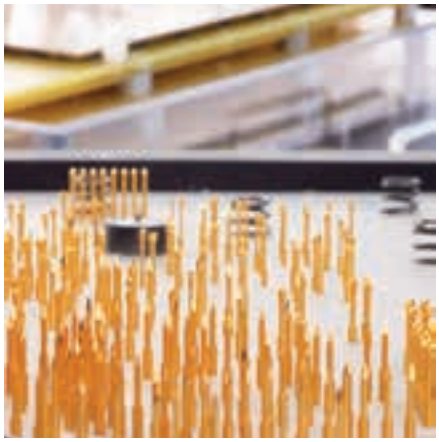
Contact Probes

GENERAL CATALOGUE **2015**

FEINMETALL
Contact Technologies

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, special contact solutions 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!

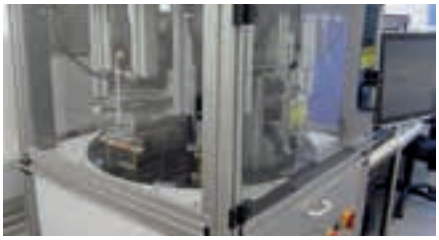
RoHS 2002/95/EC

Contents

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**.

Life Cycle Test of Contact Probes

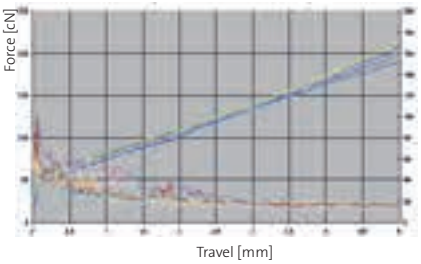
The life cycle of spring contact probes is depending on the design of the probes as well as on the operating conditions in the field. High lateral forces, high current load and contamination may lead to a significantly reduced lifetime of the probes. For us as manufacturer of these probes, it is vital 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.

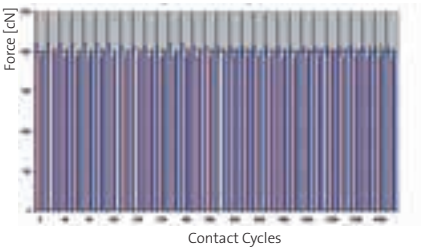


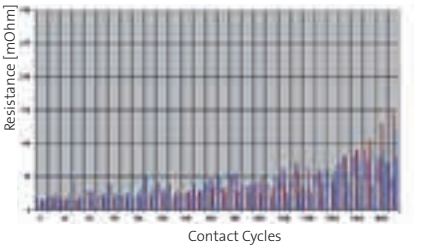
Life cycle tests are performed under the following conditions:

- → 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.



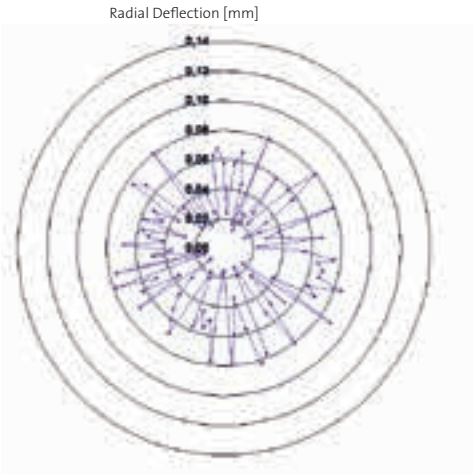




Pointing Accuracy and Radial Tolerance

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.

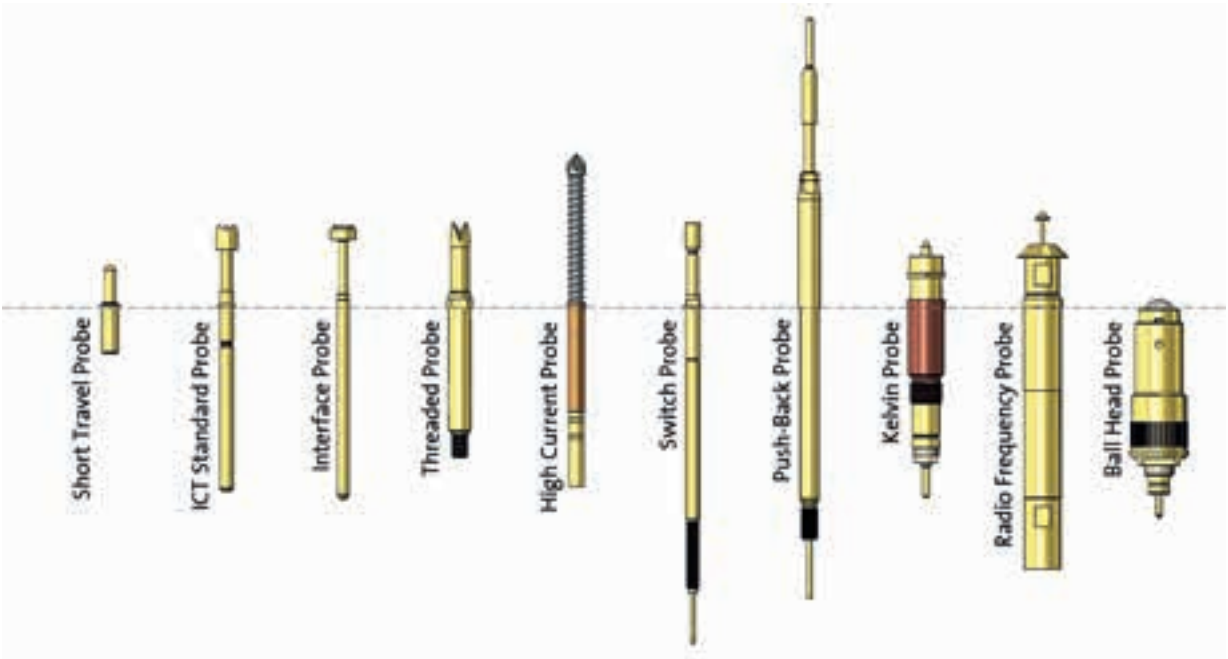
High Current Probes
For high current applications spring contact probes need to be designed for a very small probe resistance. High current probes are available in different versions. You will find a detailled description of the different designs in the chapter „High Current Probes“.

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	20	21	27	28
Flat Shaft	Flat Head	Conical Shaft 30°	4-Point Crown Head (tapered)	4-Point Crown Shaft (self cleaning)	Conical Head 120°	4-Point Crown Head

29	30	32	33	34	35	36
4-Point Crown Shaft	Triangular Shaft 45°	Rigid Needle 10°	Lance Shaft 38°	Rigid Needle Head 15°	3-Point-Crown (tapered)	6-Point Crown Head with middle pin

37	38	39	40	41	42	43
4-Point Crown (tapered)	Lance Shaft 140°	Conical Shaft 30° (flat)	6-Point Crown Shaft	6-Point Crown Head (self cleaning)	5-Point Crown Head	Lance Shaft 90°

45	46	50	55	60	61	62
Conical Head 120° (with eccentric cut)	W-Profile	Concave Head (with drill hole)	Concave (self cleaning)	3-Point Crown (reduced)	Head for Multipoint Connectors (female)	Triangular Shaft 30°

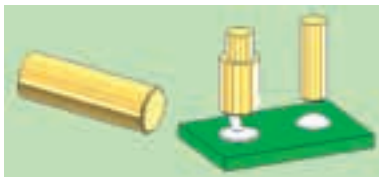
63	64	65	NEW 66	NEW 68	80	81
8-Point Crown Head (self cleaning)	Serrated Head (reduced)	Reduced Rigid Needle	Serrated Head (self cleaning)	6-Point Crown Head with middle pin	Reduced Spade	Reduced Spad (tapered)

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

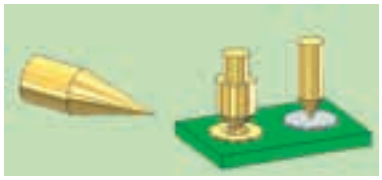
(17)H	(17)T	C	SP	PT	IK	IP
H = Synthetic Head with Ring	T = Insulated BeCu Head	C = High Current (Groove Mark)	SP = Step Probe	PT = Position Test	IK = Insulating Cap	IP = Insulated Pin

Typical Tip Styles and Applications



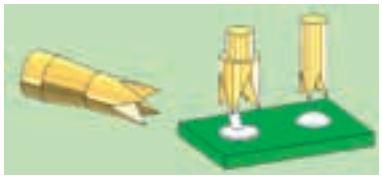
Flat
Suitable for solder pads and contact pins.

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.

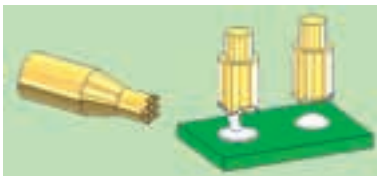
Multipoint connectors
This probe tip was designed for contacting multipoint connectors.



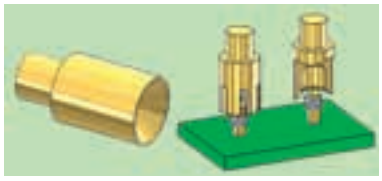
4-Point Crown
For pad surfaces and soldered pins. The sharp edges penetrate flux residues and oxide layers.

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

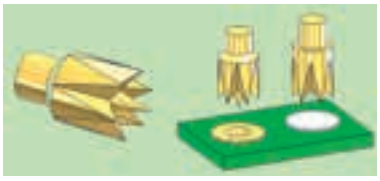
Star
For testing plated through holes and pads. The sharp edges penetrate contamination and oxide layers.



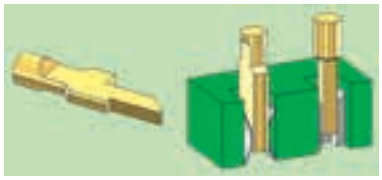
Serrated
Universal tip style for wires, contact pins and wire wrap posts, even for bent component leads.



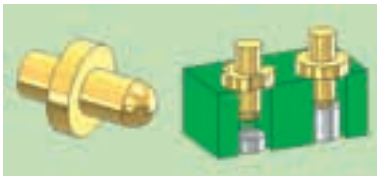
Concave
For a smooth contact of pins and wire wrap posts. The risk of contamination can be minimized by using a self cleaning version of this tip style.



Tulip
Used for severe contacting of plated of filled through holes.



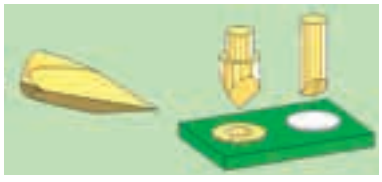
Spade
For twist proof contacting of connector elements.



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.

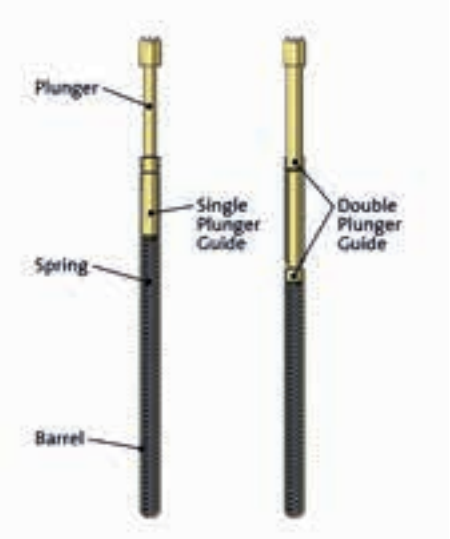


Multi-sided
For via holes and solder pads. The sharp edges penetrate flux residues and oxide layers.

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.



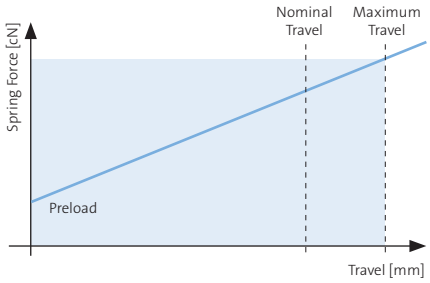
Plunger
FEINMETALL manufactures plungers with many different tip styles, suitable for a large variety of applications (see pages 6 and 7). Plungers are generally made from beryllium copper (BeCu) or steel. Aggressive tip styles are made by a special grinding process for ultra sharp edges. Optimized turning 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 contact-ing 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 (B)
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 (S)
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 (Z)
is characterized by a combination of good wear resistance, cold formability and high electrical conductivity. It is used for barrels and receptacles.

Brass (M)
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 contact probes are galvanically plated in order to protect the basic material against corrosion. At the assembled 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 (N)
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 (G)
guarantees the best chemical durability, but its hardness is 150-200HV ('85HRB) only. Gold considerably improves the contact resistance.

Silver (A)
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 (R)
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 (L)
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 (P)
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
Barrel	Nickel silver (deep-drawn) Bronze (turned or deep-drawn) Brass (turned)	Silver Gold
Plunger	Beryllium-Copper (BeCu) Steel Synthetic Material	Chemical Nickel Gold FM Longtime Gold Rhodium Progressive Coating
Spring	Music Wire (max. 80°C) Stainless Steel (max. 250°C) BeCu (non magnetic, max 200°C)	Silver Gold
Receptacle	Nickel Silver Bronze Brass	Gold

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.

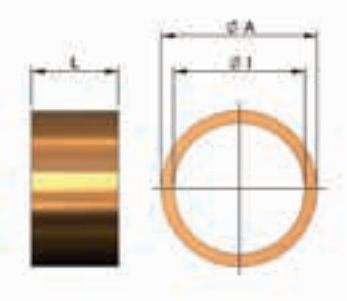
Drilling Recommendations
Mounting the receptacle into the mounting plate demands special precision. Various parameters like rotating speed, feed, helical groove length, material and plate thickness are influencing the drilling results. Therefore it is very important to make drilling tests in order to ensure that the receptacles have a proper seat in the mounting plate.

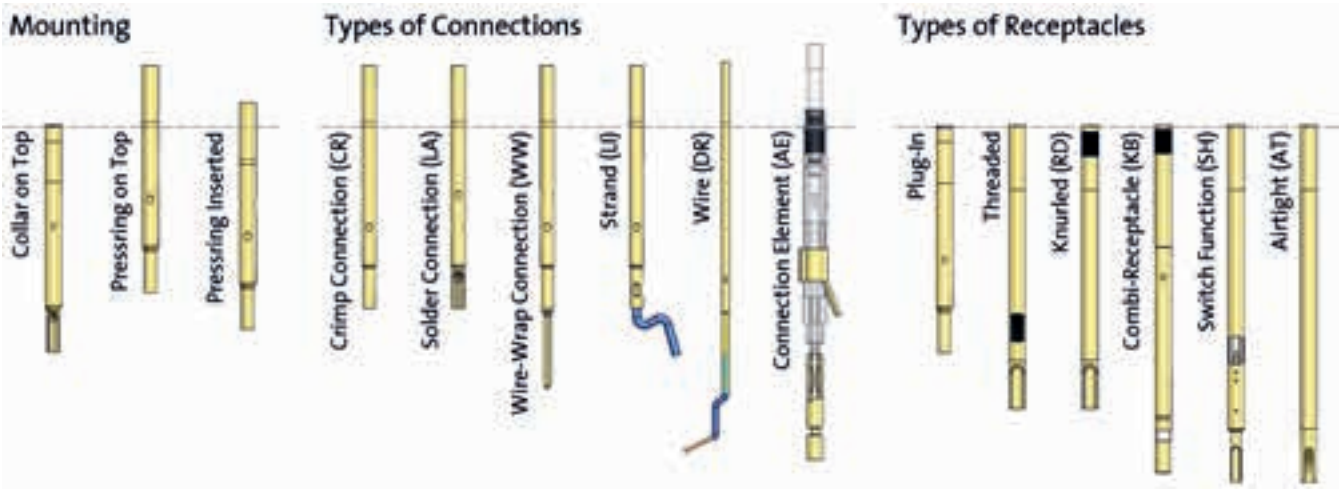
The drilling recommendations in the technical specifications of the probes are guideline values only as a basis for your own drilling trials.

Spacers
For height adjustment and balancing of tolerances.

Spacers H772 for 100 mil Probes			
Order Code	Outer-Ø	Inner-Ø	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

Spacers H773 for 138 mil Probes			
Order Code	Outer-Ø	Inner-Ø	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/0	3,2	2,7	5,0



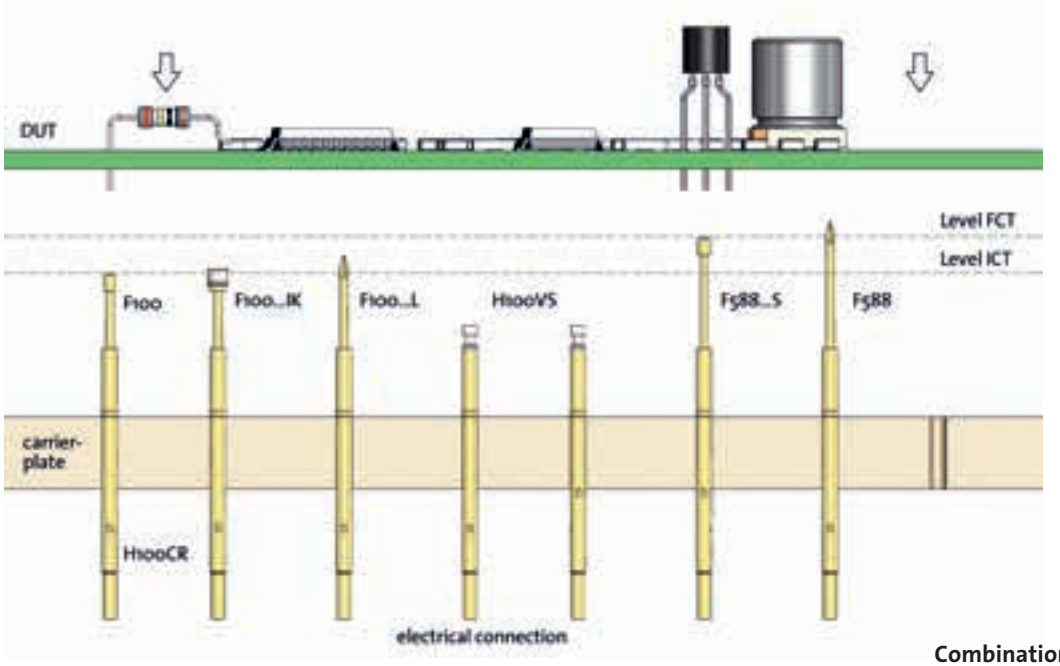


Probes for In-Circuit and Functional Test

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“.

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

Height Proportions in Dual-Stage Fixtures



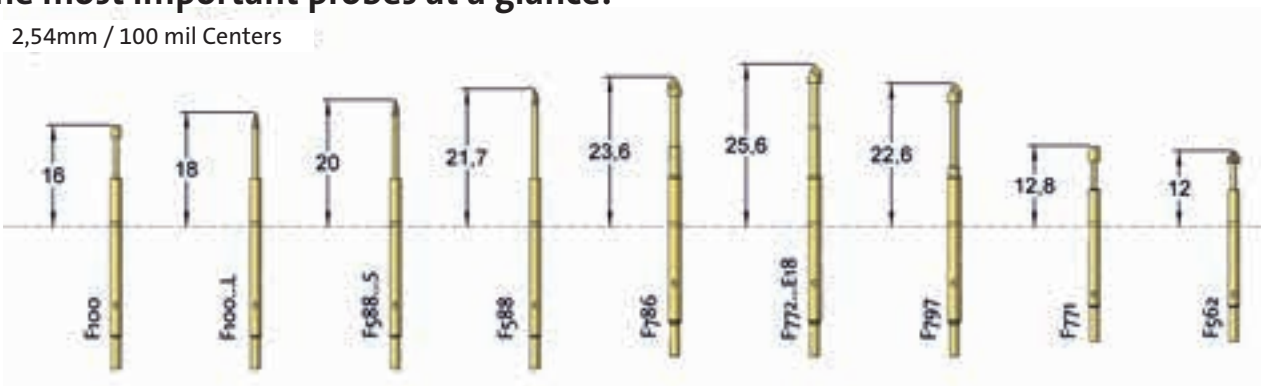
In-circuit test (ICT) and functional test (FCT) very often are performed in two steps in the same test fixture. The first step is the in-circuit test. At this level all installed probes are contacting the board. For the following functional test the travel of the fixture is reduced. Only the long travel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

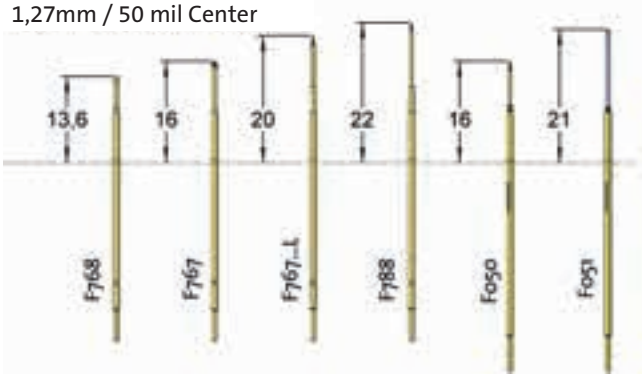
	ICT	FCT
50 mil	F050	F051
50 mil	F767	F788
75 mil	F075/F703	F793
100 mil	F100/F585	F588

The most important probes at a glance:

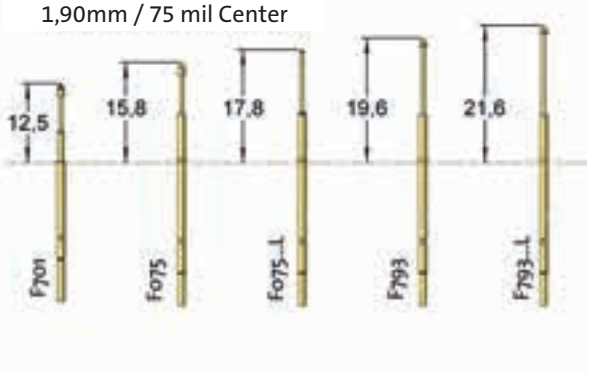
2,54mm / 100 mil Centers



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.

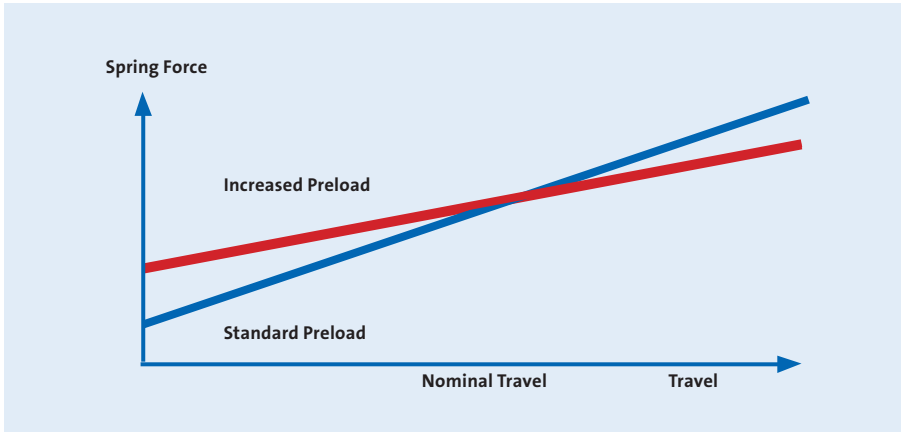
For contacting OSP coated boards the very pointed tip style 32 in Progressive Series version is well established. This version reliably penetrates the coating and leads to good contacts and long life cycles.

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

F111

Standard Probe 50 mil

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

Spring Force (cN ±20%)

Version	Preload	Nominal
E05	33	70
H	40	95
standard	20	85

Travel (mm)

Version	Nominal	Maximum
E05	2,0	2,8
H	2,0	2,5
standard	2,0	2,8
standard	2,0	2,5
Pointing Accuracy		±0,09 mm

Materials and Plating

Plunger	see tip style
Barrel	Bronze, gold plated
Spring	Music wire, silver plated; Stainless steel, unplated (H)
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

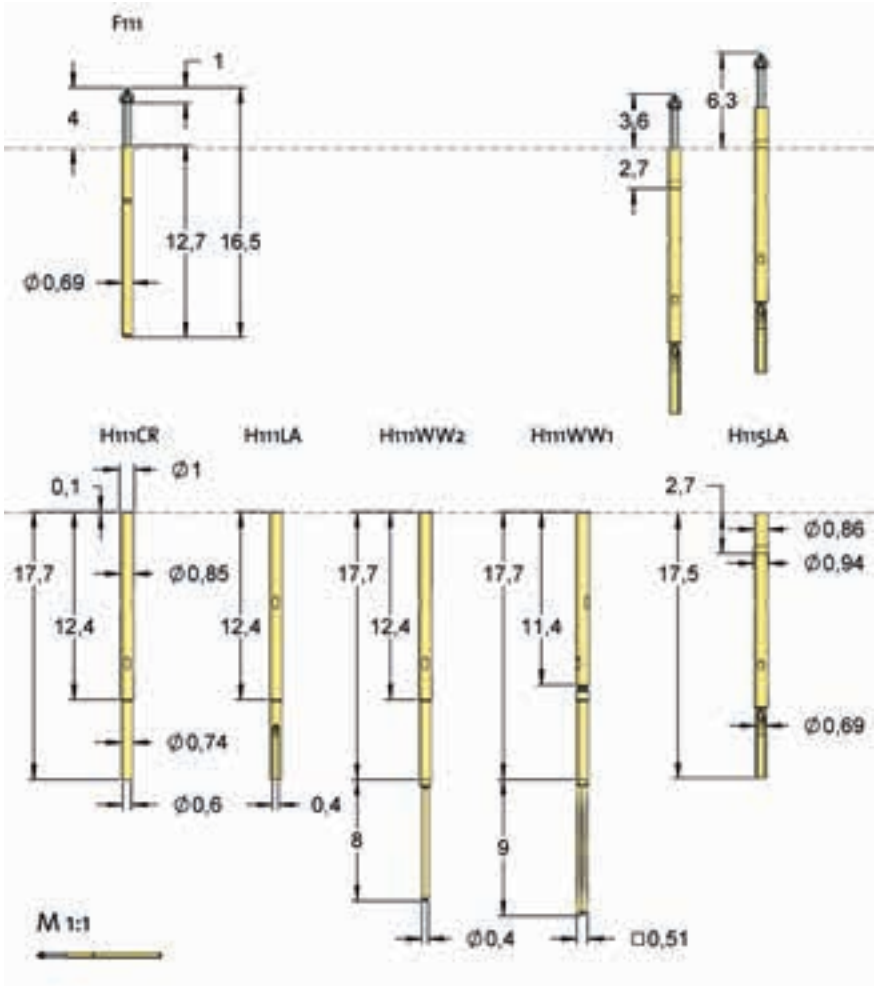
Projection Height (mm)

H111CR / H111LA	4,0
H111WW2 / H111LI	4,0
H111WW1	5,0
H111LA2	6,0
H111LA1	8,0
H115LA	3,6 - 6,3

Type			Tip-Ø		Spring Force	
F 111	18	S	053	L	095	H
	Tip Style	Material		Finish		Special Version

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



High temperature versions available on request. Special version „E05“ has a projection height of 5.0 mm. The F511 is the corresponding long travel probe to the F111. Additionally a receptacle with 550mm preassembled wire AWG30 is available (H111LI).

Tip Style	Number	Material	Plating	Ø in mm	Version
	01	S	N	0,53	-
	03	S	N	0,53	-
	05	S	L	0,90	-
	05	S	L	1,50	-
	06	B	G	0,90	-
	07	S	N	0,90	-
	09	S	N	0,90	-
	12	S	L	0,90	-
	14	S	N	0,90	-
	15	B	G	0,90	E05
	18	S	N	0,53	-
	18	S	R	0,53	-
	21	S	N	0,53	-

F112

Non-magnetic Probe 50 mil

Centers (mm/mil)	1,27 / 50
Current	3,0 A
Temperature	-20°C...+200°C
R typically	35 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	6	40

Travel (mm)

Version	Nominal	Maximum
standard	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

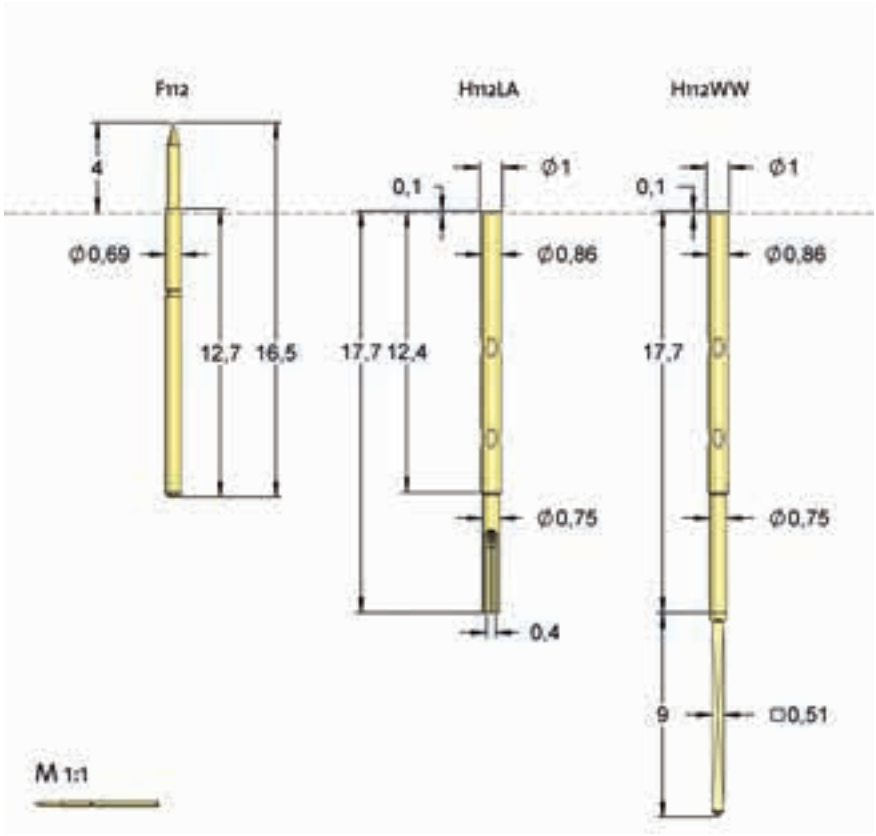
Insertion tool receptacle	FEWZ-511E0
Insertion tool probe	FDWZ-050

Drill Size (mm)

Receptacle with collar	0,83 - 0,84

Projection Height (mm)

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



The basic materials and coatings of the probe F112 do not contain magnetic components. This leads to a minimized influence of electromagnetic fields on the transmitted electric signal.

Type			Tip-Ø		Spring Force
F 112	18	B	053	G	040
	Tip Style	Material		Finish	Special Version

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	-

F040

NEW

Standard Probe 40 mil

Centers (mm/mil)	1,00 / 39
Current	2,0 A
Temperature	-20°C...+80°C
R typically	20 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	40	80

Travel (mm)

Version	Nominal	Maximum
standard	4,3	6,4
Pointing Accuracy		±0,05 mm

Materials and Plating

Plunger	see tip style
Barrel	Bronze, gold plated
Spring	Music wire, silver plated
Receptacle	BeCu, gold plated

Accessories

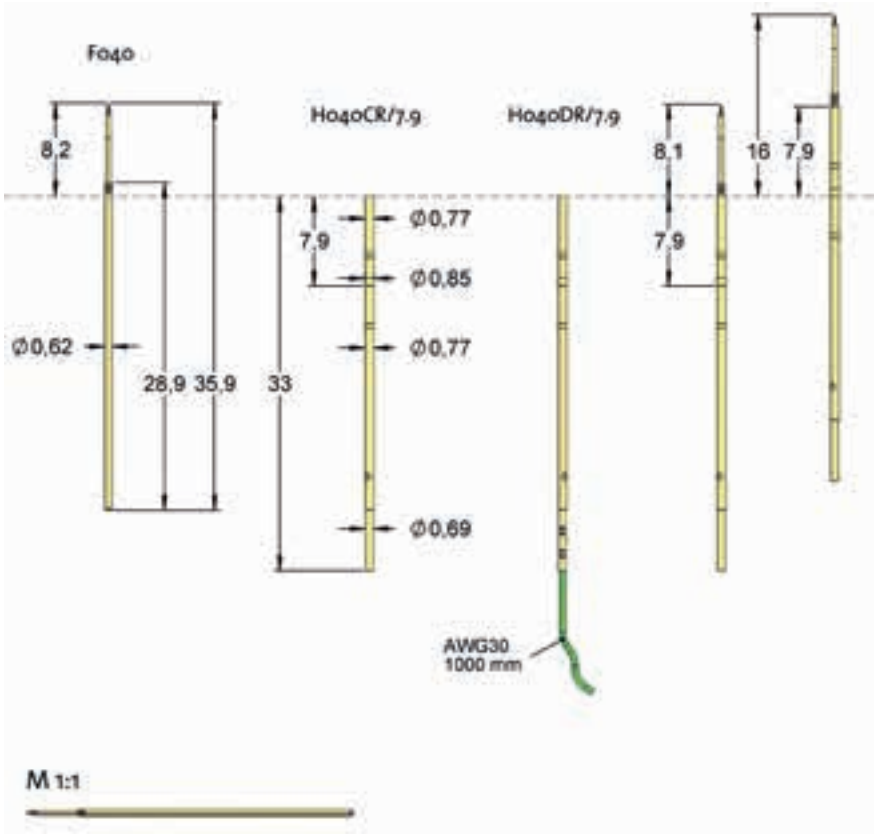
Insertion tool receptacle	FEWZ-040E0
Insertion tool probe	FDWZ-050

Drill Size (mm)

Press ring as stop	0,80 - 0,81
Press ring inserted	0,82 - 0,83

Projection Height (mm)

H040...	8,1 - 16,0



Type			Tip-Ø		Spring Force
F040	18	S	038	L	080
	Tip Style	Material		Finish	Special Version

Material: S = Steel
Tip-Ø: 038 = 0,38 mm (e.g.)
Finish: L = Longtime Gold plated
Receptacle: Order Code according drawing

ORDER EXAMPLE

Tip Style	Number	Material	Plating	Ø in mm	Version
	18	S	L	0,38	-
	29	S	L	0,38	-
	33	S	L	0,38	-
	43	S	L	0,38	-

F050

Standard Probe 50 mil

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

Spring Force (cN ±20%)

Version	Preload	Nominal
HP	80	130
HP	125	200
L	60	150
standard	60	150
standard	90	200

Travel (mm)

Version	Nominal	Maximum
HP	4,3	6,4
L	4,3	6,4
standard	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

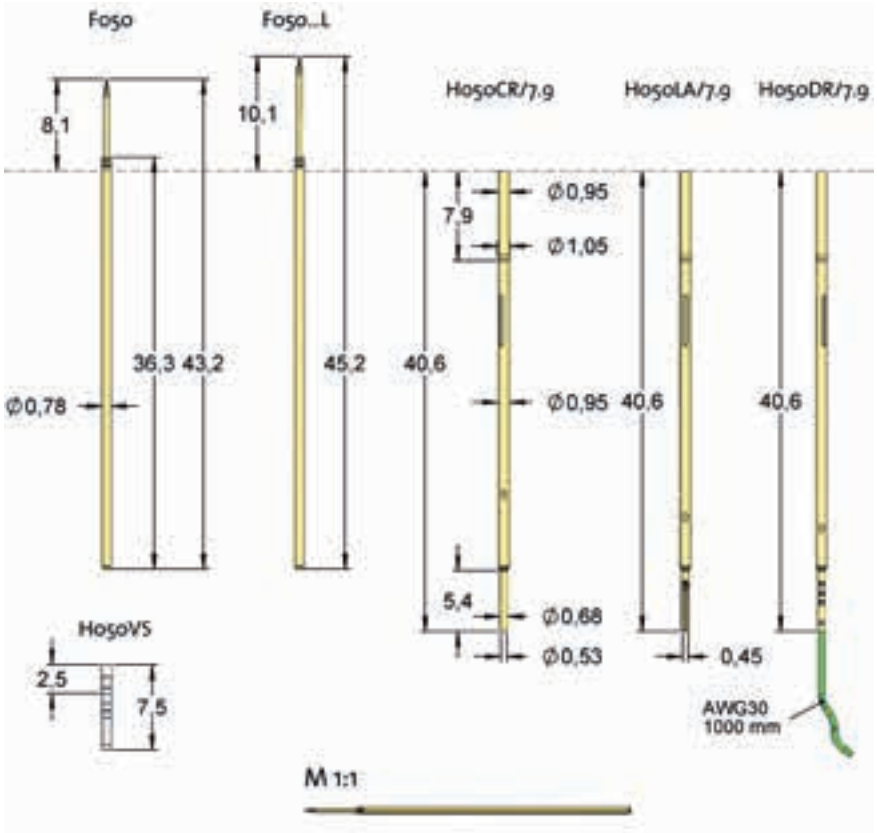
Insertion tool receptacle	FEWZ-050EV
Insertion tool receptacle	FEWZ-050E0
Insertion tool probe	FDWZ-050
Plug lock	H050VS

Drill Size (mm)

Press ring as stop	0,95 - 0,97
Press ring inserted	0,98 - 1,01

Projection Height (mm)

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



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

Type		Tip-Ø	Spring Force	
F050	33	S	050	P	130	HP
	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, P = Functional coating
Special Version:	HP = Progressive Series
Receptacle:	Order Code according drawing

ORDER EXAMPLE

F051

Long Travel Probe 50 mil

Centers (mm/mil)	1,27 / 50
Current	3,0 A
Temperature	-20°C...+80°C
R typically	40 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	35	150

Travel (mm)

Version	Nominal	Maximum
standard	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

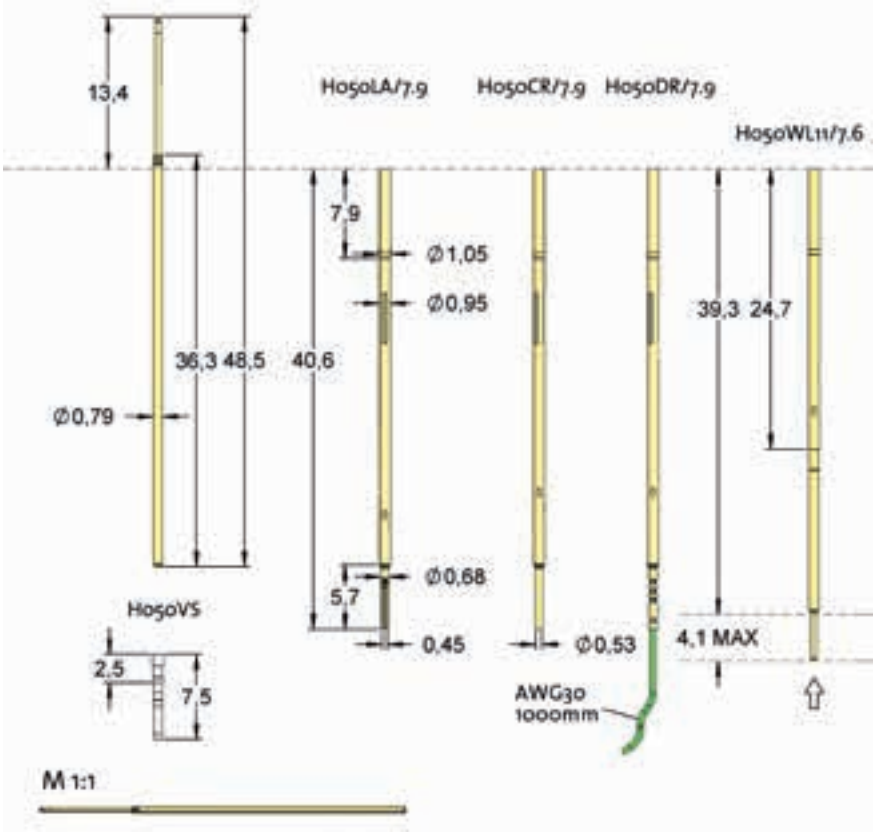
Insertion tool receptacle	FEWZ-050EV
Insertion tool receptacle	FEWZ-050E0
Insertion tool probe	FDWZ-050
Plug lock	H050VS

Drill Size (mm)

Press ring as stop	0,95 - 0.97
Press ring inserted	0.98 - 1,01

Projection Height (mm)

H050.../7.9	13,4 - 21,3
H787...	17,5 - 25,5
H050WL11/7.6	23,8 - 31,7



The F051 is the long travel version of the F050. These probes can be combined well in dual stage fixtures.

