tip Style              |
| Barrel     | Bronze, gold plated        |
| Spring     | Stainless steel, unplated  |
| Receptacle | Nickel silver, Gold plated |

#### Accessories

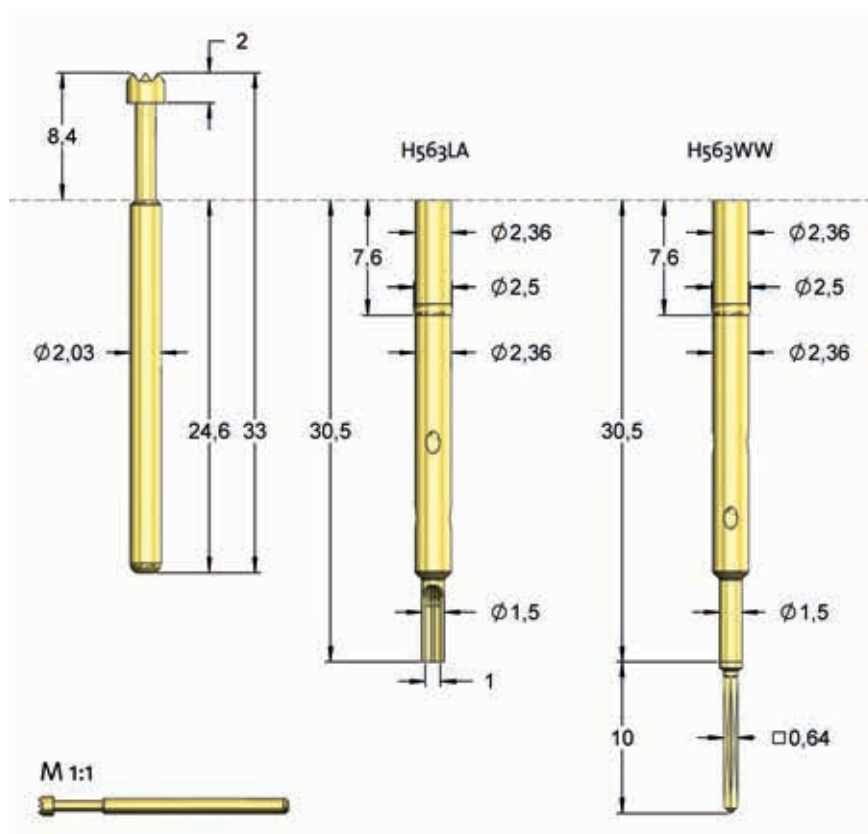
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-563E0 |
| Insertion tool probe      | FDWZ-100   |

#### Drill Size [mm]

|                     |             |
|---------------------|-------------|
| Press ring as stop  | 2,34 - 2,35 |
| Press ring inserted | 2,40 - 2,45 |

#### Projection Height

|         |            |
|---------|------------|
| H563... | 8,4 - 16,0 |
|---------|------------|



| Type                    | Tip-Ø                        | Spring Force |
|-------------------------|------------------------------|--------------|
| F 563 06 B 250 G 180 HP |                              |              |
| Tip Style               | Material                     | Finish       |
| Material:               | B = BeCu                     |              |
| Tip-Ø:                  | 250 = 2,5 mm (e.g.)          |              |
| Finish:                 | G = Gold                     |              |
| Special Version:        | HP = Progressive Series      |              |
| Receptacle:             | Order Code according drawing |              |

ORDER EXAMPLE

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 05     | B        | G       | 1,7     | -       |
|           | 05     | B        | G       | 2,5     | -       |
|           | 06     | B        | G       | 2,5     | -       |
|           | 06     | B        | G       | 2,5     | HP      |
|           | 06     | B        | G       | 4,0     | -       |
|           | 11     | B        | G       | 1,3     | -       |
|           | 12     | B        | G       | 1,7     | -       |
|           | 12     | B        | G       | 2,5     | -       |
|           | 14     | B        | G       | 2,5     | -       |
|           | 15     | B        | G       | 3,0     | -       |
|           | 18     | B        | G       | 1,3     | -       |

For Heavy Mechanical Load  
**F564**

|                  |               |
|------------------|---------------|
| Centers (mm/mil) | 3,18 / 125    |
| Current          | 7,0 A         |
| Temperature      | -20°C...+80°C |
| R typically      | 50 mOhm       |

Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 60      | 135           |

Travel (mm)

| Nominal           | Maximum |
|-------------------|---------|
| 4,2               | 6,4     |
| Pointing Accuracy | ±0,1 mm |

Materials and Plating

|            |                              |
|------------|------------------------------|
| Plunger    | see Tip Style                |
| Barrel     | Nickel silver, gold plated   |
| Spring     | Stainless steel, gold plated |
| Receptacle | Nickel silver, Gold plated   |

Accessories

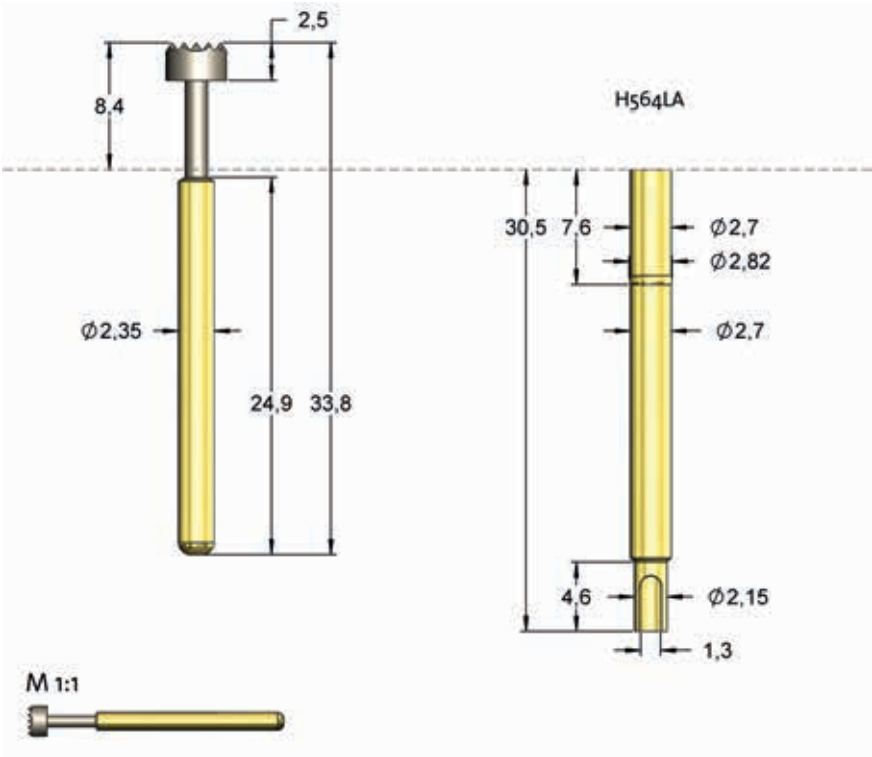
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-564E0 |
| Insertion tool probe      | FDWZ-100   |

Drill Size [mm]

|                     |             |
|---------------------|-------------|
| Press ring as stop  | 2,67 - 2,68 |
| Press ring inserted | 2,75 - 2,78 |

Projection Height

|         |            |
|---------|------------|
| H564... | 8,4 - 16,0 |
|---------|------------|



| Type                 | Tip-Ø                        |        | Spring Force    |
|----------------------|------------------------------|--------|-----------------|
| F 564 06 B 400 R 135 |                              |        |                 |
| Tip Style            | Material                     | Finish | Special Version |
| Material:            | B = BeCu                     |        |                 |
| Tip-Ø:               | 400 = 4,0 mm (e.g.)          |        |                 |
| Finish:              | R = Rhodium                  |        |                 |
| Receptacle:          | Order Code according drawing |        |                 |
| ORDER EXAMPLE        |                              |        |                 |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 06     | B        | R       | 4,0     | -       |
|           | 11     | B        | R       | 1,55    | -       |
|           | 12     | B        | R       | 2,4     | -       |
|           | 16     | B        | R       | 1,55    | -       |
|           | 17     | B        | R       | 4,0     | -       |
|           | 18     | B        | R       | 1,55    | -       |



## Probe 138 mil Robust Version

### F773

|                         |                |
|-------------------------|----------------|
| <b>Centers (mm/mil)</b> | 3,50 / 138     |
| <b>Current</b>          | 10,0 A         |
| <b>Temperature</b>      | -20°C...+80°C, |
| <b>R typically</b>      | 25 mOhm        |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 50      | 150           |
| 40      | 150           |
| 30      | 220           |
| 80      | 300           |
| 70      | 300           |
| 100     | 400           |

#### Travel (mm)

| Nominal           | Maximum |
|-------------------|---------|
| 4,0               | 5,0     |
| Pointing Accuracy | ±0,1 mm |

#### Materials and Plating

|            |                            |
|------------|----------------------------|
| Plunger    | see Tip Style              |
| Barrel     | Bronze, gold plated        |
| Spring     | Music wire, silver plated  |
| Receptacle | Nickel silver, Gold plated |

#### Accessories

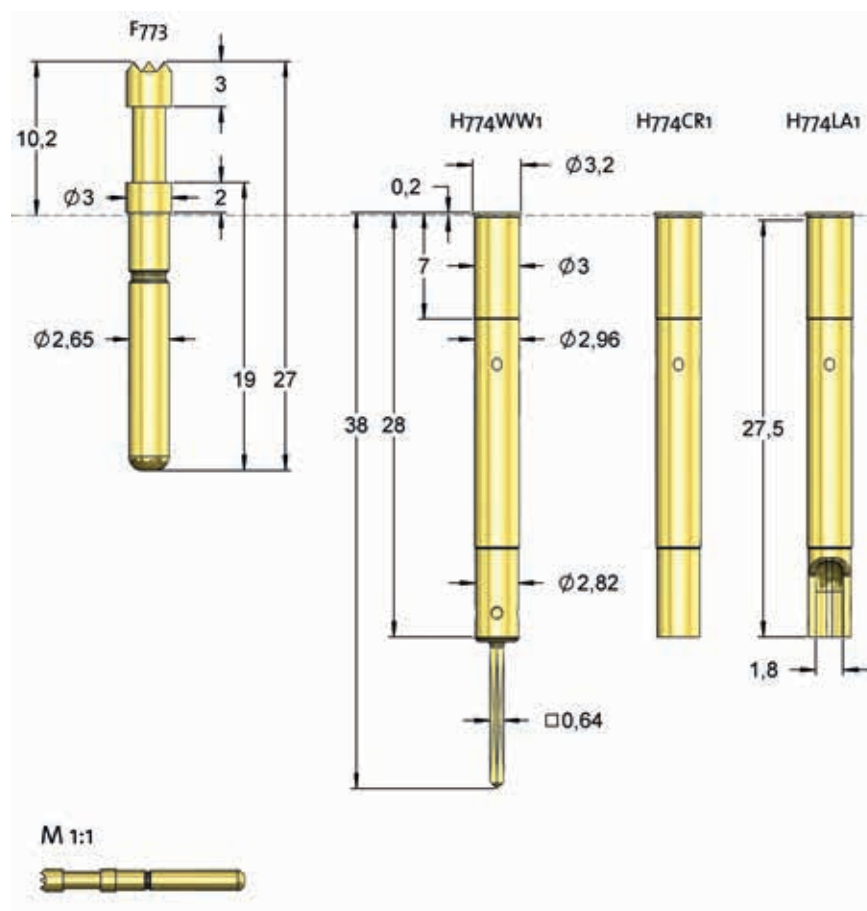
|                           |             |
|---------------------------|-------------|
| Insertion tool receptacle | FEWZ-774E0  |
| Insertion tool probe      | FDWZ-100    |
| Spacers                   | see page 10 |

#### Drill Size [mm]

|         |             |
|---------|-------------|
| H774... | 2,98 - 2,99 |
|---------|-------------|

#### Projection Height

|         |      |
|---------|------|
| H774... | 10,2 |
|---------|------|



High temperature version available on request. Special version with stainless steel plunger available as F77312E230U150.

| Type             | Tip-Ø  | Spring Force |
|------------------|--|--------------|
| F 773            | 12   | B 300        |
|                  |  | G 300        |
|                  |  | H            |
| Tip Style        | Material   | Finish       |
| Material:        | B = BeCu, S = Steel, E = Stainless Steel           |              |
| Tip-Ø:           | 300 = 3,0 mm (e.g.)                                |              |
| Finish:          | G = Gold, L = Longtime Gold plated, U = Unplated   |              |
| Special Version: | H = High Temperatur, E20 = Projection Height 20 mm |              |
| Receptacle:      | Order Code according drawing                       |              |

ORDER EXAMPLE

| Tip Style | Number | Material | Plating | Ø in mm         | Version |
|-----------|--------|----------|---------|-----------------|---------|
|           | 04     | B        | G       | 2,3             | -       |
|           | 05     | B        | G       | 2,3             | -       |
|           | 06     | B        | G       | 2,3 / 3,0 / 4,0 | -       |
|           | 07     | S        | L       | 2,3 / 4,0       | -       |
|           | 09     | S        | L       | 2,3             | -       |
|           | 11     | B        | G       | 1,8             | -       |
|           | 12     | B        | G       | 2,3 / 3,0       | -       |
|           | 14     | S        | L       | 2,3             | -       |
|           | 15     | B        | G       | 2,3 / 3,0       | -       |
|           | 16     | B        | G       | 1,4 / 1,8       | -       |
|           | 17     | B        | G       | 2,3 / 3,0       | -       |
|           | 18     | B        | G       | 1,8             | -       |

Long Travel Probe 138 mil  
Robust Version

F796

|                  |               |
|------------------|---------------|
| Centers (mm/mil) | 3,50 / 138    |
| Current          | 10,0 A        |
| Temperature      | -20°C...+80°C |
| R typically      | 25 mOhm       |

Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 60      | 150           |
| 80      | 300           |

Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 8,0               | 10,0     |
| Pointing Accuracy | ±0,13 mm |

Materials and Plating

|            |                            |
|------------|----------------------------|
| Plunger    | see Tip Style              |
| Barrel     | Bronze, gold plated        |
| Spring     | Music wire, silver plated  |
| Receptacle | Nickel silver, Gold plated |

Accessories

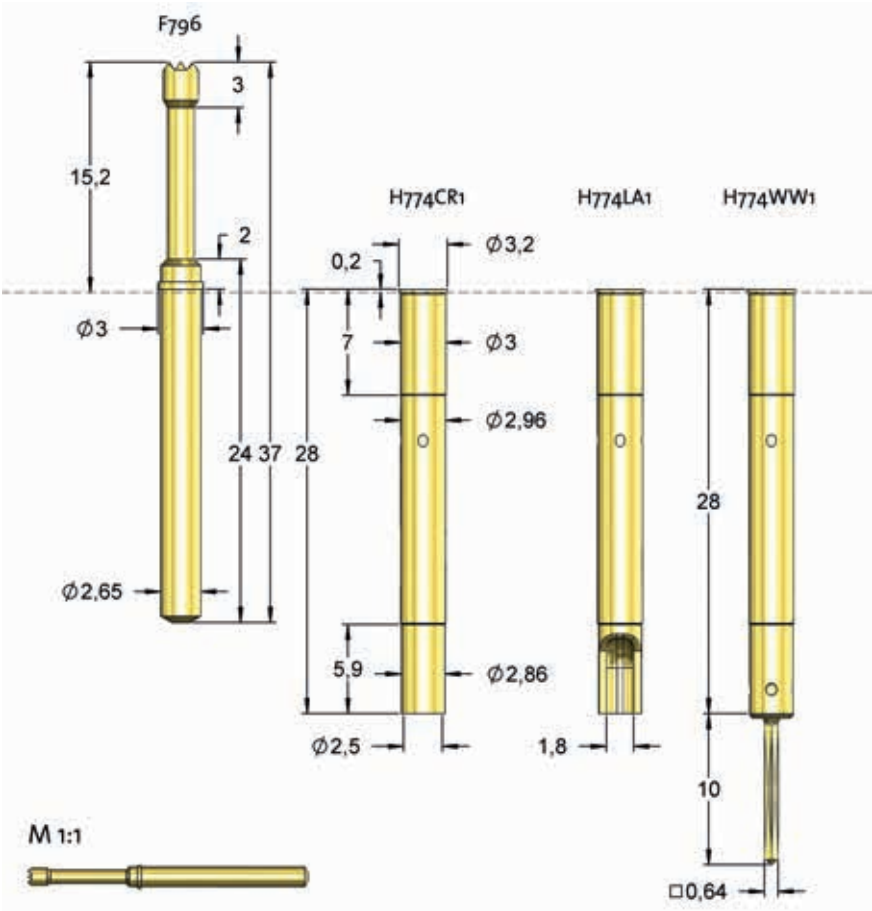
|                           |             |
|---------------------------|-------------|
| Insertion tool receptacle | FEWZ-774E0  |
| Insertion tool probe      | FDWZ-100    |
| Spacers                   | see page 10 |

Drill Size [mm]

|      |             |
|------|-------------|
| H774 | 2,98 - 2,99 |
|------|-------------|

Projection Height

|      |      |
|------|------|
| H774 | 15,2 |
|------|------|



The F796 is the long travel version of the F773. These probes can be combined well in dual stage fixtures.

| Type                 | Tip-Ø                        | Spring Force           |
|----------------------|------------------------------|------------------------|
| F 796 06 B 230 G 300 |                              |                        |
| Tip Style            | Material                     | Finish Special Version |
| Material:            | B = BeCu                     |                        |
| Tip-Ø:               | 230 = 2,3 mm (e.g.)          |                        |
| Finish:              | G = Gold                     |                        |
| Receptacle:          | Order Code according drawing |                        |
| ORDER EXAMPLE        |                              |                        |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 06     | B        | G       | 2,3     | -       |
|           | 11     | B        | G       | 1,76    | -       |
|           | 12     | B        | G       | 2,3     | -       |
|           | 14     | B        | G       | 2,3     | -       |



## Long Travel Probe 138 mil Robust Version

### F785

|                  |               |
|------------------|---------------|
| Centers (mm/mil) | 3,50 / 138    |
| Current          | 10,0 A        |
| Temperature      | -20°C...+80°C |
| R typically      | 25 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 80      | 150           |
| 80      | 300           |

#### Travel (mm)

| Nominal           | Maximum |
|-------------------|---------|
| 6,4               | 8,0     |
| Pointing Accuracy | ±0,1 mm |

#### Materials and Plating

|            |                            |
|------------|----------------------------|
| Plunger    | see Tip Style              |
| Barrel     | Bronze, gold plated        |
| Spring     | Music wire, silver plated  |
| Receptacle | Nickel silver, Gold plated |

#### Accessories

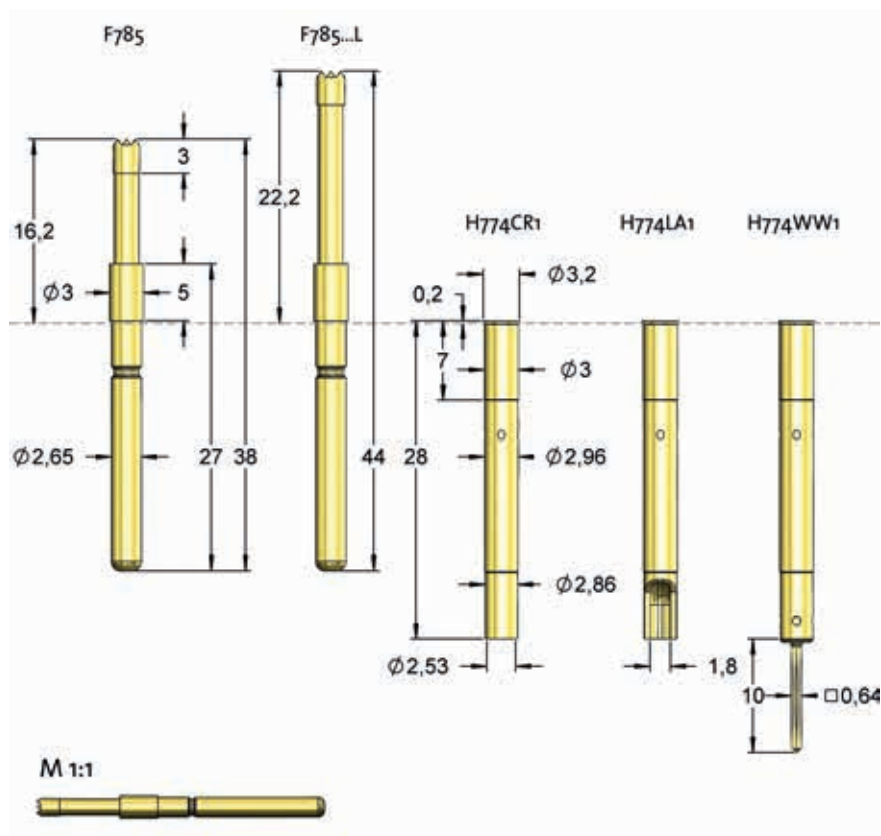
|                           |             |
|---------------------------|-------------|
| Insertion tool receptacle | FEWZ-774E0  |
| Insertion tool probe      | FDWZ-100    |
| Spacers                   | see page 10 |

#### Drill Size [mm]

|         |             |
|---------|-------------|
| H774... | 2,98 - 2,99 |
|---------|-------------|

#### Projection Height

|                    |      |
|--------------------|------|
| (F785) H774...     | 16,2 |
| (F785...L) H774... | 22,2 |



| Type                   | Tip-Ø                              | Spring Force |
|------------------------|------------------------------------|--------------|
| F 785 06 B 250 G 300 L |                                    |              |
| Tip Style              | Material                           | Finish       |
| Material:              | B = BeCu, S = Steel                |              |
| Tip-Ø:                 | 250 = 2,5 mm (e.g.)                |              |
| Finish:                | G = Gold, L = Longtime Gold plated |              |
| Special Version:       | L = Long Version                   |              |
| Receptacle:            | Order Code according drawing       |              |
| ORDER EXAMPLE          |                                    |              |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 01     | S        | L       | 2,0     | -       |
|           | 06     | B        | G       | 1,2     | L       |
|           | 06     | B        | G       | 2,3     | -       |
|           | 06     | B        | G       | 2,5     | L       |
|           | 06     | B        | G       | 3,5     | L       |
|           | 14     | S        | L       | 2,3     | -       |
|           | 14     | S        | L       | 2,3     | L       |



For Heavy Mechanical Load

F566

|                  |                |
|------------------|----------------|
| Centers (mm/mil) | 4,50 / 177     |
| Current          | 8,0 A          |
| Temperature      | -20°C...+150°C |
| R typically      | 50 mOhm        |

Spring Force (cN ±20%)

|         |               |
|---------|---------------|
| Preload | Nominal Force |
| 175     | 450           |

Travel (mm)

|                   |         |
|-------------------|---------|
| Nominal           | Maximum |
| 4,2               | 6,4     |
| Pointing Accuracy | ±0,1 mm |

Materials and Plating

|            |                            |
|------------|----------------------------|
| Plunger    | see Tip Style              |
| Barrel     | Nickel silver, gold plated |
| Spring     | Stainless steel, unplated  |
| Receptacle | Nickel silver, Gold plated |

Accessories

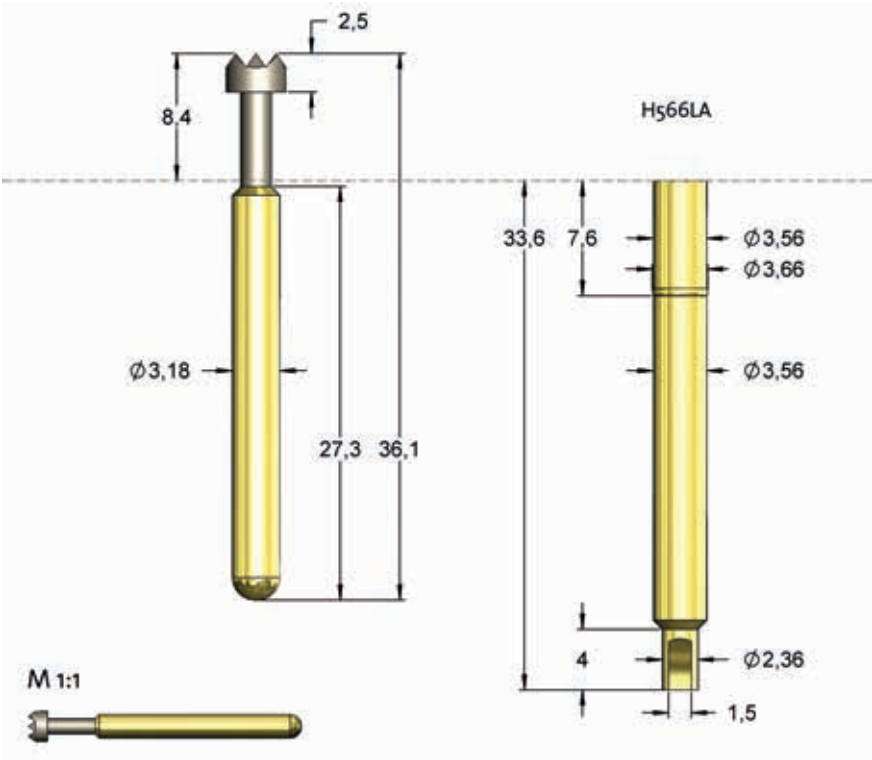
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-774E0 |
| Insertion tool probe      | FDWZ-100   |

Drill Size [mm]

|                     |             |
|---------------------|-------------|
| Press ring as stop  | 3,54 - 3,55 |
| Press ring inserted | 3,58 - 3,63 |

Projection Height

|         |            |
|---------|------------|
| H566... | 8,4 - 16,0 |
|---------|------------|



| Type                 | Tip-Ø                        | Spring Force |
|----------------------|------------------------------|--------------|
| F 566 06 B 400 R 450 |                              |              |
| Tip Style            | Material                     | Finish       |
| Material:            | B = BeCu                     |              |
| Tip-Ø:               | 400 = 4,0 mm (e.g.)          |              |
| Finish:              | G = Gold, R = Rhodium        |              |
| Special Version:     | H = High Temperatur          |              |
| Receptacle:          | Order Code according drawing |              |
| ORDER EXAMPLE        |                              |              |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 05     | B        | R       | 4,0     | -       |
|           | 06     | B        | R       | 4,0     | -       |
|           | 18     | B        | R       | 2,0     | -       |



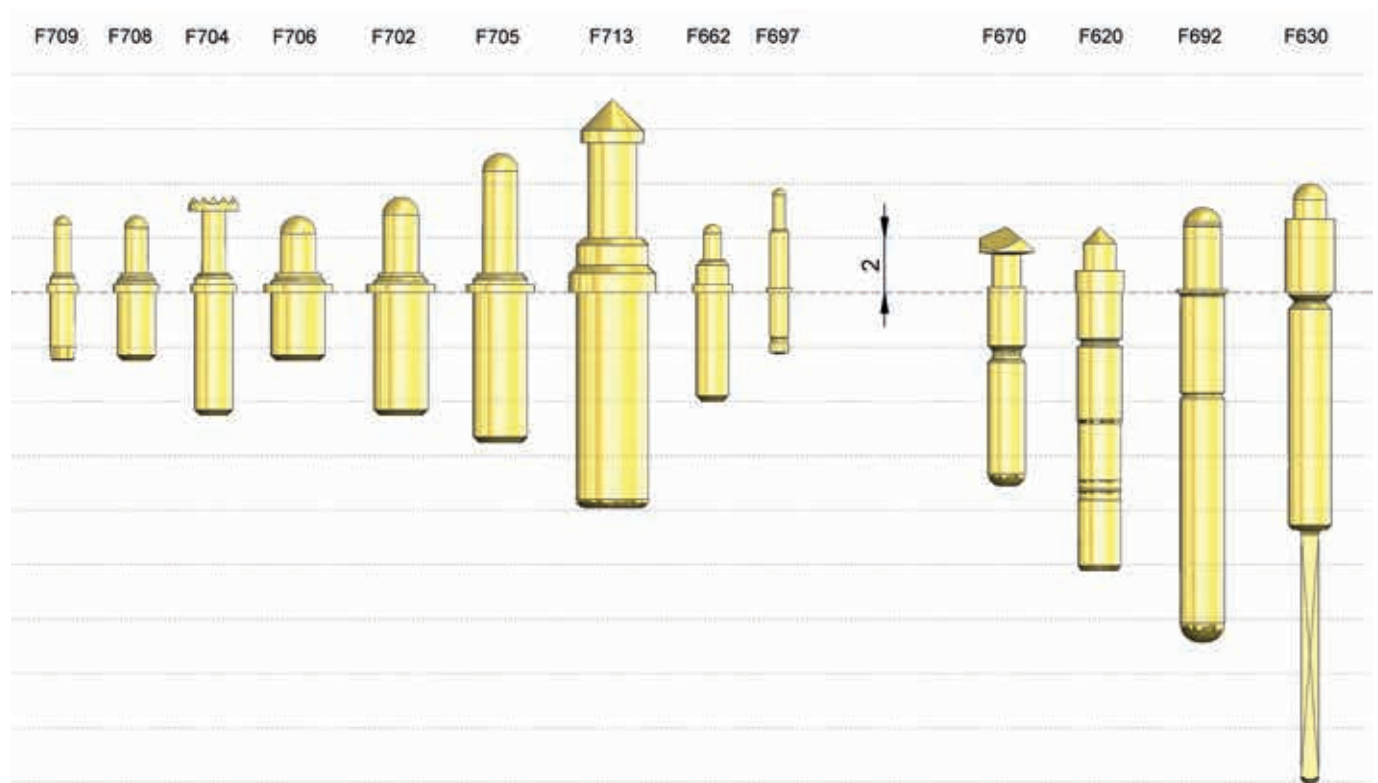
# Short Travel Probes

Short travel probes are used in a wide range of different applications – far beyond only for testing. Wherever non permanent electrical connections are demanded short travel probes provide a clever solution. This may be charging accumulators, connecting equipment in the furniture or lighting industry or a wide range of medical applications.

|      |    |
|------|----|
| F697 | 45 |
| F709 | 45 |
| F708 | 46 |
| F704 | 47 |
| F706 | 48 |
| F702 | 49 |
| F705 | 50 |
| F605 | 51 |
| F665 | 52 |
| F693 | 53 |
| F670 | 54 |
| F620 | 55 |
| F699 | 55 |
| F630 | 56 |
| F692 | 56 |
| F192 | 56 |
| F713 | 57 |
| F650 | 58 |
| F651 | 58 |

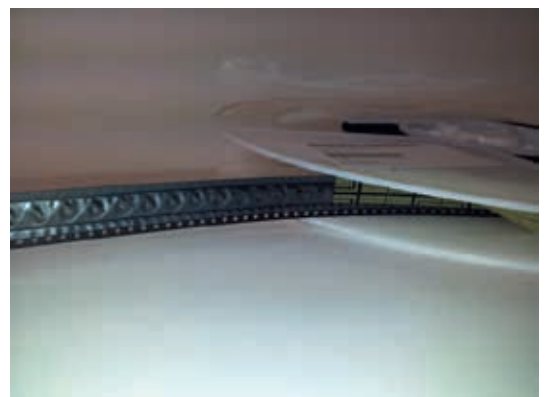
# Short Travel Probes

FEINMETALL offers a great variety of short travel probes for applications at limited space. For direct soldering into boards the probes need to be solder tight. For automatic assembly of higher volumes short travel probes can be offered as taped components.



## Probes ready for pick and place

For automatic assembly of printed circuit boards or other electronic devices, FEINMETALL offers solderable short travel contact probes as taped components. This solution allows a time and cost effective mounting of contact probes without interrupting the manufacturing process by manual tasks.





## Battery Contact

### F697

|                  |               |
|------------------|---------------|
| Centers (mm/mil) | 1,27 / 50     |
| Current          | 3,0 A         |
| Temperature      | -20°C...+80°C |
| R typically      | 20 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 10      | 30            |

| Type                 | Tip-Ø                | Spring Force |
|----------------------|----------------------|--------------|
| F 697 11 B 045 G 030 |                      |              |
| Tip Style            | Material             | Finish       |
| Material:            | B = BeCu             |              |
| Tip-Ø:               | 045 = 0,45 mm (e.g.) |              |
| Finish:              | G = Gold plated      |              |
| ORDER EXAMPLE        |                      |              |

#### Travel (mm)

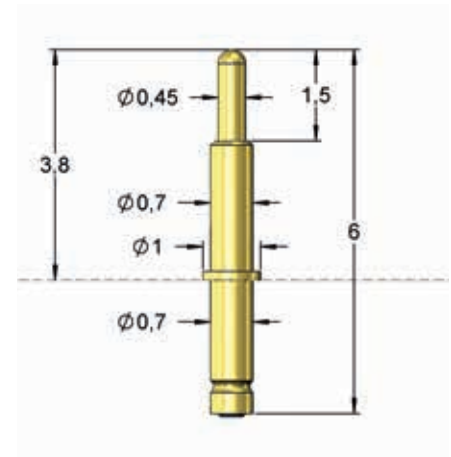
| Nominal           | Maximum  |
|-------------------|----------|
| 1,0               | 1,3      |
| Pointing Accuracy | ±0,08 mm |

#### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Bronze, gold plated       |
| Spring     | Music wire, silver plated |
| Receptacle | -                         |

#### Drill Size [mm]

|      |             |
|------|-------------|
| F697 | 0,68 - 0,70 |
|------|-------------|



| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 11     | B        | G       | 0,45    | -       |

## Battery Contact

### F709

|                  |                                       |
|------------------|---------------------------------------|
| Centers (mm/mil) | 1,70 / 67                             |
| Current          | 5,0 A                                 |
| Temperature      | -20°C...+80°C,<br>-40°C...+250°C ST/H |
| R typically      | 20 mOhm                               |

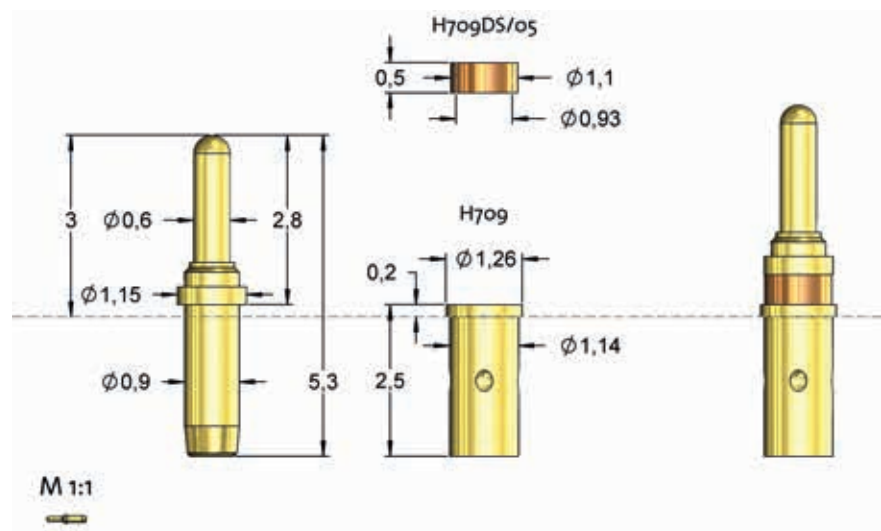
#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 10      | 20 ST/H       |
| 10      | 40            |

#### Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 1,0               | 1,2      |
| Pointing Accuracy | ±0,08 mm |

| Type                   | Tip-Ø                                     | Spring Force |
|------------------------|---|--------------|
| F 709 11 B 060 G 020 H |   |              |
| Tip Style              | Material                                  | Finish       |
| Material:              | B = BeCu                                  |              |
| Tip-Ø:                 | 060 = 0,6 mm (e.g.)                       |              |
| Finish:                | G = Gold                                  |              |
| Special Version:       | H = High Temperatur,<br>ST = Solder tight |              |
| Receptacle:            | Order Code according drawing              |              |
| ORDER EXAMPLE          |   |              |



#### Materials and Plating

|            |  |
|------------|--|
| Plunger    | see Tip Style  |
| Barrel     | Brass, gold plated                                     |
| Spring     | Music wire, silver plated<br>Stainless Steel, unplated |
| Receptacle | Bronze, Gold plated                                    |

#### Accessories

|               |           |
|---------------|-----------|
| Spacer 0,5 mm | H709DS/05 |
|---------------|-----------|

#### Drill Size [mm]

|      |             |
|------|-------------|
| H709 | 1,12 - 1,14 |
|------|-------------|

#### Projection Height

|      |     |
|------|-----|
| H709 | 3,0 |
|------|-----|

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 11     | B        | G       | 0,6     | -       |
|           | 11     | B        | G       | 0,6     | ST      |
|           | 11     | B        | G       | 0,6     | H       |

Battery Contact

F708

|                  |                |
|------------------|----------------|
| Centers (mm/mil) | 2,20 / 87      |
| Current          | 8,0 A          |
| Temperature      | -40°C...+250°C |
| R typically      | 20 mOhm        |

Spring Force (cN ±20%)

|         |               |
|---------|---------------|
| Preload | Nominal Force |
| 25      | 100           |

Travel (mm)

|                   |          |
|-------------------|----------|
| Nominal           | Maximum  |
| 1,0               | 1,2      |
| Pointing Accuracy | ±0,08 mm |

Materials and Plating

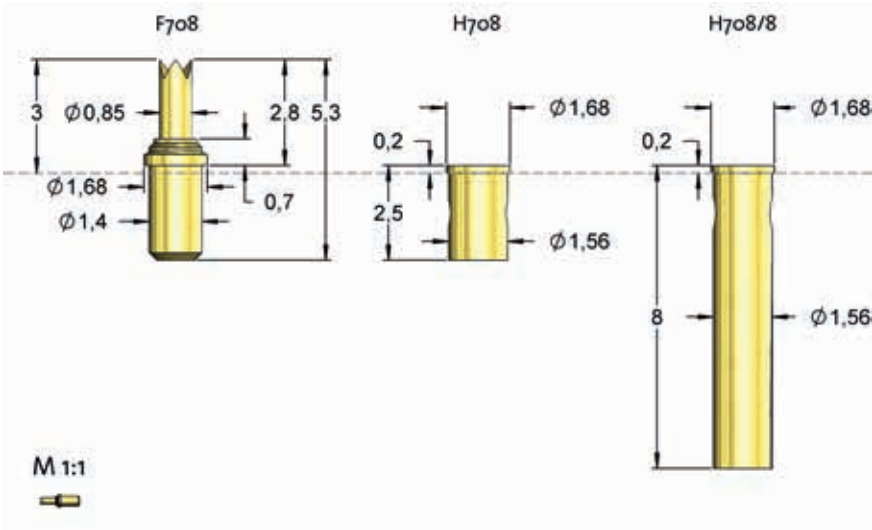
|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Stainless steel, unplated |
| Receptacle | Bronze, Gold plated       |

Drill Size [mm]

|         |             |
|---------|-------------|
| H708... | 1,54 - 1,55 |
|---------|-------------|

Projection Height

|         |     |
|---------|-----|
| H708... | 3,0 |
|---------|-----|



| Type                 | Tip-Ø                              | Spring Force           |
|----------------------|------------------------------------|------------------------|
| F 708 11 B 085 G 080 |                                    |                        |
| Tip Style            | Material                           | Finish Special Version |
| Material:            | B = BeCu, S = Steel                |                        |
| Tip-Ø:               | 085 = 0,85 mm (e.g.)               |                        |
| Finish:              | G = Gold, L = Longtime Gold plated |                        |
| Receptacle:          | Order Code according drawing       |                        |
| ORDER EXAMPLE        |                                    |                        |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 03     | S        | L       | 0,85    | -       |
|           | 11     | B        | G       | 0,85    | -       |
|           | 16     | B        | G       | 0,85    | -       |
|           | 29     | B        | G       | 0,85    | -       |





Battery Contact

F704 NEW

|                  |                |
|------------------|----------------|
| Centers (mm/mil) | 2,20 / 87      |
| Current          | 8,0 A          |
| Temperature      | -40°C...+250°C |
| R typically      | 20 mOhm        |

Spring Force (cN ±20%)

|         |               |
|---------|---------------|
| Preload | Nominal Force |
| 20      | 60            |

Travel (mm)

|                   |          |
|-------------------|----------|
| Nominal           | Maximum  |
| 1,5               | 2,2      |
| Pointing Accuracy | ±0,08 mm |

Materials and Plating

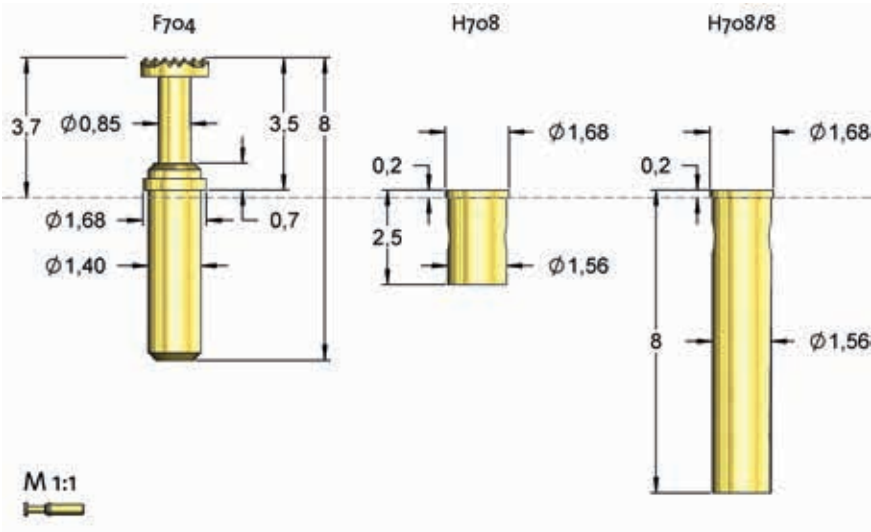
|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Stainless steel, unplated |
| Receptacle | Bronze, Gold plated       |

Drill Size [mm]

|         |             |
|---------|-------------|
| H708... | 1,54 - 1,55 |
|---------|-------------|

Projection Height

|         |     |
|---------|-----|
| H708... | 3,7 |
|---------|-----|



| Type          | Tip-Ø                        | Spring Force |
|---------------|------------------------------|--------------|
| F 704 06      | B 180                        | G 060        |
| Tip Style     | Material                     | Finish       |
| Material:     | B = BeCu                     |              |
| Tip-Ø:        | 180 = 1,8 mm (e.g.)          |              |
| Finish:       | G = Gold                     |              |
| Receptacle:   | Order Code according drawing |              |
| ORDER EXAMPLE |                              |              |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 06     | B        | G       | 1,8     | -       |

Battery Contact

F706

|                  |                |
|------------------|----------------|
| Centers (mm/mil) | 3,00 / 118     |
| Current          | 9,0 A          |
| Temperature      | -40°C...+250°C |
| R typically      | 15 mOhm        |

Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 70      | 150           |
| 80      | 200           |

Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 1,0               | 1,2      |
| Pointing Accuracy | ±0,08 mm |

Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Stainless steel, unplated |
| Receptacle | Bronze, Gold plated       |

Accessories

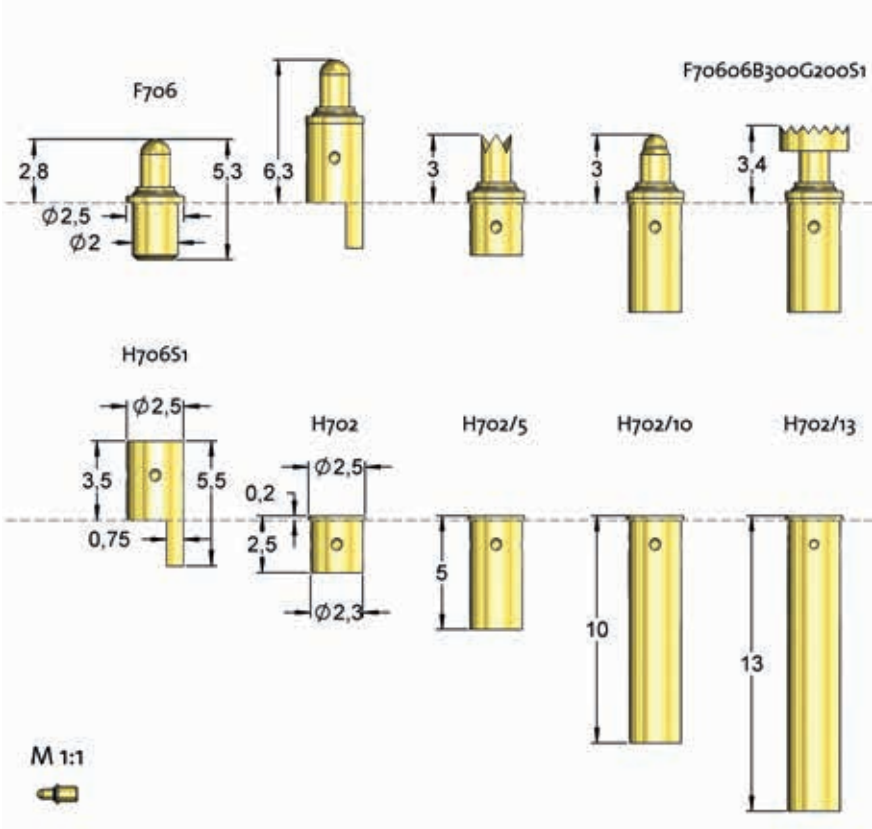
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-563E0 |
|---------------------------|------------|

Drill Size [mm]

|         |             |
|---------|-------------|
| H702... | 2,28 - 2,29 |
|---------|-------------|

Projection Height

|         |     |
|---------|-----|
| H702... | 3,0 |
| H706S1  | 6,3 |



| Type                 | Tip-Ø                        | Spring Force |
|----------------------|------------------------------|--------------|
| F 706 11 B 130 G 200 |                              |              |
| Tip Style            | Material                     | Finish       |
| Material:            | B = BeCu                     |              |
| Tip-Ø:               | 130 = 1,3 mm (e.g.)          |              |
| Finish:              | G = Gold                     |              |
| Receptacle:          | Order Code according drawing |              |
| ORDER EXAMPLE        |                              |              |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 11     | B        | G       | 1,0     | -       |
|           | 11     | B        | G       | 1,3     | -       |
|           | 29     | B        | G       | 1,3     | -       |



Battery Contact

F702

|                  |                |
|------------------|----------------|
| Centers (mm/mil) | 3,00 / 118     |
| Current          | 8,0 A          |
| Temperature      | -40°C...+250°C |
| R typically      | 15 mOhm        |

Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 10      | 15            |
| 10      | 30            |
| 40      | 130           |

Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 1,5               | 2,2      |
| Pointing Accuracy | ±0,08 mm |

Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Stainless steel, unplated |
| Receptacle | Bronze, Gold plated       |

Accessories

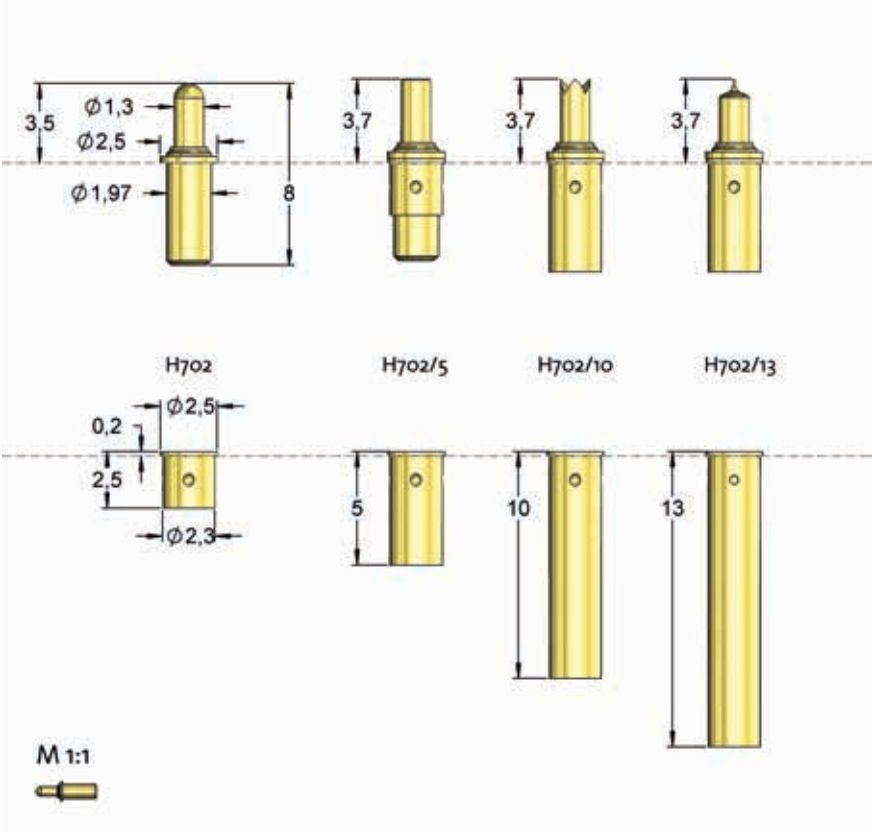
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-563E0 |
|---------------------------|------------|

Drill Size [mm]

|         |             |
|---------|-------------|
| H702... | 2,28 - 2,29 |
|---------|-------------|

Projection Height

|         |     |
|---------|-----|
| H702... | 3,7 |
|---------|-----|



| Type                 | Tip-Ø                              | Spring Force           |
|----------------------|------------------------------------|------------------------|
| F 702 11 B 130 G 130 |                                    |                        |
| Tip Style            | Material                           | Finish Special Version |
| Material:            | B = BeCu, S = Steel                |                        |
| Tip-Ø:               | 130 = 1,3 mm (e.g.)                |                        |
| Finish:              | G = Gold, L = Longtime Gold plated |                        |
| Receptacle:          | Order Code according drawing       |                        |
| ORDER EXAMPLE        |                                    |                        |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 11     | B        | G       | 1,3     | -       |
|           | 16     | B        | G       | 1,3     | -       |
|           | 29     | B        | G       | 1,3     | -       |
|           | 34     | S        | L       | 1,3     | -       |

Battery Contact

F705

|                  |                |
|------------------|----------------|
| Centers (mm/mil) | 3,00 / 118     |
| Current          | 9,0 A          |
| Temperature      | -40°C...+250°C |
| R typically      | 20 mOhm        |

Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 30      | 50            |
| 80      | 130           |
| 75      | 200           |

Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 1,5               | 3,0      |
| Pointing Accuracy | ±0,08 mm |

Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Stainless steel, unplated |
| Receptacle | Bronze, Gold plated       |

Accessories

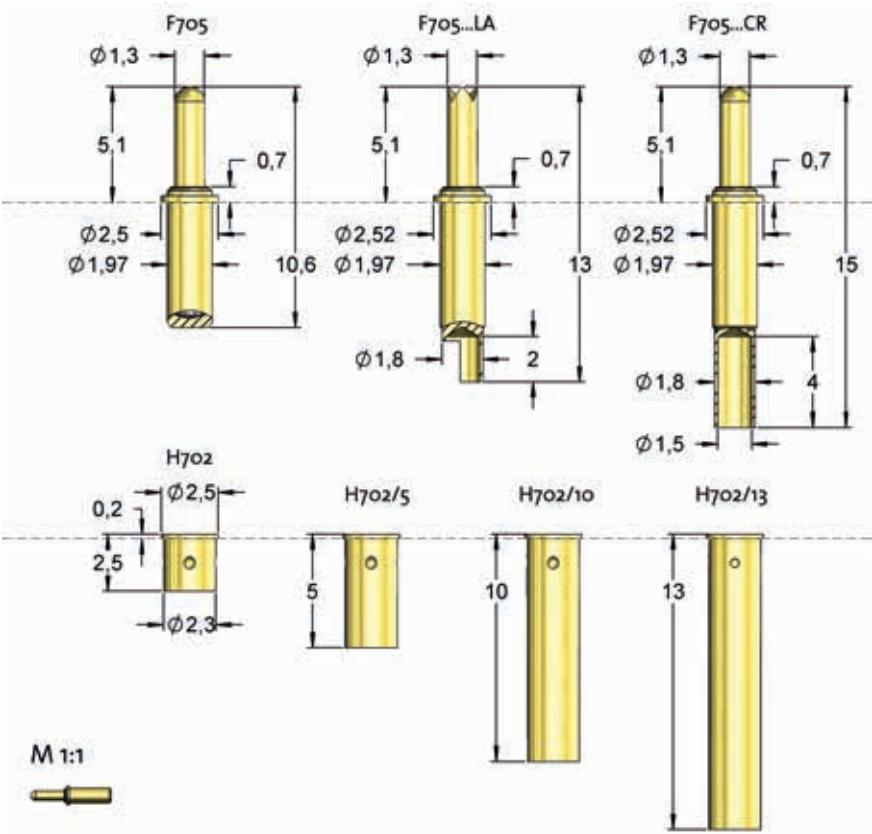
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-563E0 |
|---------------------------|------------|

Drill Size [mm]

|         |             |
|---------|-------------|
| H702... | 2,28 - 2,29 |
|---------|-------------|

Projection Height

|         |     |
|---------|-----|
| H702... | 5,3 |
|---------|-----|



Version F705...LI with 500 mm blue flexible wire (AWG20) available.  
Conductor: 0,56mm²

| Type             | Tip-Ø   | Spring Force |
|------------------|---|--------------|
| F 705            | 29  | B            |
|                  | 130   | G            |
|                  |   | CR           |
| Tip Style        | Material  | Finish       |
| Material:        | B = BeCu  |              |
| Tip-Ø:           | 130 = 1,3 mm (e.g.)                                     |              |
| Finish:          | G = Gold  |              |
| Special Version: | CR = Crimp Version, LA = Solder cup, LI = flexible Wire |              |
| Receptacle:      | Order Code according drawing                            |              |
| ORDER EXAMPLE    |   |              |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 06     | B        | G       | 3,0     | -       |
|           | 11     | B        | G       | 1,3     | CR      |
|           | 11     | B        | G       | 1,3     | -       |
|           | 11     | B        | G       | 1,3     | LI      |
|           | 11     | B        | G       | 1,3     | LA      |
|           | 18     | B        | G       | 1,3     | LA      |
|           | 29     | B        | G       | 1,3     | LA      |
|           | 29     | B        | G       | 1,3     | CR      |
|           | 29     | B        | G       | 1,3     | -       |
|           | 30     | B        | G       | 1,3     | LA      |



Short Travel Probe 50 mil  
F605

|                  |               |
|------------------|---------------|
| Centers (mm/mil) | 1,27 / 50     |
| Current          | 4,0 A         |
| Temperature      | -20°C...+80°C |
| R typically      | 70 mOhm       |

Spring Force (cN ±20%)

|         |               |
|---------|---------------|
| Preload | Nominal Force |
| 30      | 75            |

Travel (mm)

|                   |          |
|-------------------|----------|
| Nominal           | Maximum  |
| 0,8               | 1,2      |
| Pointing Accuracy | ±0,08 mm |

Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Bronze, silver plated     |
| Spring     | Music wire, silver plated |
| Receptable | Bronze, Gold plated       |

Accessories

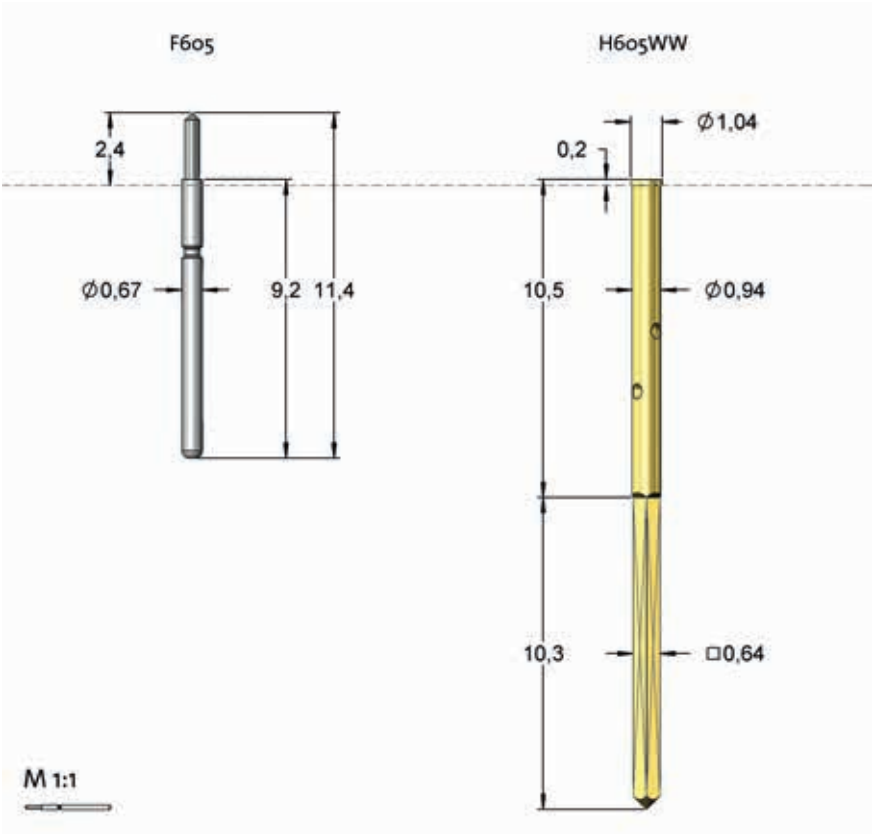
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-511E0 |
| Insertion tool probe      | FDWZ-050   |

Drill Size [mm]

|        |             |
|--------|-------------|
| H605WW | 0,94 - 0,96 |
|--------|-------------|

Projection Height

|         |     |
|---------|-----|
| H605... | 2,4 |
|---------|-----|



| Type                    | Tip-Ø   | Spring Force           |
|-------------------------|---|------------------------|
| F 605 01 S 050 L 050 ST |   |                        |
| Tip Style               | Material  | Finish Special Version |
| Material:               | S = Steel   |                        |
| Tip-Ø:                  | 050 = 0,5 mm (e.g.)   |                        |
| Finish:                 | L = Longtime Gold plated,<br>N = Nickel plated, ST = solder tight |                        |
| Receptacle:             | Order Code according drawing                                      |                        |
| ORDER EXAMPLE           |   |                        |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 01     | S        | L       | 0,5     | -       |
|           | 01     | S        | N       | 0,5     | -       |
|           | 05     | S        | L       | 1,0     | -       |
|           | 07     | S        | L       | 1,0     | -       |
|           | 11     | S        | L       | 0,5     | -       |
|           | 12     | B        | G       | 1,0     | ST      |



## Short Travel Probe 50 mil

### F665

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 1,27 / 50     |
| <b>Current</b>          | 4,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 70 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 25      | 60 S1         |
| 30      | 75            |

#### Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 0,6               | 1,1 S1   |
| 0,8               | 1,2      |
| Pointing Accuracy | ±0,08 mm |

#### Materials and Plating

|            |                              |
|------------|------------------------------|
| Plunger    | see Tip Style                |
| Barrel     | Bronze, gold plated          |
| Spring     | Stainless steel, gold plated |
| Receptacle | Bronze, Gold plated          |

#### Accessories

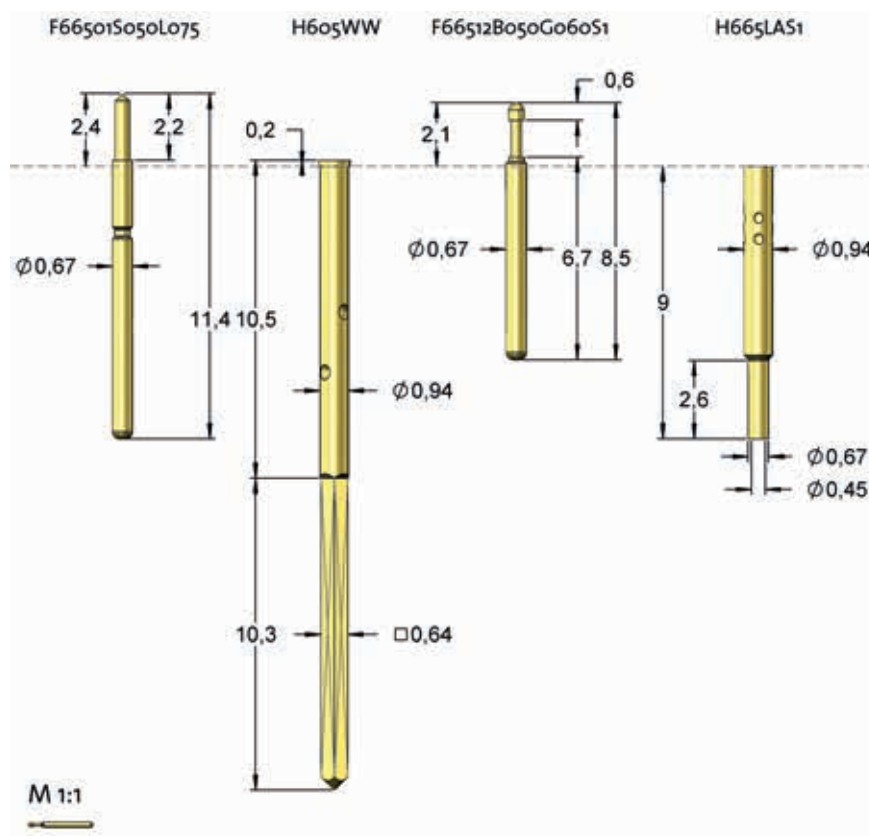
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-511E0 |
| Insertion tool probe      | FDWZ-050   |

#### Drill Size [mm]

|                     |             |
|---------------------|-------------|
| Receptacle inserted | 0,93 - 0,94 |
|---------------------|-------------|

#### Projection Height

|                                |     |
|--------------------------------|-----|
| (F665) H605WW                  | 2,4 |
| (F66512B050G060S1)<br>H665LAS1 | 2,1 |



| Type                    | Tip-Ø                              | Spring Force |
|-------------------------|------------------------------------|--------------|
| F 665 12 B 050 G 060 S1 |                                    |              |
| Tip Style               | Material                           | Finish       |
| Material:               | B = BeCu, S = Steel                |              |
| Tip-Ø:                  | 050 = 0,5 mm (e.g.)                |              |
| Finish:                 | G = Gold, L = Longtime Gold plated |              |
| Special Version:        | S1 = Special version               |              |
| Receptacle:             | Order Code according drawing       |              |
| ORDER EXAMPLE           |                                    |              |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 01     | S        | L       | 0,5     | -       |
|           | 12     | B        | G       | 0,5     | S1      |



Short Travel Probe 100 mil  
F693

|                  |               |
|------------------|---------------|
| Centers (mm/mil) | 2,54 / 100    |
| Current          | 4,0 A         |
| Temperature      | -20°C...+80°C |
| R typically      | 30 mOhm       |

Spring Force (cN ±20%)

|         |               |
|---------|---------------|
| Preload | Nominal Force |
| 40      | 85            |

Travel (mm)

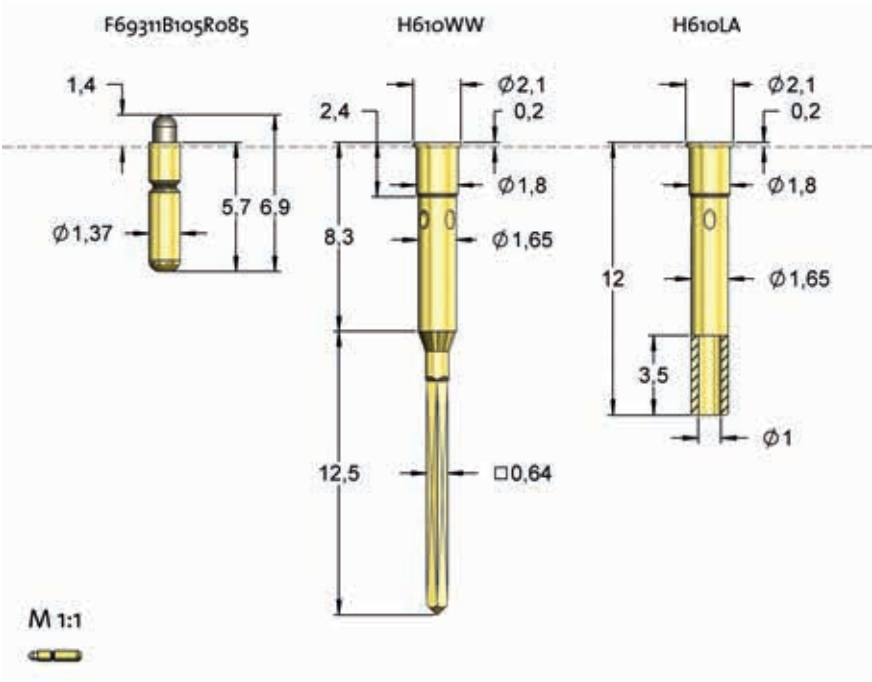
|                   |          |
|-------------------|----------|
| Nominal           | Maximum  |
| 0,8               | 1,2      |
| Pointing Accuracy | ±0,08 mm |

Materials and Plating

|            |                            |
|------------|----------------------------|
| Plunger    | see Tip Style              |
| Barrel     | Nickel silver, gold plated |
| Spring     | Music wire, silver plated  |
| Receptacle | Bronze, Gold plated        |

Drill Size [mm]

|         |             |
|---------|-------------|
| H610... | 1,78 - 1,79 |
|---------|-------------|



| Type                 | Tip-Ø                        | Spring Force |
|----------------------|------------------------------|--------------|
| F 693 11 B 105 R 085 |                              |              |
| Tip Style            | Material                     | Finish       |
| Material:            | B = BeCu                     |              |
| Tip-Ø:               | 105 = 1,05 mm (e.g.)         |              |
| Finish:              | R = Rhodium plated           |              |
| Receptacle:          | Order Code according drawing |              |
| ORDER EXAMPLE        |                              |              |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 11     | B        | R       | 1,05    | -       |

Short Travel Probe 100 mil  
F670

|                  |               |
|------------------|---------------|
| Centers (mm/mil) | 2,54 / 100    |
| Current          | 8,0 A         |
| Temperature      | -20°C...+80°C |
| R typically      | 20 mOhm       |

Spring Force (cN ±20%)

|         |               |
|---------|---------------|
| Preload | Nominal Force |
| 40      | 85            |

Travel (mm)

|                   |          |
|-------------------|----------|
| Nominal           | Maximum  |
| 0,8               | 1,2      |
| Pointing Accuracy | ±0,08 mm |

Materials and Plating

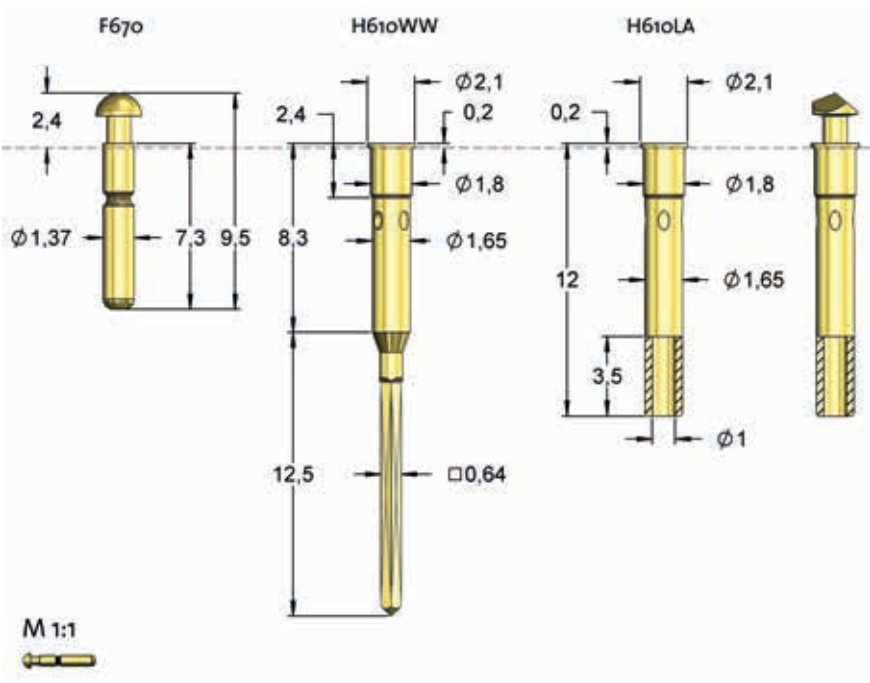
|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Bronze, gold plated       |
| Spring     | Music wire, silver plated |
| Receptacle | Bronze, Gold plated       |

Drill Size [mm]

|      |             |
|------|-------------|
| H610 | 1,78 - 1,79 |
|------|-------------|

Projection Height

|         |     |
|---------|-----|
| H610... | 2,4 |
|---------|-----|



| Type                 | Tip-Ø                        | Spring Force |
|----------------------|------------------------------|--------------|
| F 670 11 B 105 G 085 |                              |              |
| Tip Style            | Material                     | Finish       |
| Material:            | B = BeCu                     |              |
| Tip-Ø:               | 105 = 1,05 mm (e.g.)         |              |
| Finish:              | G = Gold                     |              |
| Receptacle:          | Order Code according drawing |              |
| ORDER EXAMPLE        |                              |              |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 11     | B        | G       | 1,05    | -       |
|           | 12     | B        | G       | 2,0     | -       |
|           | 15     | B        | G       | 2,0     | -       |



## Short Travel Probe 100 mil

### F620

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 2,54 / 100    |
| <b>Current</b>          | 8,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 30 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 40      | 75            |
| 40      | 130           |

#### Travel (mm)

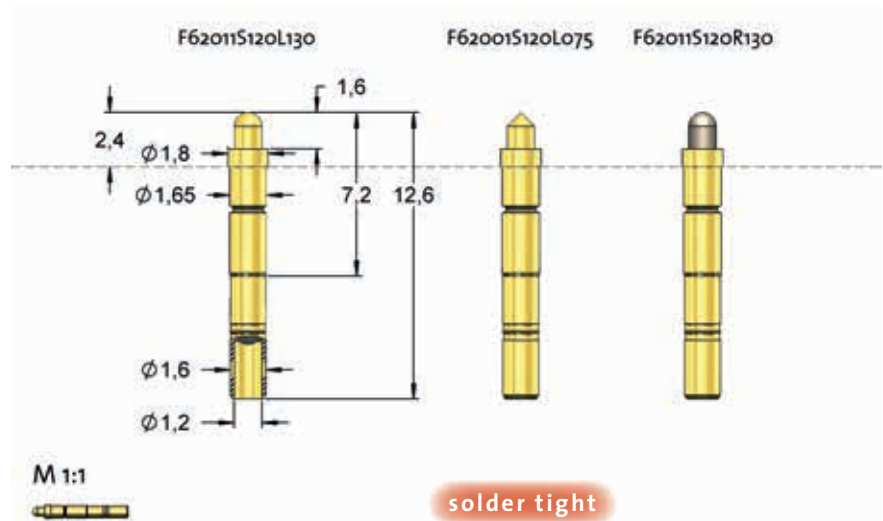
| Nominal           | Maximum  |
|-------------------|----------|
| 1,3               | 1,6      |
| Pointing Accuracy | ±0,08 mm |

#### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Bronze, gold plated       |
| Spring     | Music wire, silver plated |
| Receptacle | -                         |

#### Drill Size [mm]

|      |             |
|------|-------------|
| F620 | 1,63 - 1,65 |
|------|-------------|



| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 01     | S        | L       | 1,2     | -       |
|           | 11     | S        | L       | 1,2     | -       |
|           | 11     | S        | N       | 1,2     | -       |
|           | 11     | S        | R       | 1,2     | -       |

## Short Travel Probe 100 mil

### F699

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 2,54 / 100    |
| <b>Current</b>          | 3,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 30 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 50      | 130           |

#### Travel (mm)

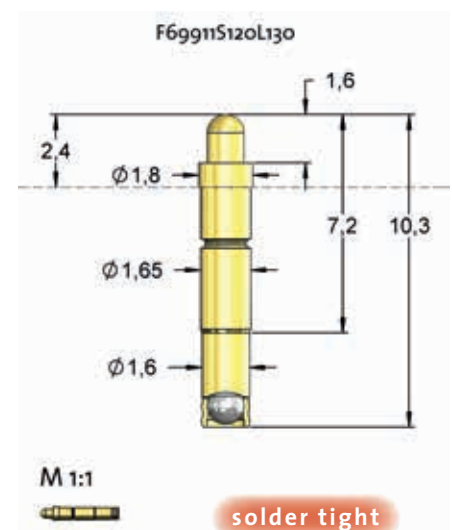
| Nominal | Maximum |
|---------|---------|
| 1,3     | 1,6     |

#### Materials and Plating

|         |                             |
|---------|-----------------------------|
| Plunger | Steel, longtime gold plated |
| Barrel  | Bronze, gold plated         |
| Spring  | Music wire, gold plated     |

#### Drill Size [mm]

|      |             |
|------|-------------|
| F699 | 1,63 - 1,65 |
|------|-------------|



## Short Travel Probe 100 mil

### F630

|                  |               |
|------------------|---------------|
| Centers (mm/mil) | 2,54 / 100    |
| Current          | 8,0 A         |
| Temperature      | -20°C...+80°C |
| R typically      | 30 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 40      | 70            |

#### Travel (mm)

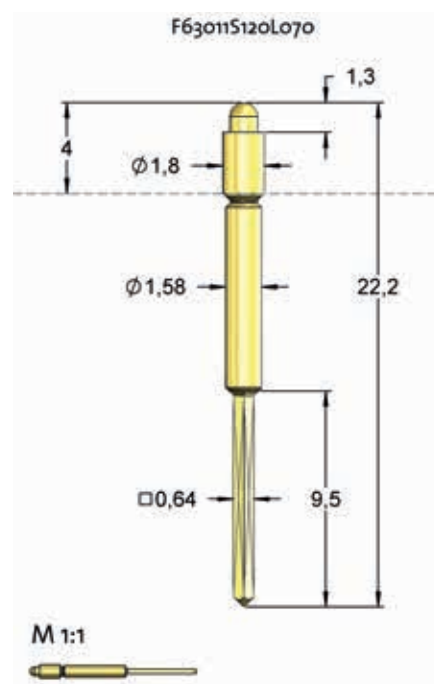
| Nominal | Maximum |
|---------|---------|
| 0,9     | 1,3     |

#### Materials and Plating

|         |                             |
|---------|-----------------------------|
| Plunger | Steel, longtime gold plated |
| Barrel  | Brass, gold plated          |
| Spring  | Music wire, silver plated   |

#### Drill Size [mm]

|      |             |
|------|-------------|
| F630 | 1,56 - 1,58 |
|------|-------------|



## Short Travel Probe 100 mil

### F692

|                  |                |
|------------------|----------------|
| Centers (mm/mil) | 2,54 / 100     |
| Current          | 8,0 A          |
| Temperature      | -40°C...+250°C |
| R typically      | 30 mOhm        |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 100     | 250           |

#### Travel (mm)

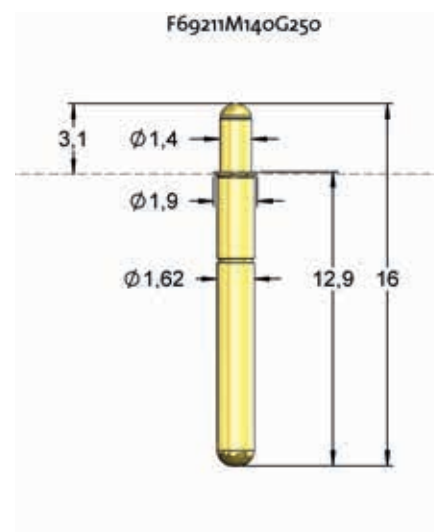
| Nominal | Maximum |
|---------|---------|
| 2,8     | 3,0     |

#### Materials and Plating

|         |                           |
|---------|---------------------------|
| Plunger | Brass, gold plated        |
| Barrel  | Brass, gold plated        |
| Spring  | Stainless steel, unplated |

#### Drill Size [mm]

|      |             |
|------|-------------|
| F692 | 1,60 - 1,62 |
|------|-------------|



## Double Plunger Probe for Pogo Towers

### F192

|                  |               |
|------------------|---------------|
| Centers (mm/mil) | 2,54 / 100    |
| Current          | 5,0 A         |
| Temperature      | -20°C...+80°C |
| R typically      | 30 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 25      | 60            |

#### Travel (mm)

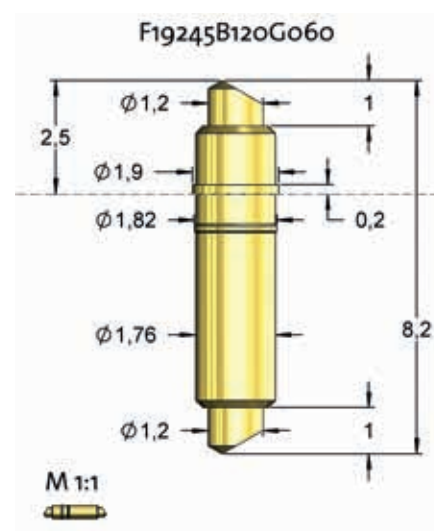
| Nominal | Maximum |
|---------|---------|
| 1,3     | 1,7     |

#### Materials and Plating

|         |                         |
|---------|-------------------------|
| Plunger | BeCu, gold plated       |
| Barrel  | Bronze, gold plated     |
| Spring  | Music wire, gold plated |

#### Drill Size [mm]

|      |             |
|------|-------------|
| F192 | 1,79 - 1,81 |
|------|-------------|







## Battery Contact

### F713

NEW

|                  |                |
|------------------|----------------|
| Centers (mm/mil) | 4,00 / 157     |
| Current          | 10,0 A         |
| Temperature      | -40°C...+250°C |
| R typically      | 15 mOhm        |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 40      | 80            |
| 70      | 150           |

#### Travel (mm)

| Nominal           | Maximum |
|-------------------|---------|
| 2,8               | 3,5     |
| Pointing Accuracy | ±0,1 mm |

#### Materials and Plating

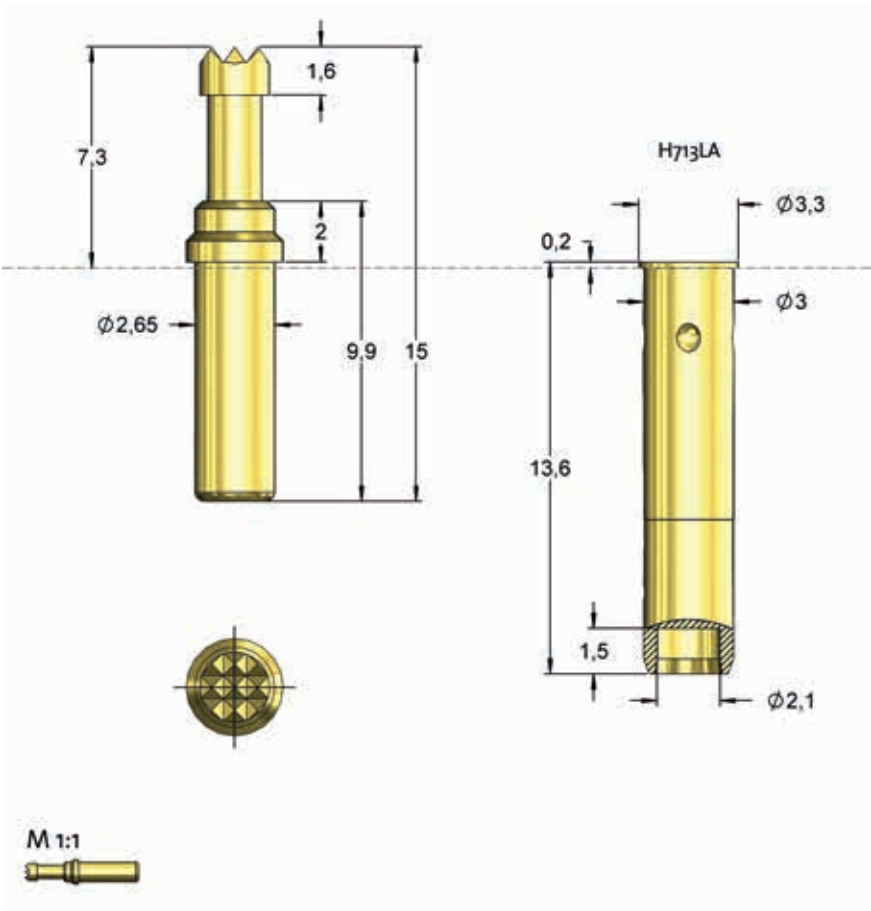
|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Stainless steel, unplated |
| Receptacle | Bronze, Gold plated       |

#### Drill Size [mm]

|         |             |
|---------|-------------|
| H713... | 2,98 - 2,99 |
|---------|-------------|

#### Projection Height

|         |     |
|---------|-----|
| H713... | 7,3 |
|---------|-----|



For a threaded version see F723.

| Type                 | Tip-Ø                        | Spring Force |
|----------------------|------------------------------|--------------|
| F 713 02 B 230 G 080 |                              |              |
| Tip Style            | Material                     | Finish       |
| Material:            | B = BeCu                     |              |
| Tip-Ø:               | 230 = 2,3 mm (e.g.)          |              |
| Finish:              | G = Gold                     |              |
| Receptacle:          | Order Code according drawing |              |
| ORDER EXAMPLE        |                              |              |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 02     | B        | G       | 2,3     | -       |
|           | 06     | B        | G       | 2,3     | -       |
|           | 12     | B        | G       | 2,3     | -       |
|           | 17     | B        | G       | 2,3     | -       |

## Robust Short Travel Probe

### F650

|                  |                |
|------------------|----------------|
| Centers (mm/mil) | 6,50 / 256     |
| Current          | 10,0 A         |
| Temperature      | -40°C...+250°C |
| R typically      | 30 mOhm        |

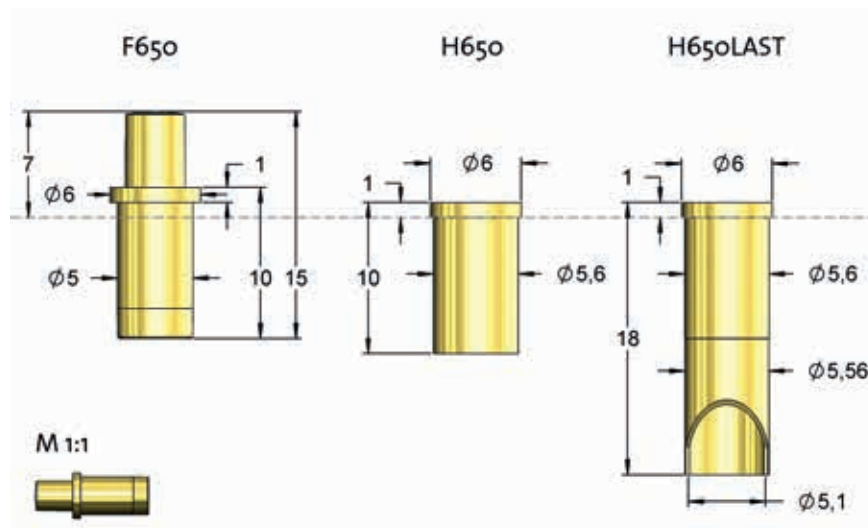
#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 50      | 150           |
| 270     | 500           |

#### Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 3,2               | 4,0      |
| Pointing Accuracy | ±0,08 mm |

| Type          | Tip-Ø                        | Spring Force |
|---------------|------------------------------|--------------|
| F 650         | 11                           | M 400        |
|               |                              | G 150        |
| Tip Style     | Material                     | Finish       |
| Material:     | M = Brass                    |              |
| Tip-Ø:        | 400 = 4,0 mm (e.g.)          |              |
| Finish:       | G = Gold                     |              |
| Receptacle:   | Order Code according drawing |              |
| ORDER EXAMPLE |                              |              |



#### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Stainless steel, unplated |
| Receptacle | Brass, Gold plated        |

#### Drill Size [mm]

|         |             |
|---------|-------------|
| H650... | 5,57 - 5,60 |
|---------|-------------|

#### Projection Height

|      |     |
|------|-----|
| H650 | 7,0 |
|------|-----|

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 11     | M        | G       | 4,0     | -       |

## Robust Short Travel Probe

### F651

NEW

|                  |                |
|------------------|----------------|
| Centers (mm/mil) | 6,50 / 256     |
| Current          | 10,0 A         |
| Temperature      | -40°C...+250°C |
| R typically      | 30 mOhm        |

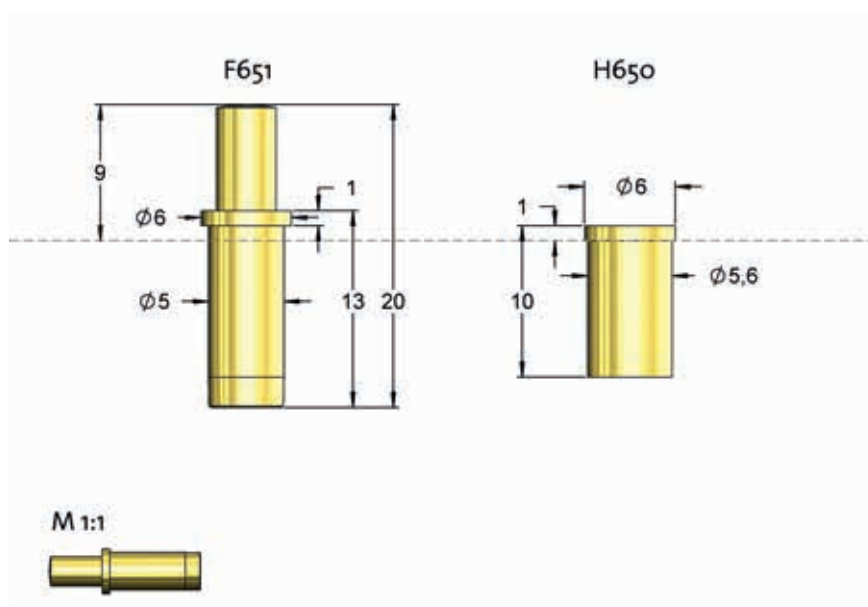
#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 160     | 500           |

#### Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 4,8               | 6,0      |
| Pointing Accuracy | ±0,08 mm |

| Type          | Tip-Ø                        | Spring Force |
|---------------|------------------------------|--------------|
| F 651         | 11                           | M 400        |
|               |                              | G 500        |
| Tip Style     | Material                     | Finish       |
| Material:     | M = Brass                    |              |
| Tip-Ø:        | 400 = 4,0 mm (e.g.)          |              |
| Finish:       | G = Gold                     |              |
| Receptacle:   | Order Code according drawing |              |
| ORDER EXAMPLE |                              |              |



#### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Stainless steel, unplated |
| Receptacle | Brass, Gold plated        |

#### Drill Size [mm]

|         |             |
|---------|-------------|
| H650... | 5,57 - 5,60 |
|---------|-------------|

#### Projection Height

|      |     |
|------|-----|
| H650 | 9,0 |
|------|-----|

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 11     | M        | G       | 4,0     | -       |



# Double Plunger and Fine Pitch Probes

Double plunger probes have two separate plungers in one barrel – one for contacting the DUT and the other used as interface to the translator board of the test system. Fine pitch probes have centers smaller than 50 mil.

|      |    |
|------|----|
| F238 | 61 |
| F239 | 61 |
| F206 | 62 |
| F207 | 62 |
| F681 | 63 |
| F209 | 63 |
| F680 | 64 |
| F685 | 64 |
| F109 | 65 |
| F252 | 66 |
| F205 | 66 |

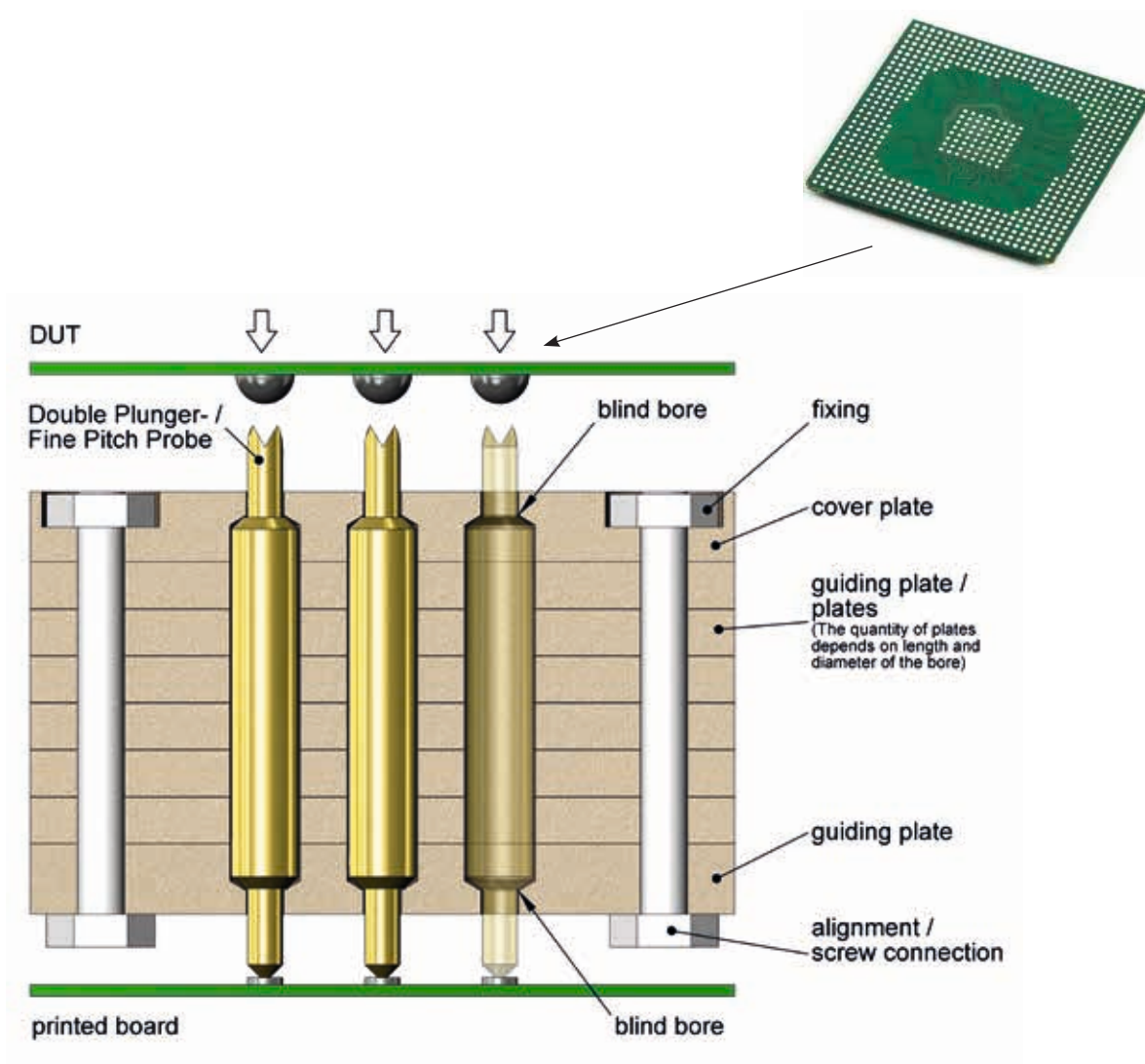
# Fine Pitch and Double Plunger Probes

## Mounting of Double Plunger Probes

Fine pitch probes are used in very small centers, especially in test sockets for component test.