Type			Tip-Ø		Spring Force
F051	43	S	050	L	150
	Tip Style	Material		Finish	Special Version

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
	11	B	G	0,50	-
	21	S	L	0,50	-
	43	S	L	0,50	-
	43	S	P	0,50	-

F561

NEW

Standard Probe 75 mil
Short Version

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	30	80
standard	50	100
standard	70	150

Travel (mm)

Version	Nominal	Maximum
standard	2,4	3,0
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

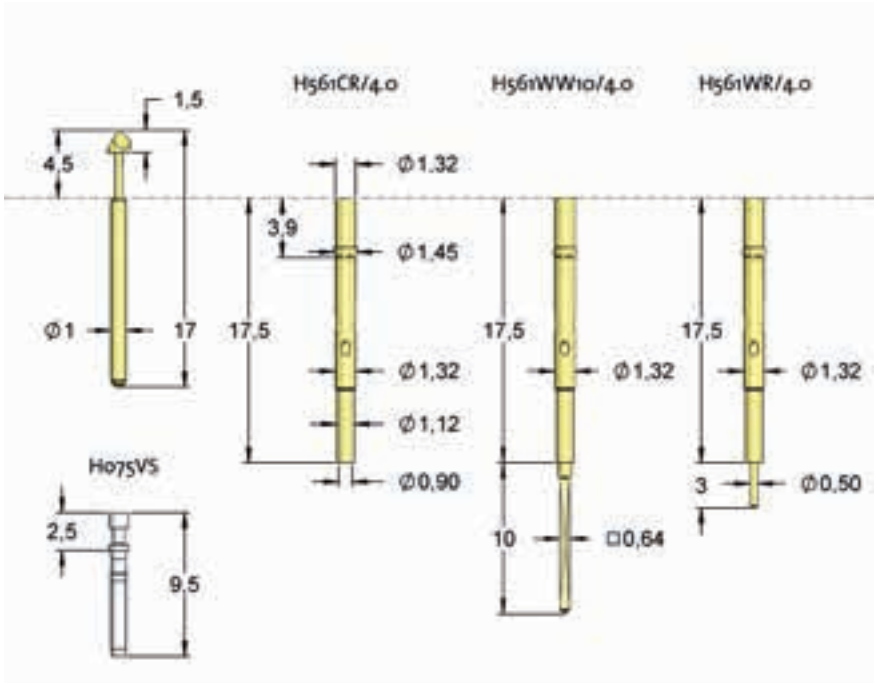
Insertion tool receptacle	FEWZ-075EV
Insertion tool receptacle	FEWZ-075E0
Insertion tool probe	FDWZ-075
Plug lock	H075VS

Drill Size (mm)

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

Projection Height (mm)

H561...	4,5 - 8,4



The F561 is a Short version of 75 mil probe.

Type F561 | Tip Style 05 | Material B | Tip-Ø 150 | Finish G | Spring Force Special Version 080

Material: B = BeCu
Tip-Ø: 150 = 1,5 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	1,50	-
	06	B	G	1,50	-
	11	B	G	0,50	-
	15	B	G	1,50	-
	18	B	G	0,50	-

F075

Standard Probe 75 mil

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

Spring Force (cN ±20%)

Version	Preload	Nominal
HP	120	200
HP	130	250
HPL	120	200
HPL	130	250
IK	30	60
IK	70	150
IK	70	280
L	50	100
L	80	200
L	100	280
RP	50	100
standard	30	60
standard	50	100
standard	70	150
standard	80	200
standard	70	200
standard	100	280

Travel (mm)

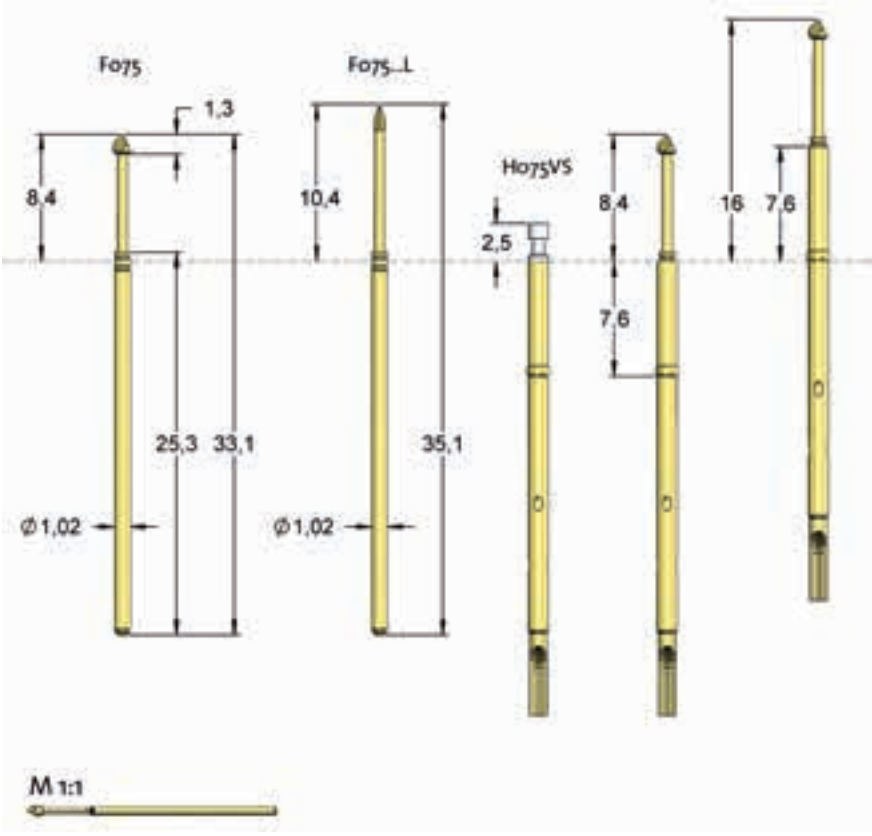
Version	Nominal	Maximum
HP	4,3	6,4
HPL	4,3	6,4
IK	4,3	6,4
L	4,3	6,4
RP	4,3	6,4
standard	4,3	6,4
Pointing Accuracy		±0,08 mm

Materials and Plating

Plunger	see tip style
Barrel	Bronze, gold plated
Spring	Music wire, gold plated (HP) Music wire, silver plated
Receptacle	Nickel silver, Gold plated

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	1,20	-
	06	B	G	1,00	-
	06	B	G	1,20	-
	06	B	G	1,30	IK
	07	S	G	1,20	-
	10	S	G	0,50	-
	10	S	L	0,50	RP
	10	S	G	0,64	-
	10	S	L	0,64	-
	11	B	G	0,64	-
	14	S	L	0,78	-
	14	S	G	1,20	-
	14	S	L	1,20	-
	15	B	G	0,90	-
	15	B	G	1,20	-
	15	B	G	1,20	L
	17	B	G	1,20	-
	18	B	G	0,78	-
	21	S	G	0,64	-
	21	S	L	0,64	-

F075

Standard Probe 75 mil

Drill Size (mm)

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

Accessories

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

Projection Height (mm)

(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

Tip Style	Number	Material	Plating	Ø in mm	Version
	21	S	L	0,64	L
	21	S	P	0,64	HP
	21	S	P	0,64	HPL
	30	S	L	0,64	-
	32	S	P	0,64	HP
	32	S	P	0,64	HPL
	33	S	G	0,64	-
	33	S	L	0,64	-
	33	S	L	0,64	HPL
	33	S	L	0,64	L
	33	S	P	0,64	HP
	33	S	P	0,64	HPL
	33	S	L	0,78	-
	33	S	L	1,20	-
	36	B	G	1,20	-
	37	B	G	0,50	-
	37	B	G	0,50	L
	38	S	L	0,64	-
	38	S	L	0,64	L
	41	B	G	1,30	IK
	43	S	G	0,64	-
	43	S	L	0,64	-
	43	S	P	0,64	HP
	43	S	P	0,64	HPL
	62	S	P	0,64	HP
	62	S	P	0,64	HPL
	63	S	G	1,20	-
	63	S	L	1,20	-

Type			Tip-Ø		Spring Force	
F075	33	S	064	P	250	HP
	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, 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

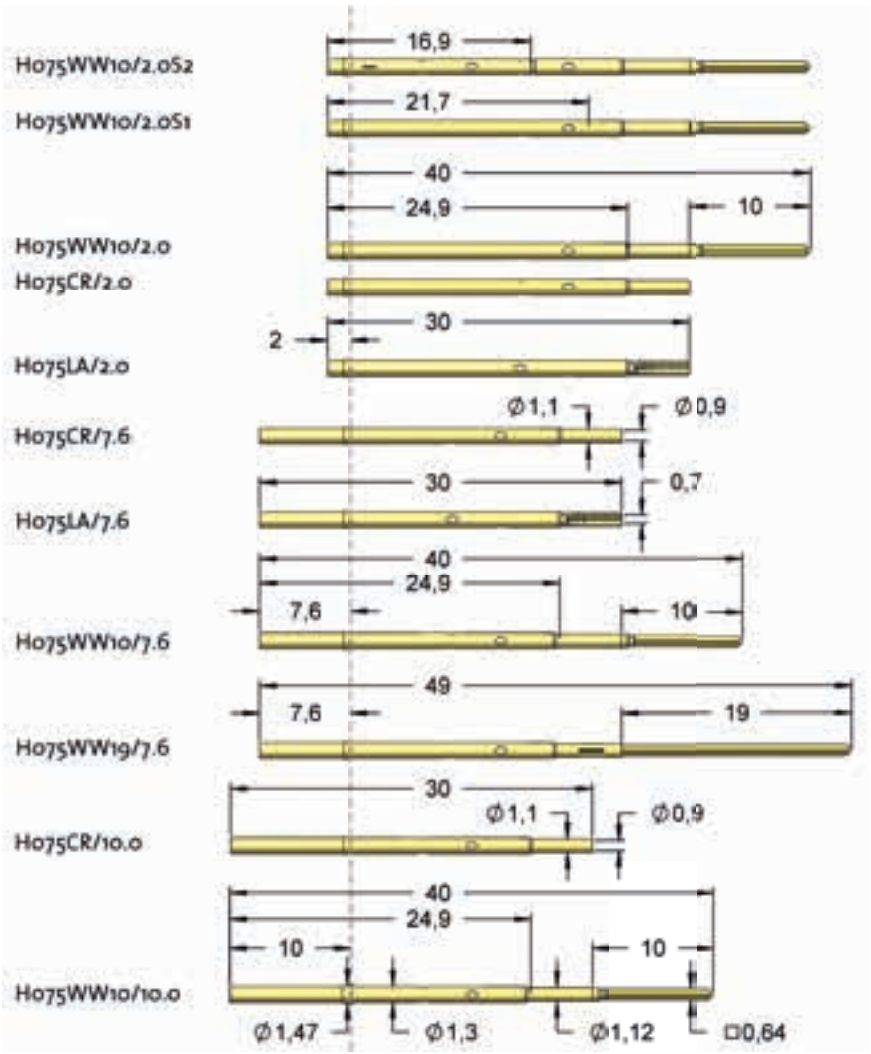
H075

Receptacles for 75 mil centers

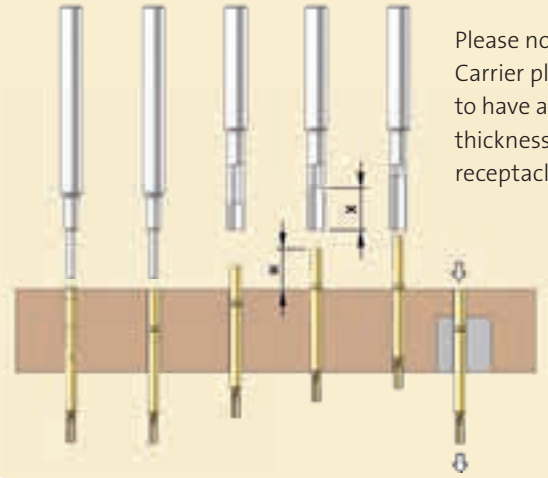
For probes F075, F793 and F703 different receptacles are available with different connection types (e.g. LA, CR, WW), different press ring positions and different wire-wrap posts.
Adequate insertion tools are available. The right tool for flush insertion is **FEWZ-703E0**. The tools for fix projection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



Appropriate tools are available for each type of receptacle.



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

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

Type — Length of Wire Wrap Pin

H075 WW 10 / 7.6

Connection Type — Press Ring Position

Connection Type:
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

	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

F793

Long Travel Probe 75 mil

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

Spring Force (cN ±20%)

Version	Preload	Nominal
HP	70	250
L	20	120
standard	20	120

Travel (mm)

Version	Nominal	Maximum
HP	8,0	9,0
L	8,0	10,0
standard	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

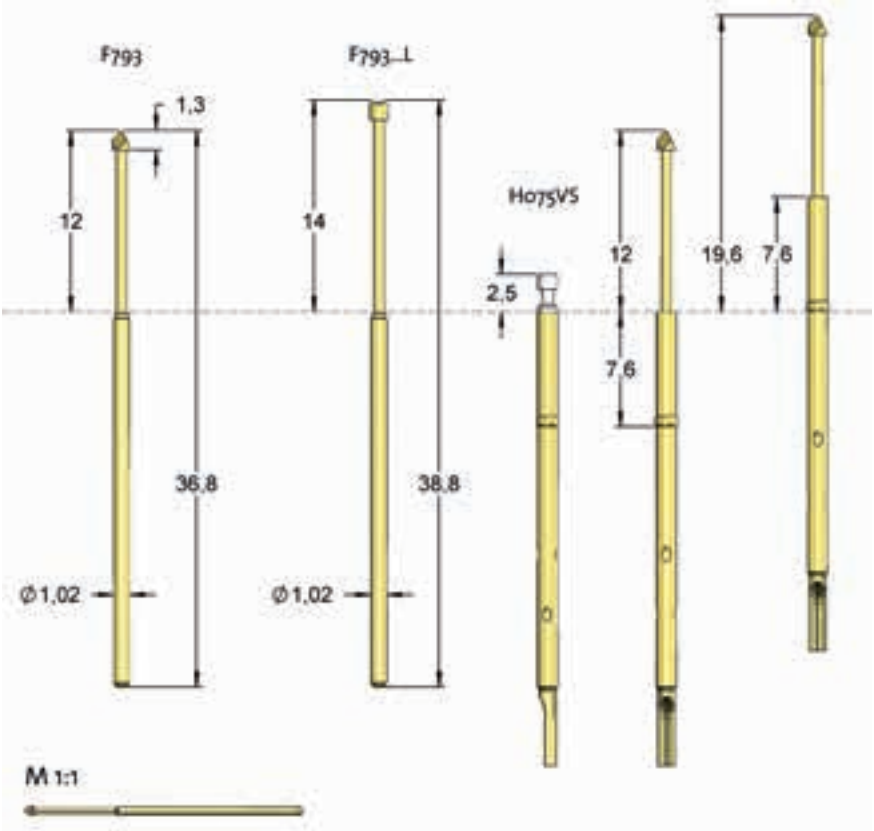
Projection Height (mm)

(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	Special Version	

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“.

Drill Size (mm)

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

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

F701

Standard Probe 75 mil
Short Version

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	15	40
standard	40	70
standard	30	150

Travel (mm)

Version	Nominal	Maximum
standard	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

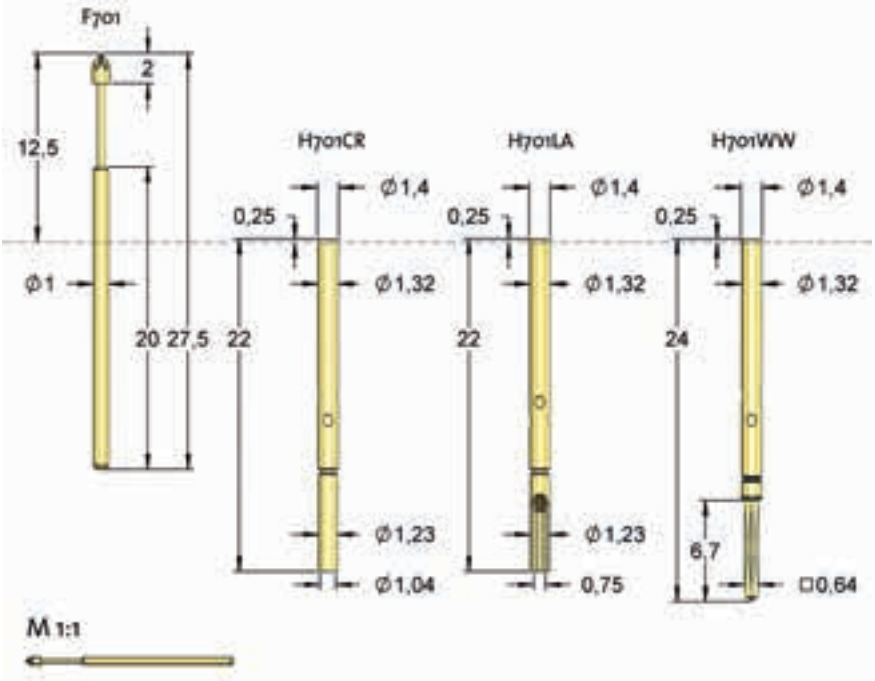
Insertion tool receptacle	FEWZ-075EV
Insertion tool receptacle	FEWZ-075E0
Insertion tool probe	FDWZ-075
Plug lock	H075VS

Drill Size (mm)

H701...	1,31 - 1,32

Projection Height (mm)

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	0,50	-
	14	S	L	1,15	-
	15	B	G	1,30	-
	18	B	G	0,50	-
	21	S	L	0,50	-

F562

Standard Probe 100 mil
Short Version

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

Spring Force (cN ±20%)

Version	Preload	Nominal
B	60	100
standard	60	100
standard	60	150
standard	60	200

Travel (mm)

Version	Nominal	Maximum
B	2,7	4,1
standard	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

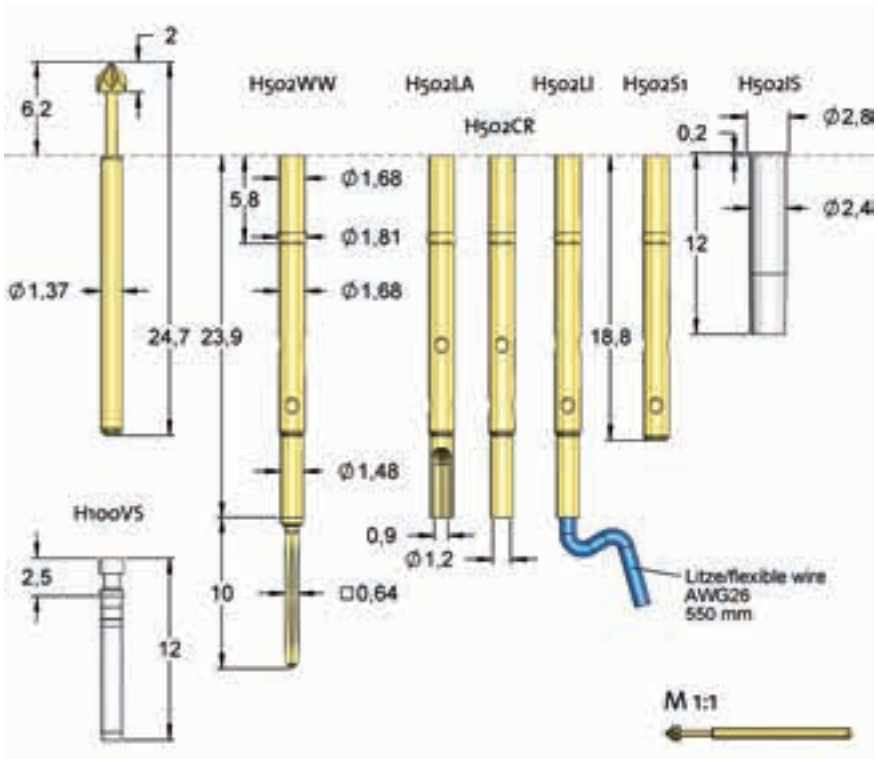
Insertion tool receptacle	FEWZ-100EV
Insertion tool receptacle	FEWZ-100EV
Insertion tool probe	FDWZ-100
Plug lock	H100VS

Drill Size (mm)

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

Projection Height (mm)

H502...	6,2 - 12,0



Tip Style	Number	Material	Plating	Ø in mm	Version
	04	B	G	1,90	-
	05	S	L	1,90	-
	06	B	G	1,90	-
	07	S	L	1,90	-
	12	B	G	1,90	-
	12	B	G	1,90	B
	14	S	L	1,90	-
	15	B	G	1,90	-
	18	B	G	0,76	-
	21	S	L	0,76	-

Type		Tip-Ø	Spring Force
F 562	05 S	190 L	100
	Tip Style / Material	Finish	Special Version

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

F100

Standard Probe 100 mil

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

Spring Force (cN ±20%)

Version	Preload	Nominal
HP	70	100
HP	75	130
HP	110	150
HP	130	200
HP	200	300
HPL	75	130
HPL	130	200
HPL	200	300
HPRPL	200	300
L	40	100
L	80	150
L	80	200
L	150	300
Mint-Pin	40	100
Mint-Pin	80	150
Mint-Pin	60	225
RP	40	100
RP	80	150
standard	30	60
standard	40	100
standard	80	150
standard	80	200
standard	150	300
standard	180	400

Travel (mm)

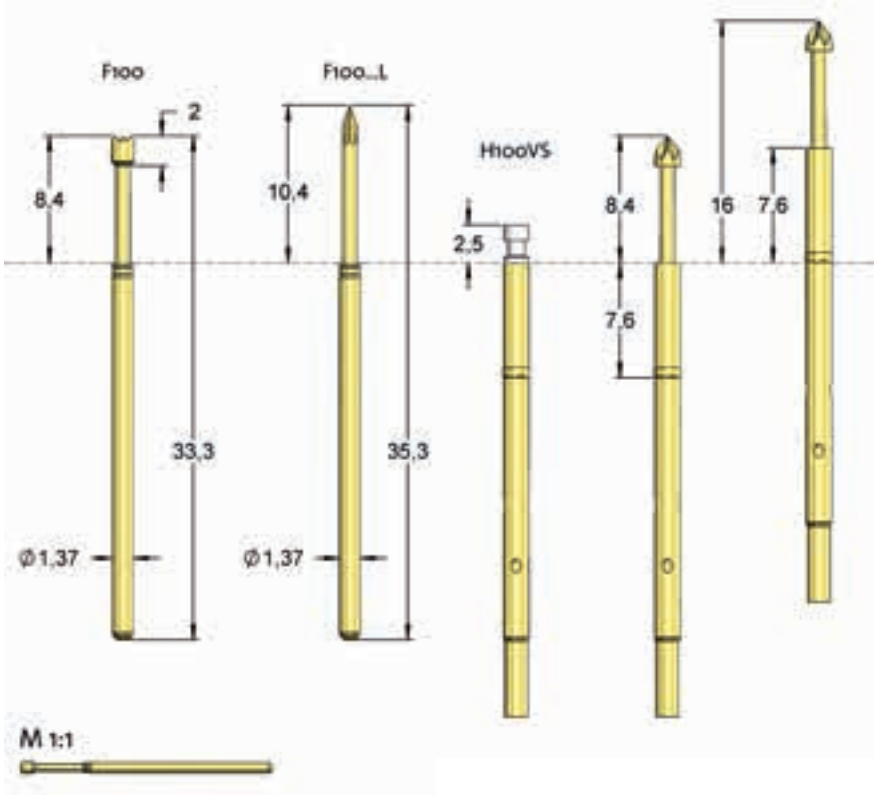
Version	Nominal	Maximum
standard	4,3	6,4
Pointing Accuracy		±0,08 mm

Materials and Plating

Plunger	see tip style
Barrel	Nickel silver, gold plated
Spring	Music wire, silver plated Stainless steel, unplated
Receptacle	Nickel silver, Gold plated

Drill Size (mm)

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



The F100 is the most common probe for 100 mil applications.
Further receptacles see „Receptacles H100“. H-Versions on request.
IK-Versions see at Overview Insulation caps.

Tip Style	Number	Material	Plating	Ø in mm	Version
	05	B	G	1,50	-
	06	B	G	1,30	-
	06	B	G	1,50	-
	06	B	G	1,50	L
	06	B	G	2,00	-
	06	B	P	2,00	HP
	06	B	G	2,50	-
	06	B	G	3,00	-
	06	B	G	3,10	Mint-Pin
	06	B	G	4,00	-
	07	S	L	1,50	-
	10	S	L	0,60	RP
	10	S	P	0,60	RP
	11	B	G	0,50	-
	11	B	G	0,64	-
	11	B	G	0,90	-
	11	B	G	0,90	L
	12	B	G	1,50	-
	14	B	G	1,30	-
	14	B	G	1,50	-
	14	S	L	1,30	-

F100

Standard Probe 100 mil

Accessories

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

Projection Height (mm)

(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

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"
Receptacle:	Order Code according drawing

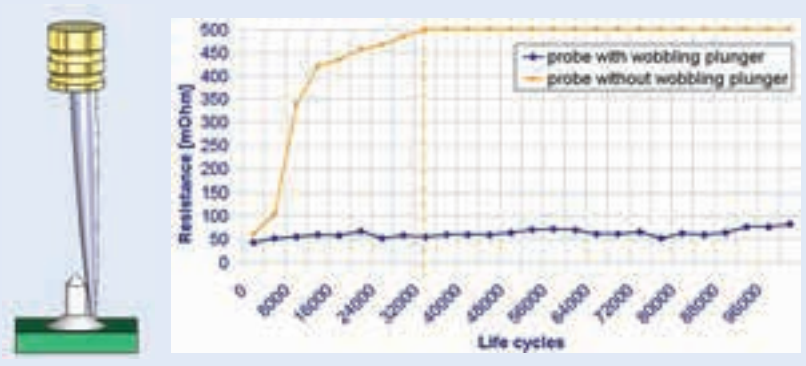
ORDER EXAMPLE

Tip Style	Number	Material	Plating	Ø in mm	Version
	14	S	L	1,50	-
	14	S	P	1,50	HP
	15	B	G	1,50	-
	15	B	G	1,50	L
	15	B	G	1,70	-
	17	B	G	1,50	-
	17	B	G	2,00	-
	18	B	G	0,90	-
	21	S	L	0,90	-
	21	S	L	0,90	L
	21	S	P	0,90	HP
	21	S	P	0,90	HPL
	30	B	G	0,90	-
	32	S	P	0,90	HP
	32	S	P	0,90	HPL
	33	S	L	0,90	-
	33	S	L	0,90	HP
	33	S	L	0,90	L
	33	S	P	0,90	HP
	33	S	P	0,90	HPL
	35	S	L	1,50	-
	36	S	L	1,30	-
	37	S	L	0,50	-
	38	S	L	0,90	-
	43	S	L	0,90	-
	43	S	P	0,90	HP
	43	S	P	0,90	HPL
	55	B	G	1,80	-
	55	B	G	1,80	L
	62	B	G	0,90	-
	62	S	P	0,90	HP
	62	S	P	0,90	HPL
	63	B	G	1,50	-

F100...RP

Wobbling Plunger for Contacting Soldered Pins

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.



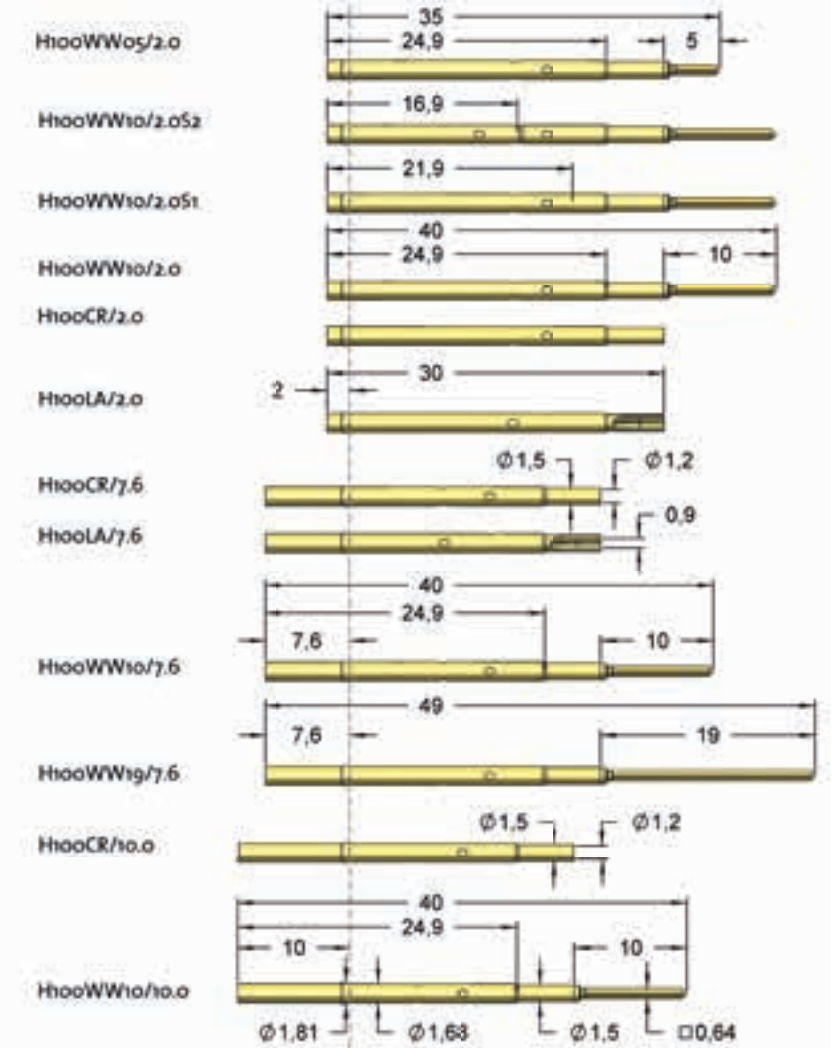
H100

Receptacles for 100 mil Centers

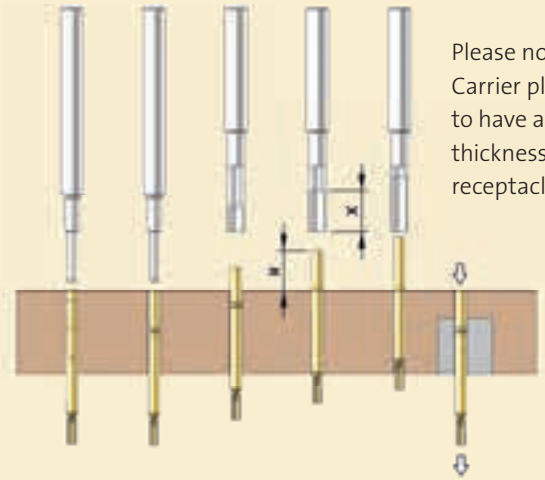
For probes **F100, F588 and F585** different receptacles are available with **different connection types** (e.g. LA, CR, WW), different press ring positions and different wire-wrap posts.
Adequate insertion tools are available. The right tool for flush insertion is **FEWZ-100E0**. The tools for fix projection 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**.



Appropriate tools are available for each type of receptacle.



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

Material and Plating

Nickel silver, gold plated

Centers (mm/mil)	2,54 / 100

Drill Size H100 (mm)

press ring as stop	1,67 - 1,68
press ring inserted	1,70 - 1,75

Type — Length of Wire Wrap Pin

H100 WW 10 / 7.6

Connection Type — Press Ring Position

Connection Type:
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

F588

Long Travel Probe 100 mil

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

Spring Force (cN ±20%)

Version	Preload	Nominal
HP	110	300
HPS	140	300
S	100	180
S	140	300
standard	80	180
standard	110	300

Travel (mm)

Version	Nominal	Maximum
HP	9,3	11,7
HPS	7,6	10,0
S	7,6	10,0
standard	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

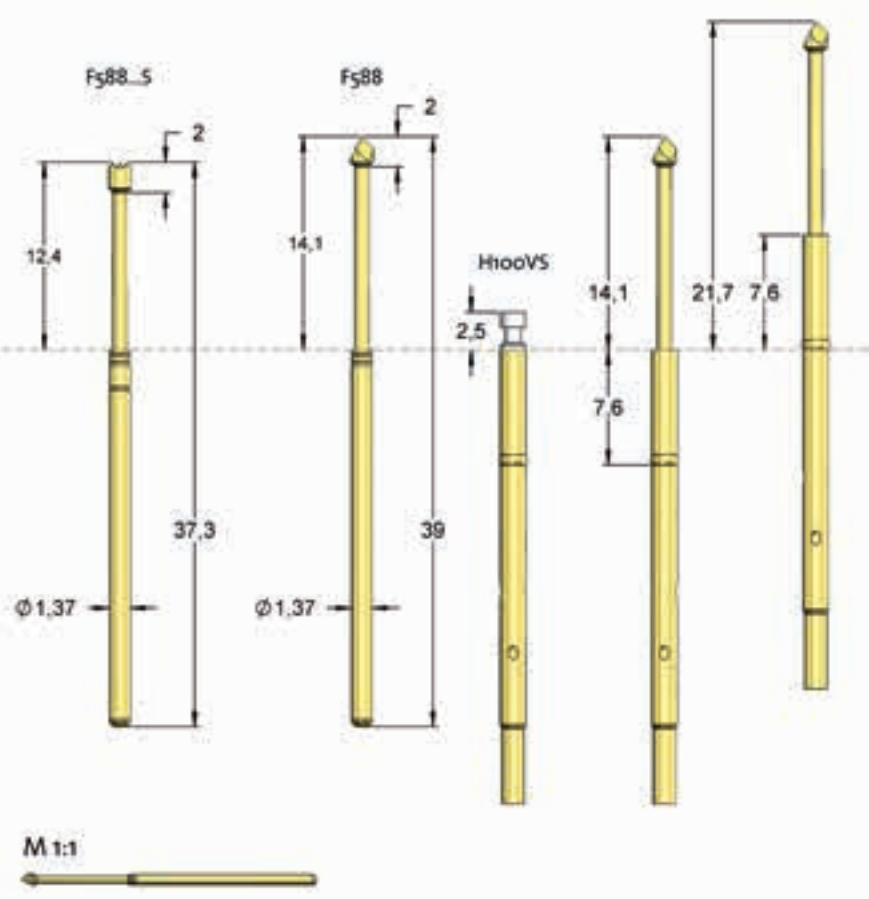
Insertion tool receptacle	FEWZ-100EV
Insertion tool receptacle	FEWZ-100E0
Insertion tool probe	FDWZ-100
Plug lock	H100VS

Drill Size (mm)

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

Projection Height (mm)

(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



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".

Tip Style	Number	Material	Plating	Ø in mm	Version
	05	B	G	1,50	-
	05	B	G	1,50	S
	06	B	G	1,50	-
	12	B	G	1,50	-
	15	B	G	1,50	-
	18	B	G	0,76	-
	21	S	L	0,76	-
	21	S	L	0,90	-
	28	B	G	1,50	-
	30	B	G	0,76	-
	30	S	L	0,90	-
	33	S	L	0,76	-
	33	S	L	0,90	-
	33	S	P	0,90	HP
	36	S	L	1,40	-
	38	S	L	0,90	-
	41	B	G	1,50	IK
	63	B	G	1,50	-
	66	B	P	2,50	HP

F772

Standard Probe 100 mil
Robust Version

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

Spring Force (cN ±20%)

Version	Preload	Nominal
HP	200	300
standard	30	80
standard	60	150
standard	60	220
standard	60	300

Travel (mm)

Version	Nominal	Maximum
HP	4,0	5,0
standard	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 Stainless steel, unplated (H)
Receptacle	Nickel silver, Gold plated

Spacers H772 for 100 mil Probes

Order Code.	Outer-Ø	Inner-Ø	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

Accessories

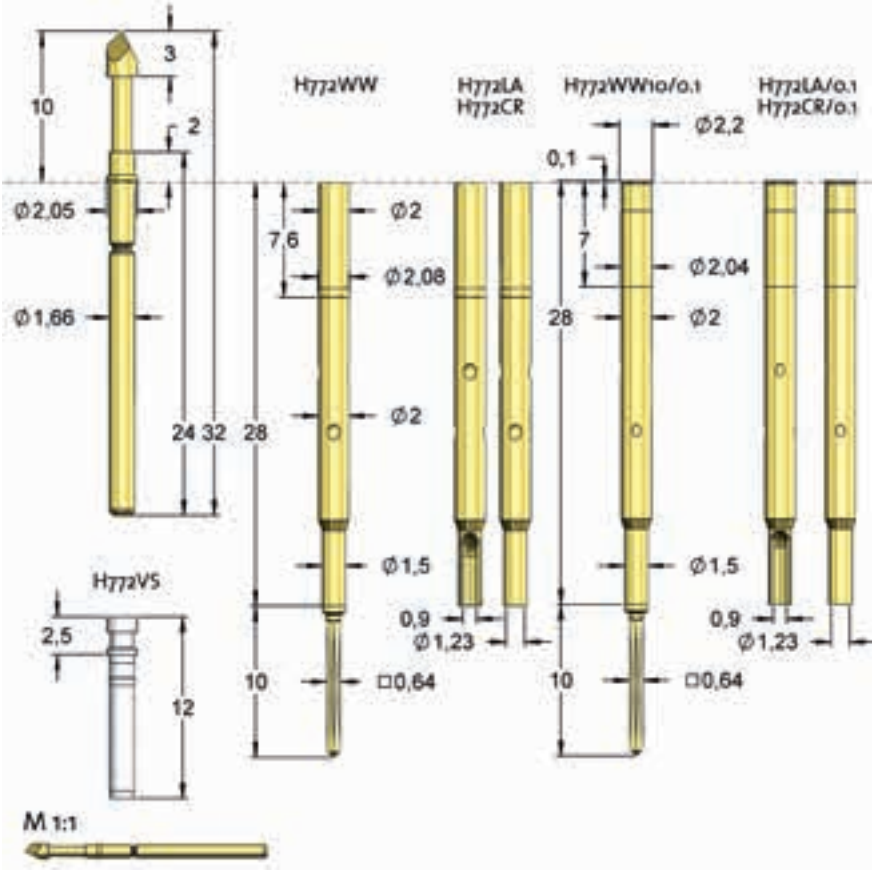
Insertion tool probe	FDWZ-100
Insertion tool receptacle	FEWZ-772EV
Insertion tool receptacle	FEWZ-772E0
Plug lock	H772VS
Spacers	see page 10

Drill Size (mm)

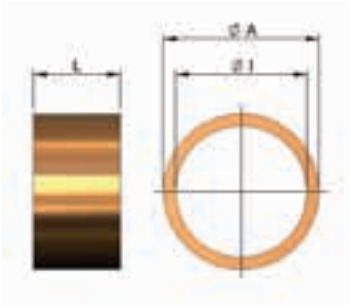
H772 Press ring as stop	1,97 - 2,00
H772 Press ring inserted	2,03 - 2,05
H772 with collar	2,02 - 2,03

Projection Height (mm)

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



High temperature versions available on request.