Double plunger probes can be used as interface probes without soldering. The mounting is realized by special guiding and distance plates as shown in the picture. The number of distance plates is depending on the requested dill size.

| Series | Centers          | Version              |
|--------|------------------|----------------------|
| F238   | 0,50 mm / 20 mil | Double Plunger Probe |
| F239   | 0,50 mm / 20 mil | Double Plunger Probe |
| F206   | 0,70 mm / 28 mil | Double Plunger Probe |
| F207   | 0,70 mm / 28 mil |                      |
| F209   | 0,70 mm / 28 mil | Double Plunger Probe |
| F681   | 0,50 mm / 20 mil | Double Plunger Probe |
| F680   | 0,75 mm / 30 mil | Double Plunger Probe |
| F685   | 0,75 mm / 30 mil | Double Plunger Probe |
| F109   | 1,00 mm / 40 mil |                      |
| F252   | 1,00 mm / 40 mil | Double Plunger Probe |
| F205   | 1,27 mm / 50 mil |                      |





## Double Plunger Probe for Fine Pitch Components

### F238

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 0,50 / 20     |
| <b>Current</b>          | 1,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 350 mOhm      |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 10      | 50            |

#### Travel (mm)

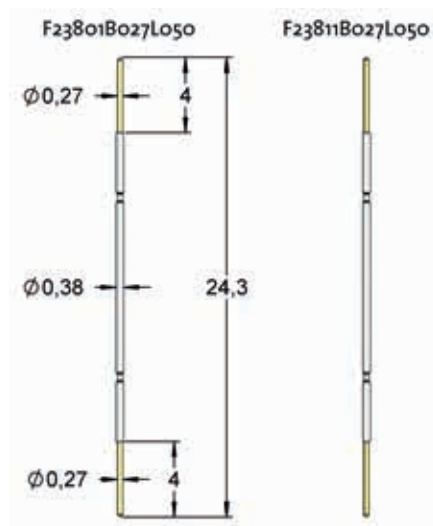
| Nominal | Maximum |
|---------|---------|
| 2,0     | 2,5     |

#### Materials and Plating

|         |                            |
|---------|----------------------------|
| Plunger | BeCu, longtime gold plated |
| Barrel  | Stainless steel, unplated  |
| Spring  | Music wire, gold plated    |

#### Drill Size [mm]

|      |             |
|------|-------------|
| F238 | 0,36 - 0,38 |
|------|-------------|



## Fine Pitch Probe 20 mil with connection element

### F239

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 0,50 / 20     |
| <b>Current</b>          | 1,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 350 mOhm      |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 10      | 50            |

#### Travel (mm)

| Nominal | Maximum |
|---------|---------|
| 2,0     | 2,5     |

#### Materials and Plating

|         |                            |
|---------|----------------------------|
| Plunger | BeCu, longtime gold plated |
| Barrel  | Stainless steel, unplated  |
| Spring  | Music wire, gold plated    |

#### Drill Size [mm]

|      |             |
|------|-------------|
| F239 | 0,36 - 0,38 |
|------|-------------|





# Fine Pitch and Double Plunger Probes

## Double Plunger Probe for Fine Pitch Components

### F206

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 0,70 / 28     |
| <b>Current</b>          | 1,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 70 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 10      | 50            |

#### Travel (mm)

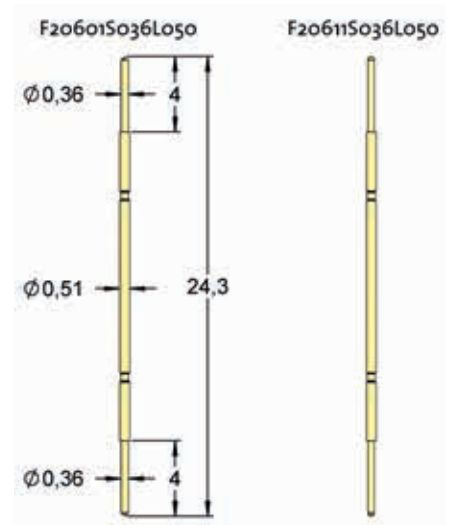
| Nominal | Maximum |
|---------|---------|
| 2,0     | 2,5     |

#### Materials and Plating

|         |                             |
|---------|-----------------------------|
| Plunger | Steel, longtime gold plated |
| Barrel  | Bronze, gold plated         |
| Spring  | Music wire, silver plated   |

#### Drill Size [mm]

|      |             |
|------|-------------|
| F206 | 0,49 - 0,51 |
|------|-------------|



## Fine Pitch Probe 28 mil with connection element

### F207

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 0,70 / 28     |
| <b>Current</b>          | 1,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 70 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 10      | 50            |

#### Travel (mm)

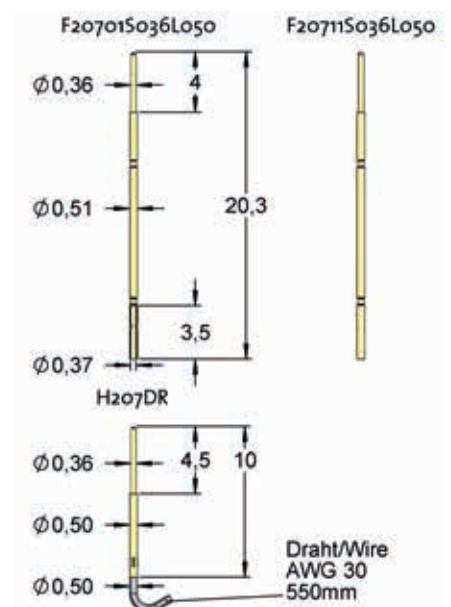
| Nominal | Maximum |
|---------|---------|
| 2,0     | 2,5     |

#### Materials and Plating

|         |                             |
|---------|-----------------------------|
| Plunger | Steel, longtime gold plated |
| Barrel  | Bronze, gold plated         |
| Spring  | Music wire, silver plated   |

#### Drill Size [mm]

|      |             |
|------|-------------|
| F207 | 0,49 - 0,51 |
|------|-------------|



# Fine Pitch and Double Plunger Probes



## Double Plunger Probe for Fine Pitch Components

### F209

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 0,70 / 28     |
| <b>Current</b>          | 1,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 70 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 10      | 50            |

#### Travel (mm)

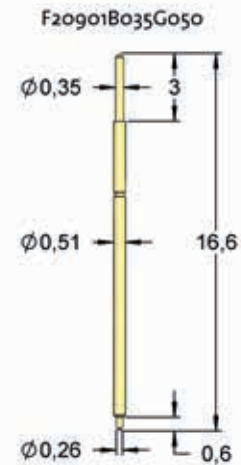
| Nominal | Maximum |
|---------|---------|
| 2,0     | 2,5     |

#### Materials and Plating

|         |                           |
|---------|---------------------------|
| Plunger | BeCu, gold plated         |
| Barrel  | Bronze, gold plated       |
| Spring  | Music wire, silver plated |

#### Drill Size [mm]

|      |            |
|------|------------|
| F209 | 0,49 - 051 |
|------|------------|



## Double Plunger Probe for Fine Pitch Components

### F681

|                         |                |
|-------------------------|----------------|
| <b>Centers (mm/mil)</b> | 0,50 / 20      |
| <b>Current</b>          | 0,15 A         |
| <b>Temperature</b>      | -42°C...+135°C |
| <b>R typically</b>      | 60 mOhm        |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 10      | 20            |

#### Travel (mm)

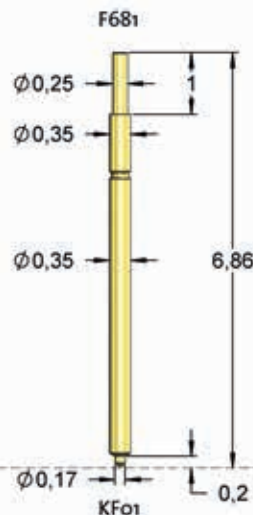
| Nominal           | Maximum  |
|-------------------|----------|
| 0,6               | 0,8      |
| Pointing Accuracy | ±0,04 mm |

#### Materials and Plating

|         |                              |
|---------|------------------------------|
| Plunger | see Tip Style                |
| Barrel  | Bronze, gold plated          |
| Spring  | Stainless steel, gold plated |

#### Drill Size [mm]

|      |             |
|------|-------------|
| F681 | 0,34 - 0,35 |
|------|-------------|



| Type          | Tip-Ø                | Spring Force |
|---------------|----------------------|--------------|
| F 681         | 29 B 025 G 020       |              |
| Tip Style     | Material             | Finish       |
| Material:     | B = BeCu             |              |
| Tip-Ø:        | 025 = 0,25 mm (e.g.) |              |
| Finish:       | G = Gold             |              |
| ORDER EXAMPLE |                      |              |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 16     | B        | G       | 0,25    | -       |
|           | 29     | B        | G       | 0,25    | -       |

# Fine Pitch and Double Plunger Probes

## Double Plunger Probe for Fine Pitch Components

### F680

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 0,75 / 30     |
| <b>Current</b>          | 0,5 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 50 mOhm       |

#### Spring Force (cN ±20%)

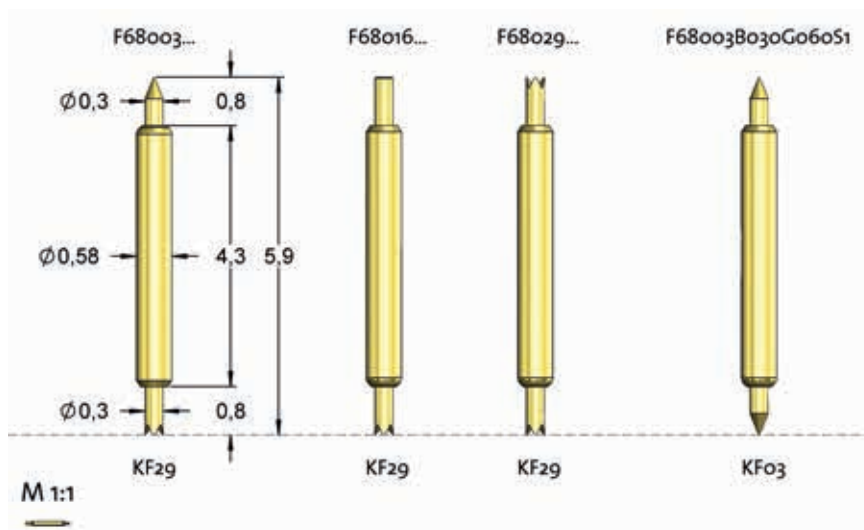
| Preload | Nominal Force |
|---------|---------------|
| 20      | 40            |
| 45      | 60 S1         |

#### Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 0,5               | 1,0      |
| 0,5               | 0,6 S1   |
| Pointing Accuracy | ±0,09 mm |

| Type                    | Tip-Ø                                   | Spring Force           |
|-------------------------|---|------------------------|
| F 680 03 B 025 G 060 S1 |   |                        |
| Tip Style               | Material                                | Finish Special Version |
| Material:               | B = BeCu                                |                        |
| Tip-Ø:                  | 025 = 0,25 mm (e.g.)                    |                        |
| Finish:                 | G = Gold, R = Rhodium                   |                        |
| Special Version:        | S1 = special version, NM = non magnetic |                        |

ORDER EXAMPLE



The version F68029B030R050NM is non-magnetic.

#### Materials and Plating

|         |                           |
|---------|---------------------------|
| Plunger | see Tip Style             |
| Barrel  | Bronze, gold plated       |
| Spring  | Music wire, silver plated |

#### Drill Size [mm]

|      |             |
|------|-------------|
| F680 | 0,56 - 0,58 |
|------|-------------|

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 03     | B        | G       | 0,3     | S1      |
|           | 16     | B        | G       | 0,3     | -       |
|           | 29     | B        | G       | 0,3     | -       |

## Double Plunger Probe for Fine Pitch Components

### F685

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 0,75 / 30     |
| <b>Current</b>          | 0,5 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 50 mOhm       |

#### Spring Force (cN ±20%)

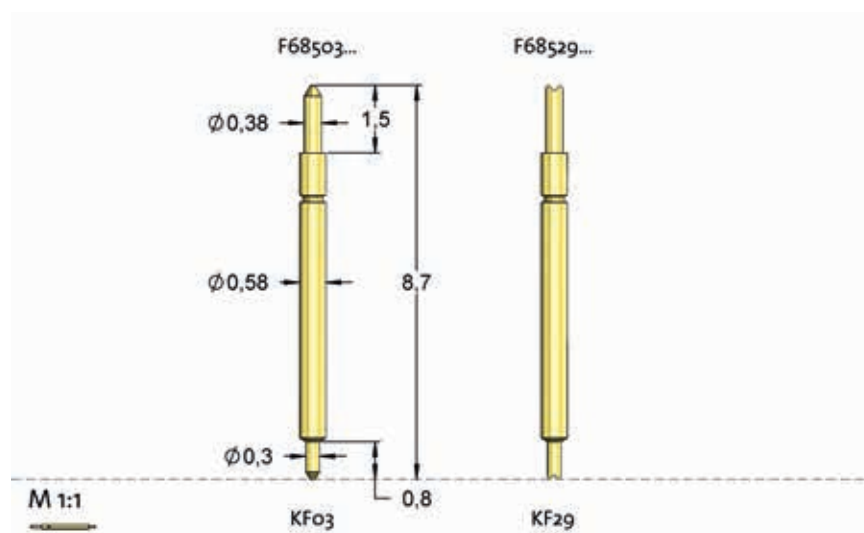
| Preload | Nominal Force |
|---------|---------------|
| 10      | 35            |

#### Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 0,8               | 1,0      |
| Pointing Accuracy | ±0,04 mm |

| Type                 | Tip-Ø                    | Spring Force           |
|----------------------|--------------------------|------------------------|
| F 685 03 S 038 L 035 |                          |                        |
| Tip Style            | Material                 | Finish Special Version |
| Material:            | S = Steel                |                        |
| Tip-Ø:               | 038 = 0,38 mm (e.g.)     |                        |
| Finish:              | L = Longtime Gold plated |                        |

ORDER EXAMPLE



#### Materials and Plating

|         |                              |
|---------|------------------------------|
| Plunger | see Tip Style                |
| Barrel  | Bronze, gold plated          |
| Spring  | Stainless steel, gold plated |

#### Drill Size [mm]

|      |             |
|------|-------------|
| F685 | 0,57 - 0,58 |
|------|-------------|

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 03     | S        | L       | 0,38    | -       |
|           | 29     | S        | L       | 0,38    | -       |

# Fine Pitch and Double Plunger Probes



## Fine Pitch Probe 39 mil with receptacle

### F109

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 1,00 / 39     |
| <b>Current</b>          | 1,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 65 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 10      | 50            |

#### Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 2,0               | 2,3      |
| Pointing Accuracy | ±0,05 mm |

#### Materials and Plating

|            |                            |
|------------|----------------------------|
| Plunger    | see Tip Style              |
| Barrel     | Nickel silver, gold plated |
| Spring     | Music wire, silver plated  |
| Receptacle | Bronze, Gold plated        |

#### Accessories

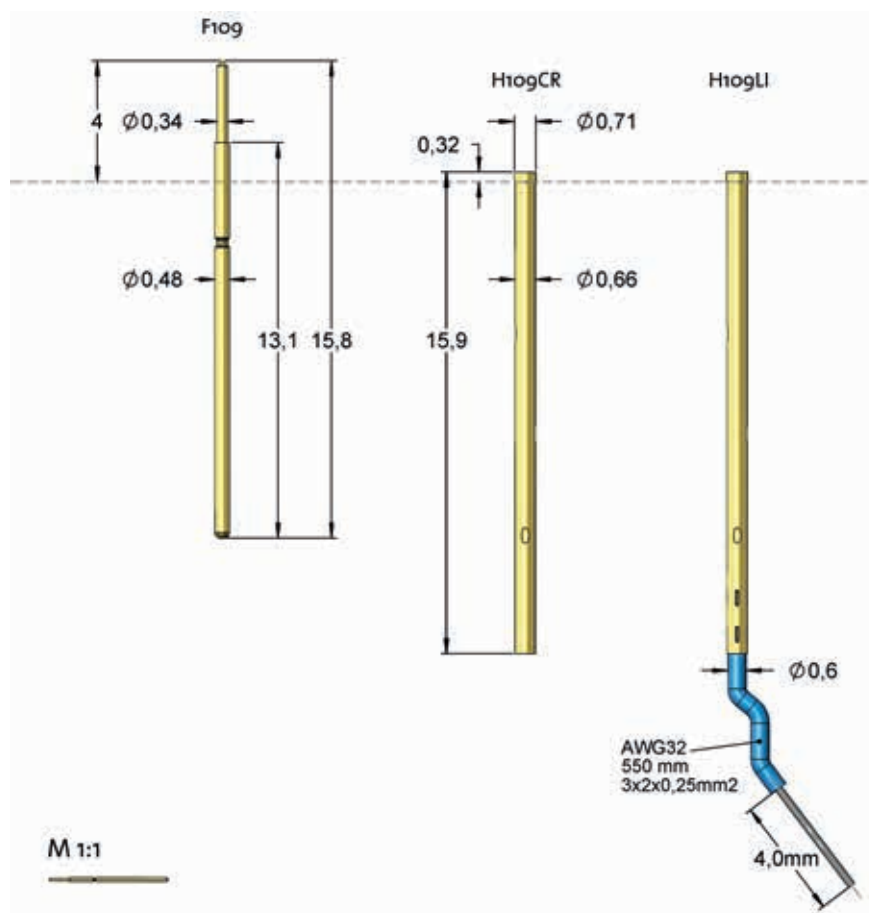
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-109E0 |
| Insertion tool probe      | FDWZ-050   |

#### Drill Size [mm]

|                        |             |
|------------------------|-------------|
| Receptacle with collar | 0,66 - 0,68 |
|------------------------|-------------|

#### Projection Height

|         |     |
|---------|-----|
| H109... | 4,0 |
|---------|-----|



| Type                 | Tip-Ø                        | Spring Force |
|----------------------|------------------------------|--------------|
| F 109 18 B 034 G 050 |                              |              |
| Tip Style            | Material                     | Finish       |
| Material:            | B = BeCu                     |              |
| Tip-Ø:               | 034 = 0,34 mm (e.g.)         |              |
| Finish:              | G = Gold                     |              |
| Receptacle:          | Order Code according drawing |              |
| ORDER EXAMPLE        |                              |              |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 01     | B        | G       | 0,34    | -       |
|           | 18     | B        | G       | 0,34    | -       |

# Fine Pitch and Double Plunger Probes

## Double Plunger Probe for Fine Pitch Components

### F252

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 1,00 / 39     |
| <b>Current</b>          | 1,5 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 75 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 30      | 85            |

#### Travel (mm)

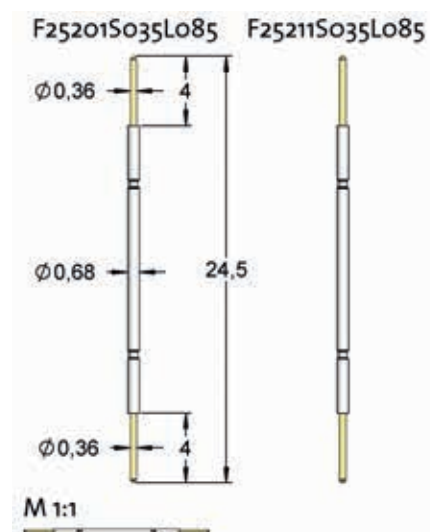
| Nominal | Maximum |
|---------|---------|
| 2,0     | 2,5     |

#### Materials and Plating

|         |                             |
|---------|-----------------------------|
| Plunger | Steel, longtime gold plated |
| Barrel  | Bronze, silver plated       |
| Spring  | Music wire, silver plated   |

#### Drill Size [mm]

|      |             |
|------|-------------|
| F252 | 0,66 - 0,68 |
|------|-------------|



## Fine Pitch Probe 50 mil with connection element

### F205

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 1,27 / 50     |
| <b>Current</b>          | 2,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 50 mOhm       |

#### Spring Force (cN ±20%)

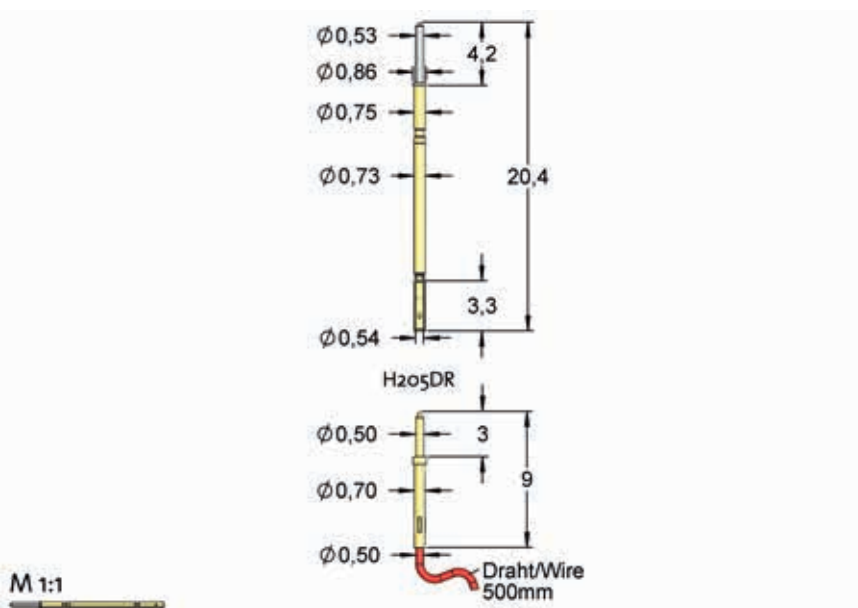
| Preload | Nominal Force |
|---------|---------------|
| 30      | 85            |

#### Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 2,0               | 2,5      |
| Pointing Accuracy | ±0,08 mm |
| Receptable        | -        |

#### Materials and Plating

|         |                           |
|---------|---------------------------|
| Plunger | see Tip Style             |
| Barrel  | BeCu, gold plated         |
| Spring  | Music wire, silver plated |



#### Drill Size [mm]

|      |             |
|------|-------------|
| F205 | 0,74 - 0,76 |
|------|-------------|

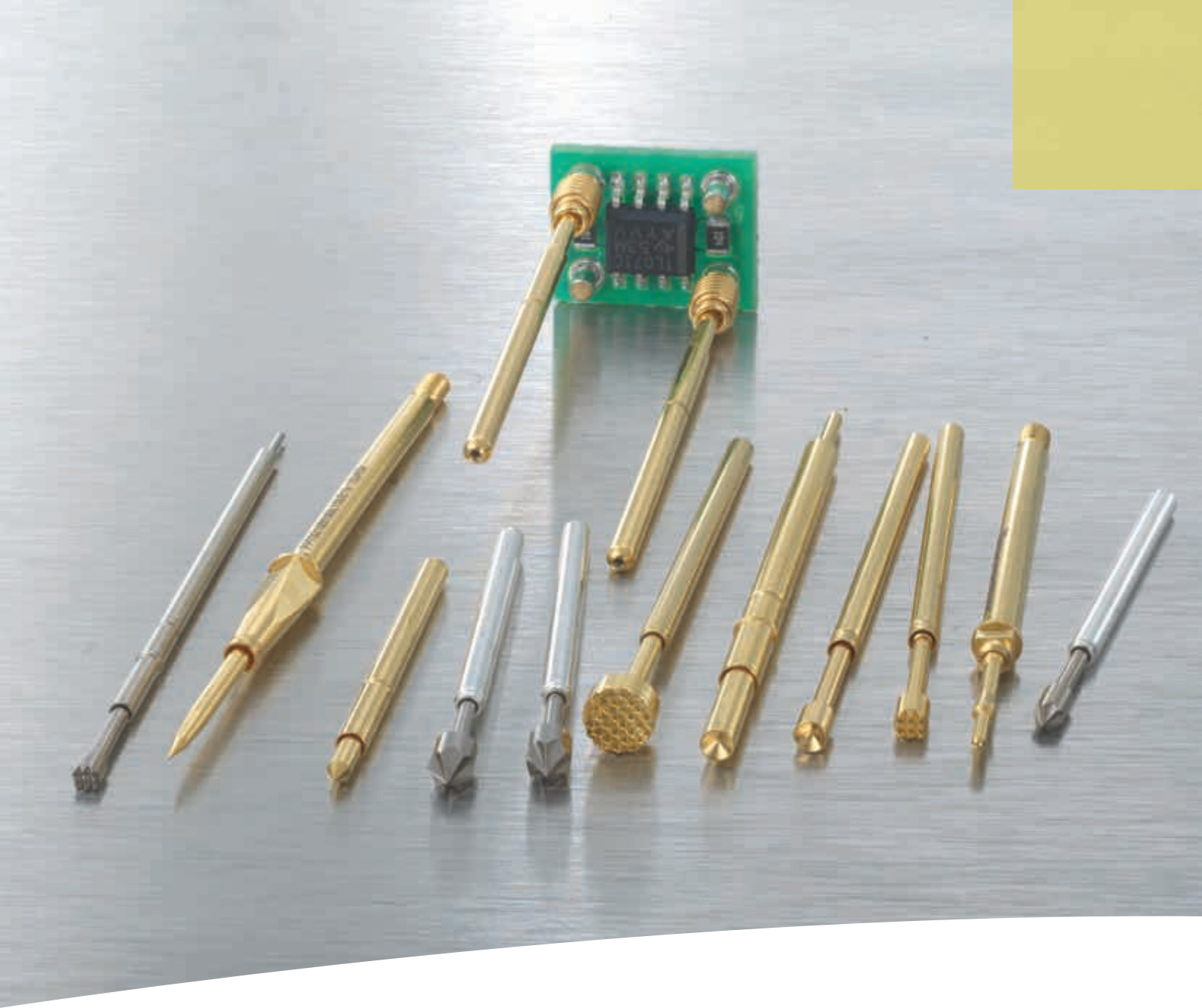
#### Projection Height

|      |     |
|------|-----|
| F205 | 4,2 |
|------|-----|

| Type                | Tip-Ø                        |        | Spring Force    |       |
|---------------------|------------------------------|--------|-----------------|-------|
| F 205               | 01                           | S      | 050             | N 085 |
| Tip Style           | Material                     | Finish | Special Version |       |
| Material:           | B = BeCu, S = Steel          |        |                 |       |
| Tip-Ø:              | 050 = 0,5 mm (e.g.)          |        |                 |       |
| Finish:             | N = Nickel                   |        |                 |       |
| Connecting Element: | Order Code according drawing |        |                 |       |
| ORDER EXAMPLE       |                              |        |                 |       |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 01     | S        | N       | 0,5     | -       |
|           | 07     | S        | N       | 0,8     | -       |
|           | 09     | B        | N       | 0,8     | -       |
|           | 11     | S        | N       | 0,5     | -       |
|           | 16     | S        | N       | 0,5     | -       |
|           | 18     | S        | N       | 0,5     | -       |





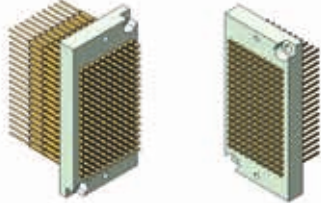
## Interface Probes

The interface between test fixture and test system is usually realized by interface probes which are specifically standardized for each test system.

|               |    |
|---------------|----|
| Kontaktblöcke | 68 |
| Interfacepins | 69 |
| F262          | 70 |
| F150          | 71 |
| F504          | 72 |
| F502          | 73 |
| F538          | 74 |

## Pylon Interface Contact Blocks

### Signal block 170-pole (max. 5A\*)



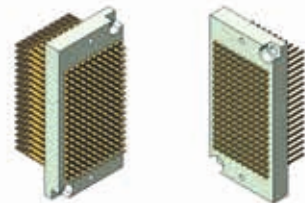
#### Receiver side (Wire-Wrap Connector)

Order Code: 43900017  
Receptacle: H502WW  
Contact Probe: F50403B104G130

#### Fixture side

Order Code: 43900015  
Receptacle: -  
Contact Pin: I-G1

### Signal block 170-pole (max. 5A\*)



#### Receiver side (Solder-Connector)

Order Code: 43900018  
Receptacle: H502LA  
Contact Probe: F50403B104G130

#### Fixture side

Order Code: 43900015  
Receptacle: -  
Contact Pin: I-G1

### Signal block 85-pole (max. 5A\*)



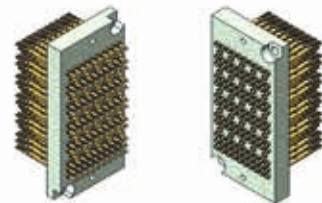
#### Receiver side

Order Code: 43900021  
Receptacle: H502LA  
Contact Probe: F50403B104G130

#### Fixture side

Order Code: 43900022  
Receptacle: -  
Contact Pin: I-C17LA/2

### Signal block 145-pole (max. 5A\*)



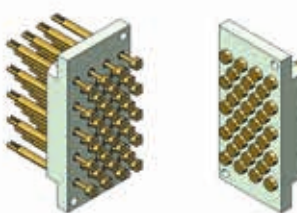
#### Receiver side

Order Code: 43900023  
Receptacle: H502LA  
Contact Probe: F50430B105G130L

#### Fixture side

Order Code: 43900024  
Receptacle: H502LA  
Contact Pin: I-Z1S2

### High current block 32-pole (max. 20 A\*)



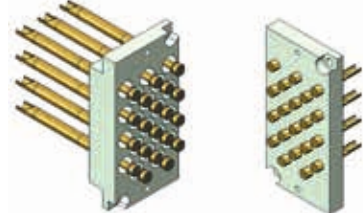
#### Receiver side

Order Code: 2101178

#### Fixture side

Order Code: 2101179

### High current block 20-pole (max. 5A\*)



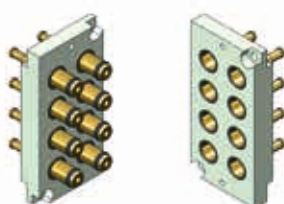
#### Receiver side

Order Code: 43900028  
Receptacle: H735LA  
Contact Probe: F73506B400G300C

#### Fixture side

Order Code: 43900027  
Receptacle: -  
Contact Pin: I-P20LA/2,5

### Pneumatic block 8-pole



#### Receiver side

Order Code: 43900025

#### Fixture side

Order Code: 43900026

FEINMETALL interface blocks (Pylon blocks) are used as internal interface. The integrated spring contact probes guarantee a good signal transmission with low transfer resistances.

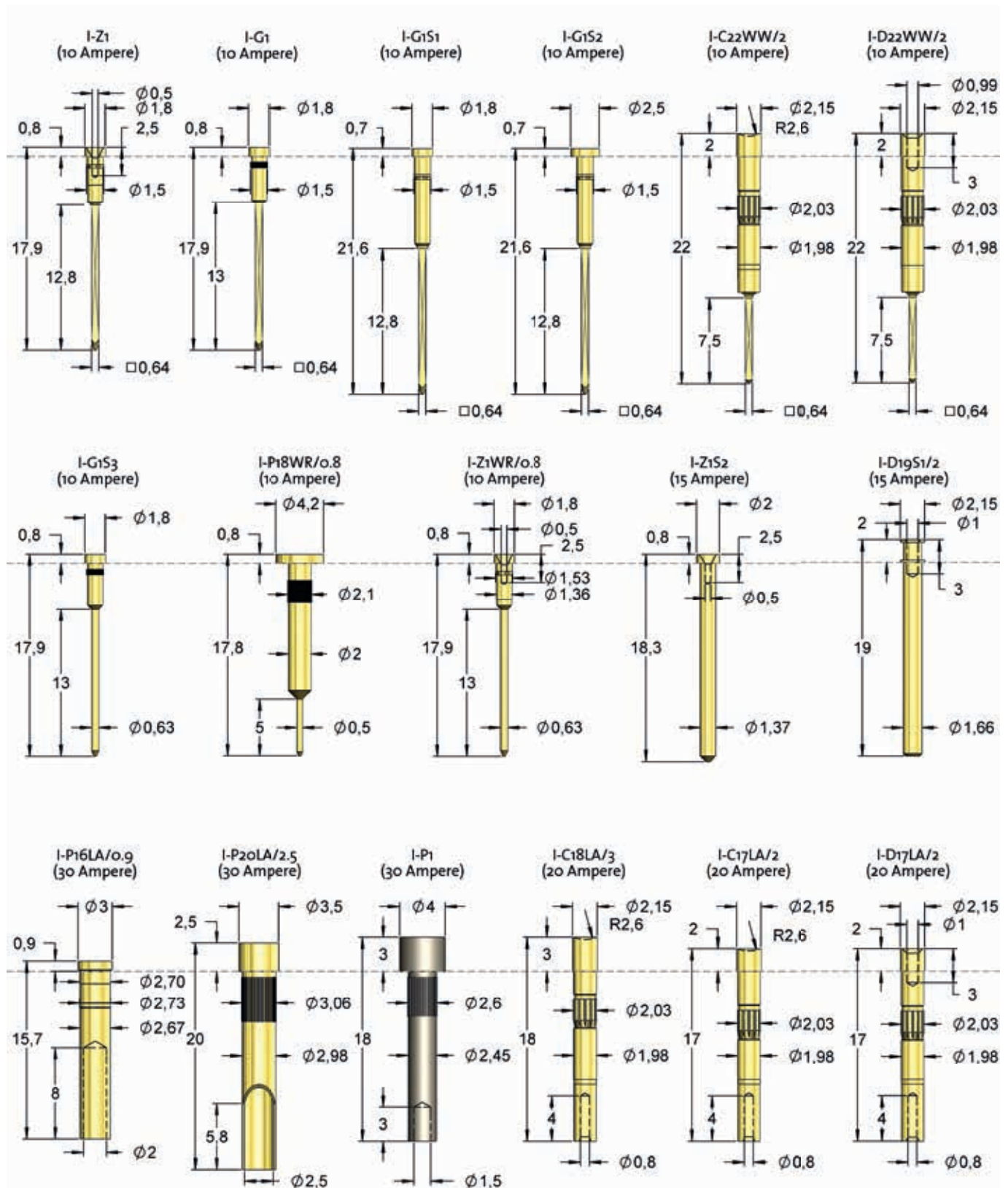
This is only a selection of available signal blocks, further variants on request.

\* The sum of the currents lead to a heating of the blocks due to power loss. The maximum allowed rise of this temperature is limited to 80 Kelvin.



## Interface Pins

Brass, Gold plated (rhodanized)



Interface Probe  
for ATG Luther & Maelzer

F262

|                  |               |
|------------------|---------------|
| Centers (mm/mil) | 1,50 / 59     |
| Current          | 2,0 A         |
| Temperature      | -20°C...+80°C |
| R typically      | 100 mOhm      |

Spring Force (cN ±20%)

|         |               |
|---------|---------------|
| Preload | Nominal Force |
| 0       | 140           |

Travel (mm)

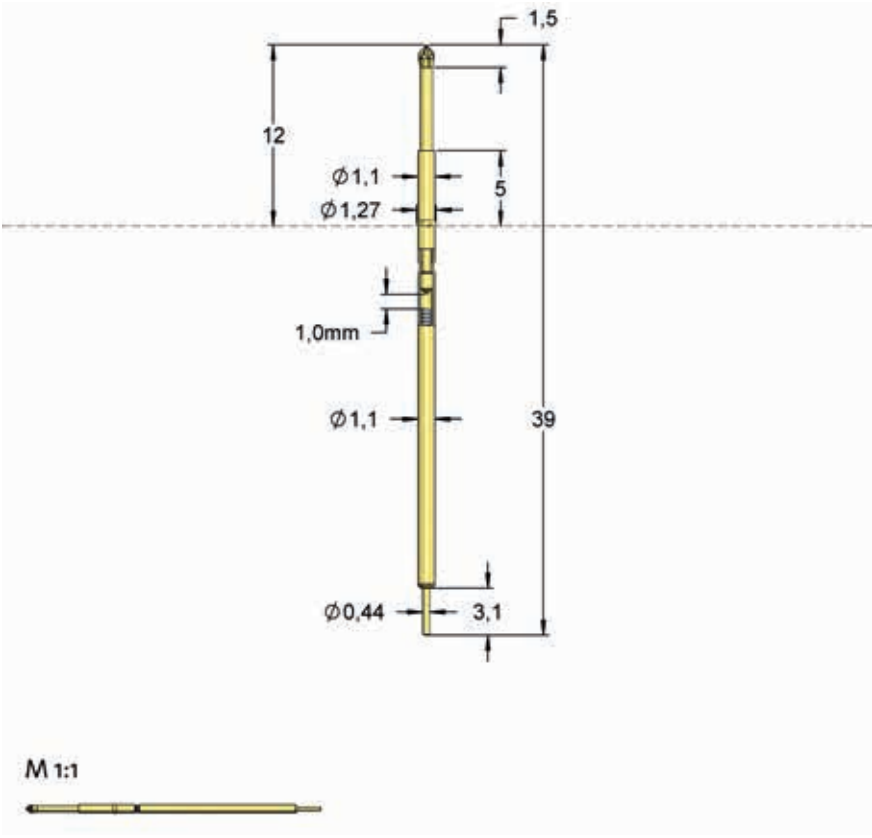
|                   |          |
|-------------------|----------|
| Nominal           | Maximum  |
| 5,0               | 7,0      |
| Pointing Accuracy | ±0,08 mm |

Materials and Plating

|         |                           |
|---------|---------------------------|
| Plunger | see Tip Style             |
| Barrel  | Nickel silver, unplated   |
| Spring  | Music wire, silver plated |


Drill Size [mm]

|      |     |
|------|-----|
| F262 | 1,1 |
|------|-----|



Probe F262 is mainly used at the basic grid field of bare board testers.

| Type          | Tip-Ø |                                      | Spring Force |                 |     |
|---------------|-------|--------------------------------------|--------------|-----------------|-----|
| F 262         | 07    | S                                    | 100          | L               | 140 |
| Tip Style     |       | Material                             | Finish       | Special Version |     |
| Material:     |       | S = Steel                            |              |                 |     |
| Tip-Ø:        |       | 100 = 1,0 mm (e.g.)                  |              |                 |     |
| Finish:       |       | L = Longtime Gold plated, N = Nickel |              |                 |     |
| ORDER EXAMPLE |       |                                      |              |                 |     |

| Tip Style   | Number | Material | Plating | Ø in mm | Version |
|---|--------|----------|---------|---------|---------|
|  | 07     | S        | L       | 1,00    | -       |



## Interface Probe for Teradyne

### F150

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 2,54 / 100    |
| <b>Current</b>          | 5,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 20 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 50      | 100           |

#### Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 4,5               | 8,0      |
| Pointing Accuracy | ±0,08 mm |

#### Materials and Plating

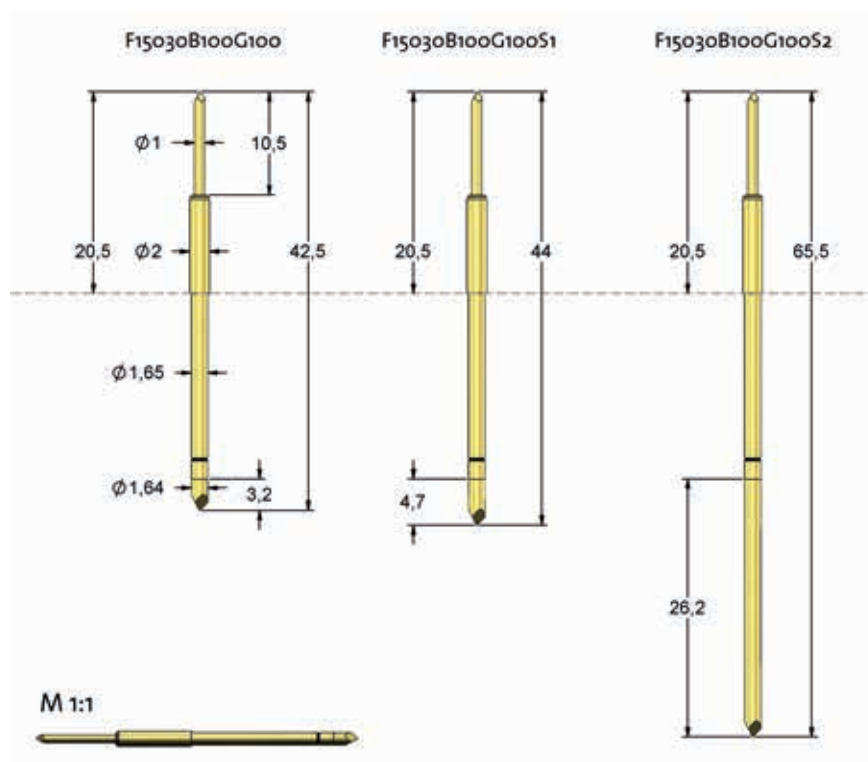
|         |                           |
|---------|---------------------------|
| Plunger | see Tip Style             |
| Barrel  | Bronze, gold plated       |
| Spring  | Music wire, silver plated |

#### Drill Size [mm]

|      |            |
|------|------------|
| F150 | 1,62 -1,65 |
|------|------------|

#### Projection Height

|         |      |
|---------|------|
| F150... | 20,5 |
|---------|------|



| Type                    | Tip-Ø                                   | Spring Force |
|-------------------------|---|--------------|
| F 150 30 B 100 G 100 S2 |   |              |
| Tip Style               | Material                                | Finish       |
| Material:               | B = BeCu                                |              |
| Tip-Ø:                  | 100 = 1,0 mm (e.g.)                     |              |
| Finish:                 | G = Gold                                |              |
| Special Version:        | S1/S2 = different Length of Contact end |              |
| ORDER EXAMPLE           |   |              |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 30     | B        | G       | 1,0     | -       |



Interface Probe for  
Genrad 227x / 228x

F504

|                  |               |
|------------------|---------------|
| Centers (mm/mil) | 2,54 / 100    |
| Current          | 5,0 A         |
| Temperature      | -20°C...+80°C |
| R typically      | 35 mOhm       |

Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 40      | 100 L         |
| 60      | 130           |

Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 2,4               | 3,2      |
| 2,0               | 3,9 L    |
| Pointing Accuracy | ±0,05 mm |

Materials and Plating

|            |                            |
|------------|----------------------------|
| Plunger    | see Tip Style              |
| Barrel     | Nickel silver, gold plated |
| Spring     | Music wire, silver plated  |
| Receptable | Nickel silver, Gold plated |

Accessories

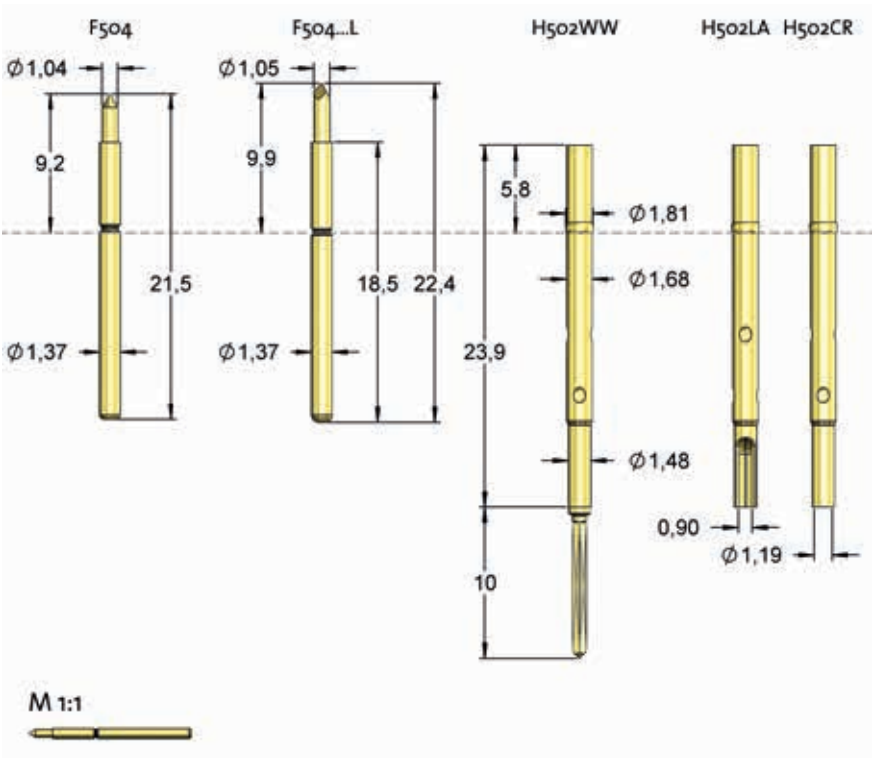
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-100EV |
| Insertion tool receptacle | FEWZ-100E0 |
| Insertion tool probe      | FDWZ-100   |
| Plug lock                 | H100VS     |

Drill Size [mm]

|                     |             |
|---------------------|-------------|
| Press ring as stop  | 1,67- 1,69  |
| Press ring inserted | 1,70 - 1,75 |

Projection Height

|                    |           |
|--------------------|-----------|
| (F504) H502...     | 3,2 - 9,0 |
| (F504...L) H502... | 4,1 - 9,9 |



Further receptacles H502LI, H502S1 as well as an insulating sleeve H502IS available.

| Type                   | Tip-Ø                                 | Spring Force |
|------------------------|---------------------------------------|--------------|
| F 504 30 B 105 G 100 L |                                       |              |
| Tip Style              | Material                              | Finish       |
| Material:              | B = BeCu                              |              |
| Tip-Ø:                 | 105 = 1,05 mm (e.g.)                  |              |
| Finish:                | G = Gold                              |              |
| Special Version:       | L = Long Version, B = „Banana Shaped“ |              |
| Receptacle:            | Order Code according drawing          |              |
| ORDER EXAMPLE          |                                       |              |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 03     | B        | G       | 1,05    | -       |
|           | 18     | B        | G       | 1,05    | L       |



## Interface Probe for ATG Luther & Maelzer

### F502

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 2,54 / 100    |
| <b>Current</b>          | 5,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 55 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 60      | 130           |

#### Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 2,7               | 4,1      |
| Pointing Accuracy | ±0,05 mm |

#### Materials and Plating

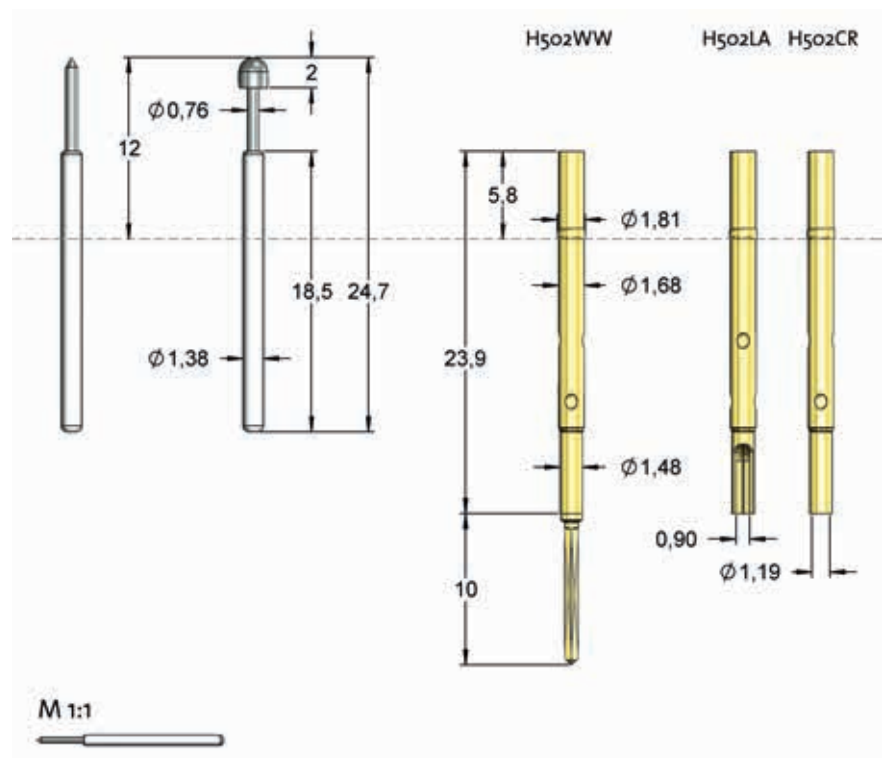
|            |                            |
|------------|----------------------------|
| Plunger    | see Tip Style              |
| Barrel     | Bronze, silver plated      |
| Spring     | Music wire, silver plated  |
| Receptacle | Nickel silver, Gold plated |

#### Drill Size [mm]

|                     |            |
|---------------------|------------|
| Press ring as stop  | 1,67- 1,69 |
| Press ring inserted | 1,70 -1,75 |

#### Projection Height

|         |            |
|---------|------------|
| H502... | 6,2 - 12,0 |
|---------|------------|



Further receptacles H502LI, H502S1 as well as an insulating sleeve H502IS available.

| Type                 | Tip-Ø                        | Spring Force |
|----------------------|------------------------------|--------------|
| F 502 12 S 190 N 130 |                              |              |
| Tip Style            | Material                     | Finish       |
| Material:            | S = Steel                    |              |
| Tip-Ø:               | 190 = 1,9 mm (e.g.)          |              |
| Finish:              | N = Nickel                   |              |
| Receptacle:          | Order Code according drawing |              |
| ORDER EXAMPLE        |                              |              |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 03     | S        | N       | 0,76    | -       |
|           | 12     | S        | N       | 1,9     | -       |

## Interface Probe for Digitaltest MTS 300

### F538

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 2,54 / 100    |
| <b>Current</b>          | 5,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 55 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 60      | 220           |

#### Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 2,7               | 4,0      |
| Pointing Accuracy | ±0,05 mm |

#### Materials and Plating

|            |                            |
|------------|----------------------------|
| Plunger    | see Tip Style              |
| Barrel     | Bronze, silver plated      |
| Spring     | Music wire, silver plated  |
| Receptacle | Nickel silver, Gold plated |

#### Accessories

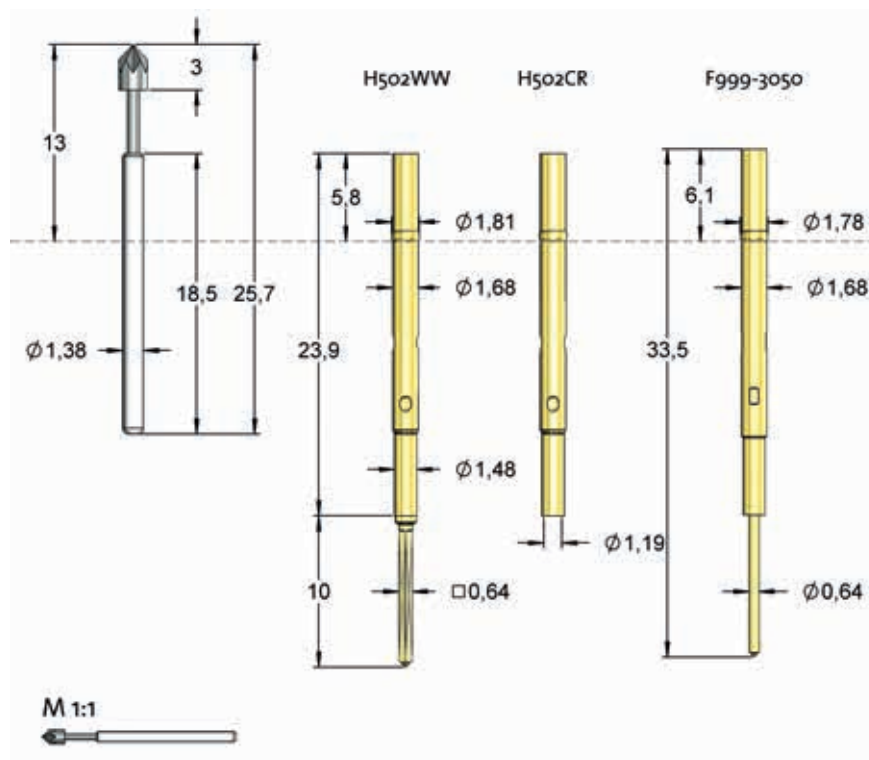
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-100EV |
| Insertion tool receptacle | FEWZ-100E0 |
| Insertion tool probe      | FDWZ-100   |
| Plug lock                 | H100VS     |

#### Drill Size [mm]

|                     |             |
|---------------------|-------------|
| Press ring as stop  | 1,67 - 1,69 |
| Press ring inserted | 1,70 - 1,75 |

#### Projection Height

|         |            |
|---------|------------|
| H502... | 7,2 - 13,0 |
|---------|------------|



Further receptacles H502LI, H502S1 as well as an insulating sleeve H502IS available.

| Type                 | Tip-Ø                        | Spring Force |
|----------------------|------------------------------|--------------|
| F 538 07 S 190 N 220 |                              |              |
| Tip Style            | Material                     | Finish       |
| Material:            | S = Steel                    |              |
| Tip-Ø:               | 190 = 1,9 mm (e.g.)          |              |
| Finish:              | N = Nickel                   |              |
| Receptacle:          | Order Code according drawing |              |
| ORDER EXAMPLE        |                              |              |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 07     | S        | N       | 1,3     | -       |
|           | 07     | S        | N       | 1,9     | -       |



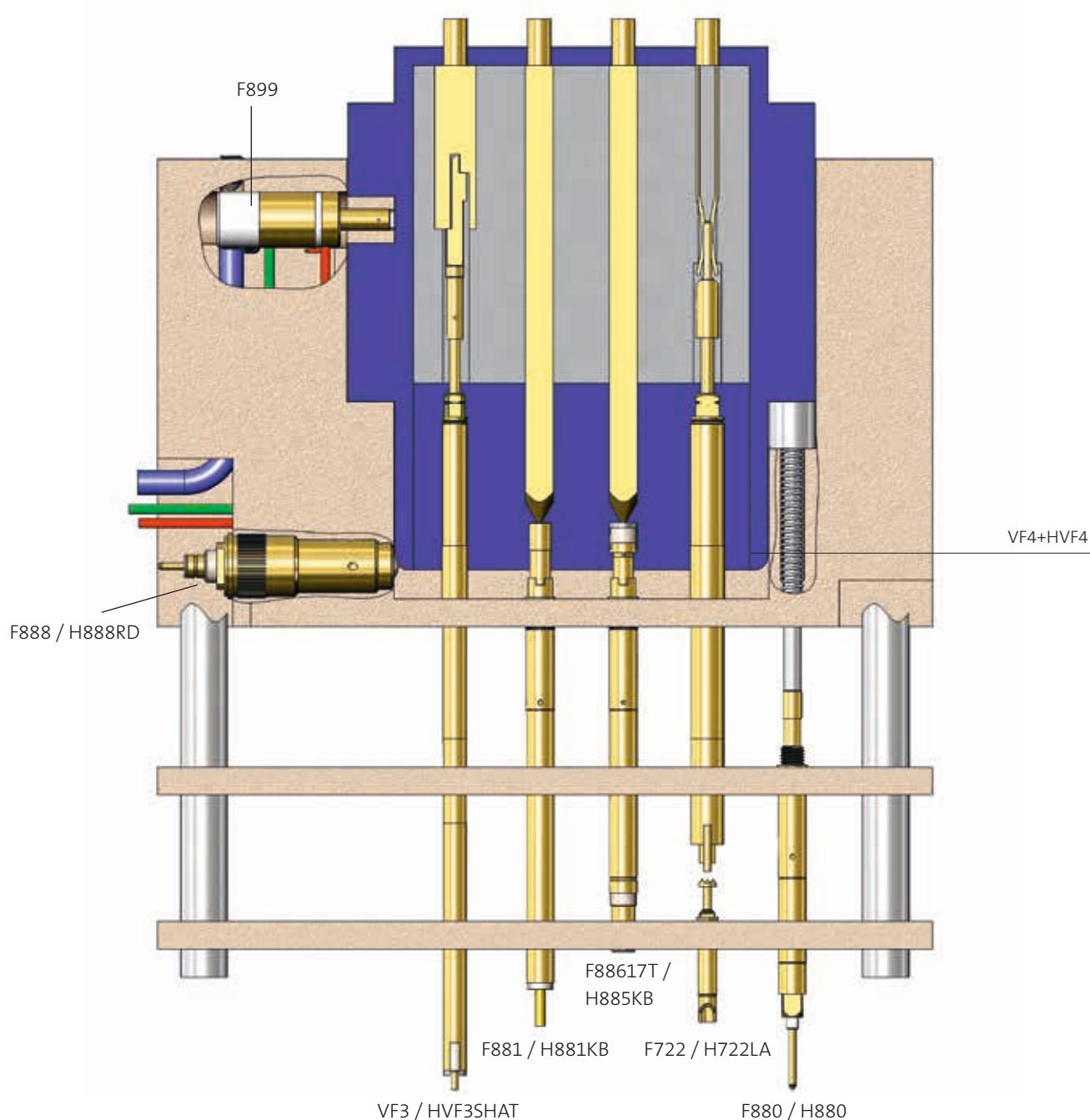
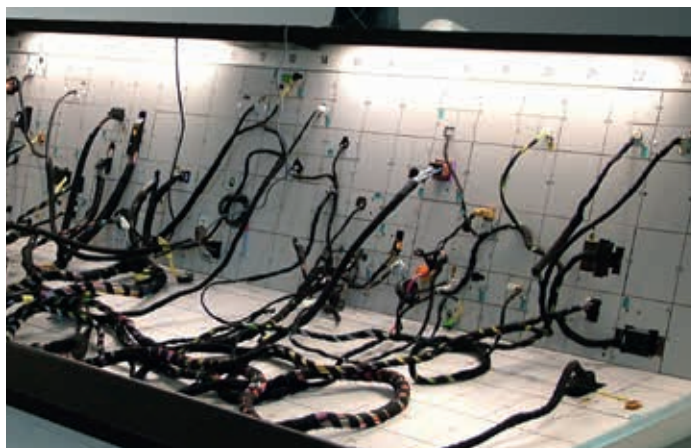
## Wire Harness and Connector Test

Based on many years of experience and great proximity to our customers, FEINMETALL today offers a perfect product portfolio of test probes for the wire harness and connector test. The high quality standard and the excellent availability of our products are inspiring our customers. FEINMETALL is setting standards in cost optimized solutions, for always new and challenging requirements from the market, by specifically and well designed products. Innovation is the key to our success.

|                        |     |
|------------------------|-----|
| Position Sensor System | 78  |
| Step Probes            | 81  |
| Threaded Probes        | 89  |
| High Current Probes    | 101 |
| Switch Probes          | 121 |
| Twist Proof Probes     | 149 |
| Push Back Probes       | 159 |
| Kelvin Probes          | 165 |
| Radio Frequency Probes | 174 |

## Design of test modules for wire harness connectors with FEINMETALL contact probes

As market leader FEINMETALL offers a broad range of special contact probes and accessories for the design of test modules. With innovative and cost-effective solutions FEINMETALL satisfies the demand in the field and is a real trend-setter in the wire harness testing technology. The picture shows the schematic design of a connector test module with FEINMETALL-products.







## Smart solutions for test module functions by FEINMETALL products

### Variable adjustment of the switch travel for push-back probes

The usage of push-back probes in combination with threaded probes on a second level allows a variable adjustment of the switch point (closing of the electric circuit) by height adjustability of the second level. To guarantee a reduced depth of the module we recommend the usage of the short-travel probe F722 together with the push-back probes VF4, VF3 or VF100.

### Push-back probes with fix switch travel

When using push-back probes, a pre-defined switching point is achieved by assembling a push-back probe with a corresponding switch receptacle. The switch function is integrated in the receptacle. For FEINMETALL airtight switch receptacles, the part number ends with "SHAT" ("SH" = switch function, "AT" = airtight). We recommend for example the combination of the push-back probe VF3 with the switch receptacle HVF3SHAT. Alternatively the new cost-saving version V03 with integrated switch function can be used (this version is airtight but not twist-proof).

### Push-back Probes with same projection height

The threaded push-back probes VF3, VF4 and VF100 have an identical projection height and thus can be combined without any additional procedures for height adjustment.

### Design of vacuum-tight modules

FEINMETALL offers all necessary probes and receptacles for the design of vacuum-tight modules. The airtight version can be identified by the ending "AT" at the order code. No additional cost-intensive provisions for tightening are necessary at contact probes and receptacles.

### Position Test of contact elements by insulated probe tips

For an insulated position test FEINMETALL offers a great selection of insulated tip styles for the switch probe series F886. Especially the version with tip style 17T (insulated metal cap) is extremely rugged and durable.

Its construction avoids any electrical connection to the barrel of the probe also at maximum travel. A silver plating helps to distinguish the insulated tip style 17T from the conducting gold plated BeCu heads.

### Short-circuit-proof modules by voltage-free switch probes

Short-circuit-proof modules and fixtures can be designed with the switch probes F881 and F888 with electrically isolated switching circuit. This is an important matter given by the fact, that test tables in the market may be equipped with modules of different manufacturers. Due to different switching concepts and voltage levels at these different modules, the activation of the probe switch may lead to short-circuits with destructive consequences when using switch probes without electrical isolation.

Isolated switch probes can avoid this problem. As the series F881 has the same installation dimensions as the standard switch probes F885/F886 no change of the design in the module is necessary for replacement. For the series F881 a specific combi-receptacle (H881KB) for solder less replacement is available.

### Note for the usage of voltage-free FEINMETALL switch probes:

According to DIN VDE 0100 (part 410) a maximum of 25V AC (rms) or 60V DC is permitted which includes any potential surge.

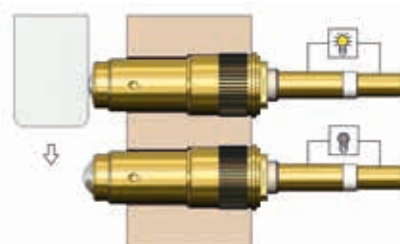
### Switch probes for backward assembly

Switch probes usually are assembled and exchanged from the top. If this is not possible or favoured, the switch probe F880 can be applied. This probe is for mounting from the bottom, and its switch point can be adjusted by the special tool FWZ888SA before fixing the wiring.

### Lateral presence test of connectors

The lateral presence test of connectors or housings generally is a problem for conventional contact probes due to the movement of the DUT. With Series F888 FEINMETALL offers an excellent and innovative solution for this application, providing lots of advantages.

- Rolling ball as contact element, which leads to a reduction of transverse forces and thus a remarkably higher durability compared to contact probes with fix plunger head of similar shape
- Airtight version for vacuum-tight modules
- electrically isolated switch available
- very short length for low installation depth
- variable height adjustment of the probe in combination with the corresponding receptacle
- Adjustment of switching point without wiring by special tool FWZ888SA





## Contact Probe with integrated travel measurement

### Position Sensor System

The Position Sensor System has been developed to enable an exact measurement of the travel additionally to contacting the test item.

To realize this, a small potentiometer is integrated in a dedicated position sensor that is screwed together with the contact probe and the receptacle. The 3-wire-circuit allows to realize a potential divider. After applying an operating voltage the sensor supplies a measurement voltage that is linear to the travel of the plunger. Alternatively, the resulting resistance can be used as measurement value.

The measurement results can be analyzed by the available tester environment, commonly.

#### Calibration

Due to test principle with a certain initial and final resistance and due to electrical and mechanical tolerances the exact plunger position in Millimeter requires a calibration of the Position Sensor System after assembly.

#### Measurement of relative values

By calculating the difference between two measurement values of one probe deviations related to a required position can be determined in positive or negative travel direction.

#### Reference measurement

By calculating the difference between two measurement values of different probes deviations related to a reference position can be determined. The reference probe can either touch a certain reference point of the test item or a special "golden device" can be used as a reference.

#### Zeroize

Depending on the hard and software of the test system the measurement signal can be zeroed at user-defined positions. This method allows positive or negative deviations without calculating differences.

**We recommend periodic calibration and zeroing.**

#### Modular design of the Position Sensor System, consisting of: Probe – Receptacle – Position Sensor



#### Specifications Position Sensor PS100F060R5.2:

Measuring range: 0...5.2 mm

Measuring principle: potentiometric

Accuracy:  $\pm 2\%$

Reproducibility: typ.  $\pm 0,05$  mm

Therm.resistance coeff.  $5 \times 10^{-5}/K$

Spring force: 60 cN

Preload: 40 cN

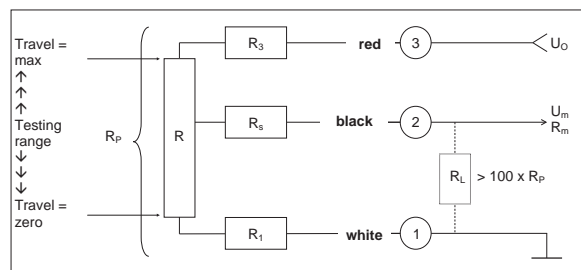
Nominal travel: 4.0 mm

Connections:

Red: Operating voltage  $U_0$

Black: Measurement signal  $U_m / R_m$

Blue: Test point contact probe (maximum current 1A)



$U_0$  Operating voltage (maximum 20 VDC)

$U_m$  Potentiometric: Measurement voltage of potential divider ( $U_1 < U_m < U_p - U_3$ )

$R_m$  Resistive: Measurement resistance ( $R_1 < R_m < R_p - R_3$ )

$R_1$  Initial resistance (400 Ohm  $\pm$  200 Ohm)

$U_1$  Initial voltage ( $U_1 = I \cdot R_1$ )

$R_3$  Final resistance

$U_3$  Final voltage ( $U_3 = I \cdot R_3$ )

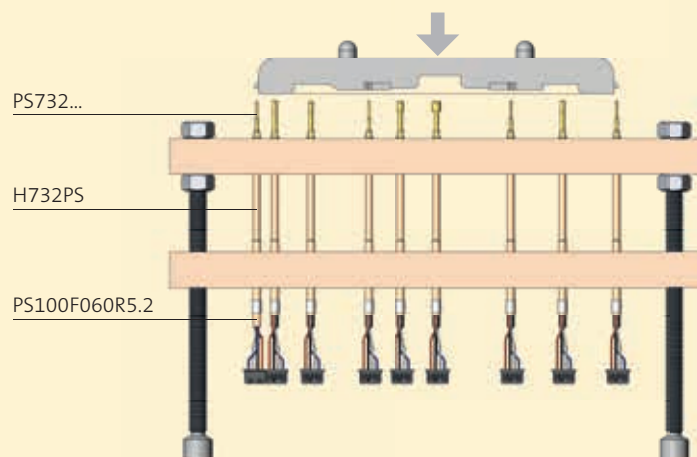
$R_p$  Potentiometer resistance (5 kOhm  $\pm$  20%) ( $R_p = R_1 + R + R_3$ )

$R_s$  Slider resistance

$R_L$  Load resistor (optional to protect against overcurrent at the slider)

#### Application example

The Position Sensor System allows the detection of pin lengths, component heights or the depth of drill holes.





## Position Sensor System Not Twist Proof

### PS732

**NEW**

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 2,54 / 100    |
| <b>Current</b>          | 5,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 20 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 30      | 90            |

#### Spring Forces for Complete System of PS732, H732PS and PS100 (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 70      | 150           |

#### Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 4,0               | 5,0      |
| Thread (M)        | 1,6      |
| Wrench Size       | 1,7      |
| Pointing Accuracy | ±0,08 mm |

#### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Music wire, silver plated |
| Receptable | Brass, Gold plated        |

#### Accessories

|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-772E0 |
| Screw-in tool probe       | FWZ732 (T) |
| Screw-in tool sensor      | FWZPS100   |

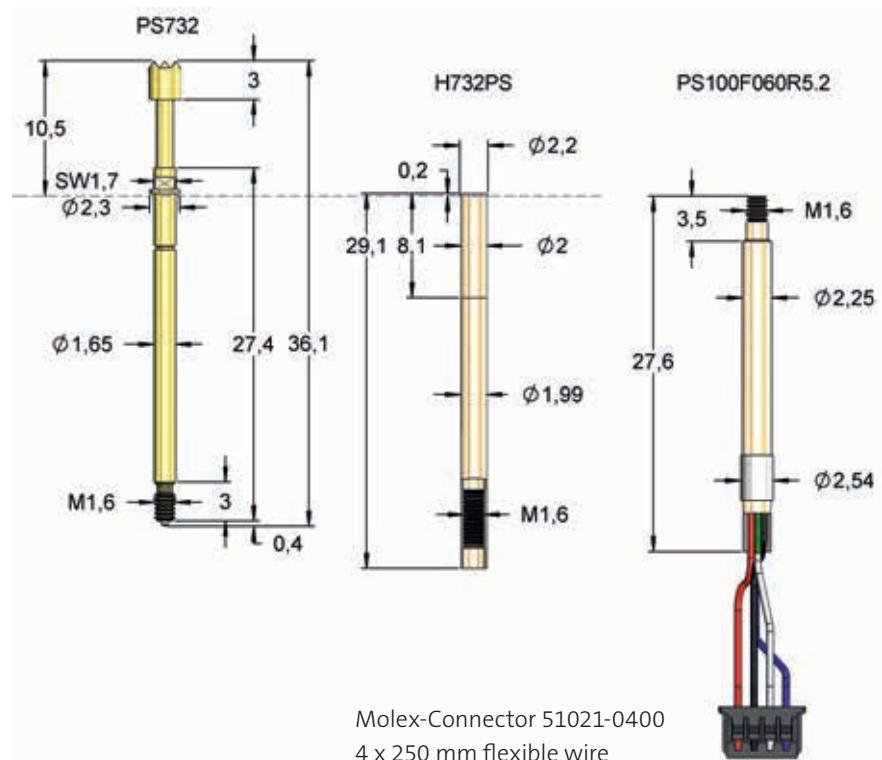
#### Drill Size [mm]

|        |             |
|--------|-------------|
| H732PS | 1,99 - 2,00 |
|--------|-------------|

#### Projection Height

|        |      |
|--------|------|
| H732PS | 10,5 |
|--------|------|

| Type  | Tip-Ø               | Spring Force |
|---|---------------------|--------------|
| PS732 05 B 180 G 090  |                     |              |
| Tip Style   | Material            | Finish       |
| Material:   | B = BeCu            |              |
| Head-Ø:   | 180 = 1,8 mm (e.g.) |              |
| Finish:   | G = Gold            |              |
| For a Position Sensor System also receptacle and position sensor are necessary. |                     |              |
| <b>ORDER EXAMPLE</b>  |                     |              |



The Position Sensor System consists of a special spring contact probe PS732, a receptacle H732PS and a sensor element PS100. These three elements are mounted into a fixture plate. The blue cable enables to connect the probe tip (test point). This solution allows a position test additionally to the electrical contact of the test item (maximum current 1 A).

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 05     | B        | G       | 1,8     | -       |
|           | 06     | B        | G       | 1,5     | -       |
|           | 06     | B        | G       | 1,8     | -       |
|           | 06     | B        | G       | 2,0     | -       |
|           | 06     | B        | G       | 2,5     | -       |
|           | 11     | B        | G       | 0,64    | -       |
|           | 11     | B        | G       | 0,8     | -       |
|           | 11     | B        | G       | 1,0     | -       |
|           | 12     | B        | G       | 1,4     | -       |
|           | 16     | B        | G       | 0,8     | -       |
|           | 16     | B        | G       | 1,0     | -       |
|           | 17     | B        | G       | 1,4     | -       |

# Wire Harness and Connector Test

## Position Sensor System Twist Proof

### PS756

NEW

|                  |               |
|------------------|---------------|
| Centers (mm/mil) | 2,54 / 100    |
| Current          | 5,0 A         |
| Temperature      | -20°C...+80°C |
| R typically      | 50 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 30      | 90            |

#### Spring Forces for Complete System of PS756, H756PS and PS100 (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 70      | 150           |

#### Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 4,0               | 5,0      |
| Thread (M)        | 1,6      |
| Wrench Size       | 1,7      |
| Pointing Accuracy | ±0,08 mm |

#### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Music wire, silver plated |
| Receptacle | Brass, Gold plated        |

#### Accessories

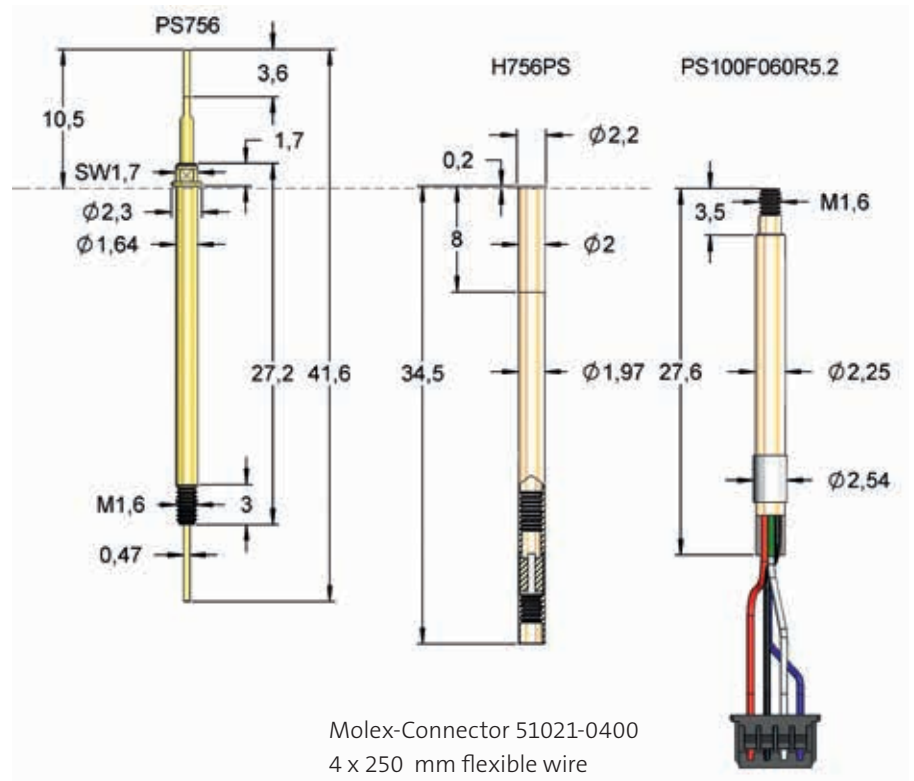
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FAWZ756    |
| Screw-in tool probe       | FWZ732 (T) |
| Screw-in tool sensor      | FWZPS100   |

#### Drill Size [mm]

|        |             |
|--------|-------------|
| H756PS | 1,99 - 2,00 |
|--------|-------------|

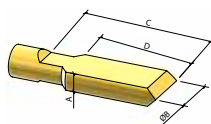
#### Projection Height

|        |      |
|--------|------|
| H756PS | 10,5 |
|--------|------|



The twist proof Position Sensor System consists of a special spring contact probe PS756, a receptacle H756PS and a sensor element PS100. These three elements are mounted into a fixture plate. The blue cable enables to connect the probe tip (test point). This solution allows a position test additionally to the electrical contact of the test item (maximum current 1 A).

| Type  | Tip-Ø     | Spring Force |
|---|-----------|--------------|
| PS756 84 B 0001 G 090   |           |              |
| Tip Style   | Material  | Finish       |
| Material:   | B = BeCu  |              |
| Head-Ø:   | see table |              |
| Finish:   | G = Gold  |              |
| For a Position Sensor System also receptacle and position sensor are necessary. |           |              |
| ORDER EXAMPLE   |           |              |



| Tip Style | Nummer | A   | B   | C   | D   | E | F    | G    | Version |
|-----------|--------|-----|-----|-----|-----|---|------|------|---------|
| 84        | 0001   | 0,5 | 1,5 | 3,6 | 5,0 | - | 10,5 | 41,6 | -       |

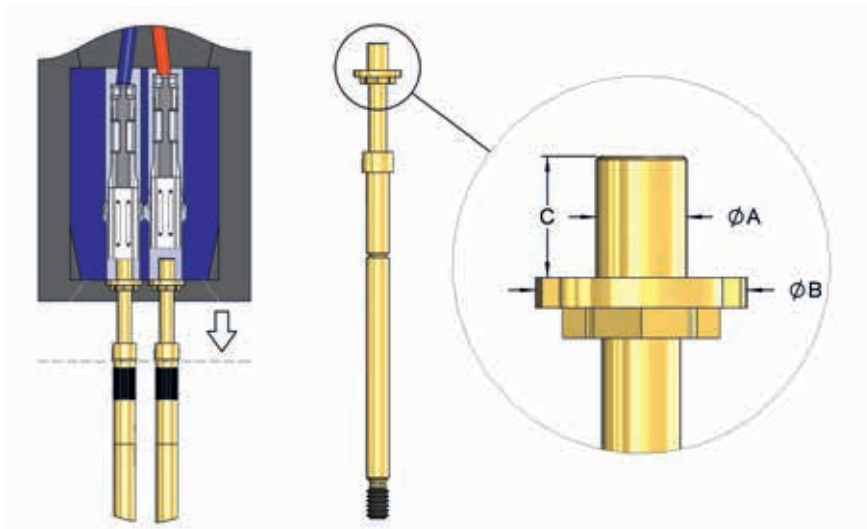


## Position Test with Step Probes

The test principle of a step probe is based on the fact that the plate comes to rest on the DUT (e.g. connector housing) and thereby a defined penetration of the pin in the connector housing is given. The pin of the step probe identifies the presence and/or the correct position of the contact element by contacting.

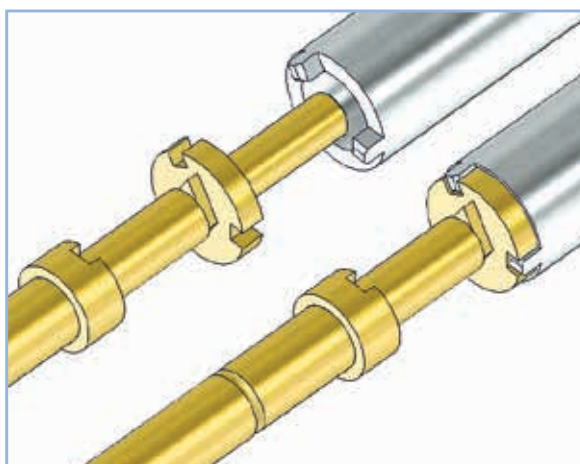
FEINMETALL offers a great variety of step probes (please see chapter „Threaded Probes“ and SP-Overview on page 88).

A special screw-in-tool allows applications with very small centers (please see page 154).



## Innovative Screw-In-Tool

For step probes with oversized plates (plate- $\phi$  larger than probe- $\phi$  or larger wrench size), FEINMETALL has developed a new 3 point tool solution which allows probe mounting at very small distances between the probes.