Tip Style	Number	Material	Plating	Ø in mm	Version
	03	B	G	1,30	-
	05	B	G	1,80	-
	05	B	G	2,00	-
	05	B	G	2,50	-
	05	B	G	3,00	-
	05	B	G	4,00	-
	06	B	G	1,50	-
	06	B	G	1,80	-
	06	B	G	2,00	-
	06	B	G	2,50	-
	07	S	L	1,75	-
	07	S	L	2,00	-

F772

Standard Probe 100 mil
Robust Version

Type			Tip-Ø		Spring Force	
F 772	33	S	130	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, 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

Tip Style	Number	Material	Plating	Ø in mm	Version
	10	S	N	0,63	-
	11	B	G	0,64	-
	11	B	G	0,70	-
	11	B	G	1,00	-
	11	B	G	1,30	-
	12	B	G	1,50	-
	12	B	G	2,00	-
	14	S	L	2,00	-
	15	B	G	2,00	-
	17	B	G	2,00	-
	17	B	G	3,00	-
	18	B	G	1,30	-
	18	S	N	0,80	-
	21	S	L	1,30	-
	28	B	G	2,00	-
	30	B	G	1,30	-
	33	S	L	1,30	-
	33	S	P	1,30	HP
	33	S	R	1,30	-

F786

Long Travel Probe 100 mil
Robust Version

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

Spring Force (cN ±20%)

Version	Preload	Nominal
HP	180	300
HP	180	500
IK	60	300
standard	60	150
standard	60	300

Travel (mm)

Version	Nominal	Maximum
HP	6,4	8,0
IK	6,4	8,0
standard	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	1,97 - 2,00
H772 Press ring inserted	2,03 - 2,05
H772 with collar	2,02 - 2,03

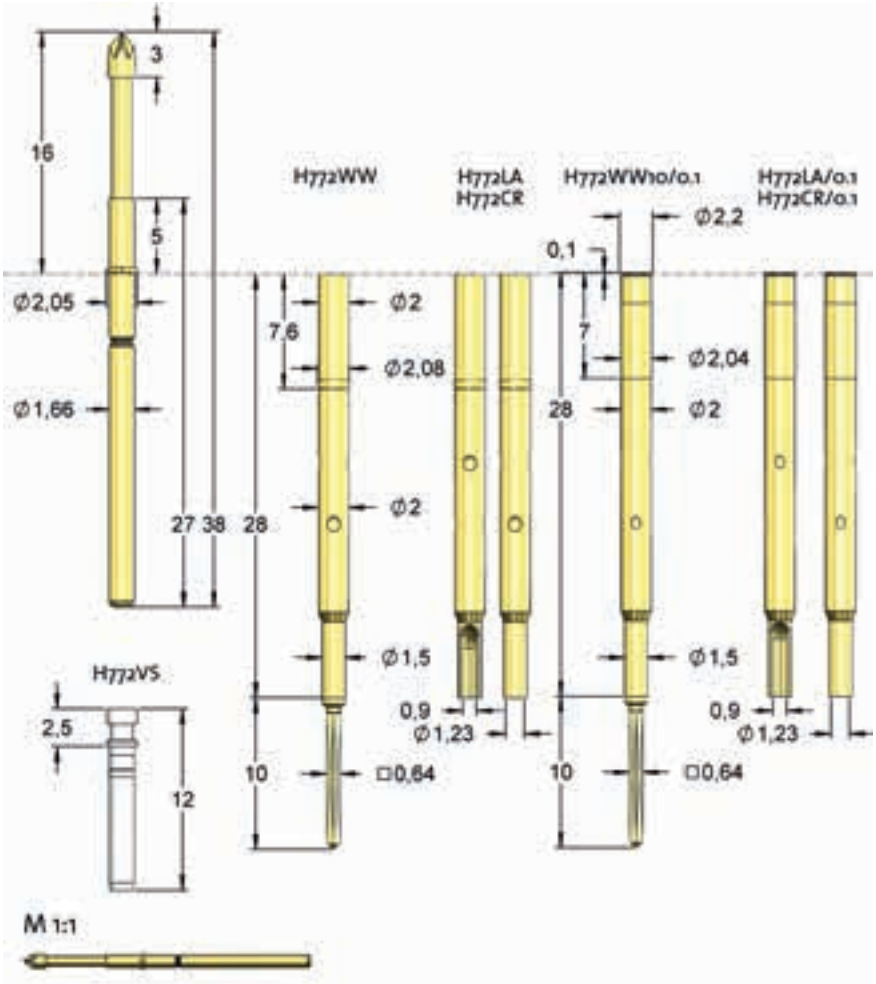
Projection Height (mm)

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 = Syntetic
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	2,00	-
	05	B	G	1,30	-
	06	B	G	2,00	-
	06	B	G	4,00	IK
	06	B	G	4,50	-
	07	S	L	1,80	-
	07	S	L	2,00	-
	10	S	P	0,63	HP
	11	B	G	1,30	-
	14	S	L	2,00	-
	15	B	G	2,00	-
	17	K	U	4,00	-
	18	B	G	1,30	-
	21	S	L	1,30	-
	32	S	L	0,80	-
	33	S	L	1,30	-
	33	S	P	1,30	HP
	63	S	L	2,00	-

F797

Long Travel Probe 100 mil Robust Version

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

Spring Force (cN ±20%)

Version	Preload	Nominal
E21	100	300
standard	60	150
standard	100	300

Travel (mm)

Version	Nominal	Maximum
E21	8,0	10,0
standard	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
Receptacle	Nickel silver, Gold plated

Accessories

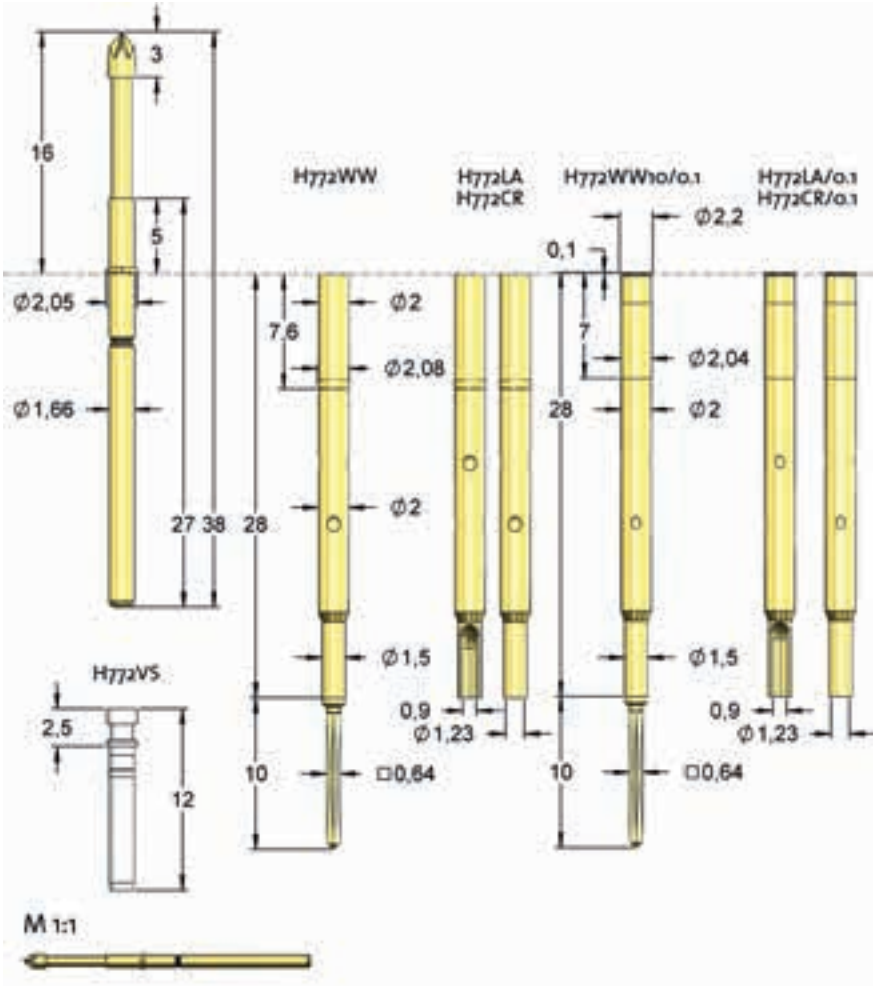
Insertion tool receptacle	FEWZ-772EV
Insertion tool receptacle	FEWZ-772E0
Insertion tool probe	FDWZ-100
Plug lock	H772VS

Drill Size (mm)

H772 Press ring as stop	1,97 - 2,00
H772 Press ring inserted	2,03 - 2,05
H772 with collar	2,02 - 2,03

Projection Height (mm)

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



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

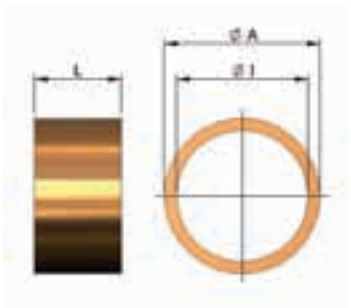
Type		Tip-Ø		Spring Force	
F 797	18	B	100	G	300	E21
	Tip Style	Material		Finish	Special Version	

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, E21 = Projection Height 21 mm
Receptacle:	Order Code according drawing

ORDER EXAMPLE

Spacers H772 for 100 mil Probes

Order Code	Outer-Ø	Inner-Ø	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



Tip Style	Number	Material	Plating	Ø in mm	Version
	14	S	L	2,00	-
	18	B	G	1,30	E21
	63	S	L	2,00	E21

F563

For Heavy Mechanical Load

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

Spring Force (cN ±20%)

Version	Preload	Nominal
HP	140	180
standard	90	120
standard	90	180
standard	130	250
standard	180	300

Travel (mm)

Version	Nominal	Maximum
HP	4,3	6,4
standard	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

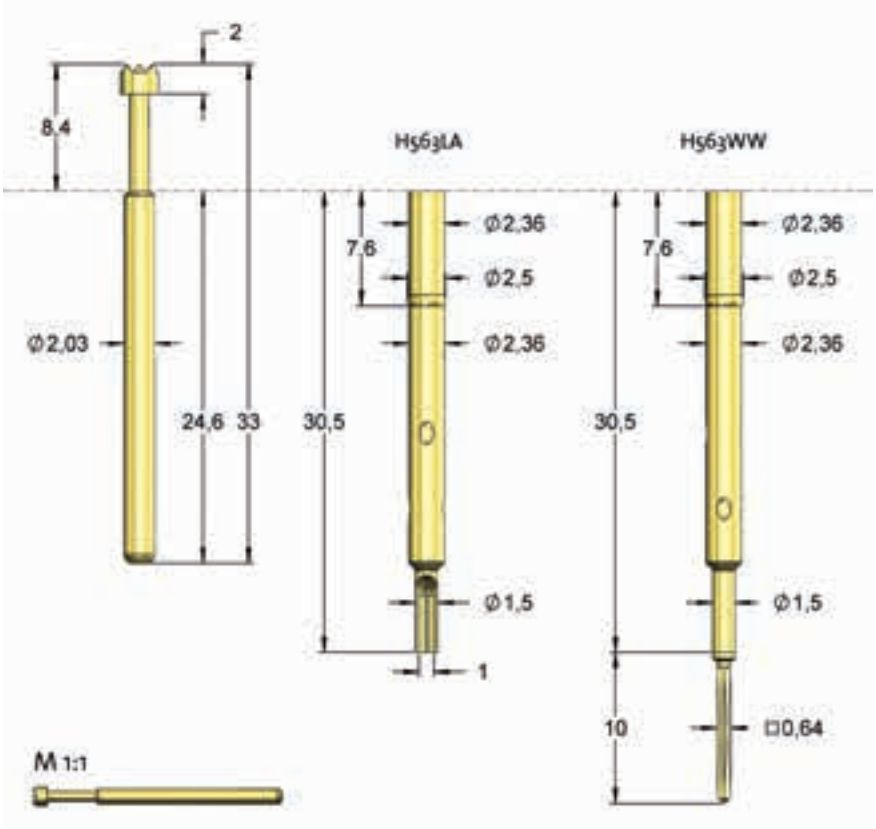
Insertion tool receptacle	FEWZ-563E0
Insertion tool probe	FDWZ-100

Drill Size (mm)

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

Projection Height (mm)

H563...	8,4 - 16,0



The F140 is the Long Travel Version to the F563. Further information on request.

Tip Style	Number	Material	Plating	Ø in mm	Version
	05	B	G	1,70	-
	05	B	G	2,50	-
	06	B	G	2,50	-
	06	B	G	2,50	HP
	06	B	G	4,00	-
	11	B	G	1,30	-
	12	B	G	1,70	-
	12	B	G	2,50	-
	14	B	G	2,50	-
	15	B	G	3,00	-
	16	B	G	1,30	-
	17	B	G	1,70	-
	18	B	G	0,70	-
	18	B	G	1,30	-

Type			Tip-Ø		Spring Force	
F 563	06	B	250	G	180	HP
	Tip Style	Material		Finish	Special Version	

Material:	B = BeCu
Tip-Ø:	250 = 2,5 mm (e.g.)
Finish:	G = Gold, P = Functional coating
Special Version:	HP = Progressive Series
Receptacle:	Order Code according drawing

ORDER EXAMPLE

F564

For Heavy Mechanical Load

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	60	135

Travel (mm)

Version	Nominal	Maximum
standard	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

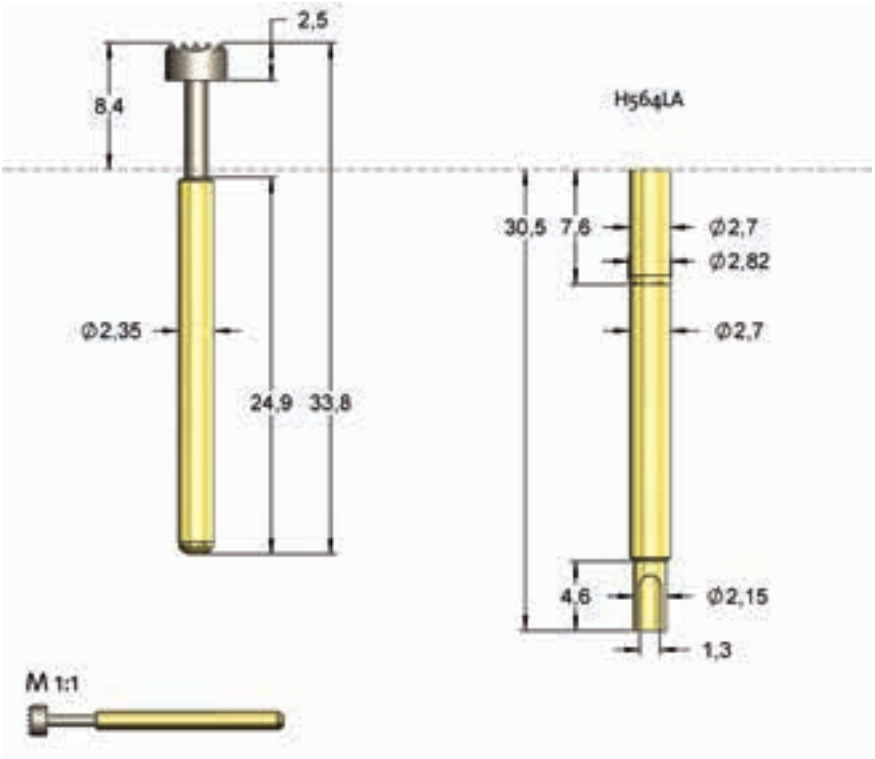
Insertion tool receptacle	FEWZ-564E0
Insertion tool probe	FDWZ-100

Drill Size (mm)

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

Projection Height (mm)

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	4,00	-
	11	B	R	1,55	-
	12	B	R	2,40	-
	16	B	R	1,55	-
	17	B	R	4,00	-
	18	B	R	1,55	-

F773

Standard Probe 138 mil
Robust Version

Centers (mm/mil)	3,50 / 138
Current	10,0 A
Temperature	-20°C...+80°C, -40°C...+250°C
R typically	25 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
H	40	150
H	80	300
standard	50	150
standard	30	220
standard	80	300
standard	100	400

Travel (mm)

Version	Nominal	Maximum
H	4,0	5,0
standard	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 Stainless steel, unplated
Receptacle	Nickel silver, Gold plated

Accessories

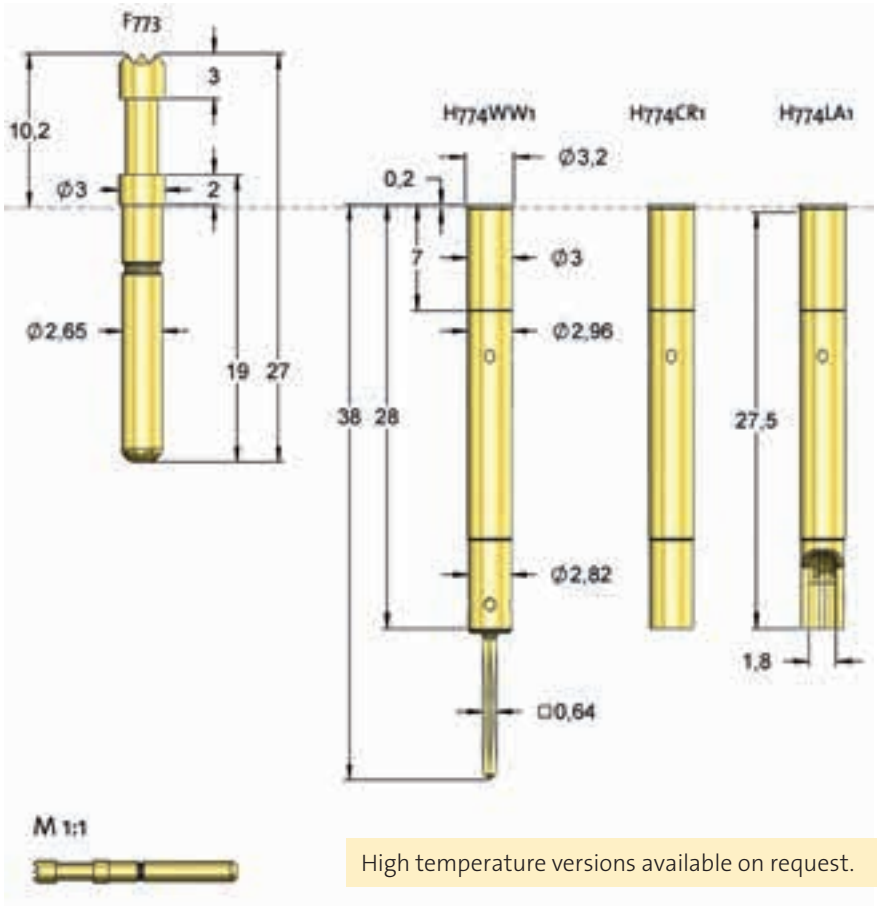
Insertion tool receptacle	FEWZ-774E0
Insertion tool probe	FDWZ-100

Drill Size (mm)

H774...	2,98 - 2,99

Projection Height (mm)

H774...	10,2



High temperature versions available on request.

Tip Style	Number	Material	Plating	Ø in mm	Version
	05	B	G	2,30	-
	06	B	G	2,30	-
	06	B	G	3,00	-
	06	B	G	4,00	-
	07	S	L	2,30	-
	07	S	L	4,00	-
	09	S	L	2,30	-
	11	B	G	1,80	-
	12	B	G	2,30	-
	12	B	G	3,00	-
	12	E	E	2,30	-
	14	S	L	2,30	-
	15	B	G	2,30	-
	15	B	G	3,00	-
	16	B	G	1,40	-
	16	B	G	1,80	-
	17	B	G	2,30	-
	17	B	G	3,00	-
	18	B	G	1,80	-
	21	S	L	1,80	-
	28	B	G	2,30	-

Type			Tip-Ø		Spring Force	
F 773	12	B	300	G	300	H
	Tip Style	Material		Finish	Special Version	

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

F796

Long Travel Probe 138 mil Robust Version

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	80	300

Travel (mm)

Version	Nominal	Maximum
standard	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

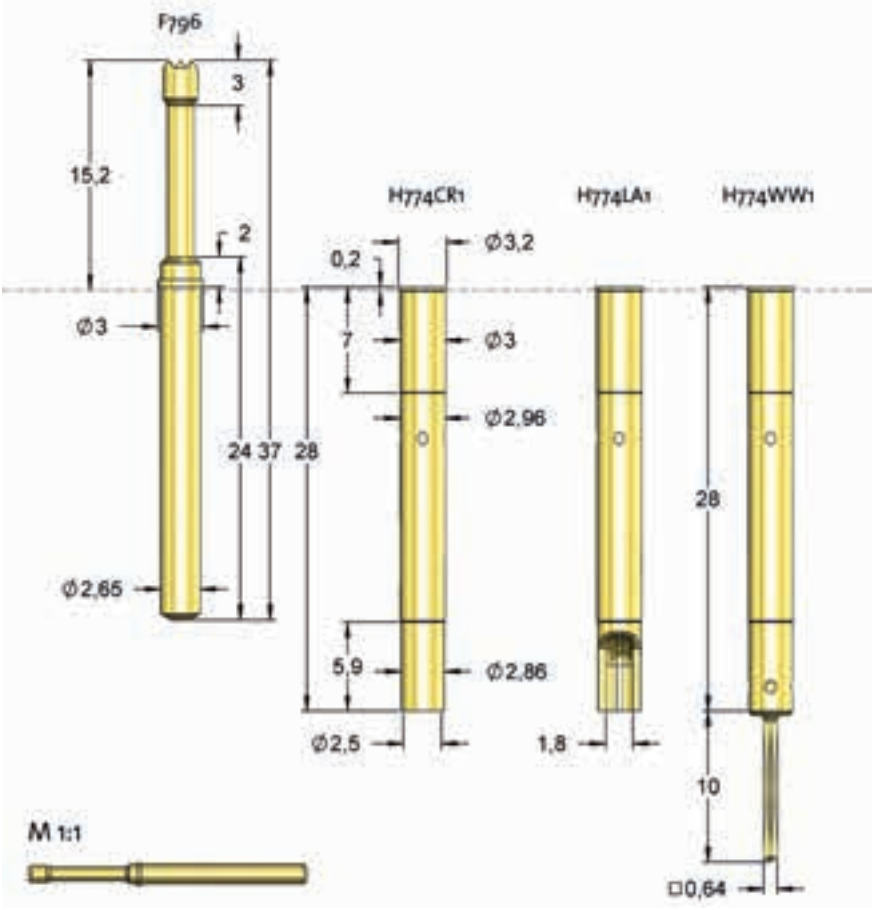
Insertion tool receptacle	FEWZ-774E0
Insertion tool probe	FDWZ-100
Spacers	see page 10

Drill Size (mm)

H774	2,98 - 2,99

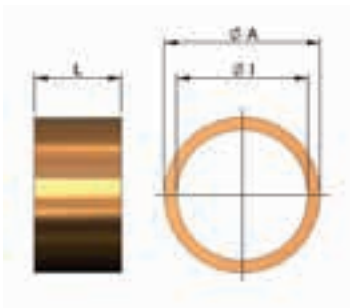
Projection Height (mm)

H774	15,2



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

Spacers H773 for 138 mil Probes			
Order Code	Outer-Ø	Inner-Ø	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/0	3,2	2,7	5,0



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	2,30	-
	11	B	G	1,76	-
	12	B	G	2,30	-
	14	B	G	2,30	-

F785

Long Travel Probe 138 mil
Robust Version

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

Spring Force (cN ±20%)

Version	Preload	Nominal
L	80	150
L	80	300
standard	80	150
standard	80	300

Travel (mm)

Version	Nominal	Maximum
L	6,4	8,0
standard	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

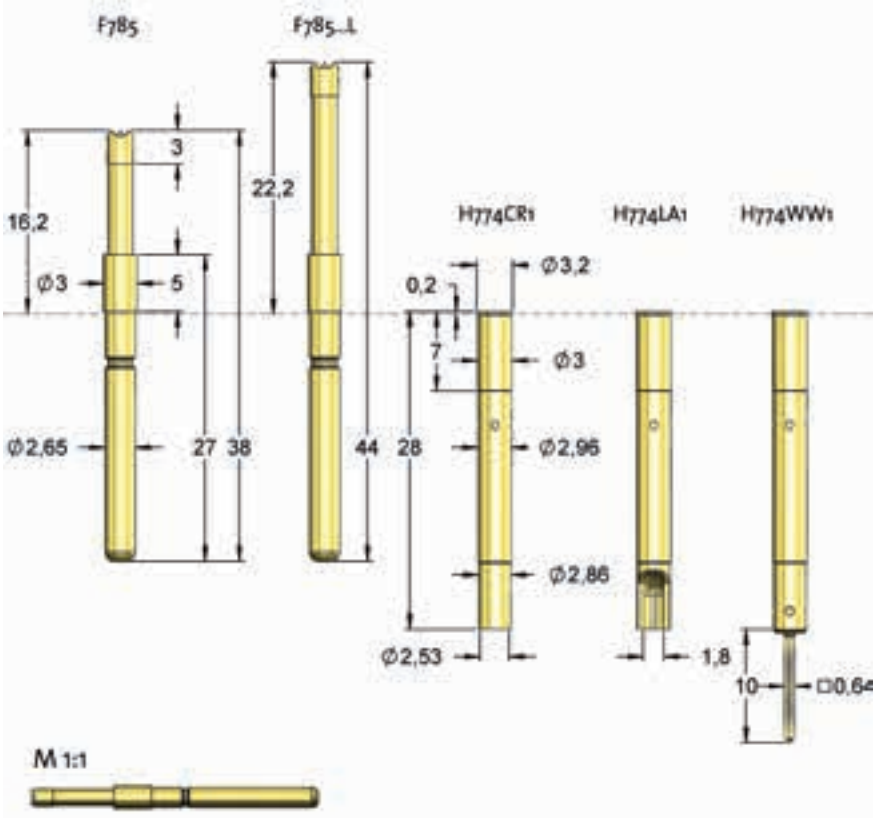
Insertion tool receptacle	FEWZ-774E0
Insertion tool probe	FDWZ-100

Drill Size (mm)

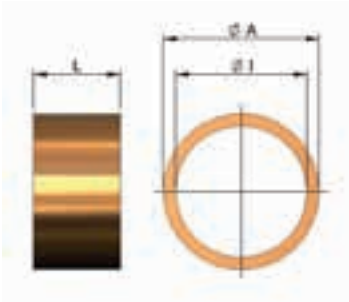
H774...	2,98 - 2,99

Projection Height (mm)

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



Spacers H773 for 138 mil Probes			
Order Code	Outer-Ø	Inner-Ø	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/0	3,2	2,7	5,0



Type			Tip-Ø		Spring Force	
F 785	06	B	250	G	300	L
	Tip Style	Material		Finish		Special Version

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	2,00	-
	06	B	G	1,20	L
	06	B	G	2,30	-
	06	B	G	2,50	L
	06	B	G	3,50	L
	14	S	L	2,30	-
	14	S	L	2,30	L

F566

For Heavy Mechanical Load

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	175	450

Travel (mm)

Version	Nominal	Maximum
standard	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

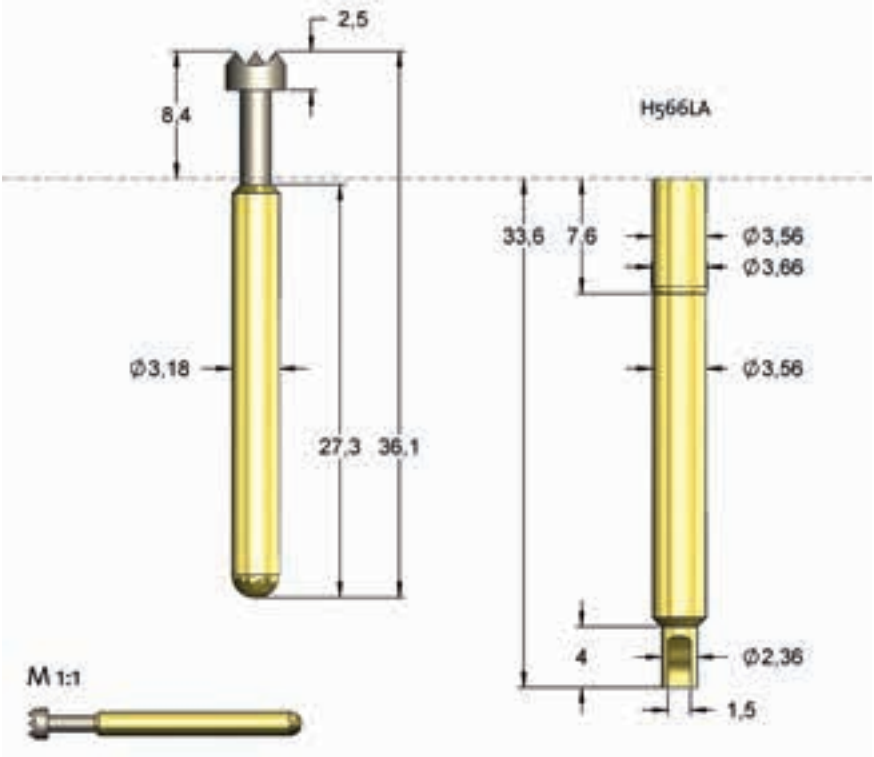
Insertion tool receptacle	FEWZ-774E0
Insertion tool probe	FDWZ-100

Drill Size (mm)

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

Projection Height (mm)

H566...	8,4 - 16,0



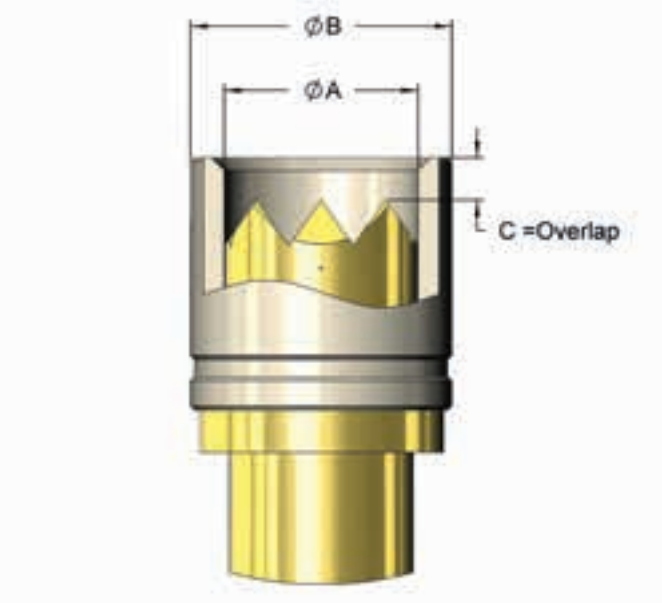
Type		Tip-Ø		Spring Force
F 566	06	B	400	R 450
	Tip Style	Material	Finish	Special Version

Material:	B = BeCu
Tip-Ø:	400 = 4,0 mm (e.g.)
Finish:	G = Gold, R = Rhodium
Receptacle:	Order Code according drawing

ORDER EXAMPLE

Tip Style	Number	Material	Plating	Ø in mm	Version
	05	B	R	4,00	-
	06	B	R	4,00	-
	18	B	R	2,00	-

Insulating Caps Overview



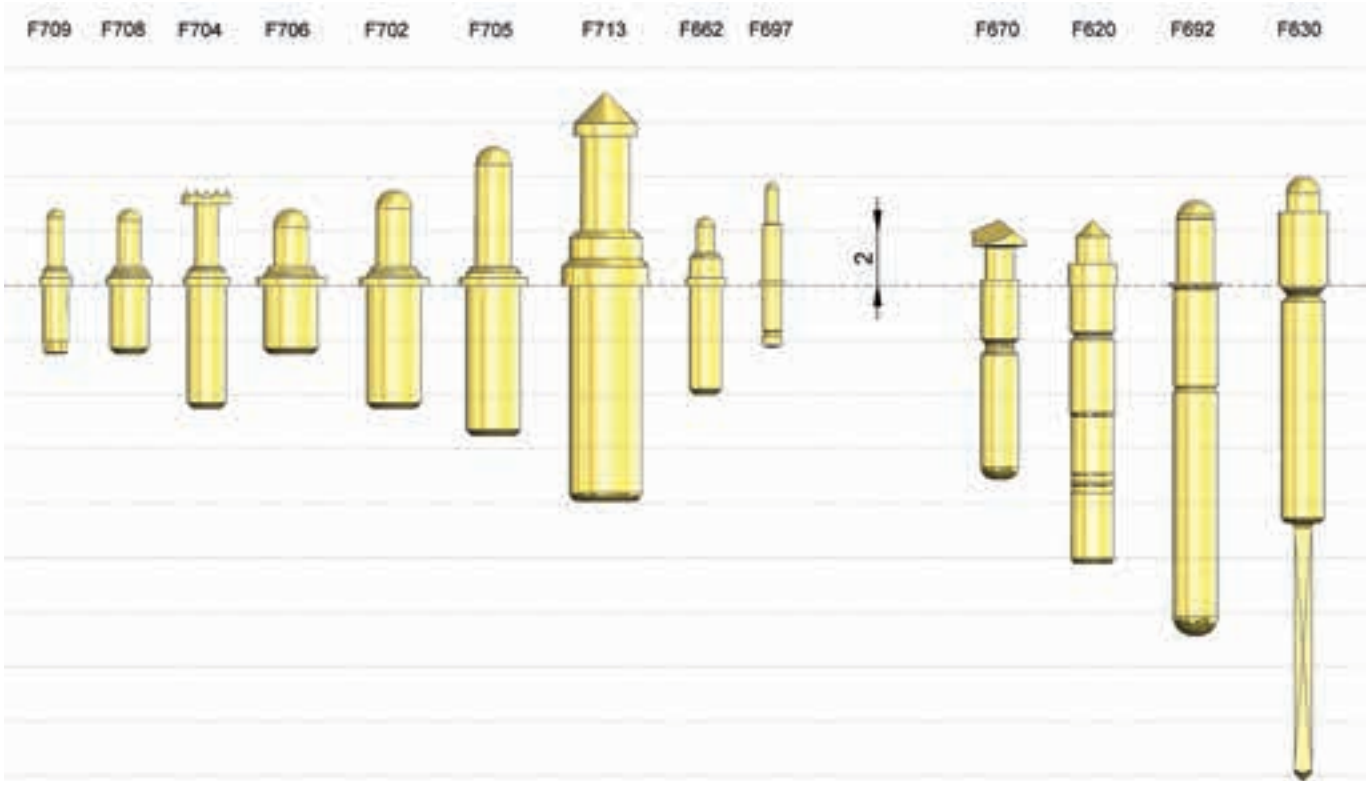
F075	**Order Example**	**F07506B130G200IK04**				
	Spring Force	200 cN				
	Inner-Ø A	Ø 1,3 mm				
	Outer-Ø B	Ø 1,7 mm				
	Overlap C	0,4 mm				
F875	**Order Example**	**F87506B100G135IK05**				
	Spring Force	135 cN				
	Inner-Ø A	Ø 1,0 mm				
	Outer-Ø B	Ø 1,9 mm				
	Overlap C	0,5 mm				
F832	**Order Example**	**F83205S0008L650IK10**				
	Spring Force	650 cN				
	Inner-Ø A	Ø 0,8 mm				
	Outer-Ø B	Ø 2,0 mm				
	Overlap C	1,0 mm				
F822	**Order Example**	**FF82205S0007L650IK15**	**F82205S0007L650IK25**	**F82205S0008L650IK10**		
	Spring Force	650 cN	650 cN	650 cN		
	Inner-Ø A	Ø 0,8 mm	Ø 0,8 mm	Ø 0,8 mm		
	Outer-Ø B	Ø 2,0 mm	Ø 2,0 mm	Ø 2,0 mm		
	Overlap C	1,5 mm	2,5 mm	1,0 mm		
F733	**Order Example**	**F73306B180G150IK05**	**F73306B230G150IK05**	**F73306B300G300IK05**	**F73306B300G300IK87**	
	Spring Force	150 cN, 300cN	150 cN	300 cN	300 cN	
	Inner-Ø A	Ø 1,8 mm	Ø 2,3 mm	Ø 3,0 mm	Ø 3,0 mm	
	Outer-Ø B	Ø 2,6 mm	Ø 3,1 mm	Ø 3,8 mm	Ø 5,45 mm	
	Overlap C	0,5 mm	0,5 mm	0,5 mm	8,7 mm	
F732	**Order Example**	**F73206B120GxxxIK05**	**F73206B120G150IK60**	**F73206B130G150IK05**	**F73206B180G150IK05**	**F73206B200G150IK60**
	Spring Force	150 cN, 300cN	150 cN	150 cN	150 cN	150 cN
	Inner-Ø A	Ø 1,2 mm	Ø 1,2 mm	Ø 1,5 mm	Ø 1,8 mm	Ø 1,8 mm
	Outer-Ø B	Ø 2,0 mm	Ø 2,0 mm	Ø 2,2 mm	Ø 2,6 mm	Ø 2,6 mm
	Overlap C	0,5 mm	6,0 mm	0,5 mm	0,5 mm	6,0 mm
F100	**Order Example**	**F10005B150GxxxIK04**	**F10006B150GxxxIK04**	**F10006B200GxxxIK04**	**F10006B350GxxxIK04**	
	Spring Force	100 cN	100 cN, 200 cN, 300 cN	200 cN, 300 cN	200 cN, 300 cN	
	Inner-Ø A	Ø 1,5 mm	Ø 1,5 mm	Ø 2,0 mm	Ø 3,5 mm	
	Outer-Ø B	Ø 2,2 mm	Ø 2,2 mm	Ø 3,2 mm	Ø 4,0 mm	
	Overlap C	0,4 mm	0,4 mm	0,4 mm	0,4 mm	
F100	**Order Example**	**F10006B350G300IK10**	**F10006B370G300IK36**	**F10017B150G200IK04**	**F10041B150GxxxIK04**	
	Spring Force	300 cN	300 cN	200 cN	200 cN, 300 cN	
	Inner-Ø A	Ø 3,5 mm	Ø 3,7 mm	Ø 1,5 mm	Ø 1,5 mm	
	Outer-Ø B	Ø 4,2 mm	Ø 4,4 mm	Ø 2,2 mm	Ø 2,2 mm	
	Overlap C	1,0 mm	3,6 mm	0,4 mm	0,4 mm	
F588	**Order Example**	**F58841B150G300IK**	**F58841B150G300IK04S**			
	Spring Force	300 cN	300 cN			
	Inner-Ø A	Ø 1,5 mm	Ø 1,5 mm			
	Outer-Ø B	Ø 2,2 mm	Ø 2,2 mm			
	Overlap C	0,4 mm	0,4 mm			
F772	**Order Example**	**F77206B120G150IK05**	**F77206B180G150IK08**	**F77206B200G150IK05**		
	Spring Force	150 cN	150 cN	150 cN		
	Inner-Ø A	Ø 1,2 mm	Ø 1,8 mm	Ø 2,0 mm		
	Outer-Ø B	Ø 2,0 mm	Ø 2,6 mm	Ø 2,8 mm		
	Overlap C	0,5 mm	0,8 mm	0,5 mm		
F786	**Order Example**	**F78606B400G300IK06**	**F78606B400G300IK17**			
	Spring Force	300 cN	300 cN			
	Inner-Ø A	Ø 4,0 mm	Ø 4,0 mm			
	Outer-Ø B	Ø 4,8 mm	Ø 4,8 mm			
	Overlap C	0,6 mm	1,7 mm			

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.

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.