# Wire Harness and Connector Test

## Step Probe 50 mil

### F730SP

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 1,27 / 50     |
| <b>Current</b>          | 3,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 50 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 20      | 110           |

#### Travel (mm)

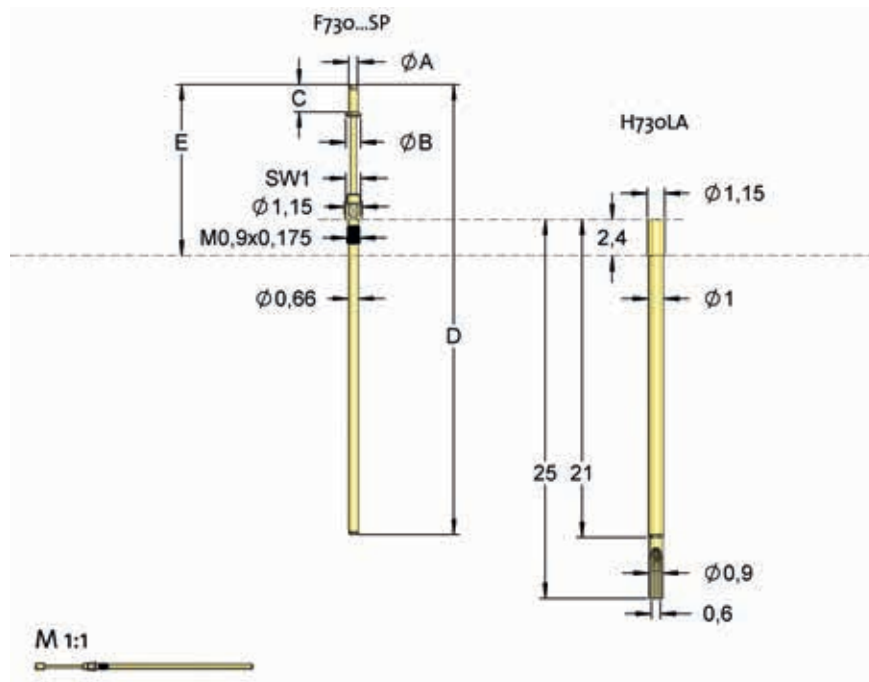
| Nominal           | Maximum   |
|-------------------|-----------|
| 4,0               | 5,0       |
| Thread (M)        | 0,9x0,175 |
| Wrench Size       | 1,0       |
| Pointing Accuracy | ±0,08 mm  |

#### Materials and Plating

|            |                         |
|------------|-------------------------|
| Plunger    | see Tip Style           |
| Barrel     | Bronze, gold plated     |
| Spring     | Music wire, gold plated |
| Receptacle | Brass, Gold plated      |

#### Drill Size [mm]

|         |             |
|---------|-------------|
| H730... | 0,99 - 1,00 |
|---------|-------------|



| Type   | Number                       | Spring Force |
|--|------------------------------|--------------|
| F 730 12 B 0001 G 110 SP   |                              |              |
| Tip Style  | Material                     | Finish       |
| Material:  | B = BeCu                     |              |
| Number:  | see table                    |              |
| Finish:  | G = Gold                     |              |
| Special Version:   | SP = Step Probe              |              |
| Receptacle:  | Order Code according drawing |              |
| At the order code of step probes, instead the coded tip diameter there is a number, by that you can find related head dimensions in the table. |                              |              |
| ORDER EXAMPLE  |                              |              |

| Order Code        | Typ Style | No.  | Pin-Ø (A) | Plate-Ø (B) | Pin Length (C) | Overall Length (D) | Projection Height (E) | Screw-In Tool     |
|-------------------|-----------|------|-----------|-------------|----------------|--------------------|-----------------------|-------------------|
| F73012B0001G110SP | 12        | 0001 | 0,60      | 1,00        | 1,80           | 29,70              | 11,30                 | FWZ730S1;FWZ730T1 |
| F73012B0002G110SP | 12        | 0002 | 0,60      | 1,00        | 2,60           | 30,50              | 12,10                 | FWZ730S1;FWZ730T1 |
| F73012B0003G110SP | 12        | 0003 | 0,50      | 0,90        | 1,40           | 29,30              | 10,90                 | FWZ730;FWZ730T    |

# Wire Harness and Connector Test



## Step Probe 94 mil

### F731SP

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 2,40 / 94     |
| <b>Current</b>          | 5,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 30 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 60      | 110           |
| 50      | 150           |
| 50      | 300           |

#### Travel (mm)

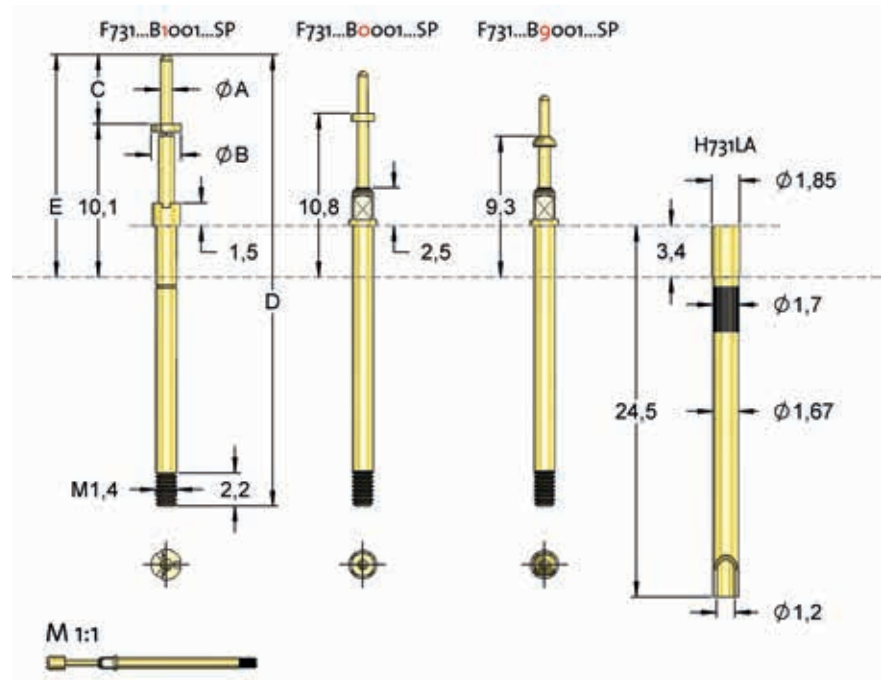
| Nominal           | Maximum                 |
|-------------------|-------------------------|
| 2,0               | 2,75* at tip style 90xx |
| 3,5               | 4,4                     |
| Thread (M)        | 1,4                     |
| Wrench Size       | 1,4                     |
| Pointing Accuracy | ±0,08 mm                |

#### Materials and Plating

|            |                         |
|------------|-------------------------|
| Plunger    | see Tip Style           |
| Barrel     | Brass, gold plated      |
| Spring     | Music wire, gold plated |
| Receptacle | Brass, Gold plated      |

#### Drill Size [mm]

|         |             |
|---------|-------------|
| H731... | 1,67 - 1,68 |
|---------|-------------|



| Type   | Number                       | Spring Force     |
|--|------------------------------|------------------|
| F 731 11 B 0001 G 150 SP   |                              |                  |
| Tip Style  | Material                     | Finish           |
| Material:  | B = BeCu                     | Finish:          |
| Number:  | see table                    | Special Version: |
| Finish:  | G = Gold                     | SP = Step Probe  |
| Special Version:   | SP = Step Probe              |                  |
| Receptacle:  | Order Code according drawing |                  |
| At the order code of step probes, instead the coded tip diameter there is a number, by that you can find related head dimensions in the table. |                              |                  |

#### ORDER EXAMPLE

| Order Code        | Typ Style | No.  | Pin-Ø (A) | Plate-Ø (B) | Pin Length (C) | Overall Length (D) | Projection Height (E) | Travel nom. | Travel max. | Screw-In Tool      |
|-------------------|-----------|------|-----------|-------------|----------------|--------------------|-----------------------|-------------|-------------|--------------------|
| F73111B0004G150SP | 11        | 0004 | 0,65      | 1,40        | 5,50           | 31,40              | 16,30                 | 3,50        | 4,40        | FWZ731;FWZ731T     |
| F73111B0002G150SP | 11        | 0002 | 0,65      | 1,50        | 2,80           | 28,70              | 13,60                 | 3,50        | 4,40        | FWZ731;FWZ731T     |
| F73111B0007G150SP | 11        | 0007 | 0,65      | 1,50        | 3,40           | 29,30              | 14,20                 | 3,50        | 4,40        | FWZ731S1;FWZ731T1  |
| F73111B0007G300SP | 11        | 0007 | 0,65      | 1,50        | 3,40           | 29,30              | 14,20                 | 3,50        | 4,40        | FWZ731S1;FWZ731T1  |
| F73111B0001G150SP | 11        | 0001 | 0,65      | 1,50        | 4,00           | 29,90              | 14,80                 | 3,50        | 4,40        | FWZ731;FWZ731T     |
| F73111B0003G150SP | 11        | 0003 | 0,70      | 1,50        | 4,00           | 29,90              | 14,80                 | 3,50        | 4,40        | FWZ731;FWZ731T     |
| F73111B1009G150SP | 11        | 1009 | 0,80      | 2,00        | 4,60           | 29,80              | 14,70                 | 3,50        | 4,40        | FWZ731SP;FWZ731SPT |
| F73112B9008G110SP | 12        | 9008 | 0,65      | 1,50        | 2,70           | 27,10              | 12,00                 | 2,00        | 2,75        | FWZ731;FWZ731T     |
| F73112B9008G150SP | 12        | 9008 | 0,65      | 1,50        | 2,70           | 27,10              | 12,00                 | 2,00        | 2,75        | FWZ731;FWZ731T     |
| F73112B9007G110SP | 12        | 9007 | 0,65      | 1,50        | 3,40           | 27,80              | 12,70                 | 2,00        | 2,75        | FWZ731;FWZ731T     |
| F73112B9001G110SP | 12        | 9001 | 0,65      | 1,50        | 4,00           | 28,40              | 13,30                 | 2,00        | 2,75        | FWZ731;FWZ731T     |
| F73116B0006G150SP | 16        | 0006 | 0,65      | 1,50        | 2,10           | 28,00              | 12,90                 | 3,50        | 4,40        | FWZ731;FWZ731T     |



# Wire Harness and Connector Test

## Step Probe 100 mil F732SP

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 2,54 / 100    |
| <b>Current</b>          | 5,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 20 mOhm       |

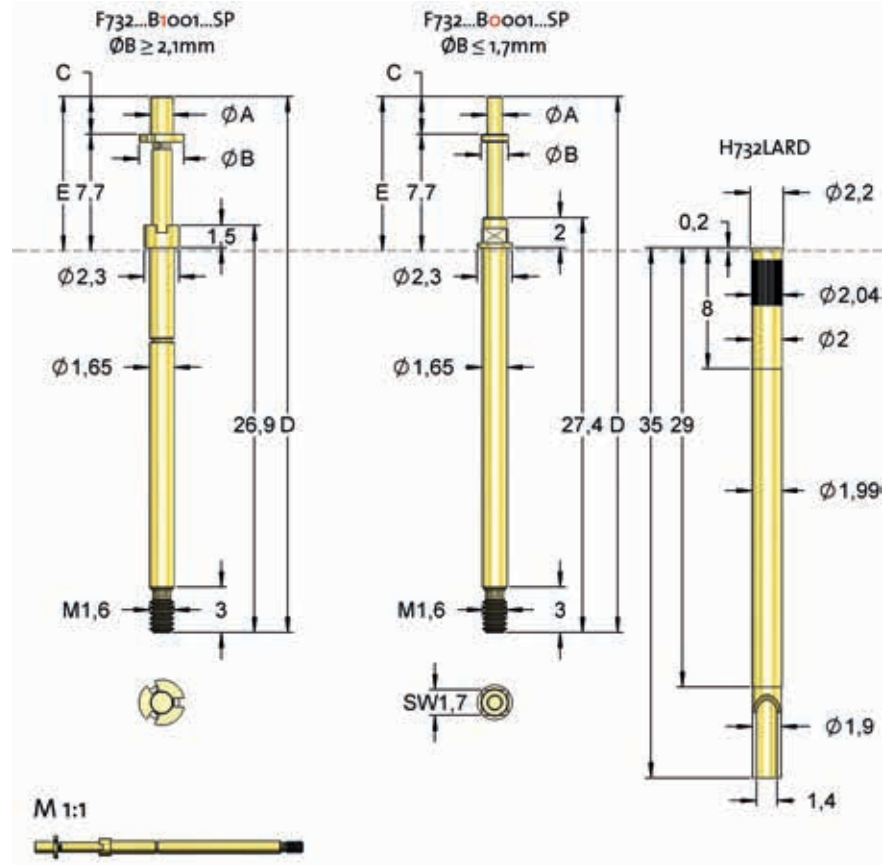
### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 30      | 80            |
| 50      | 100           |
| 60      | 150           |
| 60      | 300           |

### Drill Size [mm]

|                             |             |
|-----------------------------|-------------|
| Receptacle without knurling | 1,99 - 2,00 |
| Receptacle with knurling    | 2,00 - 2,02 |

| Type   | Number                       | Spring Force |
|--|------------------------------|--------------|
| F 732 11 B 0001 G 150 SP   |                              |              |
| Tip Style  | Material                     | Finish       |
| Material:  | B = BeCu                     |              |
| Number:  | see table                    |              |
| Finish:  | G = Gold                     |              |
| Special Version:   | SP / SP1 Step Probe          |              |
|  | tools see table              |              |
| Receptacle:  | Order Code according drawing |              |
| At the order code of step probes, instead the coded tip diameter there is a number, by that you can find related head dimensions in the table. |                              |              |
| ORDER EXAMPLE  |                              |              |



### Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 4,0               | 5,0      |
| Thread (M)        | 1,6      |
| Wrench Size       | 1,7      |
| Pointing Accuracy | ±0,08 mm |

### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Music wire, silver plated |
| Receptable | Brass, Gold plated        |

| Order Code        | Typ Style | No.  | Pin-Ø (A) | Plate-Ø (B) | Pin Length (C) | Overall Length (D) | Projection Height (E) | Screw-In Tool      |
|-------------------|-----------|------|-----------|-------------|----------------|--------------------|-----------------------|--------------------|
| F73211B1040G150SP | 11        | 1040 | 0,50      | 2,10        | 1,50           | 34,40              | 9,00                  | FWZ732SP;FWZ732SPT |
| F73211B1074G150SP | 11        | 1074 | 0,50      | 2,10        | 1,90           | 34,80              | 9,40                  | FWZ732SP;FWZ732SPT |
| F73211B1075G150SP | 11        | 1075 | 0,55      | 2,10        | 3,00           | 35,90              | 10,50                 | FWZ732SP;FWZ732SPT |
| F73211B0042G150SP | 11        | 0042 | 0,64      | 1,50        | 1,50           | 34,40              | 9,00                  | FWZ732;FWZ732T     |
| F73211B0043G150SP | 11        | 0043 | 0,64      | 1,50        | 2,50           | 35,40              | 10,00                 | FWZ732;FWZ732T     |
| F73211B0045G150SP | 11        | 0045 | 0,64      | 1,50        | 3,00           | 35,90              | 10,50                 | FWZ732;FWZ732T     |
| F73211B1026G150SP | 11        | 1026 | 0,64      | 2,50        | 2,50           | 35,40              | 10,00                 | FWZ732SP;FWZ732SPT |
| F73211B0048G150SP | 11        | 0048 | 0,65      | 1,00        | 3,00           | 35,90              | 10,50                 | FWZ732;FWZ732T     |
| F73211B0028G150SP | 11        | 0028 | 0,65      | 1,40        | 5,80           | 38,70              | 13,30                 | FWZ732;FWZ732T     |
| F73211B0029G150SP | 11        | 0029 | 0,65      | 1,50        | 2,70           | 35,60              | 10,20                 | FWZ732;FWZ732T     |
| F73211B0024G080SP | 11        | 0024 | 0,65      | 1,50        | 4,30           | 37,20              | 11,80                 | FWZ732;FWZ732T     |
| F73211B0024G150SP | 11        | 0024 | 0,65      | 1,50        | 4,30           | 37,20              | 11,80                 | FWZ732;FWZ732T     |
| F73211B0018G150SP | 11        | 0018 | 0,65      | 1,50        | 5,00           | 37,90              | 12,50                 | FWZ732;FWZ732T     |
| F73211B0053G150SP | 11        | 0053 | 0,65      | 1,70        | 3,60           | 36,50              | 11,10                 | FWZ732;FWZ732T     |
| F73211B0052G150SP | 11        | 0052 | 0,65      | 1,70        | 4,70           | 37,60              | 12,20                 | FWZ732;FWZ732T     |
| F73211B0037G300SP | 11        | 0037 | 0,65      | 1,80        | 2,00           | 34,90              | 9,50                  | FWZ732;FWZ732T     |
| F73211B1048G150SP | 11        | 1048 | 0,65      | 2,10        | 2,00           | 34,90              | 9,50                  | FWZ732SP;FWZ732SPT |
| F73211B1041G150SP | 11        | 1041 | 0,65      | 2,10        | 2,50           | 35,40              | 10,00                 | FWZ732SP;FWZ732SPT |
| F73211B1054G150SP | 11        | 1054 | 0,65      | 2,10        | 3,00           | 35,90              | 10,50                 | FWZ732SP;FWZ732SPT |
| F73211B1054G300SP | 11        | 1054 | 0,65      | 2,10        | 3,00           | 35,90              | 10,50                 | FWZ732SP;FWZ732SPT |
| F73211B1051G150SP | 11        | 1051 | 0,65      | 2,10        | 3,40           | 36,30              | 10,90                 | FWZ732SP;FWZ732SPT |
| F73211B1042G150SP | 11        | 1042 | 0,65      | 2,10        | 3,60           | 36,50              | 11,10                 | FWZ732SP;FWZ732SPT |
| F73211B1020G300SP | 11        | 1020 | 0,65      | 2,50        | 2,30           | 35,20              | 9,80                  | FWZ732SP;FWZ732SPT |
| F73211B1005G150SP | 11        | 1005 | 0,65      | 3,00        | 3,40           | 36,30              | 10,90                 | FWZ732SP;FWZ732SPT |
| F73211B1062G150SP | 11        | 1062 | 0,65      | 4,00        | 1,50           | 34,40              | 9,00                  | FWZ732SP;FWZ732SPT |
| F73211B1068G150SP | 11        | 1068 | 0,70      | 2,10        | 2,50           | 35,40              | 10,00                 | FWZ732SP;FWZ732SPT |
| F73211B0030G150SP | 11        | 0030 | 0,80      | 1,40        | 5,30           | 38,20              | 12,80                 | FWZ732;FWZ732T     |
| F73211B0033G150SP | 11        | 0033 | 0,80      | 1,80        | 2,80           | 35,70              | 10,30                 | FWZ732;FWZ732T     |
| F73211B0036G150SP | 11        | 0036 | 0,80      | 1,80        | 4,00           | 36,90              | 11,50                 | FWZ732;FWZ732T     |
| F73211B1037G150SP | 11        | 1037 | 0,80      | 2,10        | 2,80           | 35,70              | 10,30                 | FWZ732SP;FWZ732SPT |

# Wire Harness and Connector Test



| Order Code         | Typ Style | No.  | Pin-Ø<br>(A) | Plate-Ø<br>(B) | Pin Length<br>(C) | Overall<br>Length (D) | Projection Height<br>(E) | Screw-In Tool      |
|--------------------|-----------|------|--------------|----------------|-------------------|-----------------------|--------------------------|--------------------|
| F73211B1037G300SP  | 11        | 1037 | 0,80         | 2,10           | 2,80              | 35,70                 | 10,30                    | FWZ732SP;FWZ732SPT |
| F73211B1036G150SP  | 11        | 1036 | 0,80         | 2,10           | 4,00              | 36,90                 | 11,50                    | FWZ732SP;FWZ732SPT |
| F73211B0015G150SP  | 11        | 0015 | 0,80         | 2,30           | 3,20              | 36,10                 | 10,70                    | FWZ732SP;FWZ732SPT |
| F73211B1007G150SP  | 11        | 1007 | 0,80         | 2,30           | 3,20              | 36,10                 | 10,70                    | FWZ732SP;FWZ732SPT |
| F73211B1017G150SP  | 11        | 1017 | 0,80         | 2,50           | 2,00              | 34,90                 | 9,50                     | FWZ732SP;FWZ732SPT |
| F73211B1024G150SP  | 11        | 1024 | 0,80         | 2,50           | 2,30              | 35,20                 | 9,80                     | FWZ732SP;FWZ732SPT |
| F73211B1001G150SP  | 11        | 1001 | 0,80         | 2,50           | 2,80              | 35,70                 | 10,30                    | FWZ732SP;FWZ732SPT |
| F73211B1058G150SP  | 11        | 1058 | 0,80         | 2,50           | 3,40              | 36,30                 | 10,90                    | FWZ732SP;FWZ732SPT |
| F73211B1006G150SP  | 11        | 1006 | 0,80         | 2,50           | 4,00              | 36,90                 | 11,50                    | FWZ732SP;FWZ732SPT |
| F73211B1004G150SP  | 11        | 1004 | 0,80         | 2,50           | 4,60              | 37,50                 | 12,10                    | FWZ732SP;FWZ732SPT |
| F73211B1004G300SP  | 11        | 1004 | 0,80         | 2,50           | 4,60              | 37,50                 | 12,10                    | FWZ732SP;FWZ732SPT |
| F73211B1008G150SP  | 11        | 1008 | 0,80         | 2,80           | 5,30              | 38,20                 | 12,80                    | FWZ732SP;FWZ732SPT |
| F73211B1002G150SP  | 11        | 1002 | 0,80         | 3,50           | 3,20              | 36,10                 | 10,70                    | FWZ732SP;FWZ732SPT |
| F73211B0050G150SP  | 11        | 0050 | 1,00         | 1,50           | 6,00              | 38,90                 | 13,50                    | FWZ732;FWZ732T     |
| F73211B0019G150SP  | 11        | 0019 | 1,00         | 1,80           | 2,00              | 34,90                 | 9,50                     | FWZ732;FWZ732T     |
| F73211B0026G150SP  | 11        | 0026 | 1,00         | 1,80           | 4,20              | 37,10                 | 11,70                    | FWZ732;FWZ732T     |
| F73211B0031G150SP  | 11        | 0031 | 1,00         | 1,80           | 4,90              | 37,80                 | 12,40                    | FWZ732;FWZ732T     |
| F73211B1063G300SP  | 11        | 1063 | 1,00         | 2,10           | 1,30              | 34,20                 | 8,80                     | FWZ732SP;FWZ732SPT |
| F73211B1038G150SP  | 11        | 1038 | 1,00         | 2,10           | 2,00              | 34,90                 | 9,50                     | FWZ732SP;FWZ732SPT |
| F73211B1050G150SP  | 11        | 1050 | 1,00         | 2,10           | 2,60              | 35,50                 | 10,10                    | FWZ732SP;FWZ732SPT |
| F73211B1045G150SP  | 11        | 1045 | 1,00         | 2,10           | 4,20              | 37,10                 | 11,70                    | FWZ732SP;FWZ732SPT |
| F73211B1047G150SP  | 11        | 1047 | 1,00         | 2,10           | 4,90              | 37,80                 | 12,40                    | FWZ732SP;FWZ732SPT |
| F73211B1056G150SP  | 11        | 1056 | 1,00         | 2,30           | 2,60              | 35,50                 | 10,10                    | FWZ732SP;FWZ732SPT |
| F73211B1003G150SP  | 11        | 1003 | 1,00         | 2,50           | 2,60              | 35,50                 | 10,10                    | FWZ732SP;FWZ732SPT |
| F73211B1013G150SP  | 11        | 1013 | 1,00         | 2,50           | 3,50              | 36,40                 | 11,00                    | FWZ732SP;FWZ732SPT |
| F73211B1032G150SP  | 11        | 1032 | 1,00         | 2,50           | 6,00              | 38,90                 | 13,50                    | FWZ732SP;FWZ732SPT |
| F73211B1021G150SP  | 11        | 1021 | 1,20         | 2,50           | 2,20              | 35,10                 | 9,70                     | FWZ732SP;FWZ732SPT |
| F73211B1021G300SP  | 11        | 1021 | 1,20         | 2,50           | 2,20              | 35,10                 | 9,70                     | FWZ732SP;FWZ732SPT |
| F73211B1035G300SP  | 11        | 1035 | 1,40         | 2,50           | 3,50              | 36,40                 | 11,00                    | FWZ732SP;FWZ732SPT |
| F73211B1039G300SP  | 11        | 1039 | 1,40         | 2,80           | 3,50              | 36,40                 | 11,00                    | FWZ732SP;FWZ732SPT |
| F73211B1031G150SP  | 11        | 1031 | 1,40         | 3,20           | 1,60              | 34,50                 | 9,10                     | FWZ732SP;FWZ732SPT |
| F73211B1022G150SP  | 11        | 1022 | 1,50         | 3,00           | 2,50              | 35,40                 | 10,00                    | FWZ732SP;FWZ732SPT |
| F73211B1071G300SP1 | 11        | 1071 | 2,00         | 3,50           | 2,20              | 35,10                 | 9,70                     | FWZ732SPT1         |
| F73211B1065G300SP1 | 11        | 1065 | 2,00         | 4,00           | 1,70              | 34,60                 | 9,20                     | FWZ732SPT1         |
| F73211B1064G300SP1 | 11        | 1064 | 2,00         | 4,00           | 2,00              | 34,90                 | 9,50                     | FWZ732SPT1         |
| F73211B1034G300SP1 | 11        | 1034 | 2,00         | 4,00           | 3,10              | 36,00                 | 10,60                    | FWZ732SPT1         |
| F73212B0017G150SP  | 12        | 0017 | 0,65         | 1,50           | 2,70              | 35,70                 | 10,30                    | FWZ732;FWZ732T     |
| F73216B0067G150SP  | 16        | 0067 | 0,40         | 1,00           | 3,00              | 35,90                 | 10,50                    | FWZ732;FWZ732T     |
| F73216B1040G150SP  | 16        | 1040 | 0,50         | 2,10           | 1,50              | 34,40                 | 9,00                     | FWZ732SP;FWZ732SPT |
| F73216B1033G150SP  | 16        | 1033 | 0,70         | 2,10           | 1,50              | 34,40                 | 9,00                     | FWZ732SP;FWZ732SPT |
| F73216B1070G150SP  | 16        | 1070 | 0,70         | 2,10           | 1,70              | 34,60                 | 9,20                     | FWZ732SP;FWZ732SPT |
| F73216B1043G150SP  | 16        | 1043 | 0,70         | 2,10           | 2,00              | 34,90                 | 9,50                     | FWZ732SP;FWZ732SPT |
| F73216B0040G150SP  | 16        | 0040 | 0,80         | 1,80           | 3,20              | 36,10                 | 10,70                    | FWZ732;FWZ732T     |
| F73216B1069G150SP  | 16        | 1069 | 0,80         | 2,10           | 1,90              | 34,80                 | 9,40                     | FWZ732SP;FWZ732SPT |
| F73216B1052G150SP  | 16        | 1052 | 0,80         | 2,10           | 3,20              | 36,10                 | 10,70                    | FWZ732SP;FWZ732SPT |
| F73216B1060G150SP  | 16        | 1060 | 0,80         | 2,30           | 1,80              | 34,70                 | 9,30                     | FWZ732SP;FWZ732SPT |
| F73216B1059G150SP  | 16        | 1059 | 0,80         | 2,50           | 2,50              | 35,40                 | 10,00                    | FWZ732SP;FWZ732SPT |
| F73216B0027G150SP  | 16        | 0027 | 1,00         | 1,80           | 2,50              | 35,40                 | 10,00                    | FWZ732;FWZ732T     |
| F73216B0041G150SP  | 16        | 0041 | 1,00         | 1,80           | 3,00              | 35,90                 | 10,50                    | FWZ732;FWZ732T     |
| F73216B2001G150SP  | 16        | 2001 | 1,00         | 2,00           | 3,20              | 36,10                 | 10,70                    | FWZ732;FWZ732T     |
| F73216B1038G150SP  | 16        | 1038 | 1,00         | 2,10           | 2,00              | 34,90                 | 9,50                     | FWZ732SP;FWZ732SPT |
| F73216B1046G150SP  | 16        | 1046 | 1,00         | 2,10           | 2,50              | 35,40                 | 10,00                    | FWZ732SP;FWZ732SPT |
| F73216B1053G150SP  | 16        | 1053 | 1,00         | 2,10           | 3,00              | 35,90                 | 10,50                    | FWZ732SP;FWZ732SPT |
| F73216B1012G150SP  | 16        | 1012 | 1,00         | 2,30           | 3,30              | 36,20                 | 10,80                    | FWZ732SP;FWZ732SPT |
| F73216B1011G150SP  | 16        | 1011 | 1,00         | 2,40           | 3,20              | 38,60                 | 13,20                    | FWZ732SP;FWZ732SPT |
| F73216B1029G150SP  | 16        | 1029 | 1,00         | 2,50           | 1,70              | 35,10                 | 9,70                     | FWZ732SP;FWZ732SPT |
| F73216B1027G150SP  | 16        | 1027 | 1,00         | 2,50           | 1,80              | 35,20                 | 9,80                     | FWZ732SP;FWZ732SPT |
| F73216B1010G150SP  | 16        | 1010 | 1,00         | 2,50           | 2,00              | 35,40                 | 10,00                    | FWZ732SP;FWZ732SPT |
| F73216B1010G300SP  | 16        | 1010 | 1,00         | 2,50           | 2,00              | 35,40                 | 10,00                    | FWZ732SP;FWZ732SPT |
| F73216B1019G150SP  | 16        | 1019 | 1,00         | 2,50           | 3,00              | 35,90                 | 10,50                    | FWZ732SP;FWZ732SPT |
| F73216B1013G150SP  | 16        | 1013 | 1,00         | 2,50           | 3,50              | 36,40                 | 11,00                    | FWZ732SP;FWZ732SPT |
| F73216B1049G150SP  | 16        | 1049 | 1,20         | 2,10           | 2,00              | 34,90                 | 9,50                     | FWZ732SP;FWZ732SPT |
| F73216B1030G150SP  | 16        | 1030 | 1,20         | 2,50           | 1,20              | 34,10                 | 8,70                     | FWZ732SP;FWZ732SPT |
| F73216B1061G150SP  | 16        | 1061 | 1,30         | 2,10           | 2,40              | 35,30                 | 9,90                     | FWZ732SP;FWZ732SPT |
| F73216B1028G150SP  | 16        | 1028 | 1,30         | 2,50           | 2,10              | 35,00                 | 9,60                     | FWZ732SP;FWZ732SPT |
| F73216B1009G150SP  | 16        | 1009 | 1,30         | 2,50           | 3,00              | 35,90                 | 10,50                    | FWZ732SP;FWZ732SPT |
| F73216B1023G300SP  | 16        | 1023 | 1,40         | 3,50           | 1,60              | 34,50                 | 9,10                     | FWZ732SP;FWZ732SPT |
| F73216B1057G150SP  | 16        | 1057 | 1,50         | 3,00           | 2,30              | 35,20                 | 9,80                     | FWZ732SP;FWZ732SPT |
| F73216B1014G150SP  | 16        | 1014 | 1,50         | 3,00           | 2,50              | 35,40                 | 10,00                    | FWZ732SP;FWZ732SPT |
| F73216B1014G300SP  | 16        | 1014 | 1,50         | 3,00           | 2,50              | 35,40                 | 10,00                    | FWZ732SP;FWZ732SPT |
| F73216B1015G150SP  | 16        | 1015 | 1,50         | 3,50           | 2,00              | 34,90                 | 9,50                     | FWZ732SP;FWZ732SPT |
| F73216B1025G150SP1 | 16        | 1025 | 1,80         | 3,50           | 1,40              | 34,30                 | 8,90                     | FWZ732SPT1         |
| F73216B1016G300SP1 | 16        | 1016 | 1,80         | 3,50           | 1,60              | 34,50                 | 9,10                     | FWZ732SPT1         |
| F73216B1064G300SP1 | 16        | 1064 | 2,00         | 4,00           | 2,00              | 34,90                 | 9,50                     | FWZ732SPT1         |
| F73216B1066G300SP1 | 16        | 1066 | 2,00         | 4,00           | 2,30              | 35,20                 | 9,80                     | FWZ732SPT1         |

# Wire Harness and Connector Test

## Step Probe 157 mil

### F733SP

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 4,00 / 157    |
| <b>Current</b>          | 10,0 A        |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 25 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 50      | 150           |
| 60      | 300           |

#### Travel (mm)

| Nominal           | Maximum |
|-------------------|---------|
| 4,0               | 5,0     |
| Thread (M)        | 2,0     |
| Wrench Size       | 3,0     |
| Pointing Accuracy | ±0,1 mm |

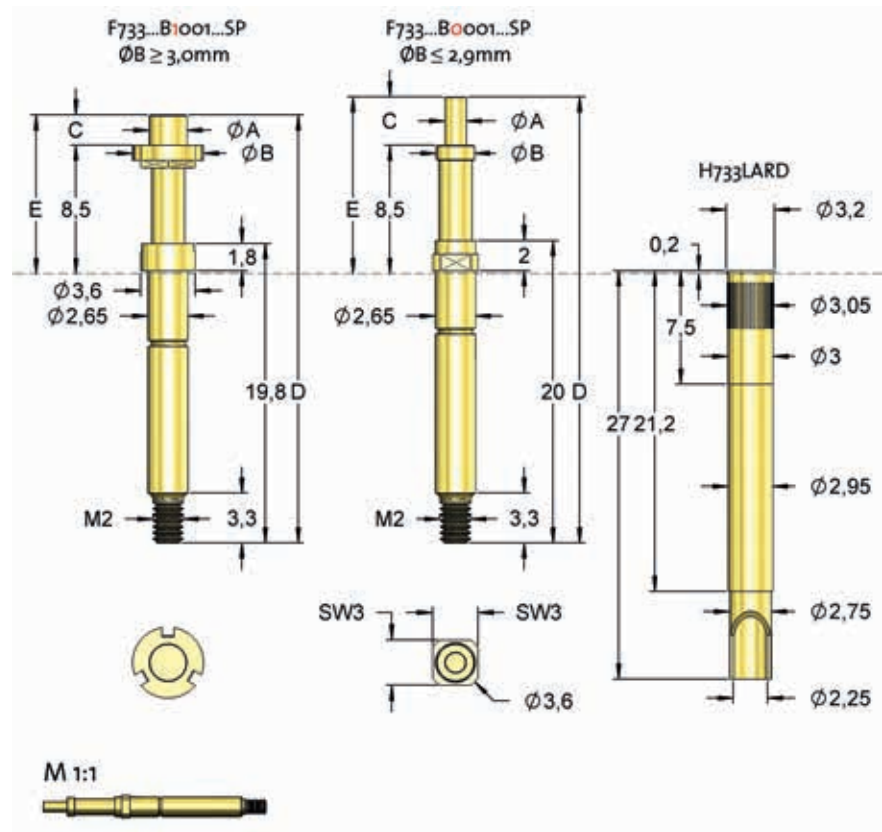
#### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Music wire, silver plated |
| Receptacle | Brass, Gold plated        |

#### Drill Size [mm]

|                             |             |
|-----------------------------|-------------|
| Receptacle without knurling | 2,98 - 2,99 |
| Receptacle with knurling    | 3,00 - 3,02 |

| Type   | Number                       | Spring Force |
|--|------------------------------|--------------|
| F 733  | 16                           | B 1016       |
|  |                              | G 150        |
|  |                              | SP1          |
| Tip Style  | Material                     | Finish       |
| Material:  | B = BeCu                     |              |
| Number:  | see table                    |              |
| Finish:  | G = Gold                     |              |
| Special Version:   | SP / SP1 tools see table     |              |
| Receptacle:  | Order Code according drawing |              |
| At the order code of step probes, instead the coded tip diameter there is a number, by that you can find related head dimensions in the table. |                              |              |
| ORDER EXAMPLE  |                              |              |



| Order Code         | Typ Style | No.  | Pin-Ø (A) | Plate-Ø (B) | Pin Length (C) | Overall Length (D) | Projection Height (E) | Screw-In Tool  |
|--------------------|-----------|------|-----------|-------------|----------------|--------------------|-----------------------|----------------|
| F73311B1037G150SP1 | 11        | 1037 | 0,80      | 3,00        | 1,50           | 27,80              | 9,80                  | FWZ732SPT1     |
| F73311B1038G150SP1 | 11        | 1038 | 0,80      | 3,00        | 2,50           | 28,80              | 10,80                 | FWZ732SPT1     |
| F73311B0036G150SP  | 11        | 0036 | 0,80      | 3,00        | 2,80           | 29,10              | 11,10                 | FWZ733;FWZ733T |
| F73311B1040G150SP1 | 11        | 1040 | 0,80      | 3,00        | 2,80           | 29,10              | 11,10                 | FWZ732SPT1     |
| F73311B0031G150SP  | 11        | 0031 | 0,80      | 3,00        | 3,00           | 29,30              | 11,30                 | FWZ733;FWZ733T |
| F73311B1039G150SP1 | 11        | 1039 | 0,80      | 3,00        | 3,00           | 29,30              | 11,30                 | FWZ732SPT1     |
| F73311B1042G150SP1 | 11        | 1042 | 1,00      | 3,50        | 2,80           | 29,10              | 11,10                 | FWZ732SPT1     |
| F73311B1030G150SP1 | 11        | 1030 | 1,00      | 3,50        | 4,00           | 30,30              | 12,30                 | FWZ732SPT1     |
| F73311B1041G150SP1 | 11        | 1041 | 1,40      | 3,20        | 1,70           | 28,00              | 10,00                 | FWZ732SPT1     |
| F73311B1045G150SP1 | 11        | 1045 | 1,40      | 3,50        | 1,00           | 27,30              | 9,30                  | FWZ732SPT1     |
| F73311B1016G150SP1 | 11        | 1016 | 1,40      | 3,50        | 2,00           | 28,30              | 10,30                 | FWZ732SPT1     |
| F73311B1027G150SP1 | 11        | 1027 | 1,40      | 3,50        | 2,40           | 28,70              | 10,70                 | FWZ732SPT1     |
| F73311B1027G300SP1 | 11        | 1027 | 1,40      | 3,50        | 2,40           | 28,70              | 10,70                 | FWZ732SPT1     |

# Wire Harness and Connector Test



| Order Code         | Typ Style | No.  | Pin-Ø<br>(A) | Plate-Ø<br>(B) | Pin Length<br>(C) | Overall<br>Length (D) | Projection Height<br>(E) | Screw-In Tool       |
|--------------------|-----------|------|--------------|----------------|-------------------|-----------------------|--------------------------|---------------------|
| F73311B1035G150SP1 | 11        | 1035 | 1,40         | 3,50           | 2,70              | 29,00                 | 11,00                    | FWZ732SPT1          |
| F73311B1049G150SP1 | 11        | 1049 | 1,40         | 3,50           | 3,20              | 29,50                 | 11,50                    | FWZ732SPT1          |
| F73311B1029G150SP1 | 11        | 1029 | 1,40         | 3,50           | 3,30              | 29,60                 | 11,60                    | FWZ732SPT1          |
| F73311B1053G150SP1 | 11        | 1053 | 1,40         | 3,50           | 3,60              | 29,90                 | 11,90                    | FWZ732SPT1          |
| F73311B1028G150SP1 | 11        | 1028 | 1,40         | 3,50           | 4,00              | 30,30                 | 12,30                    | FWZ732SPT1          |
| F73311B1056G150SP1 | 11        | 1056 | 1,40         | 3,50           | 8,00              | 34,30                 | 16,30                    | FWZ732SPT1          |
| F73311B1046G150SP1 | 11        | 1046 | 1,50         | 3,50           | 4,00              | 30,30                 | 12,30                    | FWZ732SPT1          |
| F73311B1046G300SP1 | 11        | 1046 | 1,50         | 3,50           | 4,00              | 30,30                 | 12,30                    | FWZ732SPT1          |
| F73311B1026G150SP1 | 11        | 1026 | 1,70         | 3,30           | 2,20              | 28,50                 | 10,50                    | FWZ732SPT1          |
| F73311B1052G150SP1 | 11        | 1052 | 1,80         | 3,50           | 7,00              | 33,30                 | 15,30                    | FWZ732SPT1          |
| F73311B1047G150SP1 | 11        | 1047 | 1,80         | 4,00           | 1,40              | 27,70                 | 9,70                     | FWZ732SPT1          |
| F73311B1047G300SP1 | 11        | 1047 | 1,80         | 4,00           | 1,40              | 27,70                 | 9,70                     | FWZ732SPT1          |
| F73311B0032G150SP  | 11        | 0032 | 1,80         | 4,00           | 3,00              | 29,30                 | 11,30                    | FWZ733;FWZ733T      |
| F73311B1048G150SP1 | 11        | 1048 | 1,80         | 4,00           | 3,00              | 29,30                 | 11,30                    | FWZ732SPT1          |
| F73311B1023G300SP  | 11        | 1023 | 3,00         | 5,00           | 2,60              | 28,90                 | 10,90                    | FWZ733SP; FWZ733SPT |
| F73311B1022G300SP  | 11        | 1022 | 3,00         | 5,00           | 3,40              | 29,70                 | 11,70                    | FWZ733SP; FWZ733SPT |
| F73316B1057G150SP1 | 16        | 1057 | 1,00         | 3,00           | 2,50              | 28,80                 | 10,80                    | FWZ732SPT1          |
| F73316B1033G150SP1 | 16        | 1033 | 1,00         | 3,50           | 3,00              | 29,30                 | 11,30                    | FWZ732SPT1          |
| F73316B1033G300SP1 | 16        | 1033 | 1,00         | 3,50           | 3,00              | 29,30                 | 11,30                    | FWZ732SPT1          |
| F73316B1005G150SP  | 16        | 1005 | 1,30         | 4,70           | 2,70              | 29,00                 | 11,00                    | FWZ733SP; FWZ733SPT |
| F73316B1005G300SP  | 16        | 1005 | 1,30         | 4,70           | 2,70              | 29,00                 | 11,00                    | FWZ733SP; FWZ733SPT |
| F73316B1007G150SP  | 16        | 1007 | 1,30         | 4,70           | 3,00              | 29,30                 | 11,30                    | FWZ733SP; FWZ733SPT |
| F73316B1004G150SP  | 16        | 1004 | 1,30         | 4,70           | 3,60              | 29,90                 | 11,90                    | FWZ733SP; FWZ733SPT |
| F73316B1002G150SP  | 16        | 1002 | 1,30         | 4,70           | 5,30              | 31,60                 | 13,60                    | FWZ733SP; FWZ733SPT |
| F73316B1001G150SP  | 16        | 1001 | 1,30         | 4,70           | 5,80              | 32,10                 | 14,10                    | FWZ733SP; FWZ733SPT |
| F73316B0020G150SP  | 16        | 0020 | 1,40         | 2,50           | 3,20              | 29,50                 | 11,50                    | FWZ733;FWZ733T      |
| F73316B1045G150SP1 | 16        | 1045 | 1,40         | 3,50           | 1,00              | 27,30                 | 9,30                     | FWZ732SPT1          |
| F73316B1045G300SP1 | 16        | 1045 | 1,40         | 3,50           | 1,00              | 27,30                 | 9,30                     | FWZ732SPT1          |
| F73316B1031G150SP1 | 16        | 1031 | 1,40         | 3,50           | 1,70              | 28,00                 | 10,00                    | FWZ732SPT1          |
| F73316B0008G150SP  | 16        | 0008 | 1,40         | 3,50           | 2,00              | 28,30                 | 10,30                    | FWZ733;FWZ733T      |
| F73316B1016G150SP1 | 16        | 1016 | 1,40         | 3,50           | 2,00              | 28,30                 | 10,30                    | FWZ732SPT1          |
| F73316B1016G300SP1 | 16        | 1016 | 1,40         | 3,50           | 2,00              | 28,30                 | 10,30                    | FWZ732SPT1          |
| F73316B0035G150SP  | 16        | 0035 | 1,40         | 3,50           | 2,40              | 28,70                 | 10,70                    | FWZ733;FWZ733T      |
| F73316B1027G150SP1 | 16        | 1027 | 1,40         | 3,50           | 2,40              | 28,70                 | 10,70                    | FWZ732SPT1          |
| F73316B0012G150SP  | 16        | 0012 | 1,40         | 3,50           | 3,00              | 29,30                 | 11,30                    | FWZ733;FWZ733T      |
| F73316B1032G150SP1 | 16        | 1032 | 1,40         | 3,50           | 3,00              | 29,30                 | 11,30                    | FWZ732SPT1          |
| F73316B1058G150SP1 | 16        | 1058 | 1,50         | 4,00           | 2,50              | 28,80                 | 10,80                    | FWZ732SPT1          |
| F73316B1050G150SP1 | 16        | 1050 | 1,70         | 3,00           | 2,20              | 28,50                 | 10,50                    | FWZ732SPT1          |
| F73316B1034G150SP1 | 16        | 1034 | 1,70         | 3,50           | 2,20              | 28,50                 | 10,50                    | FWZ732SPT1          |
| F73316B0025G300SP  | 16        | 0025 | 1,80         | 3,50           | 1,60              | 27,90                 | 9,90                     | FWZ733;FWZ733T      |
| F73316B1036G150SP1 | 16        | 1036 | 1,80         | 3,50           | 1,60              | 27,90                 | 9,90                     | FWZ732SPT1          |
| F73316B1036G300SP1 | 16        | 1036 | 1,80         | 3,50           | 1,80              | 27,90                 | 9,90                     | FWZ732SPT1          |
| F73316B1015G150SP1 | 16        | 1015 | 1,80         | 3,50           | 2,20              | 28,50                 | 10,50                    | FWZ732SPT1          |
| F73316B1015G300SP1 | 16        | 1015 | 1,80         | 3,50           | 2,20              | 28,50                 | 10,50                    | FWZ732SPT1          |
| F73316B1019G150SP  | 16        | 1019 | 1,80         | 4,50           | 1,40              | 27,70                 | 9,70                     | FWZ733SP; FWZ733SPT |
| F73316B1006G150SP  | 16        | 1006 | 1,80         | 4,50           | 1,50              | 27,80                 | 9,80                     | FWZ733SP; FWZ733SPT |
| F73316B1008G150SP  | 16        | 1008 | 1,80         | 4,70           | 2,00              | 28,30                 | 10,30                    | FWZ733SP; FWZ733SPT |
| F73316B1009G150SP  | 16        | 1009 | 1,80         | 4,70           | 4,20              | 30,50                 | 12,50                    | FWZ733SP; FWZ733SPT |
| F73316B1011G150SP  | 16        | 1011 | 1,80         | 4,70           | 5,00              | 31,30                 | 13,30                    | FWZ733SP; FWZ733SPT |
| F73316B1014G150SP  | 16        | 1014 | 1,80         | 4,70           | 5,80              | 32,10                 | 14,10                    | FWZ733SP; FWZ733SPT |
| F73316B1055G150SP1 | 16        | 1055 | 2,00         | 4,00           | 2,70              | 29,00                 | 11,00                    | FWZ732SPT1          |
| F73316B1044G150SP1 | 16        | 1044 | 2,20         | 3,50           | 1,80              | 28,10                 | 10,10                    | FWZ732SPT1          |
| F73316B1043G150SP1 | 16        | 1043 | 2,20         | 3,50           | 2,00              | 28,30                 | 10,30                    | FWZ732SPT1          |
| F73316B0015G150SP  | 16        | 0015 | 2,30         | 3,50           | 1,80              | 28,10                 | 10,10                    | FWZ733;FWZ733T      |
| F73316B1020G150SP  | 16        | 1020 | 2,50         | 4,70           | 1,20              | 27,50                 | 9,50                     | FWZ733SP; FWZ733SPT |
| F73316B1020G300SP  | 16        | 1020 | 2,50         | 4,70           | 1,20              | 27,50                 | 9,50                     | FWZ733SP; FWZ733SPT |
| F73316B1017G150SP  | 16        | 1017 | 2,50         | 4,70           | 2,00              | 28,30                 | 10,30                    | FWZ733SP; FWZ733SPT |
| F73316B1018G150SP  | 16        | 1018 | 2,50         | 4,70           | 2,20              | 28,50                 | 10,50                    | FWZ733SP; FWZ733SPT |
| F73316B1010G150SP  | 16        | 1010 | 2,50         | 4,70           | 3,00              | 29,30                 | 11,30                    | FWZ733SP; FWZ733SPT |
| F73316B1054G150SP  | 16        | 1054 | 3,00         | 6,00           | 2,50              | 28,80                 | 10,80                    | FWZ733SP; FWZ733SPT |
| F73316B1021G150SP  | 16        | 1021 | 3,70         | 5,00           | 3,50              | 29,80                 | 11,80                    | FWZ733SP; FWZ733SPT |
| F73316B1051G150SP  | 16        | 1051 | 3,70         | 5,00           | 5,50              | 31,80                 | 13,80                    | FWZ733SP; FWZ733SPT |
| F73316B1025G150SP  | 16        | 1025 | 4,00         | 5,00           | 1,00              | 27,30                 | 9,30                     | FWZ733SP; FWZ733SPT |
| F73316B1013G150SP  | 16        | 1013 | 4,00         | 5,00           | 1,30              | 27,60                 | 9,60                     | FWZ733SP; FWZ733SPT |
| F73316B1013G300SP  | 16        | 1013 | 4,00         | 5,00           | 1,30              | 27,60                 | 9,60                     | FWZ733SP; FWZ733SPT |
| F73316B1012G150SP  | 16        | 1012 | 4,00         | 5,00           | 1,70              | 28,00                 | 10,00                    | FWZ733SP; FWZ733SPT |
| F73316B1012G300SP  | 16        | 1012 | 4,00         | 5,00           | 1,70              | 28,00                 | 10,00                    | FWZ733SP; FWZ733SPT |
| F73316B0009G150SP  | 16        | 0009 | 4,00         | 5,00           | 2,00              | 28,30                 | 10,30                    | FWZ733;FWZ733T      |
| F73316B1003G150SP  | 16        | 1003 | 4,00         | 5,00           | 2,00              | 28,30                 | 10,30                    | FWZ733SP; FWZ733SPT |
| F73316B1024G300SP  | 16        | 1024 | 4,00         | 7,00           | 8,20              | 34,50                 | 16,50                    | FWZ733SP; FWZ733SPT |

## Overview step probes

Exact dimensions and technical details are in the relevant series.

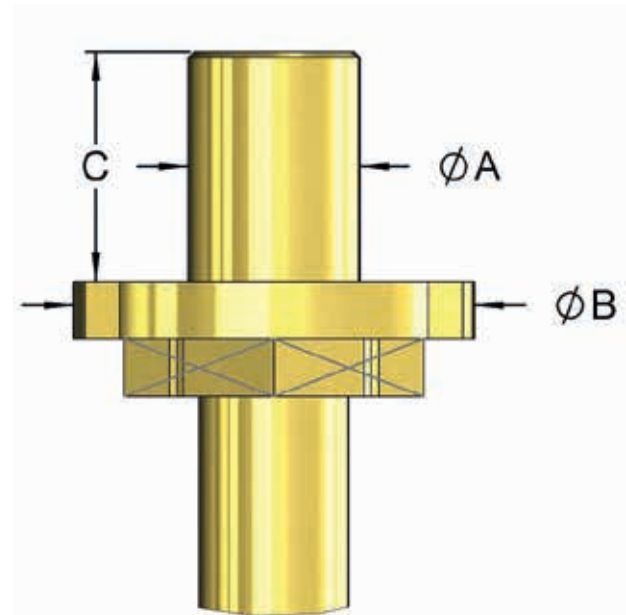
|             |  |  |
|-------------|--|--|
| <b>F086</b> | <b>Order Code</b>  | <b>F08612B0002G130SP</b>   |
|             | Spring Force<br>Pin- $\varnothing$ A<br>Plate- $\varnothing$ B<br>Pin Length C | 130 cN<br>$\varnothing$ 0,51 mm<br>$\varnothing$ 0,90 mm<br>1,5 mm |



|             |  |  |
|-------------|--|--|
| <b>F100</b> | <b>Order Code</b>  | <b>F10016B0001N100BSP</b>  |
|             | Spring Force<br>Pin- $\varnothing$ A<br>Plate- $\varnothing$ B<br>Pin Length C | 100 cN<br>$\varnothing$ 0,64 mm<br>$\varnothing$ 2,00 mm<br>2,8 mm |



|             |  |  |
|-------------|--|--|
| <b>F773</b> | <b>Order Code</b>  | <b>F77311B0002G300SP</b>   |
|             | Spring Force<br>Pin- $\varnothing$ A<br>Plate- $\varnothing$ B<br>Pin Length C | 300 cN<br>$\varnothing$ 1,40 mm<br>$\varnothing$ 3,50 mm<br>4,0 mm |



|             |  |  |  |  |
|-------------|--|--|--|--|
| <b>F737</b> | <b>Order Code</b>  | <b>F73716B0001G300SP</b>   | <b>F73716B0002G300SP</b>   | <b>F73716B0003G300SP</b>   |
|             | Spring Force<br>Pin- $\varnothing$ A<br>Plate- $\varnothing$ B<br>Pin Length C | 300 cN<br>$\varnothing$ 1,00 mm<br>$\varnothing$ 2,30 mm<br>8,0 mm | 300 cN<br>$\varnothing$ 1,00 mm<br>$\varnothing$ 1,80 mm<br>8,0 mm | 300 cN<br>$\varnothing$ 1,65 mm<br>$\varnothing$ 1,80 mm<br>8,0 mm |



|             |  |   |   |  |
|-------------|--|---|---|--|
| <b>F755</b> | <b>Order Code</b>  | <b>F75589B0001G300E13</b>   | <b>F75589B0004G300E15</b>   |  |
|             | Spring Force<br>Pin- $\varnothing$ A<br>Plate- $\varnothing$ B<br>Pin Length C | 300 cN<br>$\varnothing$ 1,8 x 0,8 mm<br>$\varnothing$ 3,00 mm<br>2,6 mm | 300 cN<br>$\varnothing$ 3,0 x 0,7 mm<br>$\varnothing$ 4,00 mm<br>1,5 mm |  |



|             |  |  |  |  |
|-------------|--|--|--|--|
| <b>F875</b> | <b>Order Code</b>  | <b>F87511B1002G200SP</b>   |  |  |
|             | Spring Force<br>Pin- $\varnothing$ A<br>Plate- $\varnothing$ B<br>Pin Length C | 200 cN<br>$\varnothing$ 0,65 mm<br>$\varnothing$ 2,10 mm<br>5,0 mm |  |  |



|             |  |  |  |  |
|-------------|--|--|--|--|
| <b>F885</b> | <b>Order Code</b>  | <b>F88506B0001G200SP</b>   | <b>F88506B0001G200SP</b>   | <b>F88506B0003G200SP</b>   |
|             | Spring Force<br>Pin- $\varnothing$ A<br>Plate- $\varnothing$ B<br>Pin Length C | 200 cN<br>$\varnothing$ 1,00 mm<br>$\varnothing$ 3,00 mm<br>2,6 mm | 200 cN<br>$\varnothing$ 1,00 mm<br>$\varnothing$ 2,30 mm<br>2,6 mm | 200 cN<br>$\varnothing$ 1,00 mm<br>$\varnothing$ 2,30 mm<br>9,1 mm |



|            |  |   |  |  |
|------------|--|---|--|--|
| <b>VF4</b> | <b>Order Code</b>  | <b>VF416B0001G15SP</b>  |  |  |
|            | Spring Force<br>Pin- $\varnothing$ A<br>Plate- $\varnothing$ B<br>Pin Length C | 1500 cN<br>$\varnothing$ 3,80 mm<br>$\varnothing$ 5,50 mm<br>1,5 mm |  |  |







## Threaded Probes and Step Probes

Threaded probes and step probes are mainly used in modules for the test of wire harnesses and connectors. The advantage is that even at difficult conditions a secure seat of the probes is guaranteed. Step probes are an effective option for testing the correct position of a connector within its housing.

|      |     |
|------|-----|
| F730 | 90  |
| F175 | 91  |
| F176 | 92  |
| F731 | 93  |
| F722 | 94  |
| F727 | 95  |
| F732 | 96  |
| F723 | 97  |
| F733 | 98  |
| F734 | 99  |
| F737 | 100 |

# Threaded Probes

## Threaded Probe 50 mil F730

|                  |               |
|------------------|---------------|
| Centers (mm/mil) | 1,27 / 50     |
| Current          | 3,0 A         |
| Temperature      | -20°C...+80°C |
| R typically      | 50 mOhm       |

### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 20      | 110           |

### Travel (mm)

| Nominal           | Maximum   |
|-------------------|-----------|
| 4,0               | 5,0       |
| Thread (M)        | 0,9x0,175 |
| Wrench Size       | 1,0       |
| Pointing Accuracy | ±0,08 mm  |

### Materials and Plating

|            |                         |
|------------|-------------------------|
| Plunger    | see Tip Style           |
| Barrel     | Bronze, gold plated     |
| Spring     | Music wire, gold plated |
| Receptacle | Brass, Gold plated      |

### Accessories

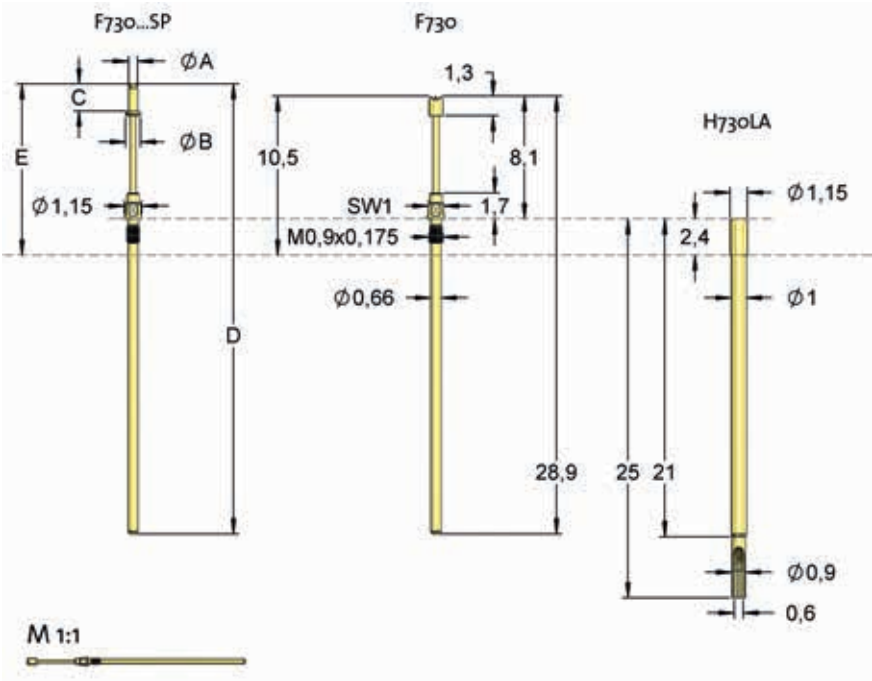
|                     |                            |
|---------------------|----------------------------|
| Screw-in tool probe | FWZ730 (T) max. Ø0,9 mm    |
| Screw-in tool probe | FWZ730S1 (T1) max. Ø1,5 mm |

### Drill Size [mm]

|         |             |
|---------|-------------|
| H730... | 0,99 - 1,00 |
|---------|-------------|

### Projection Height

|         |      |
|---------|------|
| H730... | 10,5 |
|---------|------|



| Type                 | Tip-Ø                        | Spring Force           |
|----------------------|------------------------------|------------------------|
| F 730 12 B 064 G 110 |                              |                        |
| Tip Style            | Material                     | Finish Special Version |
| Material:            | B = BeCu                     |                        |
| Tip-Ø:               | 064 = 0,64 mm (e.g.)         |                        |
| Finish:              | G = Gold                     |                        |
| Receptacle:          | Order Code according drawing |                        |
| ORDER EXAMPLE        |                              |                        |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 06     | B        | G       | 0,9     | -       |
|           | 12     | B        | G       | 0,64    | -       |
|           | 17     | B        | G       | 0,64    | -       |
|           | 18     | B        | G       | 0,4     | -       |

# Threaded Probes



## Threaded Probe 75 mil

### F175

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 1,90 / 75     |
| <b>Current</b>          | 4,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 20 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 70      | 150           |

#### Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 4,3               | 6,4      |
| Thread (M)        | 1,0      |
| Wrench Size       | 1,0      |
| Pointing Accuracy | ±0,08 mm |

#### Materials and Plating

|            |                         |
|------------|-------------------------|
| Plunger    | see Tip Style           |
| Barrel     | Brass, gold plated      |
| Spring     | Music wire, gold plated |
| Receptacle | Brass, Gold plated      |

#### Accessories

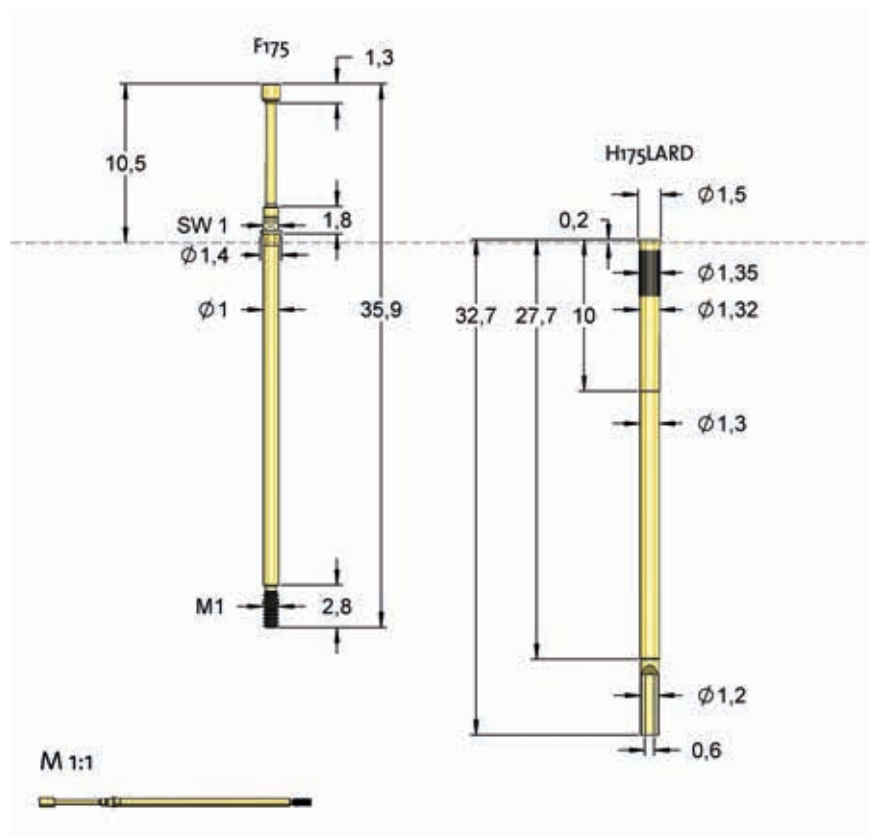
|                           |                     |
|---------------------------|---------------------|
| Insertion tool receptacle | FEWZ-075E0          |
| Screw-in tool probe       | FWZ730S1 / FWZ730T1 |

#### Drill Size [mm]

|          |             |
|----------|-------------|
| H175LARD | 1,32 - 1,34 |
|----------|-------------|

#### Projection Height

|          |      |
|----------|------|
| H175LARD | 10,5 |
|----------|------|



| Type                 | Tip-Ø                              |        | Spring Force    |  |
|----------------------|------------------------------------|--------|-----------------|--|
| F 175 11 B 064 G 180 |                                    |        |                 |  |
| Tip Style            | Material                           | Finish | Special Version |  |
| Material:            | B = BeCu, S = Steel                |        |                 |  |
| Tip-Ø:               | 064 = 0,64 mm (e.g.)               |        |                 |  |
| Finish:              | G = Gold, L = Longtime Gold plated |        |                 |  |
| Receptacle:          | Order Code according drawing       |        |                 |  |
| ORDER EXAMPLE        |                                    |        |                 |  |

| Tip Style | Number | Material | Plating | Ø in mm     | Version |
|-----------|--------|----------|---------|-------------|---------|
|           | 05     | B        | G       | 1,2         | -       |
|           | 06     | B        | G       | 1,2         | -       |
|           | 11     | B        | G       | 0,50        | -       |
|           | 11     | B        | G       | 0,64        | -       |
|           | 12     | B        | G       | 0,78        | -       |
|           | 17     | B        | G       | 1,2         | -       |
|           | 18     | B        | G       | 0,64 / 0,78 | -       |
|           | 21     | S        | L       | 0,64        | -       |
|           | 30     | S        | L       | 0,64        | -       |

# Threaded Probes

## Threaded Probe 75 mil

# F176

NEU

|                  |               |
|------------------|---------------|
| Centers (mm/mil) | 1,90 / 75     |
| Current          | 4,0 A         |
| Temperature      | -20°C...+80°C |
| R typically      | 20 mOhm       |

### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 30      | 80            |
| 85      | 150           |

### Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 2,4               | 3,0      |
| Thread (M)        | 1,0      |
| Wrench Size       | 1,0      |
| Pointing Accuracy | ±0,08 mm |

### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Music wire, silver plated |
| Receptacle | Brass, Gold plated        |

### Accessories

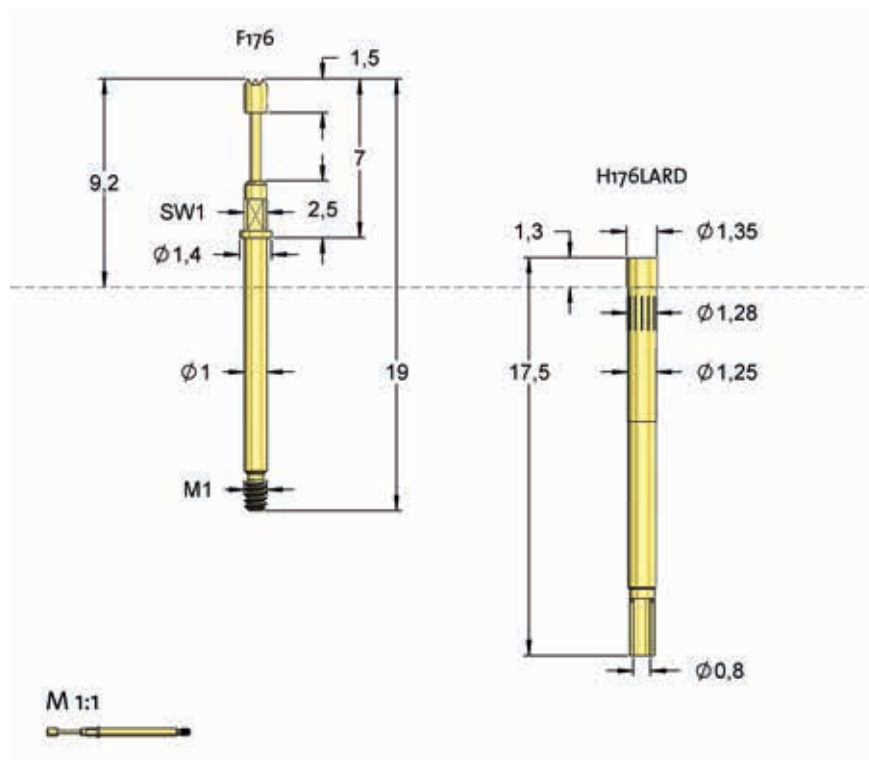
|                           |                       |
|---------------------------|-----------------------|
| Insertion tool receptacle | FEWZ-075E0            |
| Screw-in tool probe       | FWZ730S1;<br>FWZ730T1 |

### Drill Size [mm]

|          |             |
|----------|-------------|
| H176LARD | 1,25 - 1,27 |
|----------|-------------|

### Projection Height

|          |     |
|----------|-----|
| H176LARD | 9,2 |
|----------|-----|



| Type                 | Tip-Ø                        | Spring Force |
|----------------------|------------------------------|--------------|
| F 176 11 B 100 G 080 |                              |              |
| Tip Style            | Material                     | Finish       |
| Material:            | B = BeCu                     |              |
| Tip-Ø:               | 100 = 1,0 mm (e.g.)          |              |
| Finish:              | G = Gold                     |              |
| Receptacle:          | Order Code according drawing |              |
| ORDER EXAMPLE        |                              |              |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 06     | B        | G       | 1,0     | -       |
|           | 11     | B        | G       | 0,4     | -       |
|           | 11     | B        | G       | 0,5     | -       |
|           | 12     | B        | G       | 0,65    | -       |
|           | 17     | B        | G       | 1,0     | -       |
|           | 18     | B        | G       | 0,45    | -       |

# Threaded Probes



## Threaded Probe 94 mil

### F731

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 2,40 / 94     |
| <b>Current</b>          | 5,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 30 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 20      | 60            |
| 50      | 100           |
| 50      | 150           |
| 50      | 250           |
| 50      | 300           |

#### Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 3,5               | 4,4      |
| Thread (M)        | 1,4x0,3  |
| Wrench Size       | 1,4      |
| Pointing Accuracy | ±0,08 mm |

#### Materials and Plating

|            |                         |
|------------|-------------------------|
| Plunger    | see Tip Style           |
| Barrel     | Brass, gold plated      |
| Spring     | Music wire, gold plated |
| Receptacle | Brass, Gold plated      |

#### Accessories

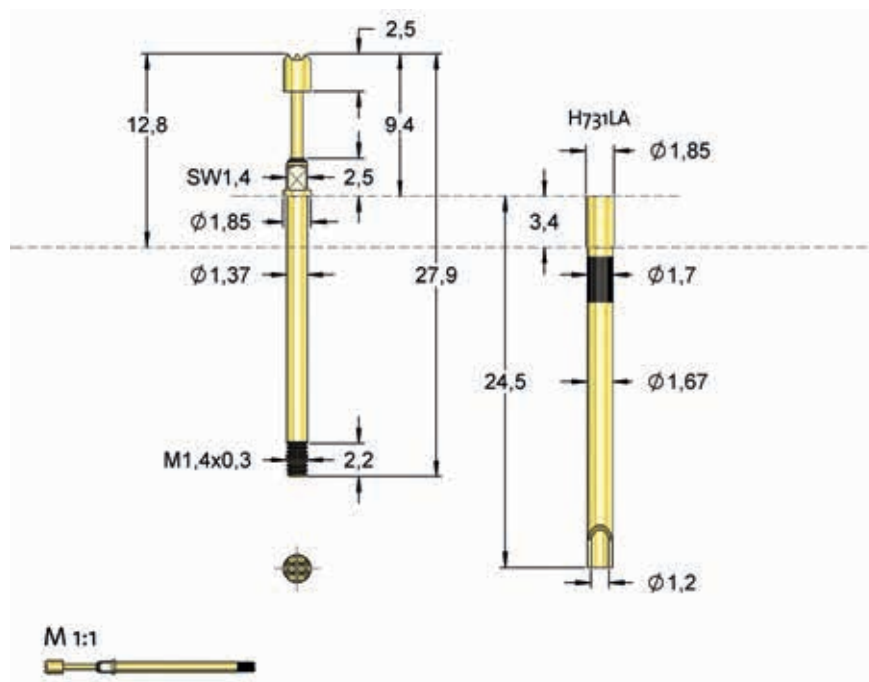
|                     |                            |
|---------------------|----------------------------|
| Screw-in tool probe | FWZ731 (T) max. Ø2,0 mm    |
| Screw-in tool probe | FWZ731S1 (T1) max. Ø1,3 mm |

#### Drill Size [mm]

|         |             |
|---------|-------------|
| H731... | 1,67 - 1,68 |
|---------|-------------|

#### Projection Height

|         |      |
|---------|------|
| H731... | 12,8 |
|---------|------|



| Type             | Tip-Ø                        | Spring Force           |
|------------------|------------------------------|------------------------|
| F 731            | 11                           | B 075 G 300 L          |
| Tip Style        | Material                     | Finish Special Version |
| Material:        | B = BeCu                     |                        |
| Tip-Ø:           | 075 = 0,75 mm (e.g.)         |                        |
| Finish:          | G = Gold                     |                        |
| Special Version: | L = Long Version             |                        |
| Receptacle:      | Order Code according drawing |                        |

ORDER EXAMPLE

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 05     | B        | G       | 1,8     | -       |
|           | 06     | B        | G       | 1,0     | -       |
|           | 06     | B        | G       | 1,3     | -       |
|           | 06     | B        | G       | 1,8     | -       |
|           | 11     | B        | G       | 0,5     | -       |
|           | 11     | B        | G       | 0,65    | -       |
|           | 11     | B        | G       | 0,75    | -       |
|           | 11     | B        | G       | 0,75    | L       |
|           | 16     | B        | G       | 0,75    | -       |
|           | 17     | B        | G       | 1,5     | -       |
|           | 17     | B        | G       | 1,6     | -       |
|           | 18     | B        | G       | 0,75    | -       |



# Threaded Probes

## Threaded Short Travel Probe 100 mil

**F722**

|                  |               |
|------------------|---------------|
| Centers (mm/mil) | 2,54 / 100    |
| Current          | 5,0 A         |
| Temperature      | -20°C...+80°C |
| R typically      | 25 mOhm       |

### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 40      | 100           |

### Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 1,5               | 2,2      |
| Thread (M)        | 1,6x0,2  |
| Wrench Size       | 1,7      |
| Pointing Accuracy | ±0,08 mm |

### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | BeCu, gold plated         |
| Spring     | Music wire, silver plated |
| Receptacle | Brass, Gold plated        |

### Accessories

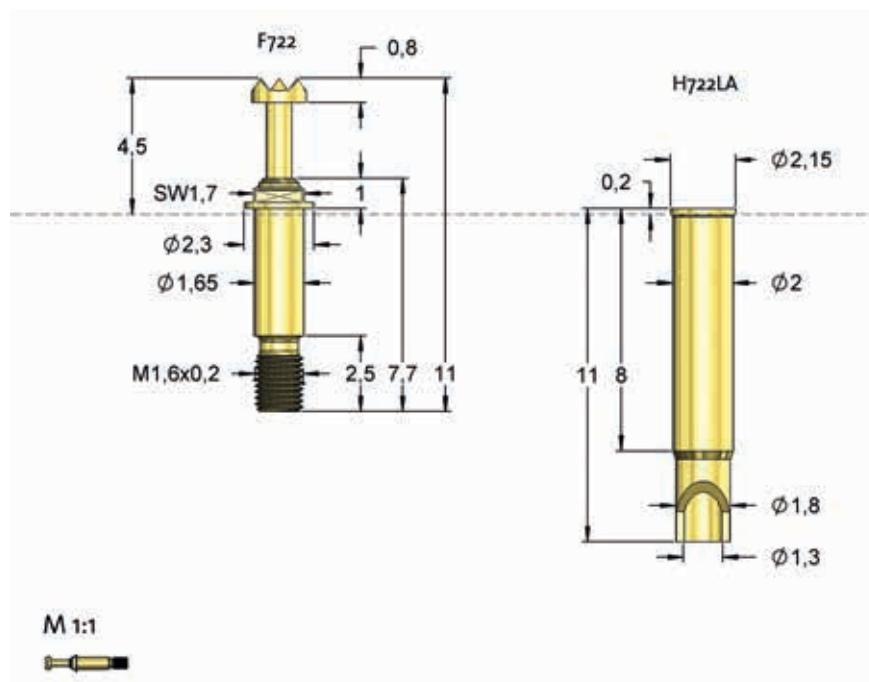
|                     |            |
|---------------------|------------|
| Screw-in tool probe | FWZ732 (T) |
|---------------------|------------|

### Drill Size [mm]

|         |             |
|---------|-------------|
| H722... | 1,99 - 2,00 |
|---------|-------------|

### Projection Height

|         |     |
|---------|-----|
| H722... | 4,5 |
|---------|-----|



| Type                 | Tip-Ø                        | Spring Force |
|----------------------|------------------------------|--------------|
| F 722 06 B 180 G 100 |                              |              |
| Tip Style            | Material                     | Finish       |
| Material:            | B = BeCu                     |              |
| Tip-Ø:               | 180 = 1,8 mm (e.g.)          |              |
| Finish:              | G = Gold                     |              |
| Receptacle:          | Order Code according drawing |              |
| ORDER EXAMPLE        |                              |              |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 05     | B        | G       | 1,8     | -       |
|           | 06     | B        | G       | 1,8     | -       |
|           | 11     | B        | G       | 0,64    | -       |
|           | 11     | B        | G       | 0,85    | -       |
|           | 17     | B        | G       | 1,8     | -       |

# Threaded Probes



## Threaded Long Travel Probe 100 mil

**F727**

NEU

|                  |               |
|------------------|---------------|
| Centers (mm/mil) | 2,54 / 100    |
| Current          | 5,0 A         |
| Temperature      | -20°C...+80°C |
| R typically      | 25 mOhm       |

### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 40      | 100           |

### Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 1,5               | 2,2      |
| Thread (M)        | 1,6x0,2  |
| Wrench Size       | 1,7      |
| Pointing Accuracy | ±0,08 mm |

### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | BeCu, gold plated         |
| Spring     | Music wire, silver plated |
| Receptacle | Brass, Gold plated        |

### Accessories

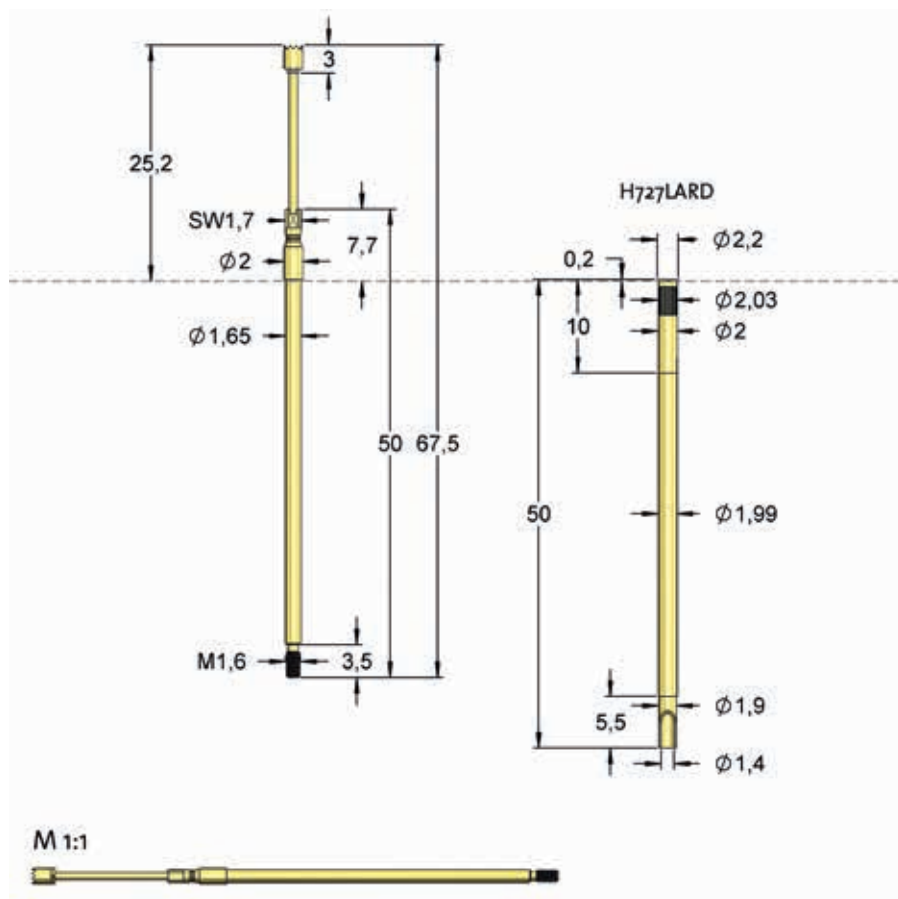
|                                |            |
|--------------------------------|------------|
| Screw-in tool probe            | FWZ732 (T) |
| Insertion tool for receptacles | FEWZ-772E0 |

### Drill Size [mm]

|      |             |
|------|-------------|
| H727 | 2,00 - 2,02 |
|------|-------------|

### Projection Height

|         |      |
|---------|------|
| H727... | 25,2 |
|---------|------|



| Type                 | Tip-Ø                        | Spring Force |
|----------------------|------------------------------|--------------|
| F 727 06 B 200 G 300 |                              |              |
| Tip Style            | Material                     | Finish       |
| Material:            | B = BeCu                     |              |
| Tip-Ø:               | 200 = 2,0 mm (e.g.)          |              |
| Finish:              | G = Gold                     |              |
| Receptacle:          | Order Code according drawing |              |
| ORDER EXAMPLE        |                              |              |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 06     | B        | G       | 2,0     | -       |
|           | 15     | B        | G       | 2,0     | -       |

# Threaded Probes

## Threaded Probe 100 mil

### F732

|                  |                                    |
|------------------|------------------------------------|
| Centers (mm/mil) | 2,54 / 100                         |
| Current          | 5,0 A                              |
| Temperature      | -20°C...+80°C,<br>-40°C...+250°C H |
| R typically      | 25 mOhm                            |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 30      | 80            |
| 60      | 150           |
| 60      | 300           |

#### Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 4,0               | 5,0      |
| Thread (M)        | 1,6      |
| Wrench Size       | 1,7      |
| Pointing Accuracy | ±0,08 mm |

#### Materials and Plating

|            |  |
|------------|--|
| Plunger    | see Tip Style  |
| Barrel     | Brass, gold plated   |
| Spring     | Music wire, silver plated ,<br>Stainless Steel, unplated H |
| Receptacle | Brass, Gold plated   |

#### Accessories

|                           |                               |
|---------------------------|-------------------------------|
| Screw-in tool probe       | FWZ732 (T) max.<br>Ø2,0 mm    |
| Screw-in tool probe       | FWZ732S1 (T1)<br>max. Ø2,7 mm |
| Insertion tool receptacle | FEWZ-772E0                    |

#### Drill Size [mm]

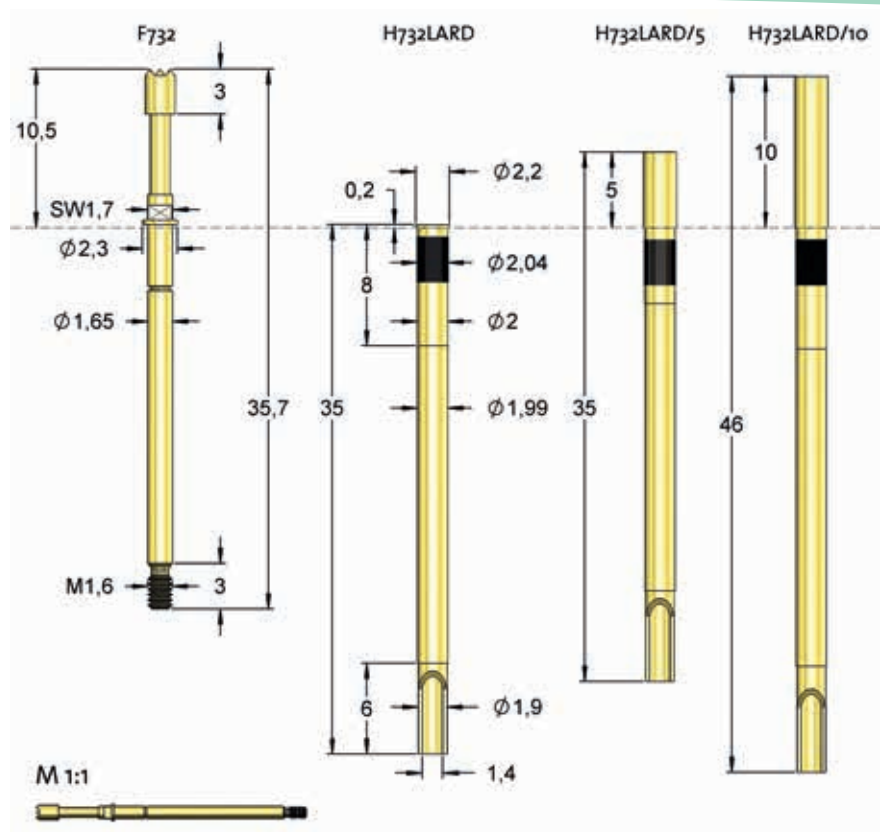
|                          |             |
|--------------------------|-------------|
| Receptacle without knurl | 1,99 - 2,00 |
| Receptacle with knurl    | 2,00 - 2,02 |

#### Projection Height

|            |      |
|------------|------|
| H732...    | 10,5 |
| H732.../5  | 15,3 |
| H732.../10 | 20,3 |

| Type                   | Tip-Ø   | Spring Force           |
|------------------------|---|------------------------|
| F 732 11 B 100 G 300 L |   |                        |
| Tip Style              | Material  | Finish Special Version |
| Material:              | B = BeCu, S = Steel   |                        |
| Tip-Ø:                 | 100 = 1,0 mm (e.g.)   |                        |
| Finish:                | G = Gold, L = Longtime Gold plated,<br>N = Nickel, R = Rhodium                            |                        |
| Special Version:       | L = Long Version, H = High Temperatur,<br>IK = Insulating cap,<br>RP = „Wobbling Plunger“ |                        |
| Receptacle:            | Order Code according drawing  |                        |

ORDER EXAMPLE



High temperature versions available on request.

| Tip Style | Number | Material | Plating | Ø in mm            | Version |
|-----------|--------|----------|---------|--------------------|---------|
|           | 03     | B        | G       | 1,3                | -       |
|           | 05     | B        | G       | 1,8; 2,0; 3,5      | -       |
|           | 06     | B        | G       | 1,3; 1,4; 1,5; 1,8 | -       |
|           | 06     | B        | R       | 2,0                | -       |
|           | 06     | B        | G       | 2,0; 2,5; 3,0      | -       |
|           | 07     | S        | L       | 1,75; 2,0          | -       |
|           | 10     | S        | N       | 0,63               | -       |
|           | 11     | B        | R       | 0,64               | -       |
|           | 11     | B        | G       | 0,64               | -       |
|           | 11     | B        | G       | 0,64               | RP      |
|           | 11     | B        | G       | 0,8; 1,0; 1,3      | -       |
|           | 12     | B        | G       | 1,4; 1,6; 1,8; 2,0 | -       |
|           | 14     | S        | L       | 2,0                | -       |
|           | 15     | B        | G       | 2,0                | -       |
|           | 16     | B        | G       | 0,64; 0,8; 1,0     | -       |
|           | 17     | B        | G       | 1,4; 1,5; 2,0      | -       |
|           | 18     | B        | G       | 1,3                | -       |
|           | 21     | S        | L       | 1,3                | -       |
|           | 28     | B        | G       | 2,0                | -       |
|           | 30     | B        | G       | 1,3                | -       |
|           | 32     | S        | N       | 0,8                | -       |
|           | 33     | S        | L       | 1,3                | -       |
|           | 41     | B        | G       | 3,0                | -       |

# Threaded Probes



## Threaded Short Travel Probe 157 mil

**F723**

|                         |                |
|-------------------------|----------------|
| <b>Centers (mm/mil)</b> | 4,00 / 157     |
| <b>Current</b>          | 10,0 A         |
| <b>Temperature</b>      | -40°C...+250°C |
| <b>R typically</b>      | 15 mOhm        |

### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 40      | 80            |
| 70      | 150           |

### Travel (mm)

| Nominal           | Maximum |
|-------------------|---------|
| 2,8               | 3,5     |
| Thread (M)        | 2,0     |
| Wrench Size       | 3,0     |
| Pointing Accuracy | ±0,1 mm |

### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Stainless steel, unplated |
| Receptacle | Brass, Gold plated        |

### Accessories

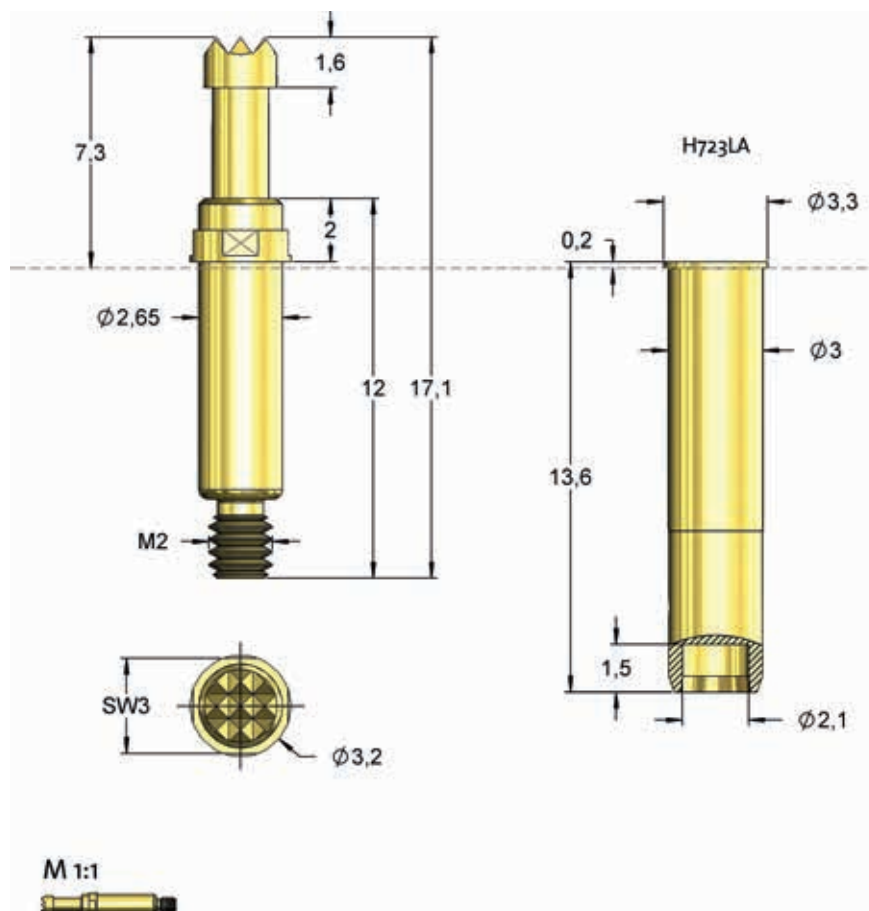
|                     |               |
|---------------------|---------------|
| Screw-in tool probe | FWZ733S1 (T1) |
|---------------------|---------------|

### Drill Size [mm]

|         |             |
|---------|-------------|
| H723... | 2,98 - 2,99 |
|---------|-------------|

### Projection Height

|         |     |
|---------|-----|
| H723... | 7,3 |
|---------|-----|



Compatible plug-in version can be found at F713.

| Type                 | Tip-Ø                        | Spring Force           |
|----------------------|------------------------------|------------------------|
| F 723 12 B 230 G 080 |                              |                        |
| Tip Style            | Material                     | Finish Special Version |
| Material:            | B = BeCu                     |                        |
| Tip-Ø:               | 230 = 2,3 mm (e.g.)          |                        |
| Finish:              | G = Gold                     |                        |
| Receptacle:          | Order Code according drawing |                        |
| ORDER EXAMPLE        |                              |                        |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 02     | B        | G       | 2,3     | -       |
|           | 06     | B        | G       | 2,3     | -       |
|           | 12     | B        | G       | 2,3     | -       |
|           | 17     | B        | G       | 2,3     | -       |

# Threaded Probes

## Threaded Probe 157 mil

**F733**

|                         |                                    |
|-------------------------|------------------------------------|
| <b>Centers (mm/mil)</b> | 4,00 / 157                         |
| <b>Current</b>          | 10,0 A                             |
| <b>Temperature</b>      | -20°C...+80°C,<br>-40°C...+250°C H |
| <b>R typically</b>      | 25 mOhm                            |

### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 50      | 150           |
| 70      | 300           |
| 80      | 300 H         |
| 70      | 600           |

### Travel (mm)

| Nominal           | Maximum |
|-------------------|---------|
| 4,0               | 5,0     |
| Thread (M)        | 2,0     |
| Wrench Size       | 3,0     |
| Pointing Accuracy | ±0,1 mm |

### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Music wire, silver plated |
| Receptacle | Brass, Gold plated        |

### Accessories

|                           |                               |
|---------------------------|-------------------------------|
| Screw-in tool probe       | FWZ733S1 (T1)<br>max. Ø3,0 mm |
| Screw-in tool probe       | FWZ733 (T) max.<br>Ø4,0 mm    |
| Insertion tool receptacle | FEWZ-744E0                    |
| Plug lock                 | H733VS                        |

### Drill Size [mm]

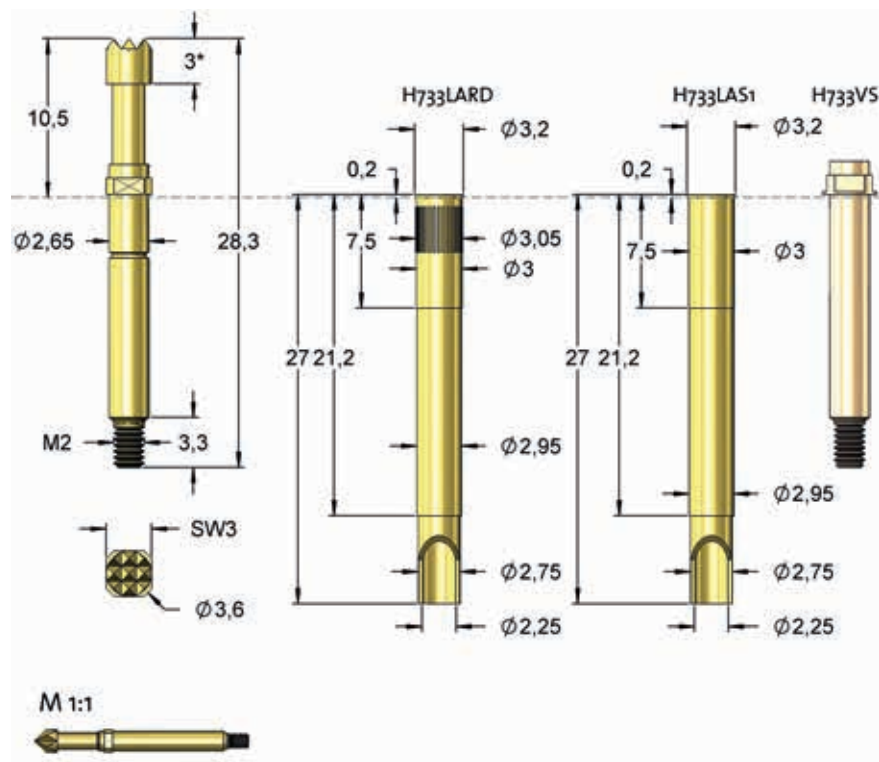
|                          |             |
|--------------------------|-------------|
| Receptacle without knurl | 2,98 - 2,99 |
| Receptacle with knurl    | 3,00 - 3,02 |

### Projection Height

|         |      |
|---------|------|
| H733... | 10,5 |
|---------|------|

| Type             | Tip-Ø  | Spring Force           |
|------------------|--|------------------------|
| F 733            | 12   | B 300 G 250 H          |
| Tip Style        | Material   | Finish Special Version |
| Material:        | B = BeCu, S = Steel  |                        |
| Tip-Ø:           | 300 = 3,0 mm (e.g.)  |                        |
| Finish:          | G = Gold, R = Rhodium,<br>L = Longtime Gold plated               |                        |
| Special Version: | H = High Temperatur,<br>IK = Insulating cap, IP = Insulating Pin |                        |
| Receptacle:      | Order Code according drawing                                     |                        |

ORDER EXAMPLE



High temperature versions available on request.

| Tip Style | Number | Material | Plating | Ø in mm                      | Version |
|-----------|--------|----------|---------|------------------------------|---------|
|           | 04     | B        | G       | 2,3                          | -       |
|           | 05     | B        | G       | 1,8; 2,0; 3,5                | -       |
|           | 06     | B        | G       | 2,3; 3,0                     | -       |
|           | 07     | B        | G       | 1,6; 2,3; 2,5; 3,0; 3,5; 4,0 | -       |
|           | 08     | S        | L       | 2,3                          | -       |
|           | 09     | S        | L       | 1,8; 2,3; 3,0                | -       |
|           | 10     | S        | L       | 2,3                          | -       |
|           | 11     | B        | G       | 0,64; 0,8; 1,0; 1,4; 1,8     | -       |
|           | 12     | B        | G       | 2,3; 3,0                     | -       |
|           | 13     | S        | L       | 2,3                          | -       |
|           | 14     | B        | G       | 2,3; 3,0                     | -       |
|           | 15     | B        | G       | 0,8; 1,0; 1,4; 1,8           | -       |
|           | 16     | B        | G       | 2,3; 3,0                     | -       |
|           | 17     | B        | G       | 2,3; 3,0                     | -       |
|           | 18     | B        | G       | 1,8                          | -       |
|           | 19     | S        | L       | 1,8                          | -       |
|           | 20     | B        | G       | 2,3                          | -       |
|           | 21     | B        | G       | 1,8                          | -       |
|           | 22     | B        | G       | 1,8                          | -       |
|           | 23     | B        | G       | 1,8                          | -       |



# Threaded Probes



## Threaded Long Travel Probe 157 mil

**F734**

NEU

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 4,00 / 157    |
| <b>Current</b>          | 10,0 A        |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 25 mOhm       |

### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 60      | 150           |
| 120     | 300           |

### Travel (mm)

| Nominal           | Maximum |
|-------------------|---------|
| 5,6               | 7,0     |
| Thread (M)        | 3,0     |
| Wrench Size       | 2,0     |
| Pointing Accuracy | ±0,1 mm |

### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Music wire, silver plated |
| Receptacle | Brass, Gold plated        |

### Accessories

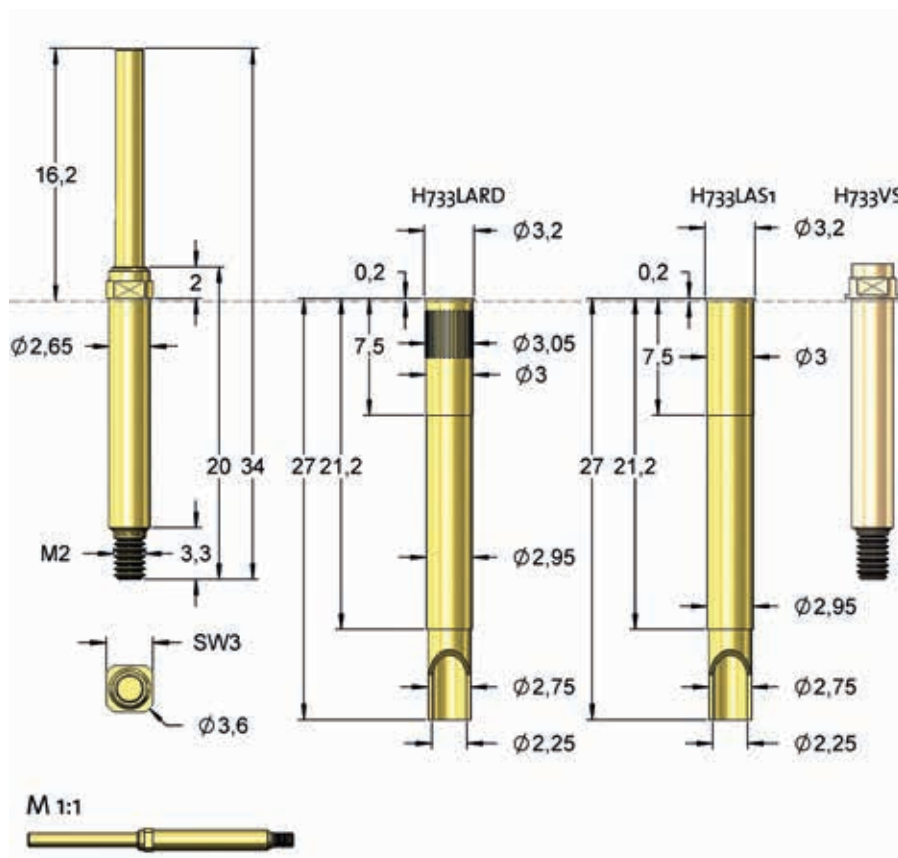
|                           |                               |
|---------------------------|-------------------------------|
| Screw-in tool receptacle  | FWZ733S1 (T1)<br>max. Ø3,0 mm |
| Screw-in tool receptacle  | FWZ733 (T) max.<br>Ø4,0 mm    |
| Insertion tool receptacle | FEWZ-774E0                    |
| Plug lock                 | H733VS                        |

### Drill Size [mm]

|                          |             |
|--------------------------|-------------|
| Receptacle without knurl | 2,98 - 2,99 |
| Receptacle with knurl    | 3,00 - 3,02 |

### Projection Height

|         |      |
|---------|------|
| H733... | 16,0 |
|---------|------|



| Type                 | Tip-Ø                        | Spring Force |
|----------------------|------------------------------|--------------|
| F 734 16 B 180 G 150 |                              |              |
| Tip Style            | Material                     | Finish       |
| Material:            | B = BeCu                     |              |
| Tip-Ø:               | 180 = 1,8 mm (e.g.)          |              |
| Finish:              | G = Gold                     |              |
| Receptacle:          | Order Code according drawing |              |
| ORDER EXAMPLE        |                              |              |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 16     | B        | G       | 1,8     | -       |
|           | 18     | S        | L       | 1,8     | -       |
|           | 39     | B        | G       | 1,8     | -       |

# Threaded Probes

## Threaded Long Travel Probe 157 mil

**F737**

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 4,00 / 157    |
| <b>Current</b>          | 10,0 A        |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 25 mOhm       |

### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 60      | 150           |
| 80      | 300           |

### Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 12,0              | 14,3     |
| Thread (M)        | 2,0      |
| Wrench Size       | 3,0      |
| Pointing Accuracy | ±0,15 mm |

### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Music wire, silver plated |
| Receptacle | Brass, Gold plated        |

### Accessories

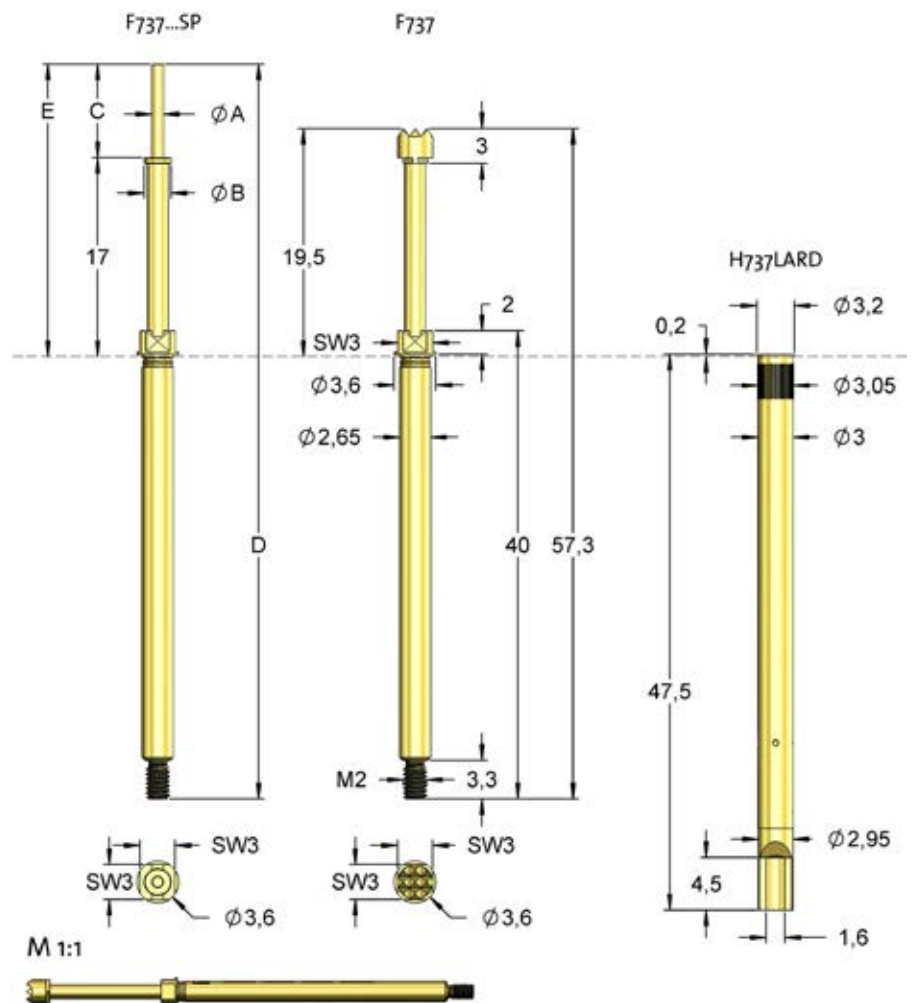
|                           |                               |
|---------------------------|-------------------------------|
| Screw-in tool probe       | FWZ733S1 (T1)<br>max. Ø3,0 mm |
| Screw-in tool probe       | FWZ733 (T)<br>max. Ø4,0 mm    |
| Insertion tool receptacle | FEWZ-774E0                    |

### Drill Size [mm]

|      |             |
|------|-------------|
| H737 | 3,00 - 3,02 |
|------|-------------|

### Projection Height

|         |      |
|---------|------|
| H737... | 19,5 |
|---------|------|



Step Probe versions see overview Step Probes.

| Type                 | Tip-Ø                        | Spring Force |
|----------------------|------------------------------|--------------|
| F 737 06 B 400 G 300 |                              |              |
| Tip Style            | Material                     | Finish       |
| Material:            | B = BeCu                     |              |
| Tip-Ø:               | 400 = 4,0 mm (e.g.)          |              |
| Finish:              | G = Gold                     |              |
| Receptacle:          | Order Code according drawing |              |
| ORDER EXAMPLE        |                              |              |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 06     | B        | G       | 3,0     | -       |
|           | 06     | B        | G       | 4,0     | -       |
|           | 16     | B        | G       | 1,8     | -       |



# High Current Probes

For high current applications spring contact probes need to be designed in a special way, with very low internal resistances. Especially the current flow through the spring needs to be limited. Depending on the special design and size FEINMETALL high current probes can be used for currents between 10 A up to 150 A.

|          |     |
|----------|-----|
| F310     | 102 |
| F320     | 103 |
| F330     | 104 |
| F340     | 105 |
| F772...C | 106 |
| F732...C | 107 |
| F360...C | 108 |
| F723...C | 109 |
| F773...C | 110 |
| F733...C | 111 |
| F775...C | 112 |
| F735...C | 113 |
| F762...C | 115 |
| 1860C001 | 116 |
| 1860C006 | 116 |
| 1860C005 | 117 |
| 1860C007 | 118 |
| 1860C004 | 119 |

# High Current Probes

## High Current Probe 75 mil Continuous Plunger

### F310

|                  |                |
|------------------|----------------|
| Centers (mm/mil) | 1,90 / 75      |
| Current          | 8,0 A          |
| Temperature      | -40°C...+250°C |
| R typically      | <25 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 40      | 90            |

#### Travel (mm)

| Nominal           | Maximum |
|-------------------|---------|
| 2,4               | 3,0     |
| Pointing Accuracy | ±0,1 mm |

#### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Bronze, unplated          |
| Spring     | Stainless steel, unplated |
| Receptacle | Bronze, Gold plated       |

#### Accessories

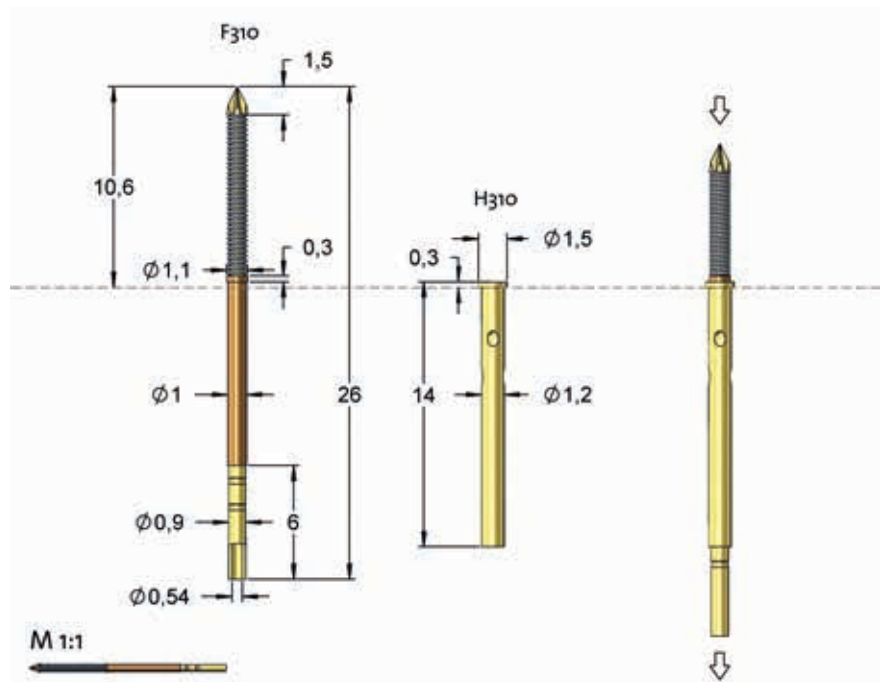
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-075E0 |
| Insertion tool probe      | FDWZ-075   |

#### Drill Size [mm]

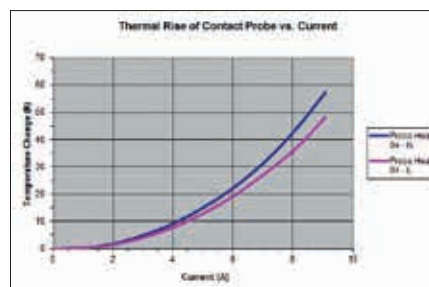
|      |            |
|------|------------|
| H310 | 1,19 - 120 |
|------|------------|

#### Projection Height

|      |      |
|------|------|
| H310 | 10,6 |
|------|------|



The continuous plunger leads to low contact resistances and allows high current applications. The connection of the plunger should be realized by a flexible wire (recommended 0,20 mm<sup>2</sup>) with sufficient space for the movement.



| Type                 | Tip-Ø                                | Spring Force |
|----------------------|--------------------------------------|--------------|
| F 310 08 S 110 L 090 |                                      |              |
| Tip Style            | Material                             | Finish       |
| Material:            | S = Steel                            |              |
| Tip-Ø:               | 110 = 1,1 mm (e.g.)                  |              |
| Finish:              | L = Longtime Gold plated, N = Nickel |              |
| Special Version:     | S1 = Special Version                 |              |
| Receptacle:          | Order Code according drawing         |              |
| ORDER EXAMPLE        |                                      |              |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 04     | S        | L       | 1,1     | -       |
|           | 04     | S        | N       | 1,1     | -       |
|           | 05     | S        | N       | 1,1     | -       |
|           | 08     | S        | L       | 1,1     | -       |
|           | 09     | S        | N       | 1,1     | -       |
|           | 09     | S        | L       | 1,1     | -       |
|           | 14     | S        | L       | 1,1     | -       |

# High Current Probes



## High Current Probe 100 mil Continuous Plunger

### F320

|                         |                |
|-------------------------|----------------|
| <b>Centers (mm/mil)</b> | 2,54 / 100     |
| <b>Current</b>          | 10,0 A         |
| <b>Temperature</b>      | -40°C...+250°C |
| <b>R typically</b>      | <20 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 50      | 130           |

#### Travel (mm)

| Nominal           | Maximum |
|-------------------|---------|
| 3,2               | 4,0     |
| Pointing Accuracy | ±0,1 mm |

#### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Bronze, unplated          |
| Spring     | Stainless steel, unplated |
| Receptacle | Bronze, Gold plated       |

#### Accessories

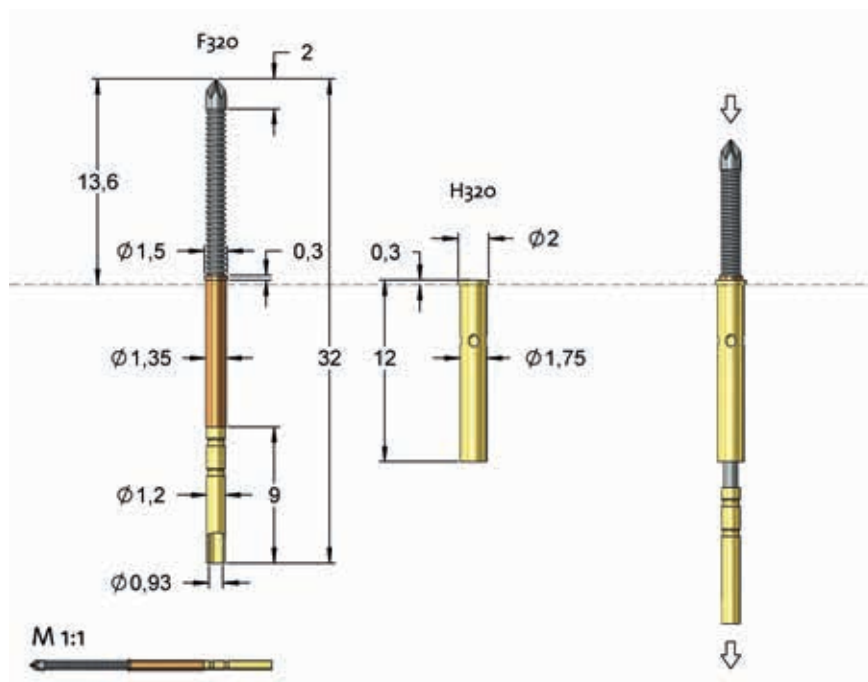
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-100E0 |
| Insertion tool probe      | FDWZ-075   |

#### Drill Size [mm]

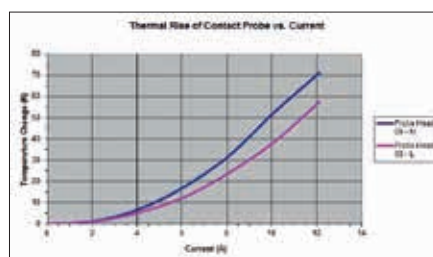
|      |             |
|------|-------------|
| H320 | 1,74 - 1,75 |
|------|-------------|

#### Projection Height

|      |      |
|------|------|
| H320 | 13,6 |
|------|------|



The continuous plunger leads to low contact resistances and allows high current applications. The connection of the plunger should be realized by a flexible wire (recommended 0,52 mm<sup>2</sup>) with sufficient space for the movement.



| Type                 | Tip-Ø                                | Spring Force |
|----------------------|--------------------------------------|--------------|
| F 320 09 S 135 L 130 |                                      |              |
| Tip Style            | Material                             | Finish       |
| Material:            | S = Steel                            |              |
| Tip-Ø:               | 135 = 1,35 mm (e.g.)                 |              |
| Finish:              | L = Longtime Gold plated, N = Nickel |              |
| Receptacle:          | Order Code according drawing         |              |
| ORDER EXAMPLE        |                                      |              |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 04     | S        | N       | 1,35    | -       |
|           | 05     | S        | N       | 1,35    | -       |
|           | 07     | S        | N       | 1,35    | -       |
|           | 08     | S        | L       | 1,35    | -       |
|           | 09     | S        | L       | 1,35    | -       |
|           | 12     | S        | L       | 1,35    | -       |
|           | 14     | S        | L       | 1,35    | -       |



# High Current Probes

## High Current Probe 118 mil Continuous Plunger

### F330

|                  |                |
|------------------|----------------|
| Centers (mm/mil) | 3,00 / 118     |
| Current          | 14,0 A         |
| Temperature      | -40°C...+250°C |
| R typically      | <15 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 60      | 210           |

#### Travel (mm)

| Nominal           | Maximum |
|-------------------|---------|
| 5,6               | 7,0     |
| Pointing Accuracy | ±0,1 mm |

#### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Bronze, unplated          |
| Spring     | Stainless steel, unplated |
| Receptacle | Bronze, Gold plated       |

#### Accessories

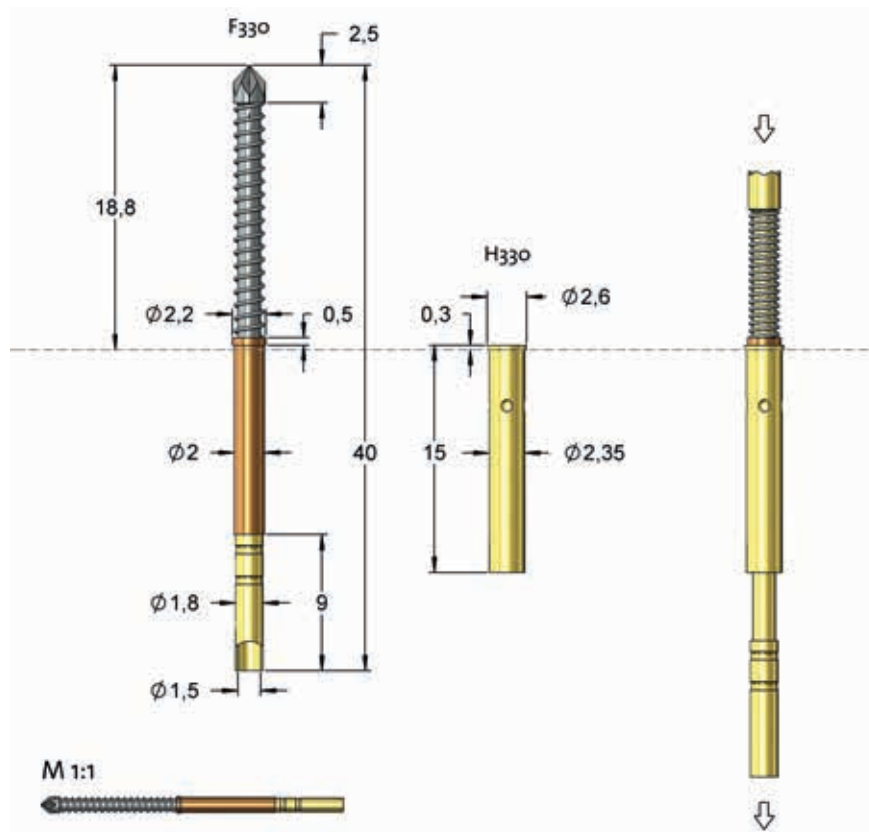
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-330E0 |
| Insertion tool probe      | FDWZ-075   |

#### Drill Size [mm]

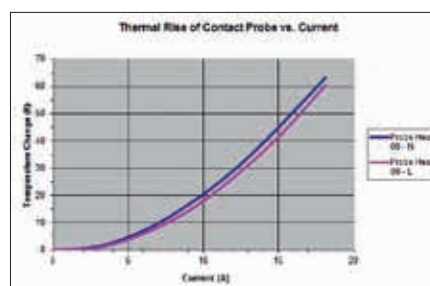
|      |            |
|------|------------|
| H330 | 2,33 -2,34 |
|------|------------|

#### Projection Height

|      |      |
|------|------|
| H330 | 18,8 |
|------|------|



The continuous plunger leads to low contact resistances and allows high current applications. The connection of the plunger should be realized by a flexible wire (recommended 1,7 mm<sup>2</sup>) with sufficient space for the movement. Spring Force 360cN and 415cN versions available on request.



| Type                 | Tip-Ø                                | Spring Force |
|----------------------|--------------------------------------|--------------|
| F 330 05 S 210 N 415 |                                      |              |
| Tip Style            | Material                             | Finish       |
| Material:            | S = Steel                            |              |
| Tip-Ø:               | 210 = 2,1 mm (e.g.)                  |              |
| Finish:              | L = Longtime Gold plated, N = Nickel |              |
| Receptacle:          | Order Code according drawing         |              |

ORDER EXAMPLE

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 02     | S        | N       | 2,1     | -       |
|           | 05     | S        | N       | 2,1     | -       |
|           | 05     | S        | L       | 2,1     | -       |
|           | 07     | S        | N       | 2,1     | -       |
|           | 08     | S        | N       | 2,1     | -       |
|           | 09     | S        | L       | 2,1     | -       |
|           | 12     | S        | N       | 2,1     | -       |
|           | 14     | S        | L       | 2,1     | -       |
|           | 14     | S        | N       | 2,1     | -       |

# High Current Probes



## High Current Probe 157 mil Continuous Plunger

### F340

|                         |                |
|-------------------------|----------------|
| <b>Centers (mm/mil)</b> | 4,00 / 157     |
| <b>Current</b>          | 16,0 A         |
| <b>Temperature</b>      | -40°C...+250°C |
| <b>R typically</b>      | <10 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 80      | 260           |
| 150     | 400           |
| 300     | 540           |

#### Travel (mm)

| Nominal           | Maximum |
|-------------------|---------|
| 6,4               | 8,0     |
| Pointing Accuracy | ±0,1 mm |

#### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Bronze, unplated          |
| Spring     | Stainless steel, unplated |
| Receptacle | Bronze, Gold plated       |

#### Accessories

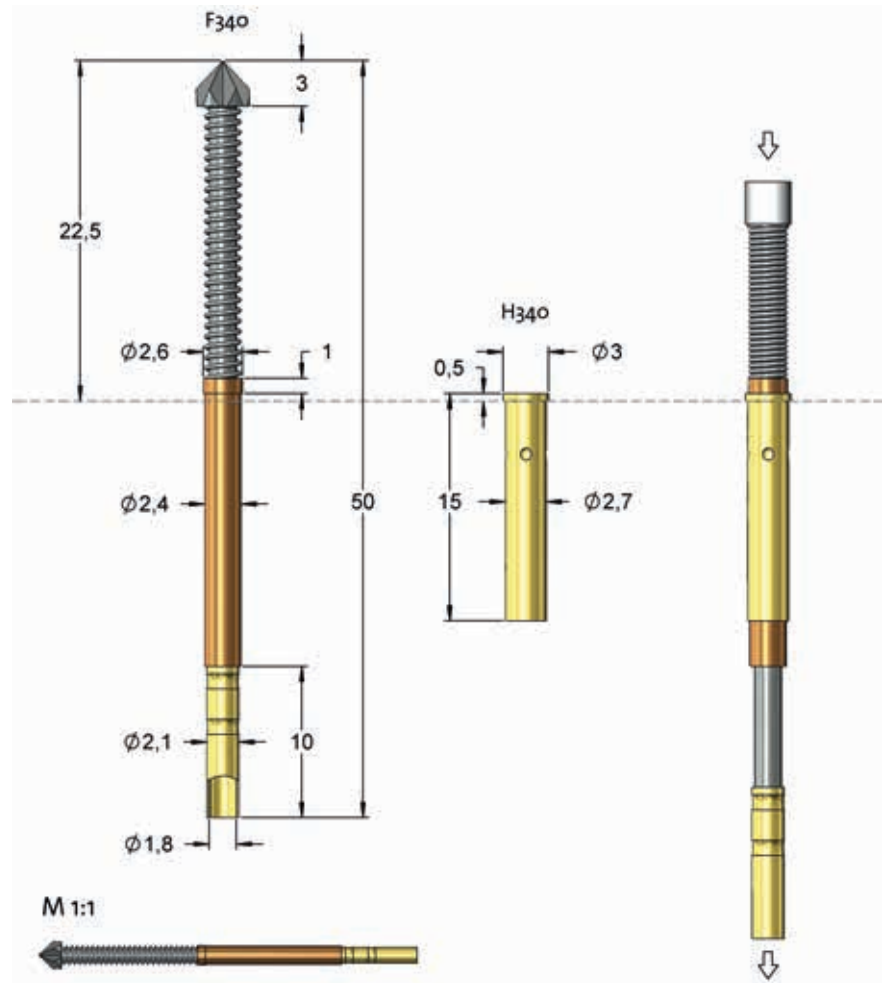
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-340E0 |
| Insertion tool probe      | FDWZ-100   |

#### Drill Size [mm]

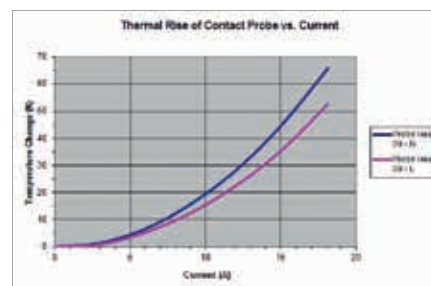
|      |             |
|------|-------------|
| H340 | 2,68 - 2,69 |
|------|-------------|

#### Projection Height

|      |      |
|------|------|
| H340 | 22,5 |
|------|------|



The continuous plunger leads to low contact resistances and allows high current applications. The connection of the plunger should be realized by a flexible wire (recommended 2,5 mm²) with sufficient space for the movement.



| Type                 | Tip-Ø   |        | Spring Force    |
|----------------------|---|--------|-----------------|
| F 340 09 S 350 L 540 |   |        |                 |
| Tip Style            | Material  | Finish | Special Version |
| Material:            | S = Steel, A = AgNi (Silver alloy)                    |        |                 |
| Tip-Ø:               | 350 = 3,5 mm (e.g.)                                   |        |                 |
| Finish:              | L = Longtime Gold plated,<br>N = Nickel, U = Unplated |        |                 |
| Receptacle:          | Order Code according drawing                          |        |                 |
| ORDER EXAMPLE        |   |        |                 |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 05     | A        | U       | 3,0     | -       |
|           | 05     | S        | L       | 3,5     | -       |
|           | 07     | S        | L       | 3,5     | -       |
|           | 09     | S        | L       | 3,5     | -       |
|           | 17     | A        | U       | 3,0     | -       |

# High Current Probes

## High Current Probe 100 mil Plug-in

### F772C

|                  |                |
|------------------|----------------|
| Centers (mm/mil) | 2,54 / 100     |
| Current          | 20,0 A         |
| Temperature      | -40°C...+250°C |
| R typically      | <10 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 50      | 150           |
| 50      | 300           |

#### Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 4,0               | 5,0      |
| Pointing Accuracy | ±0,08 mm |

#### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Stainless steel, unplated |
| Receptacle | Brass, Gold plated        |

#### Accessories

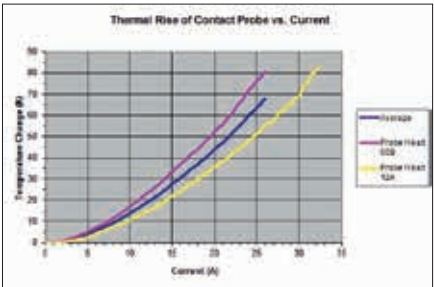
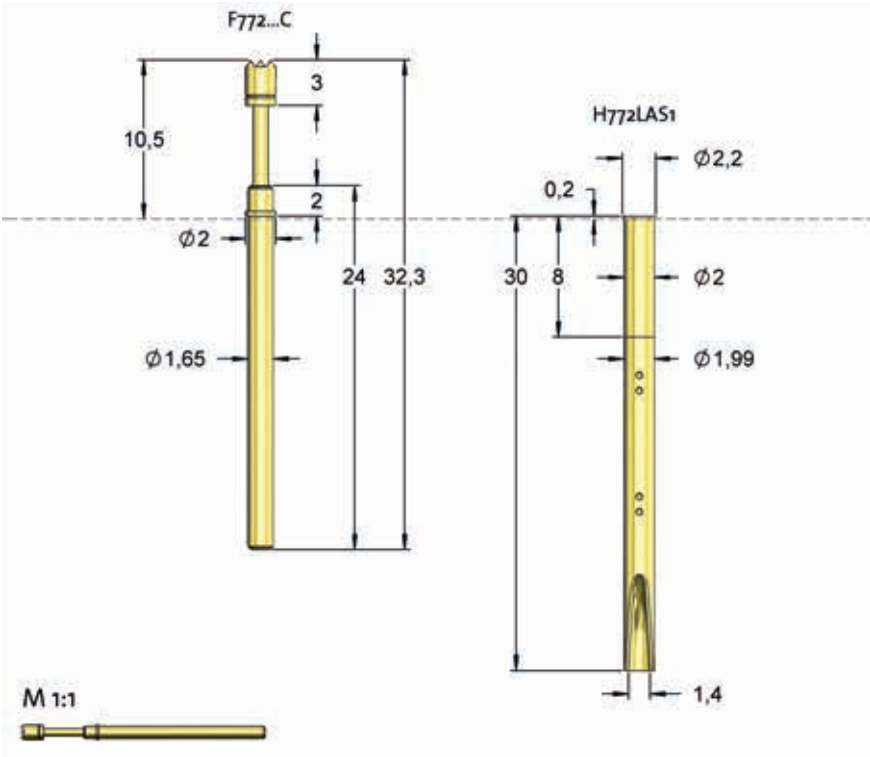
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-772E0 |
| Insertion tool probe      | FDWZ-100   |

#### Drill Size [mm]

|          |             |
|----------|-------------|
| H772LAS1 | 1,99 - 2,00 |
|----------|-------------|

#### Projection Height

|          |      |
|----------|------|
| H772LAS1 | 10,5 |
|----------|------|



| Type                   | Tip-Ø  | Spring Force |
|------------------------|--|--------------|
| F 772 06 B 200 G 300 C |  |              |
| Tip Style              | Material   | Finish       |
| Material:              | B = BeCu, A = AgNi (Silver alloy)                            |              |
| Tip-Ø:                 | 200 = 2,0 mm (e.g.)  |              |
| Finish:                | G = Gold, U = Unplated                                       |              |
| Special Version:       | C = High Current Version, e.g. E12 = Projection height 12 mm |              |
| Receptacle:            | Order Code according drawing                                 |              |
| ORDER EXAMPLE          |  |              |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 05     | A        | U       | 2,0     | C       |
|           | 05     | B        | G       | 2,0     | C       |
|           | 06     | B        | G       | 2,0     | C       |
|           | 07     | B        | G       | 2,0     | C       |
|           | 11     | B        | G       | 1,0     | C       |
|           | 14     | B        | G       | 1,3     | C       |
|           | 14     | B        | G       | 2,0     | C       |
|           | 16     | B        | G       | 1,0     | C       |

# High Current Probes



## High Current Probe 100 mil Threaded

### F732C

|                         |                |
|-------------------------|----------------|
| <b>Centers (mm/mil)</b> | 2,54 / 100     |
| <b>Current</b>          | 20,0 A         |
| <b>Temperature</b>      | -40°C...+250°C |
| <b>R typically</b>      | <10 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 50      | 150           |
| 50      | 300           |

#### Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 4,0               | 5,0      |
| Thread (M)        | 1,6      |
| Wrench Size       | 1,7      |
| Pointing Accuracy | ±0,08 mm |

#### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Stainless steel, unplated |
| Receptacle | Brass, Gold plated        |

#### Accessories

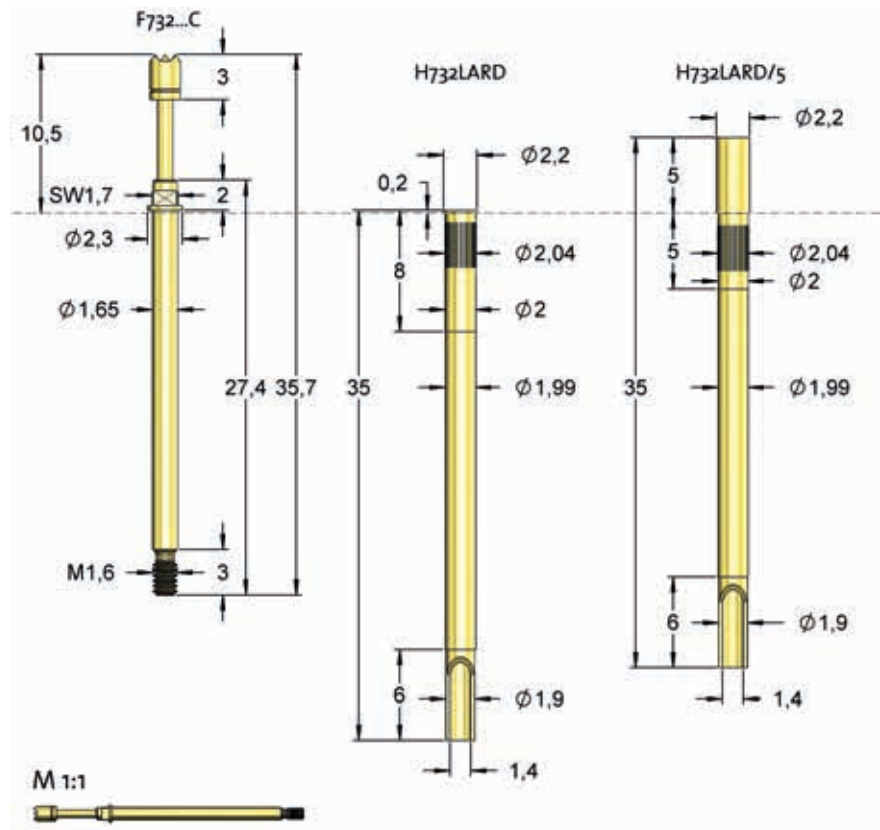
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-772E0 |
| Screw-in tool probe       | FWZ732 (T) |

#### Drill Size [mm]

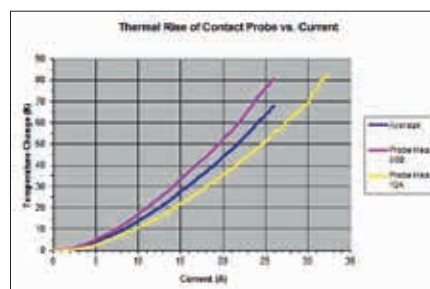
|                          |             |
|--------------------------|-------------|
| Receptacle without knurl | 1,99 - 2,00 |
| Receptacle with knurl    | 2,00 - 2,02 |

#### Projection Height

|            |      |
|------------|------|
| H732...    | 10,5 |
| H732.../5  | 15,3 |
| H732.../10 | 20,3 |



This probe is suitable for applications like burn-in or run-in test and functional test with higher currents. Tip style 05 is also available in a specific silver alloy. This material is minimizing welding or burning effects at the probe tip.



| Type                   | Tip-Ø                             | Spring Force |
|------------------------|-----------------------------------|--------------|
| F 732 06 B 200 G 300 C |                                   |              |
| Tip Style              | Material                          | Finish       |
| Material:              | B = BeCu, A = AgNi (Silver alloy) |              |
| Tip-Ø:                 | 200 = 2,0 mm (e.g.)               |              |
| Finish:                | G = Gold, U = Unplated            |              |
| Special Version:       | C = High Current Version          |              |
| Receptacle:            | Order Code according drawing      |              |

ORDER EXAMPLE

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 05     | A        | U       | 2,0     | C       |
|           | 05     | B        | G       | 2,0     | C       |
|           | 06     | B        | G       | 1,8     | C       |
|           | 06     | B        | G       | 2,0     | C       |
|           | 07     | B        | G       | 1,75    | C       |
|           | 11     | B        | G       | 0,65    | C       |
|           | 11     | B        | G       | 0,8     | C       |
|           | 11     | B        | G       | 1,0     | C       |
|           | 12     | A        | U       | 2,0     | C       |
|           | 16     | B        | G       | 1,0     | C       |

# High Current Probes

## Short Travel High Current Probe 145 mil, Threaded

### F360C

|                         |                |
|-------------------------|----------------|
| <b>Centers (mm/mil)</b> | 3,70 / 145     |
| <b>Current</b>          | 15,0 A         |
| <b>Temperature</b>      | -40°C...+250°C |
| <b>R typically</b>      | <20 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 50      | 80            |

#### Travel (mm)

| Nominal           | Maximum |
|-------------------|---------|
| 0,8               | 1,2     |
| Thread (M)        | 2,5     |
| Wrench Size       | 2,2     |
| Pointing Accuracy | ±0,1 mm |

#### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Stainless steel, unplated |
| Receptacle | Brass, Gold plated        |

#### Accessories

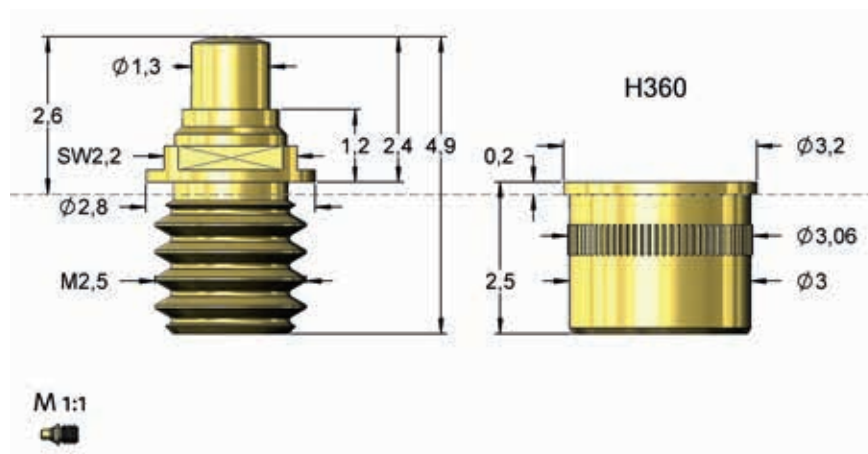
|                     |          |
|---------------------|----------|
| Screw-in tool probe | FWZVF3S2 |
|---------------------|----------|

#### Drill Size [mm]

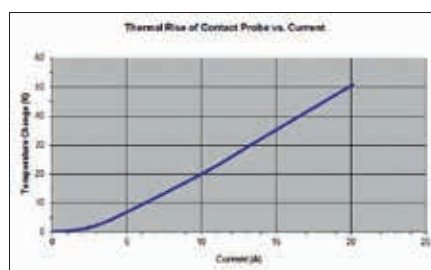
|      |             |
|------|-------------|
| H360 | 3,00 - 3,02 |
|------|-------------|

#### Projection Height

|      |     |
|------|-----|
| H360 | 2,6 |
|------|-----|



The high-current plunger leads to low contact resistances even in this compact probe design. For larger contact surfaces several probes F360C can be used in parallel to minimize the resulting contact resistance.



| Type                   | Tip-Ø                        | Spring Force |
|------------------------|------------------------------|--------------|
| F 360 11 B 130 G 080 C |                              |              |
| Tip Style              | Material                     | Finish       |
| Material:              | B = BeCu                     |              |
| Tip-Ø:                 | 130 = 1,3 mm (e.g.)          |              |
| Finish:                | G = Gold                     |              |
| Special Version:       | C = High Current Version     |              |
| Receptacle:            | Order Code according drawing |              |

ORDER EXAMPLE

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 11     | B        | G       | 1,3     | C       |



# High Current Probes



## Short Travel High Current Probe 157 mil, Threaded **F723C**

|                         |                |
|-------------------------|----------------|
| <b>Centers (mm/mil)</b> | 4,00 / 157     |
| <b>Current</b>          | 24,0 A         |
| <b>Temperature</b>      | -40°C...+250°C |
| <b>R typically</b>      | <8 mOhm        |

### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 40      | 80            |
| 70      | 150           |

### Travel (mm)

| Nominal           | Maximum |
|-------------------|---------|
| 2,8               | 3,5     |
| Thread (M)        | 2,0     |
| Wrench Size       | 3,0     |
| Pointing Accuracy | ±0,1 mm |

### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Stainless steel, unplated |
| Receptacle | Brass, Gold plated        |

### Accessories

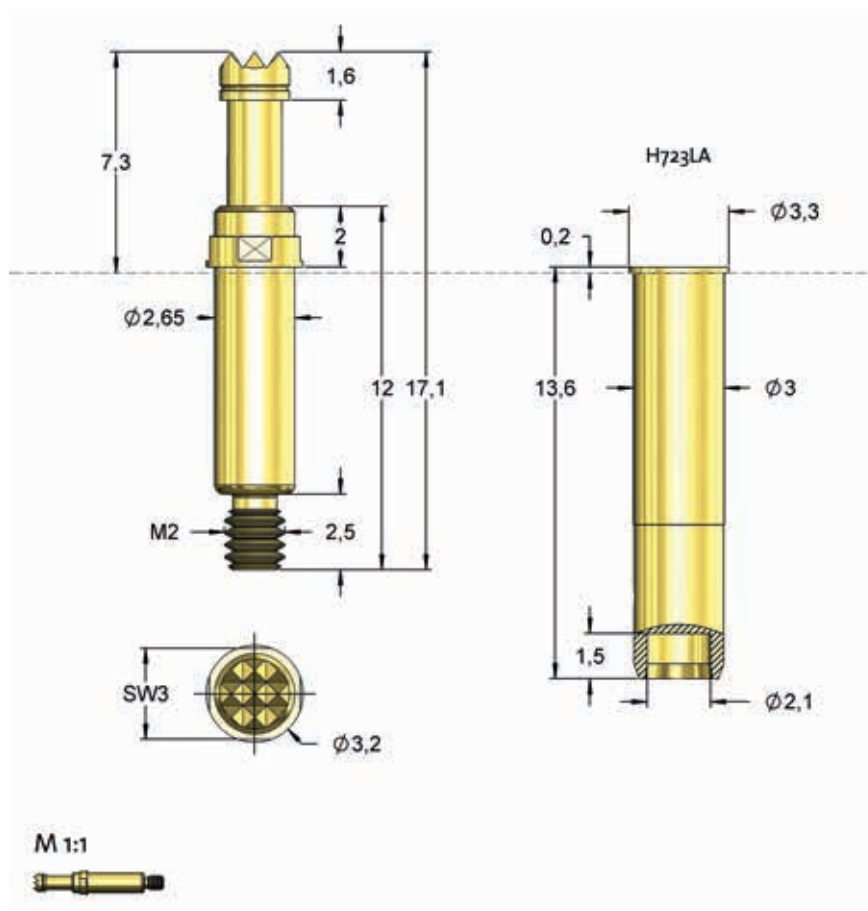
|                     |               |
|---------------------|---------------|
| Screw-in tool probe | FWZ733S1 (T1) |
|---------------------|---------------|

### Drill Size [mm]

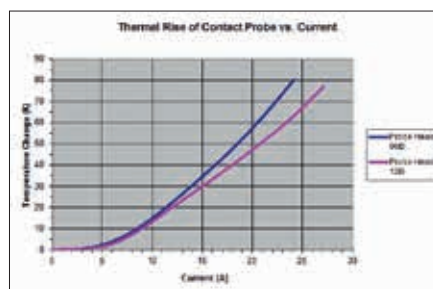
|      |             |
|------|-------------|
| H723 | 2,98 - 2,99 |
|------|-------------|

### Projection Height

|         |     |
|---------|-----|
| H723... | 7,3 |
|---------|-----|



The version with 80cN is only suitable for currents up to 18 A.



| Type                   | Tip-Ø                        | Spring Force |
|------------------------|------------------------------|--------------|
| F 723 06 B 230 G 080 C |                              |              |
| Tip Style              | Material                     | Finish       |
| Material:              | B = BeCu                     |              |
| Tip-Ø:                 | 230 = 2,3 mm (e.g.)          |              |
| Finish:                | G = Gold                     |              |
| Special Version:       | C = High Current Version     |              |
| Receptacle:            | Order Code according drawing |              |
| ORDER EXAMPLE          |                              |              |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 06     | B        | G       | 2,3     | C       |
|           | 12     | B        | G       | 2,3     | C       |

# High Current Probes

## High Current Probe 138 mil Plug in

### F773C

|                  |                |
|------------------|----------------|
| Centers (mm/mil) | 3,50 / 138     |
| Current          | 25,0 A         |
| Temperature      | -40°C...+250°C |
| R typically      | <8 mOhm        |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 60      | 150           |
| 60      | 300           |

#### Travel (mm)

| Nominal           | Maximum |
|-------------------|---------|
| 4,0               | 5,0     |
| Pointing Accuracy | ±0,1 mm |

#### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Stainless steel, unplated |
| Receptacle | Brass, Gold plated        |

#### Accessories

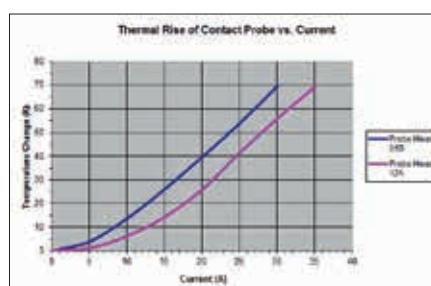
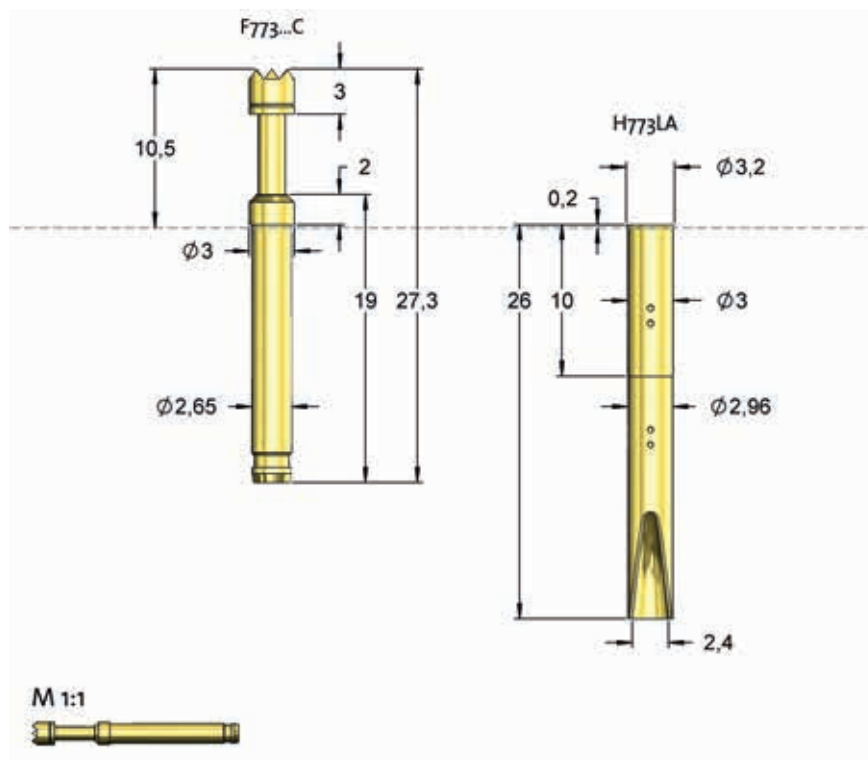
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-774E0 |
|---------------------------|------------|

#### Drill Size [mm]

|                          |           |
|--------------------------|-----------|
| Receptacle without knurl | 2,98-2,99 |
|--------------------------|-----------|

#### Projection Height

|        |      |
|--------|------|
| H773LA | 10,5 |
|--------|------|



| Type                   | Tip-Ø                             | Spring Force |
|------------------------|-----------------------------------|--------------|
| F 773 06 B 400 G 300 C |                                   |              |
| Tip Style              | Material                          | Finish       |
| Material:              | B = BeCu, A = AgNi (Silver alloy) |              |
| Tip-Ø:                 | 400 = 4,0 mm (e.g.)               |              |
| Finish:                | G = Gold, U = Unplated            |              |
| Special Version:       | C = High Current Version          |              |
| Receptacle:            | Order Code according drawing      |              |

ORDER EXAMPLE

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 06     | B        | G       | 2,3     | C       |
|           | 06     | B        | G       | 3,0     | C       |
|           | 06     | B        | G       | 4,0     | C       |
|           | 07     | B        | G       | 3,0     | C       |
|           | 11     | B        | G       | 1,4     | C       |
|           | 12     | B        | G       | 2,3     | C       |
|           | 17     | B        | G       | 4,0     | C       |

# High Current Probes



## High Current Probe 157 mil Threaded

### F733C

|                         |                |
|-------------------------|----------------|
| <b>Centers (mm/mil)</b> | 4,00 / 157     |
| <b>Current</b>          | 25,0 A         |
| <b>Temperature</b>      | -40°C...+250°C |
| <b>R typically</b>      | <8 mOhm        |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 60      | 150           |
| 60      | 300           |
| 70      | 600           |

#### Travel (mm)

| Nominal           | Maximum |
|-------------------|---------|
| 4,0               | 5,0     |
| Thread (M)        | 2,0     |
| Wrench Size       | 3,0     |
| Pointing Accuracy | ±0,1 mm |

#### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Stainless steel, unplated |
| Receptacle | Brass, Gold plated        |

#### Accessories

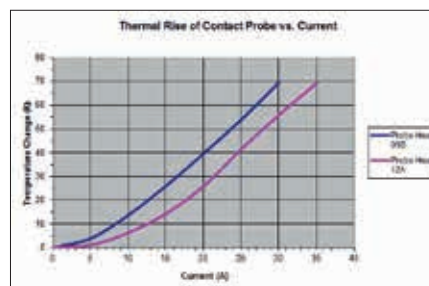
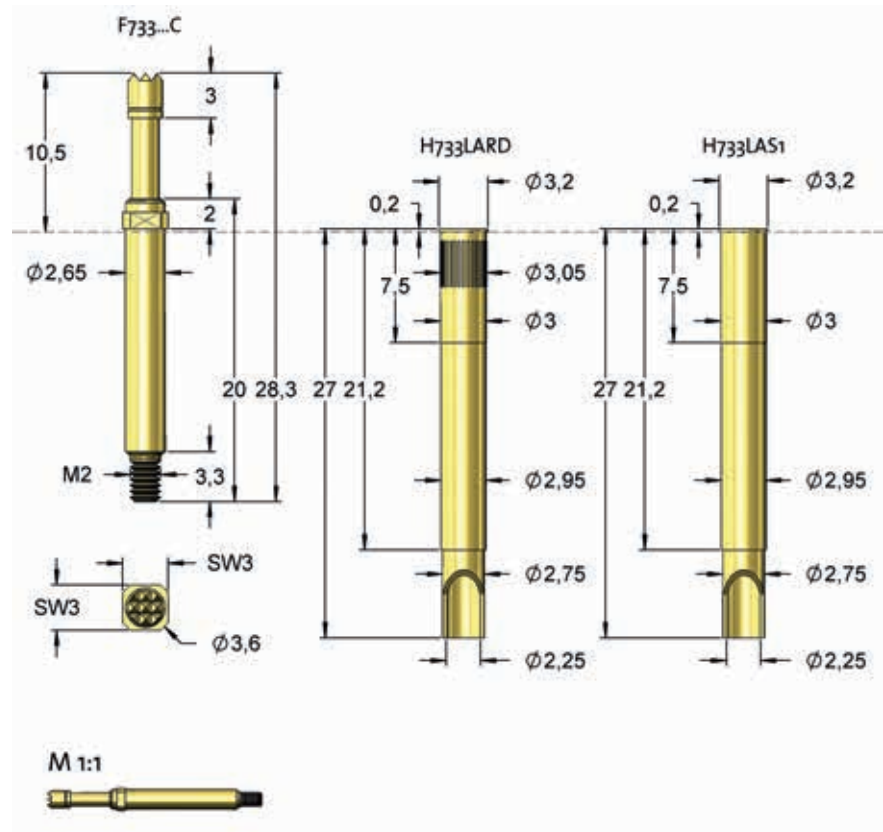
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-774E0 |
| Screw-in tool probe       | FWZ733 (T) |

#### Drill Size [mm]

|                          |             |
|--------------------------|-------------|
| Receptacle without knurl | 2,98 - 2,99 |
| Receptacle with knurl    | 3,00 - 3,02 |

#### Projection Height

|         |      |
|---------|------|
| H733... | 10,5 |
|---------|------|



| Type                   | Tip-Ø   | Spring Force |
|------------------------|---|--------------|
| F 733 06 B 300 G 150 C |   |              |
| Tip Style              | Material  | Finish       |
| Material:              | B = BeCu, A = AgNi (Silver alloy)                       |              |
| Tip-Ø:                 | 300 = 3,0 mm (e.g.)                                     |              |
| Finish:                | G = Gold, U = Unplated                                  |              |
| Special Version:       | C = High Current Version, E12 = Projection Height 12 mm |              |
| Receptacle:            | Order Code according drawing                            |              |

ORDER EXAMPLE

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 05     | A        | U       | 3,0     | C       |
|           | 06     | B        | G       | 2,3     | C       |
|           | 06     | B        | G       | 3,0     | C       |
|           | 06     | B        | G       | 4,0     | C       |
|           | 07     | B        | G       | 3,0     | C       |
|           | 11     | B        | G       | 1,4     | C       |
|           | 12     | A        | U       | 3,0     | C       |
|           | 12     | B        | G       | 2,3     | C       |
|           | 16     | B        | G       | 1,0     | C       |
|           | 17     | B        | G       | 2,3     | C       |

# High Current Probes

## High Current Probe 197 mil Plug-in

### F775C

|                  |                |
|------------------|----------------|
| Centers (mm/mil) | 5,00 / 197     |
| Current          | 50,0 A         |
| Temperature      | -40°C...+250°C |
| R typically      | <5 mOhm        |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 150     | 300           |
| 150     | 500           |

#### Travel (mm)

| Nominal           | Maximum |
|-------------------|---------|
| 4,4               | 5,5     |
| Pointing Accuracy | ±0,1 mm |

#### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Stainless steel, unplated |
| Receptacle | Brass, Gold plated        |

#### Accessories

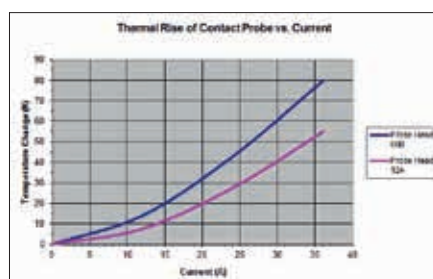
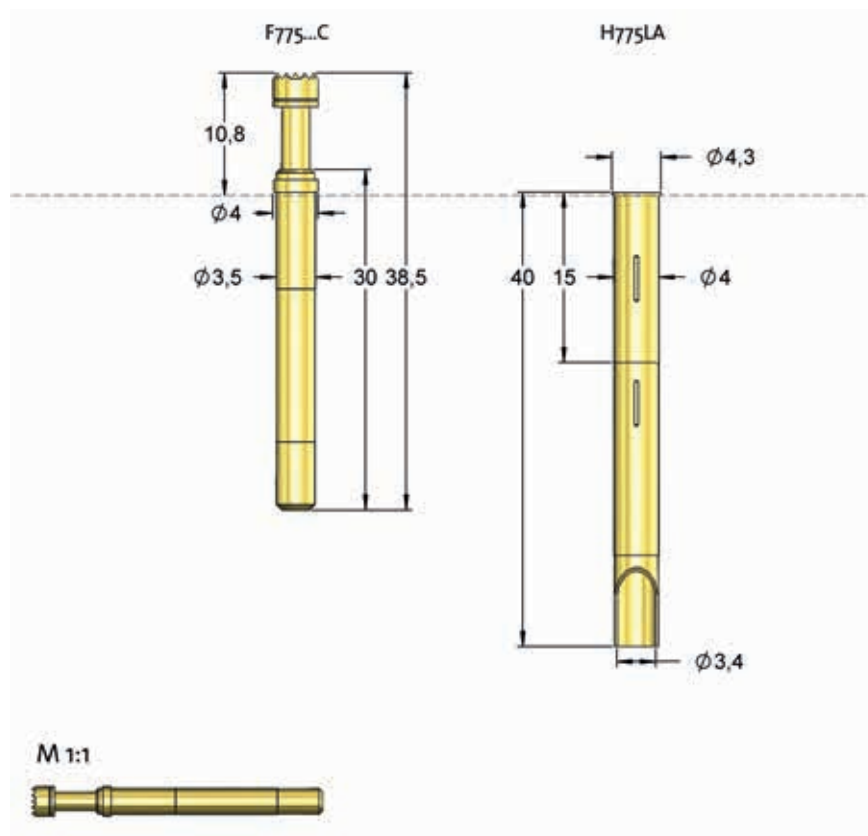
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-735E0 |
|---------------------------|------------|

#### Drill Size [mm]

|        |             |
|--------|-------------|
| H775LA | 3,98 - 3,99 |
|--------|-------------|

#### Projection Height

|         |      |
|---------|------|
| H775... | 10,8 |
|---------|------|



| Type                   | Tip-Ø                             | Spring Force |
|------------------------|-----------------------------------|--------------|
| F 775 06 B 400 G 300 C |                                   |              |
| Tip Style              | Material                          | Finish       |
| Material:              | B = BeCu, A = AgNi (Silver alloy) |              |
| Tip-Ø:                 | 400 = 4,0 mm (e.g.)               |              |
| Finish:                | G = Gold, U = Unplated            |              |
| Special Version:       | C = High Current Version          |              |
| Receptacle:            | Order Code according drawing      |              |
| ORDER EXAMPLE          |                                   |              |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 05     | B        | G       | 4,0     | C       |
|           | 06     | B        | G       | 4,0     | C       |
|           | 07     | B        | G       | 3,0     | C       |
|           | 17     | B        | G       | 4,0     | C       |

# High Current Probes



## High Current Probe 197 mil Threaded

### F735C

|                         |                |
|-------------------------|----------------|
| <b>Centers (mm/mil)</b> | 5,00 / 197     |
| <b>Current</b>          | 50,0 A         |
| <b>Temperature</b>      | -40°C...+250°C |
| <b>R typically</b>      | <5 mOhm        |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 150     | 300           |
| 150     | 500           |

#### Travel (mm)

| Nominal           | Maximum |
|-------------------|---------|
| 4,4               | 5,5     |
| Thread (M)        | 3,0     |
| Wrench Size       | 3,5     |
| Pointing Accuracy | ±0,1 mm |

#### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Stainless steel, unplated |
| Receptacle | Brass, Gold plated        |

#### Accessories

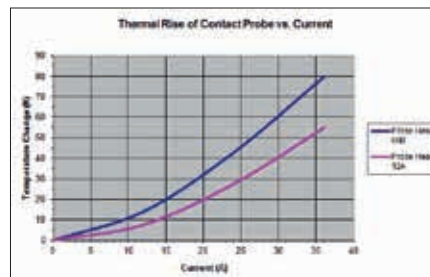
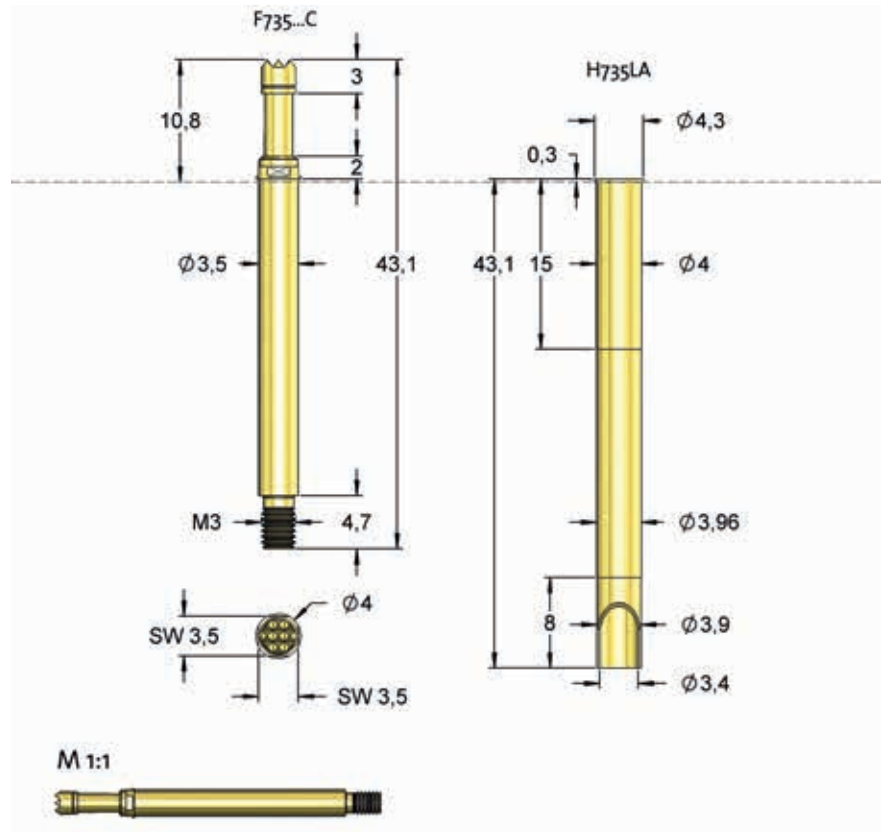
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-735E0 |
| Screw-in tool probe       | FWZ735 (T) |

#### Drill Size [mm]

|         |             |
|---------|-------------|
| H735... | 3,98 - 3,99 |
|---------|-------------|

#### Projection Height

|         |      |
|---------|------|
| H735... | 10,8 |
|---------|------|



| Type                   | Tip-Ø                        | Spring Force |
|------------------------|------------------------------|--------------|
| F 735 06 B 400 G 300 C |                              |              |
| Tip Style              | Material                     | Finish       |
| Material:              | B = BeCu                     |              |
| Tip-Ø:                 | 400 = 4,0 mm (e.g.)          |              |
| Finish:                | G = Gold                     |              |
| Special Version:       | C = High Current Version     |              |
| Receptacle:            | Order Code according drawing |              |
| ORDER EXAMPLE          |                              |              |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 06     | B        | G       | 3,0     | C       |
|           | 06     | B        | G       | 4,0     | C       |
|           | 17     | B        | G       | 4,0     | C       |



## High Current Probe for Contacting Blades

# F762C

NEU

|                         |                |
|-------------------------|----------------|
| <b>Centers (mm/mil)</b> | 4,00 / 157     |
| <b>Current</b>          | 40,0 A         |
| <b>Temperature</b>      | -40°C...+250°C |
| <b>R typically</b>      | <5 mOhm        |

**Spring Force (cN  $\pm 20\%$ )**

| Preload | Nominal Force |
|---------|---------------|
| 70      | 300           |

## Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 4,0               | 5,0      |
| Thread (M)        | 2,5      |
| Wrench Size       | 2,6      |
| Pointing Accuracy | ±0,05 mm |

## Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Stainless steel, unplated |
| Receptable | Brass, Gold plated        |

## Accessories

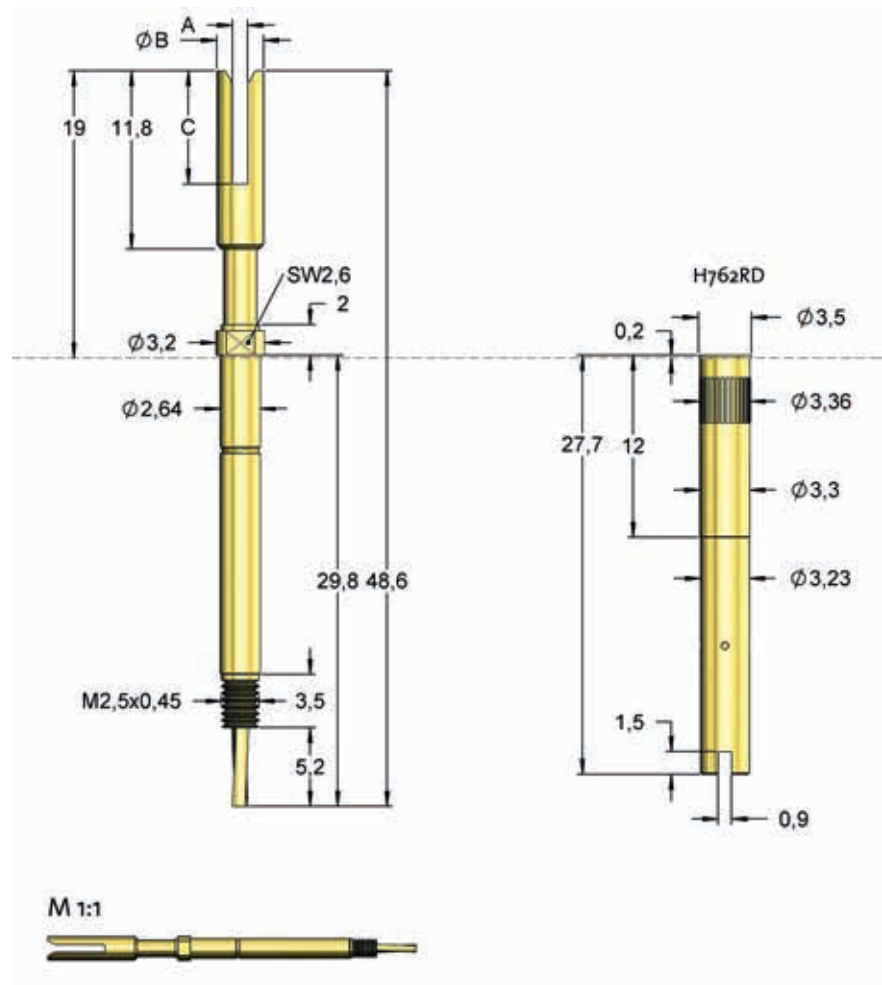
|                           |                  |
|---------------------------|------------------|
| Alignment tool receptacle | FAWZ761          |
| Screw-in tool probe       | FWZ885S1<br>(T1) |

## Drill Size [mm]

|        |             |
|--------|-------------|
| H762RD | 3,30 - 3,35 |
|--------|-------------|

### Projection Height

|         |      |
|---------|------|
| H762... | 19,0 |
|---------|------|



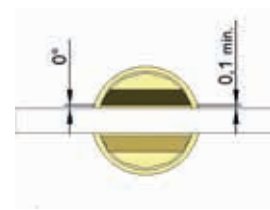
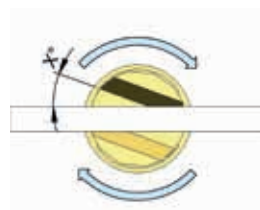
Due to the twist proof design the slotted plunger is moved over the test item well aligned. The compression of the plunger leads to a twist movement up to 20°. This leads to a low contact resistance without damaging or scratching the test item. Higher currents can be realized by using several probes in parallel.

### Functional principle

Due to the twist proof design the plunger is always brought to the test item well aligned. Once the plunger is compressed by contacting the blade connector, it is twisted up to a maximum of 20°. This results in a good electrical contact without damaging or scratching the tested item.

**Important:**

The probe needs to be moved axially to the blade connector. A chamfer at the contact probe enables an optimum guiding.





## High Current Probe for Contacting Blades

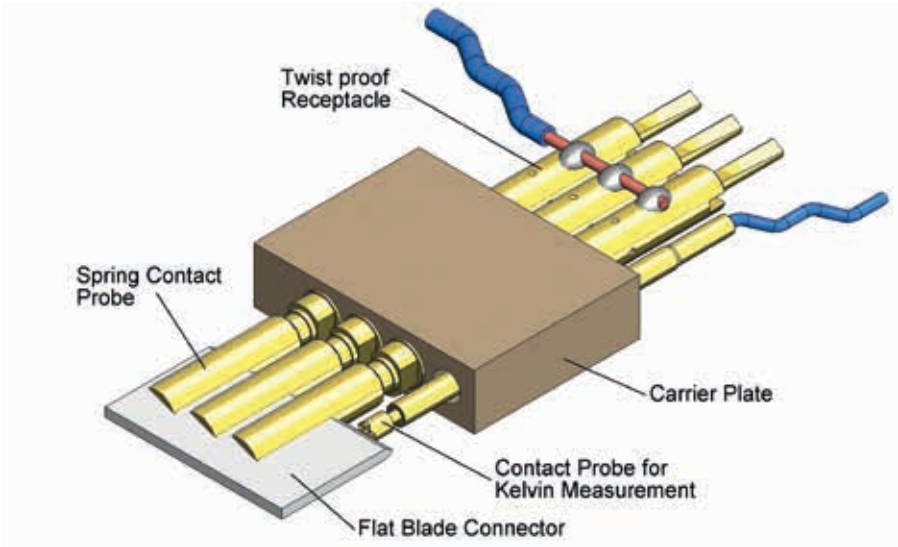
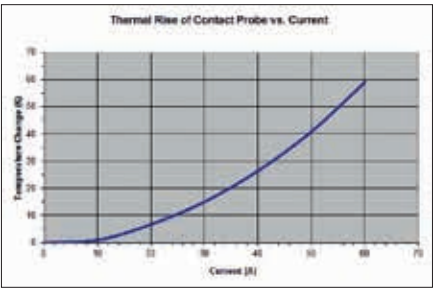
### F762C

NEU

|                  |                |
|------------------|----------------|
| Centers (mm/mil) | 4,00 / 157     |
| Current          | 40,0 A         |
| Temperature      | -40°C...+250°C |
| R typically      | <5 mOhm        |

#### Application note

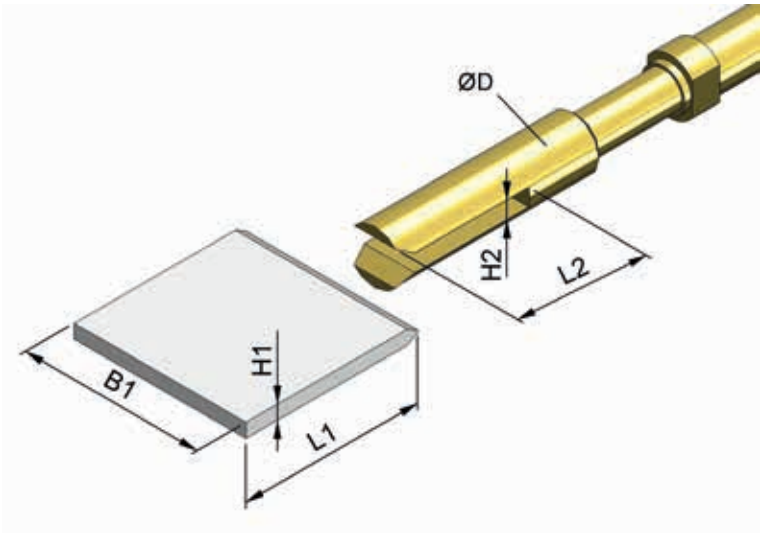
Higher currents can be realized by using several probes in parallel, e.g. 120 A in this example. In applications with Kelvin tests a normal spring contact probe can be used for the voltage (sense signal).



| Type             | number                       | Spring Force           |
|------------------|------------------------------|------------------------|
| F 762            | 89                           | B 0001 G 300 C         |
| Tip Style        | Material                     | Finish Special Version |
| Material:        | B = BeCu                     |                        |
| number:          | see table                    |                        |
| Finish:          | G = Gold                     |                        |
| Special Version: | C = High Current Version     |                        |
| Receptacle:      | Order Code according drawing |                        |

At the Order Code of coaxial versions you will find a number instead of the coded tip-Ø. This number shows in the table the belonging spade diamensions.