F697

Battery Contact

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	10	30

Travel (mm)

Version	Nominal	Maximum
standard	1,0	1,3
Pointing Accuracy		±0,08 mm

Type			Tip-Ø		Spring Force	
F 697	11	B	045	G	030	
	Tip Style	Material		Finish	Special Version	

Material: B = BeCu
Tip-Ø: 045 = 0,45 mm (e.g.)
Finish: G = Gold plated

ORDER EXAMPLE

Materials and Plating

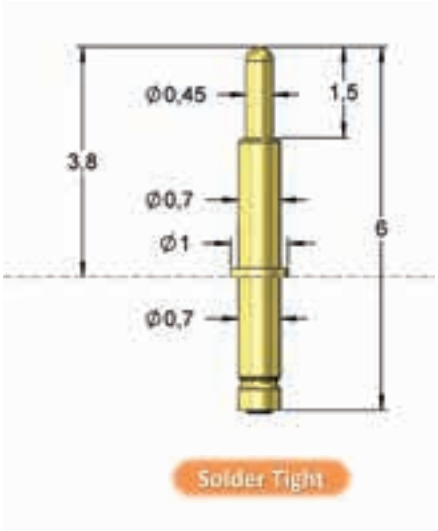
Plunger	see tip style
Barrel	Bronze, gold plated
Spring	Music wire, silver plated
Receptacle	-

Drill Size (mm)

F697	0,68 - 0,70

Projection Height (mm)

F697	3,8



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

F709

Battery Contact

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

Spring Force (cN ±20%)

Version	Preload	Nominal
H	10	20
ST	10	20
standard	10	40

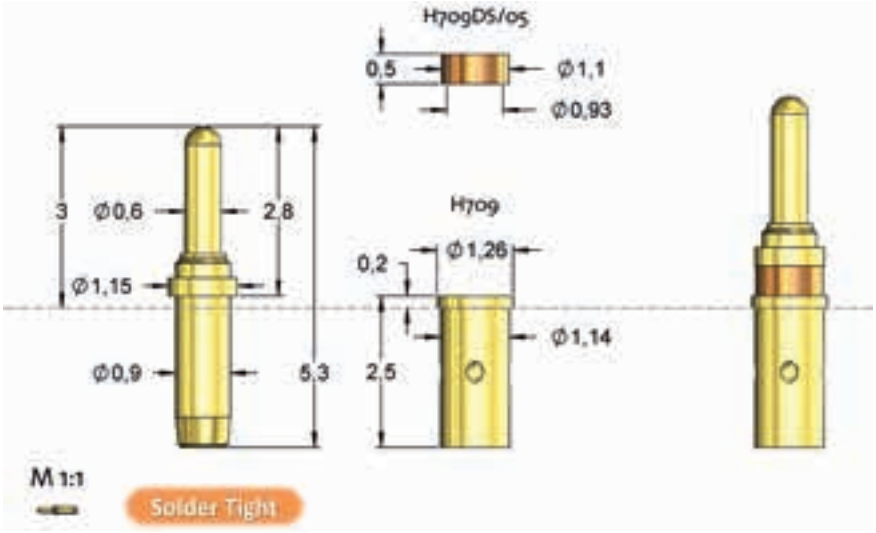
Travel (mm)

Version	Nominal	Maximum
H	1,0	1,2
ST	1,0	1,2
standard	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	Special Version	

Material: B = BeCu
Tip-Ø: 060 = 0,6 mm (e.g.)
Finish: G = Gold
Special Version: H = High Temperatur, ST = Solder tight
Receptacle: Order Code according drawing

ORDER EXAMPLE



Accessories

Spacer 0,5 mm	H709DS/05

Materials and Plating

Plunger	see tip style
Barrel	Brass, gold plated
Spring	Music wire, silver plated Stainless steel, unplated (H)
Receptacle	Bronze, Gold plated

Drill Size (mm)

H709	1,12 - 1,14
F709...	0,89 - 0,91

Projection Height (mm)

H709	3,0

Tip Style	Number	Material	Plating	Ø in mm	Version
	11	B	G	0,60	-
	11	B	G	0,60	H
	11	B	G	0,60	ST

F708

Battery Contact

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	20	80
standard	25	100

Travel (mm)

Version	Nominal	Maximum
standard	1,0	1,2
Pointing Accuracy		±0,08 mm

Materials and Plating

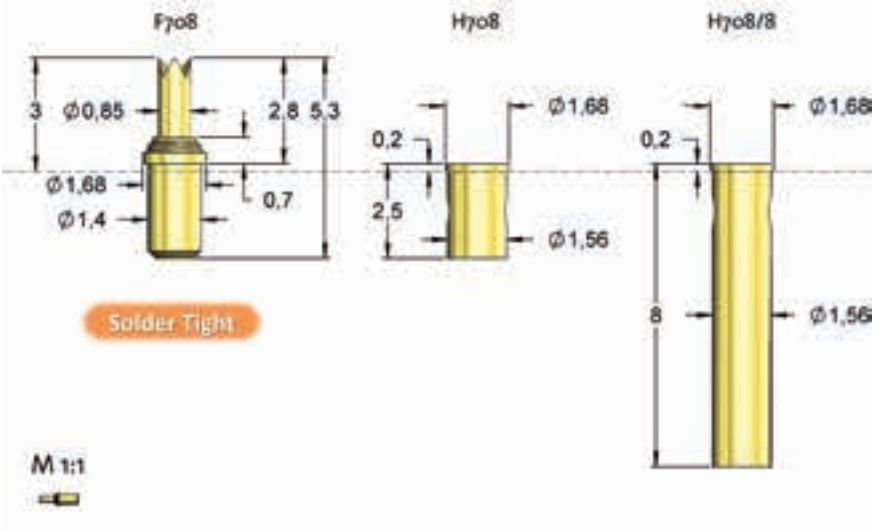
Plunger	see tip style
Barrel	Brass, gold plated
Spring	Stainless steel, unplated
Receptacle	Bronze, Gold plated

Drill Size (mm)

H708...	1,54 - 1,55
F708	1,38 - 1,40

Projection Height (mm)

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	-

F704

Battery Contact

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	20	60

Travel (mm)

Version	Nominal	Maximum
standard	1,5	2,2
Pointing Accuracy		±0,08 mm

Materials and Plating

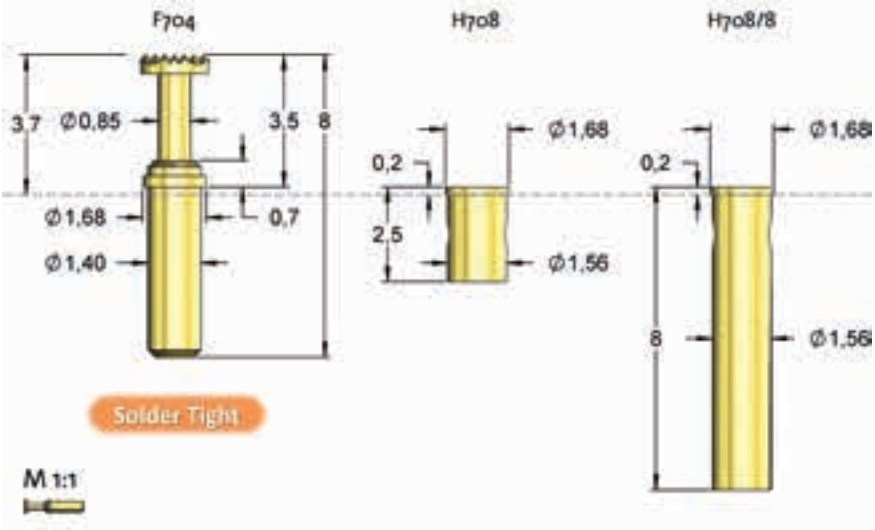
Plunger	see tip style
Barrel	Brass, gold plated
Spring	Stainless steel, unplated
Receptacle	Bronze, Gold plated

Drill Size (mm)

H708...	1,54 - 1,55
F704...	1,39 - 1,41

Projection Height (mm)

H708...	3,7



Type			Tip-Ø		Spring Force
F 704	06	B	180	G	060
	Tip Style	Material		Finish	Special Version

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	1,80	-

F706

Battery Contact

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	70	150
standard	80	200

Travel (mm)

Version	Nominal	Maximum
standard	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

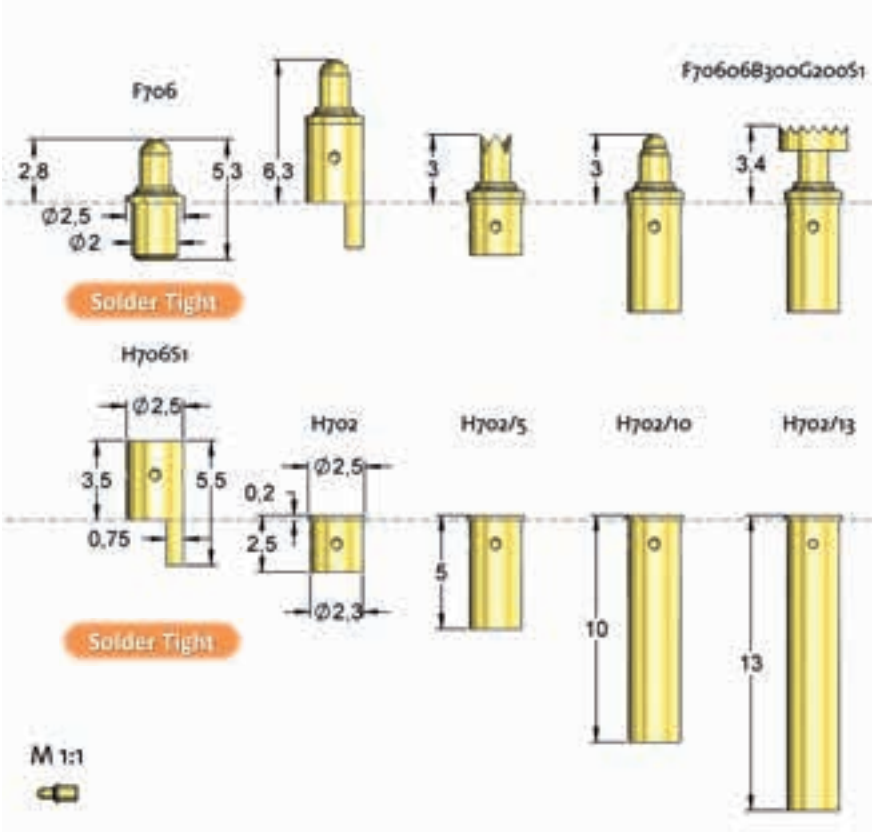
Insertion tool receptacle	FEWZ-702E0

Drill Size (mm)

H702...	2,28 - 2,29
F706...	1,97 - 2,00

Projection Height (mm)

H702...	3,0
H706S1	6,3



Type		Tip-Ø	Finish	Spring Force
F 706	11	B	130	G	200
	Tip Style	Material		Finish	Special Version

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	1,00	-
	11	B	G	1,30	-
	29	B	G	1,30	-

F702

Battery Contact

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	10	15
standard	10	30
standard	40	130

Travel (mm)

Version	Nominal	Maximum
standard	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

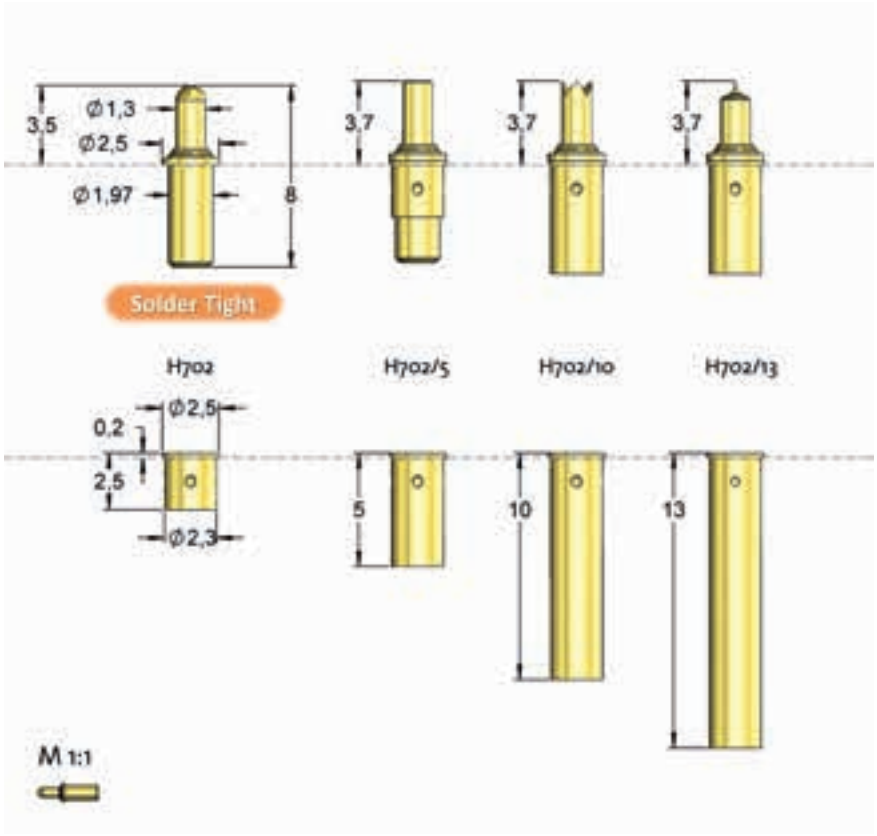
Insertion tool receptacle	FEWZ-702E0

Drill Size (mm)

H702...	2,28 - 2,29
F702...	1,96 - 1,98

Projection Height (mm)

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	1,30	-
	16	B	G	1,30	-
	29	B	G	1,30	-
	34	S	L	1,30	-

F705

Battery Contact

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

Spring Force (cN ±20%)

Version	Preload	Nominal
CR	80	130
H	30	130
LA	80	130
LA	75	200
LI	80	130
standard	30	50
standard	80	130
standard	75	200

Travel (mm)

Version	Nominal	Maximum
CR	1,5	3,0
H	1,5	3,0
LA	1,5	3,0
LI	1,5	3,0
standard	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

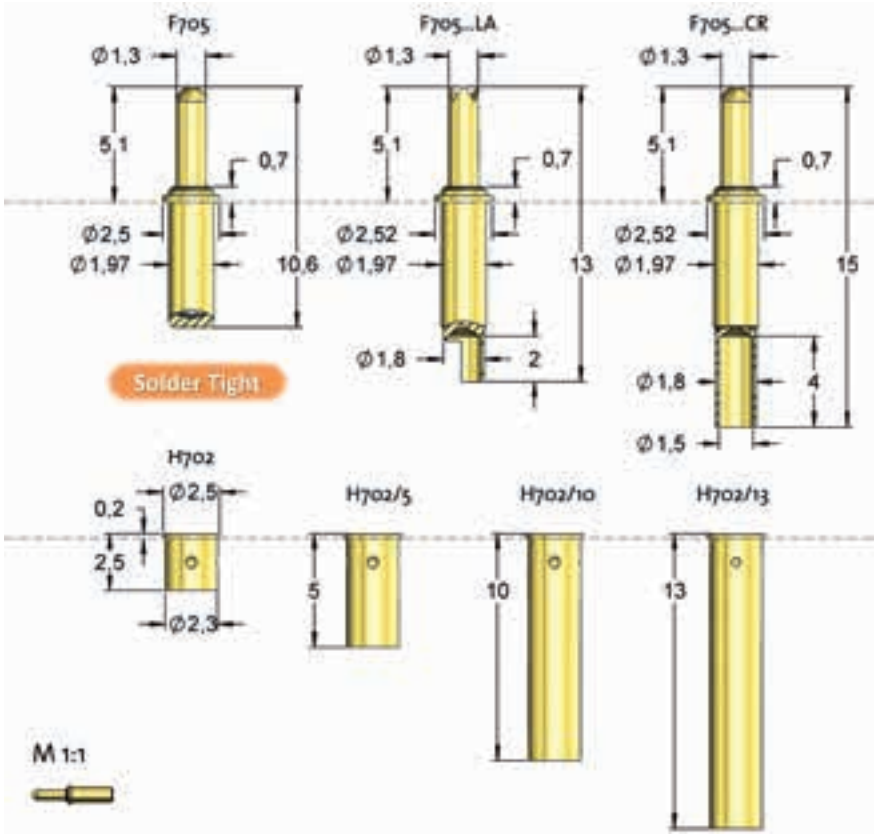
Insertion tool receptacle	FEWZ-702E0

Drill Size (mm)

H702...	2,28 - 2,29
F705...	1,96 - 1,98

Projection Height (mm)

H702...	5,3



Version F705...LI with 550 mm blue flexible wire (AWG18) available.
Conductor: 0,90mm² .

Type		Tip-Ø	Spring Force	
F 705	29	B 130	G	130 CR
	Tip Style	Material	Finish	Special Version

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	3,00	-
	11	B	G	1,30	-
	11	B	G	1,30	CR
	11	B	G	1,30	H
	11	B	G	1,30	LA
	11	B	G	1,30	LI
	18	B	G	1,30	LA
	29	B	G	1,30	-
	29	B	G	1,30	CR
	29	B	G	1,30	LA
	30	B	G	1,30	LA

F67111B1004G230

Short Travel Probe pressed-in

Centers (mm/mil)	2,70 / 106
Current	5,0 A
Temperature	-20°C...+80°C
R Typically	<30 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
Standard	60	230

Travel (mm)

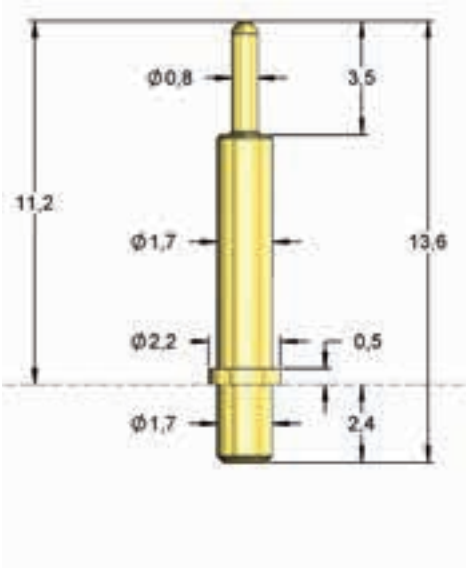
Version	Nominal	Maximum
Standard	2,0	3,5

Materials and Plating

Plunger	BeCu, gold plated
Barrel	Brass, gold plated
Spring	Federstahl, versilbert

Drill Size (mm)

F67111B1004G230	1,68 - 1,70



F67111B1005G450

Short Travel Probe pressed-in

Centers (mm/mil)	2,70 / 106
Current	5,0 A
Temperature	-20°C...+80°C
R Typically	<30 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
Standard	130	450

Travel (mm)

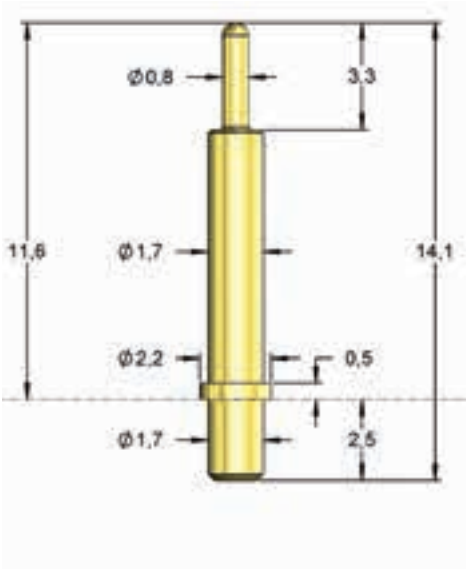
Version	Nominal	Maximum
Standard	1,5	3,0

Materials and Plating

Plunger	BeCu, gold plated
Barrel	Brass, gold plated
Spring	Federstahl, versilbert

Drill Size (mm)

F67111B1005G450	1,68 - 1,70



F67111B1006G450

Short Travel Probe pressed-in

Centers (mm/mil)	2,70 / 106
Current	5,0 A
Temperature	-20°C...+80°C
R Typically	<30 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
Standard	130	450

Travel (mm)

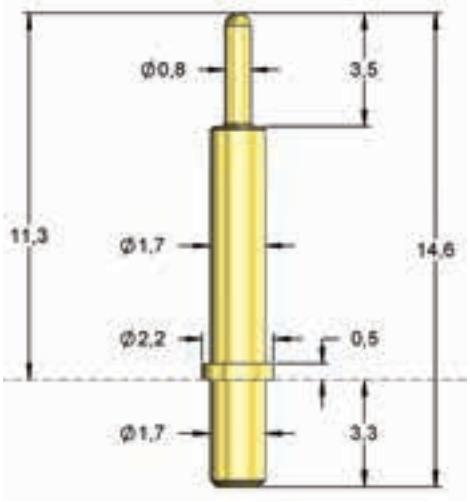
Version	Nominal	Maximum
Standard	1,5	3,0

Materials and Plating

Plunger	BeCu, gold plated
Barrel	Brass, gold plated
Spring	Federstahl, versilbert

Drill Size (mm)

F67111B1006G450	1,68 - 1,70



F67111M1007U150

Short Travel Probe pressed-in

Centers (mm/mil)	5,50 / 216
Current	5,0 A
Temperature	-40°C...+250°C
R Typically	<20 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
Standard	100	150

Travel (mm)

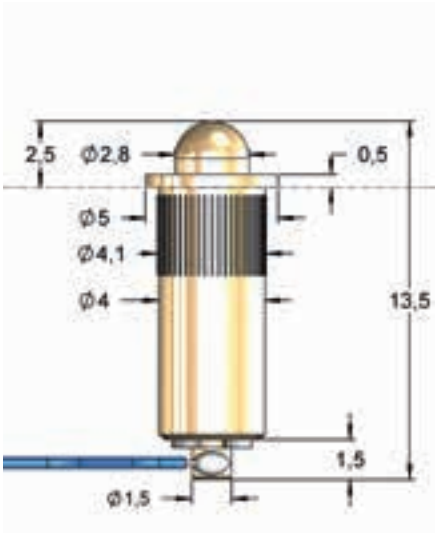
Version	Nominal	Maximum
Standard	1,5	2,0

Materials and Plating

Plunger	Brass, unplated
Barrel	Brass, unplated
Spring	Stainless Steel, unplated

Drill Size (mm)

F67111M1007U150	4,01 - 4,07



F67111M1007G200

Short Travel Probe pressed-in

Centers (mm/mil)	5,50 / 216
Current	5,0 A
Temperature	-40°C...+250°C
R Typically	<20 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
Standard	150	200

Travel (mm)

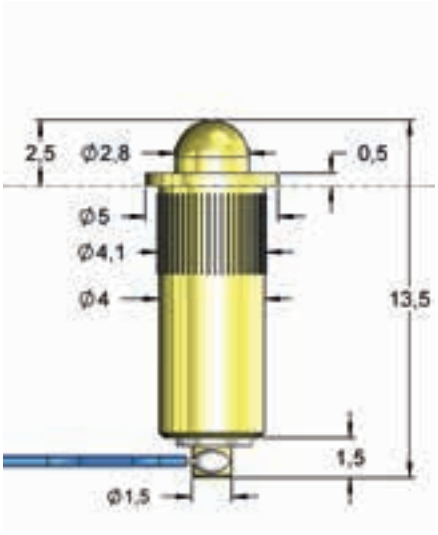
Version	Nominal	Maximum
Standard	1,5	2,0

Materials and Plating

Plunger	Brass, gold plated
Barrel	Brass, gold plated
Spring	Federstahl, gold plated

Drill Size (mm)

F67111M1007G150	4,01 - 4,07



F67211B0001G170

Short Travel Probe solder tight

Centers (mm/mil)	4,50 / 177
Current	9,0 A
Temperature	-40°C...+250°C
R Typically	<30 mOhm

Materials and Plating

Plunger	BeCu, gold plated
Barrel	Brass, gold plated
Spring	Stainless Steel, unplated

Spring Force (cN ±20%)

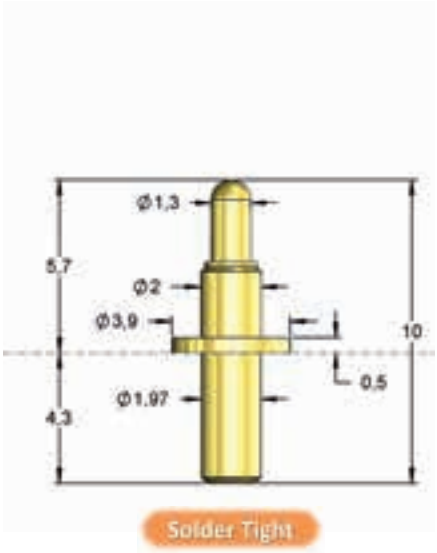
Version	Preload	Nominal
Standard	80	170

Drill Size (mm)

equal Barrel-Ø	1,96 - 1,97

Travel (mm)

Version	Nominal	Maximum
Standard	1,7	2,5



F67211B0002G250

Short Travel Probe solder tight

Centers (mm/mil)	4,50 / 177
Current	9,0 A
Temperature	-40°C...+250°C
R Typically	<30 mOhm

Materials and Plating

Plunger	BeCu, gold plated
Barrel	Brass, gold plated
Spring	Stainless Steel, unplated

Spring Force (cN ±20%)

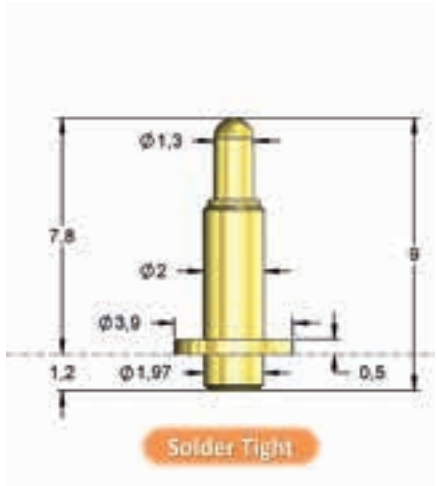
Version	Preload	Nominal
Standard	70	250

Drill Size (mm)

equal Barrel-Ø	1,96 - 1,97

Travel (mm)

Version	Nominal	Maximum
Standard	1,7	2,5



F67211B0003G040

Short Travel Probe solder tight

Centers (mm/mil)	4,50 / 177
Current	9,0 A
Temperature	-40°C...+250°C
R Typically	<30 mOhm

Materials and Plating

Plunger	BeCu, gold plated
Barrel	Brass, gold plated
Spring	Stainless Steel, unplated

Spring Force (cN ±20%)

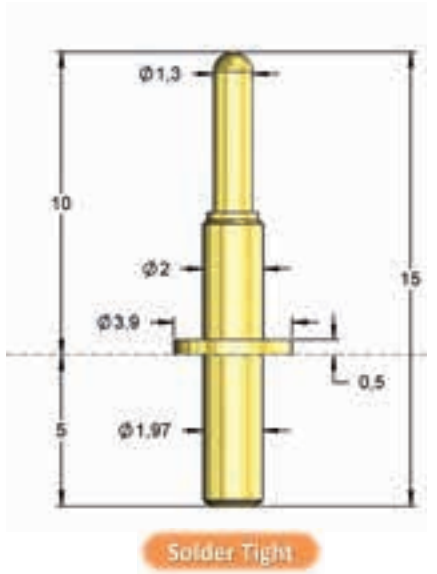
Version	Preload	Nominal
Standard	20	40

Drill Size (mm)

equal Barrel-Ø	1,96 - 1,97

Travel (mm)

Version	Nominal	Maximum
Standard	1,7	2,5



F67211B0004G020

Short Travel Probe solder tight

Centers (mm/mil)	3,18 / 125
Current	5,0 A
Temperature	-40°C...+250°C
R Typically	<30 mOhm

Materials and Plating

Plunger	BeCu, gold plated
Barrel	Brass, gold plated
Spring	Stainless Steel, unplated

Spring Force (cN ±20%)

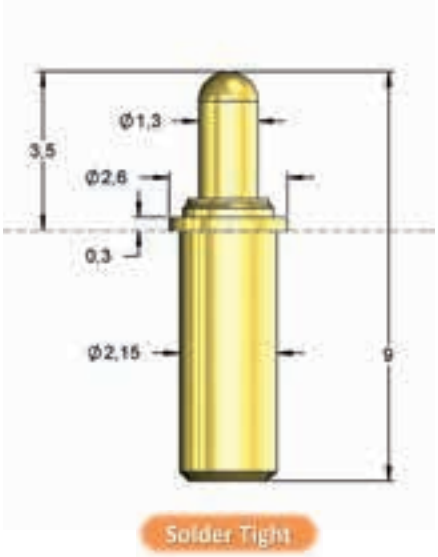
Version	Preload	Nominal
Standard	10	20

Drill Size (mm)

equal Barrel-Ø	2,14 - 2,15

Travel (mm)

Version	Nominal	Maximum
Standard	1,0	2,8



F67211B0004G150

Short Travel Probe solder tight

Centers (mm/mil)	3,18 / 125
Current	5,0 A
Temperature	-40°C...+250°C
R Typically	<30 mOhm

Materials and Plating

Plunger	BeCu, gold plated
Barrel	Brass, gold plated
Spring	Stainless Steel, unplated

Spring Force (cN ±20%)

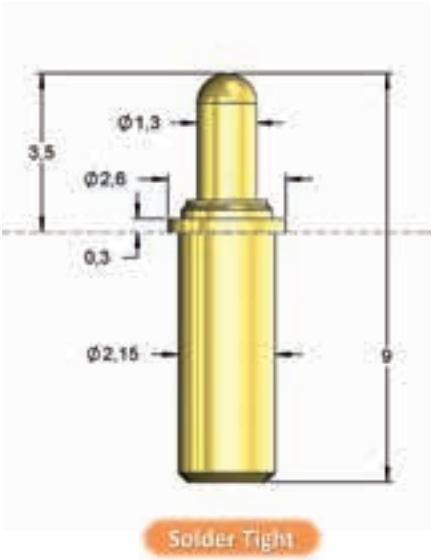
Version	Preload	Nominal
Standard	70	150

Drill Size (mm)

equal Barrel-Ø	2,14 - 2,15

Travel (mm)

Version	Nominal	Maximum
Standard	1,0	2,8



F67311B2001G065

Short Travel Probe for direct soldering on PCB

Centers (mm/mil)	3,50 / 138
Current	8,0 A
Temperature	-40°C...+250°C
R Typically	<20 mOhm

Materials and Plating

Plunger	BeCu, gold plated
Barrel	Brass, gold plated
Spring	Stainless Steel, unplated

Spring Force (cN ±20%)

Version	Preload	Nominal
Standard	10	65

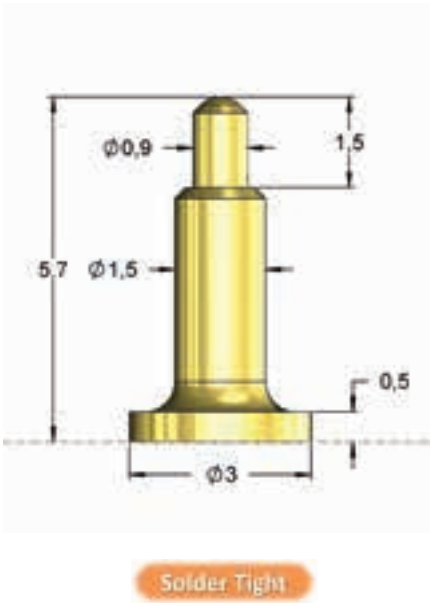
Drill Size (mm)

Barrel-Ø 1,5	1,51 - 1,53

Travel (mm)

Version	Nominal	Maximum
Standard	1,0	2,8

This probe can be mounted through a bore. The collar can be used as an stop.



F605

Short Travel Probe 50 mil

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	30	75

Travel (mm)

Version	Nominal	Maximum
standard	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
Receptacle	Bronze, Gold plated

Accessories

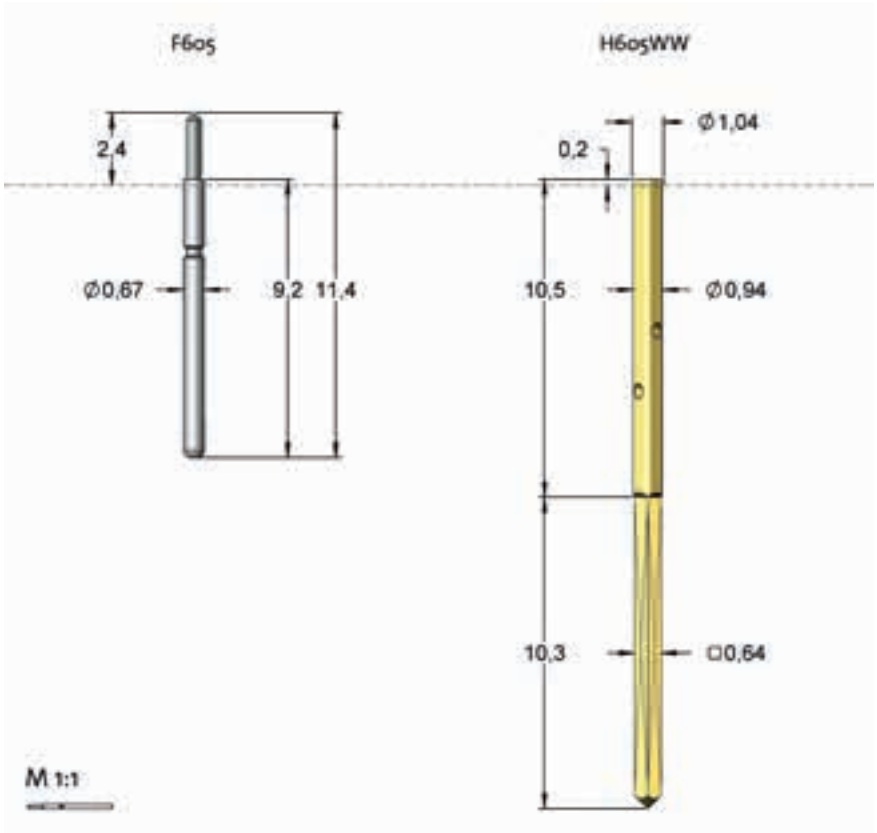
Insertion tool receptacle	FEWZ-511E0
Insertion tool probe	FDWZ-050

Drill Size (mm)

H605WW	0,94 - 0,96

Projection Height (mm)

H605...	2,4



Alternative probes with the same diameter are probes F111 (length 16.5 mm) and F511 (length 24.7 mm). Further details are available on our homepage.

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, 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	0,50	-
	01	S	N	0,50	-
	05	S	L	1,00	-
	07	S	L	1,00	-
	11	S	L	0,50	-

F665

Short Travel Probe 50 mil

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

Spring Force (cN ±20%)

Version	Preload	Nominal
S1	25	60
standard	30	75

Travel (mm)

Version	Nominal	Maximum
S1	0,6	1,1
standard	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

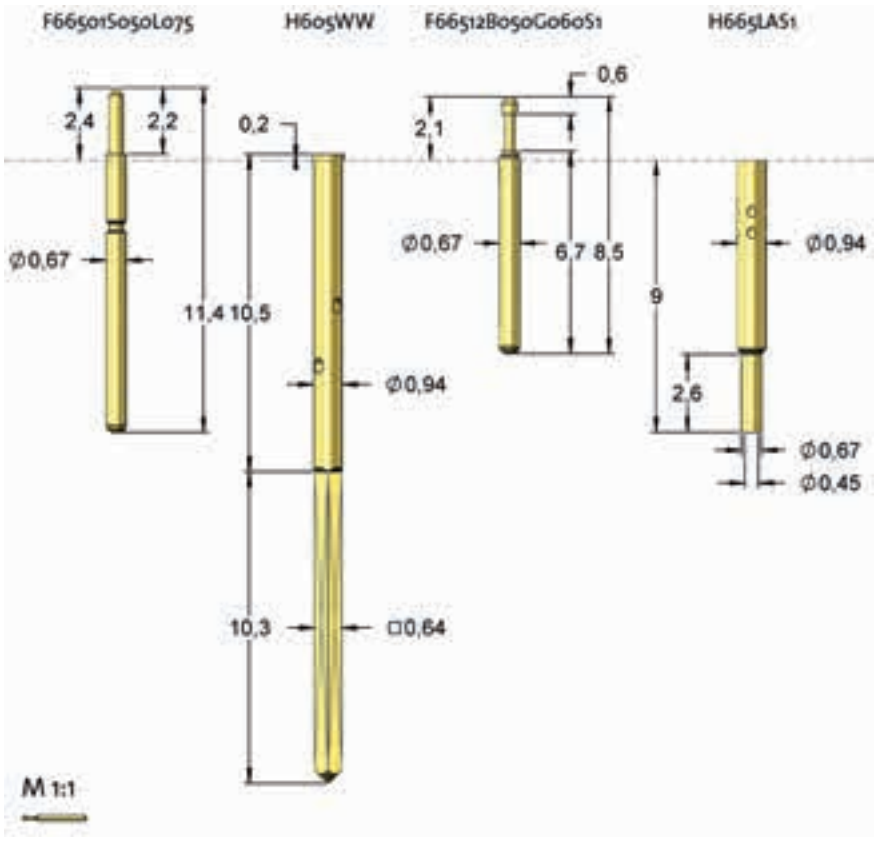
Insertion tool receptacle	FEWZ-511E0
Insertion tool probe	FDWZ-050

Drill Size (mm)

Receptacle inserted	0,93 - 0,94

Projection Height (mm)

(F665) H605WW	2,4
(F66512B050G060S1) H665LAS1	2,1



Type		Tip-Ø		Spring Force	
F 665	12	B	050	G	060	S1
	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
Special Version:	S1 = Special version
Receptacle:	Order Code according drawing

ORDER EXAMPLE

Tip Style	Number	Material	Plating	Ø in mm	Version
	01	S	L	0,50	-
	12	B	G	0,50	S1

F670

Short Travel Probe 100 mil

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	40	85

Travel (mm)

Version	Nominal	Maximum
standard	0,8	1,2
Pointing Accuracy		±0,08 mm

Materials and Plating

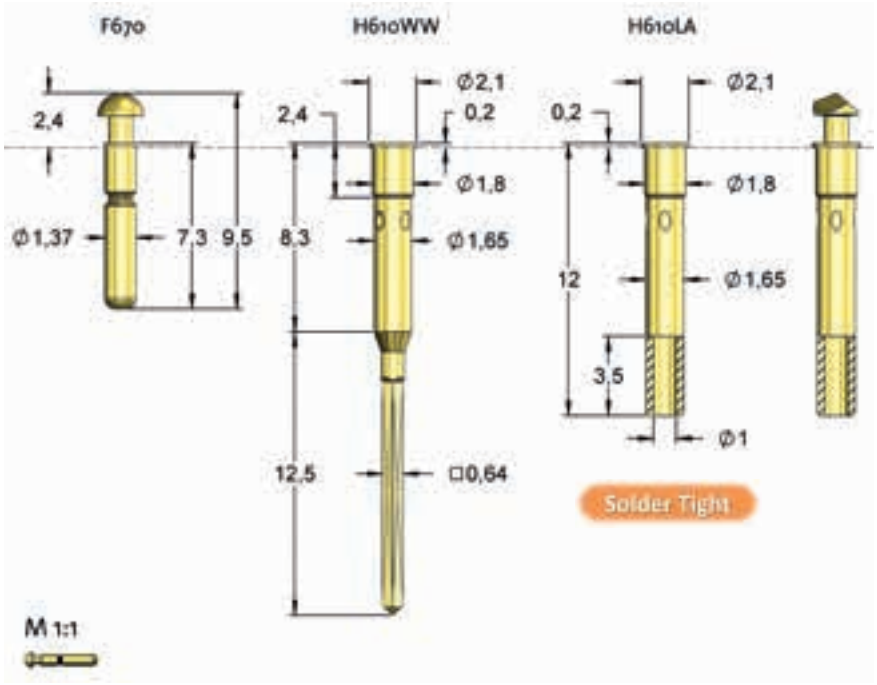
Plunger	see tip style
Barrel	Bronze, gold plated
Spring	Music wire, silver plated
Receptacle	Bronze, Gold plated

Drill Size (mm)

H610	1,78 - 1,79

Projection Height (mm)

H610...	2,4



Type		Tip-Ø		Spring Force
F 670	11	B	105	G	085
	Tip Style	Material		Finish	Special Version

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
	06	B	G	2,00	-
	11	B	G	1,05	-
	12	B	G	2,00	-
	15	B	G	2,00	-

F620

Short Travel Probe 100 mil

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

Spring Force (cN ±20%)

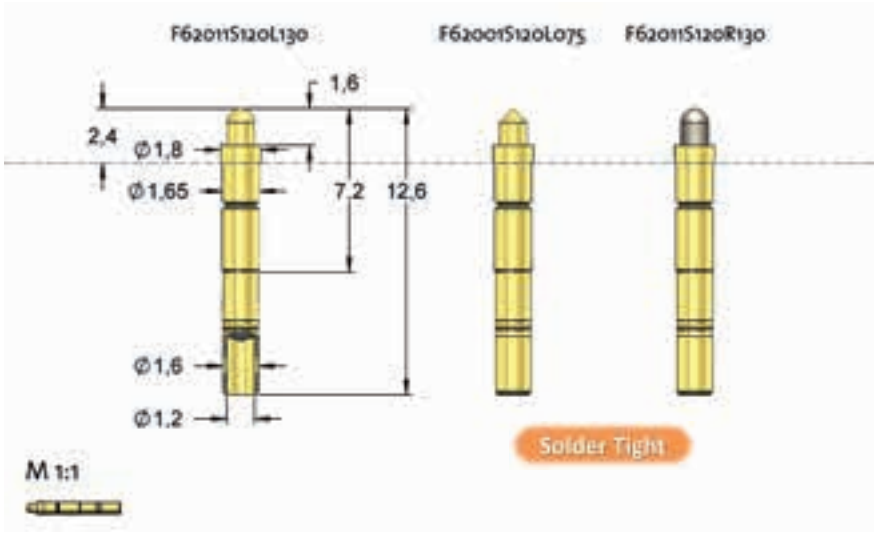
Version	Preload	Nominal
standard	40	75
standard	50	130

Travel (mm)

Version	Nominal	Maximum
standard	1,3	1,6
Pointing Accuracy		±0,08 mm

Materials and Plating

Plunger	see tip style
Barrel	Bronze, gold plated
Spring	Music wire, gold plated
Receptacle	-



Drill Size (mm)

F620	1,63 - 1,65

Projection Height (mm)

F620	2,4

Type			Tip-Ø		Spring Force
F 620	11	S	120	L	130
	Tip Style	Material		Finish	Special Version

Material: S = Steel
Tip-Ø: 120 = 1,2 mm (e.g.)
Finish: L = Longtime Gold plated
Receptacle: Order Code according drawing

ORDER EXAMPLE

Tip Style	Number	Material	Plating	Ø in mm	Version
	11	S	L	1,20	-
	11	S	N	1,20	-
	11	S	R	1,20	-

F699

Short Travel Probe 100 mil

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	50	130

Travel (mm)

Version	Nominal	Maximum
standard	1,3	1,6
Pointing Accuracy		±0,08 mm

Materials and Plating

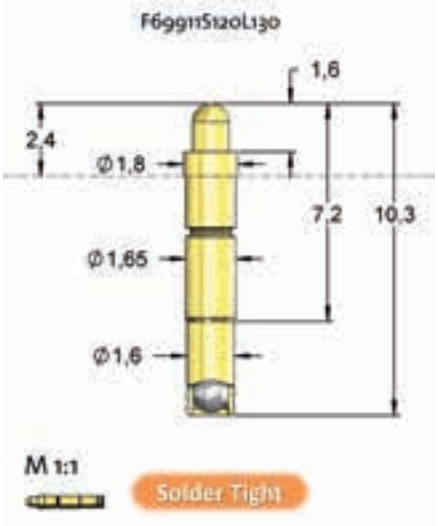
Plunger	see tip style
Barrel	Bronze, gold plated
Spring	Music wire, gold plated
Receptacle	-

Drill Size (mm)

F699	1,63 - 1,65

Projection Height (mm)

F699	2,4



F630

Short Travel Probe 100 mil

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	40	70

Travel (mm)

Version	Nominal	Maximum
standard	0,9	1,3
Pointing Accuracy		±0,08 mm

Materials and Plating

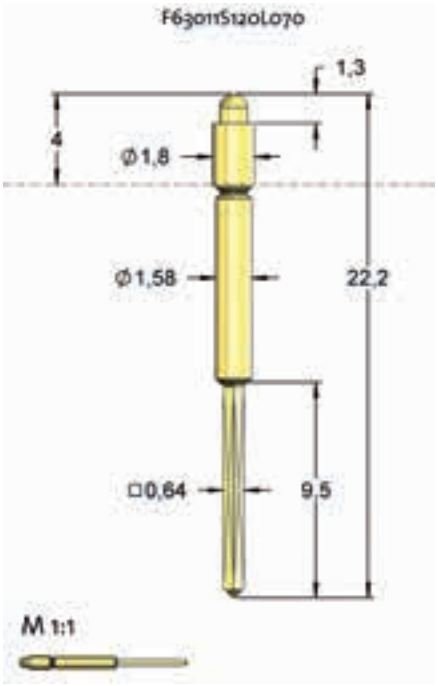
Plunger	see tip style
Barrel	Brass, gold plated
Spring	Music wire, silver plated
Receptacle	-

Drill Size (mm)

F630	1,56 - 1,58

Projection Height (mm)

F630	4,0



F692

Short Travel Probe 100 mil

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	100	250

Travel (mm)

Version	Nominal	Maximum
standard	2,8	3,0
Pointing Accuracy		±0,08 mm

Materials and Plating

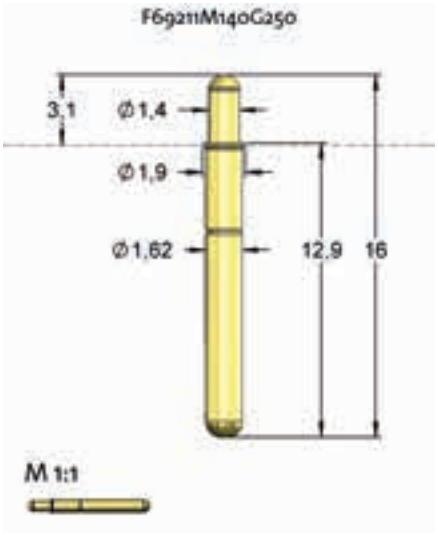
Plunger	see tip style
Barrel	Brass, gold plated
Spring	Stainless steel, unplated
Receptacle	-

Drill Size (mm)

F692	1,60 - 1,62

Projection Height (mm)

F192	3,1



F192

Double Plunger Probe for Pogo Towers

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	25	60

Travel (mm)

Version	Nominal	Maximum
standard	1,3	1,7
Pointing Accuracy		±0,08 mm

Materials and Plating

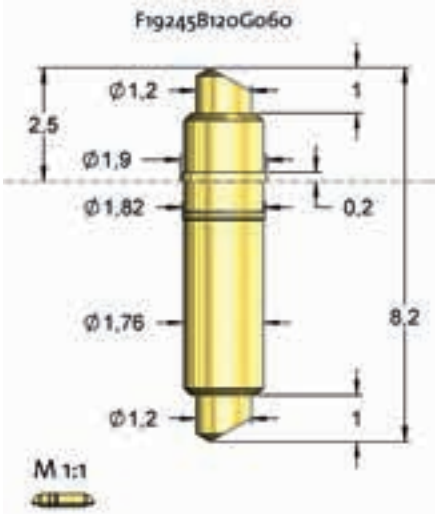
Plunger	see tip style
Barrel	Bronze, gold plated
Spring	Music wire, gold plated
Receptacle	-

Drill Size (mm)

F192	1,79 - 1,81

Projection Height (mm)

F192	2,5



F713

Battery Contact

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	40	80
standard	70	150

Travel (mm)

Version	Nominal	Maximum
standard	2,8	3,5
Pointing Accuracy		±0,1 mm

Materials and Plating

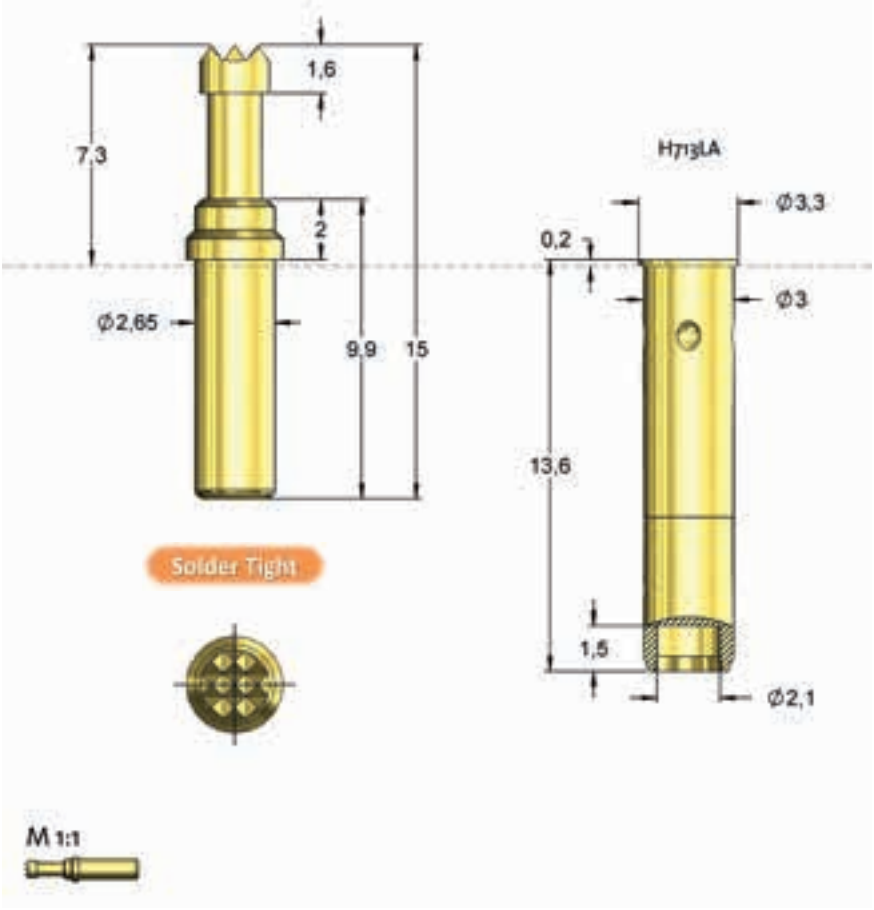
Plunger	see tip style
Barrel	Brass, gold plated
Spring	Stainless steel, unplated
Receptacle	Bronze, Gold plated

Drill Size (mm)

H713...	2,98 - 2,99

Projection Height (mm)

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	Special Version

Material: B = BeCu, E = Stainless Steel
Tip-Ø: 230 = 2,3 mm (e.g.)
Finish: G = Gold, U = Unplated
Receptacle: Order Code according drawing

ORDER EXAMPLE

Tip Style	Number	Material	Plating	Ø in mm	Version
	02	B	G	2,30	-
	06	B	G	2,30	-
	12	B	G	2,30	-
	17	B	G	2,30	-

F650

Robust Short Travel Probe

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	50	150
standard	270	500

Travel (mm)

Version	Nominal	Maximum
standard	3,2	4,0
Pointing Accuracy		±0,08 mm

Materials and Plating

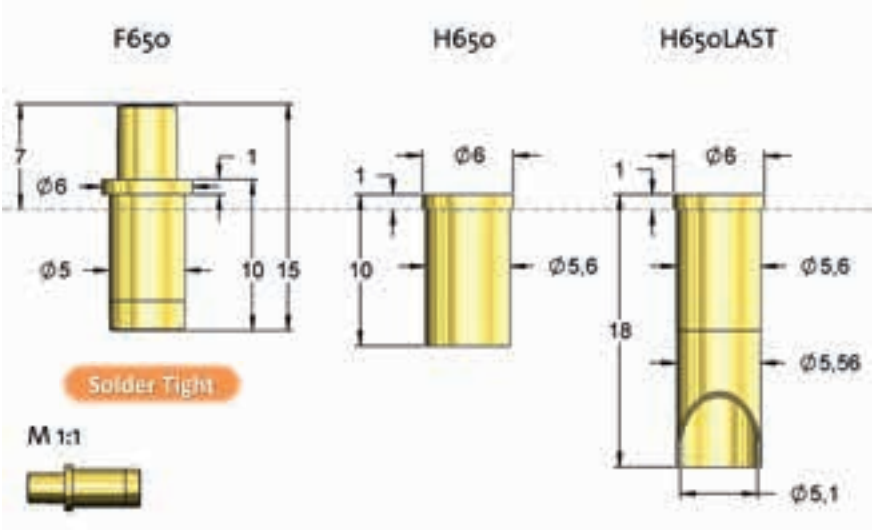
Plunger	see tip style
Barrel	Brass, gold plated
Spring	Stainless steel, unplated
Receptacle	Brass, Gold plated

Drill Size (mm)

H650...	5,57 - 5,60

Projection Height (mm)

H650	7,0



Type			Tip-Ø		Spring Force	
F650	11	M	400	G	150	
	Tip Style	Material		Finish	Special Version	

Material: M = Brass
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
	11	M	G	4,00	-

F651

Robust Short Travel Probe

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	160	500

Travel (mm)

Version	Nominal	Maximum
standard	4,8	7,0
Pointing Accuracy		±0,08 mm

Materials and Plating

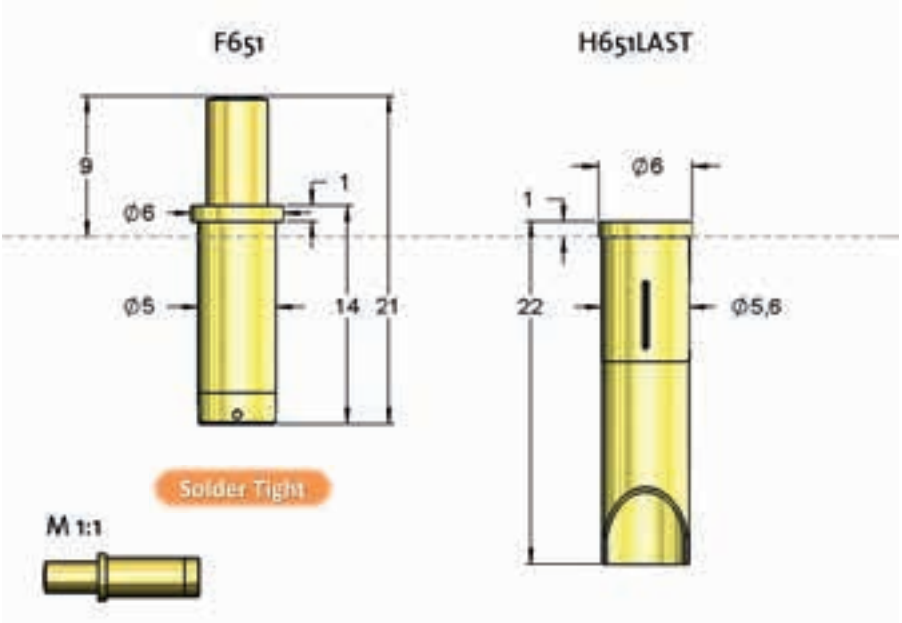
Plunger	see tip style
Barrel	Brass, gold plated
Spring	Stainless steel, unplated
Receptacle	Brass, Gold plated

Drill Size (mm)

H650...	5,57 - 5,60

Projection Height (mm)

H650	9,0



Type		Tip-Ø	Spring Force
F651	11 M 400 G 500		
	Tip Style	Material	Finish	Special Version

Material:	M = Brass
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
	11	M	G	4,00	-

Fine Pitch and Double Plunger Probes

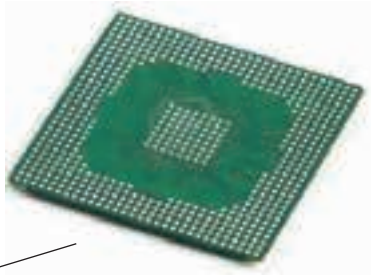
Double plunger probes have two separate plungers in one barrel – one for contacting the DUT and the other used as interface to the translator board of the test system. Fine pitch probes have centers smaller than 50 mil.

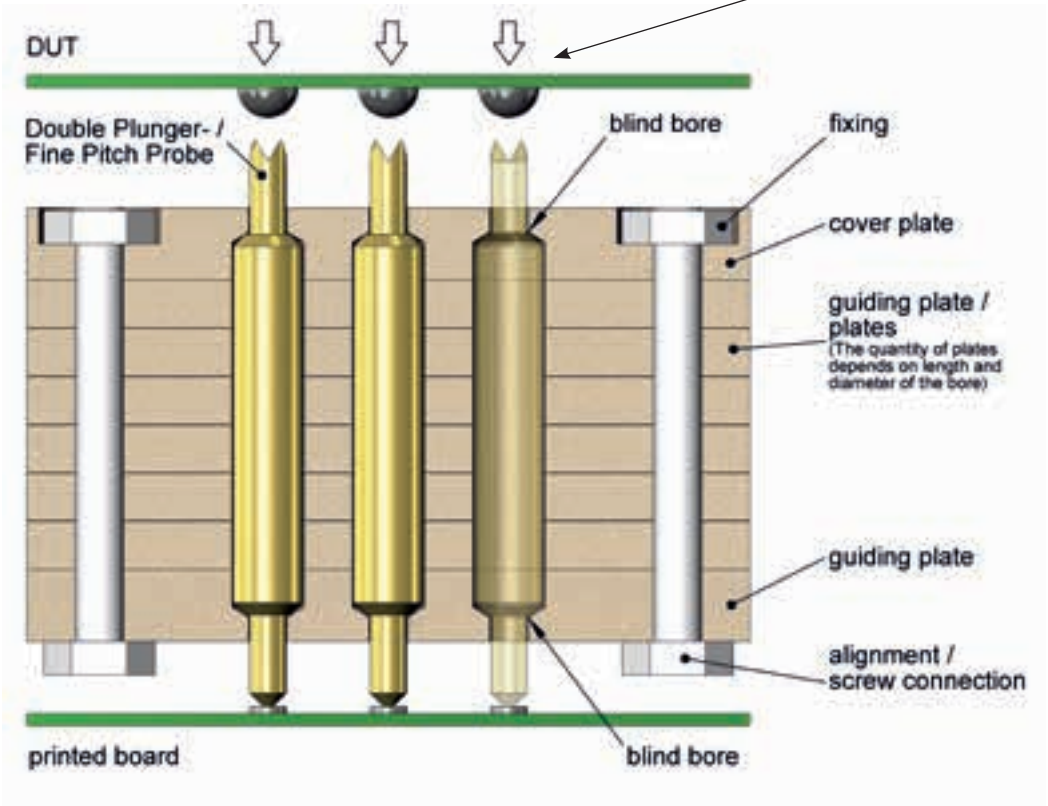
Mounting of Double Plunger Probes

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	





F238

Double Plunger Probe for Fine Pitch Components

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	10	50

Travel (mm)

Version	Nominal	Maximum
standard	2,0	2,5
Pointing Accuracy		±0,04 mm

Type			Tip-Ø		Spring Force
F 238	01	S	027	L	050
	Tip Style	Material		Finish	Special Version

Material: S = Steel
Tip-Ø: 027 = 0,27 mm (e.g.)
Finish: L = Longtime Gold plated

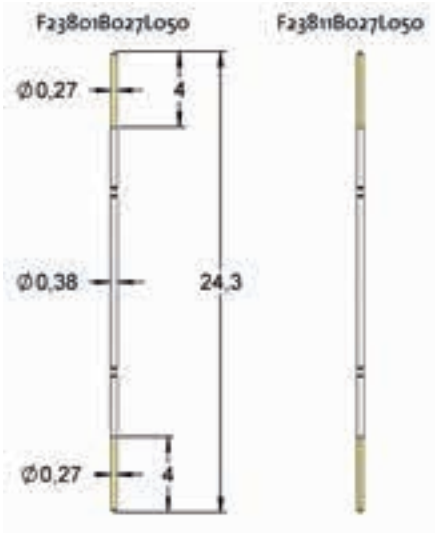
ORDER EXAMPLE

Materials and Plating

Plunger	see tip style
Barrel	Stainless steel, unplated
Spring	Music wire, gold plated

Drill Size (mm)

F238	0,36 - 0,38



Tip Style	Number	Material	Plating	Ø in mm	Version
	01	B	L	0,27	-
	11	B	L	0,27	-
	30	B	L	0,27	-

F239

For Testing Fine Pitch Components

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	10	50

Travel (mm)

Version	Nominal	Maximum
standard	2,0	2,5
Pointing Accuracy		±0,04 mm

Type			Tip-Ø		Spring Force
F 238	01	S	027	L	050
	Tip Style	Material		Finish	Special Version

Material: S = Steel
Tip-Ø: 027 = 0,27 mm (e.g.)
Finish: L = Longtime Gold plated

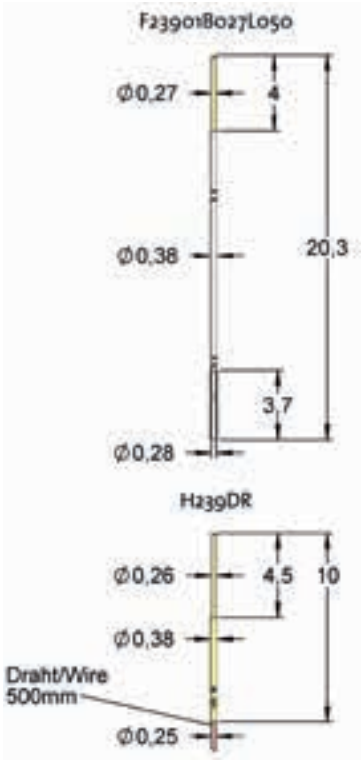
ORDER EXAMPLE

Materials and Plating

Plunger	see tip style
Barrel	Stainless steel, unplated
Spring	Music wire, gold plated

Drill Size (mm)

F239	0,36 - 0,38



Tip Style	Number	Material	Plating	Ø in mm	Version
	01	B	L	0,27	-

F681

Double Plunger Probe for Fine Pitch Components

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	10	20

Travel (mm)

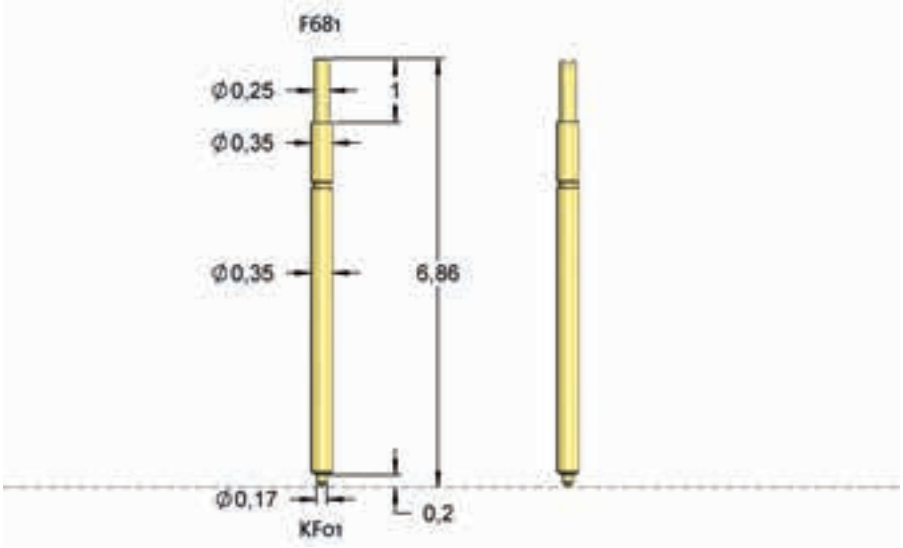
Version	Nominal	Maximum
standard	0,6	0,8
Pointing Accuracy		±0,04 mm

Materialien und Oberflächen

Kolben	siehe Kopfform
Mantel	Bronze, vergoldet
Feder	Edelstahl, vergoldet

Drill Size (mm)

F681	0,34 - 0,35



Type			Tip-Ø		Spring Force
F681	29	B	025	G	020
	Tip Style	Material		Finish	Special Version

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
	11	B	G	0,25	-
	16	B	G	0,25	-
	29	B	G	0,25	-

F209

Double Plunger Probe for Fine Pitch Components

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	10	50

Travel (mm)

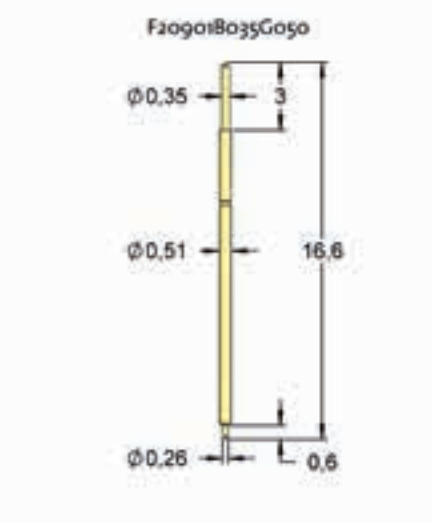
Version	Nominal	Maximum
standard	2,0	2,5
Pointing Accuracy		±0,09 mm

Materials and Plating

Plunger	see tip style
Barrel	Bronze, gold plated
Spring	Music wire, silver plated

Drill Size (mm)

F209	0,49 - 051



F206

Double Plunger Probe for Fine Pitch Components

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	10	50

Travel (mm)

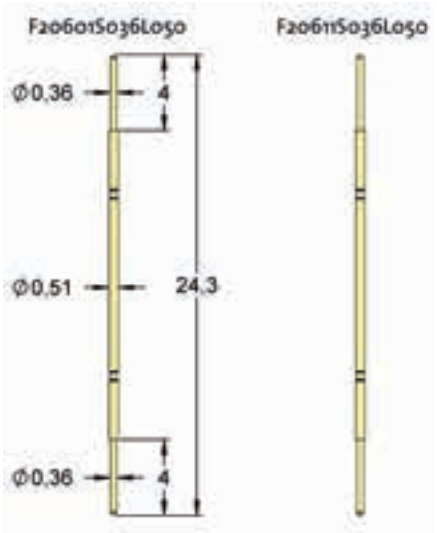
Version	Nominal	Maximum
standard	2,0	2,5
Pointing Accuracy		±0,09 mm

Materials and Plating

Plunger	see tip style
Barrel	Bronze, gold plated
Spring	Music wire, silver plated

Drill Size (mm)

F206	0,49 - 0,51



F207

For Testing Fine Pitch Components

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	10	50

Travel (mm)

Version	Nominal	Maximum
standard	2,0	2,5
Pointing Accuracy		±0,09 mm

Materials and Plating

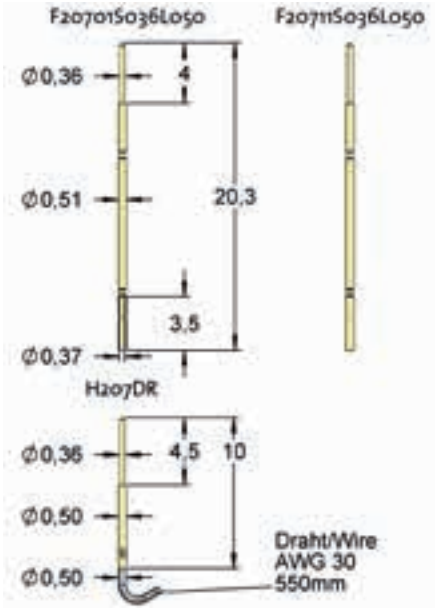
Plunger	see tip style
Barrel	Bronze, gold plated
Spring	Music wire, silver plated

Accessories

Connecting element	H207DR

Drill Size (mm)

F207	0,49 - 0,51



Type		Tip-Ø		Spring Force
F 207	11	S	036	L	050
	Tip Style	Material		Finish	Special Version

Material:	S = Steel
Tip-Ø:	036 = 0,36 mm (e.g.)
Finish:	L = Longtime Gold plated
Connecting Element:	Order Code according drawing

ORDER EXAMPLE

Tip Style	Number	Material	Plating	Ø in mm	Version
	01	S	L	0,36	-
	11	S	L	0,36	-

F680

Double Plunger Probe for Fine Pitch Components

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

Spring Force (cN ±20%)

Version	Preload	Nominal
NM	10	50
S1	45	60
standard	20	40

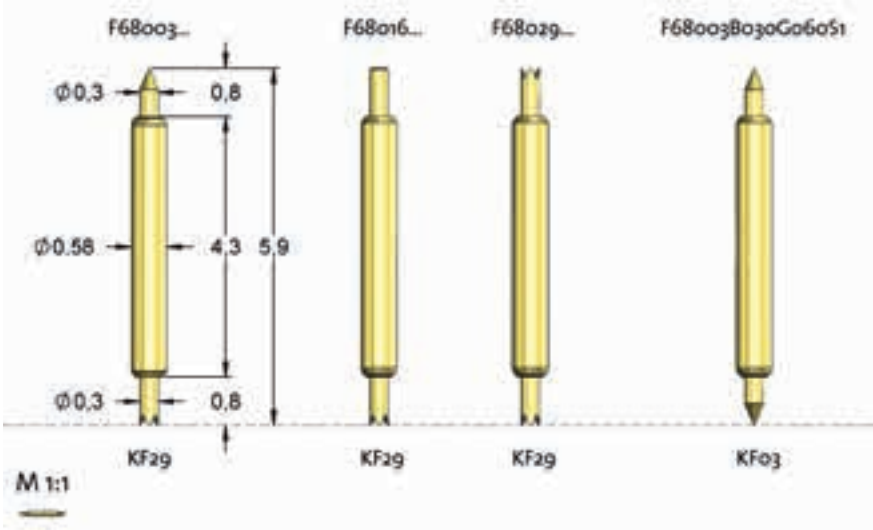
Travel (mm)

Version	Nominal	Maximum
NM	0,5	0,7
S1	0,5	0,6
standard	0,5	1,0
Pointing Accuracy		±0,09 mm

Type		Tip-Ø		Spring Force	
F680	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 Bronze, rhodanized (NM)
Spring	Music wire, silver plated BeCu, unplated (NM)

Drill Size (mm)

F680	0,56 - 0,58

Tip Style	Number	Material	Plating	Ø in mm	Version
	03	B	G	0,30	S1
	16	B	G	0,30	-
	29	B	G	0,30	-

F685

Double Plunger Probe for Fine Pitch Components

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	10	35

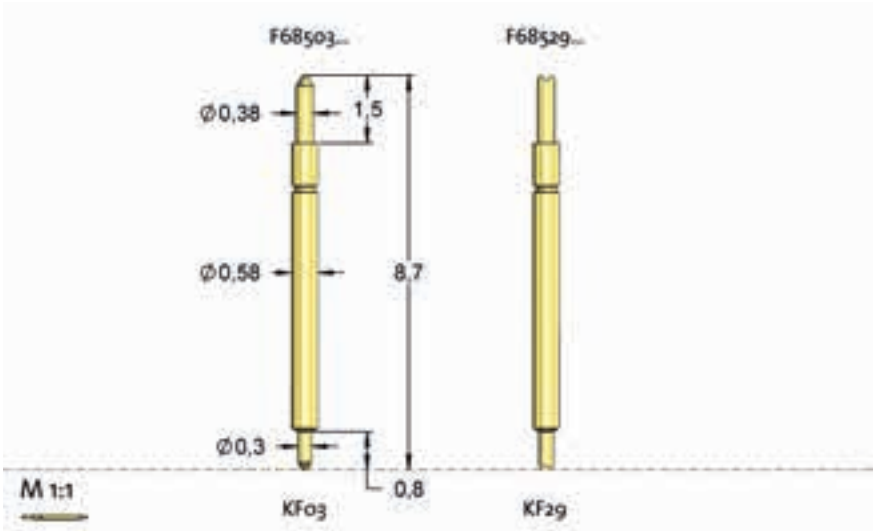
Travel (mm)

Version	Nominal	Maximum
standard	0,8	1,0
Pointing Accuracy		±0,04 mm

Type		Tip-Ø		Spring Force	
F685	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	-

F109

For Testing
Fine Pitch Components

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	10	50

Travel (mm)

Version	Nominal	Maximum
standard	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

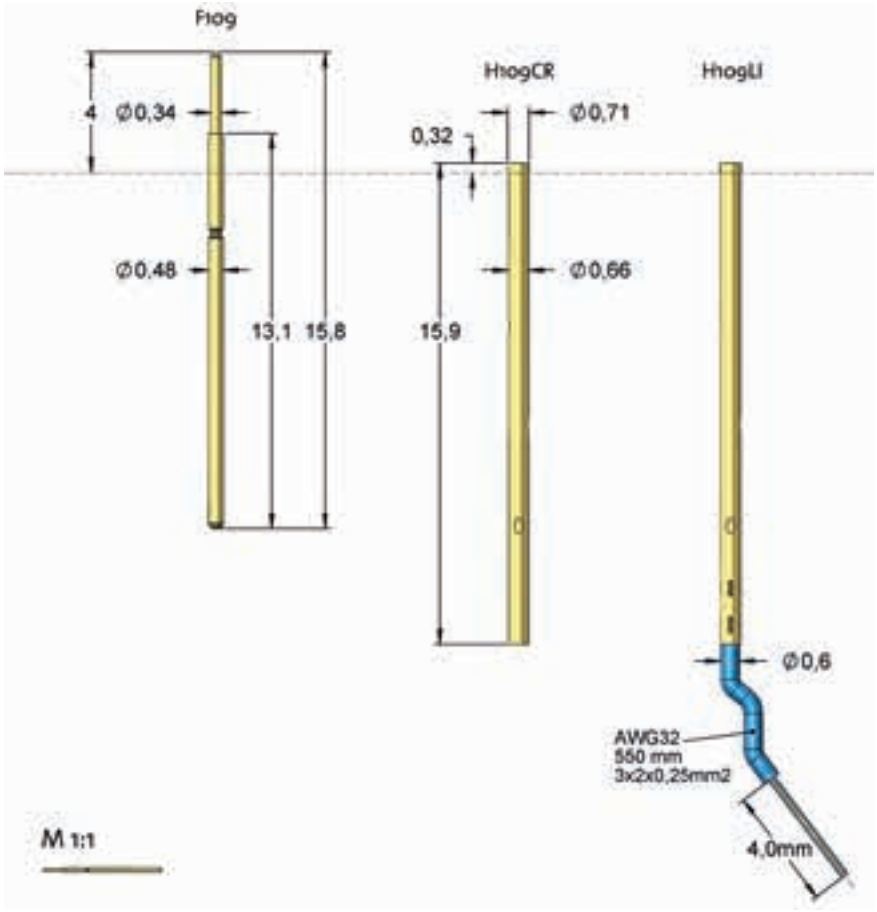
Insertion tool receptacle	FEWZ-109E0
Insertion tool probe	FDWZ-050

Drill Size (mm)

Receptacle with collar	0,66 - 0,68

Projection Height (mm)

H109...	4,0



Type			Tip-Ø		Spring Force
F 109	18	B	034	G	050
	Tip Style	Material		Finish	Special Version

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	-

F252

Double Plunger Probe for Fine Pitch Components

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	30	85

Travel (mm)

Version	Nominal	Maximum
standard	2,0	2,5
Pointing Accuracy		±0,09 mm

Type			Tip-Ø		Spring Force
F 252	01	S	036	L	085
	Tip Style	Material		Finish	Special Version

Material: S = Steel
Tip-Ø: 036 = 0,36 mm (e.g.)
Finish: L = Longtime Gold plated

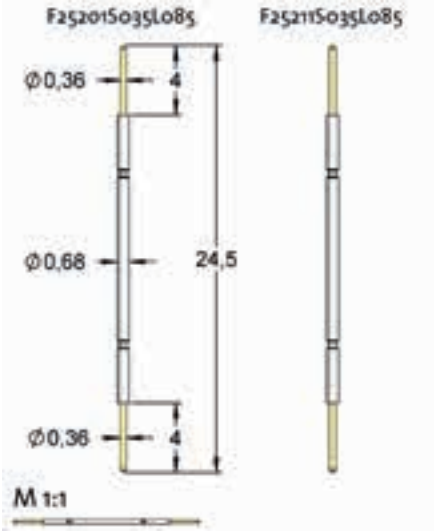
ORDER EXAMPLE

Materials and Plating

Plunger	see tip style
Barrel	Bronze, silver plated
Spring	Music wire, silver plated
Receptacle	-

Drill Size (mm)

F252	0,66 - 0,68



Tip Style	Number	Material	Plating	Ø in mm	Version
	01	S	L	0,36	-
	11	S	L	0,36	-
	18	S	L	0,36	-

F205

For Testing Fine Pitch Components

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	30	85

Travel (mm)

Version	Nominal	Maximum
standard	2,0	2,5
Pointing Accuracy		±0,08 mm

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

Materials and Plating

Plunger	see tip style
Barrel	BeCu, gold plated
Spring	Music wire, silver plated

Accessories

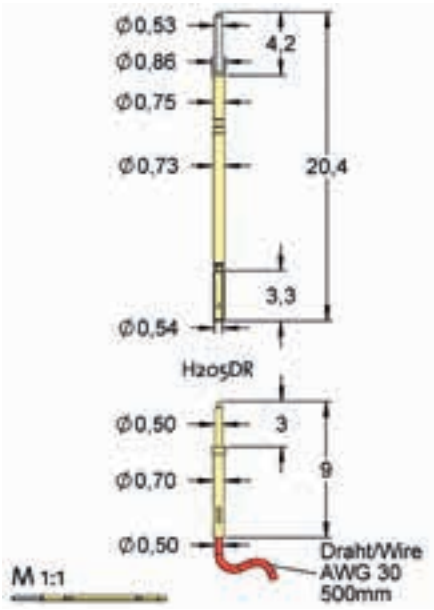
Connecting element	H205DR

Drill Size (mm)

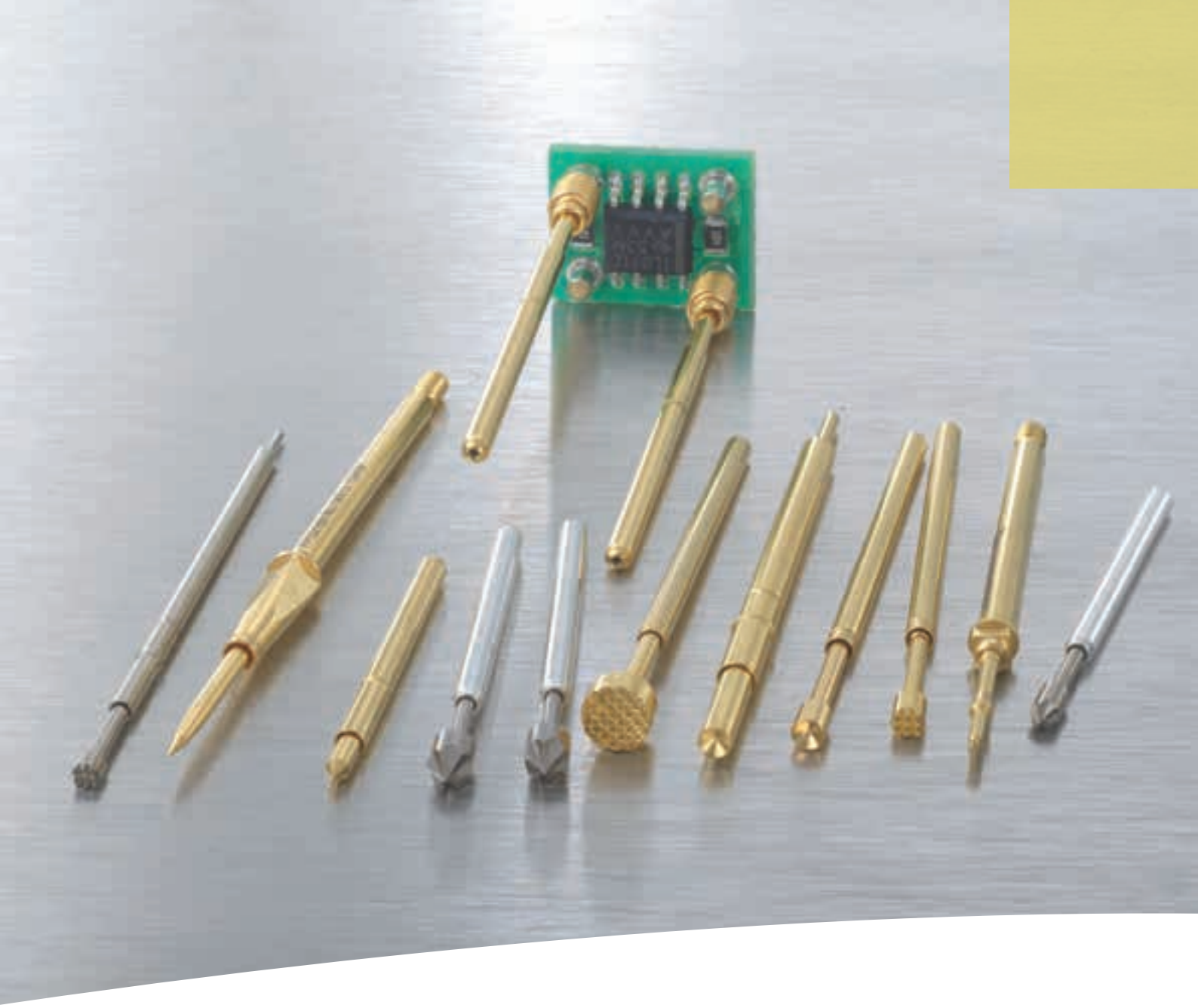
F205	0,74 - 0,76

Projection Height (mm)

F205	4,2



Tip Style	Number	Material	Plating	Ø in mm	Version
	01	S	N	0,50	-
	11	S	N	0,50	-
	18	S	N	0,50	-

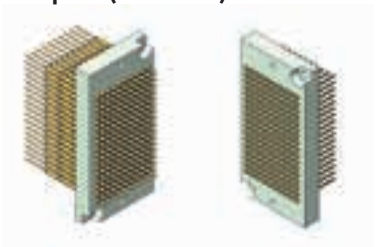


Interface Probes

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

Pylon Interface Contact Blocks

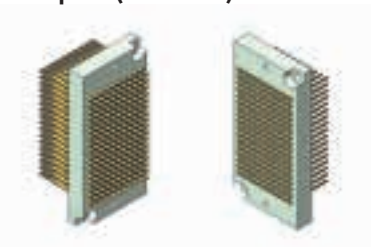
Signal block 170-pole (max. 5A*)



Receiver side (Wire-Wrap Connector)	
Order Code:	43900017
Receptacle:	H502WW
Contact Probe:	F50403B104G130

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

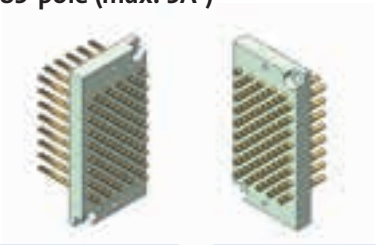
Signal block 170-pole (max. 5A*)



Receiver side (Solder-Connector)	
Order Code:	43900018
Receptacle:	H502LA
Contact Probe:	F50403B104G130

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

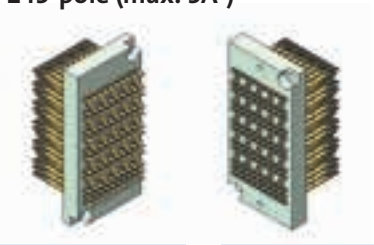
Signal block 85-pole (max. 5A*)



Receiver side	
Order Code:	43900021
Receptacle:	H502LA
Contact Probe:	F50403B104G130

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

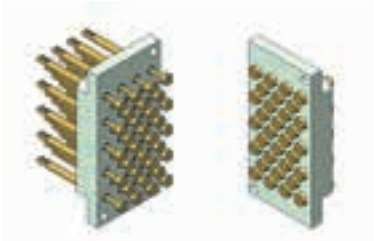
Signal block 145-pole (max. 5A*)



Receiver side	
Order Code:	43900023
Receptacle:	H502LA
Contact Probe:	F50430B105G130L

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

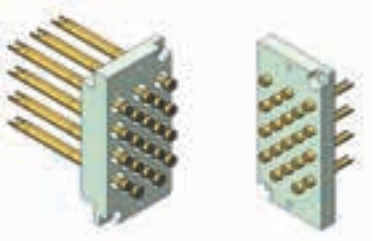
High current block 32-pole (max. 20 A*)



Receiver side	
Order Code:	2101178

Fixture side	
Order Code:	2101179

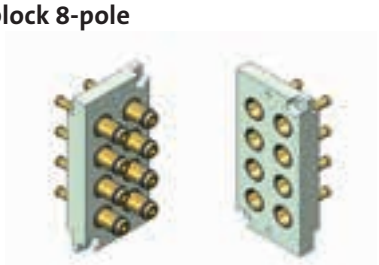
High current block 20-pole (max. 5A*)



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

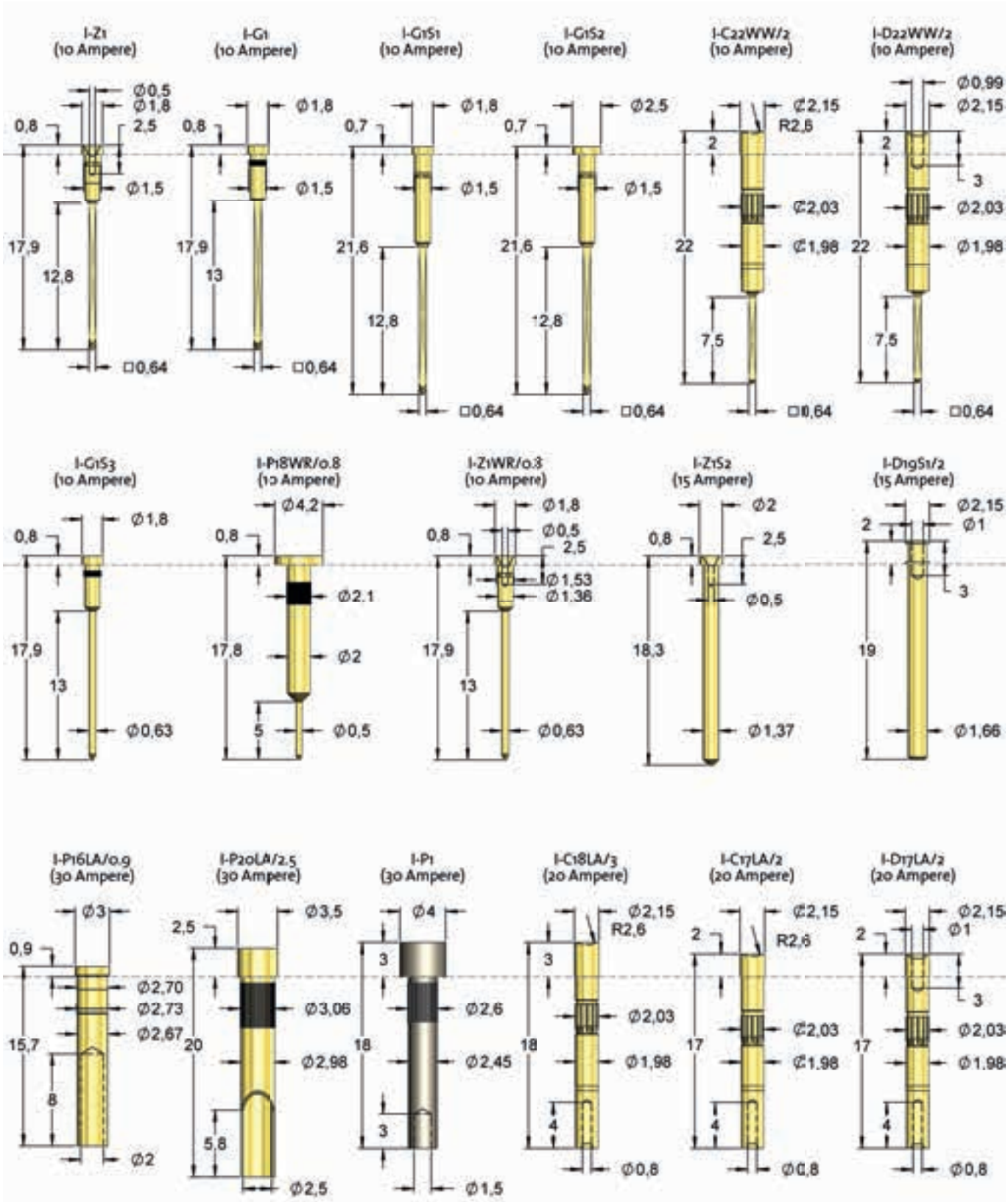
FEINMETALL interface blocks (Pylon blocks) are used as internal interface. The integrated spring contact probes guarantee a good signal transmission with low transfer resistances.