ORDER EXAMPLE



| Suitable for blades |           |          | Spring Contact Probe |         |         |         |                    |
|---------------------|-----------|----------|----------------------|---------|---------|---------|--------------------|
| B1 [mm]             | H1 [mm]   | L1 [mm]  | Order Code           | ØD [mm] | H2 [mm] | L2 [mm] | Screw-In-Tool      |
| min. 3,2            | 0,5 - 0,8 | min. 8,0 | F76289B0001G300C     | 3,1     | 1,0     | 7,5     | FWZ885S1; FWZ885T1 |
| min. 3,2            | 1,0 - 1,3 | min. 8,0 | F76289B0002G300C     | 3,1     | 1,5     | 7,5     | FWZ885S1; FWZ885T1 |
| min. 3,2            | 1,0 - 1,3 | min. 4,5 | F76289B0003G300C     | 3,1     | 1,5     | 4,0     | FWZ885S1; FWZ885T1 |
| min. 4,2            | 1,5 - 1,8 | min. 8,0 | F76289B0004G300C     | 4,0     | 2,0     | 7,5     | FWZ760S1; FWZ760T1 |

# High Current Probes

## High Current Test Head up to 50 A

### 1860C001

|                         |                |
|-------------------------|----------------|
| <b>Centers (mm/mil)</b> | 12,0 / 472     |
| <b>Current</b>          | 50,0 A         |
| <b>Temperature</b>      | -40°C...+250°C |
| <b>R typically</b>      | <4 mOhm        |

#### Spring Force (cN ±20%)

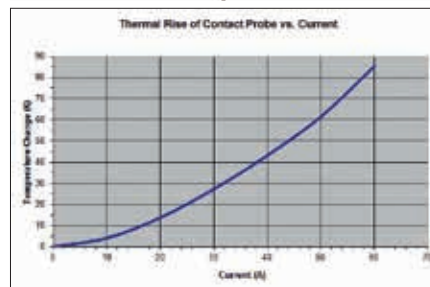
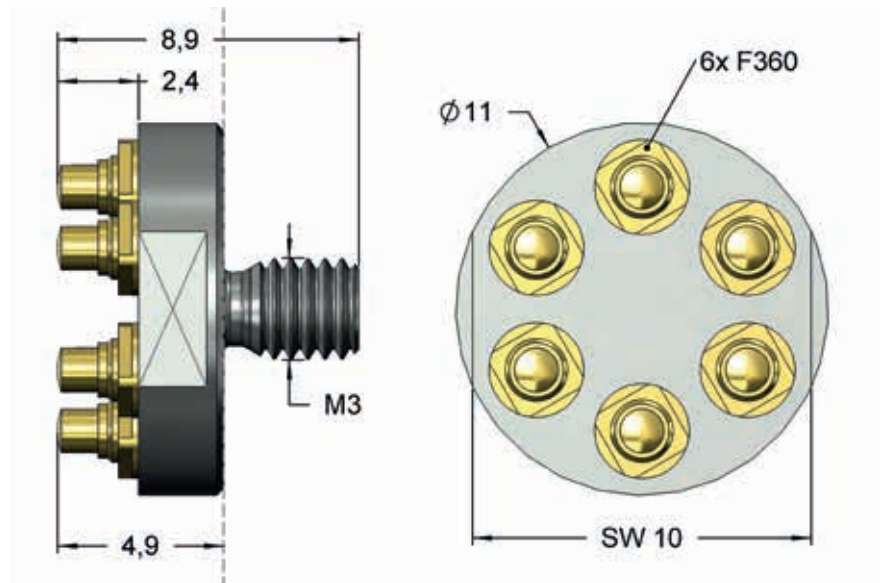
| Preload | Nominal Force |
|---------|---------------|
| 300     | 480           |

#### Travel (mm)

| Nominal     | Maximum |
|-------------|---------|
| 1,0         | 1,2     |
| Thread (M)  | 3,0     |
| Wrench Size | 10,0    |

#### Materials and Plating

|         |                           |
|---------|---------------------------|
| Plunger | see Tip Style             |
| Barrel  | Brass, gold plated        |
| Spring  | Stainless steel, unplated |



Test head with 6 probes of type F360, head diameter 11,0 mm.

## High Current Test Head up to 75 A

### 1860C006

|                         |                |
|-------------------------|----------------|
| <b>Centers (mm/mil)</b> | 12,0 / 472     |
| <b>Current</b>          | 75,0 A         |
| <b>Temperature</b>      | -40°C...+250°C |
| <b>R typically</b>      | <2 mOhm        |

#### Spring Force (cN ±20%)

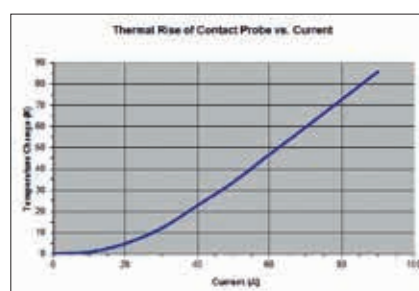
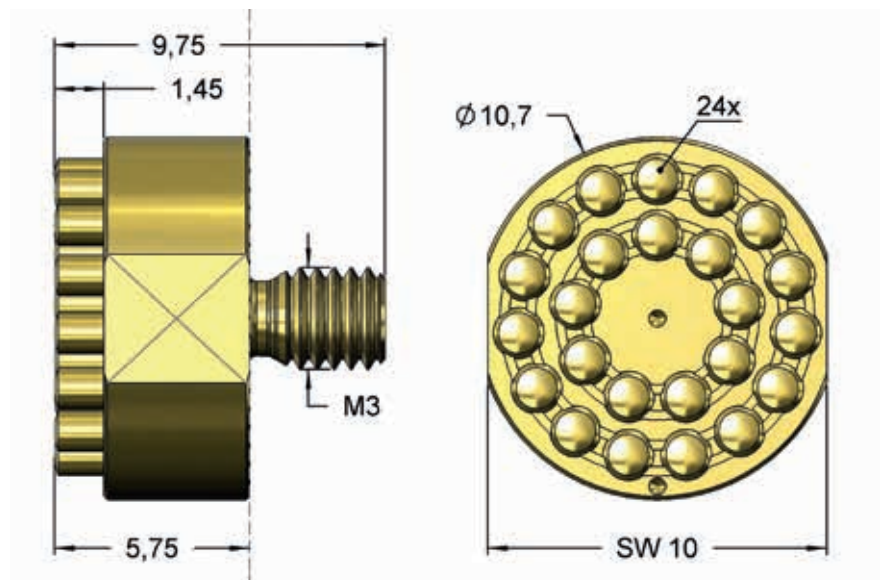
| Preload | Nominal Force |
|---------|---------------|
| 960     | 1920          |

#### Travel (mm)

| Nominal     | Maximum |
|-------------|---------|
| 0,9         | 1,2     |
| Thread (M)  | 3,0     |
| Wrench Size | 10,0    |

#### Materials and Plating

|         |                           |
|---------|---------------------------|
| Plunger | see Tip Style             |
| Barrel  | Copper, gold plated       |
| Spring  | Stainless steel, unplated |



Due to the integrated spring loaded plungers, this block offers a low resistance contact even if the contact surface is uneven or inclined. The maximum current depends on the allowed temperature.

# High Current Probes



## High Current Probe up to 50 A

### 1860C005

NEU

|                  |                |
|------------------|----------------|
| Centers (mm/mil) | 11,0 / 433     |
| Current          | 50,0 A         |
| Temperature      | -40°C...+250°C |
| R typically      | <6 mOhm        |

#### Spring Force (cN ±20%)

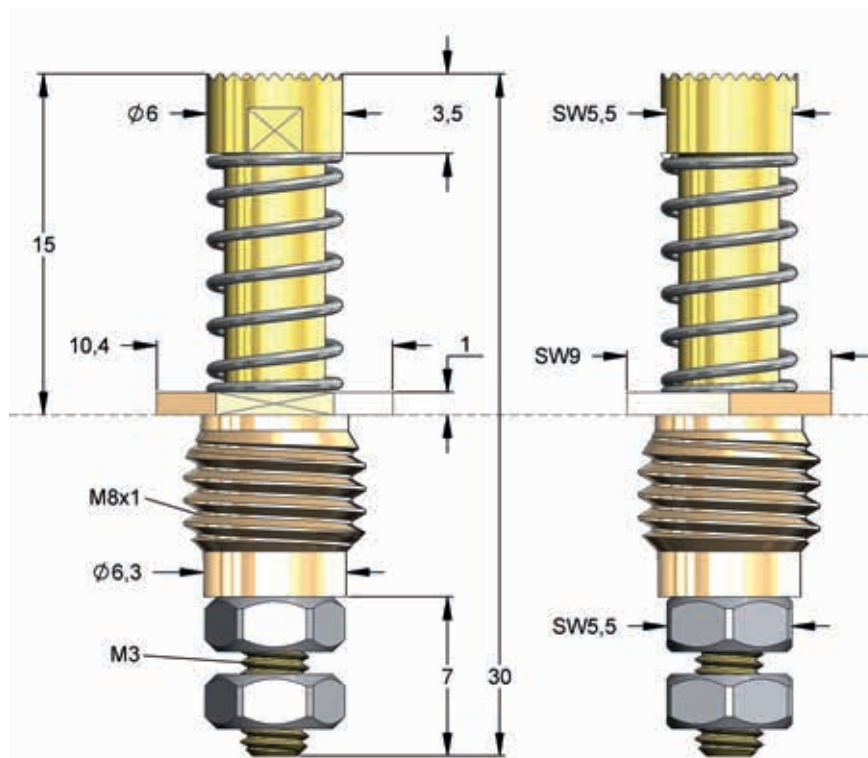
| Preload | Nominal Force |
|---------|---------------|
| 200     | 530           |

#### Travel (mm)

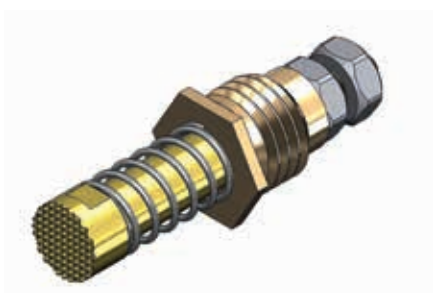
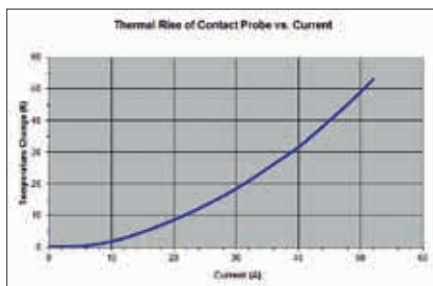
| Nominal           | Maximum |
|-------------------|---------|
| 5,0               | 7,0     |
| Thread (M)        | 3,0     |
| Wrench Size       | 9,0     |
| Pointing Accuracy | ±0,1 mm |

#### Materials and Plating

|         |                           |
|---------|---------------------------|
| Plunger | see Tip Style             |
| Barrel  | Brass, unplated           |
| Spring  | Stainless steel, unplated |



Robust designed high current probe with continuous plunger.



| Tip Style   | Number | Material | Plating | Ø in mm | Version |
|---|--------|----------|---------|---------|---------|
|  | 06     | B        | G       | 6,0     | C       |



# High Current Probes

## High Current Kelvin Probe up to 60 A

**1860C007**

**NEU**

|                                |                |
|--------------------------------|----------------|
| Centers (mm/mil)               | 14,0 / 551     |
| Temperature                    | -40°C...+250°C |
| Current (Circular)             | 60,0 A         |
| Current (Internal)             | 5,0 A          |
| Resistance (internal/circular) | <3/20 mOhm     |

### Spring Force Total (cN ±20%)

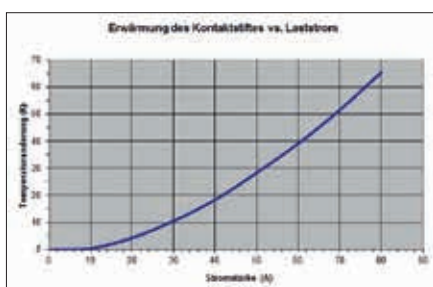
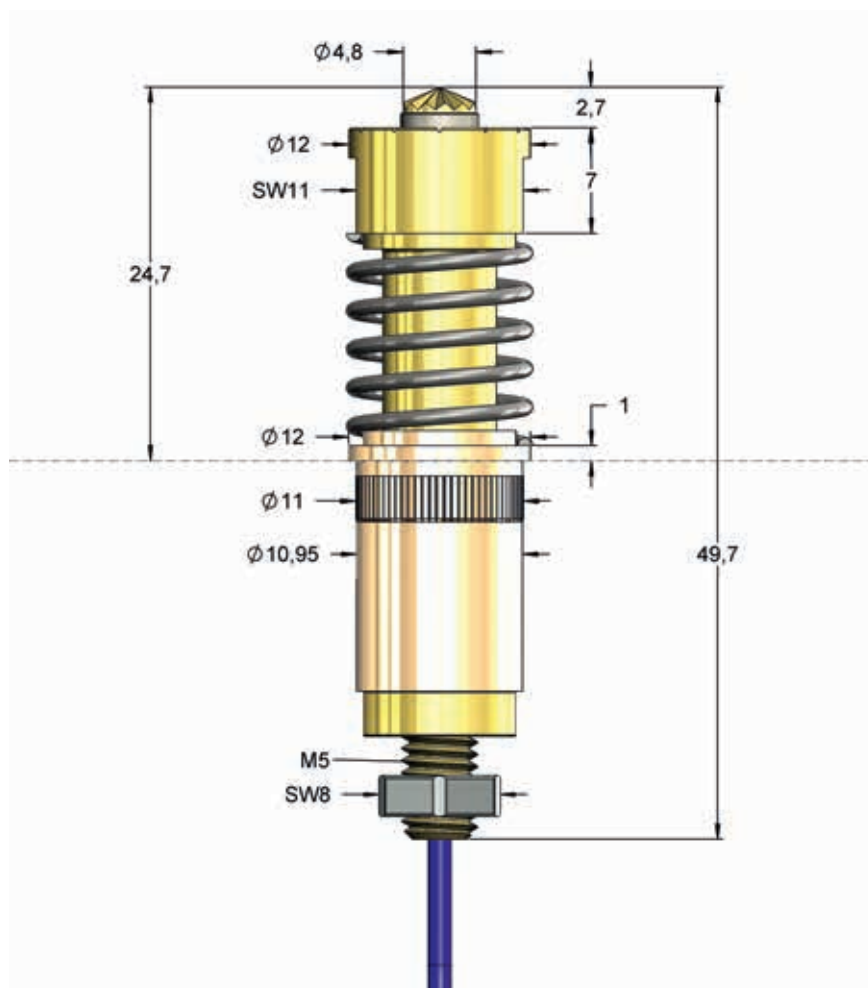
|                  | Preload | Nominal Force |
|------------------|---------|---------------|
| total            | -       | 3100          |
| Internal Contact | 160     | 300           |
| Circular Contact | 1900    | 2800          |

### Travel (mm)

|                  | Nominal | Maximum |
|------------------|---------|---------|
| Internal Contact | 1,5     | 3,0     |
| Circular Contact | 5,0     | 8,0     |
| Wrench Size      | 10,0    |         |
| Thread           | 5,0     |         |

### Materials and Plating

|                         |                           |
|-------------------------|---------------------------|
| Internal Contact        | BeCu, gold plated         |
| Circular Contact        | Brass, gold plated        |
| Barrel                  | Brass, unplated           |
| Spring Internal Contact | unplated, Stainless steel |
| Spring Circular Contact | Stainless steel, unplated |



| Tip Style   | Number | Material | Plating | Ø in mm | Version |
|---|--------|----------|---------|---------|---------|
|  | 07     | B        | G       | 4,8     | C       |

# High Current Probes



## High Current Kelvin Probe up to 150 A

1860C004

|                                |                |
|--------------------------------|----------------|
| Centers (mm/mil)               | 25,0 / 984     |
| Temperature                    | -40°C...+250°C |
| Current (Circular)             | 150 A          |
| Current (Internal)             | 5,0 A          |
| Resistance (internal/circular) | <1/20 mOhm     |

### Spring Force Total (cN ±20%)

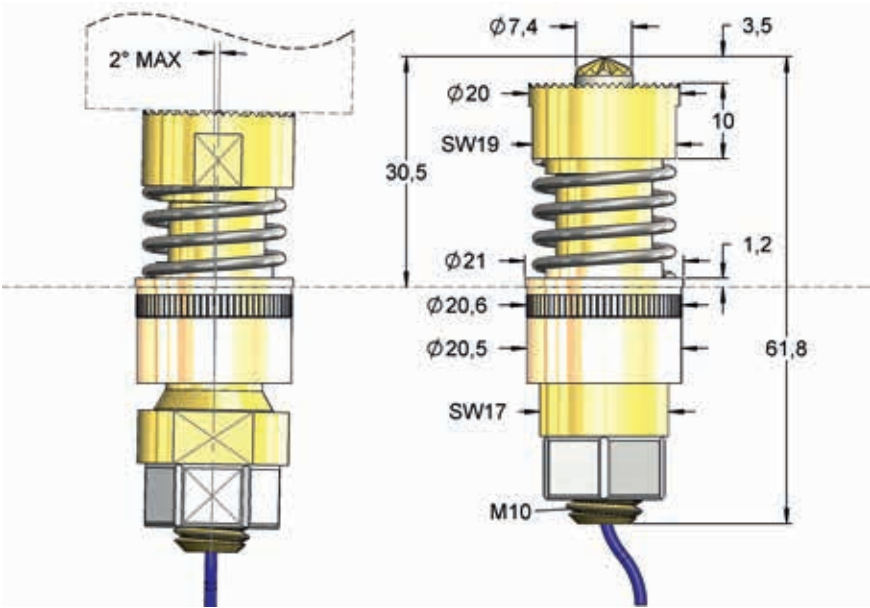
|                  | Preload | Nominal Force |
|------------------|---------|---------------|
| total            | -       | 3150          |
| Internal Contact | 130     | 300           |
| Circular Contact | 1000    | 2850          |


### Travel (mm)

|                  | Nominal | Maximum |
|------------------|---------|---------|
| Internal Contact | 2,8     | 3,5     |
| Circular Contact | 5,6     | 7,0     |
| Wrench Size      | 19      |         |
| Thread           | 10      |         |

### Materials and Plating

|                         |                           |
|-------------------------|---------------------------|
| Internal Contact        | BeCu, gold plated         |
| Circular Contact        | Brass, gold plated        |
| Barrel                  | Brass, unplated           |
| Spring Internal Contact | unplated, Stainless steel |
| Spring Circular Contact | Stainless steel, unplated |



| Tip Style   | Number | Material | Plating | Ø in mm | Version |
|---|--------|----------|---------|---------|---------|
|  | 07     | B        | G       | 7,4     | C       |



## High Current Probes

For high current applications the design of a spring contact probe has to consider a minimal electrical internal probe resistance as well as contact resistance. Otherwise, especially the spring of the probe would be overheated, what would lead to a remarkable reduction of the probe life time. A low electrical resistance of the probe significantly depends of the design and the material of the contact probe.

The maximum continuous current is defined as  $I_{RMS}$  (root-mean-square value). It is mainly limited by the maximum tolerable warming of the probe. The maximum current values in the specifications all refer to this  $I_{RMS}$ .

The design of springs of FEINMETALL high current probes ensures that also high temperatures up to 250°C do not lead to damages or a reduction in lifetime.

FEINMETALL manufactures different versions of high current probes.



### High current probes with continuous plunger

have the lowest resistance and therefore allow a high current loading. If the electrical connection is assembled at the end of the continuous plunger, the cable moves synchronously with the plunger, so that those contact probes always have to be furnished with flexible cables.

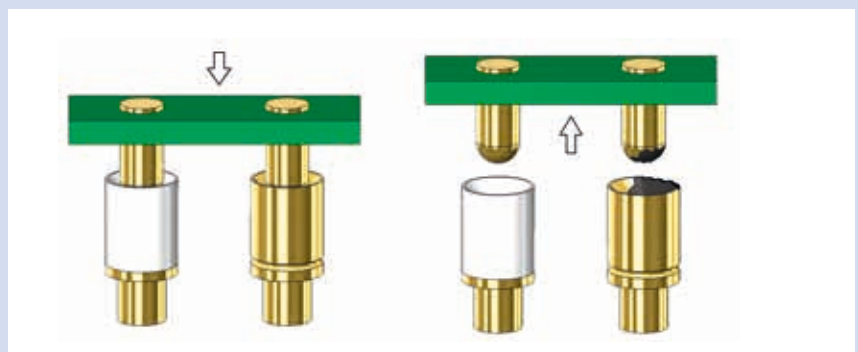
### High current probes with split plungers

are designed that way, that under force effect the plunger elements optimally establish a low-resistance connection to the barrel of the contact probe. As a consequence, the current flows mainly through plunger and barrel without stressing the spring strongly.

### Special head made of silver alloy

In high current applications ideally no voltage should apply and accordingly no current should flow during closing or releasing the contact. Otherwise, an electric spark may occur, which may damage the surface of the contact area.

To avoid or at least minimise such a contact-burn-off, FEINMETALL offers tips made of a special silver alloy to minimise the contact-burn-off, reducing the transition resistance and lead to a longer life time of the probes.



#### Application Note:

For an easy identification, FEINMETALL high current probes have a groove at the probe head. This groove makes sure that these probes can be distinguished from standard probes with identical dimensions.



## Switch Probes

Special probes with integrated switch element are mainly used for presence tests. Switch probes close or open an electric circuit after a defined travel of the plunger (switch travel).

|                  |     |
|------------------|-----|
| F865 (NC)        | 123 |
| F879 (NC)        | 124 |
| F878 (NC)        | 125 |
| F877 (NC)        | 126 |
| F876 (NC)        | 127 |
| H875 Receptacles | 128 |
| F873 (NC)        | 129 |
| F875 (NO)        | 130 |
| F375 (NO)        | 131 |
| F884 (NO)        | 132 |
| F880 (NO)        | 133 |
| F881 (NO)        | 134 |
| F885 (NO)        | 135 |
| F886 (NO)        | 136 |
| F883 (NC)        | 137 |
| F385 (NO)        | 138 |
| H885 Receptacles | 139 |
| F867 (NO)        | 140 |
| F866 (NO)        | 141 |
| F887 (NO)        | 142 |
| F419 (NC)        | 143 |
| F888 (NO)        | 144 |
| F899 (NO)        | 148 |

## Presence Test with Switch Probes

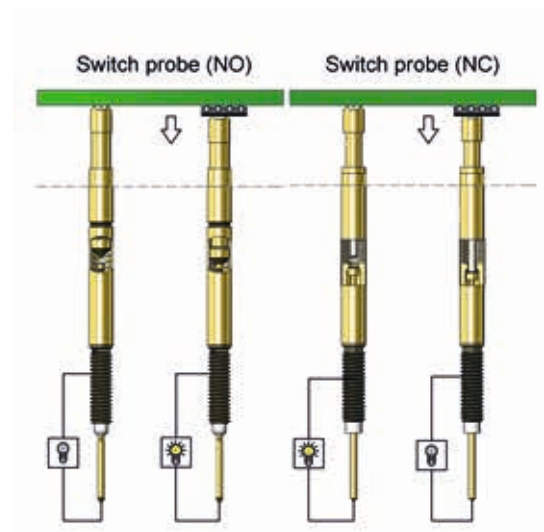
Switch Probes are contact elements, which close an electric circuit after a defined switch travel (NO - normally open) or open it (NC - normally closed). This condition persists beyond the switching point. FEINMETALL offers special combi-receptacles for the solderless exchange of switch probes (see below).

### Typical Applications:

- presence test of components or connectors
- voltage-free detection with synthetic heads
- short-circuit-proof modules by electrically isolated switch elements (voltage-free system)
- installation of intrinsically safe circuits (only with NC-versions, e.g. F873, F883)

### Versions of Switch Probes:

- openers (NC) and closers (NO)
- different switch travels
- short version for a gentle lateral contacting by ball element (F888)
- short and long versions of a series for different projection heights
- long travel versions for depth determination (F375 and F385)

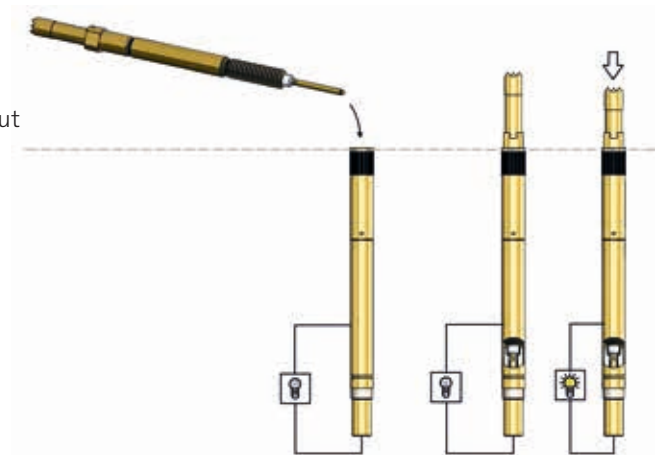


## Solder less replacement of Switch Probes / Kelvin Probes

Combi receptacles allow a quick and solder less replacement of switch probes or kelvin probes (plug-in and threaded versions) without disassembly of the module or fixture. Secure connections of both signal circuits (inner and outer conductor) are realised by contact elements within the receptacle.

### Advantages of the combi receptacle

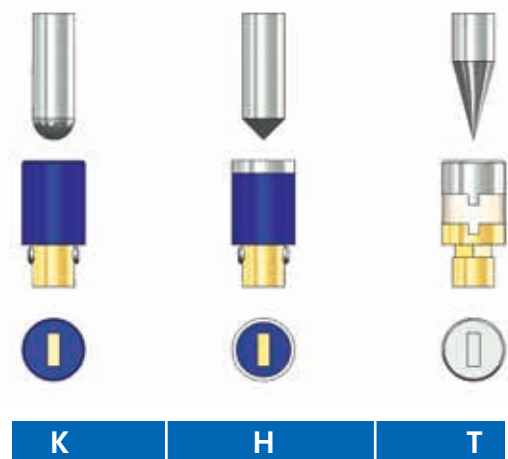
- solder less replacement of switch probes and kelvin probes
- prevention of incorrect wirings in case of maintenance
- Saving of time and assembly expenses in case of maintenance
- Height adjustability of switch probes by the probe thread and pressure marks at the receptacle
- High frequency capabilities in combination with coaxial kelvin probes



## Insulated tips for Switch Probes

There are three different versions of insulated test heads available (e.g. for Switch Probe Series F886).

- Version K made of synthetic material is the standard tip style for insulated contacting
- Version H is reinforced additionally by a brass ring, which allows higher stress on the synthetic head.
- Version T has a metall head, which is insulated versus the plunger and therefore is suitable for applications with higher mechanical exposure. The special design avoids any electrical contact between tip and barrel, even at maximum travel. The tip of this version is silver-coloured for better identification of the assembled probe.



## F865

NEW

**Spring Force (cN  $\pm 20\%$ )**

Travel (mm)

## Materials and Plating

## Accessories





Drill Size [mm]

### Projection Height

Technical drawing of a 1000 mm long, 16 mm diameter yellow metal rod. The drawing includes a side view with dimensions (16.3, 11.3, 2.5, 11.3, 38.2, 4.3, 29.6, 22.1) and diameters (φ1, φ0.88, φ2, M1,6x0,2, φ1,37, φ0,45, φ2, φ1,8, φ1,76, φ1,7, φ1,3). It also shows a cross-section view with SW1,4 and a scale bar M 1:1.

Plug-in version available on request.

| Type          | Tip-Ø                        |        | Spring Force    |       |
|---------------|------------------------------|--------|-----------------|-------|
| F 865         | 06                           | B      | 100             | G 200 |
| Tip Style     | Material                     | Finish | Special Version |       |
| Material:     | B = BeCu                     |        |                 |       |
| Tip-Ø:        | 100 = 1,0 mm (e.g.)          |        |                 |       |
| Finish:       | G = Gold                     |        |                 |       |
| Receptacle:   | Order Code according drawing |        |                 |       |
| ORDER EXAMPLE |                              |        |                 |       |

| Tip Style   | Number | Material | Plating | Ø in mm | Version |
|---|--------|----------|---------|---------|---------|
|  | 06     | B        | G       | 1,0     | -       |
|  | 06     | B        | G       | 1,3     | -       |
|  | 11     | B        | G       | 0,65    | -       |
|  | 17     | B        | G       | 1,00    | -       |

Short Switch Probe 100 mil  
Closer (NO)

F879 NEW

|                  |               |
|------------------|---------------|
| Centers (mm/mil) | 2,54 / 100    |
| Current          | 3,0 A         |
| Current (Switch) | 1,0 A         |
| Temperature      | -20°C...+80°C |
| R typically      | 65 mOhm       |

Spring Force (cN ±20%)

|         |               |
|---------|---------------|
| Preload | Nominal Force |
| 50      | 200           |

Travel (mm)

|                    |          |
|--------------------|----------|
| Nominal            | Maximum  |
| 4,0                | 5,0      |
| Switch Travel (mm) | 2,6      |
| Thread (M)         | 2,0x0,25 |
| Wrench Size        | 1,7      |
| Pointing Accuracy  | ±0,08 mm |

Materials and Plating

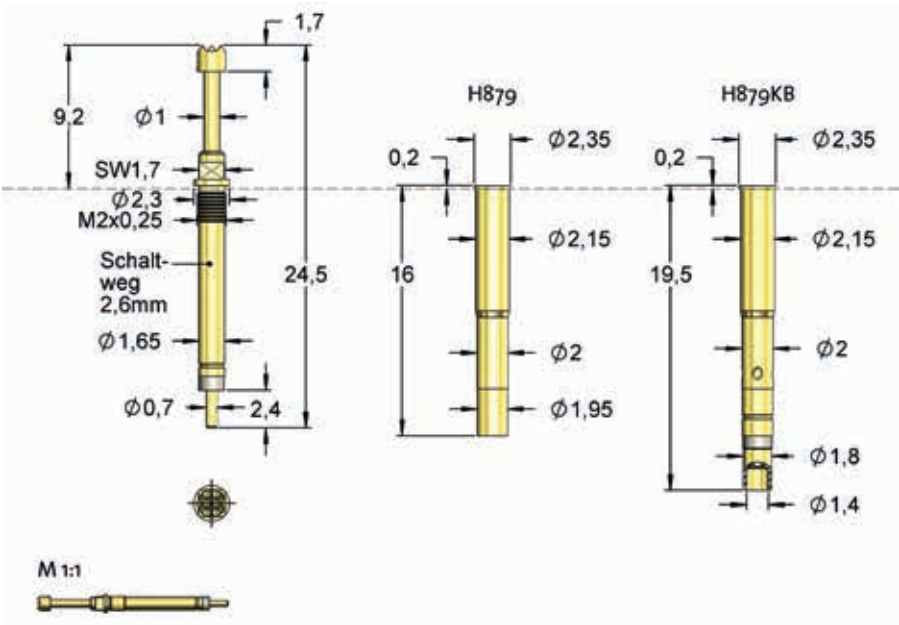
|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Music wire, silver plated |
| Receptable | Brass, Gold plated        |

Accessories

|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-772E0 |
| Screw-in tool probe       | FWZ732 (T) |

Projection Height

|         |     |
|---------|-----|
| H879... | 9,2 |
|---------|-----|



| Type                 | Tip-Ø  | Spring Force           |
|----------------------|--|------------------------|
| F 879 06 B 180 G 200 |  |                        |
| Tip Style            | Material   | Finish Special Version |
| Material:            | B = BeCu, K = Syntetic, T = isolated BeCu-Head nickel plated |                        |
| Tip-Ø:               | 180 = 1,8 mm (e.g.)  |                        |
| Finish:              | G = Gold, N = Nickel, U = Unplated                           |                        |
| Receptacle:          | Order Code according drawing                                 |                        |
| ORDER EXAMPLE        |  |                        |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 06     | B        | G       | 1,8     | -       |
|           | 11     | B        | G       | 1,0     | -       |
|           | 16     | B        | G       | 1,0     | -       |
|           | 17     | B        | G       | 1,8     | -       |
|           | 17     | T        | N       | 2,0     | -       |

# Switch Probes



## Plug-in Switch Probe 100 mil Closer (NO)

**F878**

**NEW**

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 2,54 / 100    |
| <b>Current</b>          | 3,0 A         |
| <b>Current (Switch)</b> | 1,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 20 mOhm       |

### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 20      | 80            |
| 40      | 150           |
| 110     | 300           |

### Travel (mm)

| Nominal            | Maximum  |
|--------------------|----------|
| 4,0                | 5,3      |
| Switch Travel (mm) | 2,6      |
| Pointing Accuracy  | ±0,08 mm |

### Materials and Plating

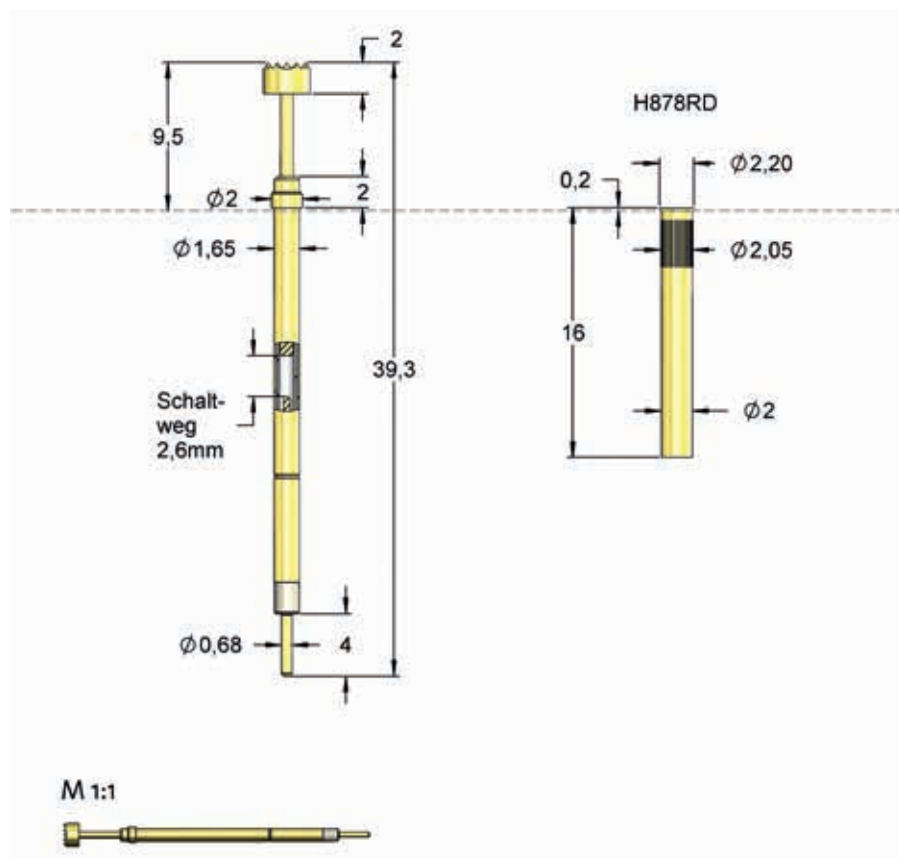
|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Music wire, silver plated |
| Receptacle | Brass, Gold plated        |

### Accessories

|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-772E0 |
| Insertion tool probe      | FDWZ-100   |

### Projection Height

|        |     |
|--------|-----|
| H878RD | 9,5 |
|--------|-----|



| Type           | Tip-Ø                                  | Spring Force           |
|----------------|--|------------------------|
| F 878 06       | B 150                                  | G 150 S26              |
| Tip Style      | Material                               | Finish Special Version |
| Material:      | B = BeCu                               |                        |
| Tip-Ø:         | 150 = 1,5 mm (e.g.)                    |                        |
| Finish:        | G = Gold                               |                        |
| Switch Travel: | S26 = 2,6 mm (deviating from standard) |                        |
| Receptacle:    | Order Code according drawing           |                        |

ORDER EXAMPLE

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 06     | B        | G       | 1,5     | S26     |
|           | 06     | B        | G       | 3,0     | S26     |
|           | 16     | B        | G       | 0,8     | S26     |
|           | 17     | B        | G       | 1,0     | S26     |



## Threaded Switch Probe 100 mil Closer (NO)

### F877

NEW

|                  |               |
|------------------|---------------|
| Centers (mm/mil) | 2,54 / 100    |
| Current          | 3,0 A         |
| Current (Switch) | 1,0 A         |
| Temperature      | -20°C...+80°C |
| R typically      | 20 mOhm       |

### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 20      | 80            |
| 40      | 150           |
| 110     | 300           |

### Travel (mm)

| Nominal            | Maximum  |
|--------------------|----------|
| 4,0                | 5,3      |
| Switch Travel (mm) | 2,6      |
| Thread (M)         | 2,0x0,25 |
| Wrench Size        | 1,7      |
| Pointing Accuracy  | ±0,08 mm |

### Materials and Plating

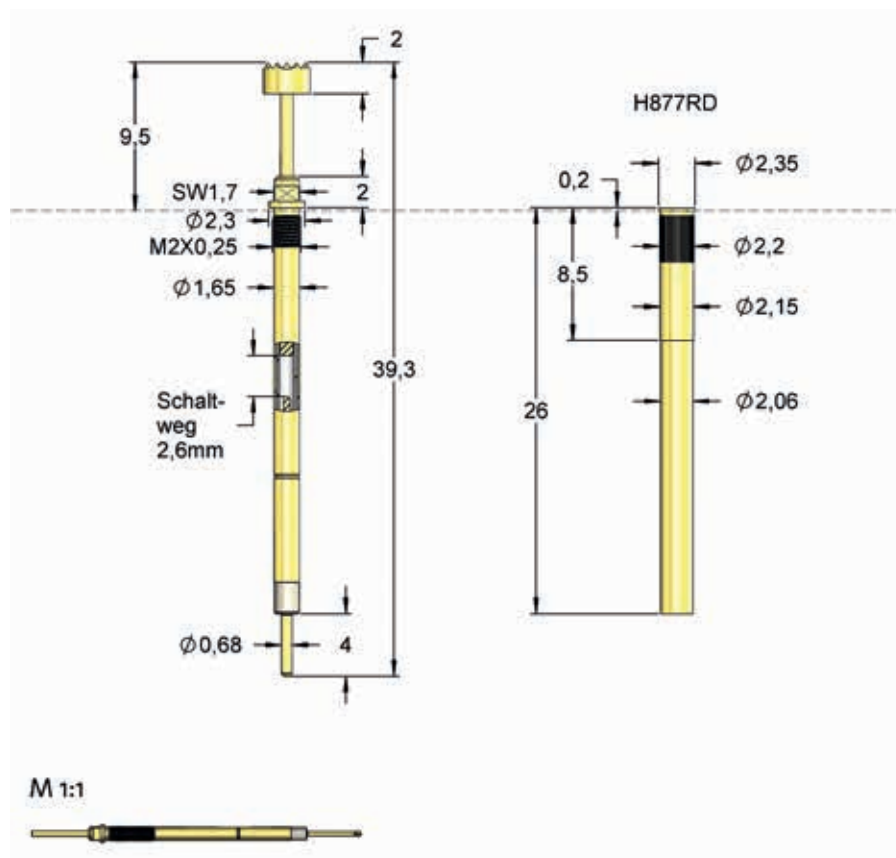
|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Music wire, silver plated |
| Receptacle | Brass, Gold plated        |

### Accessories

|                           |                                |
|---------------------------|--------------------------------|
| Insertion tool receptacle | FEWZ-772E0                     |
| Insertion tool probe      | FWZ732 (T)<br>max. Ø 2,0 mm    |
| Insertion tool probe      | FWZ732S1 (T1)<br>max. Ø 2,7 mm |

### Projection Height

|        |     |
|--------|-----|
| H877RD | 9,5 |
|--------|-----|



| Type                     | Tip-Ø                                  | Spring Force           |
|--------------------------|--|------------------------|
| F 877 06 B 150 G 150 S26 |  |                        |
| Tip Style                | Material                               | Finish Special Version |
| Material:                | B = BeCu                               |                        |
| Tip-Ø:                   | 150 = 1,5 mm (e.g.)                    |                        |
| Finish:                  | G = Gold                               |                        |
| Switch Travel:           | S26 = 2,6 mm (deviating from standard) |                        |
| Receptacle:              | Order Code according drawing           |                        |
| ORDER EXAMPLE            |  |                        |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 06     | B        | G       | 1,5     | S26     |
|           | 06     | B        | G       | 3,0     | S26     |
|           | 16     | B        | G       | 0,8     | S26     |
|           | 17     | B        | G       | 1,0     | S26     |

# Switch Probes



## Threaded Switch Probe 100 mil Closer (NO)

**F876**

**NEW**

|                  |               |
|------------------|---------------|
| Centers (mm/mil) | 2,54 / 100    |
| Current          | 3,0 A         |
| Current (Switch) | 1,0 A         |
| Temperature      | -20°C...+80°C |
| R typically      | 20 mOhm       |

### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 40      | 150           |

### Travel (mm)

| Nominal            | Maximum  |
|--------------------|----------|
| 4,0                | 5,3      |
| Switch Travel (mm) | 2,6      |
| Thread (M)         | 2,0x0,25 |
| Wrench Size        | 1,7      |
| Pointing Accuracy  | ±0,08 mm |

### Materials and Plating

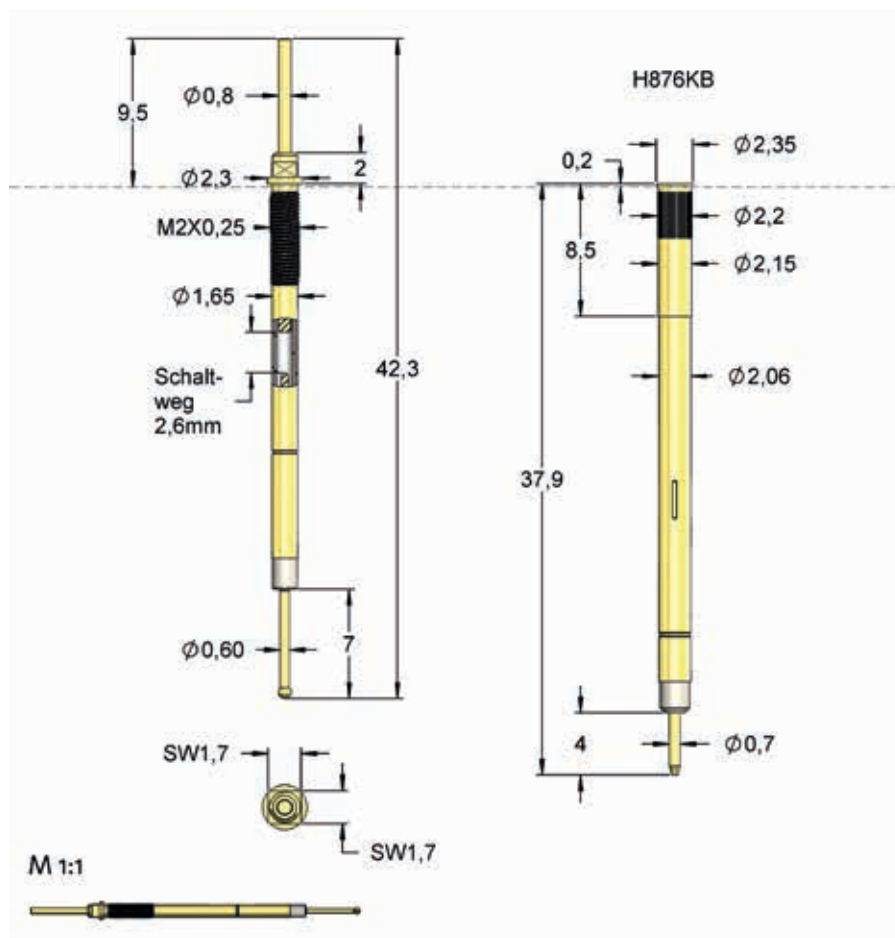
|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Music wire, silver plated |
| Receptacle | Brass, Gold plated        |

### Accessories

|                           |                                |
|---------------------------|--------------------------------|
| Insertion tool receptacle | FEWZ-772E0                     |
| Screw-in tool probe       | FWZ732 (T)<br>max. Ø 2,0 mm    |
| Screw-in tool probe       | FWZ732S1 (T1)<br>max. Ø 2,7 mm |

### Projection Height

|        |     |
|--------|-----|
| H876KB | 9,5 |
|--------|-----|



| Type                     | Tip-Ø                                  | Spring Force           |
|--------------------------|--|------------------------|
| F 876 06 B 150 G 150 S26 |  |                        |
| Tip Style                | Material                               | Finish Special Version |
| Material:                | B = BeCu                               |                        |
| Tip-Ø:                   | 150 = 1,5 mm (e.g.)                    |                        |
| Finish:                  | G = Gold                               |                        |
| Switch Travel:           | S26 = 2,6 mm (deviating from standard) |                        |
| Receptacle:              | Order Code according drawing           |                        |
| ORDER EXAMPLE            |  |                        |

| Tip Style | Number | Material | Plating | Ø in mm | Version   |
|-----------|--------|----------|---------|---------|-----------|
|           | 06     | B        | G       | 1,5     | S26 / S40 |
|           | 16     | B        | G       | 0,8     | S26 / S40 |
|           | 17     | B        | G       | 1,5     | S26 / S40 |
|           | 17     | K        | U       | 1,5     | S26 / S40 |

## Receptacles for Switch Probe Families F875, F873 und F375

### H875

#### Receptacle H875

This receptacle allows variable projection height:

F873: 10,4 – 15,4 mm      F875: 10,4 – 15,4 mm  
F375: 15,0 – 20,0 mm      F875 ... L: 16,9 – 21,9 mm

**Material:** Brass, Gold plated

#### Receptacle H875/5

The receptacle H875/5 has a 5mm collar for extended projection heights:

F873: 15,2 – 20,2 mm      F875: 15,2 – 20,2 mm  
F375: 19,8 – 24,8 mm      F875 ... L: 21,7 – 26,7 mm

**Material:** Brass, Gold plated

#### H875RD

The receptacle H875RD has the same dimensions as H875, but with knurling for proper seat.

F873: 10,4 – 15,4 mm      F875: 10,4 – 15,4 mm  
F375: 15,0 – 20,0 mm      F875 ... L: 16,9 – 21,9 mm

**Material:** Brass, Gold plated

#### Receptacle H875KB - for solderless exchange

By usage of the combi-receptacle H875KB the switch probes can be replaced solder less, saving time and cost for maintenance. Max. solder temperature 300°C. The projection height is also variable as for H875:

F873: 10,4 – 15,4 mm      F875: 10,4 – 15,4 mm  
F375: 15,0 – 20,0 mm      F875 ... L: 16,9 – 21,9 mm

**Material:** Brass, Gold plated

#### Receptacle H875KB /5 -for solderless exchange

This receptacle has the same design like H875KB, but with a 5 mm collar for extended projection height.

F873: 15,2 – 20,2 mm      F875: 15,2 – 20,2 mm  
F375: 19,8 – 24,8 mm      F875 ... L: 21,7 – 26,7 mm

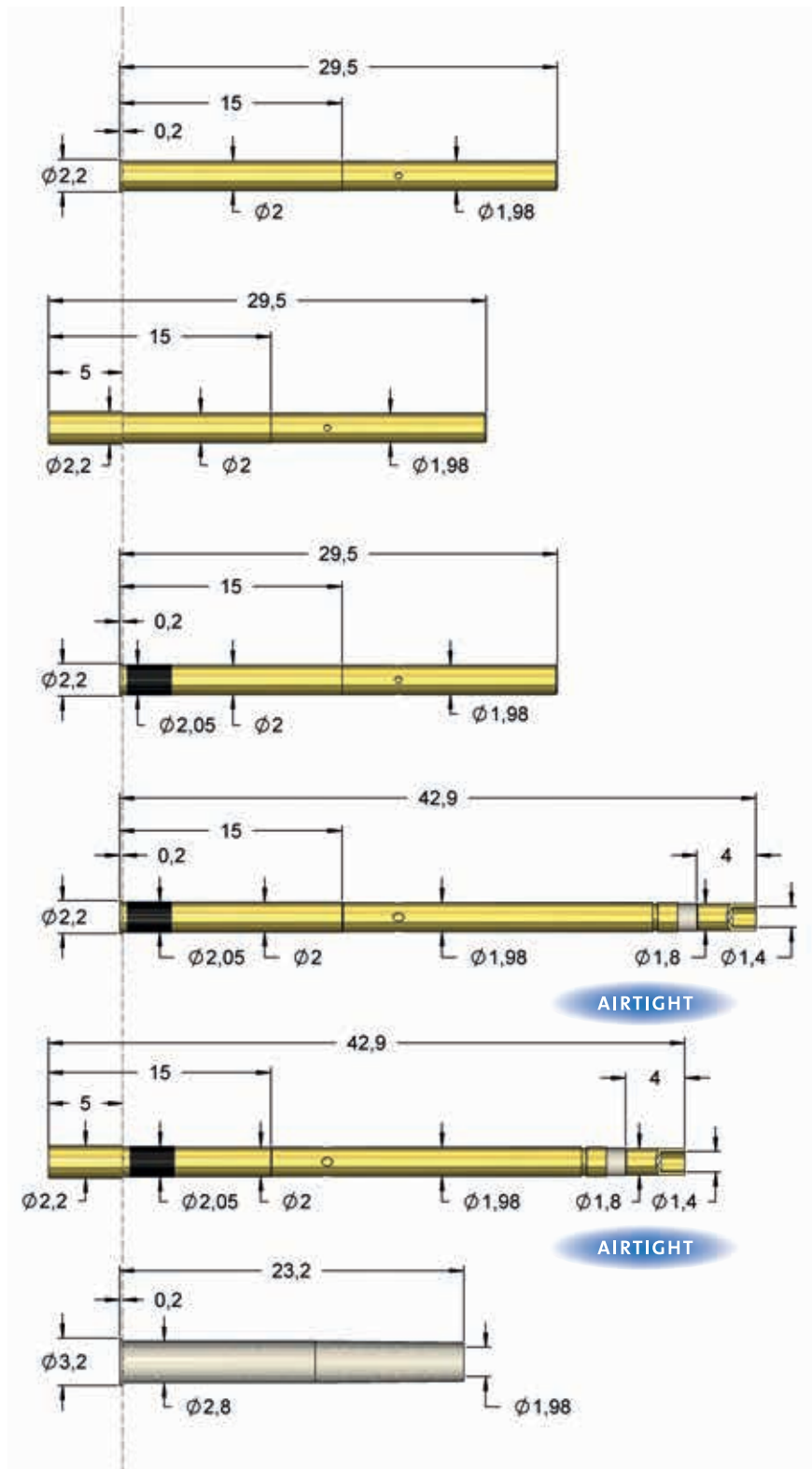
Solder temperature: max. 300 °C

**Material:** Brass, Gold plated

#### Insulating Sleeve H875IS

By usage of the insulating sleeve H875IS an insulated assembly of probes within conductive materials is possible (e.g. at steel). Maximum temperature: 300°C. Due to the sleeve collar the projection height is increase by 0,2 mm.

**Material:** PEEK



#### Drill Size [mm]

|                          |             |
|--------------------------|-------------|
| Receptacle without knurl | 1,99 - 2,00 |
| Receptacle with knurl    | 2,00 - 2,02 |

For insertion of the receptacles  
tool FEWZ-772E0 can be used.

# Switch Probes



## Standard Switch Probe 100 mil Opener (NC)

### F873

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 2,54 / 100    |
| <b>Current</b>          | 5,0 A         |
| <b>Current (Switch)</b> | 1,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 65 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 50      | 250           |

#### Travel (mm)

| Nominal            | Maximum  |
|--------------------|----------|
| 4,0                | 5,0      |
| Switch Travel (mm) | 1,5      |
| Thread (M)         | 1,6      |
| Wrench Size        | 1,7      |
| Pointing Accuracy  | ±0,08 mm |

#### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Music wire, silver plated |
| Receptacle | Brass, Gold plated        |

#### Accessories

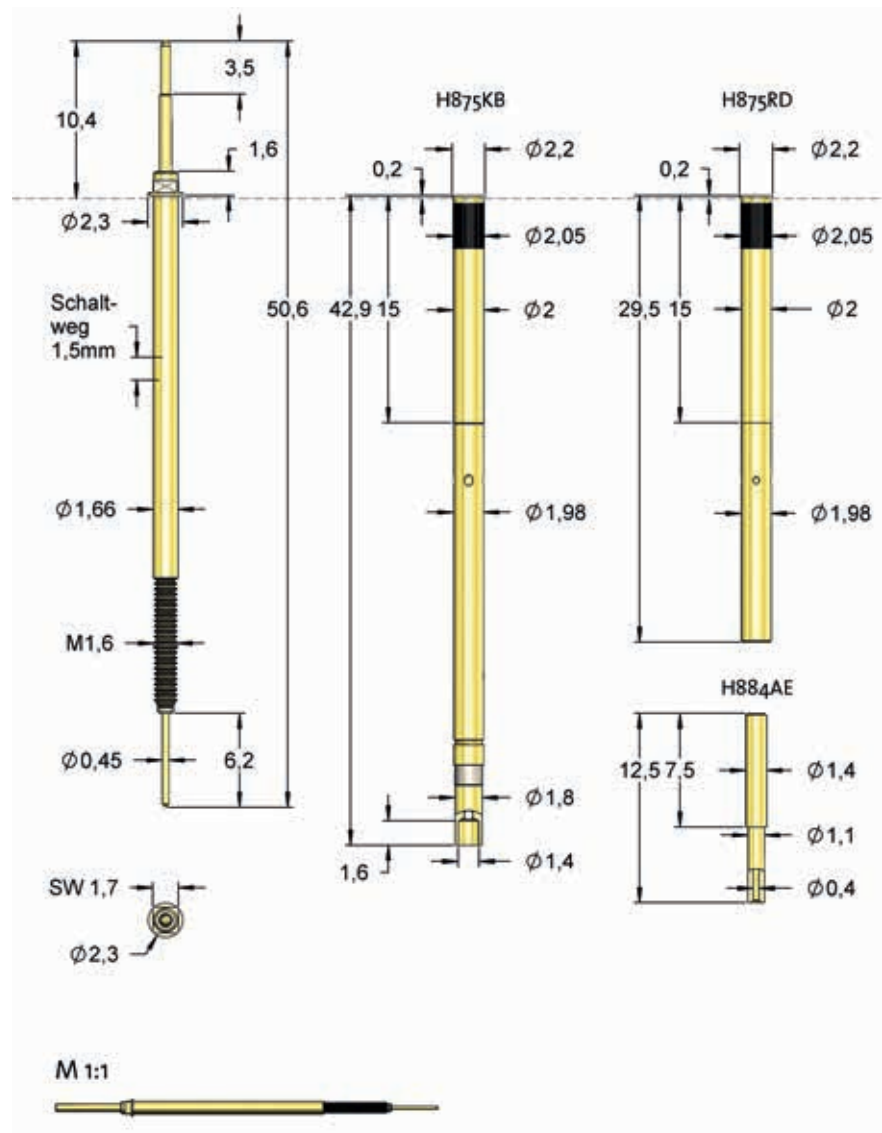
|                           |                                |
|---------------------------|--------------------------------|
| Insertion tool receptacle | FEWZ-772E0                     |
| Screw-in tool probe       | FWZ732 (T)<br>max. Ø 2,0 mm    |
| Screw-in tool probe       | FWZ732S1 (T1)<br>max. Ø 2,7 mm |

#### Drill Size [mm]

|                          |             |
|--------------------------|-------------|
| Receptacle without knurl | 1,99 - 2,00 |
| Receptacle with knurl    | 2,00 - 2,02 |

#### Projection Height

|                               |      |
|-------------------------------|------|
| (F873) H875 / H875RD / H875KB | 10,4 |
| (F873) H875/5 / H875KB/5      | 15,2 |



| Type                 | Tip-Ø                        | Spring Force |
|----------------------|------------------------------|--------------|
| F 873 16 B 100 G 250 |                              |              |
| Tip Style            | Material                     | Finish       |
| Material:            | B = BeCu                     |              |
| Tip-Ø:               | 100 = 1,0 mm (e.g.)          |              |
| Finish:              | G = Gold                     |              |
| Receptacle:          | Order Code according drawing |              |
| ORDER EXAMPLE        |                              |              |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 11     | B        | G       | 0,64    | -       |
|           | 16     | B        | G       | 1,0     | -       |

## Standard Switch Probe 100 mil, Closer (NO)

### F875

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 2,54 / 100    |
| <b>Current</b>          | 5,0 A         |
| <b>Current (Switch)</b> | 1,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 65 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 20      | 80            |
| 30      | 135           |
| 60      | 200           |
| 60      | 300           |
| 80      | 350           |

#### Travel (mm)

| Nominal            | Maximum  |
|--------------------|----------|
| 4,0                | 5,0      |
| Switch Travel (mm) | 1,5      |
| Thread (M)         | 1,6      |
| Wrench Size        | 1,7      |
| Pointing Accuracy  | ±0,08 mm |

#### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Music wire, silver plated |
| Receptacle | Brass, Gold plated        |

#### Accessories

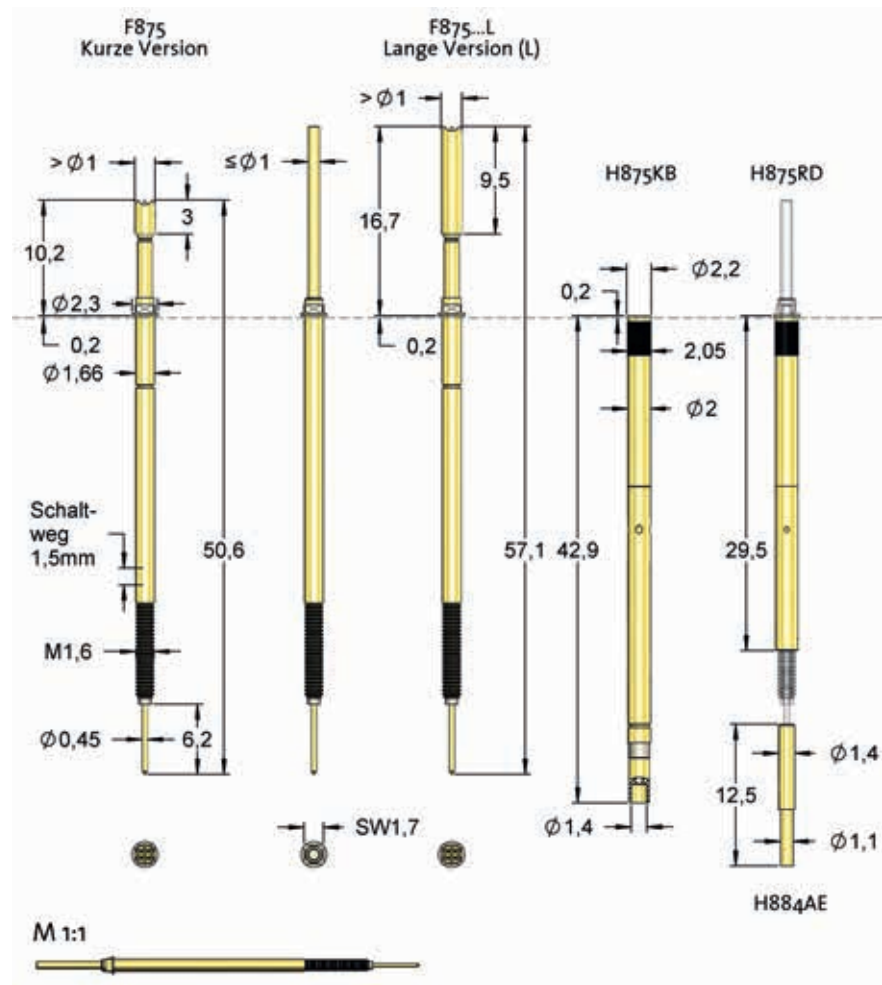
|                           |                                |
|---------------------------|--------------------------------|
| Insertion tool receptacle | FEWZ-772E0                     |
| Screw-in tool probe       | FWZ732 (T)<br>max. Ø 2,0 mm    |
| Screw-in tool probe       | FWZ732S1 (T1)<br>max. Ø 2,7 mm |

#### Drill Size [mm]

|                                 |             |
|---------------------------------|-------------|
| Receptacle without knurl        | 1,99 - 2,00 |
| Hülse mit Receptacle with knurl | 2,02 - 2,03 |

| Type             | Tip-Ø   | Spring Force |
|------------------|---|--------------|
| F 875            | 16  | B            |
|                  | 100   | G            |
|                  |   | L            |
| Tip Style        | Material  | Finish       |
| Material:        | B = BeCu, K = Syntetic,<br>T = isolated BeCu-Head nickel plated |              |
| Tip-Ø:           | 100 = 1,0 mm (e.g.)   |              |
| Finish:          | G = Gold, U = Unplated  |              |
| Special Version: | L = Long Version,   |              |
| Receptacle:      | Order Code according drawing                                    |              |

ORDER EXAMPLE



#### Projection Height

|                                   |      |
|-----------------------------------|------|
| (F875) H875 / H875RD / H875KB     | 10,4 |
| (F875) H875/5 / H875KB/5          | 15,2 |
| (F875...L) H875 / H875RD / H875KB | 16,9 |
| (F875...L) H875/5 / H875KB/5      | 21,7 |

| Tip Style | Number | Material | Plating | Ø in mm                    | Version |
|-----------|--------|----------|---------|----------------------------|---------|
|           | 05     | B        | G       | 1,8                        | -       |
|           | 06     | B        | G       | 1,0; 1,4; 1,8              | L       |
|           | 06     | B        | G       | 1,3; 1,5; 1,8;<br>2,0; 2,3 | -       |
|           | 11     | B        | G       | 0,64; 1,0                  | -       |
|           | 11     | B        | G       | 1,0                        | L       |
|           | 11     | B        | G       | 1,0                        | -       |
|           | 16     | B        | G       | 0,64; 0,7; 0,8;<br>1,0     | -       |
|           | 16     | B        | G       | 1,0                        | L       |
|           | 17     | B        | G       | 1,8                        | -       |
|           | 17     | K        | U       | 1,1,8; 2,3                 | -       |
|           | 17     | T        | N       | 1,8                        | -       |



## Long Travel Switch Probe 100 mil, Closer (NO)

### F375

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 2,54 / 100    |
| <b>Current</b>          | 5,0 A         |
| <b>Current (Switch)</b> | 1,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 50 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 30      | 200           |

#### Travel (mm)

| Nominal            | Maximum  |
|--------------------|----------|
| 8,0                | 9,5      |
| Switch Travel (mm) | 1,5      |
| Thread (M)         | 1,6      |
| Wrench Size        | 1,7      |
| Pointing Accuracy  | ±0,15 mm |

#### Materials and Plating

|            |                         |
|------------|-------------------------|
| Plunger    | see Tip Style           |
| Barrel     | Brass, gold plated      |
| Spring     | Music wire, gold plated |
| Receptacle | Brass, Gold plated      |

#### Accessories

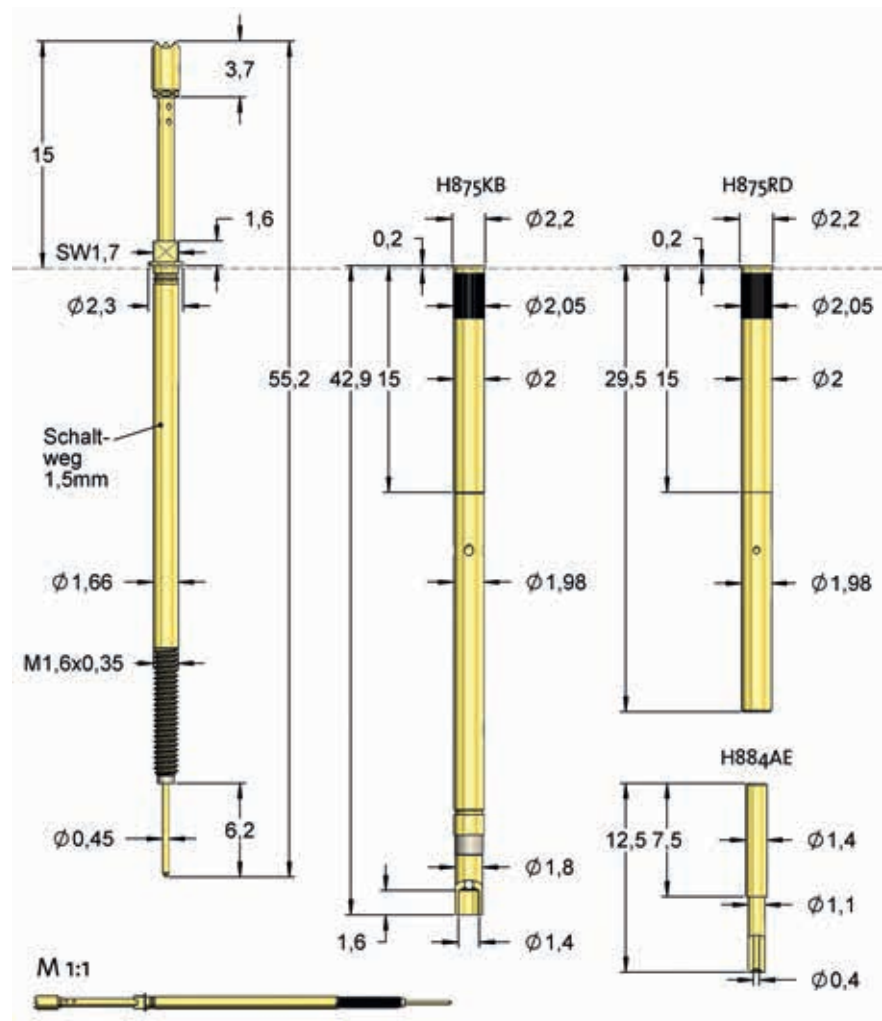
|                           |                               |
|---------------------------|-------------------------------|
| Insertion tool receptacle | FEWZ-772E0                    |
| Screw-in tool probe       | FWZ732 (T)<br>max. Ø2,0 mm    |
| Screw-in tool probe       | FWZ732S1 (T1)<br>max. Ø2,7 mm |

#### Drill Size [mm]

|                          |             |
|--------------------------|-------------|
| Receptacle without knurl | 1,99 - 2,00 |
| Receptacle with knurl    | 2,00 - 2,02 |

#### Projection Height

|                        |      |
|------------------------|------|
| H875 / H875RD / H875KB | 15,0 |
| H875/5 / H875KB/5      | 19,8 |



| Type                 | Tip-Ø                        | Spring Force |
|----------------------|------------------------------|--------------|
| F 375 17 B 180 G 200 |                              |              |
| Tip Style            | Material                     | Finish       |
| Material:            | B = BeCu                     |              |
| Tip-Ø:               | 180 = 1,8 mm (e.g.)          |              |
| Finish:              | G = Gold                     |              |
| Receptacle:          | Order Code according drawing |              |
| ORDER EXAMPLE        |                              |              |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 06     | B        | G       | 1,8     | -       |
|           | 17     | B        | G       | 1,8     | -       |



## Plug-in Switch Probe 138 mil Closer (NO)

### F884

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 3,50 / 138    |
| <b>Current</b>          | 10,0 A        |
| <b>Current (Switch)</b> | 1,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 50 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 50      | 200           |
| 80      | 350           |
| 50      | 900           |

#### Travel (mm)

| Nominal            | Maximum  |
|--------------------|----------|
| 4,0                | 5,0      |
| Switch Travel (mm) | 1,7      |
| Pointing Accuracy  | ±0,09 mm |

#### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Music wire, silver plated |
| Receptacle | Brass, Gold plated        |

#### Accessories

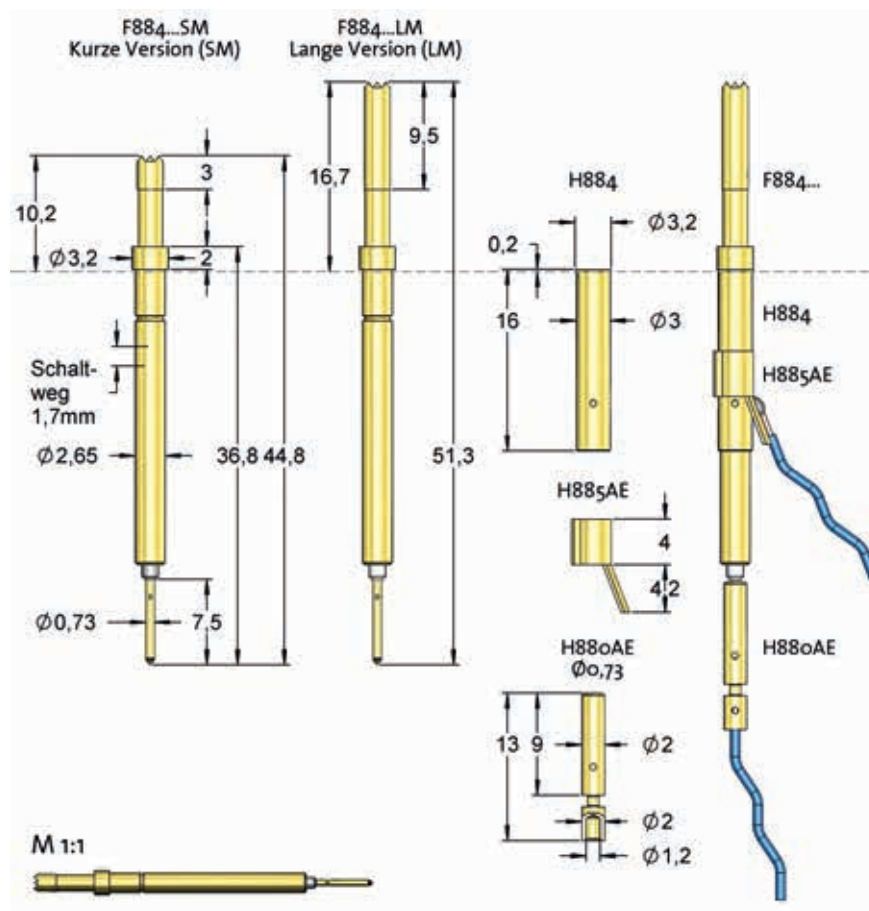
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-774E0 |
|---------------------------|------------|

#### Drill Size [mm]

|                          |            |
|--------------------------|------------|
| Receptacle without knurl | 2,98 -2,99 |
|--------------------------|------------|

#### Projection Height

|                            |      |
|----------------------------|------|
| (F884...SM) H884 / H884/23 | 10,2 |
| (F884...LM) H884 / H884/23 | 16,7 |



| Type                       | Tip-Ø                                 | Spring Force |
|----------------------------|---------------------------------------|--------------|
| F 884 06 B 230 G 170 SM 05 |                                       |              |
| Tip Style                  | Material                              | Finish       |
| Material:                  | B = BeCu, K = Synthetic               |              |
| Tip-Ø:                     | 230 = 2,3 mm (e.g.)                   |              |
| Finish:                    | G = Gold, U = unplated                |              |
| Special Version:           | SM = Short Version, LM = Long Version |              |
| Switch travel:             | 05 = 0,5 mm (deviating from standard) |              |
| Receptacle:                | Order Code according drawing          |              |
| ORDER EXAMPLE              |                                       |              |

| Tip Style | Number | Material | Plating | Ø in mm  | Version |
|-----------|--------|----------|---------|----------|---------|
|           | 06     | B        | G       | 1,0; 2,3 | SM      |
|           | 06     | B        | G       | 2,3      | LM      |
|           | 17     | B        | G       | 2,3      | SM      |
|           | 17     | B        | G       | 2,3; 3,0 | SM      |
|           | 17     | K        | U       | 3,0      | SM      |



## Switch Probe for Backward Assembly, 138 mil, Closer (NO)

### F880

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 3,50 / 138    |
| <b>Current</b>          | 10,0 A        |
| <b>Current (Switch)</b> | 1,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 50 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 50      | 150           |
| 80      | 350           |

#### Travel (mm)

| Nominal            | Maximum  |
|--------------------|----------|
| 4,0                | 5,0      |
| Switch Travel (mm) | 1,7      |
| Thread (M)         | 2,5x0,35 |
| Wrench Size        | 2,2      |
| Pointing Accuracy  | ±0,08 mm |

#### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Music wire, silver plated |
| Receptacle | Brass, Gold plated        |

#### Accessories

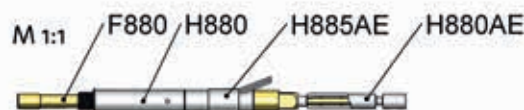
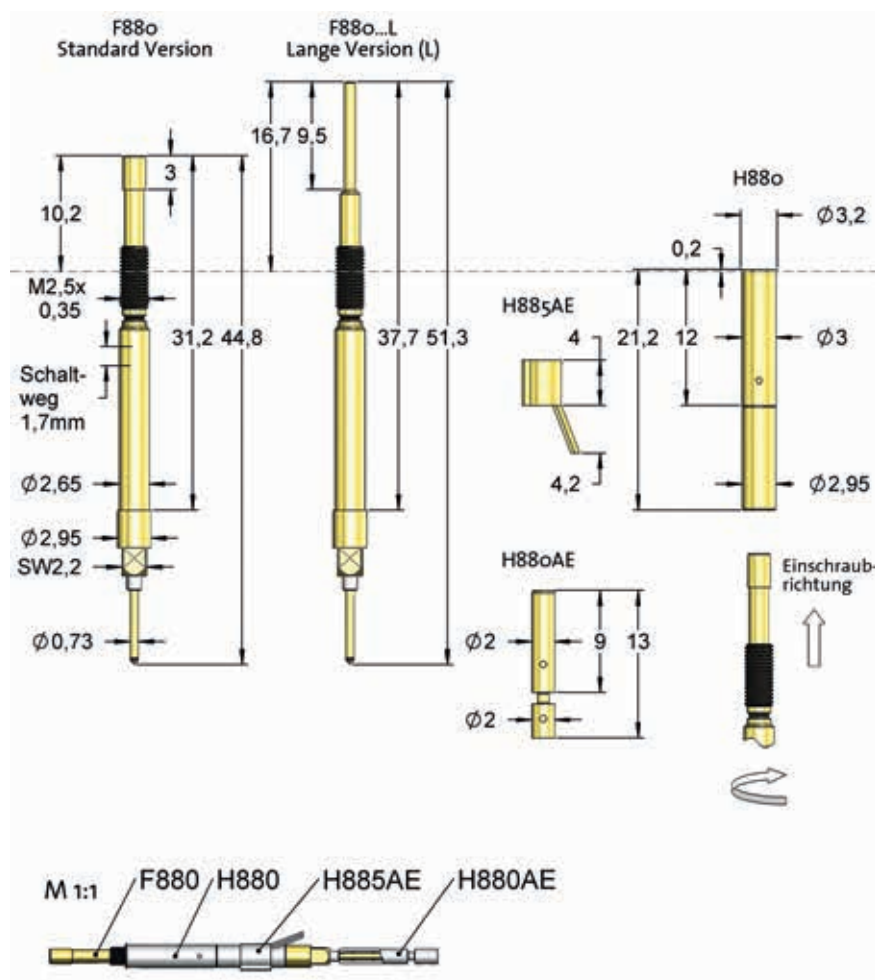
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-774E0 |
| Screw-in tool probe       | FWZVF3 (T) |
| Screw-in tool with LED    | FWZ880SA   |

#### Drill Size [mm]

|      |             |
|------|-------------|
| H880 | 2,98 - 2,99 |
|------|-------------|

#### Projection Height

|                 |      |
|-----------------|------|
| (F880) H880     | 10,2 |
| (F880...L) H880 | 16,7 |



| Type                   | Tip-Ø                        | Spring Force |
|------------------------|------------------------------|--------------|
| F 880 16 B 100 G 350 L |                              |              |
| Tip Style              | Material                     | Finish       |
| Material:              | B = BeCu                     |              |
| Tip-Ø:                 | 100 = 1,0 mm (e.g.)          |              |
| Finish:                | G = Gold                     |              |
| Special Version:       | L = Long Version             |              |
| Receptacle:            | Order Code according drawing |              |
| ORDER EXAMPLE          |                              |              |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 16     | B        | G       | 1,0     | L       |
|           | 17     | B        | G       | 2,0     | -       |

**Switch Probe (NO) 138 mil  
Electrically Isolated**

F881

|                              |               |
|------------------------------|---------------|
| <b>Centers (mm/mil)</b>      | 3,50 / 138    |
| <b>Current</b>               | 10,0 A        |
| <b>Current (Switch)</b>      | 1,0 A         |
| <b>Temperature</b>           | -20°C...+80°C |
| <b>R<sub>typically</sub></b> | 25 mOhm       |

**Spring Force (cN  $\pm 20\%$ )**

| Preload | Nominal Force |
|---------|---------------|
| 80      | 380           |

## Travel (mm)

| Nominal            | Maximum  |
|--------------------|----------|
| 4,0                | 5,0      |
| Switch Travel (mm) | 1,7      |
| Thread (M)         | 2,5      |
| Wrench Size        | 2,6      |
| Pointing Accuracy  | ±0,08 mm |

## Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Music wire, silver plated |
| Receptable | Brass, Gold plated        |

## Accessories

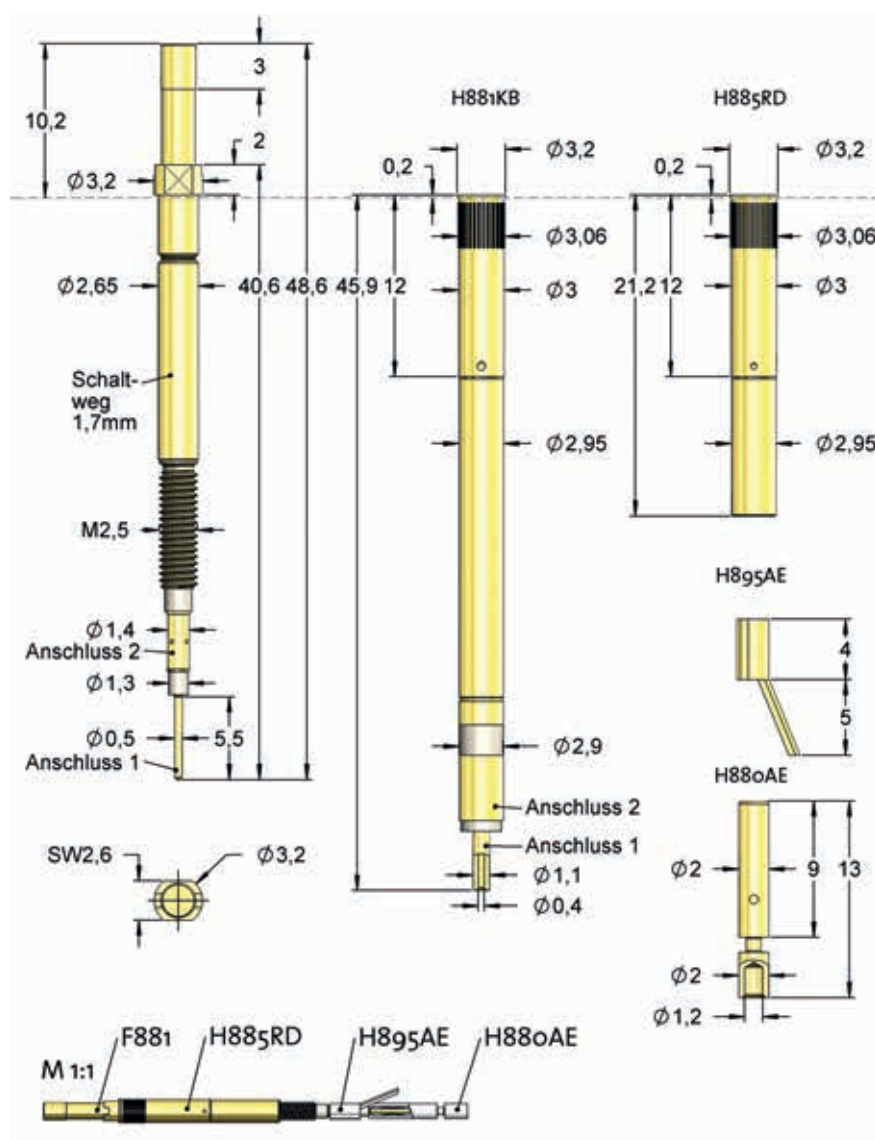
|                           |                               |
|---------------------------|-------------------------------|
| Insertion tool receptacle | FEWZ-774E0                    |
| Screw-in tool probe       | FWZ885 (T)<br>max. Ø2,5 mm    |
| Screw-in tool probe       | FWZ885S1 (T1)<br>max. Ø3,1 mm |

## Drill Size [mm]

|                       |            |
|-----------------------|------------|
| Receptacle with knurl | 3,00 -3,02 |
|-----------------------|------------|




### Projection Height

|               |      |
|---------------|------|
| H881KB        | 10,2 |
| H885 / H885RD | 10,2 |
| H885/5        | 15,0 |



| Type        | Tip-Ø                        | Spring Force |
|-------------|------------------------------|--------------|
| F881 17     | B 230                        | G 380        |
| Tip Style   | Material                     | Finish       |
| Material:   | B = BeCu                     |              |
| Tip-Ø:      | 230 = 2,3 mm (e.g.)          |              |
| Finish:     | G = Gold                     |              |
| Receptacle: | Order Code according drawing |              |

**ORDER EXAMPLE**

| Tip Style   | Number | Material | Plating | Ø in mm  | Version |
|---|--------|----------|---------|----------|---------|
|  | 05     | B        | G       | 2,3; 3,0 | -       |
|  | 06     | B        | G       | 2,3; 3,0 | -       |
|  | 17     | B        | G       | 2,3; 3,0 | -       |

# Switch Probes



## Standard Switch Probe 138 mil Closer (NO)

### F885

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 3,50 / 138    |
| <b>Current</b>          | 10,0 A        |
| <b>Current (Switch)</b> | 1,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 50 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 30      | 70            |
| 50      | 200           |
| 80      | 350           |
| 120     | 550           |
| 50      | 900           |
| 300     | 1250          |

#### Travel (mm)

| Nominal | Maximum |
|---------|---------|
| 4,0     | 5,0     |

|                    |           |
|--------------------|-----------|
| Switch Travel (mm) | 1,7 / 3,5 |
| Thread (M)         | 2,5       |
| Wrench Size        | 2,6       |
| Pointing Accuracy  | ±0,08 mm  |

#### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Music wire, silver plated |
| Receptacle | Brass, Gold plated        |

#### Accessories

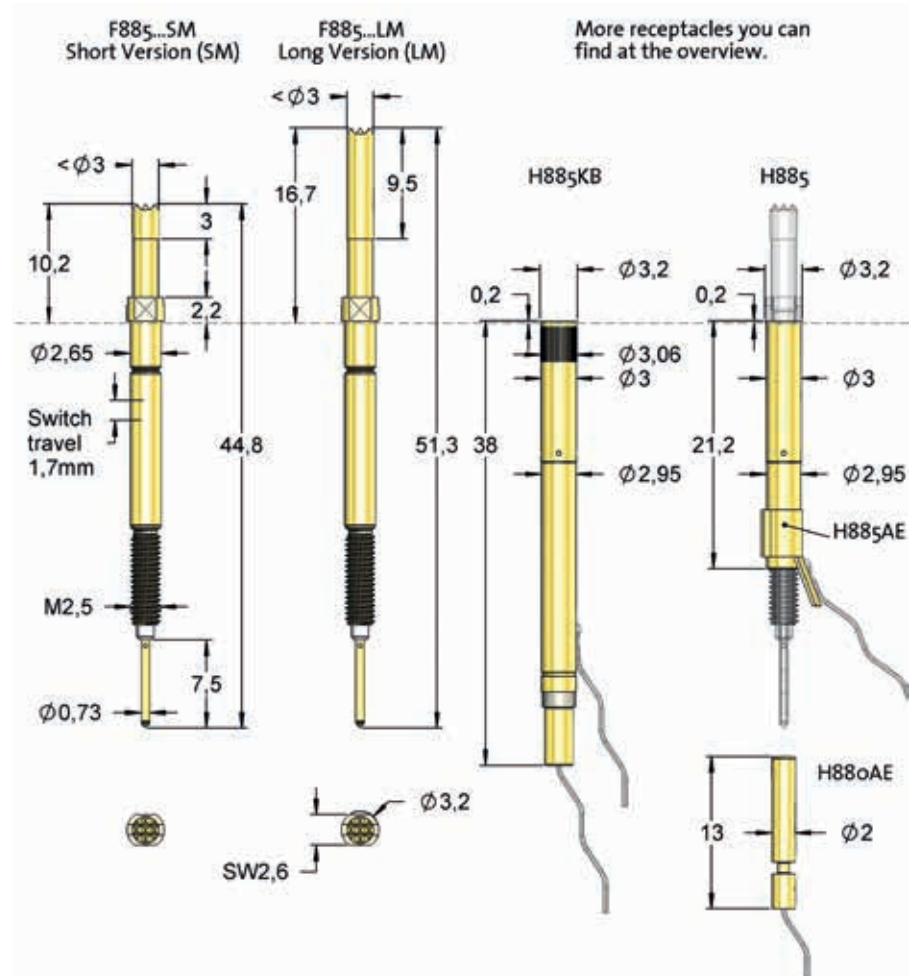
|                           |                               |
|---------------------------|-------------------------------|
| Insertion tool receptacle | FEWZ-774E0                    |
| Screw-in tool probe       | FWZ885 (T)<br>max. Ø2,5 mm    |
| Screw-in tool probe       | FWZ885S1 (T1)<br>max. Ø3,1 mm |