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

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

Interface Pins

Brass, Gold plated (rhodanized)



F262

For ATG Test Systems

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	0	40
standard	0	140

Travel (mm)

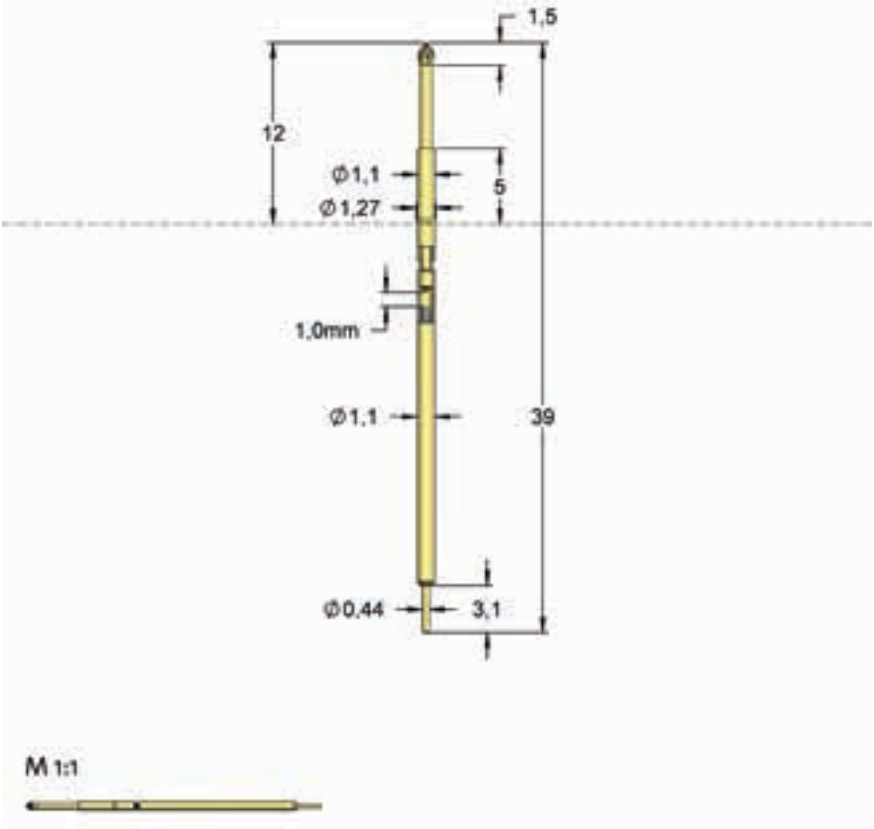
Version	Nominal	Maximum
standard	5,0	7,0
Pointing Accuracy		±0,08 mm

Materials and Plating

Plunger	see tip style
Barrel	Nickel silver, gold plated
Spring	Music wire, silver plated
Receptacle	-

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	-

F150

For Teradyne Test Systems

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

Spring Force (cN ±20%)

Version	Preload	Nominal
S1	50	100
S2	50	100
standard	50	100

Travel (mm)

Version	Nominal	Maximum
S1	4,5	8,0
S2	4,5	8,0
standard	4,5	8,0
Pointing Accuracy		±0,08 mm

Materials and Plating

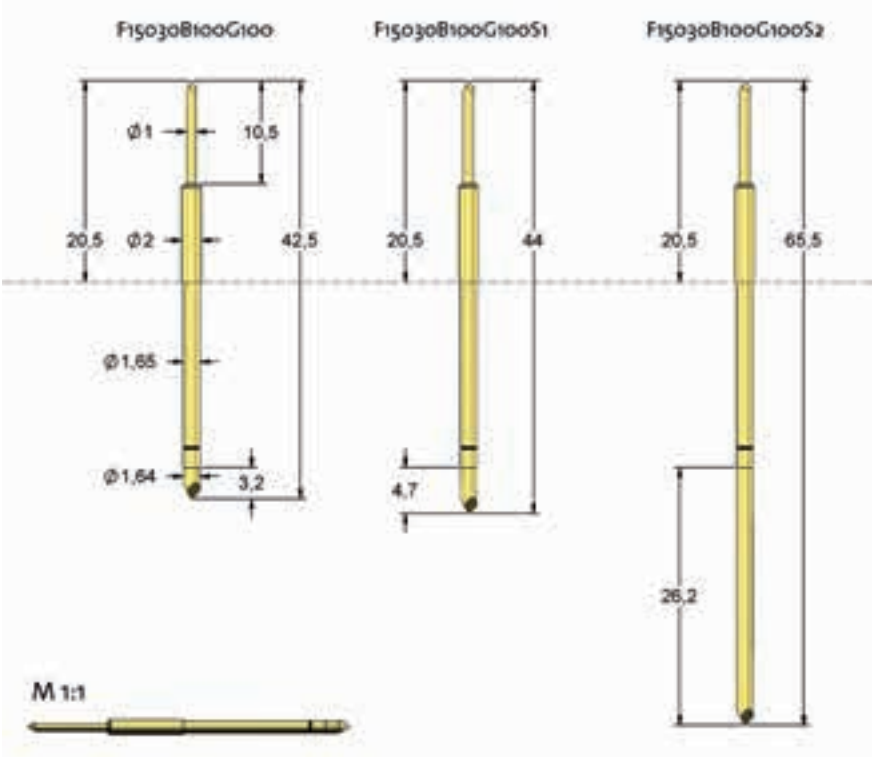
Plunger	see tip style
Barrel	Bronze, gold plated
Spring	Music wire, silver plated

Drill Size (mm)

F150	1,62 -1,65

Projection Height (mm)

F150...	20,5



Type			Tip-Ø		Spring Force	
F 150	30	B	100	G	100	S2
	Tip Style	Material		Finish	Special Version	

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	1,00	-
	30	B	G	1,00	S1
	30	B	G	1,00	S2

F504

For Test System Genrad 227x / 228x

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

Spring Force (cN ±20%)

Version	Preload	Nominal
L	40	100
standard	60	130

Travel (mm)

Version	Nominal	Maximum
L	2,0	3,9
standard	2,4	3,2
Pointing Accuracy		±0,05 mm

Materials and Plating

Plunger	see tip style
Barrel	Nickel silver, gold plated
Spring	BeCu, silver plated Music wire, silver plated
Receptacle	Nickel silver, Gold plated

Accessories

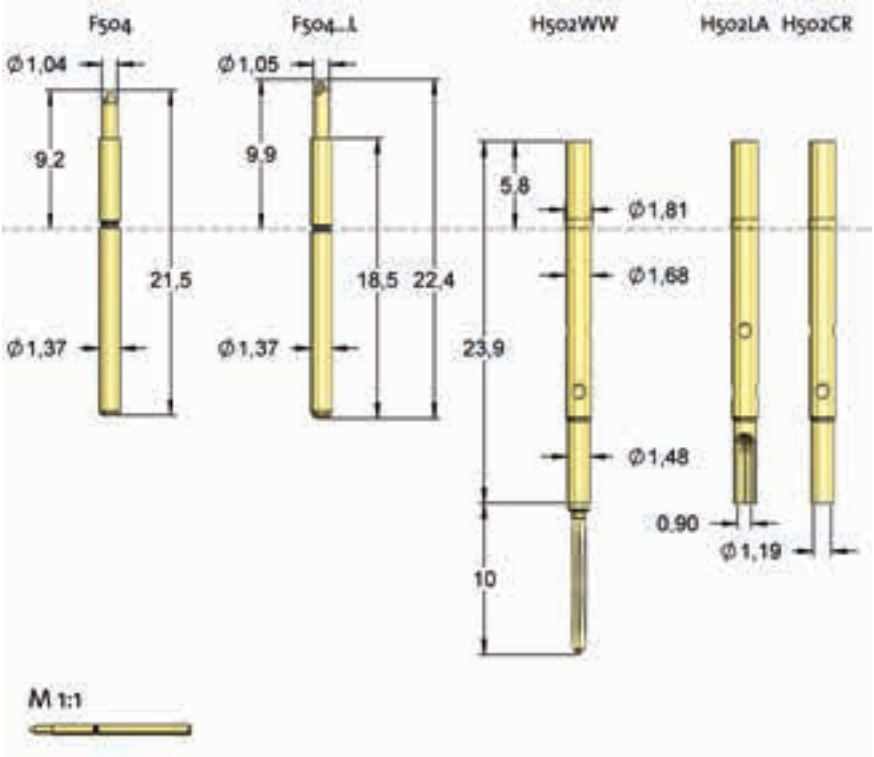
Insertion tool receptacle	FEWZ-100EV
Insertion tool receptacle	FEWZ-100E0
Insertion tool probe	FDWZ-100
Plug lock	H100VS

Drill Size (mm)

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

Projection Height (mm)

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



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

Type			Tip-Ø		Spring Force	
F 504	30	B	105	G	100	L
	Tip Style	Material		Finish	Special Version	

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
	18	B	N	1,05	L

F502

Test System
Luther & Maelzer

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	60	130

Travel (mm)

Version	Nominal	Maximum
standard	2,7	4,1
Pointing Accuracy		±0,05 mm

Materials and Plating

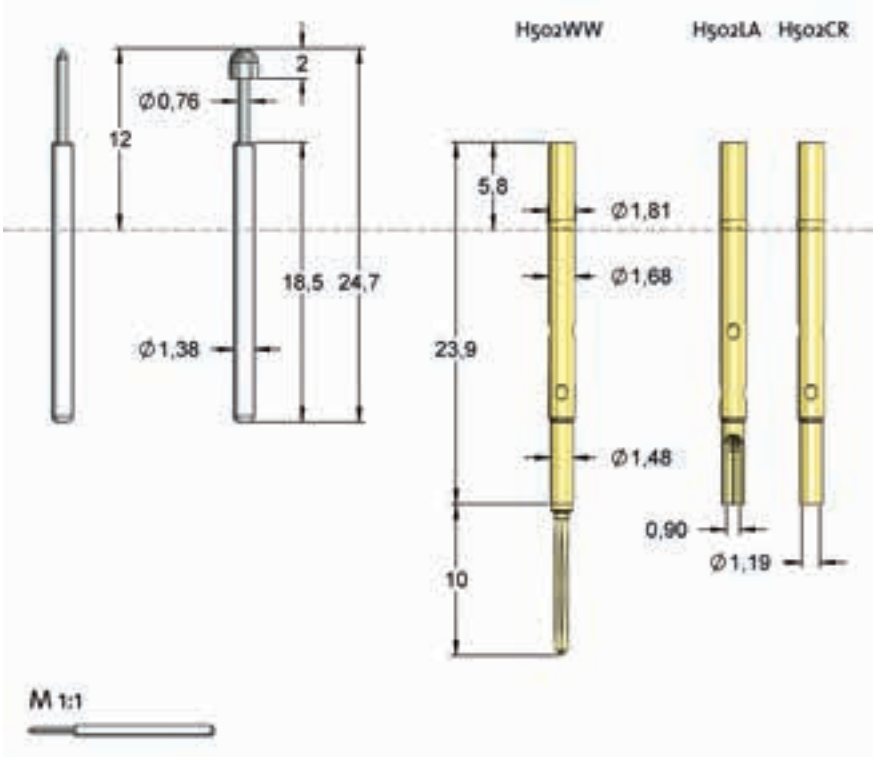
Plunger	see tip style
Barrel	Bronze, silver plated
Spring	Music wire, silver plated
Receptacle	Nickel silver, Gold plated

Drill Size (mm)

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

Projection Height (mm)

H502...	6,2 - 12,0



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

Type			Tip-Ø		Spring Force
F 502	12	S	190	N	130
	Tip Style	Material		Finish	Special Version

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	1,90	-

F538

For Test System Digitaltest MTS 300

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	60	220

Travel (mm)

Version	Nominal	Maximum
standard	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

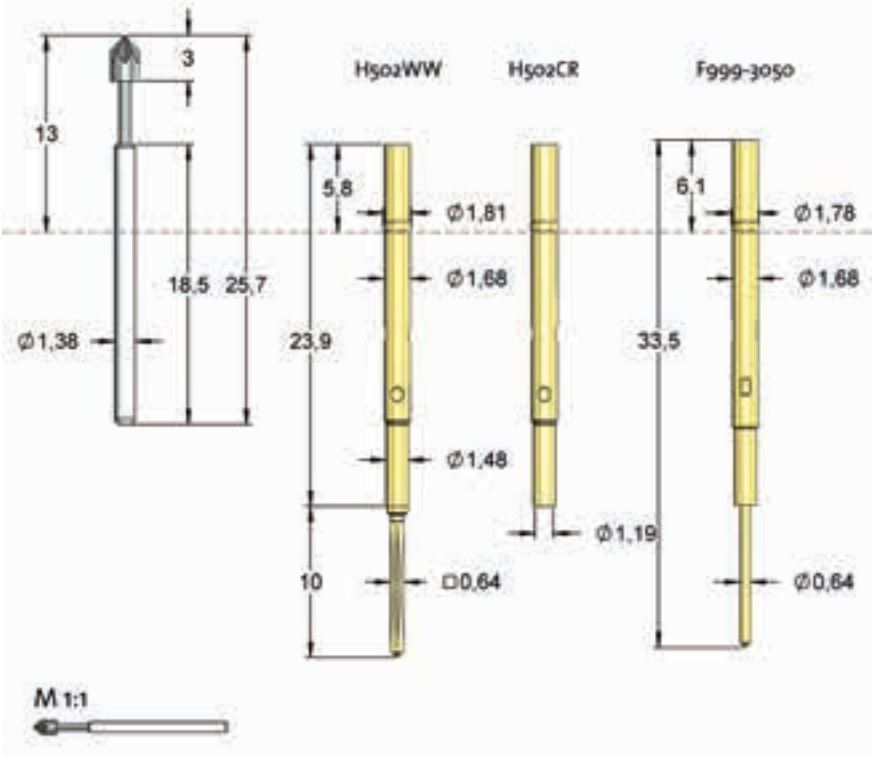
Insertion tool receptacle	FEWZ-100EV
Insertion tool receptacle	FEWZ-100E0
Insertion tool probe	FDWZ-100
Plug lock	H100VS

Drill Size (mm)

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

Projection Height (mm)

H502...	7,2 - 13,0



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

Type			Tip-Ø		Spring Force
F 538	07	S	190	N	220
	Tip Style	Material		Finish	Special Version

Material: S = Steel
Tip-Ø: 190 = 1,9 mm (e.g.)
Finish: N = Nickel
Receptacle: Order Code according drawing

ORDER EXAMPLE

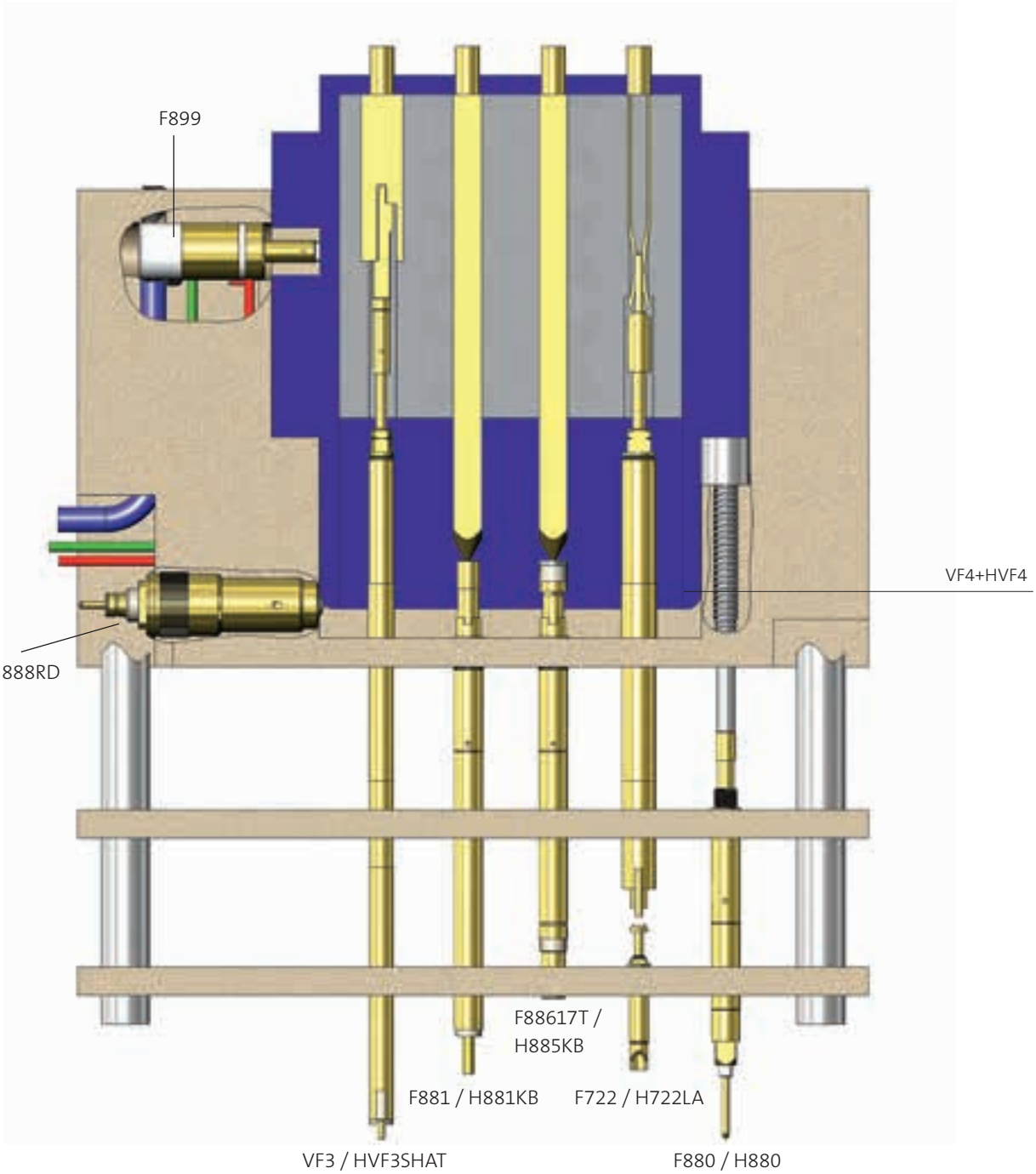
Tip Style	Number	Material	Plating	Ø in mm	Version
	07	S	N	1,30	-
	07	S	N	1,90	-

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.

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 predefined 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 or V04 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.

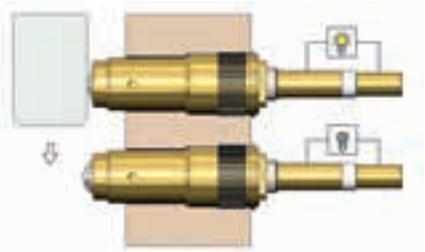
Short-circuit-proof modules by voltage-free switch probes
Short-circuit-proof modules and fixtures can be designed with the switch probes F881 and F888 with electrically isolated switching circuit. This is an important matter given by the fact, that test tables in the market may be equipped with modules 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.

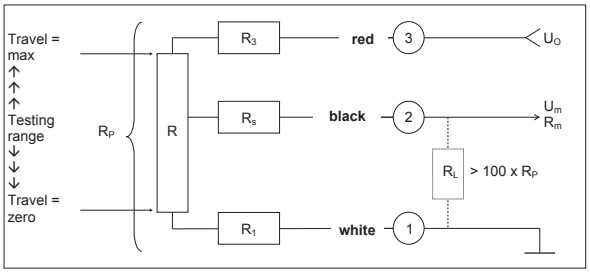
Zeroize
Depending on the hard and software of the test system the measurement signal can be zeroed at user-defined positions. This method allows positive or negative deviations without calculating differences.

We recommend periodic calibration and zeroing.

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

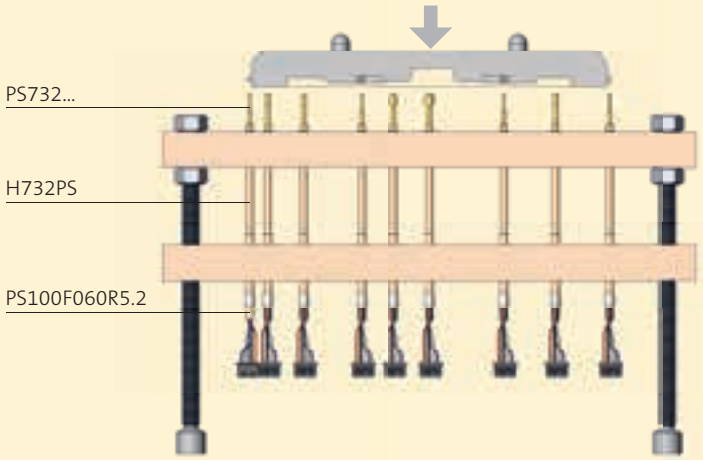
Spezifications Position Sensor PS100F060R5.2:
Measuring range: 0...5.2 mm
Measuring principle: potentiometric
Accuracy: ±2%
Reproducibility: typ. ±0,05 mm
Therm.resistance coeff. $5x10^{-5}$/K
Spring force: 60 cN
Preload: 40 cN
Nominal travel: 4.0 mm

Connections:
Red: Operating volatage U_0
Black: Measurement signal U_m / R_m
Blue: Test point contact probe (maximum current 1A)



U_o 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 ± 200 Ohm)
U_1 Initial voltage ($U_1 = I * R_1$)
R_3 Final resistance
U_3 Final voltage ($U_3 = I * R_3$)
R_p Potentiometer resistance (5 kOhm ± 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.



PS732

Position Sensor System Not Twist Proof

UTILITY MODEL

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	30	90

Travel (mm)

Version	Nominal	Maximum
standard	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

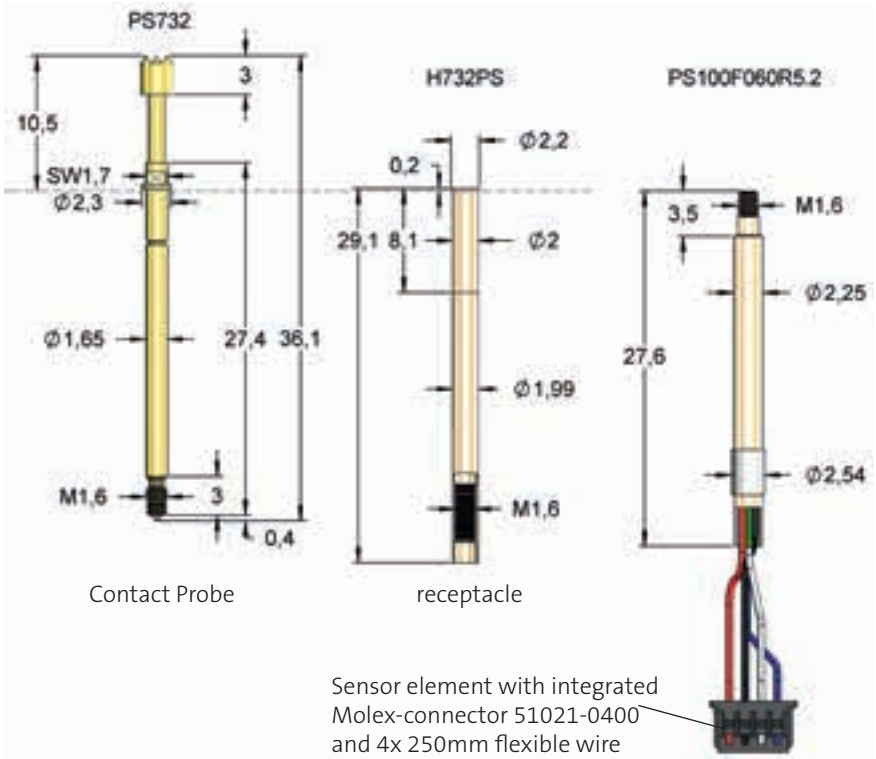
Insertion tool receptacle	FEWZ-772E0
Screw-in tool probe	FWZ732 (T)
Screw-in tool sensor	FWZPS100

Drill Size (mm)

H732PS	1,99 - 2,00

Projection Height (mm)

H732PS	10,5



Contact Probe

receptacle

Sensor element with integrated Molex-connector 51021-0400 and 4x 250mm flexible wire

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).
A twist proof Position Sensor System is available. Order code PS75684B0001G090 (probe), H756PS (receptacle), PS100F060R5.2 (sensor element) and FAWZ756 (alignment tool).

Tip Style	Number	Material	Plating	Ø in mm	Version
	05	B	G	1,80	-
	06	B	G	1,50	-
	06	B	G	1,80	-
	06	B	G	2,00	-
	06	B	G	2,50	-
	11	B	G	0,64	-
	11	B	G	0,80	-
	11	B	G	1,00	-
	12	B	G	1,40	-
	16	B	G	0,80	-
	16	B	G	1,00	-
	17	B	G	1,40	-

Type		Tip-Ø		Spring Force
PS732	05	B	180	G	090
	Tip Style	Material		Finish	Special Version

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.

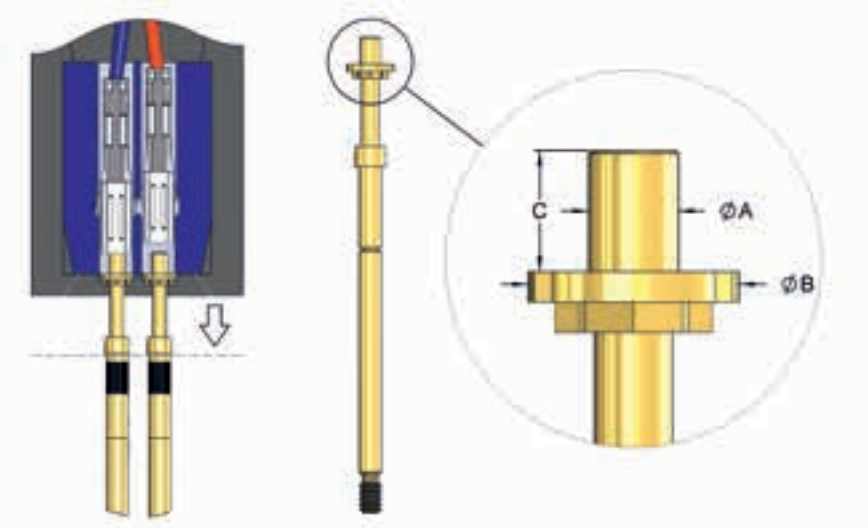
ORDER EXAMPLE

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.

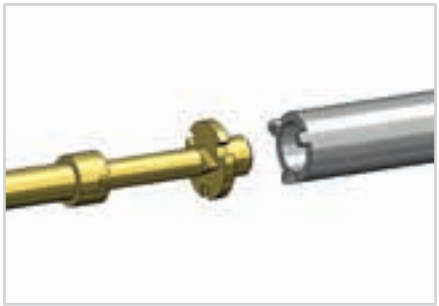


Standard Screw-In-Tool Hook Wrench

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.

Innovative Screw-In-Tool

For step probes with oversized plates (plate-Ø larger than probe-Ø or wrench size), Feinmetall has developed a new 3-point-tool that allows mounting the probes even at very small centers. But also in other applications with limited space this tool can be a good alternative to the standard tool.



Step Probes for Position Test

Position Test with Standard Step Probes
Step probes allow testing the correct positon of a contact element in a connector housing. If the position of the contact element is correct, the pin of the step probe creates an electrical contact to the contact element. If the contact element is too short, the plate is stopped at the connector housing and the pin does not connect to the contact element.

PLATE STANDARD

	Type		Number		Spring Force	
e.g.	F 732	16	B	0xxx	G	150	SP
		Tip Style	Material		Finish		Step Probe

0 = without slots and plate-Ø smaller than wrench size

ORDER EXAMPLE STEP PROBES

PLATE OVERSIZED

	Type		Number		Spring Force	
e.g.	F 732	16	B	1xxx	G	150	SP
		Tip Style	Material		Finish		Step Probe

1 = with slots and Plate-Ø larger than wrench size

ORDER EXAMPLE STEP PROBES

Position Test with Partially Insulated Step Probe
Step probes with partially insulated pin allow testing coaxial or multi-pole connectors or connectors that need to be contacted in a certain depth of the connector housing.

PLATE STANDARD, INSULATED PIN

	Type		Number		Spring Force	
e.g.	F 732	16	B	2xxx	G	150	SP
		Tip Style	Material		Finish		Step Probe

2 = with slots and Plate-Ø larger than wrench size

ORDER EXAMPLE STEP PROBES

PLATE OVERSIZED, INSULATED PIN

	Type		Number		Spring Force	
e.g.	F 732	16	B	3xxx	G	150	SP
		Tip Style	Material		Finish		Step Probe

3 = with slots and Plate-Ø larger than wrench size

ORDER EXAMPLE STEP PROBES

Position Test with Fully Insulated Step Probes
Step probes with fully insulated pin allow testing and contacting the ring contact of connector sleeves. Only if the sleeve has the correct length and is not damaged or bent, the plate of the step probe creates an electrical contact.

PLATE STANDARD, FULLY INSULATED PIN

	Type		Number		Spring Force	
e.g.	F 732	16	B	4xxx	G	150	SP
		Tip Style	Material		Finish		Step Probe

4 = without slots and Plate-Ø smaller than wrench size

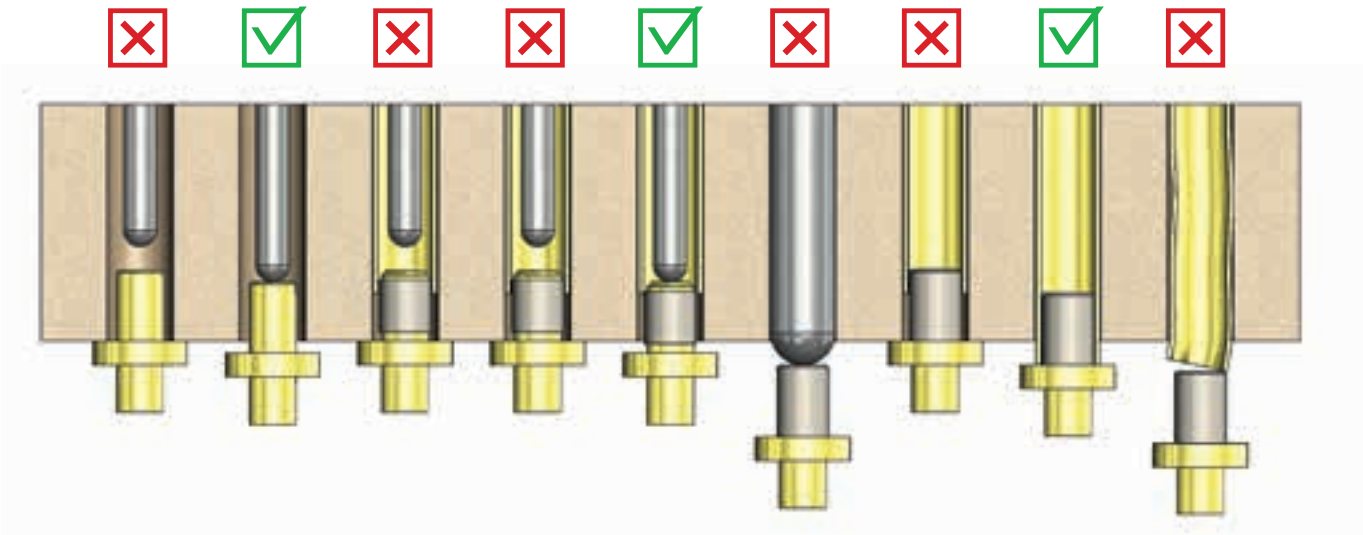
ORDER EXAMPLE STEP PROBES

PLATE OVERSIZED, FULLY INSULATED PIN

	Type		Number		Spring Force	
e.g.	F 732	16	B	5xxx	G	150	SP
		Tip Style	Material		Finish		Step Probe

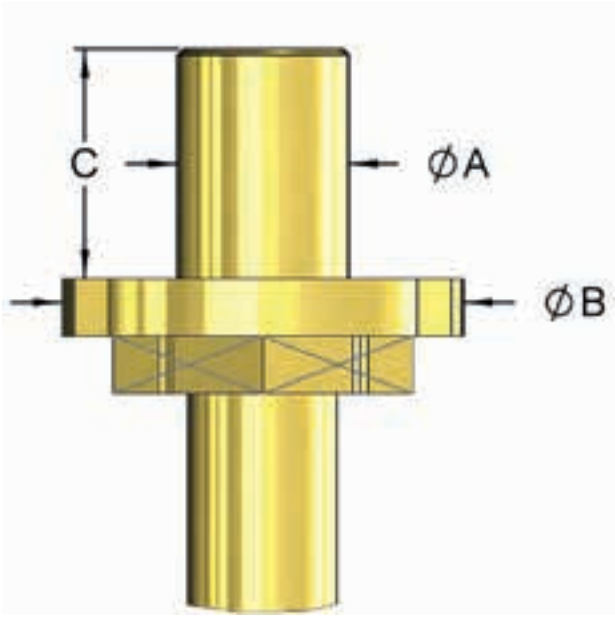
5 = with slots and Plate-Ø larger than wrench size

ORDER EXAMPLE STEP PROBES



Overview step probes

Exact dimensions and technical details are in the relevant series.



F086	**Order Code** Spring Force Pin-Ø A Plate-Ø B Pin Length C	**F08612B0002G130SP** 130 cN Ø 0,51 mm Ø 0,90 mm 1,5 mm		
F100	**Order Code** Spring Force Pin-Ø A Plate-Ø B Pin Length C	**F10016B0001N100BSP** 100 cN Ø 0,64 mm Ø 2,00 mm 2,8 mm		
F773	**Order Code** Spring Force Pin-Ø A Plate-Ø B Pin Length C	**F77311B0002G300SP** 300 cN Ø 1,40 mm Ø 3,50 mm 4,0 mm		
F737	**Order Code** Spring Force Pin-Ø A Plate-Ø B Pin Length C	**F73716B0001G300SP** 300 cN Ø 1,00 mm Ø 2,30 mm 8,0 mm	**F73716B0002G300SP** 300 cN Ø 1,00 mm Ø 1,80 mm 8,0 mm	**F73716B0003G300SP** 300 cN Ø 1,65 mm Ø 1,80 mm 8,0 mm
F755	**Order Code** Spring Force Pin-Ø A Plate-Ø B Pin Length C	**F75589B0001G300E13** 300 cN Ø 1,8 x 0,8 mm Ø 3,00 mm 2,6 mm	**F75589B0004G300E15** 300 cN Ø 3,0 x 0,7 mm Ø 4,00 mm 1,5 mm	
F875	**Order Code** Spring Force Pin-Ø A Plate-Ø B Pin Length C	**F87511B1002G200SP** 200 cN Ø 0,65 mm Ø 2,10 mm 5,0 mm		
F885	**Order Code** Spring Force Pin-Ø A Plate-Ø B Pin Length C	**F88506B0001G200SP** 200 cN Ø 1,00 mm Ø 3,00 mm 2,6 mm	**F88506B0001G200SP** 200 cN Ø 1,00 mm Ø 2,30 mm 2,6 mm	**F88506B0003G200SP** 200 cN Ø 1,00 mm Ø 2,30 mm 9,1 mm
VF4	**Order Code** Spring Force Pin-Ø A Plate-Ø B Pin Length C	**VF416B0001G15SP** 1500 cN Ø 3,80 mm Ø 5,50 mm 1,5 mm		

F730SP

Step Probe 50 mil

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

Spring Force (cN ±20%)

Version	Preload	Nominal
SP	50	110

Travel (mm)

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

Materials and Plating

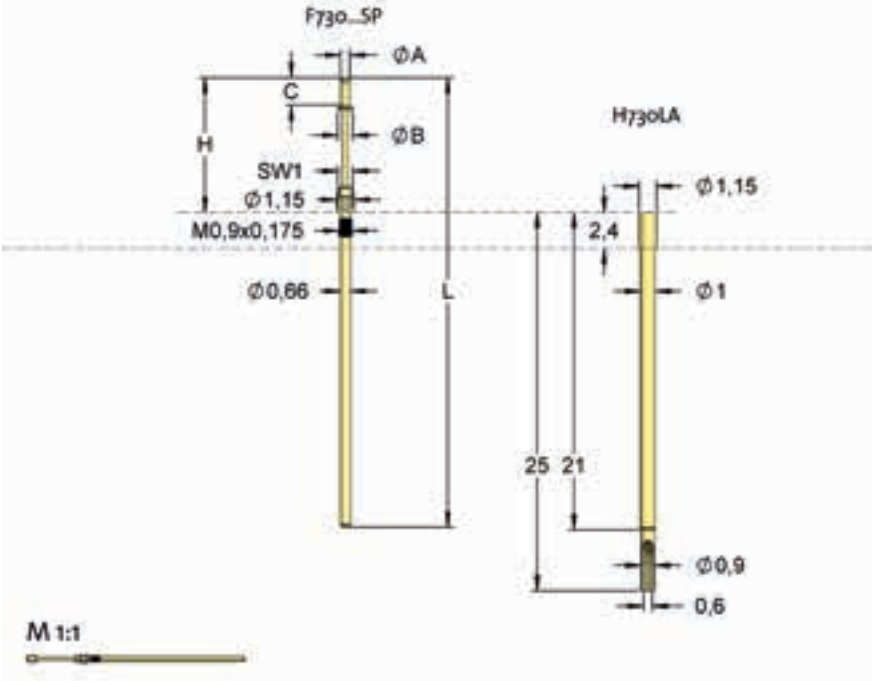
Plunger	see tip style
Barrel	Bronze, gold plated
Spring	Music wire, gold plated
Receptacle	Brass, Gold plated

Accessories

Insertion Tool Receptacle	FEWZ-511E0

Drill Size (mm)

H730...	0,99 - 1,00



Type | Number | Spring Force

F730 12 B 0001 G 110 SP

Tip Style | Material | Finish | Special Version

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	Ø A	Ø B	C	H	L	Version	Screw-In-Tool
F73011B0004G110SP	11	0,50	1,00	3,60	10,70	31,50	SP	FWZ730;FWZ730T
F73012B0005G110SP	12	0,50	0,90	1,00	8,10	28,90	SP	FWZ730;FWZ730T
F73012B0004G110SP	12	0,50	0,90	1,10	8,20	29,00	SP	FWZ730;FWZ730T
F73012B0003G110SP	12	0,50	0,90	1,40	8,50	29,30	SP	FWZ730;FWZ730T
F73012B0001G110SP	12	0,60	1,00	1,80	8,90	29,70	SP	FWZ730;FWZ730T
F73012B0002G110SP	12	0,60	1,00	2,60	9,70	30,50	SP	FWZ730;FWZ730T
F73016B0007G110SP	16	0,50	1,00	0,60	7,70	28,50	SP	FWZ730;FWZ730T

Further Variants see on our homepage.