#### Drill Size [mm]

|                          |            |
|--------------------------|------------|
| Receptacle without knurl | 2,98 -2,99 |
| Receptacle with knurl    | 3,00 -3,02 |

| Type             | Tip-Ø                                 | Spring Force       |
|------------------|---------------------------------------|--------------------|
| F 885            | 06                                    | B 230 G 1250 SM 35 |
| Tip Style        | Material                              | Finish             |
| Material:        | B = BeCu, K = Synthetic               |                    |
| Tip-Ø:           | 230 = 2,3 mm (e.g.)                   |                    |
| Finish:          | G = Gold, U = unplated                |                    |
| Special Version: | SM = Short Version, LM = Long Version |                    |
| Switch travel:   | 35 = 3,5 mm (deviating from standard) |                    |
| Receptacle:      | Order Code according drawing          |                    |

ORDER EXAMPLE



#### Projection Height

|                                    |      |
|------------------------------------|------|
| (F885...SM) H885 / H885RD / H885KB | 10,2 |
| (F885...SM) H885/5 / H885KB/5      | 15,0 |
| (F885...LM) H885 / H885RD / H885KB | 16,7 |
| (F885...LM) H885/5 / H885KB/5      | 21,5 |

M 1:1



Variants with a switch travel of 3,5 mm available on request.  
At the spring force 1250 cN the max. travel is reduced to 4.2 mm.

| Tip Style | Number | Material | Plating | Ø in mm                 | Version |
|-----------|--------|----------|---------|-------------------------|---------|
|           | 03     | B        | G       | 0,8                     | SM      |
|           | 05     | B        | G       | 2,3; 3,0                | SM      |
|           | 05     | B        | G       | 2,3; 3,0                | LM      |
|           | 06     | B        | G       | 0,7; 1,0; 1,3; 1,8; 2,3 | SM      |
|           | 06     | B        | G       | 1,0; 1,4; 1,8; 2,3      | LM      |
|           | 06     | B        | G       | 1,3                     | S2      |
|           | 06     | B        | G       | 1,4                     | LM      |
|           | 16     | B        | G       | 1,0; 1,4; 1,8           | SM      |
|           | 16     | B        | G       | 1,0; 1,2                | LM      |
|           | 17     | B        | G       | 2,3                     | SM      |
|           | 17     | K        | U       | 2,3                     | SM      |
|           | 17     | K        | U       | 2,3                     | LM      |
|           | 55     | B        | G       | 2,3                     | LM      |

## Standard Switch Probe 138 mil Closer (NO)

### F886

|                  |               |
|------------------|---------------|
| Centers (mm/mil) | 3,50 / 138    |
| Current          | 10,0 A        |
| Current (Switch) | 1,0 A         |
| Temperature      | -20°C...+80°C |
| R typically      | 50 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 34      | 70            |
| 30      | 120           |
| 50      | 200           |
| 80      | 350           |
| 50      | 900           |

#### Travel (mm)

| Nominal            | Maximum   |
|--------------------|-----------|
| 4,0                | 4,2       |
| Switch Travel (mm) | 1,7 / 3,5 |
| Thread (M)         | 2,5       |
| Wrench Size        | 2,6       |
| Pointing Accuracy  | ±0,09 mm  |

#### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Music wire, silver plated |
| Receptacle | Brass, Gold plated        |

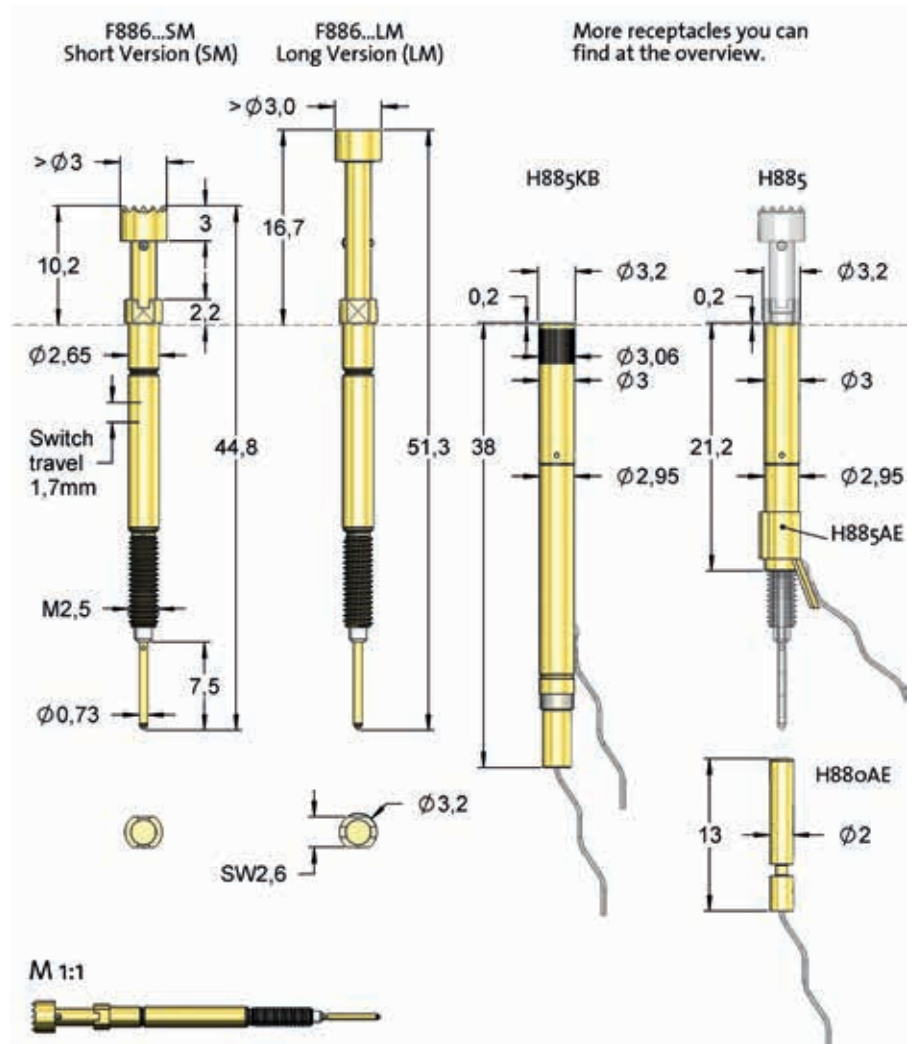
#### Accessories

|                           |                       |
|---------------------------|-----------------------|
| Insertion tool receptacle | FEWZ-774E0            |
| Screw-in tool probe       | FWZ885S1 max. Ø3,1 mm |
| Screw-in tool probe       | FWZ760S1 max. Ø4,0 mm |
| Screw driver              | FWZ886S2              |

#### Drill Size [mm]

|                          |             |
|--------------------------|-------------|
| Receptacle without knurl | 2,98 - 2,99 |
| Receptacle with knurl    | 3,00 - 3,02 |

| Type             | Tip-Ø   |          | Spring Force |   |                 |       |
|------------------|---|----------|--------------|---|-----------------|-------|
| F 886            | 17  | B        | 400          | G | 900             | SM 35 |
| Tip Style        |   | Material | Finish       |   | Special Version |       |
| Material:        | B = BeCu, K = Synthetic,<br>H = Synthetic Head with Ring,<br>T = BeCu-Head insulated, Gold plated |          |              |   |                 |       |
| Tip-Ø:           | 400 = 4,0 mm (e.g.)   |          |              |   |                 |       |
| Finish:          | G = Gold, N = Nickel, U = unplated  |          |              |   |                 |       |
| Special Version: | SM = Short Version, LM = Long Version,<br>E14 = Projection Height 14 mm                           |          |              |   |                 |       |
| Switch travel:   | 35 = 3,5 mm (deviating from standard)   |          |              |   |                 |       |
| Receptacle:      | Order Code according drawing  |          |              |   |                 |       |
| ORDER EXAMPLE    |   |          |              |   |                 |       |



#### Projection Height

|                                    |      |
|------------------------------------|------|
| (F886...SM) H885 / H885RD / H885KB | 10,2 |
| (F886...SM) H885/5 / H885KB/5      | 15,0 |
| (F886...LM) H885 / H885RD / H885KB | 16,7 |
| (F886...LM) H885/5 / H885KB/5      | 21,5 |

Variants with a switch travel of 3,5 mm available on request.

| Tip Style | Number | Material | Plating | Ø in mm                           | Version |
|-----------|--------|----------|---------|-----------------------------------|---------|
|           | 06     | B        | G       | 3,0; 4,0                          | SM      |
|           | 06     | B        | G       | 3,0                               | LM      |
|           | 17     | B        | G       | 3,0; 3,5; 4,0; 4,5; 5,9           | LM      |
|           | 17     | B        | G       | 3,0; 3,5; 4,0; 4,5; 5,0; 5,5; 5,9 | SM      |
|           | 17     | H        | U       | 3,0; 3,5; 4,0; 4,5; 5,0           | LM      |
|           | 17     | H        | U       | 3,0; 3,5; 4,0; 4,5; 5,0; 5,5      | SM      |
|           | 17     | K        | U       | 3,0; 3,5; 4,0; 4,5; 5,0; 5,5; 5,9 | SM      |
|           | 17     | K        | U       | 3,0; 3,5                          | LM      |
|           | 17     | T        | N       | 3,0 / 5,0                         | SM      |



# Switch Probes



## Standard Switch Probe 138 mil Opener (NC)

### F883

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 3,50 / 138    |
| <b>Current</b>          | 10,0 A        |
| <b>Current (Switch)</b> | 1,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 50 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 40      | 230           |

#### Travel (mm)

| Nominal            | Maximum   |
|--------------------|-----------|
| 4,0                | 5,0       |
| Switch Travel (mm) | 0,5 / 1,7 |
| Thread (M)         | 2,5       |
| Wrench Size        | 2,6       |
| Pointing Accuracy  | ±0,09 mm  |

#### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Music wire, silver plated |
| Receptacle | Brass, Gold plated        |

#### Accessories

|                           |                               |
|---------------------------|-------------------------------|
| Insertion tool receptacle | FEWZ-774E0                    |
| Screw-in tool probe       | FWZ885 (T)<br>max. Ø2,5 mm    |
| Screw-in tool probe       | FWZ885S1 (T1)<br>max. Ø3,1 mm |

#### Drill Size [mm]

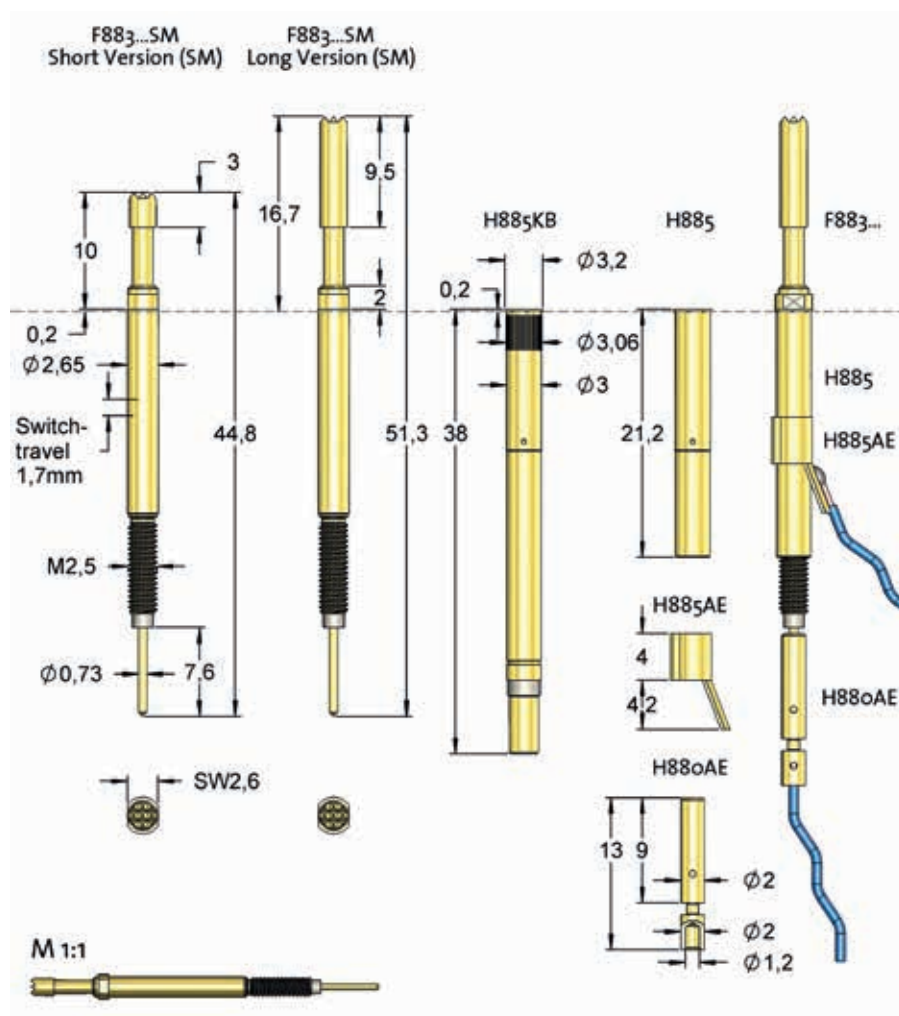
|                          |             |
|--------------------------|-------------|
| Receptacle without knurl | 2,98 - 2,99 |
| Receptacle with knurl    | 3,00 - 3,02 |

#### Projection Height

|                                    |      |
|------------------------------------|------|
| (F883...SM) H885 / H885RD / H885KB | 10,2 |
| (F883...SM) H885/5 / H885KB/5      | 15,0 |
| (F883...LM) H885 / H885RD / H885KB | 16,7 |
| (F883...LM) H885/5 / H885KB/5      | 21,5 |

| Type             | Tip-Ø                                 | Spring Force      |
|------------------|---------------------------------------|-------------------|
| F 883            | 17                                    | B 230 G 170 SM 05 |
| Tip Style        | Material                              | Finish            |
| Material:        | B = BeCu, K = Synthetic               |                   |
| Tip-Ø:           | 230 = 2,3 mm (e.g.)                   |                   |
| Finish:          | G = Gold, U = unplated                |                   |
| Special Version: | SM = Short Version, LM = Long Version |                   |
| Switch travel:   | 05 = 0,5 mm (deviating from standard) |                   |
| Receptacle:      | Order Code according drawing          |                   |

ORDER EXAMPLE



Variants with a switch travel of 0,5 mm available on request.  
The nominal travel is reduced to 2.8 mm.

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 05     | B        | G       | 2,3     | SM      |
|           | 06     | B        | G       | 2,3     | LM      |
|           | 06     | B        | G       | 2,3     | SM      |
|           | 16     | B        | G       | 1,8     | SM      |
|           | 17     | B        | G       | 2,3     | SM      |
|           | 17     | K        | U       | 2,3     | SM      |



**Long Travel Switch Probe 157mil  
Closer (NO)**

F385

|                              |               |
|------------------------------|---------------|
| <b>Centers (mm/mil)</b>      | 4,00 / 157    |
| <b>Current</b>               | 10,0 A        |
| <b>Current (Switch)</b>      | 1,0 A         |
| <b>Temperature</b>           | -20°C...+80°C |
| <b>R<sub>typically</sub></b> | 50 mOhm       |

**Spring Force (cN  $\pm 20\%$ )**

| Preload | Nominal Force |
|---------|---------------|
| 40      | 200           |

## Travel (mm)

| Nominal            | Maximum  |
|--------------------|----------|
| 9,0                | 11,0     |
| Switch Travel (mm) | 1,7      |
| Thread (M)         | 2,5      |
| Wrench Size        | 2,6      |
| Pointing Accuracy  | ±0,15 mm |

## Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Music wire, silver plated |
| Receptable | Brass, Gold plated        |

## Accessories

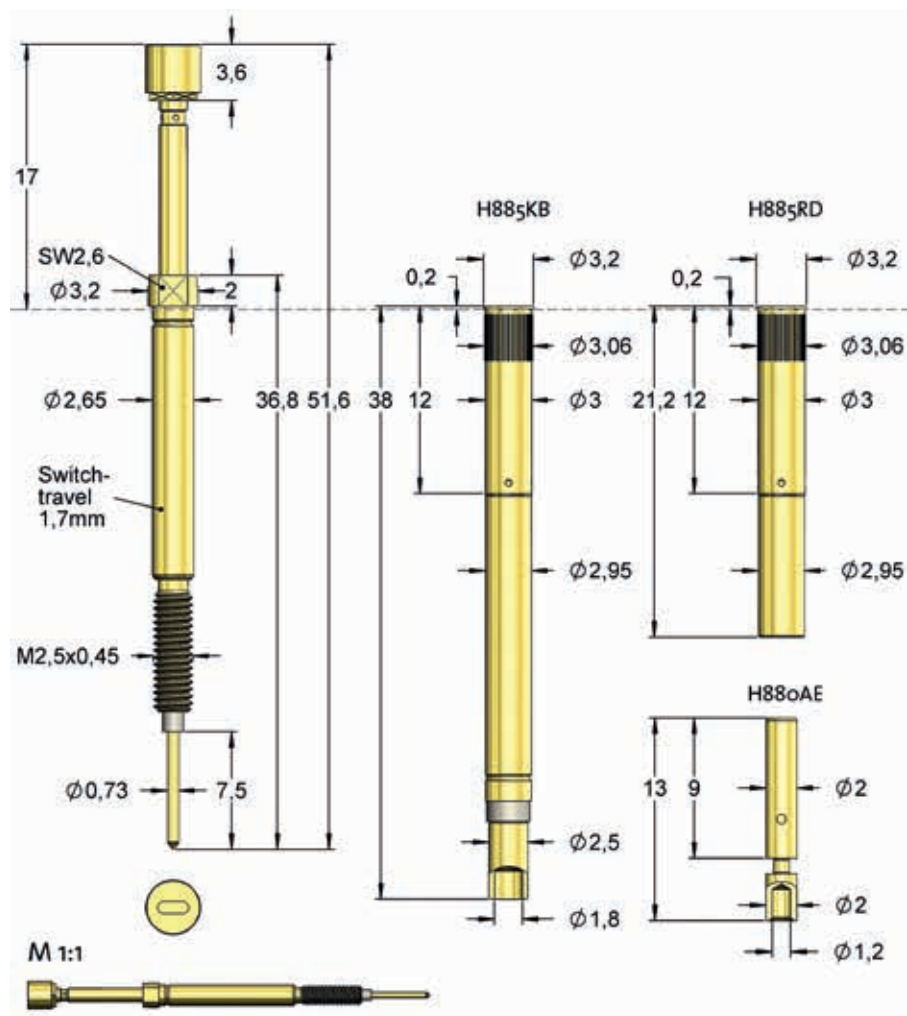
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-774E0 |
| Screw-in tool probe       | FWZ760S1   |

## Drill Size [mm]

|                          |             |
|--------------------------|-------------|
| Receptacle without knurl | 2,98 - 2,99 |
| Receptacle with knurl    | 3,00 - 3,02 |



### Projection Height

|                        |      |
|------------------------|------|
| H885 / H885RD / H885KB | 17,0 |
| H885/5 / H885KB/5      | 21.8 |



| Type                 | Tip-Ø                        | Spring Force |
|----------------------|------------------------------|--------------|
| F 385 17 B 350 G 200 |                              |              |
| Tip Style            | Material                     | Finish       |
| Material:            | B = BeCu                     |              |
| Tip-Ø:               | 350 = 3,5 mm (e.g.)          |              |
| Finish:              | G = Gold                     |              |
| Receptacle:          | Order Code according drawing |              |

**ORDER EXAMPLE**

| Tip Style   | Number | Material | Plating | Ø in mm | Version |
|---|--------|----------|---------|---------|---------|
|  | 06     | B        | G       | 3,5     | -       |
|  | 17     | B        | G       | 3,5     | -       |



## Receptacles for Switch Probe Families F883, F885, F886 und F385

### H885

#### Receptacle H885

This receptacle allows variable projection height:

F883: 10,2 – 15,7 mm F885/F886 ... SM 10,2 – 15,7 mm

F385: 17,0 – 22,5 mm F885/F886 ... LM: 16,7 – 22,2 mm

**Material:** Brass, Gold plated

#### Receptacle H885/5

The receptacle H885/5 has a 5mm collar for extended projection height:

F883: 15,2 – 20,2 mm F885/F886 ... SM: 15,2 – 20,2 mm

F385: 21,8 – 27,3 mm F885/F886 ... LM: 21,5 – 27,0 mm

**Material:** Brass, Gold plated

#### Receptacle H885RD

The receptacle H885RD has the same dimensions as H885, but with knurling for proper seat.

Possible projection heights:

F883: 10,2 – 15,7 mm F885/F886 ... SM 10,2 – 15,7 mm

F385: 17,0 – 22,5 mm F885/F886 ... LM: 16,7 – 22,2 mm

**Material:** Brass, Gold plated

#### Receptacle H885KB - for solderless exchange

By usage of the combi-receptacle H885KB the switch probes can be replaced solderless, saving time and cost for maintenance. Max. solder temperature 300°C.

F883: 10,2 – 15,7 mm F885/F886 ... SM 10,2 – 15,7 mm

F385: 17,0 – 22,5 mm F885/F886 ... LM: 16,7 – 22,2 mm

**Material:** Brass, Gold plated

#### Receptacle H885KB /5 - for solderless exchange

This receptacle has the same design like H885KB, but with a 5 mm collar for extended projection height.

F883: 15,2 – 20,2 mm F885/F886 ... SM: 15,2 – 20,2 mm

F385: 21,8 – 27,3 mm F885/F886 ... LM: 21,5 – 27,0 mm

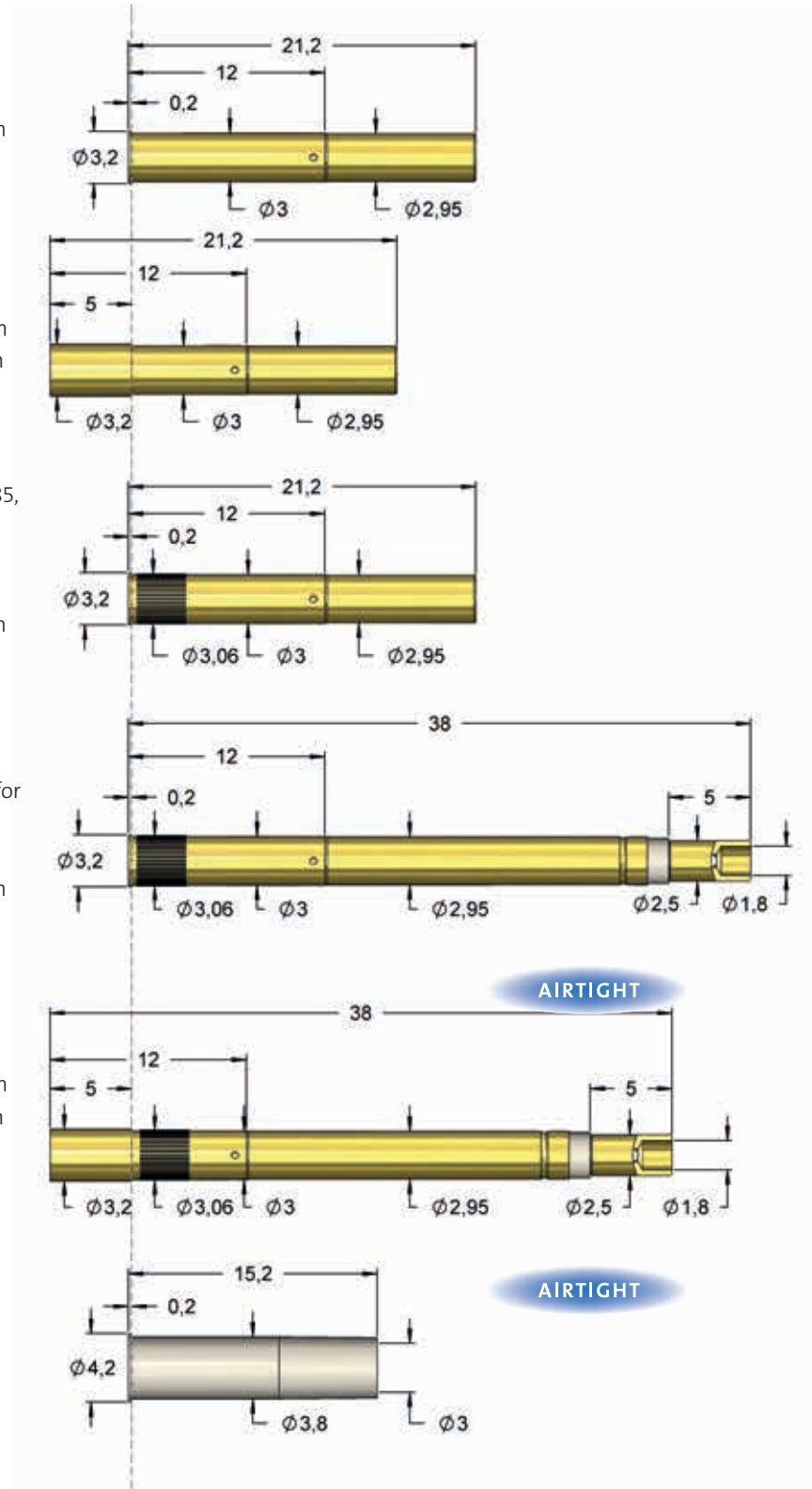
Solder temperature: max. 300 °C

**Material:** Brass, Gold plated

#### Insulating Sleeve H885IS

By usage of the insulating sleeve H885IS an insulated assembly of probes within conductive materials is possible (e.g. at steel). Maximum temperature: 300°C  
Due to the sleeve's collar the projection height is increase by 0,2 mm.

**Material:** PEEK



#### Drill Size [mm]

|                          |             |
|--------------------------|-------------|
| Receptacle without knurl | 2,98 - 2,99 |
| Receptacle with knurl    | 3,00 - 3,02 |

For insertion of the receptacles  
tool FEWZ-774E0 can be used.

# Switch Probes

## Standard Switch Probe 157mil Closer (NO)

### F867

NEW

|                  |               |
|------------------|---------------|
| Centers (mm/mil) | 4,00 / 157    |
| Current          | 5,0 A         |
| Current (Switch) | 1,0 A         |
| Temperature      | -20°C...+80°C |
| R typically      | 20 mOhm       |

### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 50      | 130           |
| 70      | 180           |
| 50      | 230           |
| 70      | 280           |
| 120     | 300           |
| 120     | 400           |
| 450     | 800           |
| 450     | 900           |

### Travel (mm)

| Nominal            | Maximum  |
|--------------------|----------|
| 4,0                | 5,0      |
| Switch Travel (mm) | 4,0      |
| Thread (M)         | 3,0x0,35 |
| Wrench Size        | 3,0      |
| Pointing Accuracy  | ±0,08 mm |

### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Music wire, silver plated |
| Receptacle | Brass, Gold plated        |

### Accessories

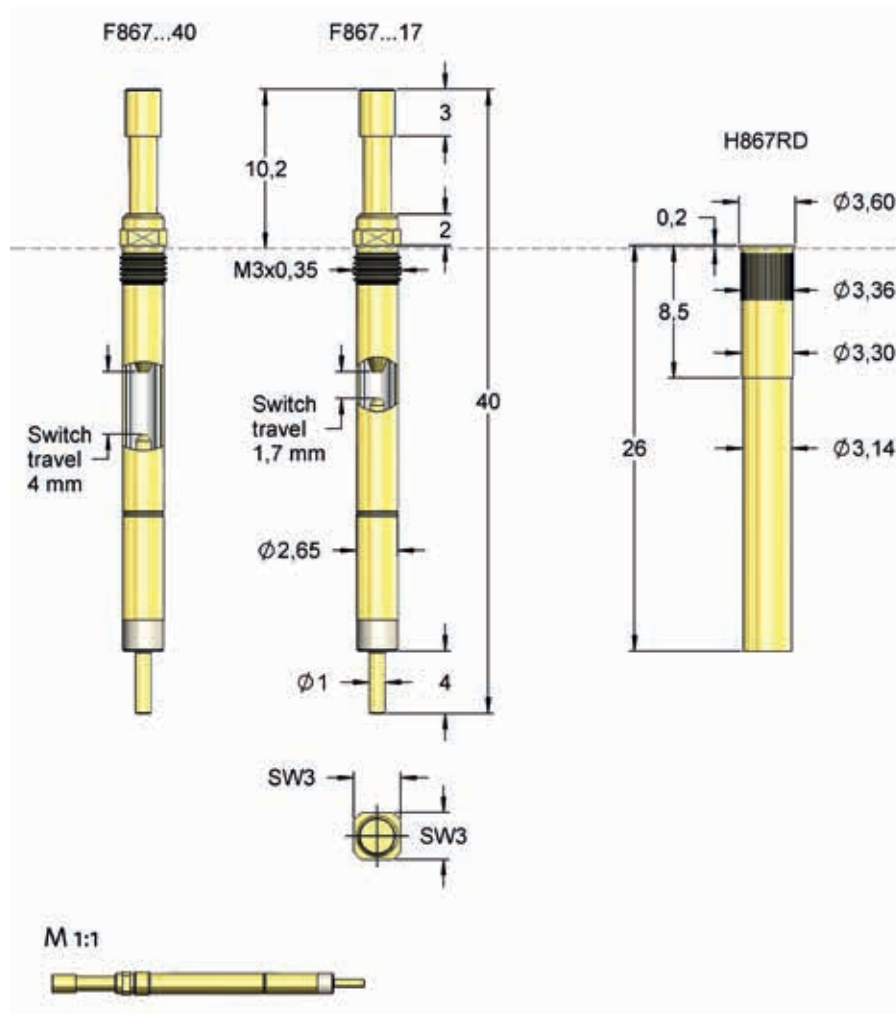
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-774E0 |
| Screw-in tool probe       | FWZ733 (T) |

### Drill Size [mm]

|        |             |
|--------|-------------|
| H867RD | 3,30 - 3,32 |
|--------|-------------|

### Projection Height

|        |      |
|--------|------|
| H867RD | 10,2 |
|--------|------|



| Type                     | Tip-Ø                                  | Spring Force           |
|--------------------------|--|------------------------|
| F 867 06 B 180 G 130 S40 |  |                        |
| Tip Style                | Material                               | Finish Special Version |
| Material:                | B = BeCu, K = Synthetic                |                        |
| Tip-Ø:                   | 180 = 1,8 mm (e.g.)                    |                        |
| Finish:                  | G = Gold, U = Unplated                 |                        |
| Switch Travel:           | S40 = 4,0 mm (deviating from standard) |                        |
| Receptacle:              | Order Code according drawing           |                        |
| ORDER EXAMPLE            |  |                        |

| Tip Style | Number | Material | Plating | Ø in mm  | Version |
|-----------|--------|----------|---------|----------|---------|
|           | 06     | B        | G       | 1,8; 2,3 | -       |
|           | 16     | B        | G       | 1,8      | -       |
|           | 17     | B        | G       | 2,3      | -       |
|           | 17     | K        | U       | 2,3      | -       |

# Switch Probes



## Standard Switch Probe 157mil Closer (NO)

### F866

**NEW**

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 4,00 / 157    |
| <b>Current</b>          | 5,0 A         |
| <b>Current (Switch)</b> | 1,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 20 mOhm       |

### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 50      | 130           |
| 70      | 180           |
| 50      | 230           |
| 70      | 280           |
| 120     | 300           |
| 60      | 400           |
| 450     | 800           |
| 450     | 900           |

### Travel (mm)

| Nominal            | Maximum  |
|--------------------|----------|
| 4,0                | 5,0      |
| Switch Travel (mm) | 1,7      |
| Thread (M)         | 3,0x0,35 |
| Wrench Size        | 3,0      |
| Pointing Accuracy  | ±0,08 mm |

### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Music wire, silver plated |
| Receptacle | Brass, Gold plated        |

### Accessories

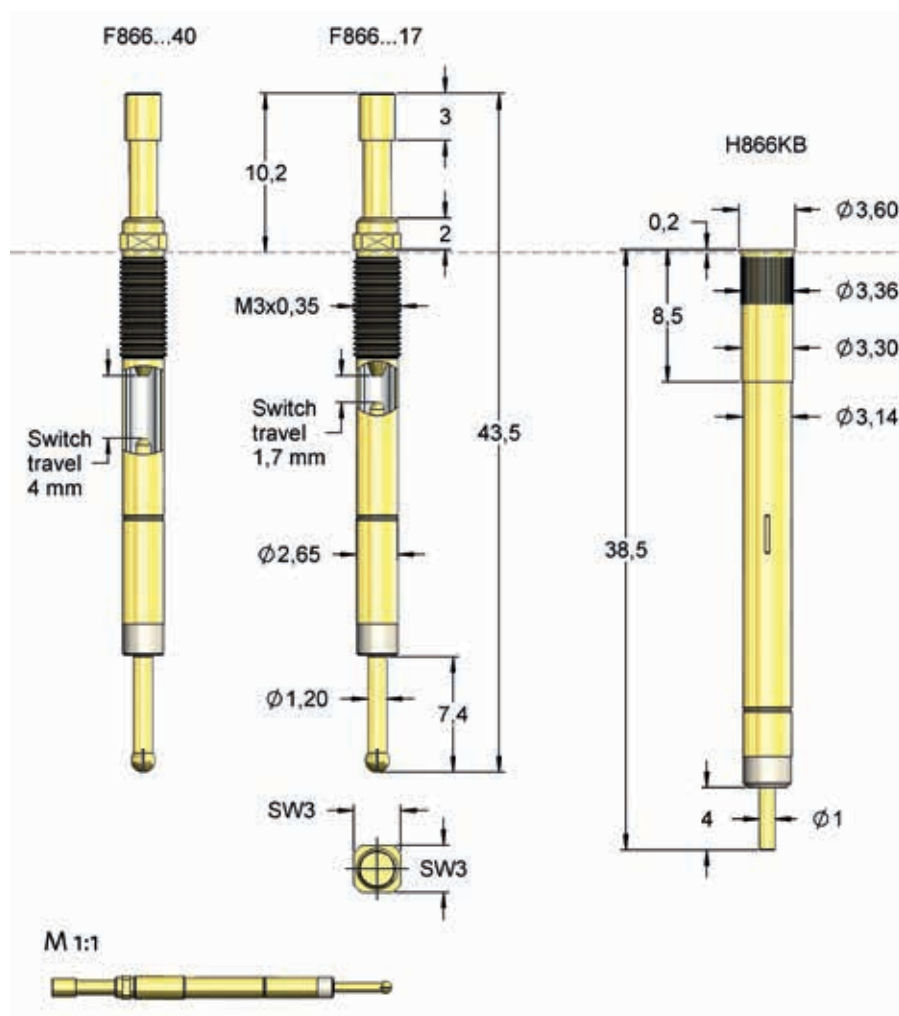
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-774E0 |
| Screw-in tool probe       | FWZ733 (T) |

### Drill Size [mm]

|                       |             |
|-----------------------|-------------|
| Receptacle with knurl | 3,30 - 3,33 |
|-----------------------|-------------|

### Projection Height

|         |      |
|---------|------|
| H866... | 10,2 |
|---------|------|



| Type                     | Tip-Ø                                  | Spring Force |
|--------------------------|--|--------------|
| F 866 06 B 180 G 130 S40 |  |              |
| Tip Style                | Material                               | Finish       |
| Material:                | B = BeCu, K = Syntetic                 |              |
| Tip-Ø:                   | 180 = 1,8 mm (e.g.)                    |              |
| Finish:                  | G = Gold, U = Unplated                 |              |
| Switch Travel:           | S40 = 4,0 mm (deviating from standard) |              |
| Receptacle:              | Order Code according drawing           |              |
| ORDER EXAMPLE            |  |              |

| Tip Style | Number | Material | Plating | Ø in mm  | Version |
|-----------|--------|----------|---------|----------|---------|
|           | 06     | B        | G       | 1,8; 2,3 | -       |
|           | 16     | B        | G       | 1,8      | -       |
|           | 17     | B        | G       | 2,3      | -       |
|           | 17     | K        | U       | 2,3      | -       |

Short Switch Probe 157mil  
Closer (NO)

F887

|                  |               |
|------------------|---------------|
| Centers (mm/mil) | 4,00 / 157    |
| Current          | 10,0 A        |
| Current (Switch) | 1,0 A         |
| Temperature      | -20°C...+80°C |
| R typically      | 40 mOhm       |

Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 50      | 150           |
| 50      | 200           |
| 50      | 300           |

Travel (mm)

| Nominal            | Maximum  |
|--------------------|----------|
| 4,0                | 5,0      |
| Switch Travel (mm) | 1,7      |
| Thread (M)         | 3,0x0,35 |
| Wrench Size        | 2,5      |
| Pointing Accuracy  | ±0,1 mm  |

Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | BeCu, gold plated         |
| Spring     | Music wire, silver plated |
| Receptacle | Brass, Gold plated        |

Accessories

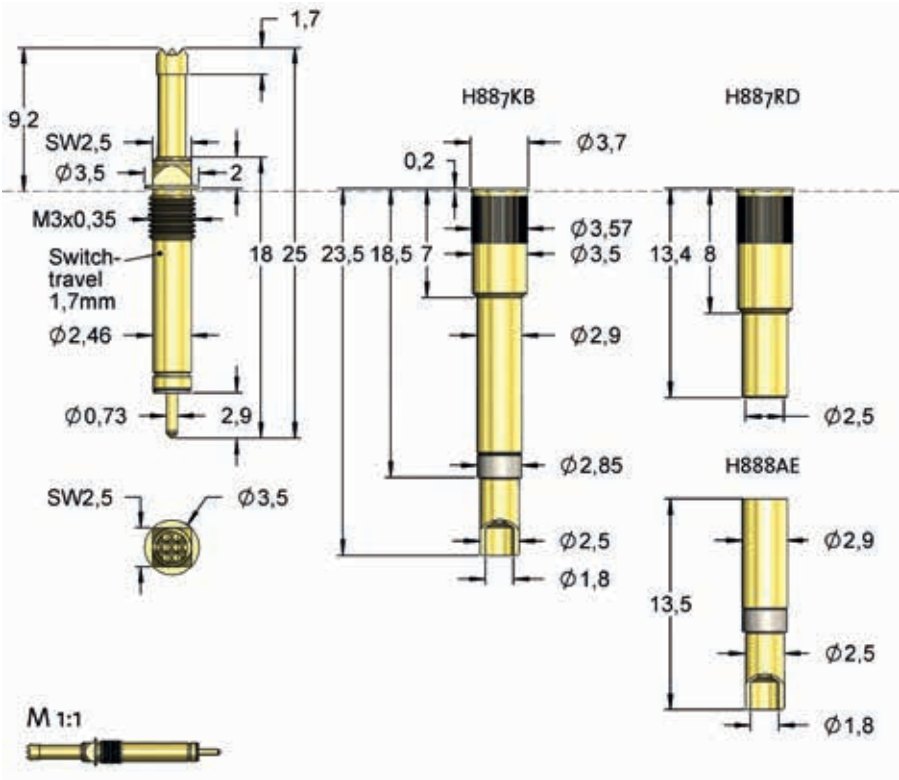
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-340E0 |
| Screw-in tool probe       | FWZVF4 (T) |

Drill Size [mm]

|                       |             |
|-----------------------|-------------|
| Receptacle with knurl | 3,50 - 3,52 |
|-----------------------|-------------|

Projection Height

|         |     |
|---------|-----|
| H887... | 9,2 |
|---------|-----|



| Type                 | Tip-Ø                        | Spring Force |
|----------------------|------------------------------|--------------|
| F 887 06 B 300 G 150 |                              |              |
| Tip Style            | Material                     | Finish       |
| Material:            | B = BeCu                     |              |
| Tip-Ø:               | 300 = 3,00 mm (e.g.)         |              |
| Finish:              | G = Gold                     |              |
| Receptacle:          | Order Code according drawing |              |
| ORDER EXAMPLE        |                              |              |

| Tip Style | Number | Material | Plating | Ø in mm       | Version |
|-----------|--------|----------|---------|---------------|---------|
|           | 06     | B        | G       | 1,0; 2,0; 3,0 | -       |
|           | 16     | B        | G       | 1,0           | -       |
|           | 17     | B        | G       | 2,0; 3,0      | -       |

# Switch Probes



## Long Travel Switch Probe 256mil, Closer (NO)

### F419

**NEW**

|                  |               |
|------------------|---------------|
| Centers (mm/mil) | 6,50 / 256    |
| Current          | 10,0 A        |
| Current (Switch) | 1,0 A         |
| Temperature      | -20°C...+80°C |
| R typically      | 20 mOhm       |

### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 200     | 400           |

### Travel (mm)

| Nominal            | Maximum  |
|--------------------|----------|
| 11,0               | 16,0     |
| Switch Travel (mm) | 2,0      |
| Thread (M)         | 4,0x0,5  |
| Wrench Size        | 5,0      |
| Pointing Accuracy  | ±0,06 mm |

### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Music wire, silver plated |
| Receptacle | Brass, Gold plated        |

### Accessories

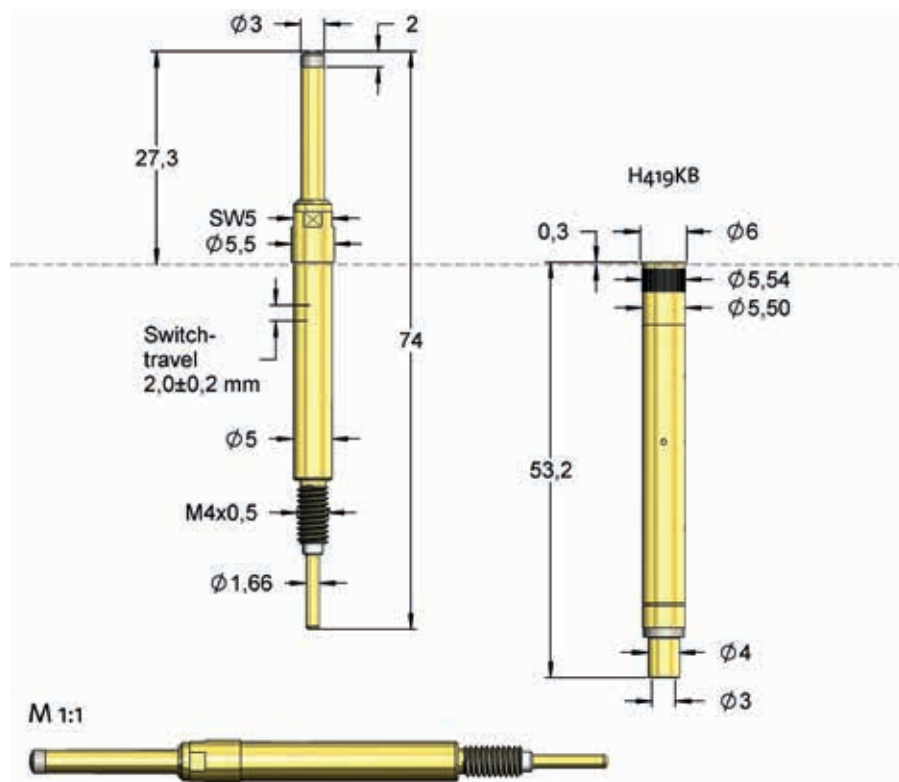
|                     |            |
|---------------------|------------|
| Screw-in tool probe | FWZ888 (T) |
|---------------------|------------|

### Drill Size [mm]

|                       |             |
|-----------------------|-------------|
| Receptacle with knurl | 5,50 - 5,54 |
|-----------------------|-------------|

### Projection Height

|        |      |
|--------|------|
| H419KB | 27,3 |
|--------|------|



| Type                 | Tip-Ø                        | Spring Force |                 |
|----------------------|------------------------------|--------------|-----------------|
| F 419 11 K 300 U 400 |                              |              |                 |
| Tip Style            | Material                     | Finish       | Special Version |
| Material:            | K = Synthetic                |              |                 |
| Tip-Ø:               | 300 = 3,0 mm (e.g.)          |              |                 |
| Finish:              | U = Unplated                 |              |                 |
| Receptacle:          | Order Code according drawing |              |                 |
| ORDER EXAMPLE        |                              |              |                 |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 11     | K        | U       | 3,0     | -       |



## Switch Probe with Ball Head Closer (NO), Threaded F88890S1101U200S05

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 7,00 / 275    |
| <b>Current</b>          | 10,0 A        |
| <b>Current (Switch)</b> | 1,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 25 mOhm       |

### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 100     | 200           |

### Travel (mm)

| Nominal            | Maximum  |
|--------------------|----------|
| 1,0                | 1,0      |
| Switch Travel (mm) | 0,5      |
| Thread (M)         | 6,0x0,75 |
| Wrench Size        | 5,0      |

### Materials and Plating

|            |                         |
|------------|-------------------------|
| Plunger    | see Tip Style           |
| Barrel     | Brass, gold plated      |
| Spring     | Music wire, gold plated |
| Receptacle | Brass, Gold plated      |

### Accessories

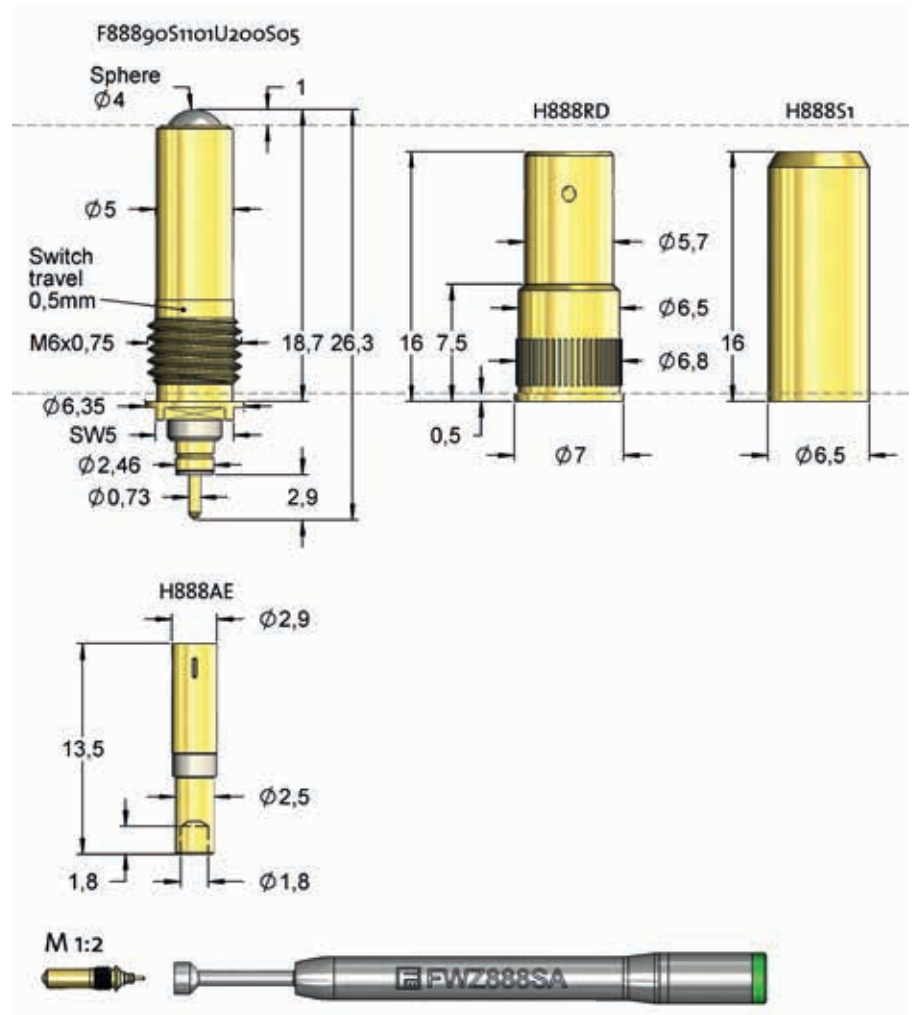
|                        |          |
|------------------------|----------|
| Screw-in tool          | FWZ888   |
| Screw-in tool with LED | FWZ888SA |
| Connecting element     | H888AE   |

### Drill Size [mm]

|                    |             |
|--------------------|-------------|
| F88890S1101U200S05 | M6x0,75     |
| H888RD             | 6,55 - 6,70 |
| H888S1             | 6,50        |

### Projection Height

|                    |     |
|--------------------|-----|
| F88890S1101U200S05 | 1,0 |
|--------------------|-----|



Due to a rolling ball as contact element probes of the family F888 are not sensitive to lateral forces. The most important application is a lateral presence test of connectors in test modules. The switch circuit is electrically isolated to the barrel.

| Type                      | Number  | Spring Force |
|---------------------------|---|--------------|
| F 888 90 S 1101 U 200 S05 |   |              |
| Tip Style                 | Material  | Finish       |
| Material:                 | S = Steel   |              |
| Number:                   |   |              |
| 1. digit:                 | 0 = switch not isolated<br>1 = switch electrically isolated<br>2 = without switch |              |
| 2. digit:                 | 0 = without thread<br>1 = with thread   |              |
| 3./4. digit:              | running number  |              |
| Finish:                   | U = unplated  |              |
| Switch travel:            | e.g. S05 = 0,5 mm   |              |
| Receptacle:               | Order-Code according drawing  |              |

ORDER EXAMPLE

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 90     | S        | U       | 4,0     | -       |



## Switch Probe with Ball Head Closer (NO), Threaded F88890S1102U100S07

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 9,00 / 354    |
| <b>Current</b>          | 10,0 A        |
| <b>Current (Switch)</b> | 1,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 25 mOhm       |

### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 70      | 100           |

### Travel (mm)

| Nominal            | Maximum |
|--------------------|---------|
| 1,5                | 1,5     |
| Switch Travel (mm) | 0,7     |
| Thread (M)         | 8,0x0,5 |
| Wrench Size        | 5,0     |

### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Stainless steel, unplated |
| Receptacle | Brass, Gold plated        |

### Accessories

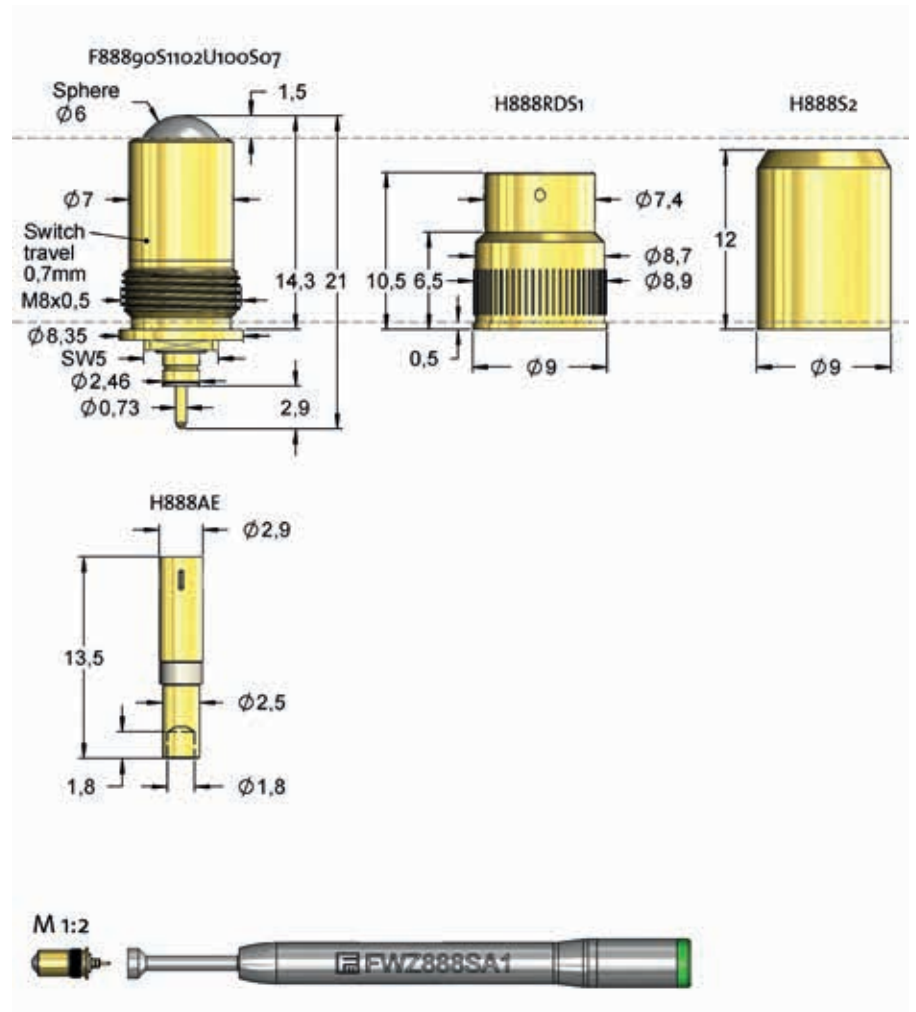
|                        |           |
|------------------------|-----------|
| Screw-in tool          | FWZ888    |
| Screw-in tool with LED | FWZ888SA1 |
| Connecting element     | H888AE    |

### Drill Size [mm]

|                    |             |
|--------------------|-------------|
| F88890S1102U100S07 | M8x0,5      |
| H888RDS1           | 8,75 - 8,85 |
| H888S2             | 9,00        |

### Projection Height

|                    |     |
|--------------------|-----|
| F88890S1102U100S07 | 1,5 |
|--------------------|-----|



Due to a rolling ball as contact element probes of the family F888 are not sensitive to lateral forces. The most important application is a lateral presence test of connectors in test modules. The switch circuit is electrically isolated to the barrel.

| Type                      | Number  | Spring Force |
|---------------------------|---|--------------|
| F 888 90 S 1102 U 100 S07 |   |              |
| Tip Style                 | Material  | Finish       |
| Material:                 | S = Steel   |              |
| Number:                   |   |              |
| 1. digit:                 | 0 = switch not isolated<br>1 = switch electrically isolated<br>2 = without switch |              |
| 2. digit:                 | 0 = without thread<br>1 = with thread   |              |
| 3./4. digit:              | running number  |              |
| Finish:                   | U = unplated  |              |
| Switch travel:            | e.g. S07 = 0,7 mm   |              |
| Receptacle:               | Order-Code according drawing  |              |
| ORDER EXAMPLE             |   |              |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 90     | S        | U       | 6,0     | -       |

## Switch Probe with Ball Head Closer (NO), Plug-in F88890S0003U100S08

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 6,50 / 256    |
| <b>Current</b>          | 10,0 A        |
| <b>Current (Switch)</b> | 1,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 25 mOhm       |

### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 70      | 100           |

### Travel (mm)

| Nominal            | Maximum |
|--------------------|---------|
| 1,4                | 1,4     |
| Switch Travel (mm) | 0,8     |

### Materials and Plating

|         |                           |
|---------|---------------------------|
| Plunger | see Tip Style             |
| Barrel  | Brass, gold plated        |
| Spring  | Stainless steel, unplated |

### Accessories

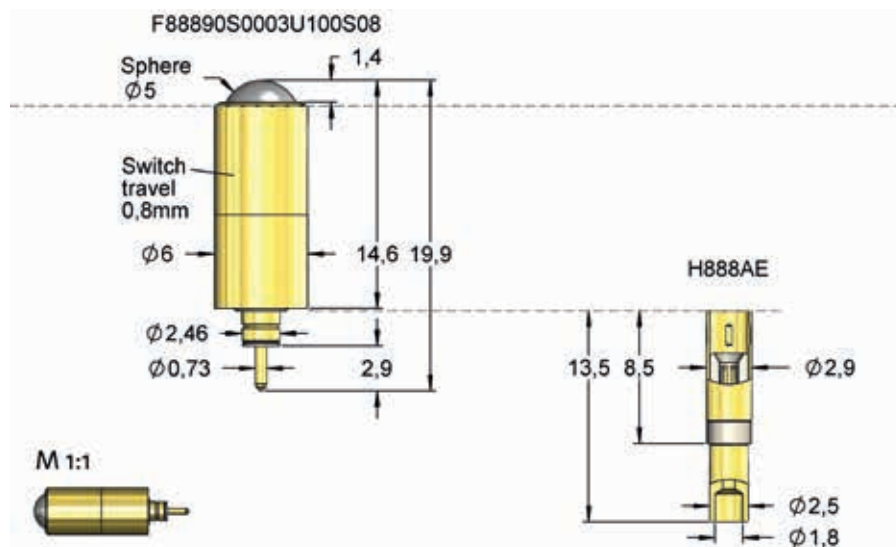
|                    |        |
|--------------------|--------|
| Connecting element | H888AE |
|--------------------|--------|

### Drill Size [mm]

|                    |      |
|--------------------|------|
| F88890S0003U100S08 | 6,00 |
|--------------------|------|

### Projection Height

|                    |     |
|--------------------|-----|
| F88890S0003U100S08 | 1,4 |
|--------------------|-----|



Due to a rolling ball as contact element probes of the family F888 are not sensitive to lateral forces. The most important application is a lateral presence test of connectors in test modules.

| Type                      | Number  | Spring Force |
|---------------------------|---|--------------|
| F 888 90 S 0003 U 100 S08 |   |              |
| Tip Style                 | Material  | Finish       |
| Material:                 | S = Steel   |              |
| Number:                   |   |              |
| 1. digit:                 | 0 = switch not isolated<br>1 = switch electrically isolated<br>2 = without switch |              |
| 2. digit:                 | 0 = without thread<br>1 = with thread   |              |
| 3./4. digit:              | running number  |              |
| Finish:                   | U = unplated  |              |
| Switch travel:            | e.g. S08 = 0,8 mm   |              |
| Receptacle:               | Order-Code according drawing  |              |

ORDER EXAMPLE

| Tip Style   | Number | Material | Plating | Ø in mm | Version |
|---|--------|----------|---------|---------|---------|
|  | 90     | S        | U       | 5,0     | -       |



## Threaded Probe with Ball Head

**NEW**

**F88890M2104G150**

|                  |                |
|------------------|----------------|
| Centers (mm/mil) | 6,00 / 236     |
| Current          | 10,0 A         |
| Temperature      | -40°C...+250°C |
| R typically      | 20 mOhm        |

### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 100     | 150           |

### Travel (mm)

| Nominal    | Maximum |
|------------|---------|
| 0,8        | 0,8     |
| Thread (M) | 5,0     |

### Materials and Plating

|         |                           |
|---------|---------------------------|
| Plunger | see Tip Style             |
| Barrel  | Brass, gold plated        |
| Spring  | Stainless steel, unplated |

### Accessories

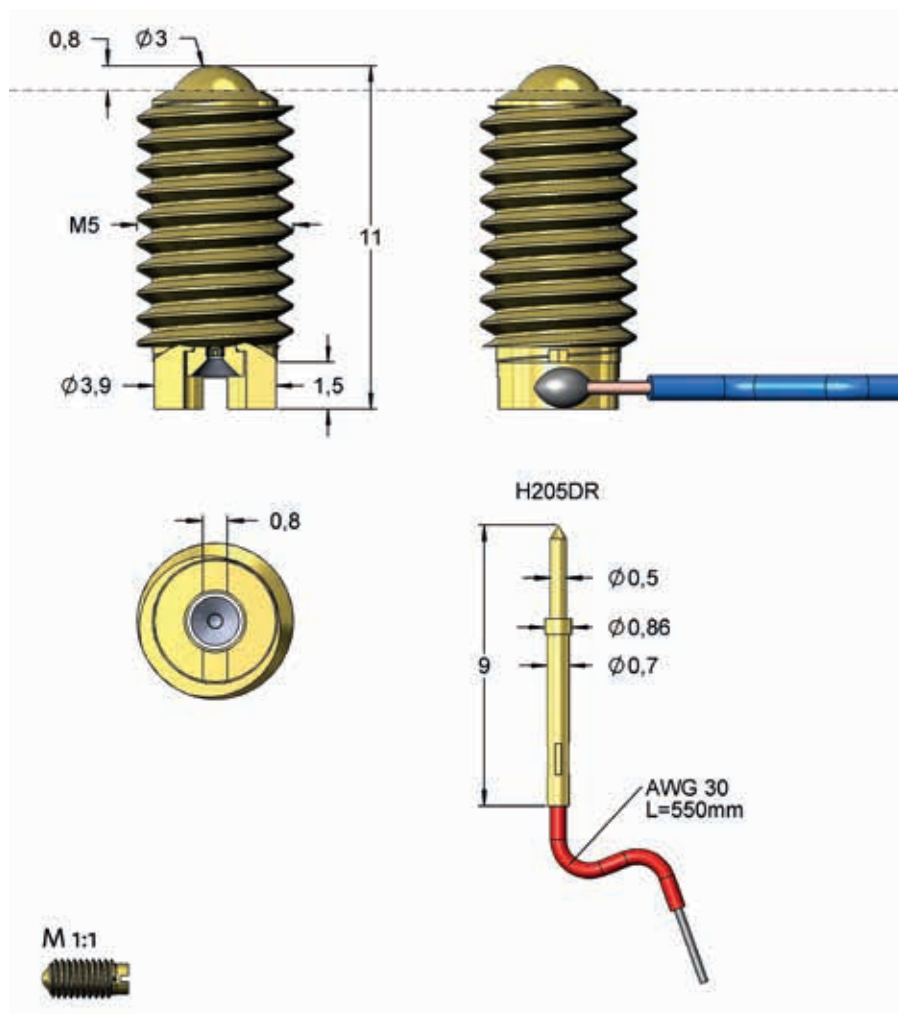
|                                       |          |
|---------------------------------------|----------|
| Screw driver                          | FWZ888S2 |
| Connecting element                    | H205DR   |
| Insertion tool for connecting element | FWZ888S1 |

### Drill Size [mm]

|                 |    |
|-----------------|----|
| F88890M2104G150 | M5 |
|-----------------|----|

### Projection Height

|                 |     |
|-----------------|-----|
| F88890M2104G150 | 0,8 |
|-----------------|-----|



Due to a rolling ball as contact element probes of the family F888 are not sensitive to lateral forces. **This special version does not include a switch.** This probe can be used like a normal spring contact probe.

| Type                 | Number  | Spring Force |
|----------------------|---|--------------|
| F888 90 M 2104 G 150 |   |              |
| Tip Style            | Material  | Finish       |
| Special Version      |   |              |
| Material:            | M = Brass   |              |
| Number:              |   |              |
| 1. digit:            | 0 = switch not isolated<br>1 = switch electrically isolated<br>2 = without switch |              |
| 2. digit:            | 0 = without thread<br>1 = with thread   |              |
| 3./4. digit:         | running number  |              |
| Finish:              | G = Gold plated   |              |
| ORDER EXAMPLE        |   |              |

| Tip Style   | Number | Material | Plating | Ø in mm | Version |
|---|--------|----------|---------|---------|---------|
|  | 90     | M        | G       | 3,0     | -       |

## Pneumatic Micro Switch Probe Closer (NO)

### F899

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 6,50 / 256    |
| <b>Current</b>          | 1,0 A         |
| <b>Current (Switch)</b> | 1,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 500 mOhm      |

#### Spring Force (cN ±20%)

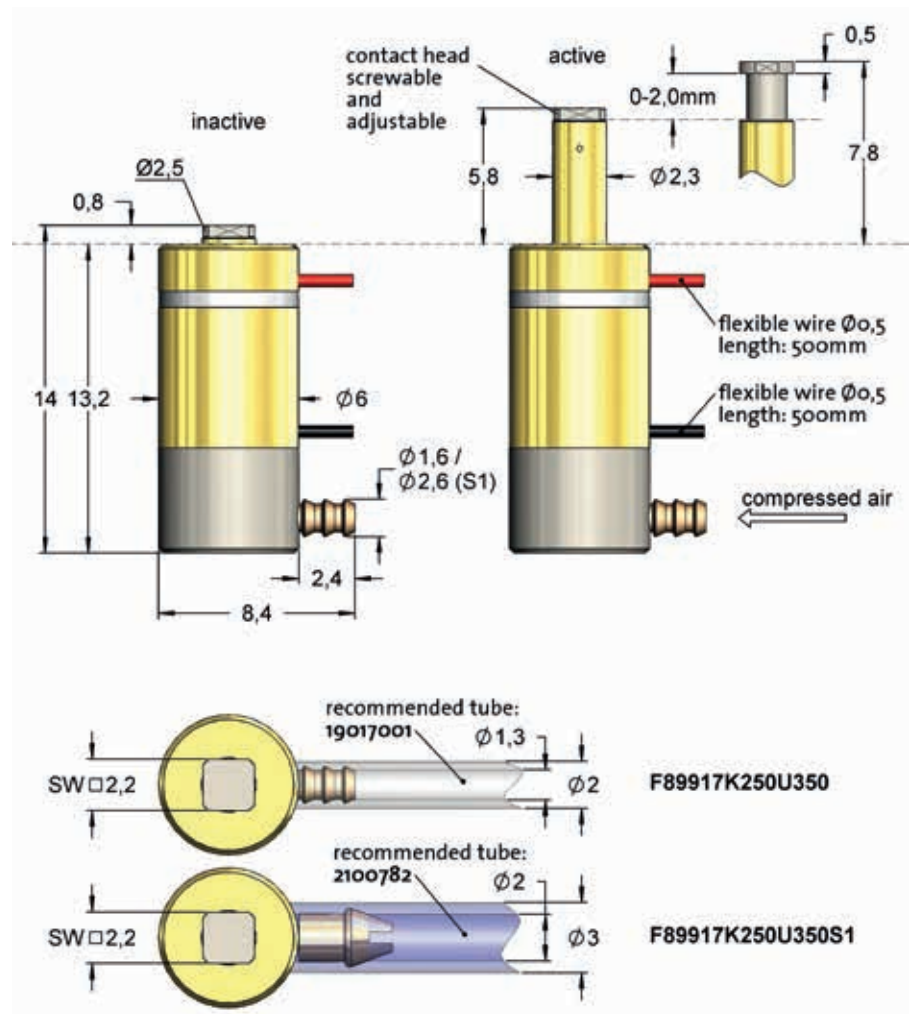
| Preload | Nominal Force |
|---------|---------------|
| 500     | 350           |

#### Travel (mm)

| Nominal            | Maximum                       |
|--------------------|-------------------------------|
| 3,8                | 5,0                           |
| Switch Travel (mm) | 3,3 - 4,3                     |
| Wrench Size        | 2,2                           |
| Operating pressure | 6 bar nominal                 |
| Operating medium   | compressed air (dry+filtered) |

#### Materials and Plating

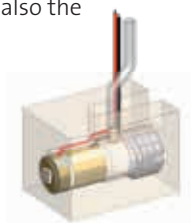
|         |                           |
|---------|---------------------------|
| Plunger | see Tip Style             |
| Barrel  | Brass, gold plated        |
| Spring  | Music wire, silver plated |



Special solution for a pneumatic presence test at limited space. An integrated switch function allows to detect the exact position of the test item.

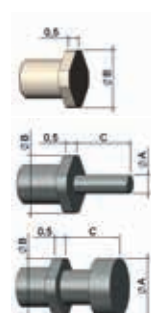
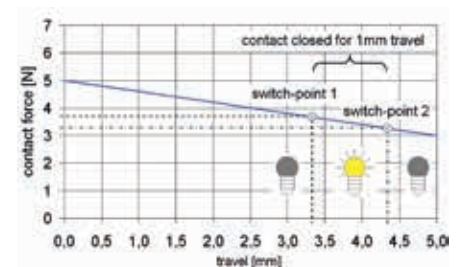
#### Switch Function for Position Test

The F899 switch function works according to an off-on-off characteristic. Therefore not only the presence, but also the correct position of a DUT can be detected.



#### Mounting and Application

For an adjustable position of the F899 in axial direction a lateral setscrew (M2, max. torque 8 cNm) can be used. For a fix and secure position the F899 can be mounted by an axial setscrew (M8).



| Order Code       | Tip Style | No.  | Pin - Ø A | Plate- Ø B | Pin-length C | Length (inactive) | Projection Height (inactive) | Screw-In-Tool |
|------------------|-----------|------|-----------|------------|--------------|-------------------|------------------------------|---------------|
| F89917K250U350*  | 17 K; U   | -    | -         | 2,50       | -            | 14,00             | 0,80                         | FWZVF3        |
| F89916M0001N350* | 16 M;N    | 0001 | 0,80      | 2,50       | 4,50         | 18,50             | 5,30                         | FWZVF3        |
| F89916M0002N350* | 16 M;N    | 0002 | 1,00      | 2,50       | 4,50         | 18,50             | 5,30                         | FWZVF3        |
| F89917M0001N350* | 17 M;N    | 0001 | 2,30      | 2,50       | 4,50         | 18,50             | 5,30                         | FWZVF3        |
| F89917M0002N350* | 17 M;N    | 0002 | 3,00      | 2,50       | 4,50         | 18,50             | 5,30                         | FWZVF3S1      |





## Twist Proof Probes

Twist proof probes are used for testing connectors and contact blades. In these applications rectangular shaped probe are needed, that move into the connector housing well aligned. The twist proof design is realized either within the probe or by mounting into a receptacle.

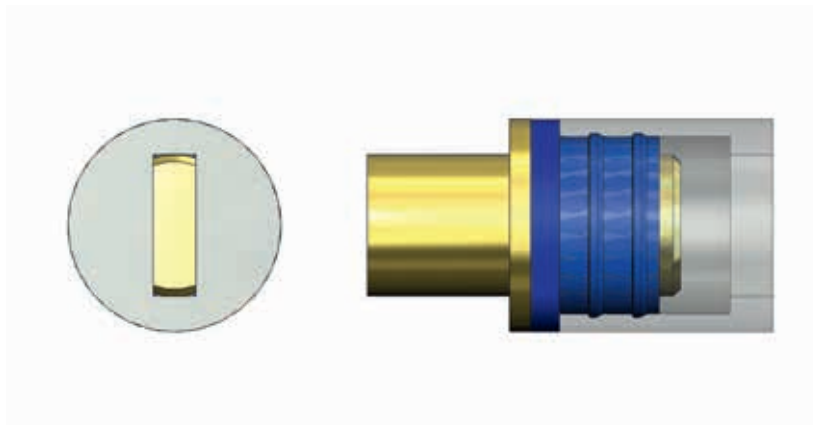
|      |     |
|------|-----|
| F751 | 151 |
| F752 | 152 |
| F754 | 153 |
| F756 | 154 |
| F760 | 155 |
| F755 | 156 |
| F755 | 157 |



## Twist proof insulating caps

For testing the correct position and alignment of flat contact elements FEINMETALL has developed a simple and effective solution. With a slotted tip style in combination with a twist proof probe flat contact elements can be tested regarding the correct length. Additionally deformed, twisted or due too false components too thick contacts can be detected.

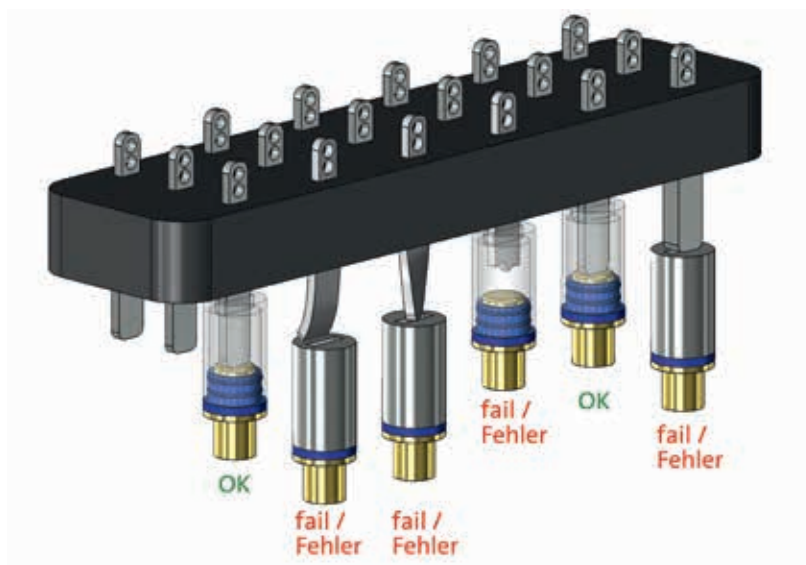
Slotted insulating caps are available for the twist proof probes F751, F756 and F760. They can be identified by the ending PT (Position Test) in the order code.



## Functional principle and application

With the new slotted insulating cap in combination with a twist proof probe the correct length as well as the correct alignment of a contact element can be tested. If flat contact elements are deformed, twisted or too thick, the insulating cap goes solid and does not establish an electrical connection. Only if length, alignment and shape of the contact is ok, the insulating cap can be moved over the contact element and an electrical contact to the test item is established.

This method allows to detect a great variety of failures reliably and in a very simple way.