F731SP

Step Probe 94 mil

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

Spring Force (cN ±20%)

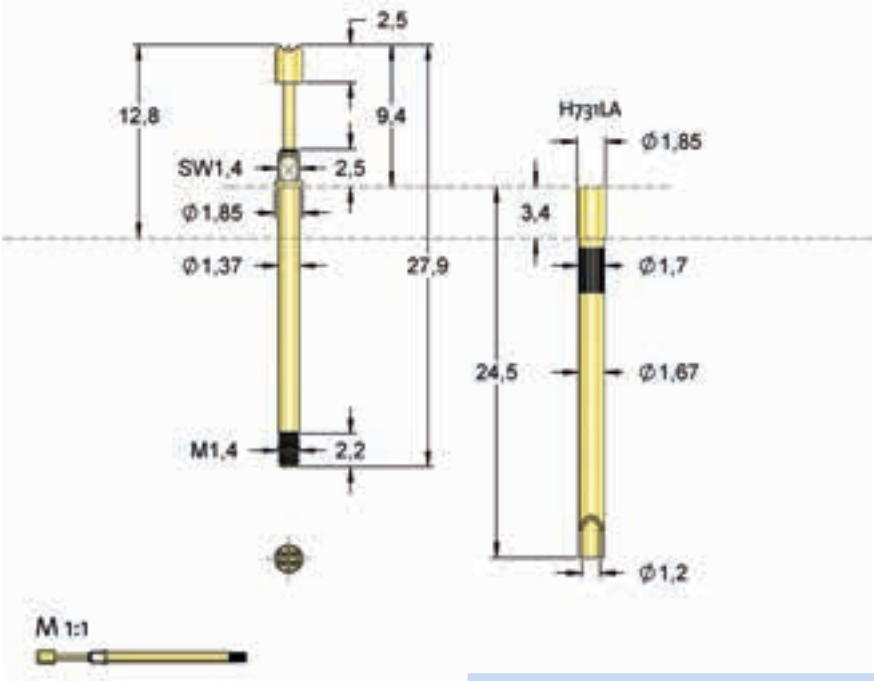
Version	Preload	Nominal
SP	50	110
SP	50	150
SP	50	300

Travel (mm)

Version	Nominal	Maximum
F731...B90...SP	2,0	2,8
SP	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



Accessories

Insertion Tool Receptacle	FEWZ-100E0

Drill Size (mm)

H731...	1,67 - 1,68

Type			Number		Spring Force	
F 731	11	B	0001	G	150	SP
	Tip Style	Material		Finish		Special Version

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	Ø A	Ø B	C	H	L	Version	Screw-In-Tool
F73111B0004G150SP	11	0,65	1,40	5,50	12,90	31,40	SP	FWZ731;FWZ731T
F73111B0014G300SP	11	0,65	1,50	1,50	8,90	27,40	SP	FWZ731;FWZ731T
F73111B0011G300SP	11	0,65	1,50	2,30	9,70	28,80	SP	FWZ731;FWZ731T
F73111B0012G300SP	11	0,65	1,50	2,50	9,70	28,40	SP	FWZ731;FWZ731T
F73111B0002G300SP	11	0,65	1,50	2,80	10,20	28,70	SP	FWZ731;FWZ731T
F73111B0002G150SP	11	0,65	1,50	2,80	10,30	28,80	SP	FWZ731;FWZ731T
F73111B0017G300SP	11	0,65	1,50	3,00	9,50	28,00	SP	FWZ731;FWZ731T
F73111B0007G300SP	11	0,65	1,50	3,40	10,80	29,30	SP	FWZ731S1;FWZ731T1
F73111B0007G150SP	11	0,65	1,50	3,40	10,80	29,30	SP	FWZ731S1;FWZ731T1
F73111B0001G300SP	11	0,65	1,50	4,00	11,50	30,00	SP	FWZ731;FWZ731T
F73111B0001G150SP	11	0,65	1,50	4,00	11,50	30,00	SP	FWZ731;FWZ731T
F73111B0015G300SP	11	0,65	1,50	4,50	11,90	30,40	SP	FWZ731;FWZ731T
F73111B0016G300SP	11	0,65	1,50	5,00	12,40	30,90	SP	FWZ731;FWZ731T
F73111B0010G150SP	11	0,70	1,50	3,50	10,90	29,40	SP	FWZ731;FWZ731T
F73111B0003G150SP	11	0,70	1,50	4,00	11,40	29,90	SP	FWZ731;FWZ731T
F73111B9013G150SP	11	0,75	1,50	2,00	7,90	26,40	SP	FWZ731;FWZ731T
F73111B1009G150SP	11	0,80	2,00	4,60	11,30	29,80	SP	FWZ731SP;FWZ731SPT
F73112B9008G150SP	12	0,65	1,50	2,70	8,60	27,10	SP	FWZ731;FWZ731T
F73112B9008G110SP	12	0,65	1,50	2,70	8,60	27,10	SP	FWZ731;FWZ731T
F73112B9007G110SP	12	0,65	1,50	3,40	9,30	27,80	SP	FWZ731;FWZ731T
F73112B9001G110SP	12	0,65	1,50	4,00	9,90	28,40	SP	FWZ731;FWZ731T
F73116B0006G150SP	16	0,65	1,50	2,10	9,50	28,00	SP	FWZ731;FWZ731T

Further Variants see on our homepage.

F732

Threaded Probe 100 mil

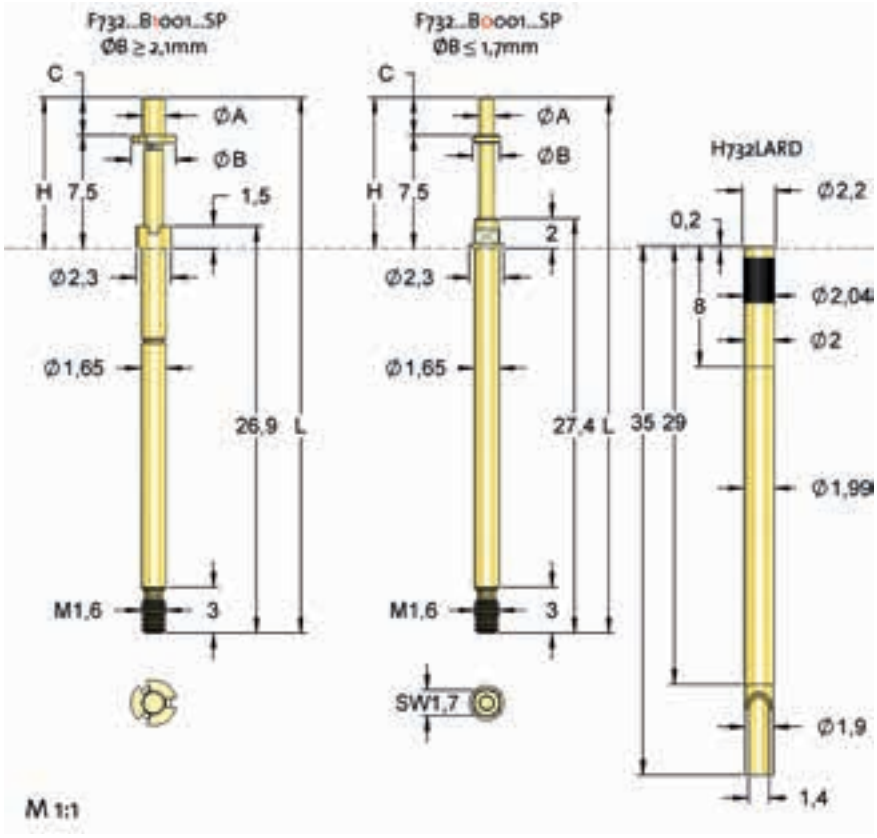
Centers (mm/mil)	2,54 / 100
Current	5,0 A
Temperature	-20°C...+80°C
R typically	25 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
SP	30	80
SP	50	100
SP	60	150
SP	60	300
SP1	60	150
SP1	60	300

Travel (mm)

Version	Nominal	Maximum
SP	4,0	5,0
SP1	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

Drill Size (mm)

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

Accessories

Insertion tool receptacle	FEWZ-772E0

Order Code	Typ Style	Ø A	Ø B	C	H	L	Version	Screw-In-Tool
F73211B0029G150SP	11	0,65	1,50	2,70	10,20	35,60	SP	FWZ732;FWZ732T
F73211B0045G150SP	11	0,65	1,50	3,00	10,50	35,90	SP	FWZ732;FWZ732T
F73211B0024G150SP	11	0,65	1,50	4,30	11,80	37,20	SP	FWZ732;FWZ732T
F73211B0018G150SP	11	0,65	1,50	5,00	12,50	37,90	SP	FWZ732;FWZ732T
F73211B0053G150SP	11	0,65	1,70	3,60	11,10	36,50	SP	FWZ732;FWZ732T
F73211B1041G150SP	11	0,65	2,10	2,50	10,00	35,40	SP	FWZ732SPT
F73211B1054G150SP	11	0,65	2,10	3,00	10,50	35,90	SP	FWZ732SPT
F73211B1042G150SP	11	0,65	2,10	3,60	11,10	36,50	SP	FWZ732SPT
F73211B1037G150SP	11	0,80	2,10	2,80	10,30	35,70	SP	FWZ732SPT
F73211B1036G150SP	11	0,80	2,10	4,00	11,50	36,90	SP	FWZ732SPT
F73211B1006G150SP	11	0,80	2,50	4,00	11,50	36,90	SP	FWZ732SPT
F73211B1038G150SP	11	1,00	2,10	2,00	9,50	34,90	SP	FWZ732SPT
F73211B1039G300SP	11	1,40	2,80	3,50	11,00	36,40	SP	FWZ732SPT
F73212B0017G150SP	12	0,65	1,50	2,70	10,30	35,70	SP	FWZ732;FWZ732T
F73216B1033G150SP	16	0,70	2,10	1,50	9,00	34,40	SP	FWZ732;FWZ732T
F73216B1043G150SP	16	0,70	2,10	2,00	9,50	34,90	SP	FWZ732SPT
F73216B1052G150SP	16	0,80	2,10	3,20	10,70	36,10	SP	FWZ732SPT
F73216B1038G150SP	16	1,00	2,10	2,00	9,50	34,90	SP	FWZ732SPT
F73216B1010G150SP	16	1,00	2,50	2,00	10,00	35,40	SP	FWZ732SPT
F73216B1014G150SP	16	1,50	3,00	2,50	10,00	35,40	SP	FWZ732SPT

Further Variants see on our homepage.

F733

Threaded Probe 157 mil

Centers (mm/mil)	4,00 / 157
Current	10,0 A
Temperature	-20°C...+80°C, -40°C...+250°C (H)
R typically	25 mOhm

Spring Force (cN ±20%)

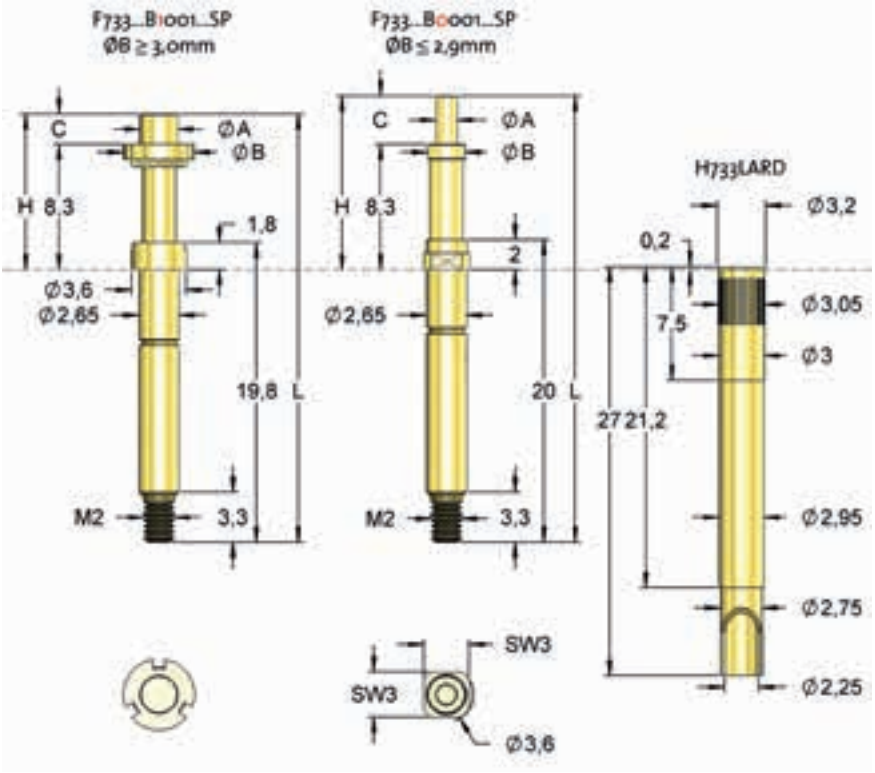
Version	Preload	Nominal
SP	50	150
SP	60	300
SP1	50	150
SP1	60	300

Travel (mm)

Version	Nominal	Maximum
SP	4,0	5,0
SP1	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 knurl	2,98 - 2,99
Receptacle with knurl	3,00 - 3,02

Accessories

Insertion tool receptacle	FEWZ-744E0

Order Code	Typ Style	Ø A	Ø B	C	H	L	Version	Screw-In-Tool
F73311B1042G150SP1	11	1,00	3,50	2,80	11,10	29,10	SP1	FWZ732SPT1
F73311B1027G150SP1	11	1,40	3,50	2,40	10,70	28,70	SP1	FWZ732SPT1
F73311B1035G150SP1	11	1,40	3,50	2,70	11,00	29,00	SP1	FWZ732SPT1
F73311B1028G150SP1	11	1,40	3,50	4,00	12,30	30,30	SP1	FWZ732SPT1
F73316B1005G150SP	16	1,30	4,70	2,70	11,00	29,00	SP	FWZ733SPT
F73316B1004G150SP	16	1,30	4,70	3,60	11,90	29,90	SP	FWZ733SPT
F73316B1002G150SP	16	1,30	4,70	5,30	13,60	31,60	SP	FWZ733SPT
F73316B1031G150SP1	16	1,40	3,50	1,70	10,00	28,00	SP1	FWZ732SPT1
F73316B1016G150SP1	16	1,40	3,50	2,00	10,30	28,30	SP1	FWZ732SPT1
F73316B1027G150SP1	16	1,40	3,50	2,40	10,70	28,70	SP1	FWZ732SPT1
F73316B1032G150SP1	16	1,40	3,50	3,00	11,30	29,30	SP1	FWZ732SPT1
F73316B1034G150SP1	16	1,70	3,50	2,20	10,50	28,50	SP1	FWZ732SPT1
F73316B1036G150SP1	16	1,80	3,50	1,60	9,90	27,90	SP1	FWZ732SPT1
F73316B1015G150SP1	16	1,80	3,50	2,20	10,50	28,50	SP1	FWZ732SPT1
F73316B1019G150SP	16	1,80	4,50	1,40	9,70	27,70	SP	FWZ733SPT
F73316B1009G300SP	16	1,80	4,70	4,20	12,50	30,50	SP	FWZ733SPT
F73316B1044G150SP1	16	2,20	3,50	1,80	10,10	28,10	SP1	FWZ732SPT1
F73316B1043G150SP1	16	2,20	3,50	2,00	10,30	28,30	SP1	FWZ732SPT1
F73316B1051G150SP	16	3,70	5,00	5,50	13,80	31,80	SP	FWZ732SPT
F73316B1013G150SP	16	4,00	5,00	1,30	9,60	27,60	SP	FWZ732SPT

Further Variants see on our homepage.

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

Threaded Probe 50 mil

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	50	110

Travel (mm)

Version	Nominal	Maximum
standard	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

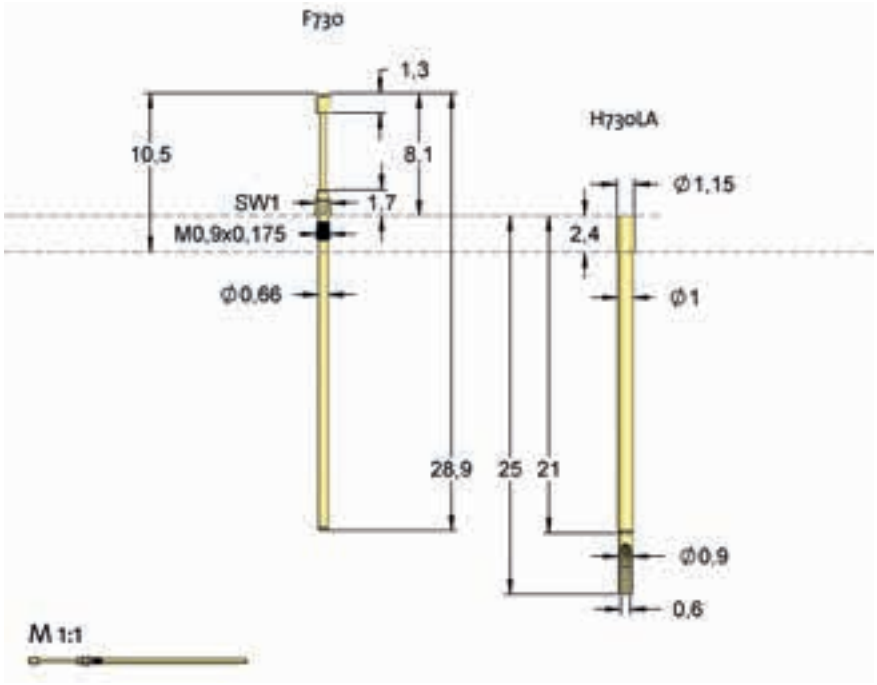
Screw-in tool probe	FWZ730 (T) max. Ø0,9 mm
Screw-in tool probe	FWZ730S1 (T1) max. Ø1,5 mm
Insertion Tool Receptacle	FEWZ-511E0

Drill Size (mm)

H730...	0,99 - 1,00

Projection Height (mm)

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	0,90	-
	12	B	G	0,64	-
	16	B	G	0,40	-
	17	B	G	0,64	-
	18	B	G	0,40	-

F175

Threaded Probe 75 mil

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	40	100
standard	70	150

Travel (mm)

Version	Nominal	Maximum
standard	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, silver plated
Receptacle	Brass, Gold plated

Accessories

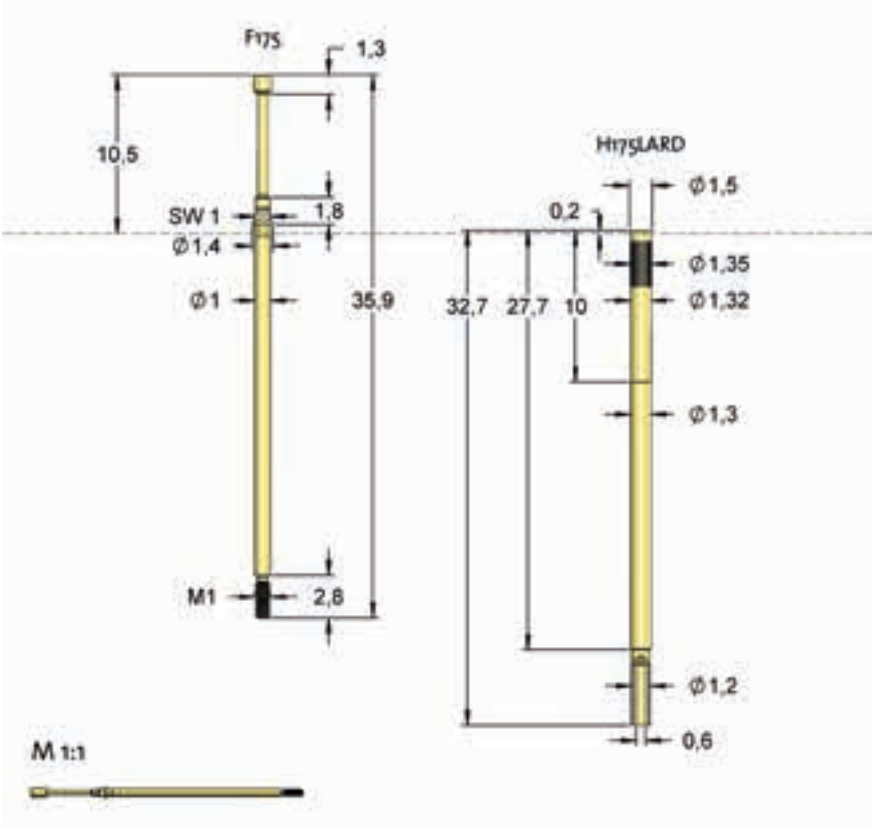
Insertion tool receptacle	FEWZ-075E0
Screw-in tool probe	FWZ730S1 / FWZ730T1

Drill Size (mm)

H175LARD	1,32 - 1,34

Projection Height (mm)

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	1,20	-
	06	B	G	1,20	-
	11	B	G	0,50	-
	11	B	G	0,64	-
	12	B	G	0,78	-
	17	B	G	1,20	-
	18	B	G	0,64	-
	18	B	G	0,78	-
	21	S	L	0,64	-
	30	S	L	0,64	-

F176

Threaded Probe 75 mil, Short Version

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	30	80
standard	85	150

Travel (mm)

Version	Nominal	Maximum
standard	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

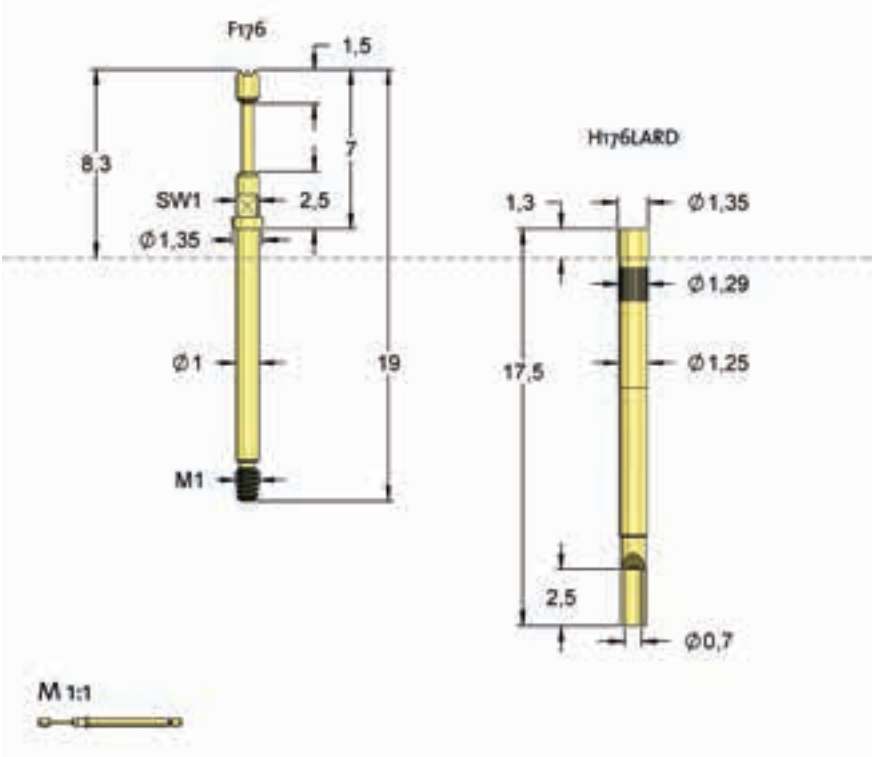
Insertion tool receptacle	FEWZ-075E0
Screw-in tool probe	FWZ730S1; FWZ730T1

Drill Size (mm)

H176LARD	1,25 - 1,27

Projection Height (mm)

H176LARD	7,9



Type		Tip-Ø		Spring Force
F 176	11	B	100	G	080
	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	1,00	-
	11	B	G	0,40	-
	11	B	G	0,50	-
	12	B	G	0,65	-
	17	B	G	1,00	-
	18	B	G	0,45	-

F731

Threaded Probe 94 mil

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

Spring Force (cN ±20%)

Version	Preload	Nominal
L	50	300
standard	20	60
standard	50	100
standard	50	150
standard	50	250
standard	50	300

Travel (mm)

Version	Nominal	Maximum
L	3,5	4,4
standard	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

Accessories

Screw-in tool probe	FWZ731 (T) max. Ø2,0 mm
Screw-in tool probe	FWZ731S1 (T1) max. Ø1,3 mm
Insertion Tool Receptacle	FEWZ-100E0

Drill Size (mm)

H731...	1,67 - 1,68

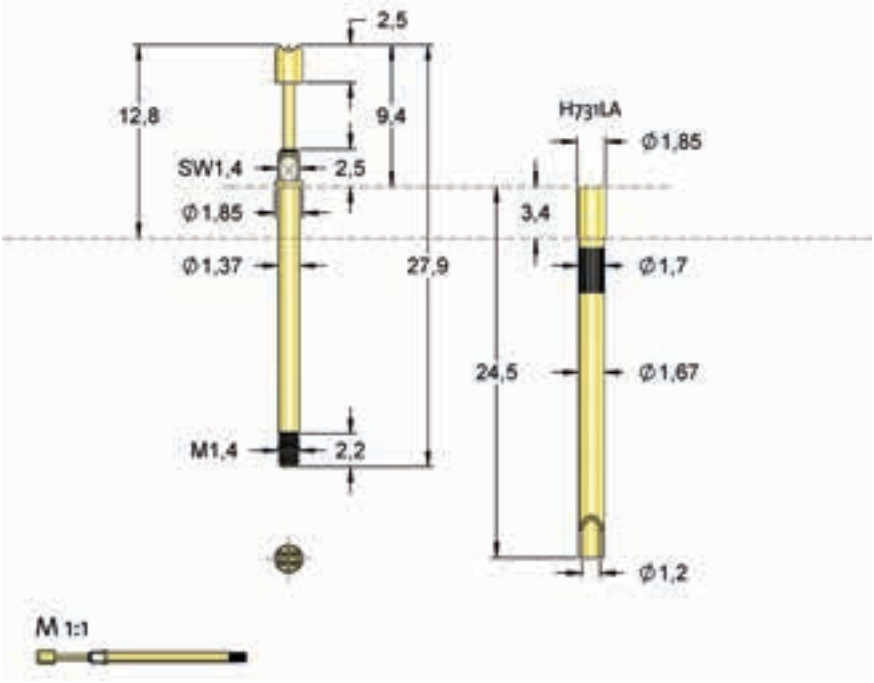
Projection Height (mm)

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



A solder tight version of receptacle is available (H731LAST).

Tip Style	Number	Material	Plating	Ø in mm	Version
	05	B	G	1,80	-
	06	B	G	1,00	-
	06	B	G	1,30	-
	06	B	G	1,80	-
	11	B	G	0,50	-
	11	B	G	0,65	-
	11	B	G	0,75	-
	11	B	G	0,75	L
	12	B	G	1,80	-
	16	B	G	0,75	-
	17	B	G	1,50	-
	17	B	G	1,60	-
	18	B	G	0,75	-

F732

Threaded Probe 100 mil

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

Spring Force (cN ±20%)

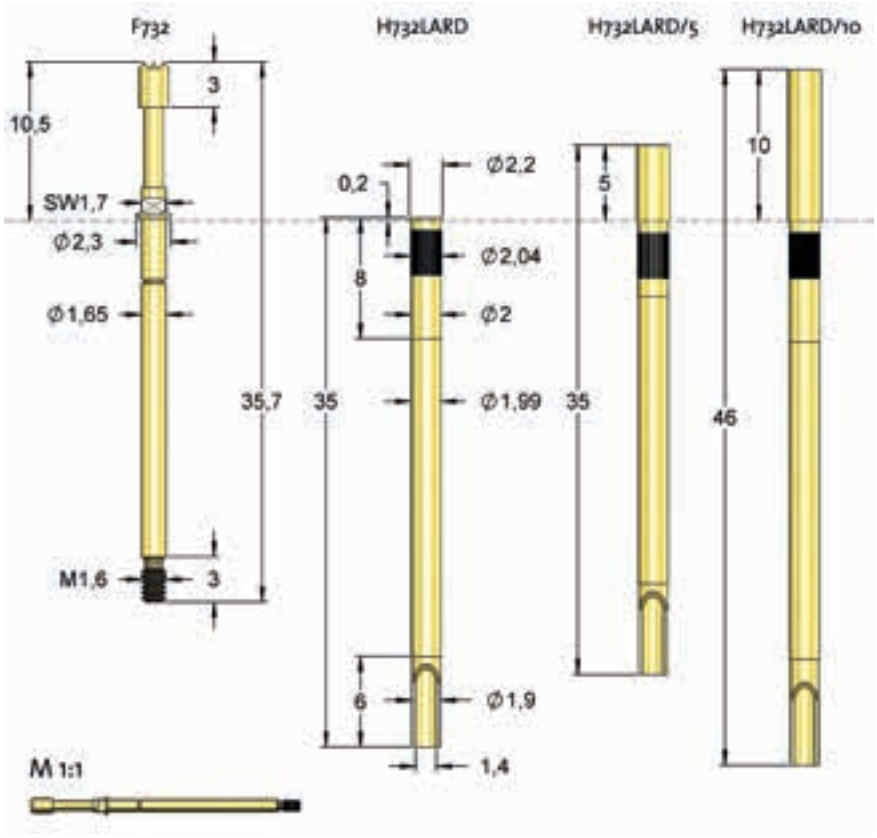
Version	Preload	Nominal
E14	60	150
H	60	150
H	50	300
IK	60	150
IK	60	300
RP	60	150
RP	60	300
standard	30	80
standard	60	150
standard	60	200
standard	60	300

Travel (mm)

Version	Nominal	Maximum
E14	4,0	5,0
H	4,0	5,0
IK	4,0	5,0
RP	4,0	5,0
standard	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 Stainless steel, unplated
Receptacle	Brass, Gold plated



Tip Style	Number	Material	Plating	Ø in mm	Version
	05	B	G	1,80	-
	05	B	G	2,00	-
	06	B	G	1,20	IK
	06	B	G	1,30	-
	06	B	G	1,40	-
	06	B	G	1,50	-
	06	B	G	1,80	-
	06	B	G	1,80	IK
	06	B	G	2,00	-
	06	B	G	2,00	H
	06	B	G	2,50	-
	07	S	L	1,75	-
	07	S	L	1,75	H
	07	S	L	2,00	-
	11	B	G	0,64	-
	11	B	G	0,64	E14
	11	B	G	0,64	H
	11	B	G	0,64	RP
	11	B	G	0,80	-

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, N = Nickel, R = Rhodium
Special Version:	L = Long Version, H = High Temperatur, IK = Insulating cap, RP = „Wobbling Plunger"
Receptacle:	Order Code according drawing

ORDER EXAMPLE

F732

Threaded Probe 100 mil

Accessories

Screw-in tool probe	FWZ732 (T) max. Ø2,0 mm
Screw-in tool probe	FWZ732S1 (T1) 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 (mm)

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

Tip Style	Number	Material	Plating	Ø in mm	Version
	11	B	G	1,00	-
	11	B	G	1,30	-
	12	B	G	1,40	-
	12	B	G	1,60	-
	12	B	G	1,80	-
	12	B	G	2,00	-
	14	S	L	2,00	-
	15	B	R	1,70	-
	16	B	G	0,64	-
	16	B	G	0,80	-
	16	B	G	1,00	-
	17	B	G	1,40	-
	17	B	G	1,50	-
	17	B	G	2,00	-
	18	B	G	1,30	-
	18	B	G	1,30	H
	21	S	L	1,30	-
	30	B	G	1,30	-
	41	B	G	2,00	-

F722

Threaded Probe 100 mil, Short Version

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	40	100

Travel (mm)

Version	Nominal	Maximum
standard	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

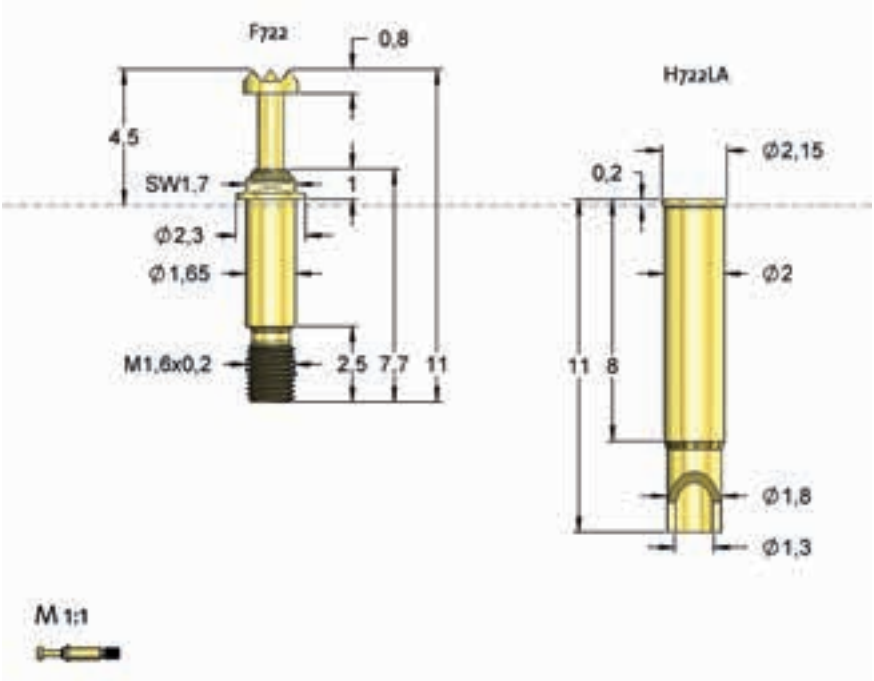
Screw-in tool probe	FWZ732 (T)

Drill Size (mm)

H722...	1,99 - 2,00

Projection Height (mm)

H722...	4,5



Type		Tip-Ø		Spring Force
F 722	06	B	180	G	100
	Tip Style	Material		Finish	Special Version

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	1,80	-
	06	B	G	1,80	-
	11	B	G	0,64	-
	11	B	G	0,85	-
	17	B	G	1,80	-

F727

Threaded Probe 100 mil, Long Travel Version

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	110	300

Travel (mm)

Version	Nominal	Maximum
standard	12,0	14,5
Thread (M)		M1,6
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

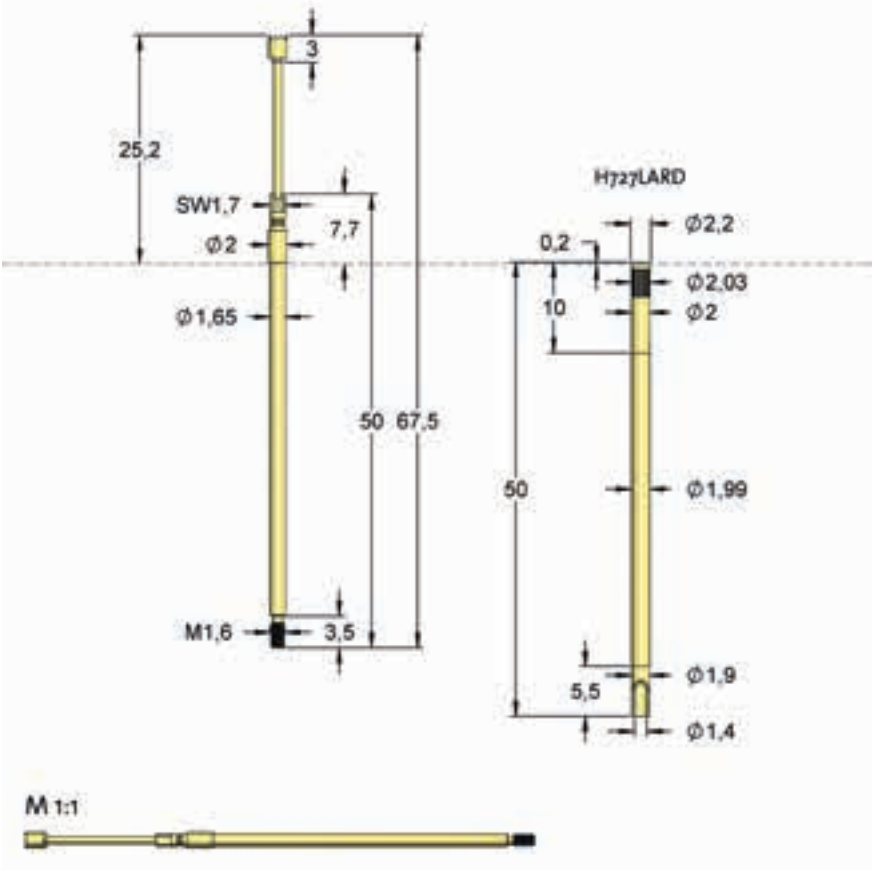
Screw-in tool probe	FWZ732 (T)
Insertion tool for receptacles	FEWZ-772E0

Drill Size (mm)

H727	2,00 - 2,02

Projection Height (mm)

H727...	25,2



Due to its long travel the F727 is suitable for applications with large depth of contacts, for example for contacting sockets. Also, it is suitable for dual-stage fixtures.