# Twist Proof Probes



## Twist Proof Probe 87 mil Threaded

**NEW**

### F751

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 2,20 / 87     |
| <b>Current</b>          | 5,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 50 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 30      | 150           |

#### Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 4,0               | 5,0      |
| Thread (M)        | 1,4      |
| Wrench Size       | 1,4      |
| Pointing Accuracy | ±0,08 mm |

#### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Music wire, silver plated |
| Receptacle | Brass, Gold plated        |

#### Accessories

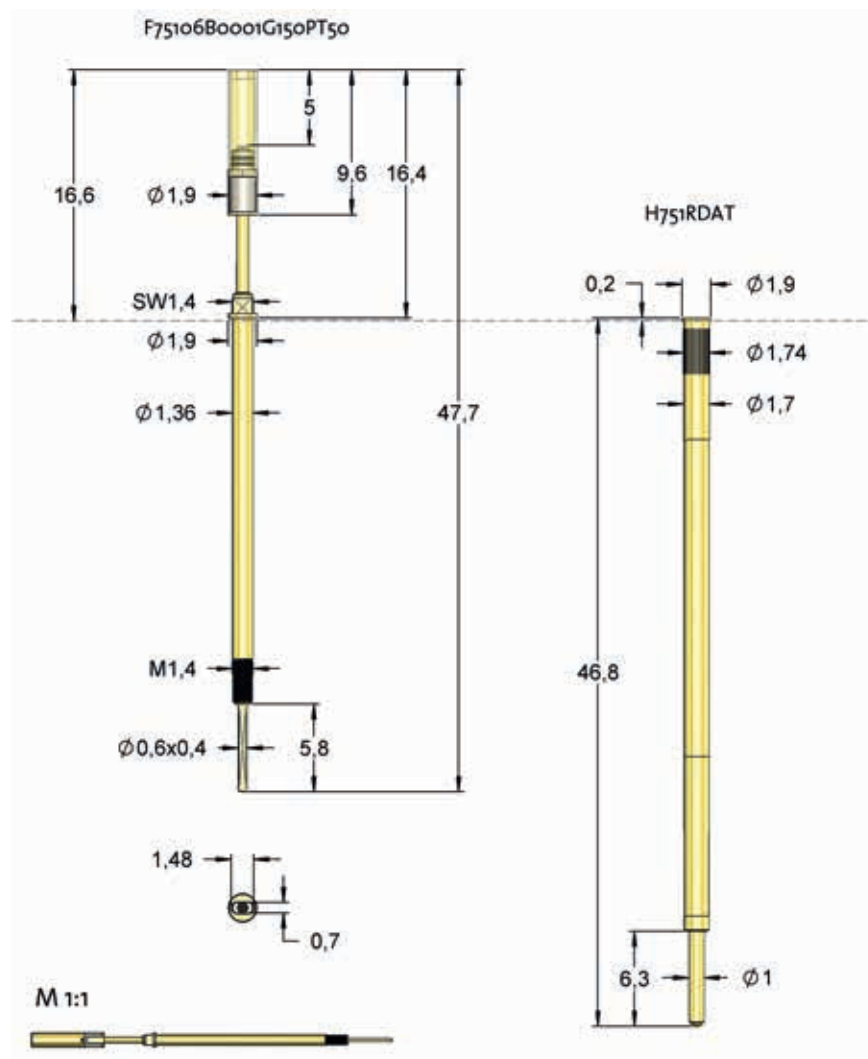
|                           |           |
|---------------------------|-----------|
| Alignment tool receptacle | FAWZ751   |
| Screw-in tool probe       | FWZ731(T) |

#### Drill Size [mm]

|          |             |
|----------|-------------|
| H751RDAT | 1,70 - 1,72 |
|----------|-------------|

#### Projection Height

|          |      |
|----------|------|
| H751RDAT | 16,6 |
|----------|------|



Further information about F75106B0001G150PT50 with twist-proof insulating cap see applications on page 150.

| Type             | number                         | Spring Force      |
|------------------|--------------------------------|-------------------|
| F 751            | 06                             | B 0001 G 150 PT50 |
| Tip Style        | Material                       | Finish            |
| Material:        | B = BeCu                       |                   |
| number:          | see table                      |                   |
| Finish:          | G = Gold plated                |                   |
| Special Version: | PT = Twist proof insulated cap |                   |
| Receptacle:      | Order Code according drawing   |                   |
| ORDER EXAMPLE    |                                |                   |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 06     | B        | G       | 1,90    | PT      |

# Twist Proof Probes

## Twist Proof Probe 100 mil Plug-in

### F752

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 2,54 / 100    |
| <b>Current</b>          | 3,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 30 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 50      | 150           |
| 50      | 300           |

#### Travel (mm)

| Nominal           | Maximum |
|-------------------|---------|
| 4,0               | 5,0     |
| Pointing Accuracy | ±0,1 mm |

#### Materials and Plating

|            |                         |
|------------|-------------------------|
| Plunger    | see Tip Style           |
| Barrel     | Brass, gold plated      |
| Spring     | Music wire, gold plated |
| Receptacle | Brass, Gold plated      |

#### Accessories

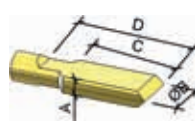
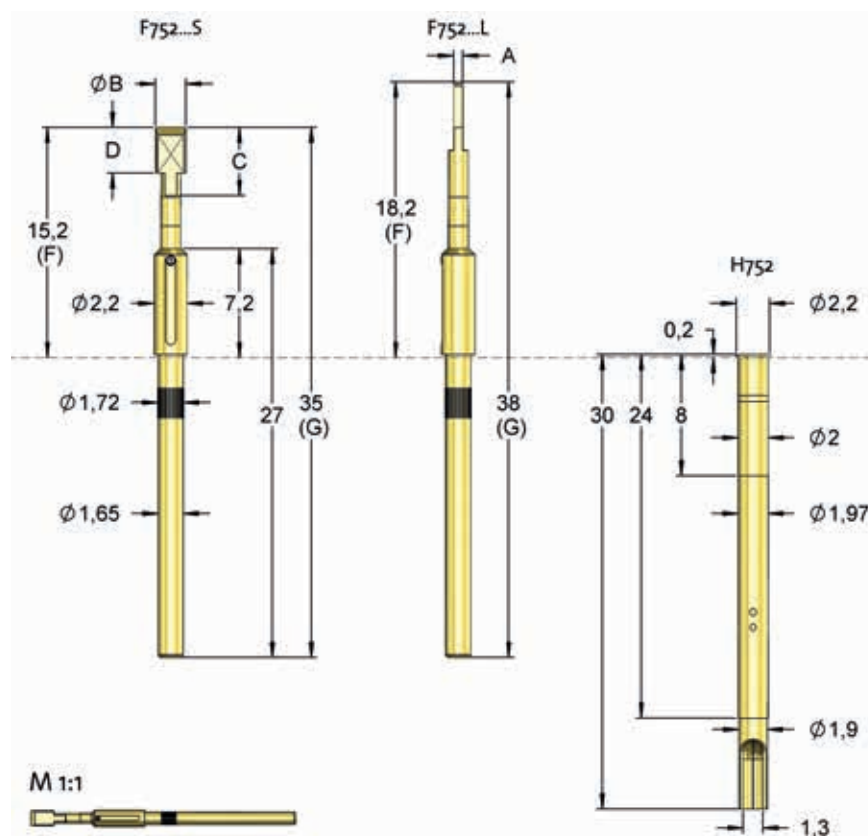
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-772E0 |
|---------------------------|------------|

#### Drill Size [mm]

|      |             |
|------|-------------|
| F752 | 1,66        |
| H752 | 1,99 - 2,00 |

#### Projection Height

|                 |      |
|-----------------|------|
| (F752...S) H752 | 15,2 |
| (F752...L) H752 | 18,2 |



| Type                    | number                              | Spring Force |
|-------------------------|-------------------------------------|--------------|
| F 752 84 S 0004 L 150 L |                                     |              |
| Tip Style               | Material                            | Finish       |
| Material:               | S = Steel                           |              |
| number:                 | see table                           |              |
| Finish:                 | L = Longtime Gold plated            |              |
| Special Version:        | S = Short Version, L = Long Version |              |
| Receptacle:             | Order Code according drawing        |              |
| ORDER EXAMPLE           |                                     |              |

| Tip Style | Number | A   | B   | C   | D   | E | F    | G    | Version |
|-----------|--------|-----|-----|-----|-----|---|------|------|---------|
| 84        | 0003   | 1,0 | 2,0 | 4,5 | 3,0 | - | 15,2 | 35,0 | -       |
| 84        | 0004   | 0,5 | 2,0 | 8,0 | 6,0 | - | 18,2 | 38,0 | -       |
| 84        | 0005   | 0,5 | 1,5 | 7,5 | 6,0 | - | 18,2 | 38,0 | -       |

# Twist Proof Probes



## Twist Proof Probe 177 mil Plug-in

### F754

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 4,50 / 177    |
| <b>Current</b>          | 10,0 A        |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 20 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 30      | 150           |
| 80      | 300           |

#### Travel (mm)

| Nominal           | Maximum |
|-------------------|---------|
| 4,0               | 4,5     |
| Pointing Accuracy | ±0,1 mm |

#### Materials and Plating

|            |                         |
|------------|-------------------------|
| Plunger    | see Tip Style           |
| Barrel     | Brass, gold plated      |
| Spring     | Music wire, gold plated |
| Receptacle | Brass, Gold plated      |

#### Accessories

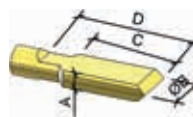
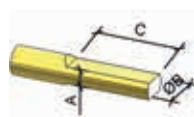
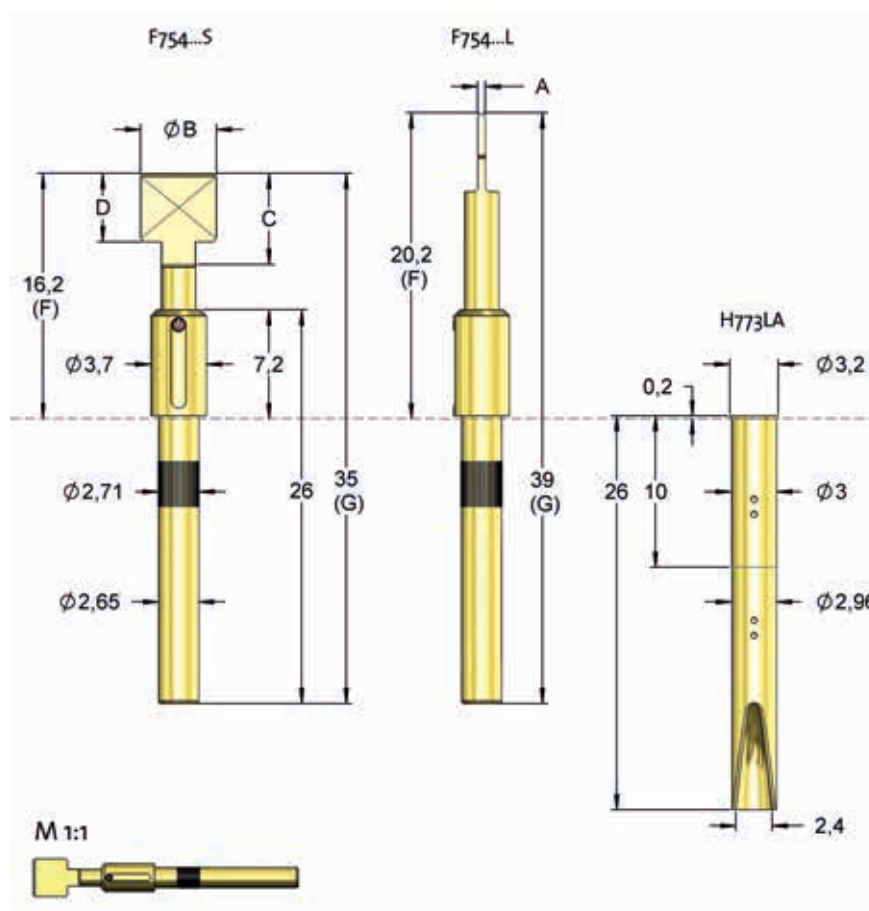
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-774E0 |
|---------------------------|------------|

#### Drill Size [mm]

|        |             |
|--------|-------------|
| F754   | 2,66        |
| H773LA | 2,98 - 2,99 |

#### Projection Height

|                   |      |
|-------------------|------|
| (F754...S) H773LA | 16,2 |
| (F754...L) H773LA | 20,2 |



| Type                    | number                              | Spring Force |
|-------------------------|-------------------------------------|--------------|
| F 754 84 B 0002 G 150 S |                                     |              |
| Tip Style               | Material                            | Finish       |
| Material:               | B = BeCu                            |              |
| number:                 | see table                           |              |
| Finish:                 | G = Gold                            |              |
| Special Version:        | S = Short Version, L = Long Version |              |
| Receptacle:             | Order Code according drawing        |              |

ORDER EXAMPLE

| Tip Style | Number | A    | B   | C   | D   | E | F    | G    | Version |
|-----------|--------|------|-----|-----|-----|---|------|------|---------|
| 82        | 0001   | 0,65 | 2,3 | 6,0 | -   | - | 20,2 | 39,0 | -       |
| 84        | 0001   | 1,0  | 5,0 | 4,5 | 3,0 | - | 16,2 | 35,0 | -       |
| 84        | 0002   | 1,0  | 4,0 | 6,0 | 3,0 | - | 16,2 | 35,0 | -       |
| 84        | 0003   | 0,5  | 5,0 | 5,0 | 3,0 | - | 20,2 | 39,0 | -       |
| 84        | 0004   | 0,65 | 4,0 | 6,0 | 3,0 | - | 20,2 | 39,0 | -       |
| 84        | 0005   | 0,4  | 5,0 | 7,5 | 4,5 | - | 20,2 | 39,0 | -       |
| 84        | 0006   | 1,0  | 5,0 | 6,0 | 4,5 | - | 16,2 | 35,0 | -       |
| 84        | 0007   | 1,0  | 7,0 | 6,0 | 4,5 | - | 16,2 | 35,0 | -       |

# Twist Proof Probes

## Twist Proof Probe 100 mil with optional switch function

### F756

|                         |                |
|-------------------------|----------------|
| <b>Centers (mm/mil)</b> | 2,54 / 100     |
| <b>Current</b>          | 5,0 A          |
| <b>Temperature</b>      | -40°C...+250°C |
| <b>R typically</b>      | 30 mOhm        |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 60      | 150           |
| 100     | 300           |

#### Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 4,0               | 4,4      |
| Thread (M)        | 1,6      |
| Wrench Size       | 1,7      |
| Pointing Accuracy | ±0,08 mm |

#### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Stainless steel, unplated |
| Receptacle | Brass, Gold plated        |

#### Accessories

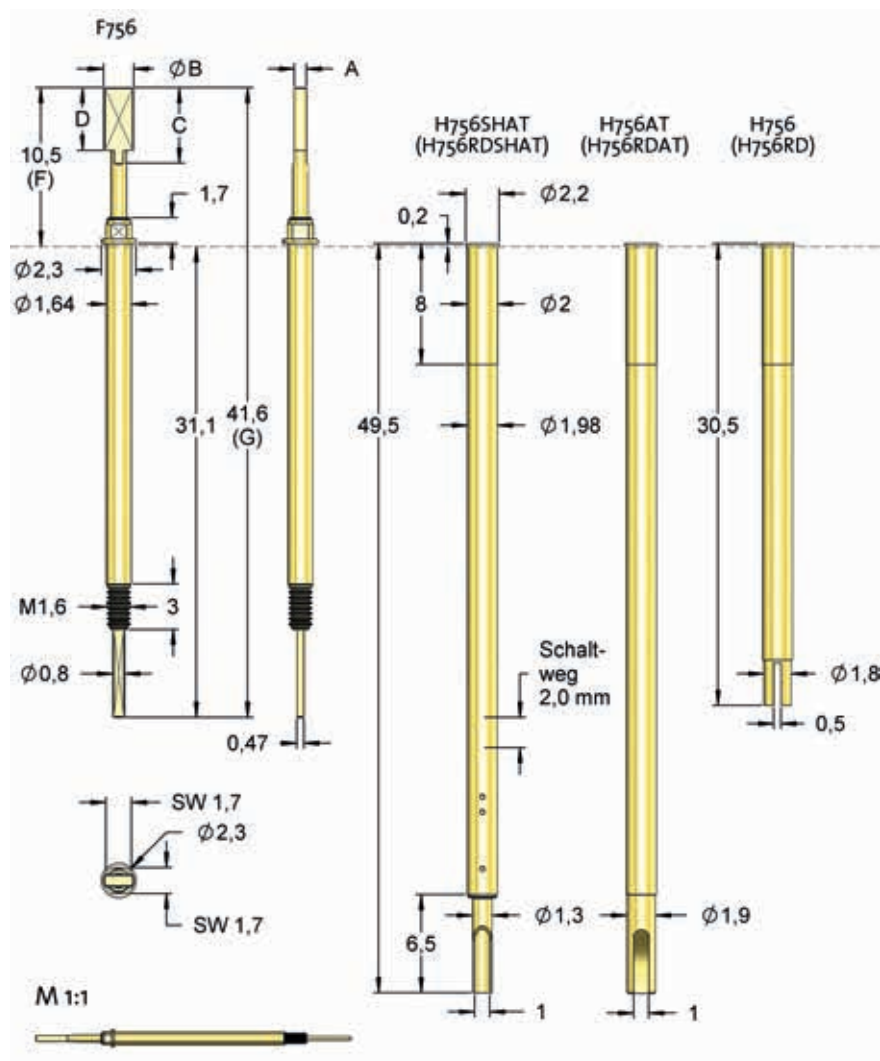
|                           |            |
|---------------------------|------------|
| Alignment tool receptacle | FAWZ756    |
| Screw-in tool probe       | FWZ732 (T) |

#### Drill Size [mm]

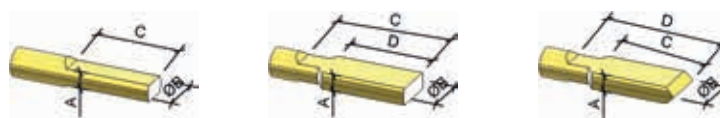
|      |             |
|------|-------------|
| H756 | 1,99 - 2,00 |
|------|-------------|

#### Projection Height

|         |      |
|---------|------|
| H756... | 10,5 |
|---------|------|



Further information about F75684B0007G080PT with twist-proof insulating cap see applications on page 150.



| Type                     | Number   | Spring Force |
|--------------------------|--|--------------|
| F 756 84 B 0007 G 080 PT |  |              |
| Tip Style                | Material   | Finish       |
| Material:                | B = BeCu   |              |
| Number:                  | see table  |              |
| Finish:                  | G = Gold   |              |
| Special Version:         | H = High Temperature Version, PT = Twist proof insulated cap |              |
| Receptacle:              | Order Code according drawing                                 |              |
| ORDER EXAMPLE            |  |              |

| Tip Style | Number | A    | B   | C    | D    | E | F    | G    | Version  |
|-----------|--------|------|-----|------|------|---|------|------|----------|
| 82        | 0001   | 0,45 | 1,1 | 5,0  | -    | - | 10,5 | 41,6 | -        |
| 84        | 0001   | 0,5  | 1,5 | 5,0  | 4,15 | - | 10,5 | 41,6 | -        |
| 84        | 0003   | 0,8  | 2,0 | 5,0  | 4,15 | - | 10,5 | 41,6 | -        |
| 84        | 0004   | 1,0  | 1,5 | 4,15 | 4,15 | - | 10,5 | 41,6 | -        |
| 84        | 0006   | 0,8  | 2,0 | 5,0  | 4,15 | - | 10,5 | 41,6 | mit Fase |



# Twist Proof Probes



## Twist Proof Probe 138 mil with optional switch function

### F760

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 3,50 / 138    |
| <b>Current</b>          | 10,0 A        |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 25 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 50      | 150           |
| 80      | 300           |
| 100     | 400           |

#### Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 4,0               | 5,0      |
| Thread (M)        | 2,5      |
| Wrench Size       | 2,6      |
| Pointing Accuracy | ±0,08 mm |

#### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Music wire, silver plated |
| Receptacle | Brass, Gold plated        |

#### Accessories

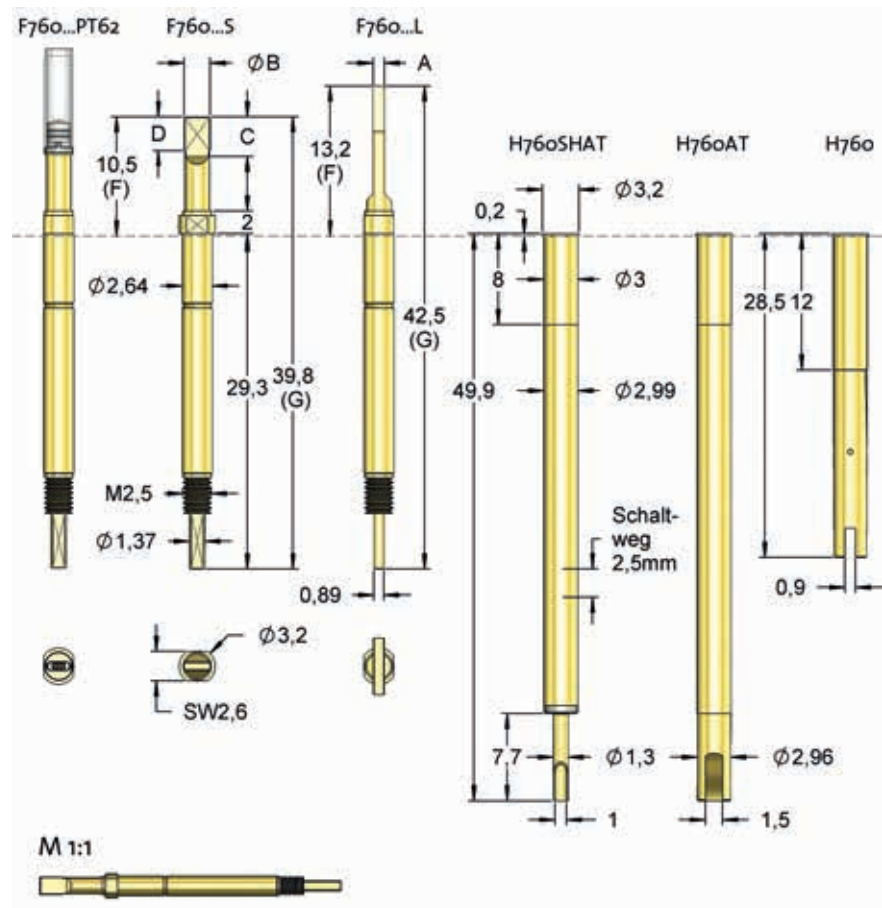
|                           |                          |
|---------------------------|--------------------------|
| Alignment tool receptacle | FAWZ761                  |
| Screw-in tool probe       | FWZ760S1<br>max. Ø4,0 mm |
| Screw-in tool probe       | FWZ760S2<br>max. Ø4,9 mm |

#### Drill Size [mm]

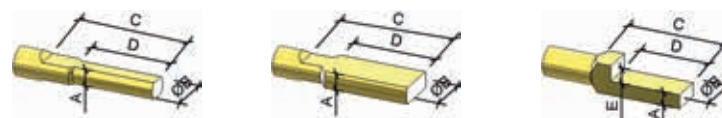
|      |            |
|------|------------|
| H760 | 2,98- 2,99 |
|------|------------|

#### Projection Height

|                    |      |
|--------------------|------|
| (F760...S) H760... | 10,5 |
| (F760...L) H760... | 13,2 |



Further information about F76006B0001G300PT62 with twist-proof insulating cap see applications on page 150.



| Type                       | Number  | Spring Force           |
|----------------------------|---|------------------------|
| F 760 06 B 0001 G 300 PT62 |   |                        |
| Tip Style                  | Material  | Finish Special Version |
| Material:                  | B = BeCu  |                        |
| Number:                    | see table   |                        |
| Finish:                    | G = Gold  |                        |
| Special Version:           | S = Short Version, L = Long Version, PT = Twist proof insulated cap |                        |
| Receptacle:                | Order Code according drawing  |                        |
| ORDER EXAMPLE              |   |                        |

| Tip Style | Number | A    | B   | C    | D    | E   | F    | G    | Version |
|-----------|--------|------|-----|------|------|-----|------|------|---------|
| 81        | 0001   | 0,80 | 2,0 | 5,0  | 4,15 | -   | 10,5 | 39,8 | -       |
| 81        | 0002   | 0,6  | 1,5 | 9,5  | 6,0  | -   | 13,2 | 42,5 | -       |
| 84        | 0001   | 0,5  | 2,8 | 9,5  | 6,0  | -   | 13,2 | 42,5 | -       |
| 84        | 0002   | 0,8  | 2,5 | 9,5  | 4,0  | -   | 13,2 | 42,5 | -       |
| 84        | 0003   | 0,8  | 2,3 | 3,5  | 3,0  | -   | 10,5 | 39,8 | -       |
| 84        | 0004   | 1,0  | 5,0 | 9,5  | 4,0  | -   | 13,2 | 42,5 | -       |
| 84        | 0005   | 1,0  | 5,0 | 15,5 | 10,0 | -   | 19,2 | 48,5 | -       |
| 84        | 0006   | 0,8  | 2,8 | 9,5  | 6,0  | -   | 21,2 | 50,5 | -       |
| 86        | 0001   | 0,5  | 3,0 | 6,0  | 2,7  | 2,3 | 13,2 | 42,5 | -       |

# Twist Proof Probes

## Twist Proof Probe 177 mil Threaded

### F755

|                         |                |
|-------------------------|----------------|
| <b>Centers (mm/mil)</b> | 4,50 / 177     |
| <b>Current</b>          | 10,0 A         |
| <b>Temperature</b>      | -40°C...+250°C |
| <b>R typically</b>      | 30 mOhm        |

### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 70      | 150           |
| 90      | 300           |
| 120     | 500           |

### Travel (mm)

| Nominal           | Maximum |
|-------------------|---------|
| 5,6               | 7,0     |
| Thread (M)        | 2,5     |
| Wrench Size       | 3,0     |
| Pointing Accuracy | ±0,1 mm |

### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Stainless steel, unplated |
| Receptacle | Brass, Gold plated        |

### Accessories

|   |   |
|---|---|
| Insertion tool receptacle (not twist proof) | FEWZ-755E0                                |
| Alignment tool receptacle                   | FAWZVF4                                   |
| Screw-in tool probe                         | FWZ733S1 (T1)<br>max. Ø3,0 mm             |
| Screw-in tool probe                         | FWZ886S1 (T1)<br>> Ø3,1 mm<br>mit Schlitz |

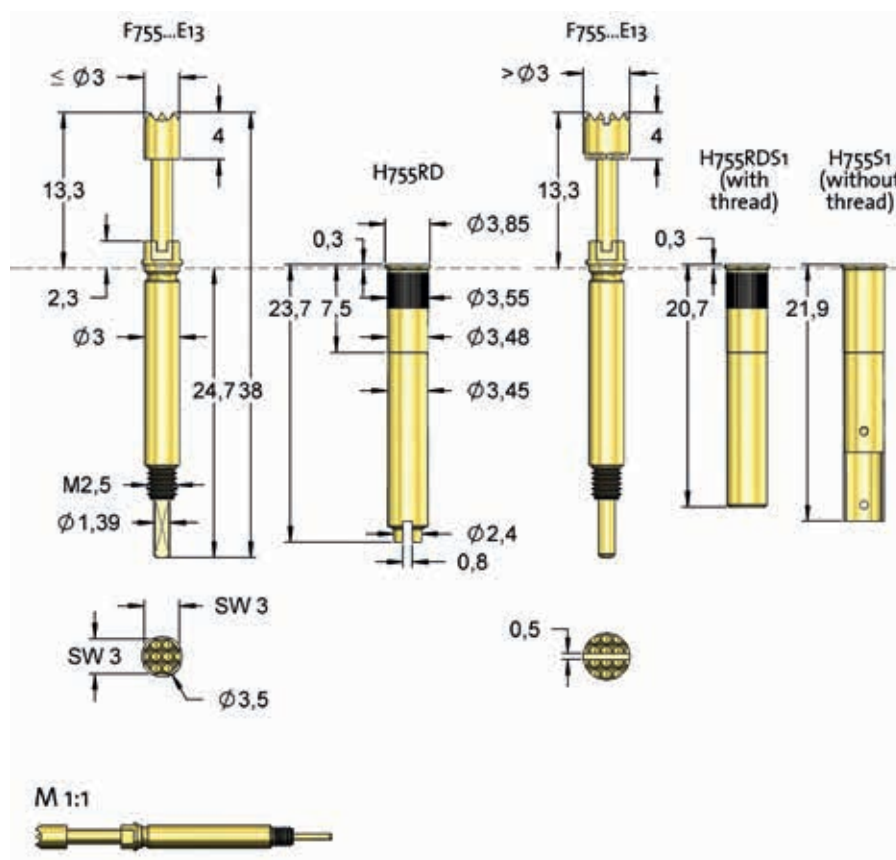
### Drill Size [mm]

|                          |             |
|--------------------------|-------------|
| Receptacle without knurl | 3,48 - 3,49 |
| Receptacle with knurl    | 3,48 - 3,52 |

### Projection Height

|                      |      |
|----------------------|------|
| (F755...E13) H755... | 13,3 |
| (F755...E15) H755... | 15,3 |
| (F755...E18) H755... | 18,3 |

| Type  | Tip-Ø                                | Spring Force |
|---|--------------------------------------|--------------|
| F 755 06 B 400 G 300 E13  |                                      |              |
| Tip Style   | Material                             | Finish       |
| Material:   | B = BeCu                             |              |
| Tip-Ø:  | 400 = 4,0 mm (e.g.)                  |              |
| Finish:   | G = Gold                             |              |
| Special Version:  | E13 = Projection Height 13 mm (e.g.) |              |
| Receptacle:   | Order Code according drawing         |              |
| At the Order Code of spade versions you will find a number instead of the coded tip-Ø. This number shows in the table the belonging spade dimensions. |                                      |              |
| ORDER EXAMPLE   |                                      |              |



Probes with tip diameter up to 3.0 mm are twist-proof. Larger diameters are not twist-proof.

| Tip Style | Number | Material | Plating | Ø in mm | Version  |
|-----------|--------|----------|---------|---------|----------|
|           | 06     | B        | G       | 3,0     | E13, E15 |
|           | 06     | B        | G       | 4,0     | E13      |
|           | 14     | B        | G       | 3,0     | E13      |
|           | 18     | B        | G       | 1,8     | E13      |

# Twist Proof Probes



## Twist Proof Probe 177 mil Threaded

### F755

|                         |                |
|-------------------------|----------------|
| <b>Centers (mm/mil)</b> | 4,50 / 177     |
| <b>Current</b>          | 10,0 A         |
| <b>Temperature</b>      | -40°C...+250°C |
| <b>R typically</b>      | 30 mOhm        |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 70      | 150           |
| 90      | 300           |
| 120     | 500           |

#### Travel (mm)

| Nominal           | Maximum |
|-------------------|---------|
| 5,6               | 7,0     |
| Thread (M)        | 2,5     |
| Wrench Size       | 3,0     |
| Pointing Accuracy | ±0,1 mm |

#### Materials and Plating

|            |                           |
|------------|---------------------------|
| Plunger    | see Tip Style             |
| Barrel     | Brass, gold plated        |
| Spring     | Stainless steel, unplated |
| Receptacle | Brass, Gold plated        |

#### Accessories

|   |   |
|---|---|
| Insertion tool receptacle (not twist proof) | FEWZ-755E0                                |
| Alignment tool receptacle                   | FAWZVF4                                   |
| Screw-in tool probe                         | FWZ733S1 (T1)<br>max. Ø3,0 mm             |
| Screw-in tool probe                         | FWZ886S1 (T1)<br>> Ø3,1 mm<br>mit Schlitz |

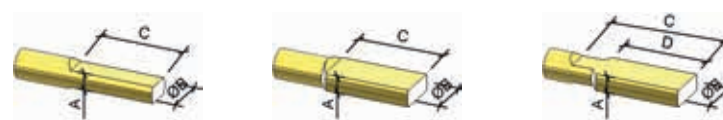
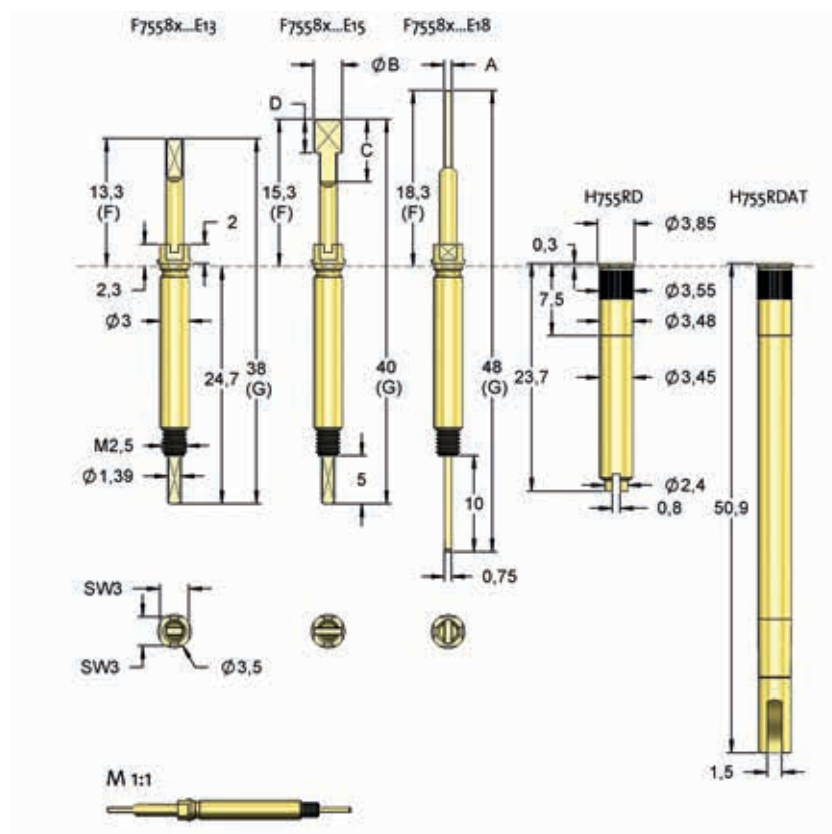
#### Drill Size [mm]

|                          |             |
|--------------------------|-------------|
| Receptacle without knurl | 3,48 - 3,49 |
| Receptacle with knurl    | 3,48 - 3,52 |

#### Projection Height

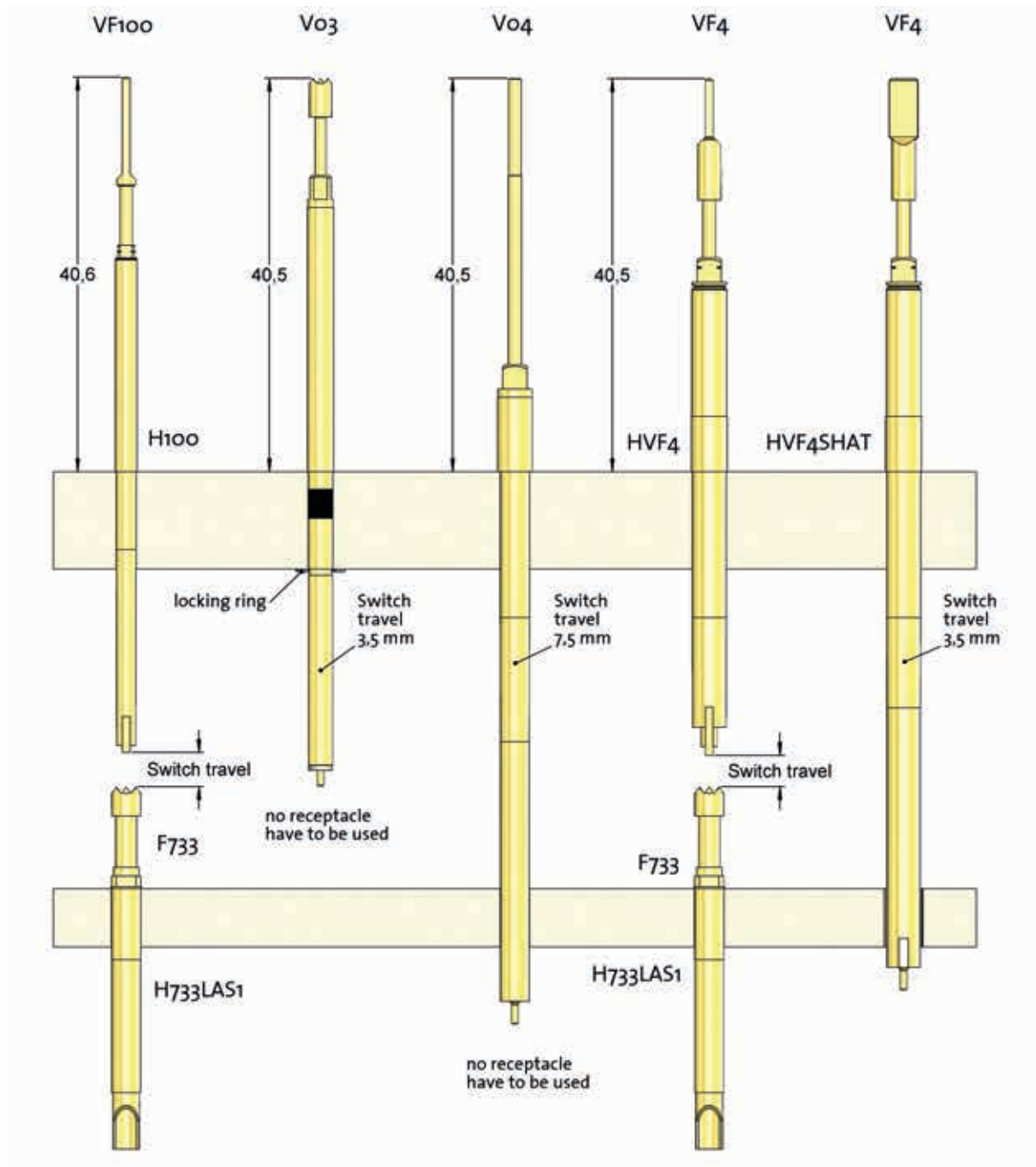
|                      |      |
|----------------------|------|
| (F755...E13) H755... | 13,3 |
| (F755...E15) H755... | 15,3 |
| (F755...E18) H755... | 18,3 |

| Type  | Tip-Ø                                | Spring Force |
|---|--------------------------------------|--------------|
| F755 06 B 400 G 300 E13   |                                      |              |
| Tip Style   | Material                             | Finish       |
| Material:   | B = BeCu                             |              |
| Tip-Ø:  | 400 = 4,0 mm (e.g.)                  |              |
| Finish:   | G = Gold                             |              |
| Special Version:  | E13 = Projection Height 13 mm (e.g.) |              |
| Receptacle:   | Order Code according drawing         |              |
| At the Order Code of spade versions you will find a number instead of the coded tip-Ø. This number shows in the table the belonging spade dimensions. |                                      |              |
| ORDER EXAMPLE   |                                      |              |



| Tip Style | Number | A   | B   | C   | D   | E | F    | G    | Version |
|-----------|--------|-----|-----|-----|-----|---|------|------|---------|
| 82        | 0001   | 0,8 | 1,8 | 4,0 | -   | - | 13,2 | 38,0 | E13     |
| 82        | 0002   | 0,5 | 1,8 | 4,0 | -   | - | 13,2 | 38,0 | E13     |
| 83        | 0001   | 0,8 | 2,5 | 8,0 | -   | - | 18,2 | 48,0 | E18     |
| 84        | 0001   | 0,7 | 3,0 | 6,5 | 3,5 | - | 15,2 | 40,0 | E15     |
| 84        | 0002   | 0,4 | 2,8 | 6,0 | -   | - | 15,2 | 40,0 | E15     |
| 84        | 0003   | 0,4 | 5,2 | 6,0 | -   | - | 15,2 | 40,0 | E15     |

## Typical probe combination for push back tests



## Threaded probes for push back tests of wire harnesses and connectors

Push back probes are used for testing wire harnesses and connectors. FEINMETALL push back probes provide a great variety of tip styles and spring forces as well as further advantages.

### Selection of variable and fix switch points

The modular design of FEINMETALL push back probes enables a separate exchange of switch element and push back probe. This is a great economical advantage. The picture shows different combinations of probes at different levels.

#### Note

In case of connecting several probes in series the resulting spring force is the sum of the single spring forces.



## Push Back Probes

During the push back test of connectors the tight seat of the connector elements is verified. For this application contact probes with very high spring forces are used.

|              |            |
|--------------|------------|
| <b>VF100</b> | <b>160</b> |
| <b>VF3</b>   | <b>161</b> |
| <b>V03</b>   | <b>162</b> |
| <b>VF4</b>   | <b>163</b> |
| <b>V04</b>   | <b>164</b> |



## Push Back Probes

### Push Back Probe 100 mil

# VF100

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 2,54 / 100    |
| <b>Current</b>          | 5,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 30 mOhm       |

**Spring Force (cN  $\pm 20\%$ )**

| Preload | Nominal Force |
|---------|---------------|
| 80      | 500           |
| 80      | 1000          |
| 120     | 1500          |

## Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 5,0               | 5,5      |
| Thread (M)        | 2,0x0,25 |
| Wrench Size       | 1,8      |
| Pointing Accuracy | ±0,1 mm  |

## Materials and Plating

|            |                         |
|------------|-------------------------|
| Plunger    | see Tip Style           |
| Barrel     | Brass, gold plated      |
| Spring     | Music wire, gold plated |
| Receptable | Brass, Gold plated      |

## Accessories

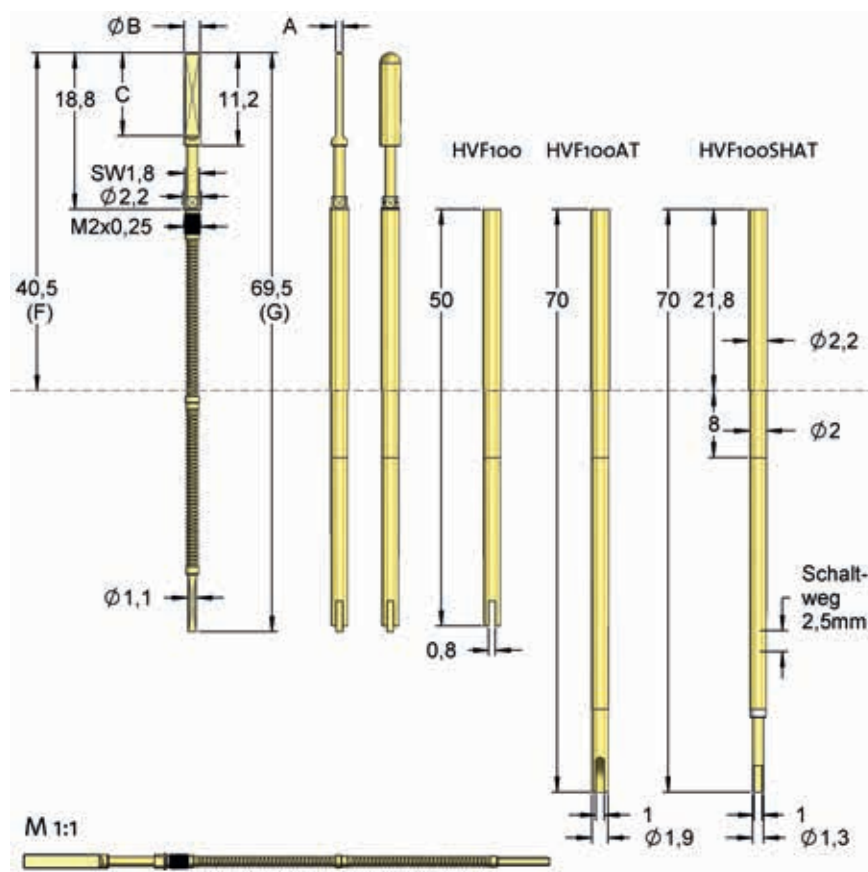
|                           |                                 |
|---------------------------|---------------------------------|
| Insertion tool receptacle | FEWZ-VF100E0                    |
| Screw-in tool probe       | FWZVF100 (T)<br>max. Ø2,0 mm    |
| Screw-in tool probe       | FWZVF100S1 (T1)<br>max. Ø2.7 mm |







## Drill Size [mm]

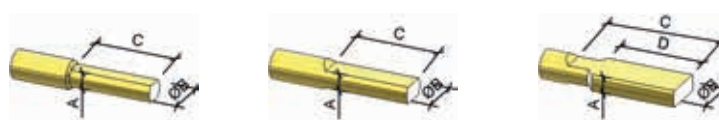
|        |             |
|--------|-------------|
| HVF100 | 1,99 - 2,00 |
|--------|-------------|

### Projection Height

|           |      |
|-----------|------|
| HVF100... | 40,5 |
|-----------|------|



| Tip Style   | Number | Material | Plating | Ø in mm | Version |
|---|--------|----------|---------|---------|---------|
|  | 05     | B        | G       | 1,9     | -       |
|  | 05     | B        | G       | 2,2     | -       |
|  | 11     | B        | G       | 1,2     | -       |
|  | 12     | B        | G       | 2,5     | -       |
|  | 17     | B        | G       | 1,5     | -       |
|  | 17     | B        | G       | 1,8     | -       |



| Type             | Tip-Ø                              | Spring Force (N) |                 |   |    |
|------------------|------------------------------------|------------------|-----------------|---|----|
| VF100            | 17                                 | B                | 180             | G | 15 |
| Tip Style        | Material                           | Finish           | Special Version |   |    |
| Material:        | B = BeCu, S = Steel                |                  |                 |   |    |
| Head-Ø:          | 180 = 1,8 mm (e.g.)                |                  |                 |   |    |
| Finish:          | G = Gold, L = Longtime Gold plated |                  |                 |   |    |
| Special Version: | L = Long Version                   |                  |                 |   |    |
| Receptacle:      | Order Code according drawing       |                  |                 |   |    |

At the Order Code of spade versions you will find a number instead of the coded tip-Ø. This number shows in the table the belonging spade dimensions.

ORDER EXAMPLE

| Tip Style | Number | A    | B   | C    | D   | E | F    | G    | Version |
|-----------|--------|------|-----|------|-----|---|------|------|---------|
| 80        | 0001   | 0,5  | 1,6 | 10,0 | -   | - | 40,5 | 69,5 | -       |
| 82        | 0001   | 0,3  | 1,9 | 10,0 | -   | - | 40,5 | 69,5 | -       |
| 82        | 0002   | 0,36 | 1,9 | 10,0 | -   | - | 40,5 | 69,5 | -       |
| 82        | 0003   | 0,5  | 1,9 | 10,0 | -   | - | 40,5 | 69,5 | -       |
| 82        | 0004   | 0,8  | 1,9 | 10,0 | -   | - | 40,5 | 69,5 | -       |
| 84        | 0001   | 0,8  | 2,5 | 10,0 | 3,0 | - | 40,5 | 69,5 | -       |



# Push Back Probes



## Push Back Probe 118 mil

### VF3

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 3,00 / 118    |
| <b>Current</b>          | 8,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 30 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 100     | 500           |
| 200     | 1000          |
| 300     | 1500          |

#### Travel (mm)

| Nominal           | Maximum |
|-------------------|---------|
| 5,0               | 5,5     |
| Thread (M)        | 2,0x0,2 |
| Wrench Size       | 2,2     |
| Pointing Accuracy | ±0,1 mm |

#### Materials and Plating

|            |                         |
|------------|-------------------------|
| Plunger    | see Tip Style           |
| Barrel     | Brass, gold plated      |
| Spring     | Music wire, gold plated |
| Receptacle | Brass, Gold plated      |

#### Accessories

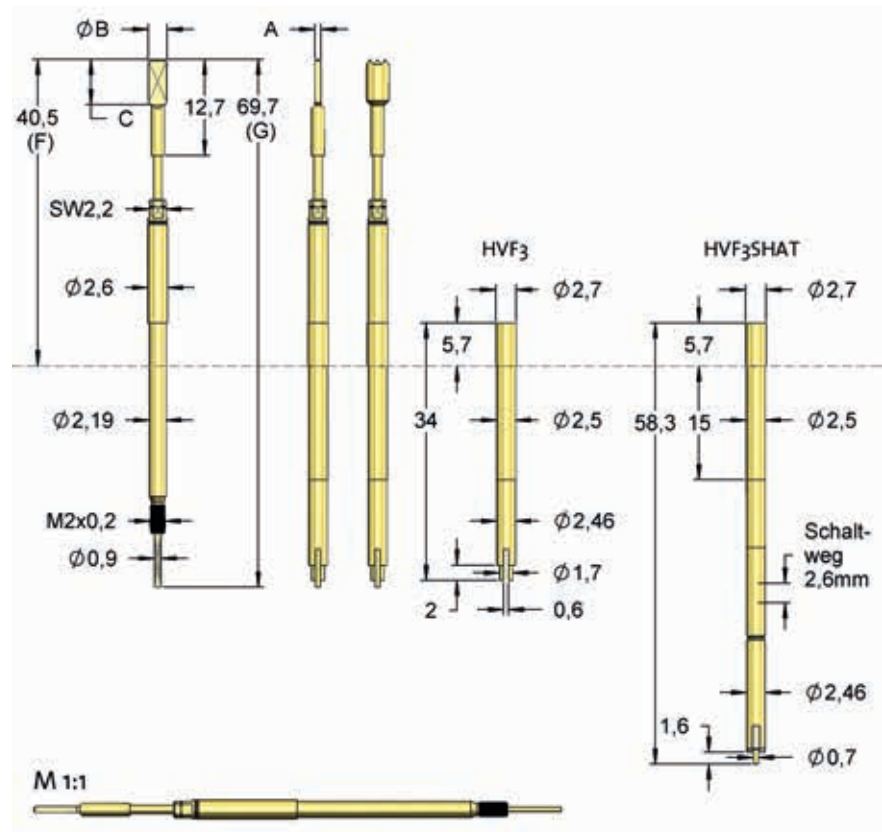
|                           |                               |
|---------------------------|-------------------------------|
| Insertion tool receptacle | FAWZVF3                       |
| Screw-in tool probe       | FWZVF3 (T)<br>max. Ø2,7 mm    |
| Screw-in tool probe       | FWZVF3S3 (T3)<br>max. Ø4,0 mm |

#### Drill Size [mm]

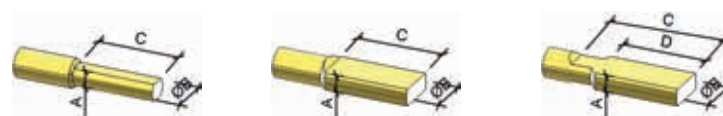
|     |             |
|-----|-------------|
| VF3 | 2,48 - 2,49 |
|-----|-------------|

#### Projection Height

|         |      |
|---------|------|
| HVF3... | 40,5 |
|---------|------|



| Tip Style | Number | Material | Plating | Ø in mm               | Version |
|-----------|--------|----------|---------|-----------------------|---------|
|           | 05     | B        | G       | 1,9 / 2,2 / 3,0       | -       |
|           | 06     | B        | G       | 2,7 / 3,0             | -       |
|           | 12     | B        | G       | 2,3                   | -       |
|           | 17     | B        | G       | 1,5 / 1,8 / 2,3 / 3,0 | -       |



| Tip Style | Number | A   | B   | C    | D | E | F    | G    | Version |
|-----------|--------|-----|-----|------|---|---|------|------|---------|
| 80        | 0001   | 0,5 | 1,6 | 6,0  | - | - | 40,5 | 69,7 | -       |
| 80        | 0002   | 0,5 | 1,4 | 6,0  | - | - | 40,5 | 69,7 | -       |
| 83        | 0001   | 0,8 | 2,5 | 6,0  | - | - | 40,5 | 69,7 | -       |
| 83        | 0001   | 0,8 | 2,5 | 12,1 | - | - | 44,5 | 75,7 | L       |
| 83        | 0002   | 0,5 | 2,5 | 6,0  | - | - | 40,5 | 69,7 | -       |
| 83        | 0003   | 1,5 | 2,5 | 6,0  | - | - | 40,5 | 69,7 | -       |
| 83        | 0004   | 0,5 | 1,9 | 6,0  | - | - | 40,5 | 69,7 | -       |
| 83        | 0004   | 0,5 | 1,9 | 12,1 | - | - | 44,5 | 75,7 | L       |
| 83        | 0005   | 0,8 | 1,9 | 6,0  | - | - | 40,5 | 69,7 | -       |
| 83        | 0006   | 0,6 | 4,0 | 10,0 | - | - | 44,5 | 73,7 | -       |
| 83        | 0007   | 1,2 | 2,2 | 6,0  | - | - | 40,5 | 69,7 | -       |
| 83        | 0008   | 0,8 | 2,7 | 6,0  | - | - | 40,5 | 69,7 | -       |
| 83        | 0009   | 0,7 | 2,1 | 12,0 | - | - | 44,5 | 75,7 | L       |
| 83        | 0010   | 0,8 | 2,7 | 10,0 | - | - | 44,5 | 73,7 | -       |
| 85        | 0001   | 0,9 | 1,4 | 6,5  | - | - | 40,5 | 69,7 | -       |

| Type  | Tip-Ø                        | Spring Force (N) |
|---|------------------------------|------------------|
| VF3   | 17 B 230 G 15                |                  |
| Tip Style   | Material                     | Finish           |
| Material:   | B = BeCu                     |                  |
| Head-Ø:   | 230 = 2,3 mm (e.g.)          |                  |
| Finish:   | G = Gold                     |                  |
| Special Version:  | L = Long Version             |                  |
| Receptacle:   | Order Code according drawing |                  |
| At the Order Code of spade versions you will find a number instead of the coded tip-Ø. This number shows in the table the belonging spade dimensions. |                              |                  |
| ORDER EXAMPLE   |                              |                  |

# Push Back Probes

## Push Back Probe 118 mil Plug-in with Switch Function V03

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 3,00 / 118    |
| <b>Current</b>          | 8,0 A         |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 30 mOhm       |

### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 300     | 1500          |

### Travel (mm)

| Nominal            | Maximum |
|--------------------|---------|
| 5,0                | 6,0     |
| Switch Travel (mm) | 3,5     |
| Wrench Size        | 2,2     |
| Pointing Accuracy  | ±0,1 mm |

### Materials and Plating

|         |                         |
|---------|-------------------------|
| Plunger | see Tip Style           |
| Barrel  | Brass, gold plated      |
| Spring  | Music wire, gold plated |

### Accessories

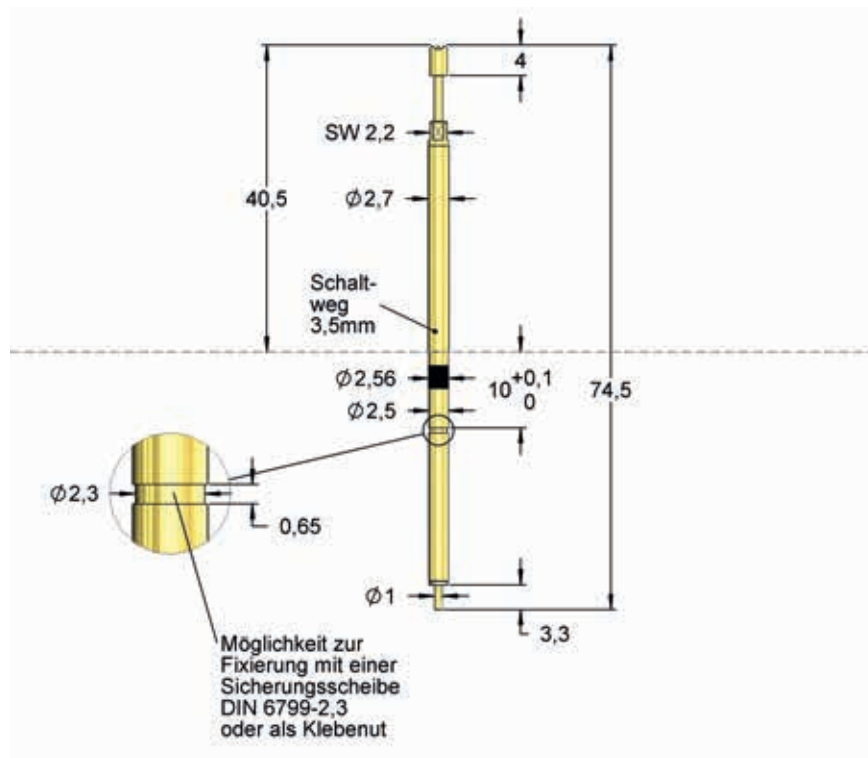
|               |               |
|---------------|---------------|
| Screw-in tool | FWZVF3S2 (T2) |
|---------------|---------------|

### Drill Size [mm]

|     |             |
|-----|-------------|
| V03 | 2,50 - 2,52 |
|-----|-------------|

### Projection Height

|     |      |
|-----|------|
| V03 | 40,5 |
|-----|------|



| Type              | Tip-Ø               | Spring Force (N) |
|-------------------|---------------------|------------------|
| V03 06 B 230 G 15 |                     |                  |
| Tip Style         | Material            | Finish           |
| Material:         | B = BeCu            |                  |
| Head-Ø:           | 230 = 2,3 mm (e.g.) |                  |
| Finish:           | G = Gold            |                  |
| ORDER EXAMPLE     |                     |                  |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 06     | B        | G       | 2,3     | -       |
|           | 17     | B        | G       | 2,3     | -       |

# Push Back Probes



## Push Back Probe 157 mil VF4

|                         |               |
|-------------------------|---------------|
| <b>Centers (mm/mil)</b> | 4,00 / 157    |
| <b>Current</b>          | 10,0 A        |
| <b>Temperature</b>      | -20°C...+80°C |
| <b>R typically</b>      | 30 mOhm       |

### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 80      | 300           |
| 100     | 500           |
| 300     | 1000          |
| 300     | 1500          |
| 300     | 2000          |
| 300     | 2500          |

### Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 5,0               | 5,5      |
| Thread (M)        | 2,5x0,35 |
| Wrench Size       | 2,5      |
| Pointing Accuracy | ±0,1 mm  |

### Materials and Plating

|            |                         |
|------------|-------------------------|
| Plunger    | see Tip Style           |
| Barrel     | Brass, gold plated      |
| Spring     | Music wire, gold plated |
| Receptacle | Brass, Gold plated      |

### Accessories

|                           |                               |
|---------------------------|-------------------------------|
| Insertion tool receptacle | FAWZVF4                       |
| Screw-in tool probe       | FWZVF4 (T)<br>max. Ø4,0 mm    |
| Screw-in tool probe       | FWZVF4S1 (T1)<br>max. Ø3,1 mm |

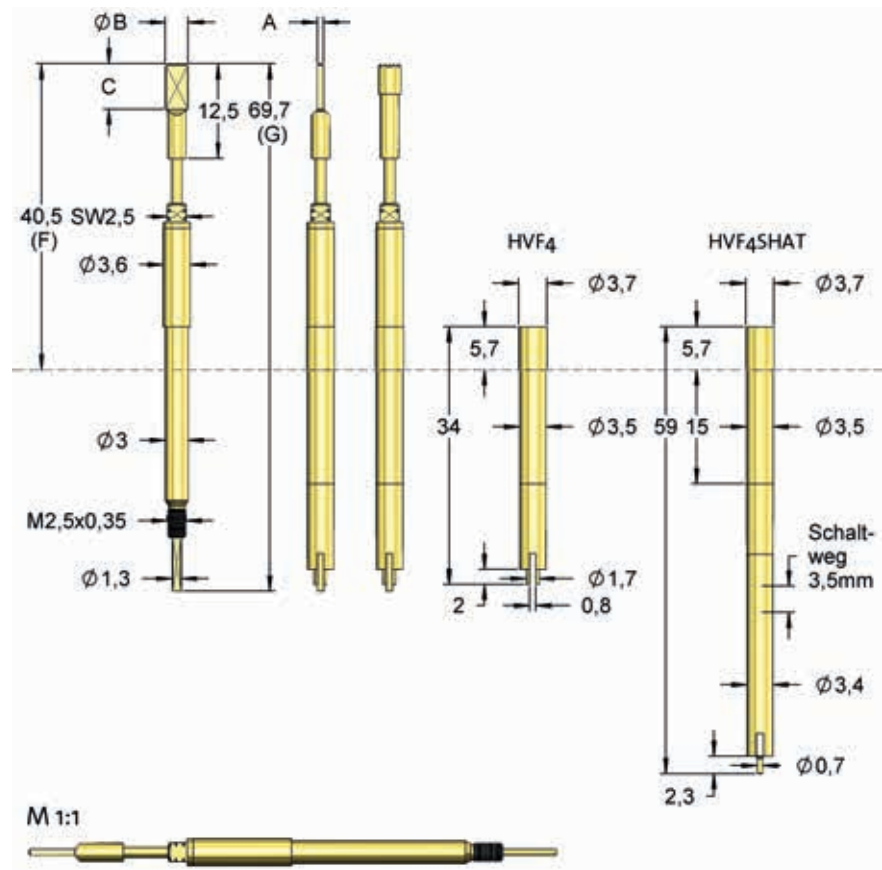
### Drill Size [mm]

|     |             |
|-----|-------------|
| VF4 | 2,48 - 2,49 |
|-----|-------------|

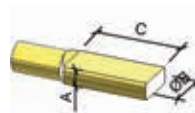
### Projection Height

|         |      |
|---------|------|
| HVF4... | 40,5 |
|---------|------|

| Type  | Tip-Ø                        | Spring Force (N) |
|---|------------------------------|------------------|
| VF4   | 06 B 300 G 15                |                  |
|   | Tip Style                    | Material         |
|   |                              | Finish           |
|   |                              | Special Version  |
| Material:   | B = BeCu                     |                  |
| Head-Ø:   | 300 = 3,0 mm (e.g.)          |                  |
| Finish:   | G = Gold                     |                  |
| Special Version:  | L = Long Version             |                  |
| Receptacle:   | Order Code according drawing |                  |
| At the Order Code of spade versions you will find a number instead of the coded tip-Ø. This number shows in the table the belonging spade dimensions. |                              |                  |
| ORDER EXAMPLE   |                              |                  |



| Tip Style | Bezeichnung | Material | Oberfläche | Ø in mm                 | Version |
|-----------|-------------|----------|------------|-------------------------|---------|
|           | 05          | B        | G          | 2,3; 3,0; 4,0           | -       |
|           | 06          | B        | G          | 2,4; 3,0; 4,0; 4,8      | -       |
|           | 11          | B        | G          | 1,8; 2,0; 2,3; 3,0; 3,7 | -       |
|           | 14          | S        | L          | 3,0                     | -       |
|           | 16          | B        | G          | 1,0; 1,4; 1,8; 2,0; 2,3 | -       |
|           | 17          | B        | G          | 3,0; 4,0                | -       |
|           | 50          | B        | G          | 3,0                     | -       |



| Tip Style | Number | A   | B    | C    | D | E | F    | G    | Version |
|-----------|--------|-----|------|------|---|---|------|------|---------|
| 83        | 0001   | 0,8 | 2,5  | 6,0  | - | - | 40,5 | 69,7 | -       |
| 83        | 0002   | 0,8 | 3,0  | 6,0  | - | - | 40,5 | 69,7 | -       |
| 83        | 0003   | 1,6 | 2,25 | 6,0  | - | - | 40,5 | 69,7 | -       |
| 83        | 0004   | 1,6 | 3,0  | 6,0  | - | - | 40,5 | 69,7 | -       |
| 83        | 0005   | 1,8 | 2,25 | 6,0  | - | - | 40,5 | 69,7 | -       |
| 83        | 0006   | 0,6 | 2,5  | 6,0  | - | - | 40,5 | 69,7 | -       |
| 83        | 0007   | 1,3 | 2,25 | 16,0 | - | - | 50,5 | 79,7 | L       |
| 83        | 0008   | 1,4 | 2,2  | 6,0  | - | - | 40,5 | 69,7 | -       |
| 83        | 0009   | 1,3 | 2,2  | 6,0  | - | - | 40,5 | 69,7 | -       |
| 83        | 0010   | 0,8 | 2,5  | 12,0 | - | - | 46,5 | 75,7 | -       |

# Push Back Probes

## Push Back Probe 157 mil Plug-in with Switch Function V04

|                  |               |
|------------------|---------------|
| Centers (mm/mil) | 4,00 / 157    |
| Current          | 8,0 A         |
| Current (Switch) | 1,0 A         |
| Temperature      | -20°C...+80°C |
| R typically      | 30 mOhm       |

### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 200     | 900           |
| 400     | 1500          |

### Travel (mm)

| Nominal            | Maximum |
|--------------------|---------|
| 9,5                | 10,0    |
| Switch Travel (mm) | 7,5     |
| Wrench Size        | 2,5     |
| Pointing Accuracy  | ±0,1 mm |

### Materials and Plating

|         |                           |
|---------|---------------------------|
| Plunger | see Tip Style             |
| Barrel  | Brass, gold plated        |
| Spring  | Music wire, silver plated |

### Accessories

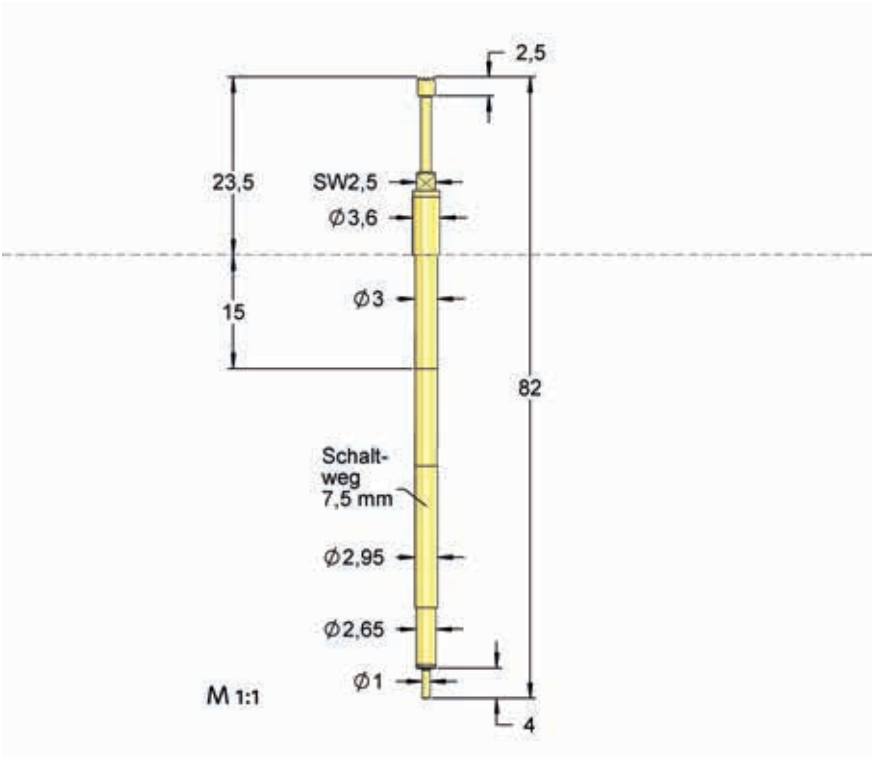
|               |        |
|---------------|--------|
| Screw-in tool | FWZVF4 |
|---------------|--------|

### Drill Size [mm]


|     |             |
|-----|-------------|
| V04 | 2,98 - 2,99 |
|-----|-------------|

### Projection Height

|     |      |
|-----|------|
| V04 | 40,5 |
|-----|------|



| Type              | Tip-Ø               | Spring Force (N) |
|-------------------|---------------------|------------------|
| V04 17 B 180 G 15 |                     |                  |
| Tip Style         | Material            | Finish           |
| Material:         | B = BeCu            |                  |
| Head-Ø:           | 180 = 1,8 mm (e.g.) |                  |
| Finish:           | G = Gold            |                  |
| ORDER EXAMPLE     |                     |                  |

| Tip Style   | Number | Material | Plating | Ø in mm         | Version |
|---|--------|----------|---------|-----------------|---------|
|  | 06     | B        | G       | 1,8 / 2,3 / 3,0 | -       |



## Kelvin and Radio Frequency Probes

Very low resistances of components are measured by the „Kelvin 4-wire measurement“. For this application the connection of the current source and the voltmeter need to be very close to the component. Otherwise the resistances of the conductors are leading to false results. These connections can be realized by special coaxial probes (Kelvin Probes), using the outer conductor for the constant current and the inner conductor for measuring the voltage.

In many test applications, like testing RF-connectors, radio frequency signals need to be transmitted. To carry these signals special coaxial contact probes are used. The coaxial probes have an inner conductor for the transmission of the signal and an outer conductor for the electromagnetic shielding.

|              |            |
|--------------|------------|
| <b>F805</b>  | <b>166</b> |
| <b>F810</b>  | <b>167</b> |
| <b>F835</b>  | <b>168</b> |
| <b>F830</b>  | <b>169</b> |
| <b>F822</b>  | <b>170</b> |
| <b>F832</b>  | <b>171</b> |
| <b>F840</b>  | <b>172</b> |
| <b>HF860</b> | <b>175</b> |
| <b>HF819</b> | <b>180</b> |
| <b>F086</b>  | <b>181</b> |



## Kelvin Probe 87 mil Plug-in F805

NEW

|                    |               |
|--------------------|---------------|
| Centers (mm/mil)   | 2,20 / 87     |
| Temperature        | -20°C...+80°C |
| Current (Circular) | 2,5 A         |
| Current (Internal) | 0,5 A         |

### Spring Force Total (cN ±20%)

|                  | Preload | Nominal Force |
|------------------|---------|---------------|
| total            | -       | 250           |
| Internal Contact | 10      | 50            |
| Circular Contact | 80      | 200           |

### Travel (mm)

|                  | Nominal | Maximum |
|------------------|---------|---------|
| Internal Contact | 2,0     | 2,5     |
| Circular Contact | 2,0     | 2,5     |

### Materials and Plating

|                         |                           |
|-------------------------|---------------------------|
| Internal Contact        | BeCu, gold plated         |
| Circular Contact        | BeCu, gold plated         |
| Barrel                  | Bronze, gold plated       |
| Spring Internal Contact | gold plated, Music wire   |
| Spring Circular Contact | Stainless steel, unplated |
| Receptable              | Bronze, gold plated       |

### Accessories

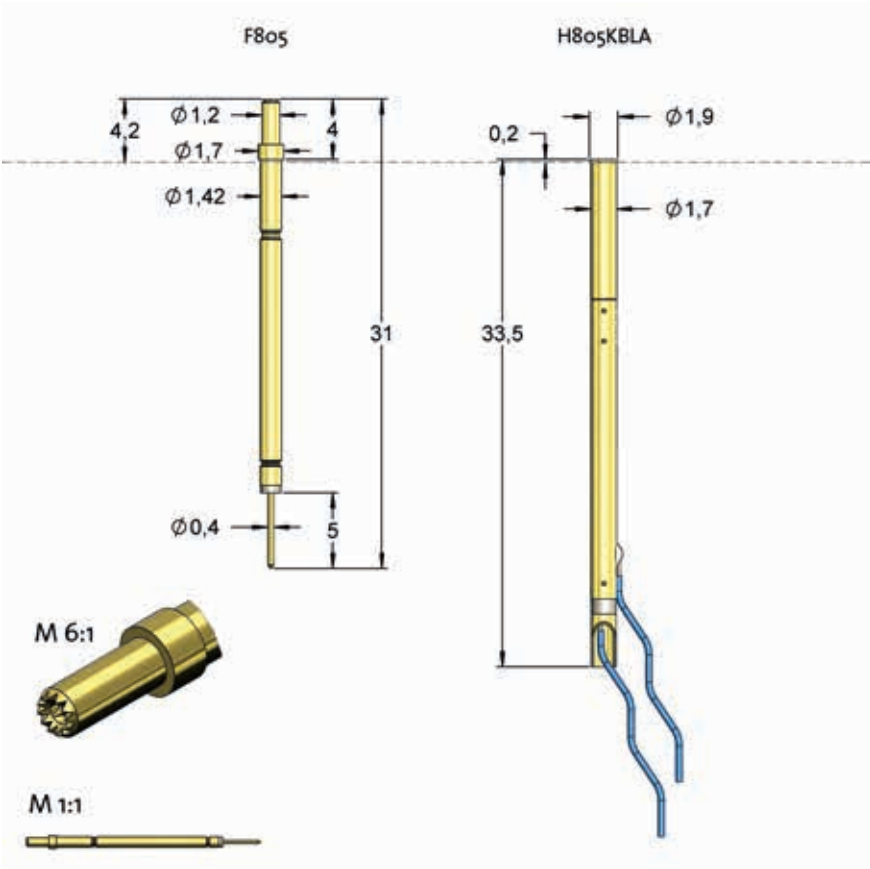
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-100E0 |
|---------------------------|------------|

### Projection Height (mm)


|          |     |
|----------|-----|
| H805KBLA | 4,2 |
|----------|-----|

### Drill Size (mm)

|          |             |
|----------|-------------|
| H805KBLA | 1,68 - 1,70 |
|----------|-------------|



| Type          | number                       |        | Spring Force    |   |     |
|---------------|------------------------------|--------|-----------------|---|-----|
| F 805         | 18                           | B      | 0001            | G | 250 |
| Tip Style     | Material                     | Finish | Special Version |   |     |
| Material:     | B = BeCu                     |        |                 |   |     |
| number:       | see table                    |        |                 |   |     |
| Finish:       | G = Gold                     |        |                 |   |     |
| Receptacle:   | Order Code according drawing |        |                 |   |     |
| ORDER EXAMPLE |                              |        |                 |   |     |

| Tip Style   | Number | Material | Plating | Ø in mm | Version |
|---|--------|----------|---------|---------|---------|
|  | 18     | B        | G       | 1,18    | -       |



## Kelvin Probe 100 mil Plug-in F810

|                    |               |
|--------------------|---------------|
| Centers (mm/mil)   | 2,54 / 100    |
| Temperature        | -20°C...+80°C |
| Current (Circular) | 3,0 A         |
| Current (Internal) | 0,8 A         |

### Spring Force Total (cN ±20%)

|                  | Preload | Nominal Force |
|------------------|---------|---------------|
| total            | -       | 170           |
| total            | -       | 230           |
| Internal Contact | 10      | 70            |
| Internal Contact | 25      | 90            |
| Circular Contact | 40      | 100           |
| Circular Contact | 40      | 140           |

### Travel (mm)

|                  | Nominal | Maximum |
|------------------|---------|---------|
| Internal Contact | 2,8     | 4,0     |
| Circular Contact | 2,3     | 3,5     |

### Materials and Plating

|                         |                             |
|-------------------------|-----------------------------|
| Internal Contact        | Steel, longtime gold plated |
| Circular Contact        | BeCu, gold plated           |
| Barrel                  | Bronze, silver plated       |
| Spring Internal Contact | silver plated, Music wire   |
| Spring Circular Contact | Music wire, silver plated   |
| Receptacle              | Bronze, gold plated         |

### Accessories

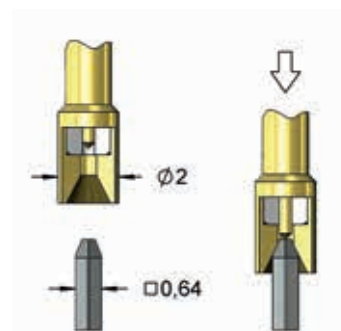
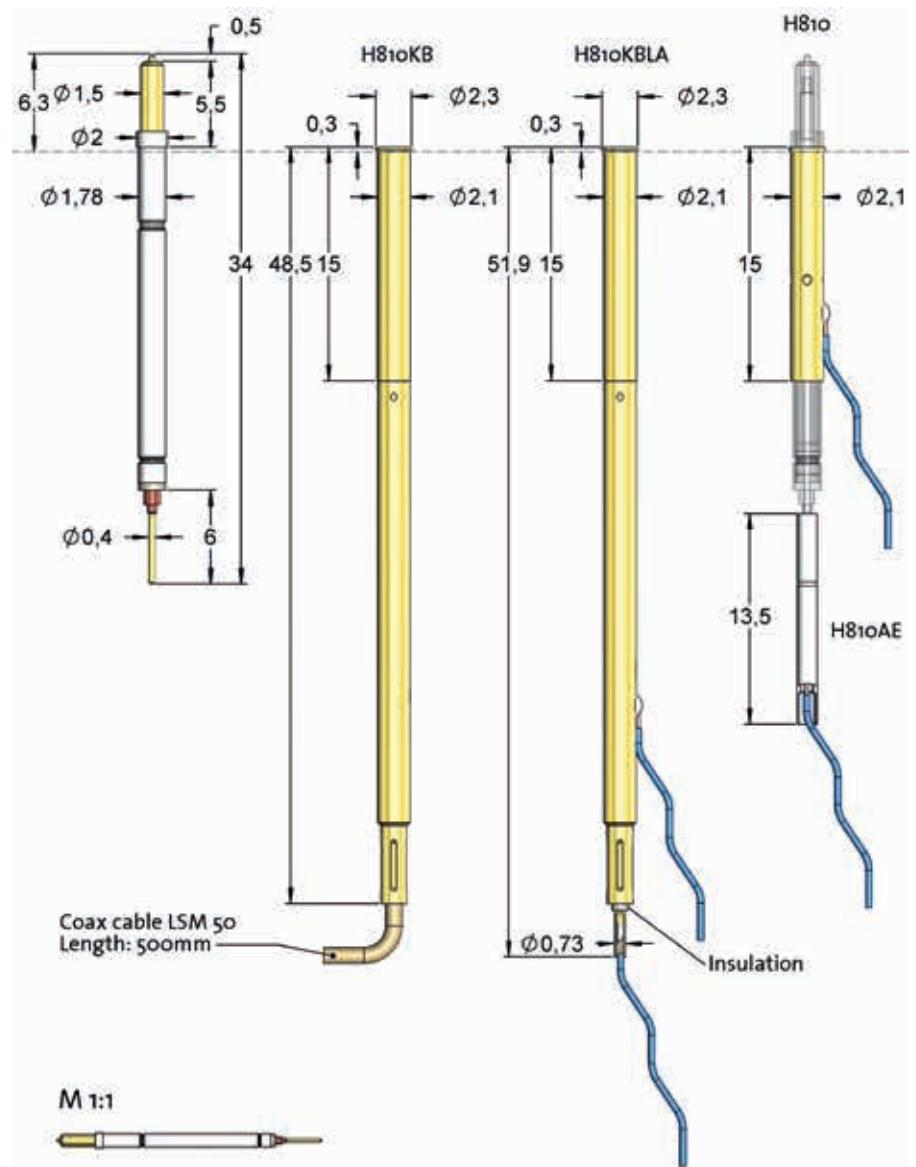
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-772E0 |
|---------------------------|------------|

### Projection Height (mm)

|                  |     |
|------------------|-----|
| Hülse mit Kragen | 6,3 |
|------------------|-----|

### Drill Size (mm)

|         |             |
|---------|-------------|
| H810... | 2,08 - 2,09 |
|---------|-------------|



Special version for contacting Wire-Wrap-Pins.  
Order Code: F81001S040L230S1

| Type                    | Tip-Ø                                      | Spring Force |
|-------------------------|--|--------------|
| F 810 01 S 040 L 230 S1 |  |              |
| Tip Style               | Material                                   | Finish       |
| Material:               | S = Steel                                  |              |
| Tip-Ø:                  | 040 = 0,40 mm (e.g.)                       |              |
| Finish:                 | L = Longtime Gold plated                   |              |
| Special Version:        | S1 = Version for contacting wire-wrap-pins |              |
| Receptacle:             | Order Code according drawing               |              |

ORDER EXAMPLE

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 01     | S        | L       | 0,4     | -       |
|           | 01     | S        | L       | 0,4     | S1      |
|           | 16     | S        | L       | 0,4     | -       |

## Kelvin Probe 138 mil Threaded F835

|                    |               |
|--------------------|---------------|
| Centers (mm/mil)   | 3,50 / 138    |
| Temperature        | -20°C...+80°C |
| Current (Circular) | 10,0 A        |
| Current (Internal) | 2,0 A         |
| Z                  | 50 Ohm        |
| Frequency          | 2,0 GHz       |

### Spring Force Total (cN ±20%)

|                  | Preload | Nominal Force |
|------------------|---------|---------------|
| total            | -       | 410           |
| Internal Contact | 50      | 110           |
| Circular Contact | 80      | 300           |

### Travel (mm)

|                  | Nominal | Maximum |
|------------------|---------|---------|
| Internal Contact | 4,0     | 5,0     |
| Circular Contact | 4,0     | 5,0     |
| Wrench Size      | 2,6     |         |
| Thread           | 2,5     |         |

### Materials and Plating

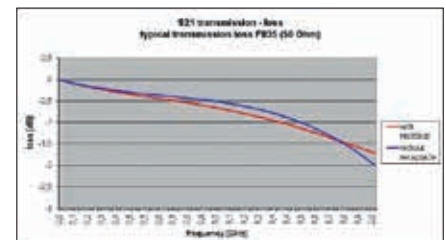
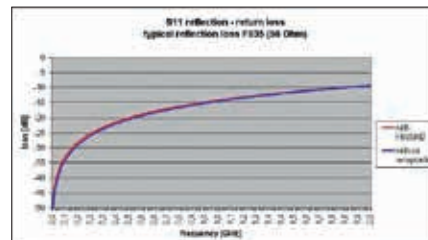
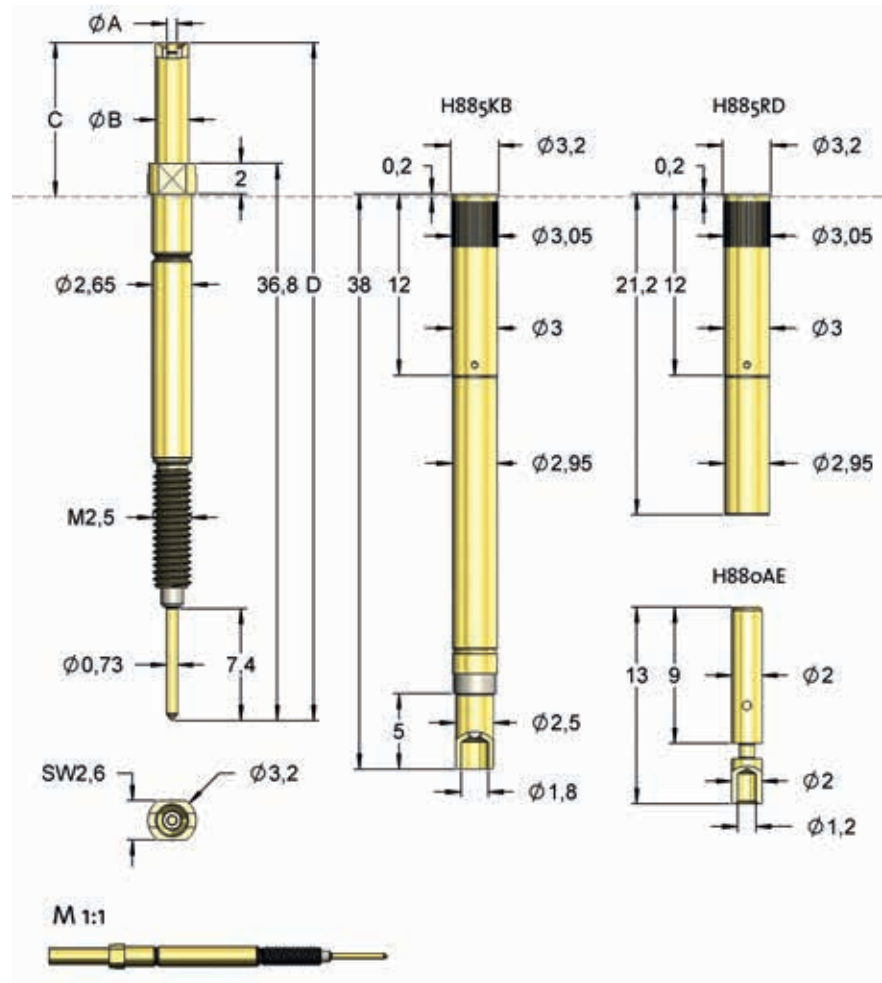
|                         |                           |
|-------------------------|---------------------------|
| Internal Contact        | BeCu, gold plated         |
| Circular Contact        | BeCu, gold plated         |
| Barrel                  | Brass, gold plated        |
| Spring Internal Contact | silver plated, Music wire |
| Spring Circular Contact | Music wire, silver plated |
| Receptacle              | Brass, gold plated        |

### Accessories

|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-774E0 |
| Screw-in tool probe       | FWZ885 (T) |

### Drill Size (mm)

|                          |             |
|--------------------------|-------------|
| Receptacle without knurl | 2,98 - 2,99 |
| Receptacle with knurl    | 3,00 - 3,02 |



| Type  | number                       | Spring Force |
|---|------------------------------|--------------|
| F 835   | 16 B 0001 G                  | 410          |
| Tip Style   | Material                     | Finish       |
| Material:   | B = BeCu, S = Steel          |              |
| number:   | see table                    |              |
| Finish:   | G = Gold                     |              |
| Receptacle:   | Order Code according drawing |              |
| At the Order Code of coaxial versions you will find a number instead of the coded tip-Ø. This number shows in the table the belonging spade dimensions. |                              |              |
| ORDER EXAMPLE   |                              |              |

| Tip Style | Number | Plating | Ø in mm | Version |
|-----------|--------|---------|---------|---------|
|           | 16     | G       | 0,64    | -       |

| F835            | Tip Style | Number | Ø A  | Ø B  | C     | D     | E | Version |
|-----------------|-----------|--------|------|------|-------|-------|---|---------|
| F83509B0001G180 | 09        | 0001   | 0,64 | 2,17 | 10,20 | 44,80 | - |         |
| F83516B0001G410 | 16        | 0001   | 0,64 | 2,17 | 10,20 | 44,80 | - |         |



Kelvin Probe 157 mil  
Plug-in  
**F830**

|                    |               |
|--------------------|---------------|
| Centers (mm/mil)   | 4,00 / 157    |
| Temperature        | -20°C...+80°C |
| Current (Circular) | 5,0 A         |
| Current (Internal) | 1,0 A         |

Spring Force Total (cN ±20%)

|                  |         |               |
|------------------|---------|---------------|
|                  | Preload | Nominal Force |
| total            | -       | 320           |
| Internal Contact | 60      | 160           |
| Circular Contact | 60      | 160           |

Travel (mm)

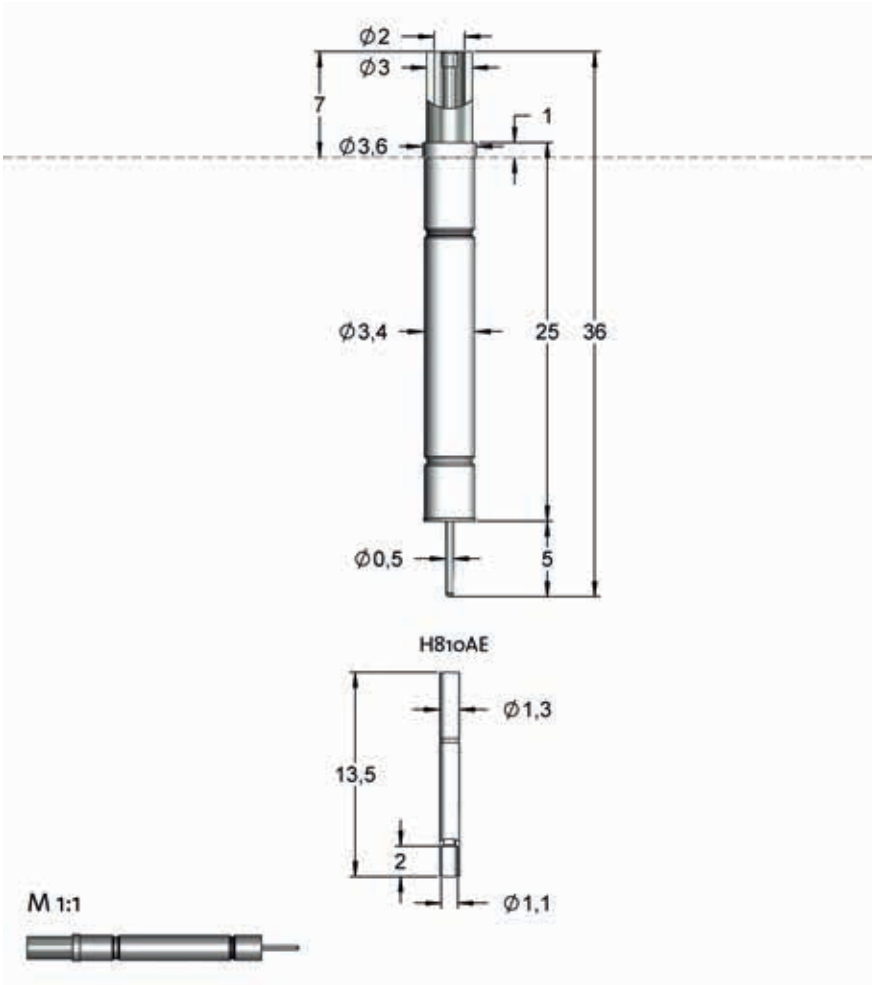
|                  |         |         |
|------------------|---------|---------|
|                  | Nominal | Maximum |
| Internal Contact | 4,0     | 4,2     |
| Circular Contact | 4,0     | 4,2     |

Materials and Plating

|                         |                           |
|-------------------------|---------------------------|
| Internal Contact        | Steel, nickel plated      |
| Circular Contact        | BeCu, nickel plated       |
| Barrel                  | Bronze, silver plated     |
| Spring Internal Contact | silver plated, Music wire |
| Spring Circular Contact | Music wire, silver plated |

Drill Size (mm)

|      |             |
|------|-------------|
| F830 | 3,39 - 3,40 |
|------|-------------|



| Type                 | number                       | Spring Force |
|----------------------|------------------------------|--------------|
| F 830 09 S 100 N 320 |                              |              |
| Tip Style            | Material                     | Finish       |
| Material:            | S = Steel                    |              |
| Tip-Ø:               | 100 = 1,0 mm (e.g.)          |              |
| Finish:              | N = Nickel plated            |              |
| Receptacle:          | Order Code according drawing |              |
| ORDER EXAMPLE        |                              |              |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 02     | S        | N       | 1,0     | -       |
|           | 09     | S        | N       | 1,0     | -       |
|           | 17     | S        | N       | 1,0     | -       |

## Kelvin Probe 216 mil Plug-in F822

|                    |                |
|--------------------|----------------|
| Centers (mm/mil)   | 5,50 / 216     |
| Temperature        | -40°C...+250°C |
| Current (Circular) | 6,0 A          |
| Current (Internal) | 1,6 A          |
| Z                  | 50 Ohm         |
| Frequency          | 1,2 GHz        |

### Spring Force Total (cN ±20%)

|                  | Preload | Nominal Force |
|------------------|---------|---------------|
| total            | -       | 650           |
| Internal Contact | 100     | 200           |
| Circular Contact | 250     | 450           |
| Circular Contact | 300     | 450           |

### Travel (mm)

|                  | Nominal | Maximum |
|------------------|---------|---------|
| Internal Contact | 3,0     | 3,5     |
| Circular Contact | 2,0     | 2,6     |

### Materials and Plating

|                         |                             |
|-------------------------|-----------------------------|
| Internal Contact        | Steel, longtime gold plated |
| Circular Contact        | BeCu, gold plated           |
| Barrel                  | Bronze, unplated            |
| Spring Internal Contact | unplated, Stainless steel   |
| Spring Circular Contact | Stainless steel, unplated   |
| Receptacle              | Bronze, gold plated         |

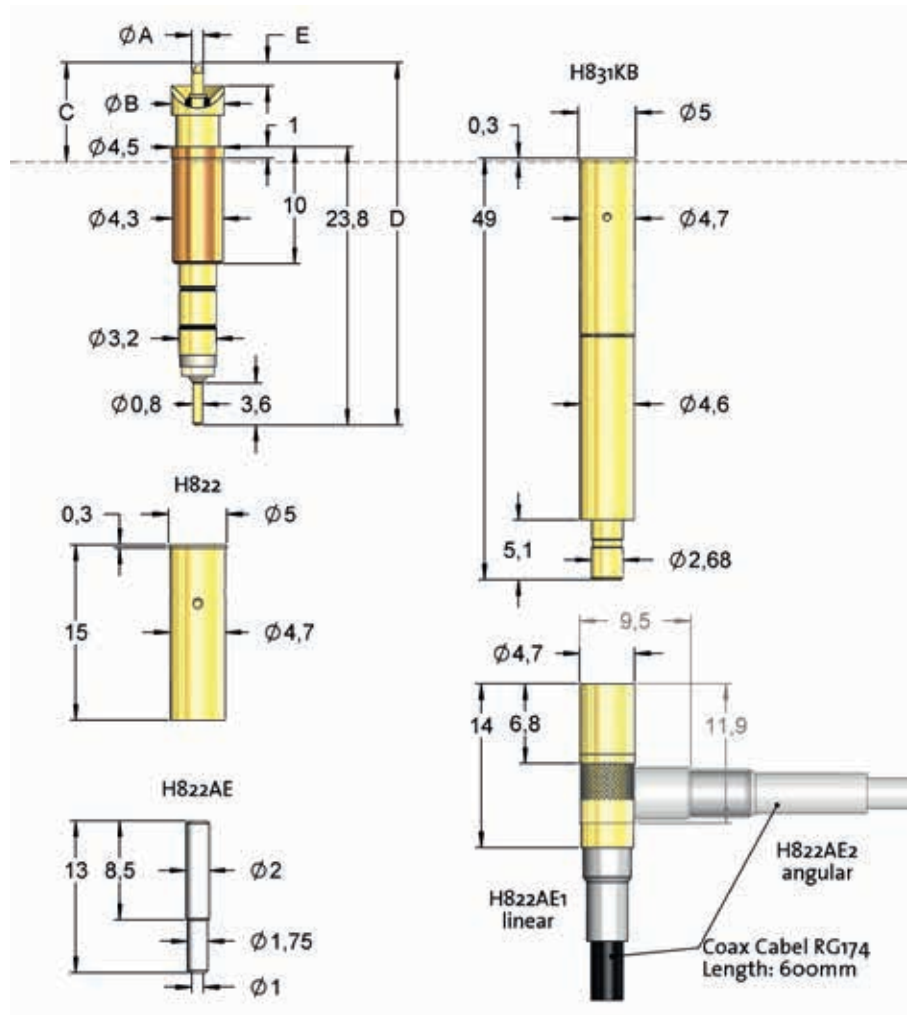
### Accessories

|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-822E0 |
|---------------------------|------------|

### Drill Size (mm)

|                          |             |
|--------------------------|-------------|
| Receptacle without knurl | 4,68 - 4,69 |
| Receptacle with knurl    | 4,70 - 4,72 |

| Type  | number                       | Spring Force |
|---|------------------------------|--------------|
| F 822 03 S 0001 L 650   |                              |              |
| Tip Style   | Material                     | Finish       |
| Material:   | S = Steel                    |              |
| number:   | see table                    |              |
| Finish:   | L = Longtime Gold plated     |              |
| Receptacle:   | Order Code according drawing |              |
| At the Order Code of coaxial versions you will find a number instead of the coded tip-Ø. This number shows in the table the belonging spade dimensions. |                              |              |
| ORDER EXAMPLE   |                              |              |



| F822                | Tip Style | Number | Ø A  | Ø B  | C     | D     | E     | Version |
|---------------------|-----------|--------|------|------|-------|-------|-------|---------|
| F82202S0013L650     | 02        | 0013   | 0,80 | 4,00 | 8,30  | 30,80 | 1,80  |         |
| F82202S0016L650     | 02        | 0016   | 1,50 | 4,00 | 7,50  | 30,00 | 1,00  |         |
| F82202S0017L650S1   | 02        | 0017   | 1,50 | 4,00 | 7,50  | 30,00 | -1,80 | Sonder  |
| F82203S0010L650     | 03        | 0010   | 0,30 | 4,00 | 10,00 | 32,50 | 3,50  |         |
| F82203S0011L650     | 03        | 0011   | 0,50 | 4,00 | 8,50  | 31,00 | 2,00  |         |
| F82203S0001L650     | 03        | 0001   | 1,00 | 4,00 | 8,50  | 31,00 | 2,00  |         |
| F82203S0014L650     | 03        | 0014   | 1,00 | 4,00 | 10,00 | 32,50 | 3,50  |         |
| F82203S0003L650     | 03        | 0003   | 1,00 | 4,50 | 8,50  | 31,00 | 2,00  |         |
| F82203S0015L650     | 03        | 0015   | 1,00 | 4,50 | 10,00 | 32,50 | 3,50  |         |
| F82205S0007L650IK15 | 05        | 0007   | 0,60 | 4,00 | 9,80  | 32,30 | -1,50 | Sonder  |
| F82205S0007L650IK25 | 05        | 0007   | 0,60 | 4,00 | 10,80 | 33,30 | -2,50 | Sonder  |
| F82205S0001L650     | 05        | 0001   | 1,00 | 4,00 | 8,50  | 31,00 | 2,00  |         |
| F82205S0003L650     | 05        | 0003   | 1,00 | 4,50 | 8,50  | 31,00 | 2,00  |         |
| F82205S0005L650     | 05        | 0005   | 1,50 | 4,00 | 11,00 | 33,50 | 4,50  |         |
| F82209S0016L650     | 09        | 0016   | 1,50 | 4,00 | 7,50  | 30,00 | 1,00  |         |
| F82209S0018L650S1   | 09        | 0018   | 1,50 | 5,00 | 11,50 | 34,00 | -4,00 | Sonder  |
| F82211S0012L650     | 11        | 0012   | 0,64 | 4,50 | 10,00 | 32,50 | 3,50  |         |
| F82217S0006L650     | 17        | 0006   | 0,64 | 4,00 | 8,50  | 31,00 | 2,00  |         |
| F82217S0002L650     | 17        | 0002   | 1,50 | 4,00 | 11,00 | 33,50 | 4,50  |         |
| F82217S0016L650     | 17        | 0016   | 1,50 | 4,00 | 7,50  | 30,00 | 1,00  |         |
| F82217S0004L650     | 17        | 0004   | 1,50 | 4,50 | 11,00 | 34,00 | 4,50  |         |
| F82241S0009L650S2   | 41        | 0009   | 1,50 | 5,00 | 11,00 | 33,50 | 0,70  | Sonder  |
| F82241S0008L650S1   | 41        | 0008   | 1,50 | 5,70 | 12,80 | 35,30 | -1,80 | Sonder  |



## Kelvin Probe 216 mil Threaded F832

|                    |                |
|--------------------|----------------|
| Centers (mm/mil)   | 5,50 / 216     |
| Temperature        | -40°C...+250°C |
| Current (Circular) | 6,0 A          |
| Current (Internal) | 1,6 A          |
| Z                  | 50 Ohm         |
| Frequency          | 1,2 GHz        |

### Spring Force Total (cN ±20%)

|                  | Preload | Nominal Force |
|------------------|---------|---------------|
| total            | -       | 650           |
| Internal Contact | 100     | 200           |
| Circular Contact | 250     | 450           |

### Travel (mm)

|                  | Nominal | Maximum |
|------------------|---------|---------|
| Internal Contact | 3,0     | 3,5     |
| Circular Contact | 2,0     | 2,5     |
| Thread           | 4,0x0,5 |         |

### Materials and Plating

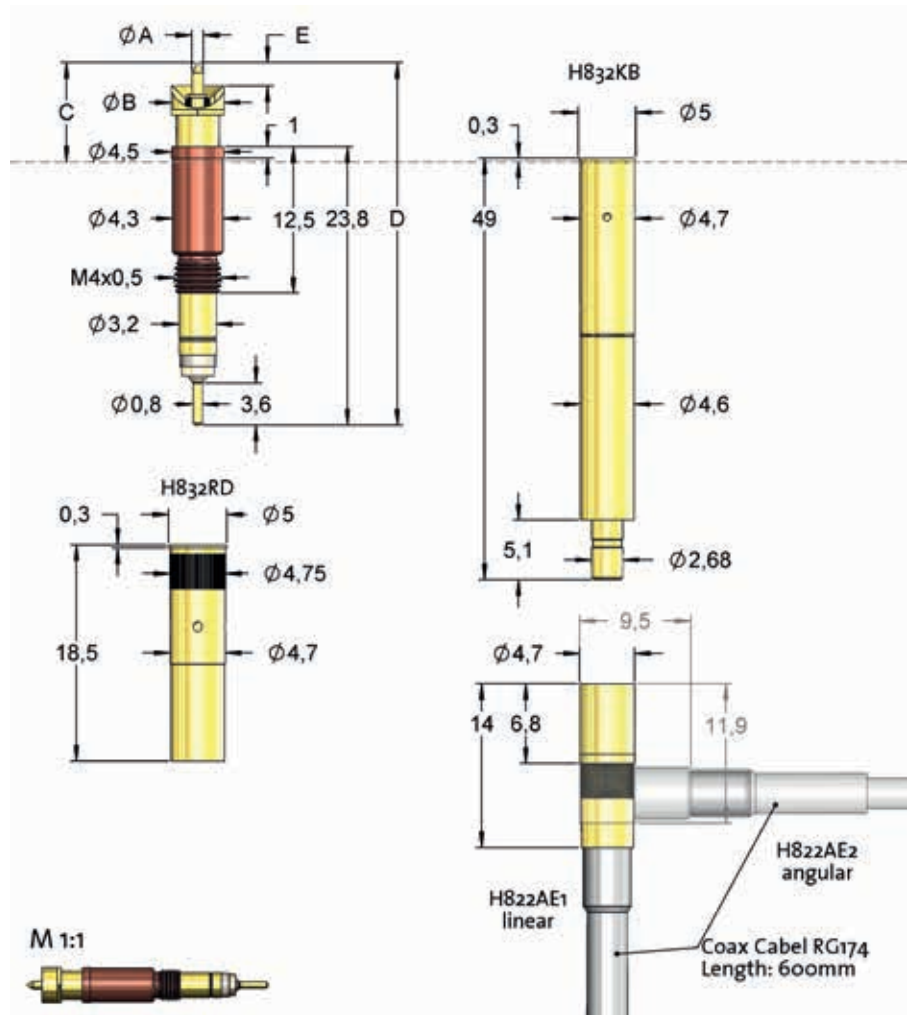
|                         |                             |
|-------------------------|-----------------------------|
| Internal Contact        | Steel, longtime gold plated |
| Circular Contact        | BeCu, gold plated           |
| Barrel                  | Brass, unplated             |
| Spring Internal Contact | unplated, Stainless steel   |
| Spring Circular Contact | Stainless steel, unplated   |
| Receptacle              | Bronze, gold plated         |

### Accessories

|                           |             |
|---------------------------|-------------|
| Insertion tool receptacle | FEWZ-822E0  |
| Screw-in tool probe       | FWZ-831 (T) |

### Drill Size (mm)

|                          |             |
|--------------------------|-------------|
| Receptacle without knurl | 4,68 - 4,69 |
| Receptacle with knurl    | 4,70 - 4,72 |



| Type  | number                       | Spring Force |
|---|------------------------------|--------------|
| F 832 03 S 0001 L 650   |                              |              |
| Tip Style   | Material                     | Finish       |
| Material:   | S = Steel                    |              |
| number:   | see table                    |              |
| Finish:   | L = Longtime Gold            |              |
| Receptacle:   | Order Code according drawing |              |
| At the Order Code of coaxial versions you will find a number instead of the coded tip-Ø. This number shows in the table the belonging spade dimensions. |                              |              |
| ORDER EXAMPLE   |                              |              |

| F832                | Tip Style | Number | Ø A  | Ø B  | C     | D     | E    | Version |
|---------------------|-----------|--------|------|------|-------|-------|------|---------|
| F83203S0001L650     | 03        | 0001   | 1,00 | 4,00 | 8,50  | 31,00 | 2,00 |         |
| F83203S0004L650     | 03        | 0004   | 1,00 | 4,50 | 8,50  | 31,00 | 2,00 |         |
| F83203S0005L650     | 03        | 0005   | 1,00 | 4,50 | 10,00 | 32,50 | 3,50 |         |
| F83205S0008L650IK10 | 05        | 0008   | 0,60 | 4,00 | 9,30  | 31,80 | 2,80 | Sonder  |
| F83205S0001L650     | 05        | 0001   | 1,00 | 4,00 | 8,50  | 31,00 | 2,00 |         |
| F83205S0003L650     | 05        | 0003   | 1,00 | 4,50 | 8,50  | 31,00 | 2,00 |         |
| F83217S0002L650     | 17        | 0002   | 1,50 | 4,00 | 11,00 | 33,50 | 4,50 |         |



High Current Kelvin Probe  
up to 30 A  
**F840**

|                    |               |
|--------------------|---------------|
| Centers (mm/mil)   | 7,00 / 275    |
| Temperature        | -20°C...+80°C |
| Current (Circular) | 30,0 A        |
| Current (Internal) | 5,0 A         |

Spring Force Total (cN ±20%)

|                  |         |               |
|------------------|---------|---------------|
|                  | Preload | Nominal Force |
| total            | -       | 1780          |
| Internal Contact | 200     | 280           |
| Circular Contact | 100     | 1500          |

Travel (mm)

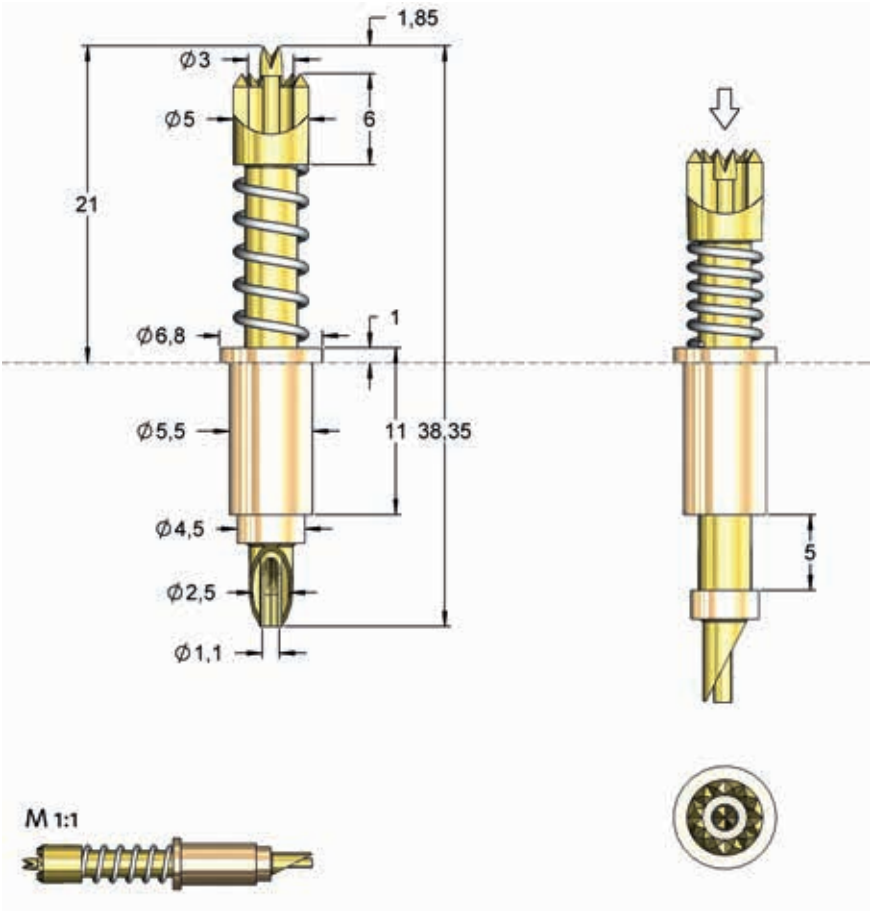
|                  |         |         |
|------------------|---------|---------|
|                  | Nominal | Maximum |
| Internal Contact | 1,9     | 6,4     |
| Circular Contact | 5,0     | 5,5     |

Materials and Plating


|                         |                             |
|-------------------------|-----------------------------|
| Internal Contact        | Steel, longtime gold plated |
| Circular Contact        | Steel, longtime gold plated |
| Barrel                  | Brass, unplated             |
| Spring Internal Contact | silver plated, Music wire   |
| Spring Circular Contact | Music wire, silver plated   |

Drill Size (mm)

|      |      |
|------|------|
| F840 | 5,50 |
|------|------|



| Type                  | Tip-Ø                    | Spring Force |
|-----------------------|--------------------------|--------------|
| F 840 14 S 150 L 1780 |                          |              |
| Tip Style             | Material                 | Finish       |
| Material:             | S = Steel                |              |
| Tip-Ø:                | 150 = 1,5 mm (e.g.)      |              |
| Finish:               | L = Longtime Gold plated |              |
| ORDER EXAMPLE         |                          |              |

| Tip Style   | Number | Material | Plating | Ø in mm | Version |
|---|--------|----------|---------|---------|---------|
|  | 14     | S        | L       | 1,5     | -       |



## Radio Frequency Probes from FEINMETALL

### Design of RF-Probes

Spring contact probes for RF-applications are coaxial probes. The inner and outer conductors are designed and dimensioned according to the RF specific requirements. That means the signals within a wide frequency band are transmitted with a minimum loss. For evaluation of RF-probes various definitions and parameters are relevant.

### Two-Port Network

The common two-port network describes the characteristics of possible transmission paths. These can be wires, radio transmissions or RF-contact probes.

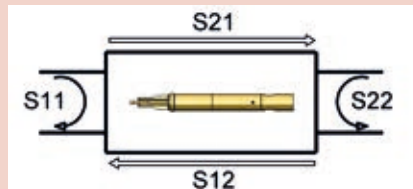
### S-Parameters

In radio frequency technology the transmission characteristics of two-port networks are described by S-parameters (scattering parameters). The S-parameters are typically specified as attenuation given in decibel [dB].  
S11: Reflection input side (matching)

S21: Transmission loss forward  
S12: Transmission loss backward  
S22: Reflection output side

### Matching

The matching respectively the reflection characteristic always refers to the impedance of the DUT and its RF related environment.



The more constant the impedance on the transmission path is, the better is the matching and the transmission of the signal. For RF testing always the complete transmission path of DUT, RF-probe and connecting element has to be considered. A major part of the signal loss is caused by mismatching

between RF probe and DUT. The frequency response charts in the specification sheets of the probes HF860 include the probe as well as an RF-connector (representing the DUT) and a connecting element with connected cable. The type and length of the cable is also influencing the transmission of the signal and may lead to a reduced bandwidth. For reference, the values S21 and S11 for the HF860 without DUT and connecting element are shown as well.

### Transmission loss

The transmission loss describes the transmission behavior of a two-port network and is represented by the value S21. Very often the 3dB cutoff frequency is used as characteristic value. This is the frequency with an attenuation of -3dB. At this frequency the power has reduced by 50% and the voltage by 30%.

## HF860 Variants for Common RF-Connector Types

The overview is a selection of the FEINMETALL RF Probe Program. Further versions on request.



## 4-Wire Resistance Measurement by Kelvin Coaxial Probes

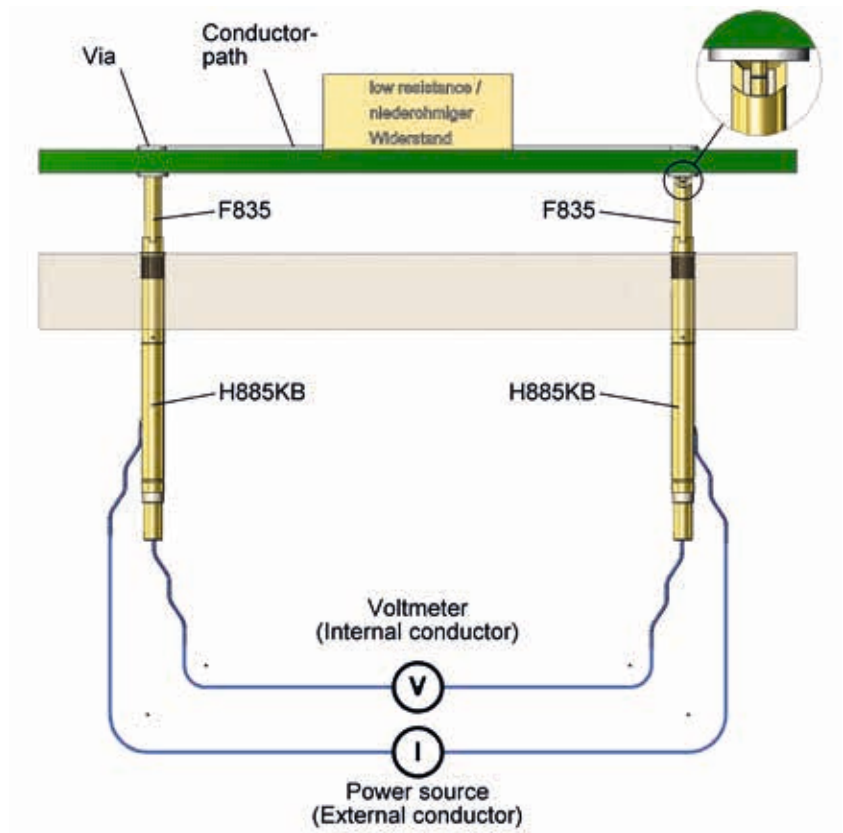
### The Kelvin Method

A Kelvin probe is a coaxial contact probe with two electrically insulated measuring circuits. The typical 4-wire-method is based on a constant current, flowing through the test resistance and the measurement of the resulting drop in voltage, which is directly proportional to the resistance value.

According " $I=\text{constant}$ " and because of the very high internal resistance of the voltmeter, the cable and contact resistances are not influencing the measuring result. This leads to high accuracy of this measuring method.

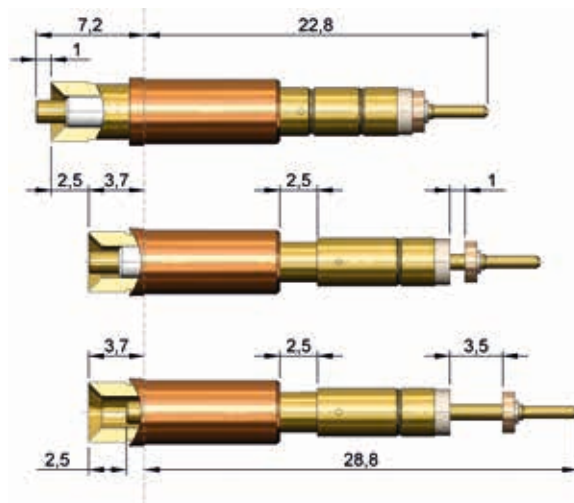
The contacting for current source and voltmeter is realised by two Kelvin probes, ideally located very close to the device under test. The constant current usually is carried by the outer conductor (force signal), while the voltage drop is detected by the inner conductor (sense signal).

The inner and outer conductors of FEINMETALL Coaxial Probes are independently spring loaded in order to balance mechanical tolerances and heights.



### Application Note F820

Depending on the shape of the DUT the travel of inner contact and ring contact might be different. As soon as the ring contact is pushed in, the inner contact is carried along. This might lead to other travels and spring forces than the nominal values.



# High Frequency Probes



## Contacting of SMA-Female

**HF86002B0001G530**

|                           |               |
|---------------------------|---------------|
| <b>Centers (mm/mil)</b>   | 6,50 / 256    |
| <b>Temperature</b>        | -20°C...+80°C |
| <b>Current (Circular)</b> | 10,0 A        |
| <b>Current (Internal)</b> | 3,0 A         |
| <b>Z</b>                  | 50 Ohm        |
| <b>Frequency</b>          | 8,0 GHz       |

### Spring Force Total (cN ±20%)

|                  | Preload | Nominal Force |
|------------------|---------|---------------|
| total            | -       | 530           |
| Internal Contact | 75      | 130           |
| Circular Contact | 90      | 400           |

### Travel (mm)

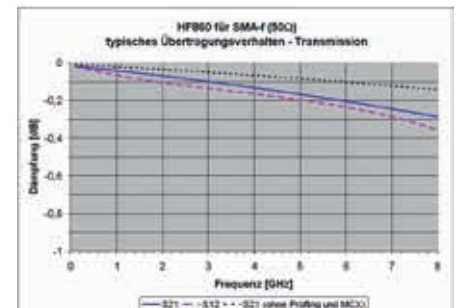
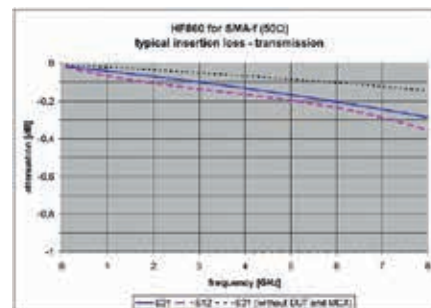
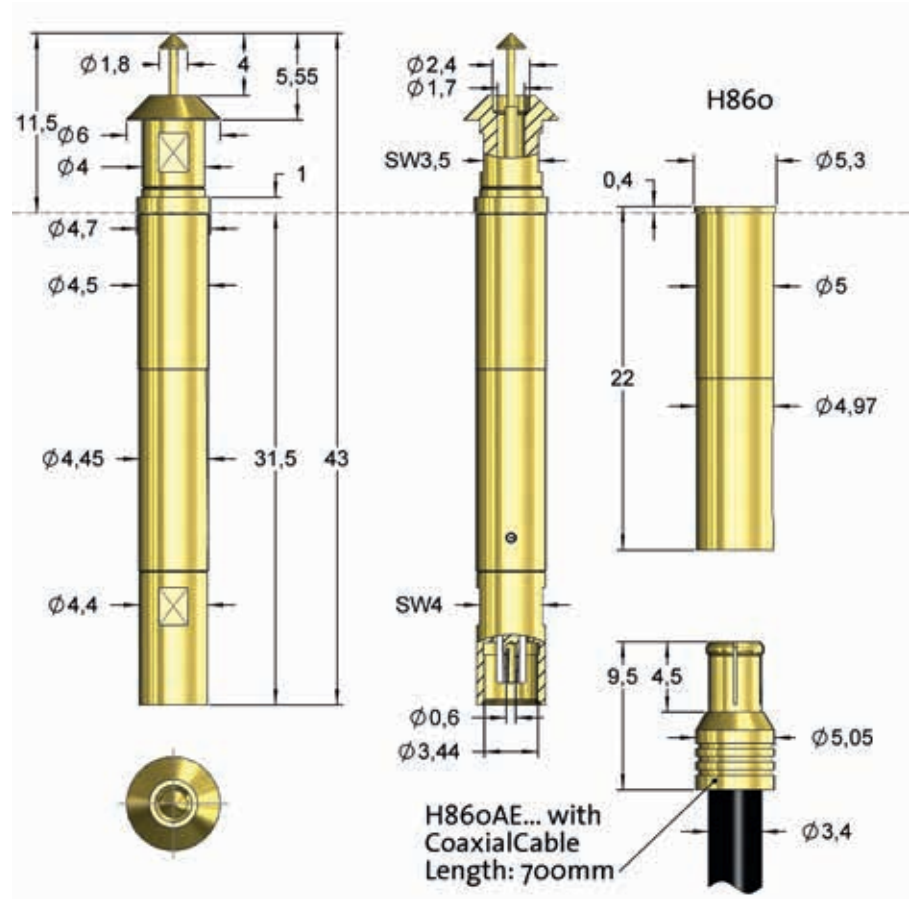
|                  | Nominal | Maximum |
|------------------|---------|---------|
| Internal Contact | 2,0     | 3,7     |
| Circular Contact | 4,0     | 5,0     |
| Wrench Size      | 3,5/4,0 |         |

### Materials and Plating

|                         |                           |
|-------------------------|---------------------------|
| Internal Contact        | BeCu, gold plated         |
| Circular Contact        | BeCu, gold plated         |
| Barrel                  | Brass, gold plated        |
| Spring Internal Contact | gold plated, Music wire   |
| Spring Circular Contact | Stainless steel, unplated |
| Receptacle              | Brass, gold plated        |

### Drill Size (mm)

|      |             |
|------|-------------|
| H860 | 4,99 - 5,00 |
|------|-------------|



**SMA-Female**

| ORDER NUMBER                  |
|-------------------------------|
| HF86002B0001G530 (SMA-Female) |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 02     | B        | G       | 1,8     | -       |

# High Frequency Probes

## Contacting of SMB-Male

**HF86005B0004G530**

|                           |               |
|---------------------------|---------------|
| <b>Centers (mm/mil)</b>   | 6,00 / 236    |
| <b>Temperature</b>        | -20°C...+80°C |
| <b>Current (Circular)</b> | 10,0 A        |
| <b>Current (Internal)</b> | 3,0 A         |
| <b>Z</b>                  | 50 Ohm        |
| <b>Frequency</b>          | 5,0 GHz       |

### Spring Force Total (cN ±20%)

|                  | Preload | Nominal Force |
|------------------|---------|---------------|
| total            | -       | 530           |
| Internal Contact | 75      | 130           |
| Circular Contact | 90      | 400           |

### Travel (mm)

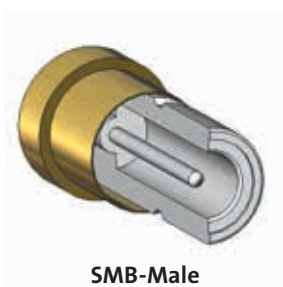
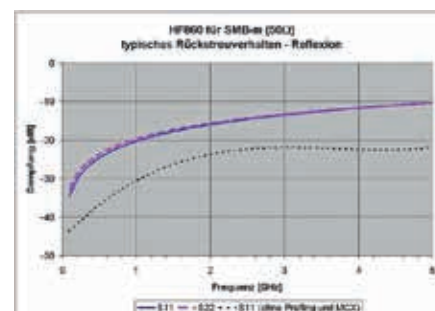
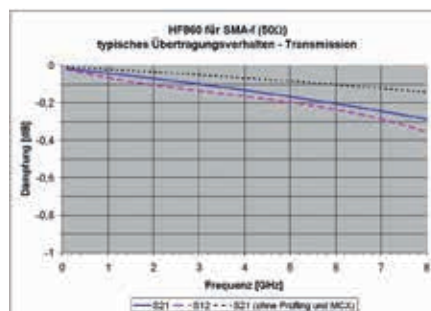
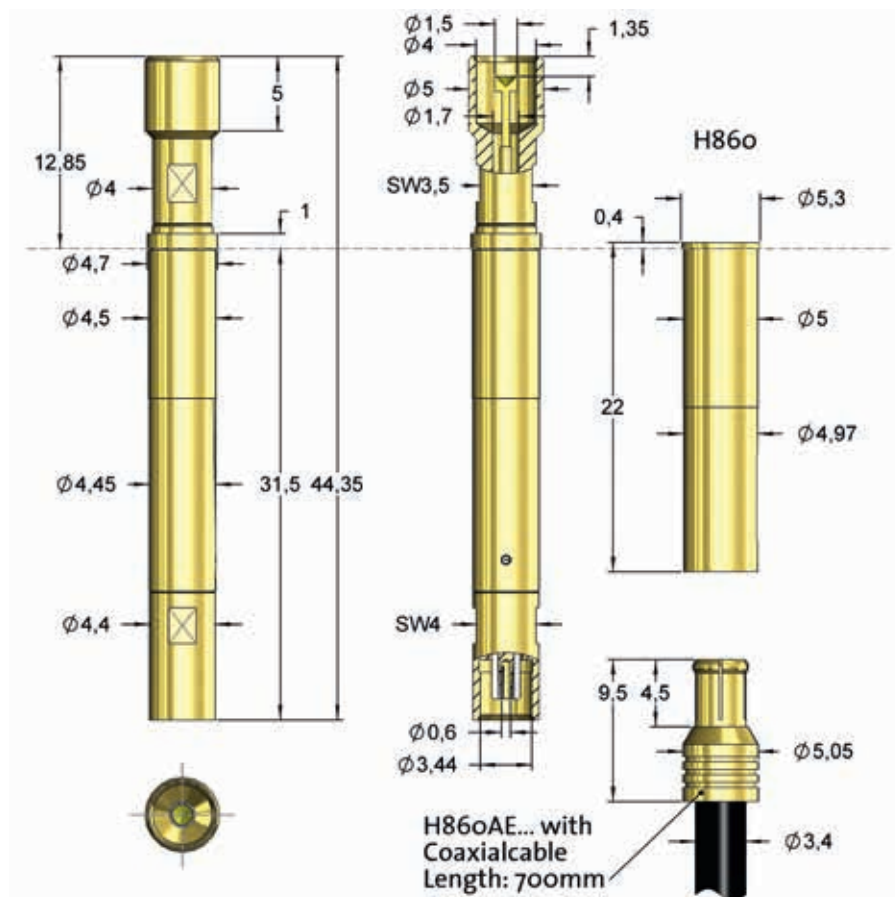
|                  | Nominal | Maximum |
|------------------|---------|---------|
| Internal Contact | 2,0     | 3,7     |
| Circular Contact | 4,0     | 5,0     |
| Wrench Size      | 3,5/4,0 |         |

### Materials and Plating

|                         |                           |
|-------------------------|---------------------------|
| Internal Contact        | BeCu, gold plated         |
| Circular Contact        | BeCu, gold plated         |
| Barrel                  | Brass, gold plated        |
| Spring Internal Contact | gold plated, Music wire   |
| Spring Circular Contact | Stainless steel, unplated |
| Receptacle              | Brass, gold plated        |

### Drill Size (mm)

|      |             |
|------|-------------|
| H860 | 4,99 - 5,00 |
|------|-------------|



| ORDER NUMBER                |
|-----------------------------|
| HF86005B0004G530 (SMB-Male) |

| Tip Style   | Number | Material | Plating | Ø in mm | Version |
|---|--------|----------|---------|---------|---------|
|  | 05     | B        | G       | 1,5     | -       |



# High Frequency Probes



## Contacting of SMB-Female

**HF86002B0005G530**

|                           |               |
|---------------------------|---------------|
| <b>Centers (mm/mil)</b>   | 6,50 / 256    |
| <b>Temperature</b>        | -20°C...+80°C |
| <b>Current (Circular)</b> | 10,0 A        |
| <b>Current (Internal)</b> | 3,0 A         |
| <b>Z</b>                  | 50 Ohm        |
| <b>Frequency</b>          | 6,0 GHz       |

### Spring Force Total (cN ±20%)

|                  | Preload | Nominal Force |
|------------------|---------|---------------|
| total            | -       | 530           |
| Internal Contact | 75      | 130           |
| Circular Contact | 90      | 400           |

### Travel (mm)

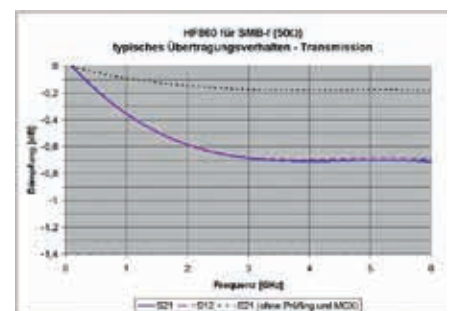
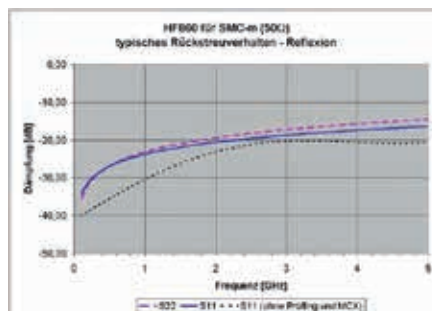
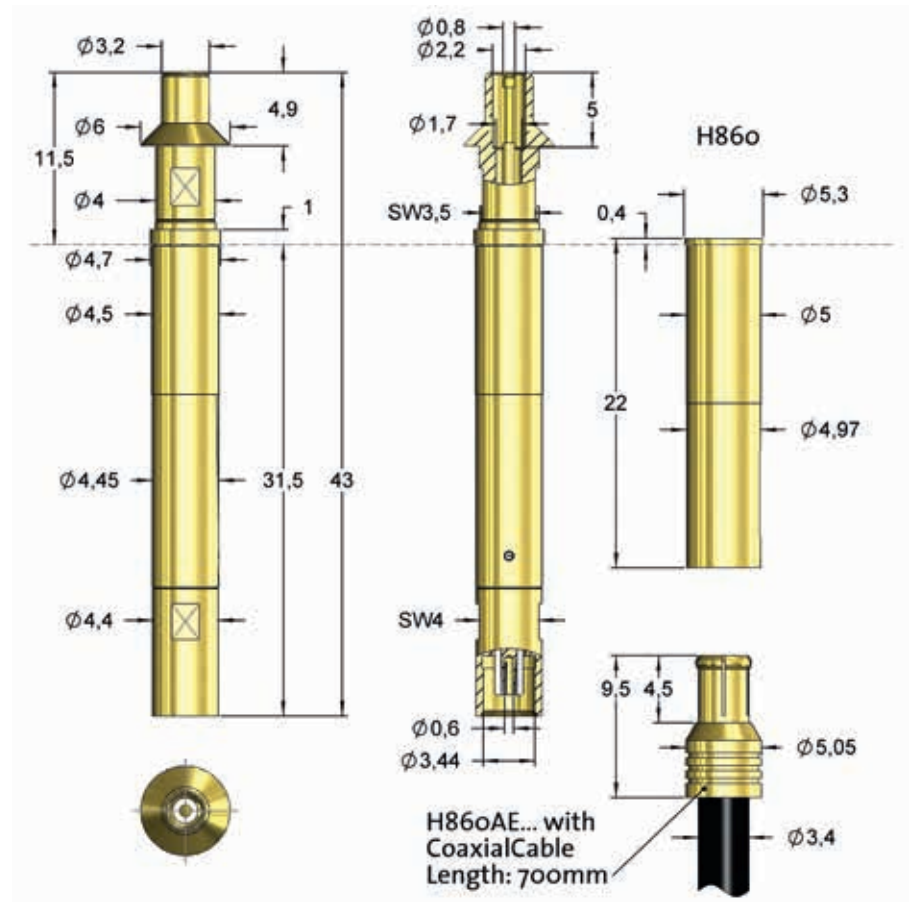
|                  | Nominal | Maximum |
|------------------|---------|---------|
| Internal Contact | 2,0     | 3,7     |
| Circular Contact | 4,0     | 5,0     |
| Wrench Size      | 3,5/4,0 |         |

### Materials and Plating

|                         |                           |
|-------------------------|---------------------------|
| Internal Contact        | BeCu, gold plated         |
| Circular Contact        | BeCu, gold plated         |
| Barrel                  | Brass, gold plated        |
| Spring Internal Contact | gold plated, Music wire   |
| Spring Circular Contact | Stainless steel, unplated |
| Receptable              | Brass, gold plated        |

### Drill Size (mm)

|      |             |
|------|-------------|
| H860 | 4,99 - 5,00 |
|------|-------------|



**SMB.Female**

| ORDER NUMBER                  |
|-------------------------------|
| HF86002B0005G530 (SMB-Female) |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 02     | B        | G       | 0,8     | -       |



# High Frequency Probes

## Contacting of SMC-Male

### HF86005B0003G530

|                           |               |
|---------------------------|---------------|
| <b>Centers (mm/mil)</b>   | 6,00 / 236    |
| <b>Temperature</b>        | -20°C...+80°C |
| <b>Current (Circular)</b> | 10,0 A        |
| <b>Current (Internal)</b> | 3,0 A         |
| <b>Z</b>                  | 50 Ohm        |
| <b>Frequency</b>          | 5,0 GHz       |

#### Spring Force Total (cN ±20%)

|                  | Preload | Nominal Force |
|------------------|---------|---------------|
| total            | -       | 530           |
| Internal Contact | 75      | 130           |
| Circular Contact | 90      | 400           |

#### Travel (mm)

|                  | Nominal | Maximum |
|------------------|---------|---------|
| Internal Contact | 2,0     | 3,7     |
| Circular Contact | 4,0     | 5,0     |
| Wrench Size      | 3,5/4,0 |         |

#### Materials and Plating

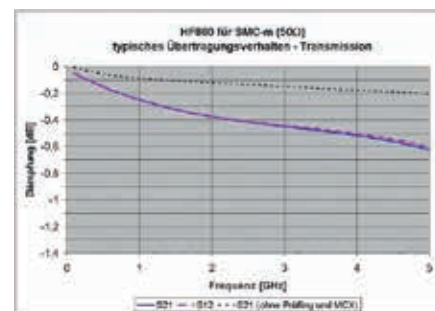
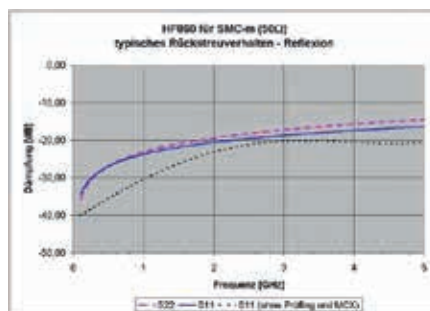
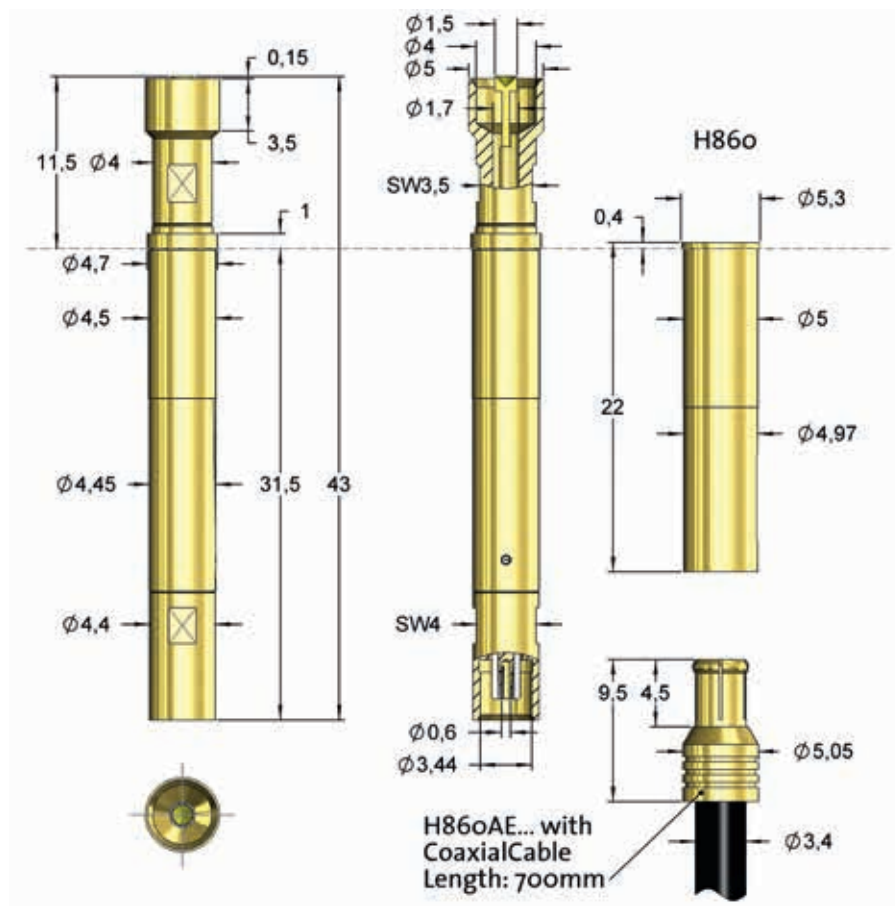
|                         |                           |
|-------------------------|---------------------------|
| Internal Contact        | BeCu, gold plated         |
| Circular Contact        | BeCu, gold plated         |
| Barrel                  | Brass, gold plated        |
| Spring Internal Contact | gold plated, Music wire   |
| Spring Circular Contact | Stainless steel, unplated |
| Receptable              | Brass, gold plated        |

#### Drill Size (mm)

|      |             |
|------|-------------|
| H860 | 4,99 - 5,00 |
|------|-------------|



SMC-Male



#### ORDER NUMBER

HF86005B0003G530 (SMC-Male)

#### Tip Style



#### Number

05

#### Material

B

#### Plating

G

#### Ø in mm

1,5

#### Version

-

# High Frequency Probes



## Contacting of U.FL-Male

**HF86005B0002G530**

|                           |               |
|---------------------------|---------------|
| <b>Centers (mm/mil)</b>   | 6,00 / 236    |
| <b>Temperature</b>        | -20°C...+80°C |
| <b>Current (Circular)</b> | 10,0 A        |
| <b>Current (Internal)</b> | 3,0 A         |
| <b>Z</b>                  | 50 Ohm        |
| <b>Frequency</b>          | 5,0 GHz       |

### Spring Force Total (cN ±20%)

|                  | Preload | Nominal Force |
|------------------|---------|---------------|
| total            | -       | 530           |
| Internal Contact | 75      | 130           |
| Circular Contact | 90      | 400           |

### Travel (mm)

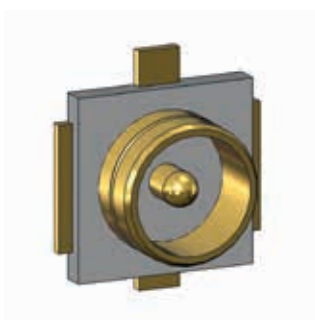
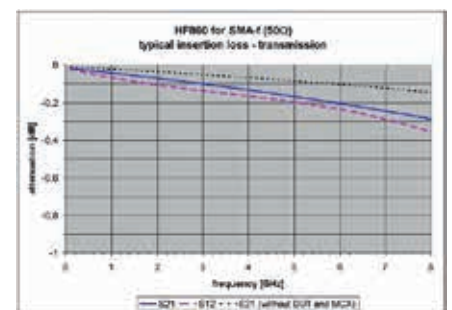
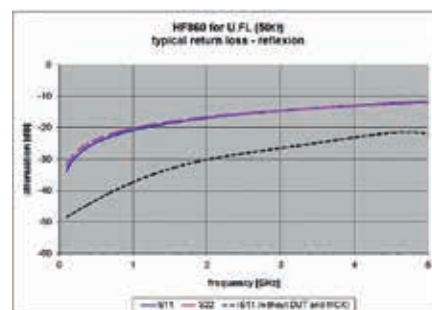
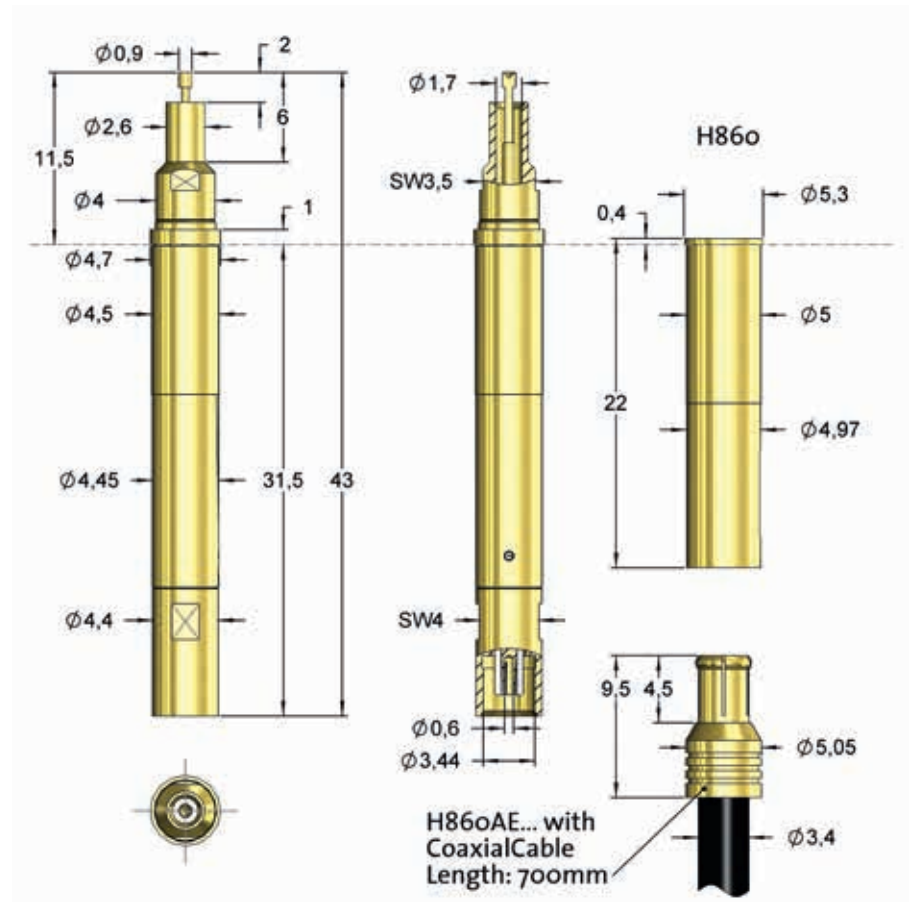
|                  | Nominal | Maximum |
|------------------|---------|---------|
| Internal Contact | 2,0     | 3,7     |
| Circular Contact | 4,0     | 5,0     |
| Wrench Size      | 3,5/4,0 |         |

### Materials and Plating

|                         |                           |
|-------------------------|---------------------------|
| Internal Contact        | BeCu, gold plated         |
| Circular Contact        | BeCu, gold plated         |
| Barrel                  | Brass, gold plated        |
| Spring Internal Contact | gold plated, Music wire   |
| Spring Circular Contact | Stainless steel, unplated |
| Receptacle              | Brass, gold plated        |

### Drill Size (mm)

|      |             |
|------|-------------|
| H860 | 4,99 - 5,00 |
|------|-------------|



U.FL-Male

| ORDER NUMBER                 |
|------------------------------|
| HF86005B0002G530 (U.FL-Male) |

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 05     | B        | G       | 0,9     | -       |

## Contacting of HSD Connectors HF819

|                           |               |
|---------------------------|---------------|
| <b>Centers (mm/mil)</b>   | 12,0 / 472    |
| <b>Temperature</b>        | -20°C...+80°C |
| <b>Current (Circular)</b> | 10,0 A        |
| <b>Current (Internal)</b> | 3,0 A         |
| <b>Z</b>                  | 100 Ohm       |
| <b>Frequency</b>          | 1-2 GHz       |

### Spring Force Total (cN ±20%)

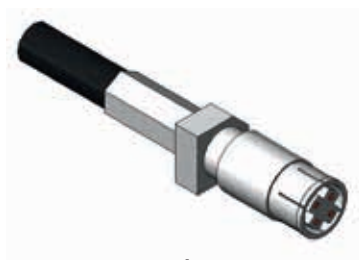
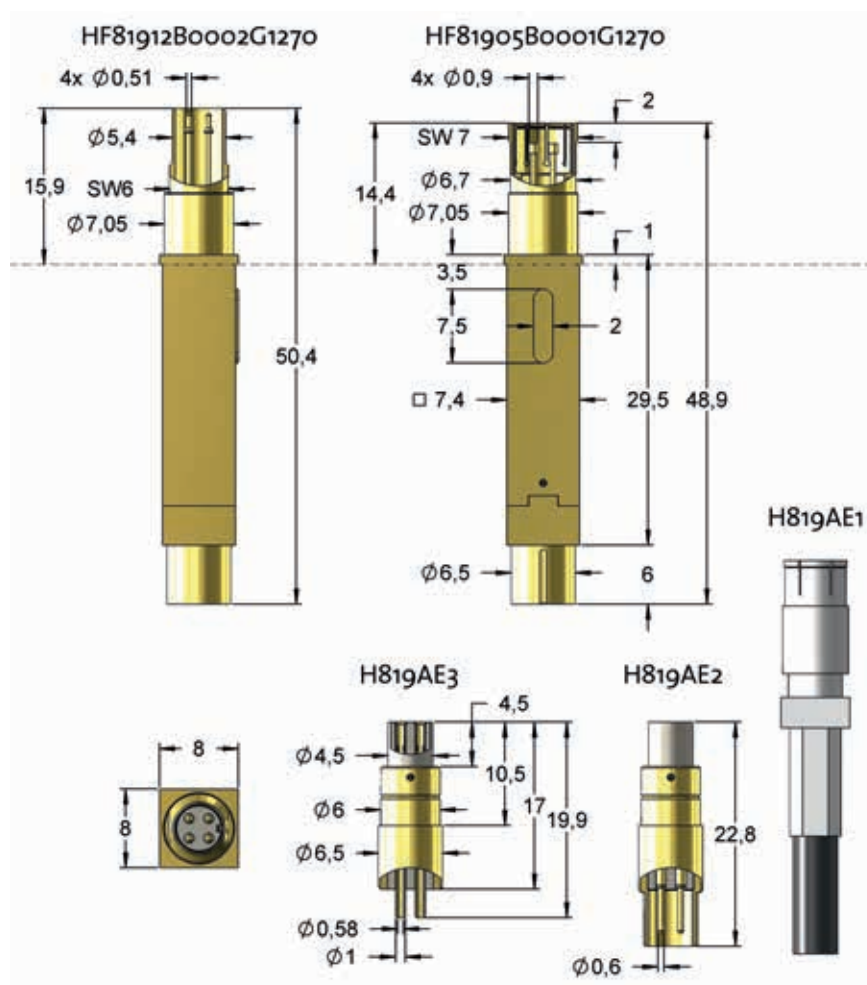
|                  | Preload | Nominal Force |
|------------------|---------|---------------|
| total            | -       | 1270          |
| Internal Contact | 75      | 130           |
| Circular Contact | 300     | 750           |

### Travel (mm)

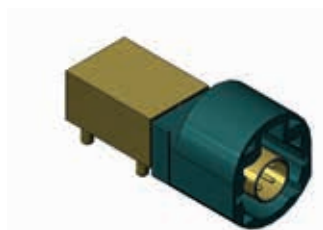
|                  | Nominal   | Maximum |
|------------------|-----------|---------|
| Internal Contact | 2,0       | 3,7     |
| Circular Contact | 5,0       | 6,0     |
| Wrench Size      | 6,0 / 7,0 |         |

### Materials and Plating

|                         |                           |
|-------------------------|---------------------------|
| Internal Contact        | BeCu, gold plated         |
| Circular Contact        | BeCu, gold plated         |
| Barrel                  | Brass, gold plated        |
| Spring Internal Contact | gold plated, Music wire   |
| Spring Circular Contact | Stainless steel, unplated |



HSD-Female H819AE1

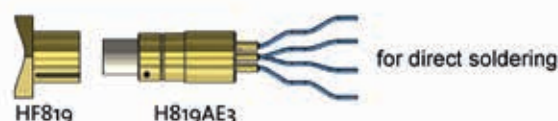


HSD-Male D4S20A-40ML5-Z

By combining connecting elements H819AE1 and H819AE2 the signal path can be realized without soldering. This leads to a well defined and reproducible measuring section.



### Flexible connection



### Order Number

HF81905B0001G1270  
(for HSD Connector Male)  
HF81912B0002G1270  
(for HSD Connector Female)

| Tip Style | Number | Material | Plating | Ø in mm | Version |
|-----------|--------|----------|---------|---------|---------|
|           | 05     | B        | G       | 0,9     | -       |
|           | 12     | B        | G       | 0,51    | -       |



## Inner Contact for RF-Probes

### F086

|                  |               |
|------------------|---------------|
| Centers (mm/mil) | 1,27 / 50     |
| Current          | 3,0 A         |
| Temperature      | -20°C...+80°C |
| R typically      | 10 mOhm       |

#### Spring Force (cN ±20%)

| Preload | Nominal Force |
|---------|---------------|
| 75      | 130           |

#### Travel (mm)

| Nominal           | Maximum  |
|-------------------|----------|
| 2,0               | 3,7      |
| Pointing Accuracy | ±0,05 mm |

#### Materials and Plating

|            |                            |
|------------|----------------------------|
| Plunger    | see Tip Style              |
| Barrel     | Bronze, gold plated        |
| Spring     | Music wire, gold plated    |
| Receptacle | Nickel silver, Gold plated |

#### Accessories

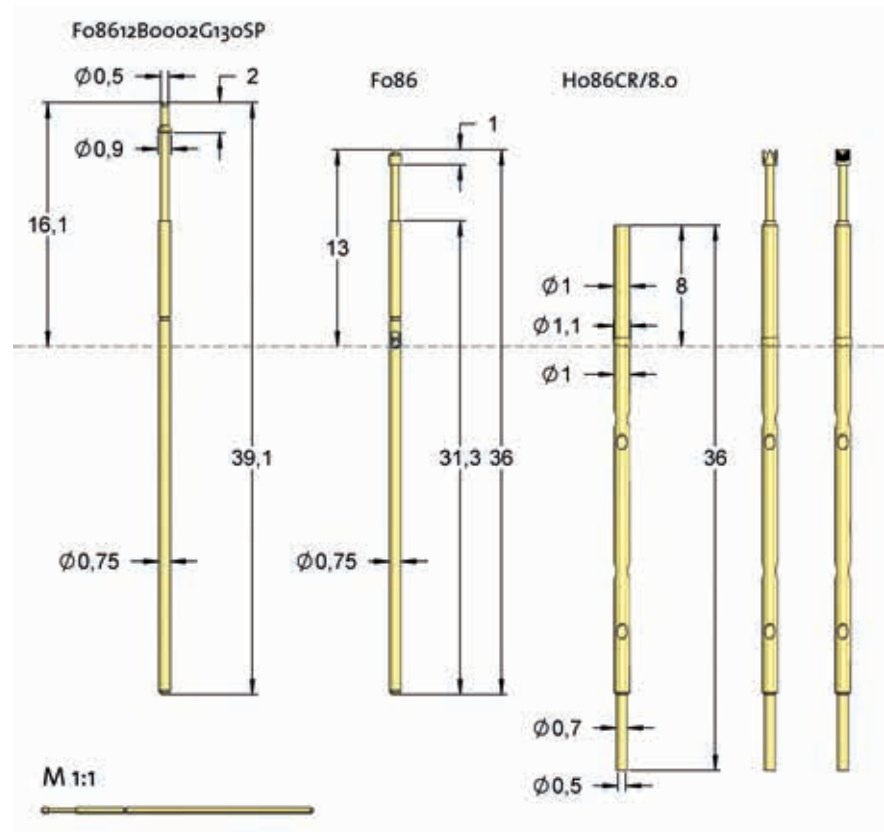
|                           |            |
|---------------------------|------------|
| Insertion tool receptacle | FEWZ-050EV |
| Insertion tool receptacle | FEWZ-050E0 |
| Insertion tool probe      | FDWZ-050   |

#### Drill Size [mm]

|                     |             |
|---------------------|-------------|
| Press ring as stop  | 0,99 - 1,00 |
| Press ring inserted | 1,05 - 1,07 |

#### Projection Height

|            |            |
|------------|------------|
| H086CR/8.0 | 5,0 - 13,0 |
|------------|------------|



| Tip Style | Number | Material | Plating | Ø in mm  | Version |
|-----------|--------|----------|---------|----------|---------|
|           | 02     | B        | G       | 0,8; 1,8 | -       |
|           | 05     | B        | G       | 0,9; 1,5 | -       |
|           | 11     | B        | G       | 0,51     | -       |
|           | 12     | B        | G       | 0,51     | SP      |
|           | 14     | B        | L       | 0,9      | -       |

## Connecting Cables for HF860



#### H860AE1

Connecting cable  
Pre-assembled  
Type RG316

#### Specification RG 316

Impedance: 50 Ohm  
Bandwidth: recommended up to 3 GHz  
Standard length: 700 mm  
Standard end 1: Connector MCX-male  
Standard end 2: open  
Further assemblies on request



#### H860AE2

Connecting cable  
Pre-assembled  
Type Multiflex 86

#### Specification Multiflex 86

Impedance: 50 Ohm  
Bandwidth: recommended up to 10 GHz  
Standard length: 700 mm  
Standard end 1: Connector MCX-male  
Standard end 2: Connector SMA-male  
Further assemblies on request

| Type             | Tip-Ø                                     |        | Spring Force    |   |     |
|------------------|---|--------|-----------------|---|-----|
| F086             | 14  | S      | 090             | L | 130 |
| Tip Style        | Material                                  | Finish | Special Version |   |     |
| Material:        | B = BeCu, S = Steel                       |        |                 |   |     |
| Tip-Ø:           | 090 = 0,9 mm (e.g.)                       |        |                 |   |     |
| Finish:          | G = Gold plated, L = Longtime Gold plated |        |                 |   |     |
| Special Version: | SP = Step Probe (see drawing)             |        |                 |   |     |
| Receptacle:      | Order Code according drawing              |        |                 |   |     |
| ORDER EXAMPLE    |   |        |                 |   |     |

ORDER EXAMPLE





## Tools and Accessories

For installation and maintenance of contact probes and receptacles FEINMETALL offers a great variety of tools. For the mounting of standard probes practical insertion- and screw-in tools are useful. For a simple and effective mounting of switch probes tools with integrated functions are ideal, for example to adjust the correct position of the switch point. A spring force gauge additionally enables the measurement of spring forces, for example to identify inserted contact probes in existing modules or fixtures.

|          |     |
|----------|-----|
| FEWZ     | 184 |
| FAWZ     | 184 |
| FDWZ     | 184 |
| FWZ      | 185 |
| FWZ...SA | 186 |
| FK50     | 187 |

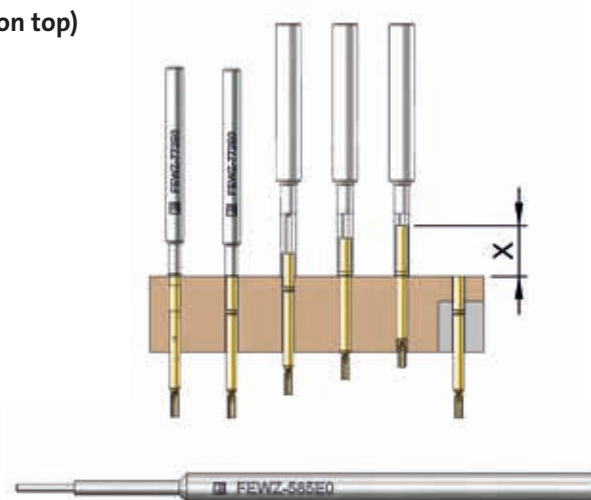




## Insertion tool for receptacles with fixed stop (collar or press ring on top)

| Receptacle | Insertion Height (mm) | PIN-Ø (mm) | Insertion Tool |
|------------|-----------------------|------------|----------------|
| H050, H787 | 0,0                   | 0,8        | FEWZ-787E0     |
| H075, H703 | 0,0                   | 0,9        | FEWZ-075E0     |
| H100, H585 | 0,0                   | 1,3        | FEWZ-100E0     |
| H109       | 0,0                   | 0,5        | FEWZ-109E0     |
| H111, H511 | 0,0                   | 0,6        | FEWZ-511E0     |
| H563       | 0,0                   | 2,0        | FEWZ-563E0     |
| H564       | 0,0                   | 2,4        | FEWZ-564E0     |
| H735       | 0,0                   | 3,5        | FEWZ-735E0     |
| H772       | 0,0                   | 1,6        | FEWZ-772E0     |
| H774, H566 | 0,0                   | 2,6        | FEWZ-774E0     |

All receptacles with dead stop (collar or press ring on top) can be inserted with tool FEWZ-...E0. The guiding pin of the tool helps to stabilize and properly mount the receptacle.



## Insertion tool for receptacles with fixed stop (press ring inserted)

| Receptacle | Insertion Height XX (mm) | I-Ø (mm) | Insertion Tool |
|------------|--------------------------|----------|----------------|
| H050, H787 | xx                       | 1,1      | FEWZ-050Exx    |
| H075       | xx                       | 1,5      | FEWZ-075Exx    |
| H100       | xx                       | 1,83     | FEWZ-100Exx    |

All receptacles with press ring can be inserted with tool FEWZ-...Ex.

In this case the x is the fix height level (see picture). This value is required for ordering the correct tool.



## Variable insertion tool for receptacles

| Receptacle | Insertion Height X (mm) | Insertion Tool |
|------------|-------------------------|----------------|
| H050, H787 | 0 - 10                  | FEWZ-050EV     |
| H075, H073 | 0 - 12                  | FEWZ-075EV     |
| H100, H585 | 0 - 12                  | FEWZ-100EV     |
| H772       | 0 - 10                  | FEWZ-772EV     |

For different height levels of the receptacles with inserted press ring, the tool FEWZ-...EV is appropriate.

The required height level can be adjusted at the tool.



## Insertion tool for plug-in contact probes

| Insertion Tool | Shank-Ø (mm) | Length (mm) |
|----------------|--------------|-------------|
| FDWZ-050       | 1,5          | 100,0       |
| FDWZ-075       | 2,5          | 100,0       |
| FDWZ-100       | 3,5          | 100,0       |

For inserting the probe into the receptacle tool FDWZ is helpful. After the probe is pushed into the receptacle and stopped by the pressure marks, the probe is driven into the receptacle with the FDWZ tool. The tool is made of a synthetic material to avoid any damaging of the plunger tips.



## Mounting tool for twist proof receptacles

| Receptacle | (BIT + Handle) | BIT     | Handle    |
|------------|----------------|---------|-----------|
| H756...    | FAWZ756        | AS756   | GSFAWZ500 |
| H757...    | FAWZ756        | AS756   | GSFAWZ500 |
| H760...    | FAWZ761        | AS761   | GSFAWZ500 |
| H761...    | FAWZ761        | AS761   | GSFAWZ500 |
| HVF3...    | FAWZVF3        | ASVF3   | GSFAWZ500 |
| HVF4...    | FAWZVF4        | ASVF4   | GSFAWZ500 |
| HVF100...  | FAWZVF100      | ASVF100 | GSFAWZ500 |

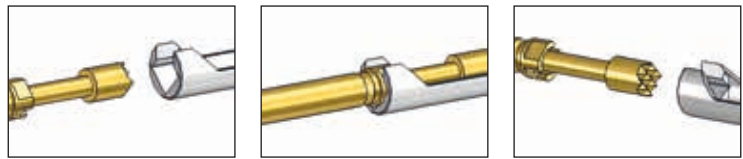


Receptacles for twist proof probes need to be mounted well aligned into the fixture or module. This can be done with the alignment tool FAWZ. This tool can be chucked into a lever press.

## Hook Wrench



The hook wrench is the standard tool for all probes with square wrench sizes even if the head diameter is larger than the wrench size.



## Socket Wrench



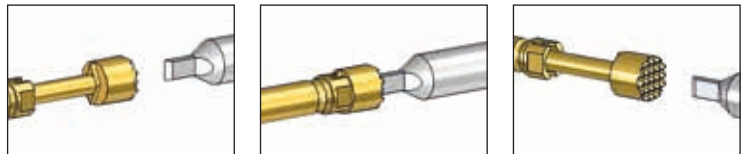
The socket wrench can be used for square wrench sizes if the head diameter is smaller than the wrench size. The tool helps to assemble probes within small centers.



## Screw Driver



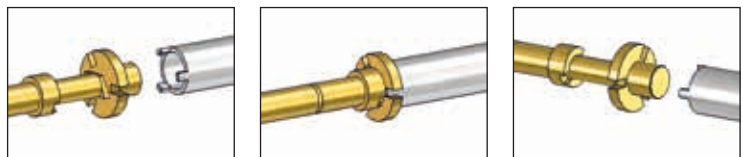
Screw drivers can be used if the contact area has any support (e.g. serrated honeycomb or slit) and the head has an integrated locking system.



## Tool for Step Probes



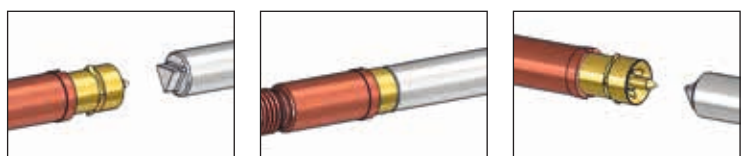
For assembly of oversized step probes FEINMETALL has developed a special tool for applications with very limited space between the probes.



## Tool for Coaxial Probes








For the mounting of large outer conductors FEINMETALL has developed a special tool that enables applications with limited space between the probes.













## Screw-In-Tools

|            |  |  |  |          |     |  |            |        |  |            |        |
|------------|---|---|---|----------|-----|--|------------|--------|---|------------|--------|
| max. tip-Ø | Hook--  | Socket-   | Triangle  | Shank ØA | SW  | FWZ  | BIT        | Handle | FWZ...T   | BIT        | Handle |
| 0,9        | x   |   |   | 1,6      | 1,0 | FWZ730   | BIT730     | GS300  | FWZ730T   | BIT730     | GS300T |
| 1,5        | x   |   |   | 2,0      | 1,0 | FWZ730S1   | BIT730S1   | GS300  | FWZ730T1  | BIT730S1   | GS300T |
| 1,3        |   | x   |   | 2,4      | 1,4 | FWZ731S1   | BIT731S1   | GS400  | FWZ731T1  | BIT731S1   | GS400T |
| 2,0        | x   |   |   | 2,8      | 1,4 | FWZ731   | BIT731     | GS400  | FWZ731T   | BIT731     | GS400T |
| 1,6        |   | x   |   | 2,7      | 1,7 | FWZ732S2   | BIT732S2   | GS400  | FWZ732T2  | BIT732S2   | GS400T |
| 2,0        | x   |   |   | 2,8      | 1,7 | FWZ732   | BIT732     | GS400  | FWZ732T   | BIT732     | GS400T |
| 2,7        | x   |   |   | 3,5      | 1,7 | FWZ732S1   | BIT732S1   | GS400  | FWZ732T1  | BIT732S1   | GS400T |
| 2,0        |   | x   |   | 2,8      | 1,8 | FWZVF100   | BITVF100   | GS400  | FWZVF100T   | BITVF100   | GS400T |
| 2,7        | x   |   |   | 3,5      | 1,8 | FWZVF100S1   | BITVF100S1 | GS400  | FWZVF100T1  | BITVF100S1 | GS400T |
| 2,7        | x   |   |   | 3,5      | 2,2 | FWZVF3   | BITVF3     | GS500  | FWZVF3T   | BITVF3     | GS500T |
| 3,1        | x   |   |   | 4,0      | 2,2 | FWZVF3S1   | BITVF3S1   | GS500  | FWZVF3T1  | BITVF3S1   | GS500T |
| 2,3        |   | x   |   | 3,5      | 2,2 | FWZVF3S2   | BITVF3S2   | GS500  | FWZVF3T2  | BITVF3S2   | GS500T |
| 4,0        | x   |   |   | 5,0      | 2,2 | FWZVF3S3   | BITVF3S3   | GS500  | FWZVF3T3  | BITVF3S3   | GS500T |
| 3,1        | x   |   |   | 4,0      | 2,5 | FWZVF4S1   | BITVF4S1   | GS500  | FWZVF4T1  | BITVF4S1   | GS500T |
| 4,0        | x   |   |   | 5,0      | 2,5 | FWZVF4   | BITVF4     | GS500  | FWZVF4T   | BITVF4     | GS500T |
| 2,5        |   | x   |   | 3,8      | 2,6 | FWZ885   | BIT885     | GS500  | FWZ885T   | BIT885     | GS500T |
| 3,1        | x   |   |   | 4,0      | 2,6 | FWZ885S1   | BIT885S1   | GS500  | FWZ885T1  | BIT885S1   | GS500T |
| 4,0        | x   |   |   | 5,0      | 2,6 | FWZ760S1   | BIT760S1   | GS500  | FWZ760T1  | BIT760S1   | GS500T |
| 4,9        | x   |   |   | 6,5      | 2,6 | FWZ760S2   | BIT760S2   | GS500  | FWZ760T2  | BIT760S2   | GS500T |
| 3,0        |   | x   |   | 5,0      | 3,0 | FWZ733S1   | BIT733S1   | GS500  | FWZ733T1  | BIT733S1   | GS500T |
| 4,0        | x   |   |   | 5,0      | 3,0 | FWZ733   | BIT733     | GS500  | FWZ733T   | BIT733     | GS500T |
| -          | x   |   |   | 8,0      | 5,0 | FWZ888   | BIT888     | GS500  | FWZ888T   | BIT888     | GS500T |
| -          |   |   | x   | 4,0      | -   | FWZ831   | BIT831     | GS500  | FWZ831T   | BIT831     | GS500T |
| -          |   |   | x   | 4,0      | -   | FWZ831   | BIT831     | GS500  | FWZ831T   | BIT831     | GS500T |

## Screw-In-Tools for F886



| Probe      |  |  |        |        |  |        |        |
|------------|---|--|--------|--------|---|--------|--------|
|            |   | (BIT+Handle)   | BIT    | Handle | (BIT+Handle)  | BIT    | Handle |
| F88606...  | FWZ886S1 / FWZ886S2   | FWZ886   | BIT886 | GS500  | FWZ886T   | BIT886 | GS500T |
| F88617K... | FWZ886S1  | FWZ886   | BIT886 | GS500  | FWZ886T   | BIT886 | GS500T |
| F88617H... | FWZ886S1  | FWZ886   | BIT886 | GS500  | FWZ886T   | BIT886 | GS500T |
| F88617T... | FWZ886S2  | FWZ886   | BIT886 | GS500  | FWZ886T   | BIT886 | GS500T |
| F88617B... | FWZ886S2  | FWZ886   | BIT886 | GS500  | FWZ886T   | BIT886 | GS500T |

## Screw-In-Tools for Step Probes

| Probe      | Plate Ø    | Tip-Ø      |  |  |  | Shank Ø A |  |           |           | with ratchet  |            |           |        |
|------------|------------|------------|---|---|---|-----------|--|-----------|-----------|--|------------|-----------|--------|
|            |            |            |   |   |   |           | (BIT+Handle)   | BIT       | Handle    | (BIT+Handle)   | BIT        | Handle    |        |
|            |            |            |   |   |   |           |  |           |           |  |            |           |        |
| F730...SP  | 0,4 - 1,0  | 0,3 - 0,8  |   |   |   | x         | 1,5  | FWZ730    | BIT730    | GS300  | FWZ730T    | BIT730    | GS300T |
| F731...SP  | 0,4 - 1,3  | 0,3 - 1,1  |   |   |   | x         | 2,4  | FWZ731S1  | BIT731S1  | GS400  | FWT731T1   | BIT731S1  | GS400T |
|            | 0,4 - 1,7  | 0,3 - 0,8  | x   |   |   |           | 2,8  | FWZ731    | BIT731    | GS400  | FWT731T    | BIT731    | GS400T |
|            | 1,8 - 3,0  | 0,3 - 1,0  |   | x   |   |           | 1,85   | FWZ731SP  | BIT731SP  | GS400  | FWZ731SP   | BIT731SP  | GS400T |
|            |            |            |   |   |   |           |  |           |           |  |            |           |        |
| F732...SP  | 1,0 - 2,0  | 0,3 - 1,5  | x   |   |   |           | 2,8  | FWZ732    | BIT732    | GS400  | FWZ732T    | BIT732    | GS400T |
|            | 1,0 - 2,7  | 0,3 - 1,5  | x   |   |   |           | 3,5  | FWZ732S1  | BIT732S1  | GS400  | FWZ732T1   | BIT732S1  | GS400T |
|            | 2,1 - 6,0  | 0,3 - 1,5  |   | x   |   |           | 2,4  | FWZ732SP  | BIT732SP  | GS400  | FWZ732SPT  | BIT732SP  | GS400T |
|            |            |            |   |   |   |           |  |           |           |  |            |           |        |
| F732...SP1 | 2,8 - 6,0  | 1,51 - 2,2 |   | x   |   |           | 3,1  | FWZ732SP1 | BIT732SP1 | GS400  | FWZ732SPT1 | BIT732SP1 | GS400T |
| F733...SP  | 2,2 - 2,9  | 0,3 - 2,7  | x   |   |   |           | 5  | FWZ733    | BIT733    | GS500  | FWZ733T    | BIT733    | GS500T |
|            | 2,2 - 2,9  | 0,3 - 2,7  |   |   | x   |           | 5  | FWZ733S1  | BIT733S1  | GS500  | FWZ733T1   | BIT733S1  | GS500T |
|            | 3,5 - 7,0  | 3,31 - 6,8 |   | x   |   |           | 2,4  | FWZ732SP  | BIT732SP  | GS400  | FWZ732SPT  | BIT732SP  | GS400T |
|            | 4,01 - 7,0 | 0,3 - 3,3  |   | x   |   |           | 4,2  | FWZ733SP  | BIT733SP  | GS500  | FWZ733SPT  | BIT733SP  | GS500T |
| F733...SP1 | 3,0 - 4,0  | 0,3 - 2,2  |   | x   |   |           | 3,1  | FWZ732SP1 | BIT732SP1 | GS400  | FWZ732SPT1 | BIT732SP1 | GS400T |

Bits and handles can be ordered separately. Handles are colour marked depending on wrench size.

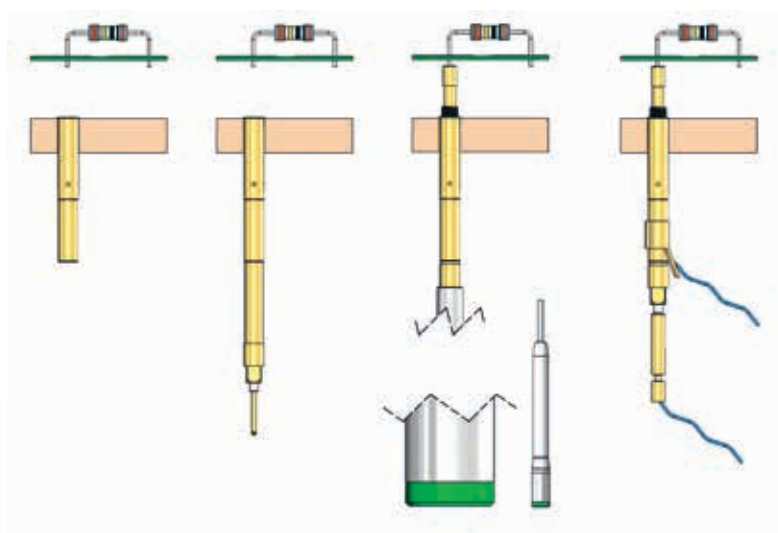


| Probe              |  | SW  | Overall Length | Shank $\varnothing A$ | Batteries     |  |
|--------------------|---|-----|----------------|-----------------------|---------------|---|
| F880...            | x   | 2,2 | 147,0          | 3,7                   | 2 x AAAA 1,5V | FWZ880SA  |
| F88890S1101U200S05 | x   | 5,0 | 147,0          | 8,0                   | 2 x AAAA 1,5V | FWZ888SA  |
| F88890S1102U100S07 | x   | 5,0 | 146,0          | 8,0                   | 2 x AAAA 1,5V | FWZ888SA1   |

Batteries non included in delivery

## LED tool for adjusting the optimum switch point of switch probes

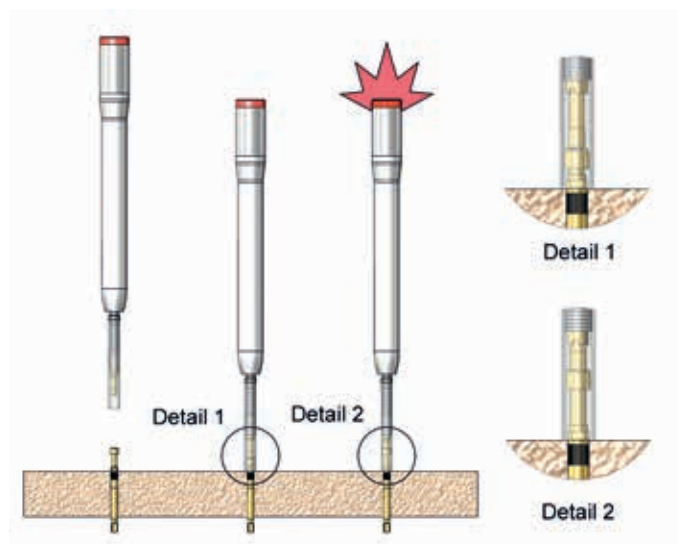
The tool FWZ...SA enables the mounting and correct positioning of switch probes before the final electrical connections are made. The exact switching position can be adjusted by help of the integrated LED signal which is illuminated as soon as the switch circuit is closed.



## Tool for detection of blocked or tight plungers

With this tool the correct function of contact probes built in at test modules or fixtures can be tested very fast and simple (max. spring force 600 cN). Thereby a potential damage of connector elements can be avoided.

- simple tool with integrated switch probe (F885) and LED-display
- test height (nominal travel) adjustable by threaded sleeve
- spring force adjustment possible by exchange of the integrated switch probe



Order Code 32001



## Spring Force Gauge

### FK50

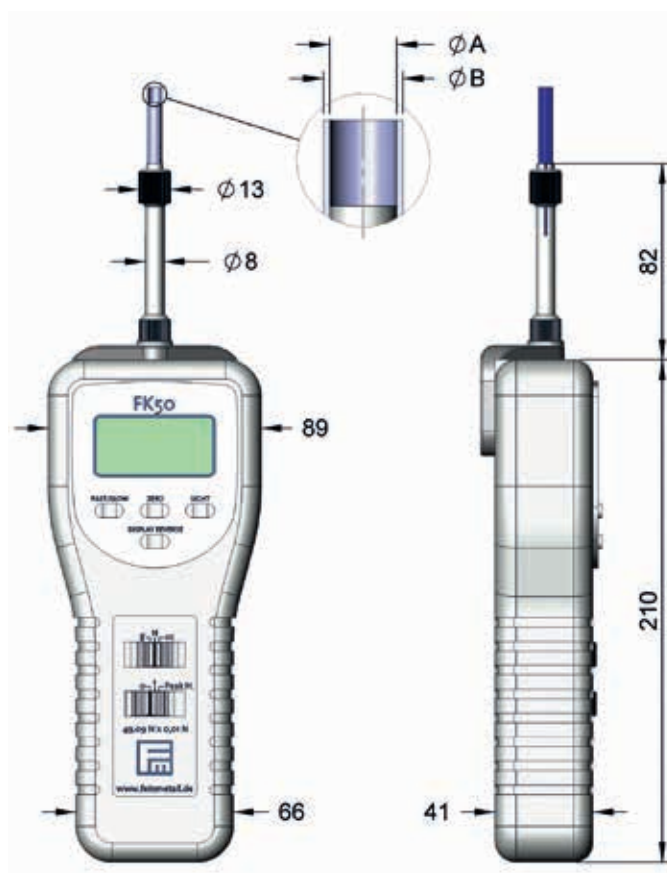
The Spring Force Gauge allows force measurement at all types of spring contact probes up to 50N. This instrument allows in a very simple way to verify, if a probe is still intact and to determine the spring force of the probe. The measuring results are displayed at the instrument and the display can be electrically turned by 180° if needed, e.g. for overhead applications. For the measurement just put the measuring sleeve over the probe and push it to the mounting plate. The sleeves depth can be adjusted according to the projection height of the probe. Adjustable measuring sleeves are available with three different diameters.

#### Technical Specifications:

- minimum force: 3g / 0,10oz / 0,03N
- resolution 1g / 0,03oz / 0,01N
- measuring accuracy: +/- 0,5% at 25°C
- data output via RS 232
- power supply: 6 x 1,5V AA (UM-3 batteries)  
(Batteries non included in delivery)

#### Included in Delivery:

- Spring Force Gauge with receptacle for measuring sleeve
- measuring sleeve Ø 5,0mm
- operating manual
- calibration certificate
- carrying case



| Article                   | Order Code |
|---------------------------|------------|
| Spring Force Gauge FK50   | FK50       |
| Measuring Sleeve Ø 3,0 mm | MS30       |
| Measuring Sleeve Ø 4,0 mm | MS40       |
| Measuring Sleeve Ø 5,0 mm | MS50       |
| Data Cable RS232          | 2111810    |

| Dimensions of adjustable measuring sleeves |           |           |                      |
|--|-----------|-----------|----------------------|
|  | Outer-Ø B | Inner-Ø A | Height Adjustability |
| MS30                                       | 4 mm      | 3 mm      | 0-40,5 mm            |
| MS40                                       | 5 mm      | 4 mm      | 0-40,5 mm            |
| MS50                                       | 6 mm      | 5 mm      | 0-40,5 mm            |

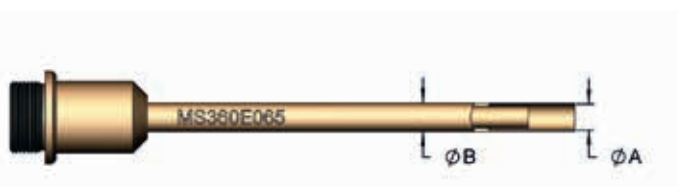
#### Rigid measuring sleeves with fixed stop

Rigid measuring sleeves for repeat measurements at probes with fixed projection height are available with different diameters.

#### Example for height adjustment at measuring sleeve

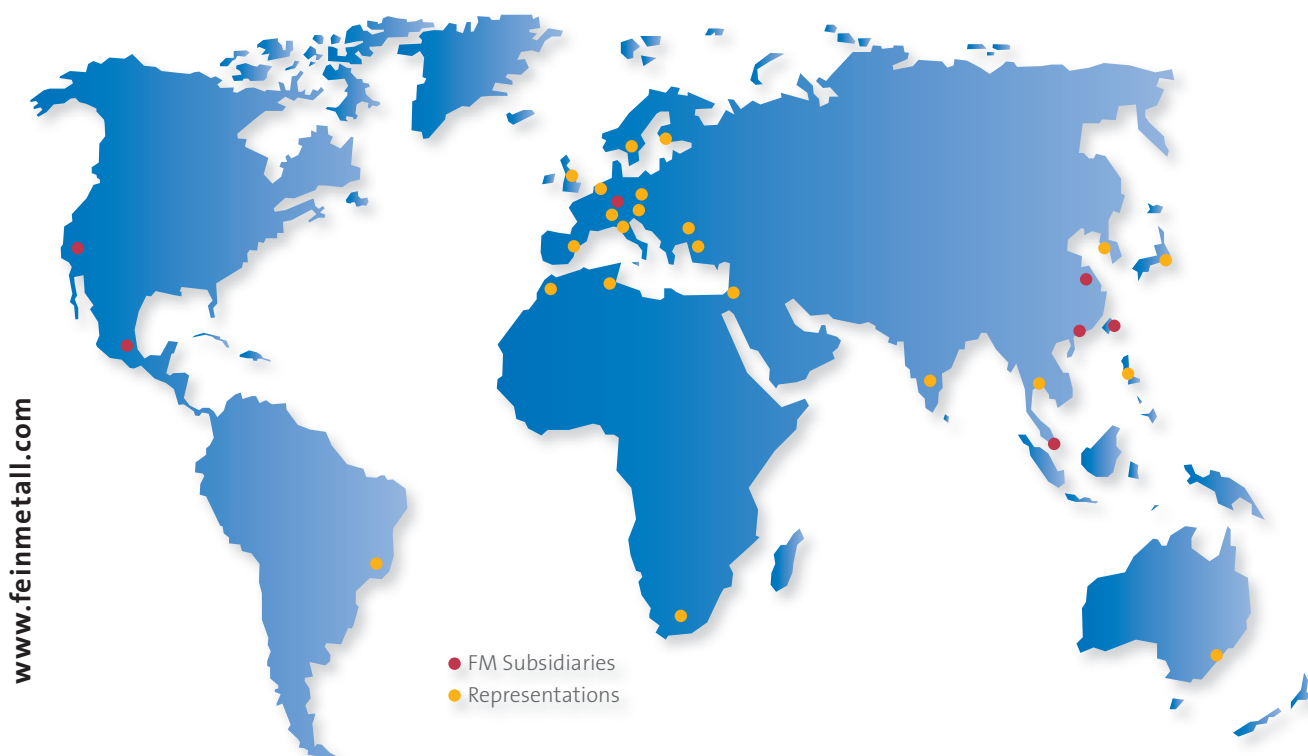


projection height of the probe, e.g. F732: = 10,50 mm  
 Nominal Travel: = 4,00 mm  
 Projection height-  
 Nominal Travel: = 10,50-4,00 mm  
 Height to fix: = 6,50 mm



| Measuring Sleeve      | Order Code | for Probe | innerØ A | outerØ B | Projection Height Probe | Nominal Travel |
|-----------------------|------------|-----------|----------|----------|-------------------------|----------------|
| measuring sleeve F732 | MS230E065  | F732      | 2,30 mm  | 2,70 mm  | 10,50 mm                | 4,00 mm        |
| measuring sleeve F733 | MS360E065  | F733      | 3,60 mm  | 4,00 mm  | 10,50 mm                | 4,00 mm        |
| measuring sleeve VF3  | MS270E355  | VF3       | 2,70 mm  | 3,20 mm  | 40,50 mm                | 5,00 mm        |
| measuring sleeve VF4  | MS370E355  | VF4       | 3,70 mm  | 4,20 mm  | 40,50 mm                | 5,00 mm        |
| measuring sleeve VF5  | MS460E315  | VF5       | 4,60 mm  | 5,00 mm  | 36,50 mm                | 4,80 mm        |





## Europe

|                |             |                |
|----------------|-------------|----------------|
| Austria        | Hungary     | Slovakia       |
| Belgium        | Italy       | Slovenia       |
| Croatia        | Netherlands | Spain          |
| Czech Republic | Latvia      | Sweden         |
| Estonia        | Lithuania   | Switzerland    |
| Finland        | Macedonia   | Turkey         |
| France         | Poland      | United Kingdom |
| Germany        | Romania     |                |

## Worldwide

|           |              |          |
|-----------|--------------|----------|
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| Indonesia | Morocco      |          |
| Israel    | Singapore    |          |
| India     | South Africa |          |
| Japan     | Taiwan       |          |

## FEINMETALL Product Range

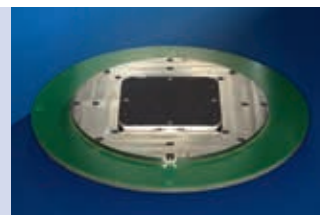
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