Type			Tip-Ø		Spring Force
F 727	06	B	200	G	300
	Tip Style	Material		Finish	Special Version

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	2,00	-
	15	B	G	2,00	-

F733

Threaded Probe 157 mil

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

Spring Force (cN ±20%)

Version	Preload	Nominal
IP	50	150
standard	50	150
standard	80	300
standard	30	400
standard	70	600

Travel (mm)

Version	Nominal	Maximum
IP	4,0	5,0
standard	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) max. Ø3,0 mm
Screw-in tool probe	FWZ733 (T) max. 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

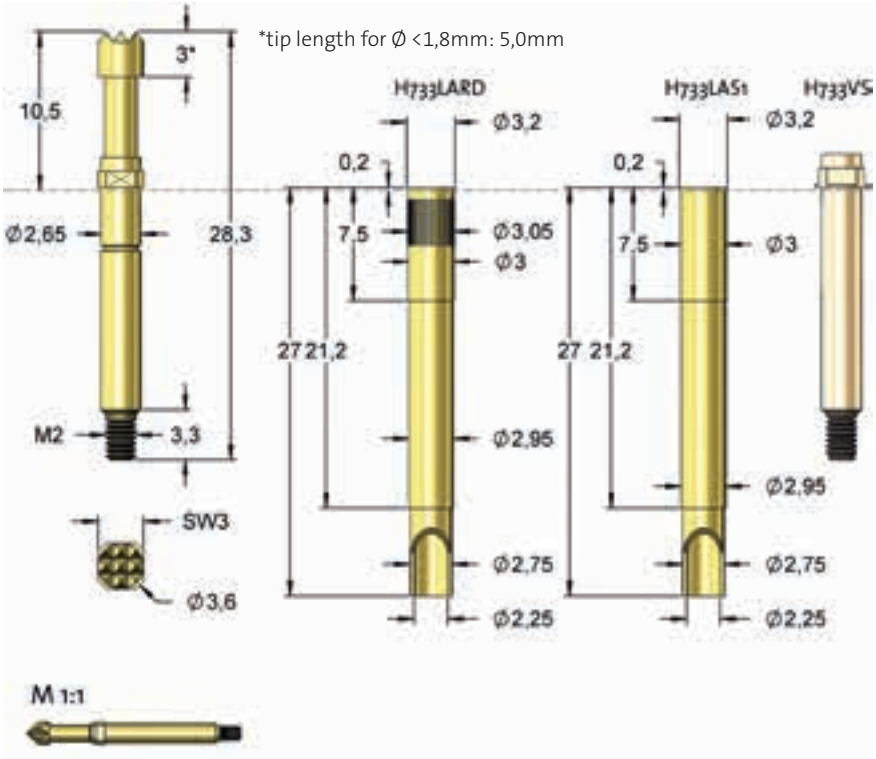
Projection Height (mm)

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, L = Longtime Gold plated
Special Version:	H = High Temperatur, 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	2,30	-
	05	B	G	2,00	-
	05	B	G	2,30	-
	05	B	G	3,00	-
	06	B	G	1,60	-
	06	B	G	2,30	-
	06	B	G	2,50	-
	06	B	G	3,00	-
	06	B	G	3,50	-
	06	B	G	4,00	-
	06	S	L	2,30	-
	07	S	L	1,80	-
	07	S	L	2,30	-
	07	S	L	3,00	-
	09	S	L	2,30	-
	11	B	G	0,64	-
	11	B	G	0,80	-
	11	B	G	1,00	-
	11	B	G	1,40	-
	11	B	G	1,55	IP
	11	B	G	1,80	-
	12	B	G	2,30	-

F733

Threaded Probe 157 mil

Tip Style	Number	Material	Plating	Ø in mm	Version
	12	B	G	3,00	-
	14	S	L	2,30	-
	15	B	G	2,30	-
	15	B	G	3,00	-
	16	B	G	0,80	-
	16	B	G	1,00	-
	16	B	G	1,40	-
	16	B	G	1,80	-
	17	B	G	2,30	-
	17	B	G	3,00	-
	18	B	G	1,80	-
	21	S	L	1,80	-
	28	B	G	2,30	-
	29	B	G	1,80	-
	39	B	G	1,80	-

F723

Threaded Probe 157 mil, Short Version

Centers (mm/mil)	4,00 / 157
Current	10,0 A
Temperature	-40°C...+250°C
R typically	8 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	40	80
standard	70	150

Travel (mm)

Version	Nominal	Maximum
standard	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

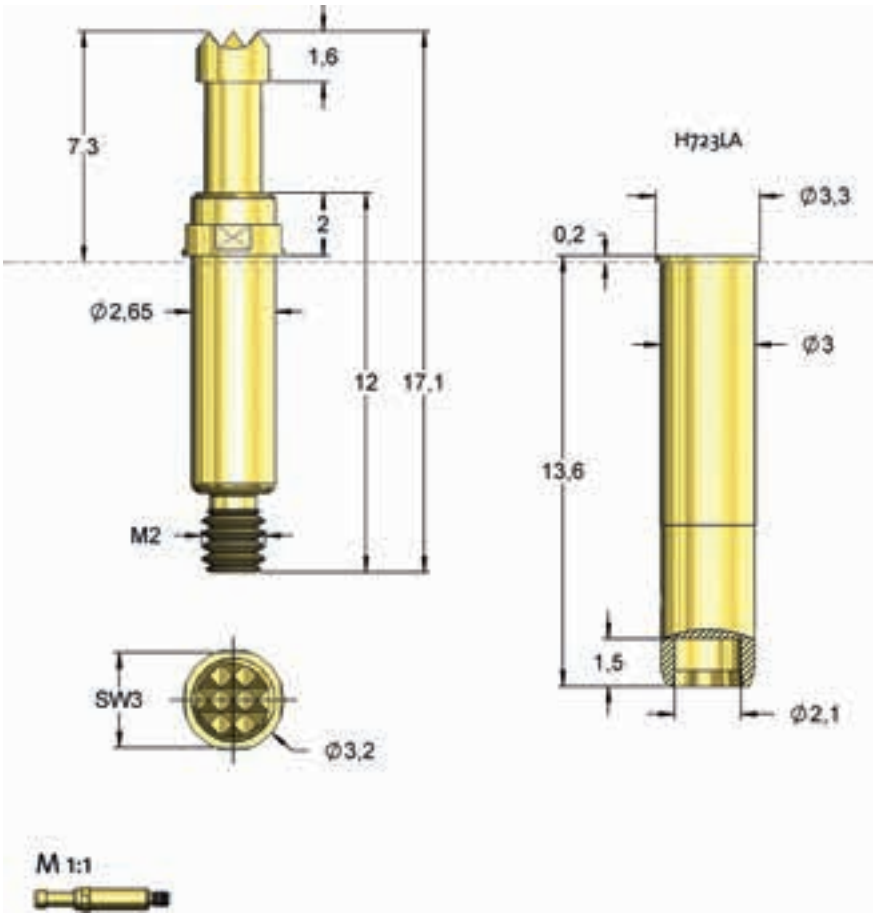
Screw-in tool probe	FWZ733S1 (T1)

Drill Size (mm)

H723...	2,98 - 2,99

Projection Height (mm)

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	2,30	-
	06	B	G	2,30	-
	12	B	G	2,30	-
	17	B	G	2,30	-

F734

Threaded Probe 157 mil, Long Travel Version

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	60	150
standard	120	300

Travel (mm)

Version	Nominal	Maximum
standard	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

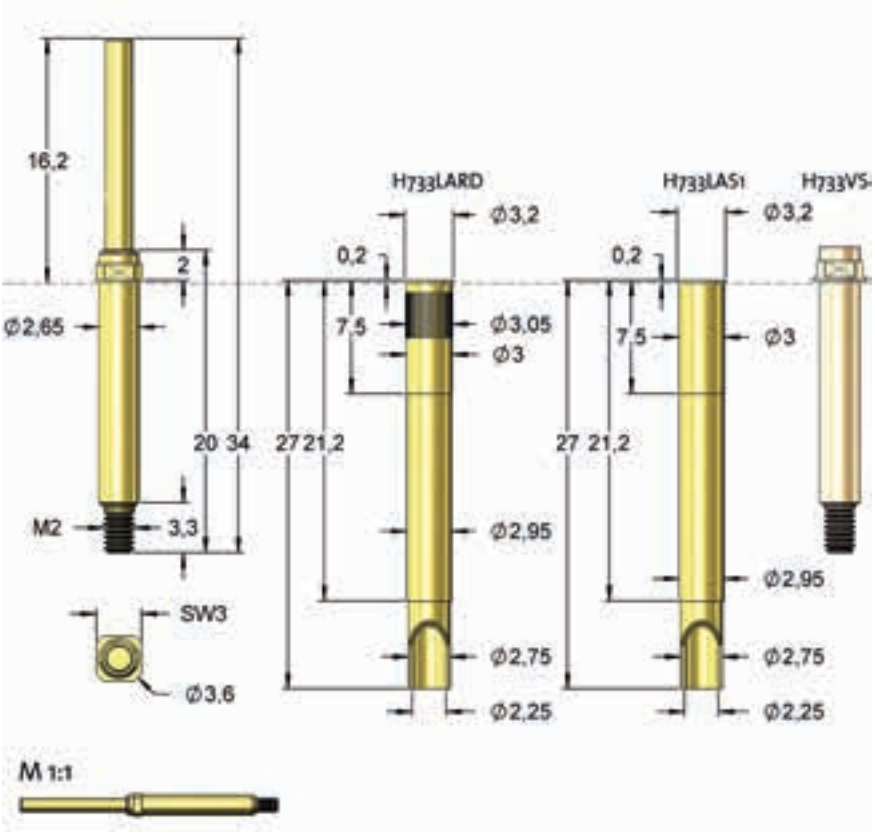
Screw-in tool probe	FWZ733S1 (T1) max. Ø3,0 mm
Screw-in tool probe	FWZ733 (T) max. Ø4,0 mm
Insertion tool receptacle	FEWZ-774E0
Plug lock	H733VS

Drill Size (mm)

Receptacle without knurl	2,98 - 2,99
Receptacle with knurl	3,00 - 3,02

Projection Height (mm)

H733...	16,2



The probe F734 is a variation of the probe F733. It is used for wire harness tests. The long continuous plunger and the spring travel of up to 7.0 mm allows usage in combination with guiding plates.

Type		Tip-Ø		Spring Force	
F 734	16	B	180	G	150
	Tip Style	Material		Finish	Special Version

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	1,80	-
	18	S	L	1,80	-
	39	B	G	1,80	-

F737

Threaded Probe 157 mil, Long Travel Version

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	60	150
standard	80	300

Travel (mm)

Version	Nominal	Maximum
standard	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

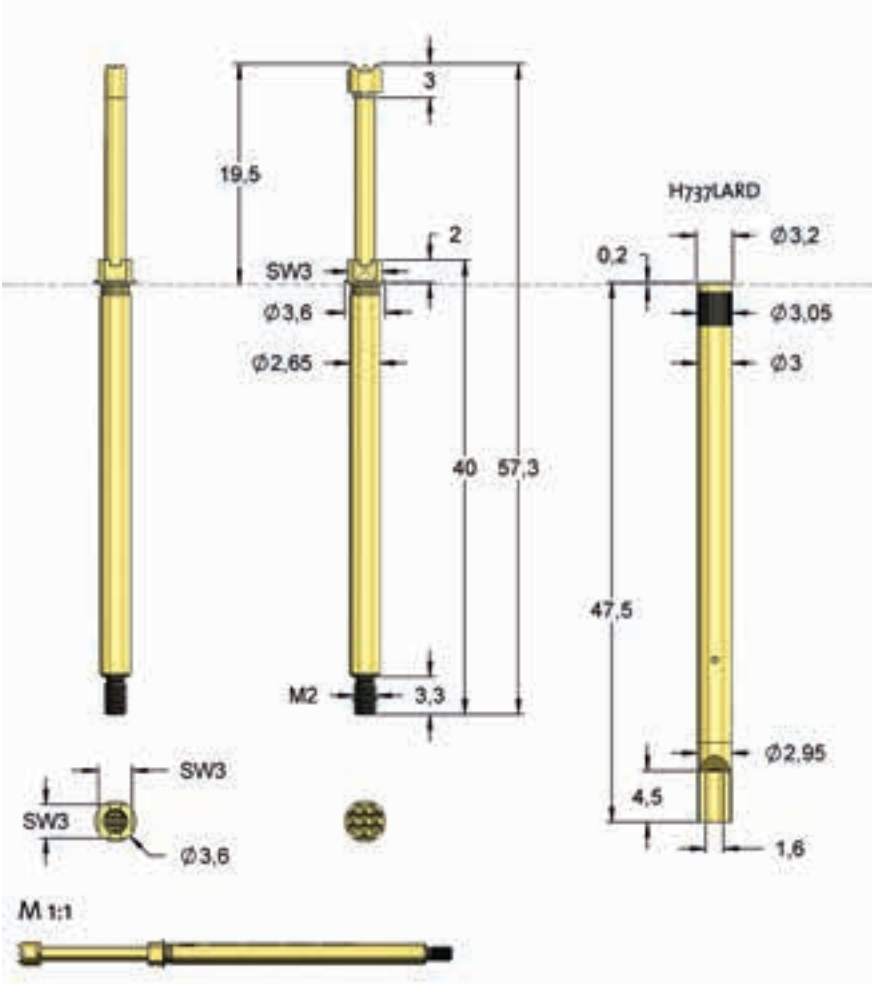
Screw-in tool probe	FWZ733S1 (T1) max. Ø3,0 mm
Screw-in tool probe	FWZ733 (T) max. Ø4,0 mm
Insertion tool receptacle	FEWZ-774E0

Drill Size (mm)

H737	3,00 - 3,02

Projection Height (mm)

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	Special Version

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	1,80	-
	06	B	G	3,00	-
	06	B	G	4,00	-
	16	B	G	1,80	-

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.

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.

F310

Continuous Plunger, 75 mil

Centers (mm/mil)	1,90 / 75
Current	8,0 A
Temperature	-40°C...+250°C
R typically	25 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	20	45
standard	40	90

Travel (mm)

Version	Nominal	Maximum
standard	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

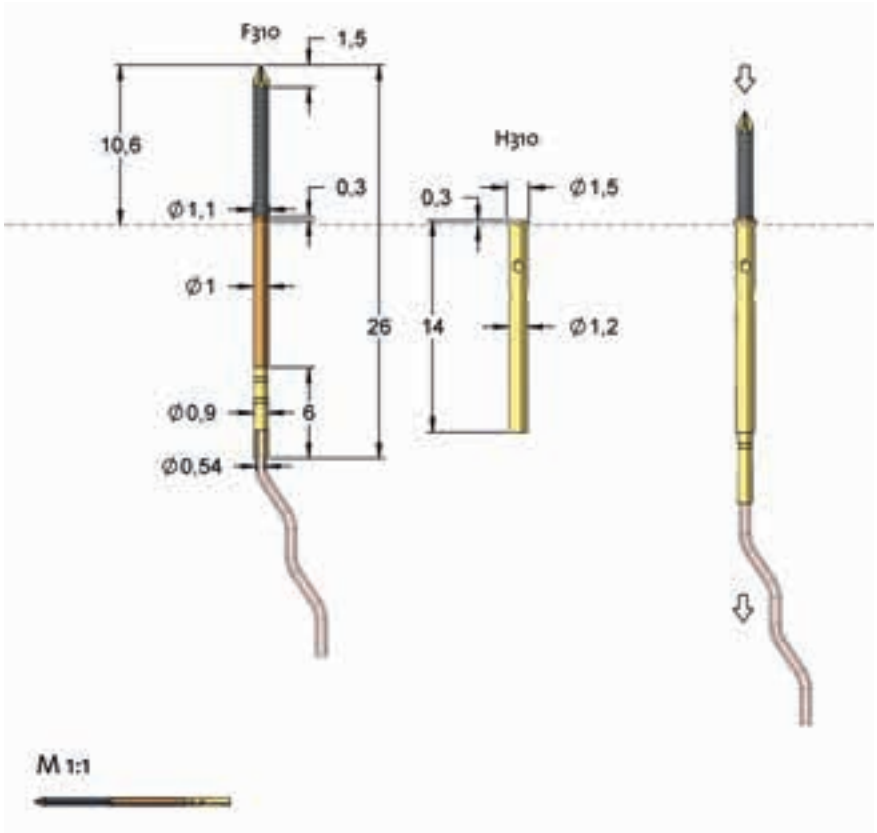
Insertion tool receptacle	FEWZ-075E0
Insertion tool probe	FDWZ-075

Drill Size (mm)

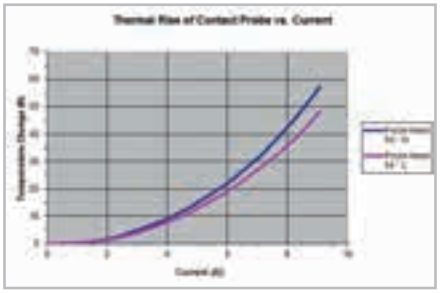
H310	1,19 - 1,20

Projection Height (mm)

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 with sufficient space for the movement.



Type			Tip-Ø		Spring Force
F 310	08	S	110	L	090
	Tip Style	Material		Finish	Special Version

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	1,10	-
	04	S	N	1,10	-
	05	S	N	1,10	-
	08	S	L	1,10	-
	09	S	L	1,10	-
	09	S	N	1,10	-
	14	S	L	1,10	-

F320

Continuous Plunger, 100 mil

Centers (mm/mil)	2,54 / 100
Current	10,0 A
Temperature	-40°C...+250°C
R typically	20 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	50	130

Travel (mm)

Version	Nominal	Maximum
standard	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

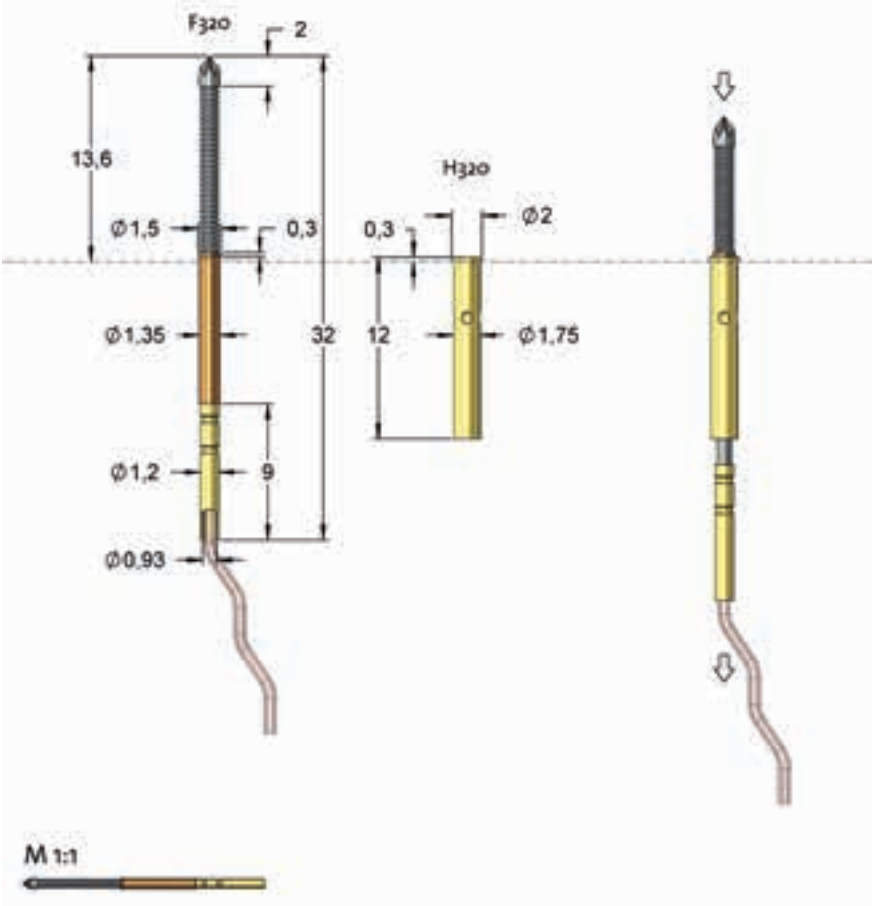
Insertion tool receptacle	FEWZ-100E0
Insertion tool probe	FDWZ-075

Drill Size (mm)

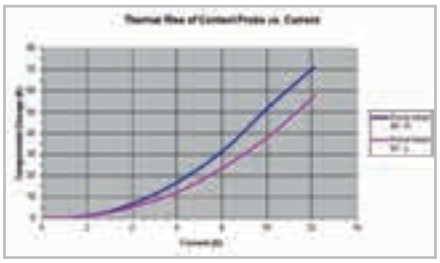
H320	1,74 - 1,75

Projection Height (mm)

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 with sufficient space for the movement.



Type			Tip-Ø		Spring Force
F 320	09	S	135	L	130
	Tip Style	Material		Finish	Special Version

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	N	1,35	-
	09	S	L	1,35	-
	09	S	N	1,35	-
	12	S	L	1,35	-
	14	S	L	1,35	-

F330

Continuous Plunger, 118 mil

Centers (mm/mil)	3,00 / 118
Current	14,0 A
Temperature	-40°C...+250°C
R typically	15 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	60	210
standard	100	360
standard	180	415

Travel (mm)

Version	Nominal	Maximum
standard	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

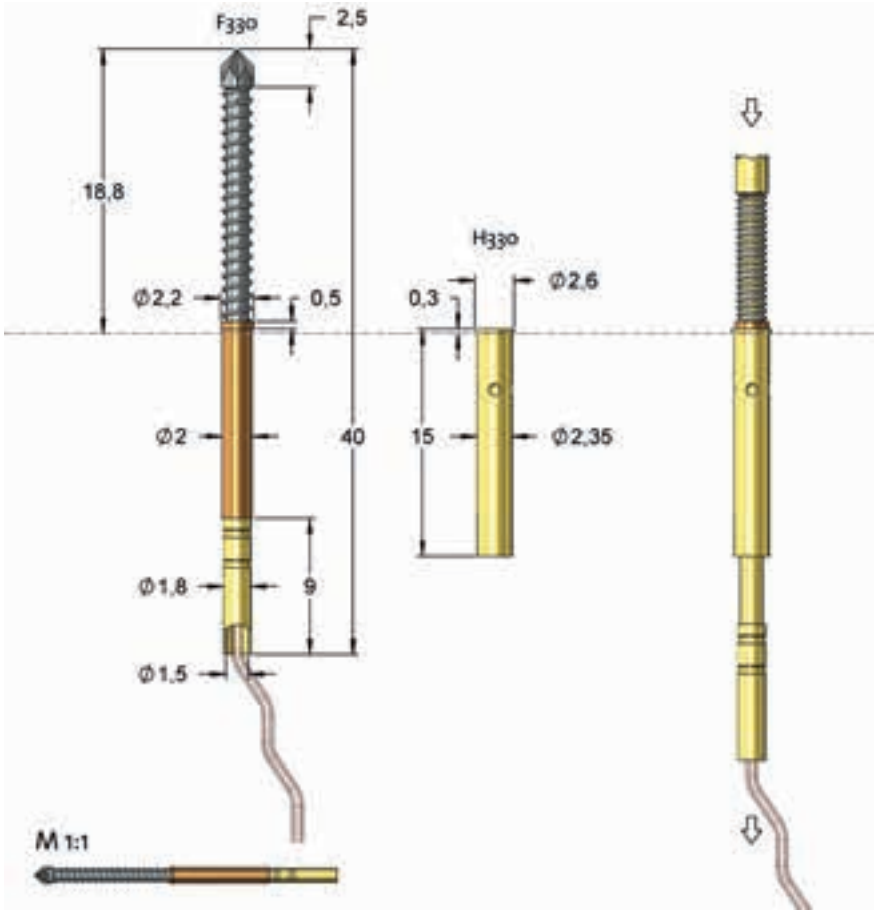
Insertion tool receptacle	FEWZ-330E0
Insertion tool probe	FDWZ-075

Drill Size (mm)

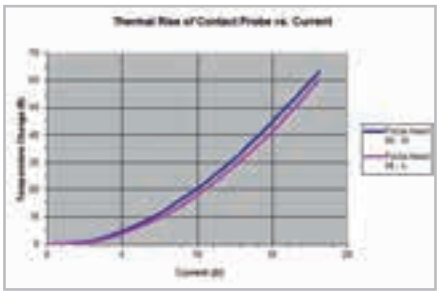
H330	2,33 -2,34

Projection Height (mm)

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 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	Special Version

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
	05	S	L	2,10	-
	05	S	N	2,10	-
	07	S	L	2,10	-
	07	S	N	2,10	-
	08	S	N	2,10	-
	09	S	L	2,10	-
	12	S	N	2,10	-
	14	S	L	2,10	-
	14	S	N	2,10	-

F340

Continuous Plunger, 138 mil

Centers (mm/mil)	4,00 / 157
Current	16,0 A
Temperature	-40°C...+250°C
R typically	10 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	80	260
standard	150	400
standard	300	540

Travel (mm)

Version	Nominal	Maximum
standard	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

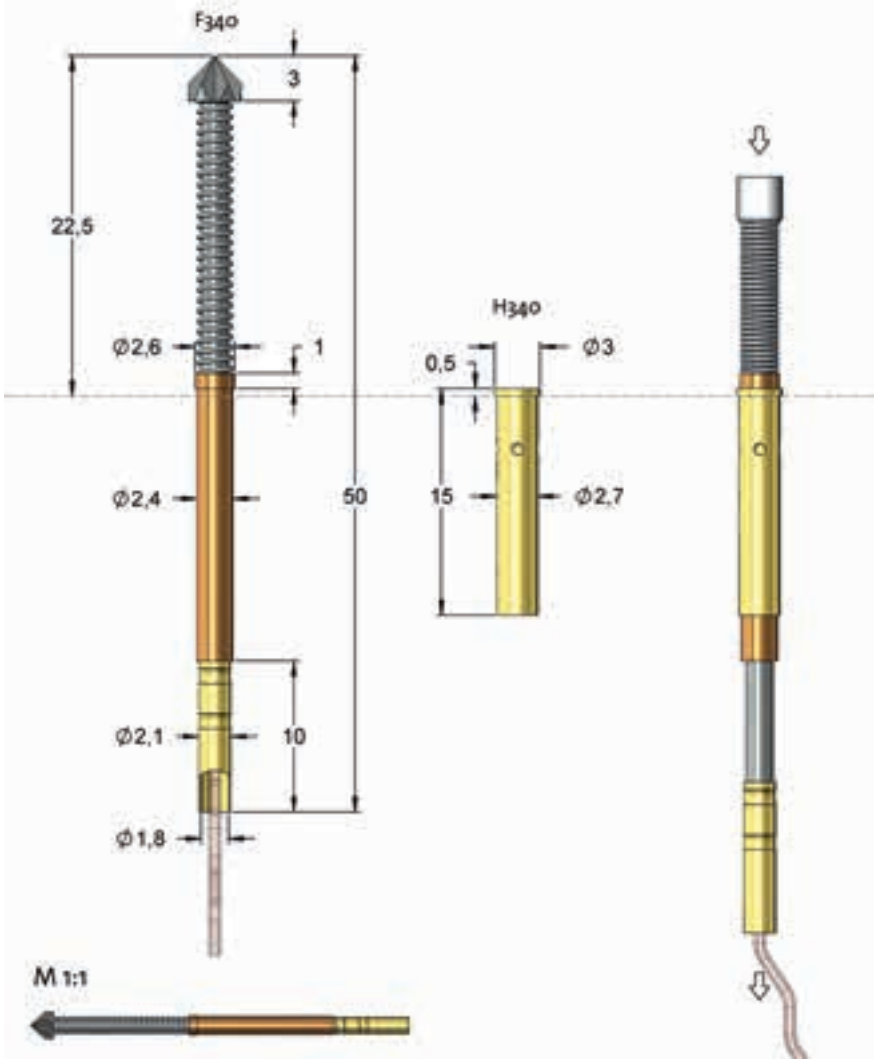
Insertion tool receptacle	FEWZ-340E0
Insertion tool probe	FDWZ-100

Drill Size (mm)

H340	2,68 - 2,69

Projection Height (mm)

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 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, N = Nickel, U = Unplated
Receptacle:	Order Code according drawing

ORDER EXAMPLE

Tip Style	Number	Material	Plating	Ø in mm	Version
	04	S	N	3,50	-
	05	A	U	3,00	-
	05	S	L	3,50	-
	05	S	N	3,50	-
	07	S	L	3,50	-
	08	S	N	3,50	-
	09	S	L	3,50	-
	09	S	N	3,50	-
	14	S	N	3,50	-
	17	A	U	3,00	-

F732C

Threaded Probe 100 mil

Centers (mm/mil)	2,54 / 100
Current	20,0 A
Temperature	-40°C...+250°C
R typically	10 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
C	50	150
C	50	300

Travel (mm)

Version	Nominal	Maximum
C	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

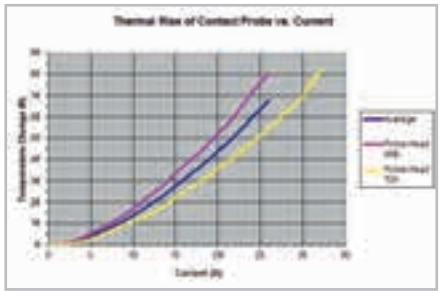
Insertion tool receptacle	FEWZ-772E0
Screw-in tool probe	FWZ732 (T)

Drill Size (mm)

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

Projection Height (mm)

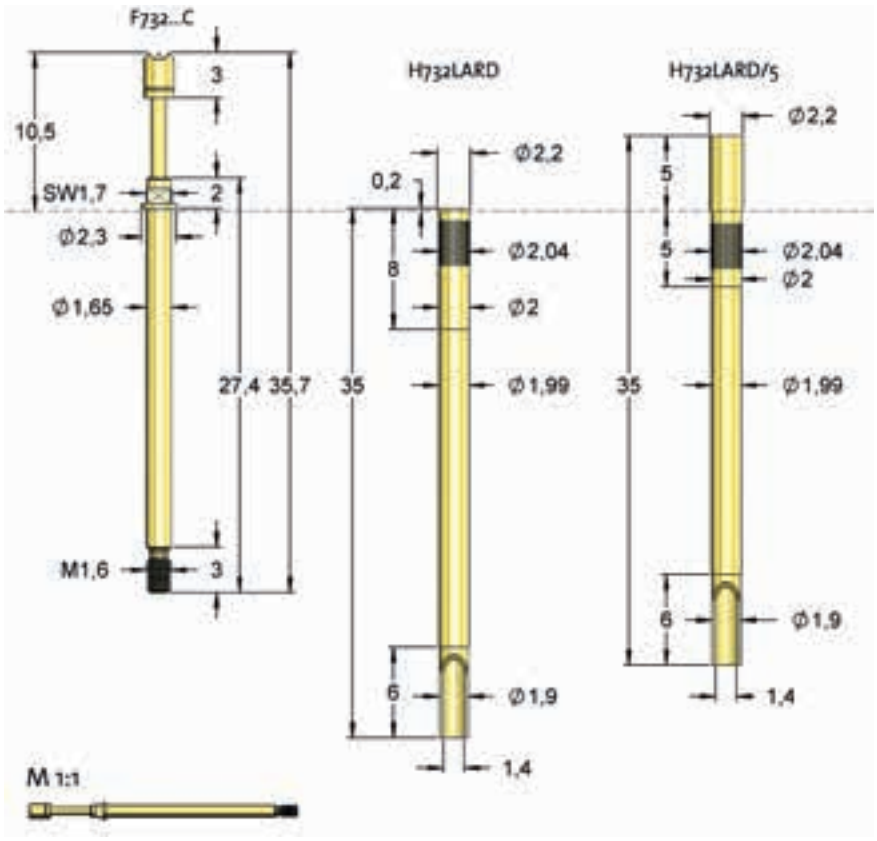
H732...	10,5
H732.../5	15,3
H732.../10	20,3



Type		Tip-Ø		Spring Force	
F 732	06	B	200	G	300	C
	Tip Style	Material		Finish		Special Version

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



This probe is suitable for applications like burn-in test, run-in test or functional test with higher currents. For this probe FEINMETALL offers the conical tip style 05 in a special silver alloy, minimizing contact-burn-off that may occur due to voltages or vibrations. For connecting the probe a flexible wire should be used (2.50 mm² recommended).

Tip Style	Number	Material	Plating	Ø in mm	Version
	05	A	U	2,00	C
	05	B	G	2,00	C
	06	B	G	1,60	C
	06	B	G	1,80	C
	06	B	G	2,00	C
	07	B	G	1,75	C
	11	B	G	0,65	C
	11	B	G	0,80	C
	11	B	G	1,00	C
	12	A	U	2,00	C
	16	B	G	1,00	C
	55	B	G	2,00	C

F772C

Plug-in Probe 100 mil

Centers (mm/mil)	2,54 / 100
Current	20,0 A
Temperature	-40°C...+250°C
R typically	10 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
C	50	150
C	70	220
C	50	300

Travel (mm)

Version	Nominal	Maximum
C	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

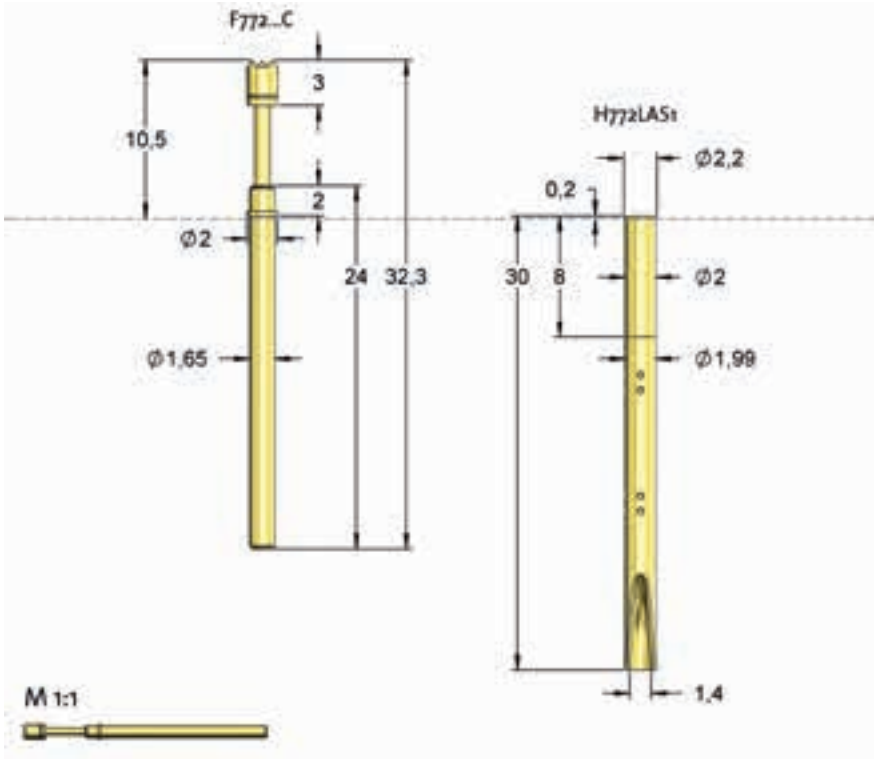
Insertion tool receptacle	FEWZ-772E0
Insertion tool probe	FDWZ-100

Drill Size (mm)

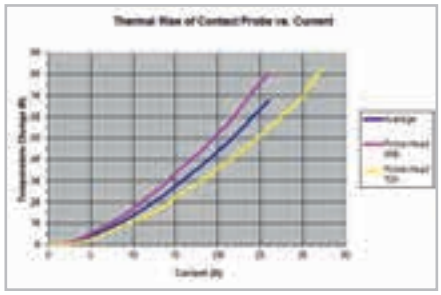
H772LAS1	1,99 - 2,00

Projection Height (mm)

H772LAS1	10,5



This probe is suitable for applications like burn-in test, run-in test or functional test with higher currents. For this probe FEINMETALL offers the conical tip style 05 in a special silver alloy, minimizing contact-burn-off that may occur due to voltages or vibrations. For connecting the probe a flexible wire should be used (2.50 mm² recommended).



Type			Tip-Ø		Spring Force	
F 772	06	B	200	G	300	C
	Tip Style	Material		Finish	Special Version	

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	2,00	C
	05	B	G	2,00	C
	06	B	G	2,00	C
	06	B	G	2,50	C
	07	B	G	2,00	C
	11	B	G	1,00	C
	14	B	G	1,30	C
	14	B	G	2,00	C
	16	B	G	1,00	C
	55	B	G	2,00	C

F773C

Plug-in Probe 138 mil

Centers (mm/mil)	3,50 / 138
Current	25,0 A
Temperature	-40°C...+250°C
R typically	8 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
C	60	150
C	60	300
C	170	600

Travel (mm)

Version	Nominal	Maximum
C	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

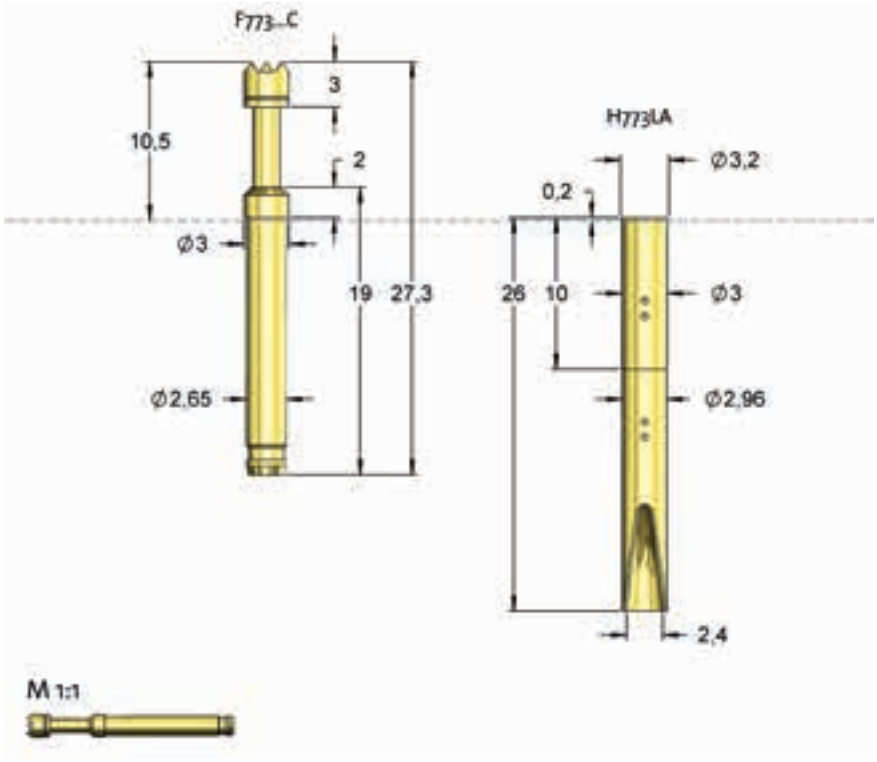
Insertion tool receptacle	FEWZ-774E0

Drill Size (mm)

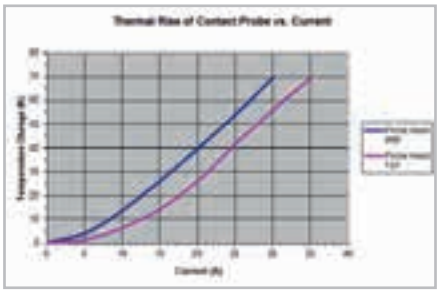
Receptacle without knurl	2,98-2,99

Projection Height (mm)

H773LA	10,5



The connection of the plunger should be realized by a flexible wire (recommended 2,50 mm²) with sufficient space for the movement.



Type		Tip-Ø		Spring Force	
F 773	06	B	400	G	300	C
	Tip Style	Material		Finish	Special Version	

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	A	U	3,00	C
	06	B	G	2,30	C
	06	B	G	3,00	C
	06	B	G	4,00	C
	07	B	G	3,00	C
	11	B	G	1,40	C
	11	B	G	1,80	C
	12	B	G	2,30	C
	14	B	G	2,30	C
	17	B	G	4,00	C
	55	B	G	3,00	C

F723C

Threaded Probe 157 mil, Short Version

Centers (mm/mil)	4,00 / 157
Current	24,0 A
Temperature	-40°C...+250°C
R typically	8 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
C	40	80
C	70	150

Travel (mm)

Version	Nominal	Maximum
C	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

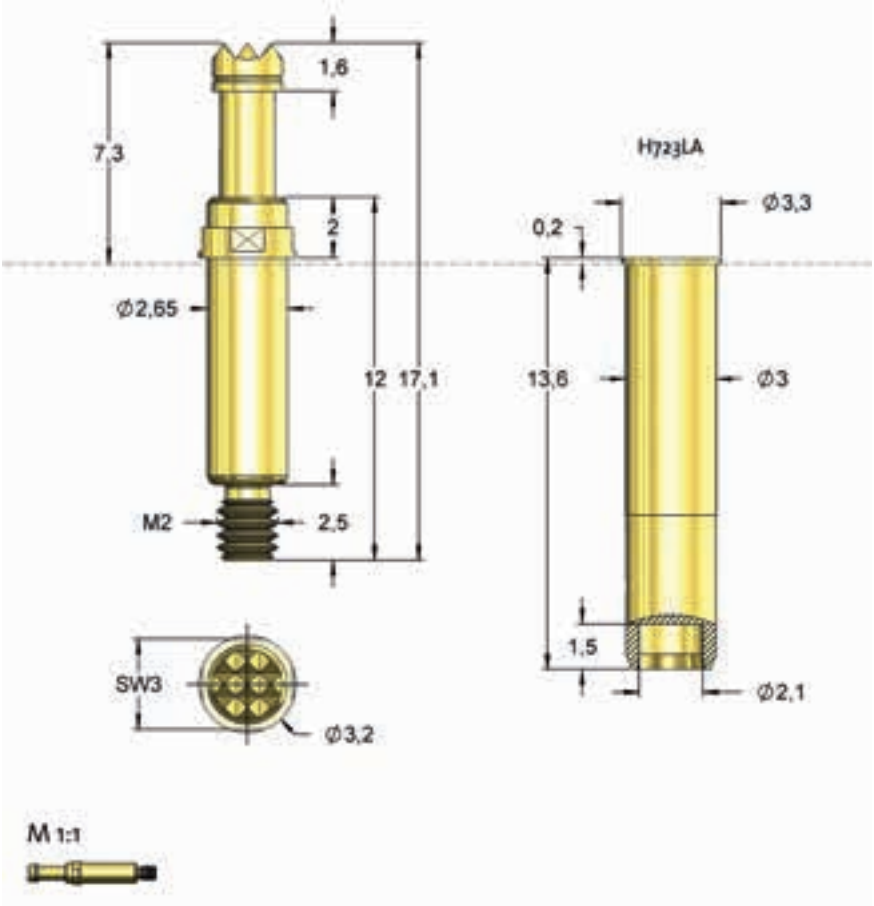
Screw-in tool probe	FWZ733S1 (T1)

Drill Size (mm)

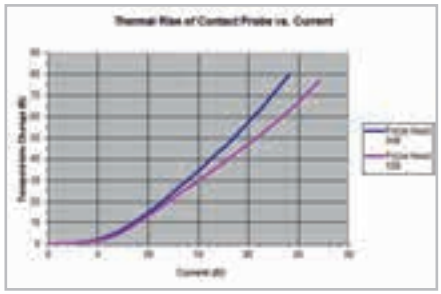
H723	2,98 - 2,99

Projection Height (mm)

H723...	7,3



The version with the nominal force 80 cN is only suitable for currents up to 18 A. For connecting the probe a flexible wire should be used (2.50 mm² recommended).



Type			Tip-Ø		Spring Force	
F 723	06	B	230	G	080	C
	Tip Style	Material		Finish	Special Version	

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	2,30	C
	12	B	G	2,30	C

F733C

Threaded Probe 157 mil

Centers (mm/mil)	4,00 / 157
Current	25,0 A
Temperature	-40°C...+250°C
R typically	8 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
C	60	150
C	60	300
C	170	600

Travel (mm)

Version	Nominal	Maximum
C	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

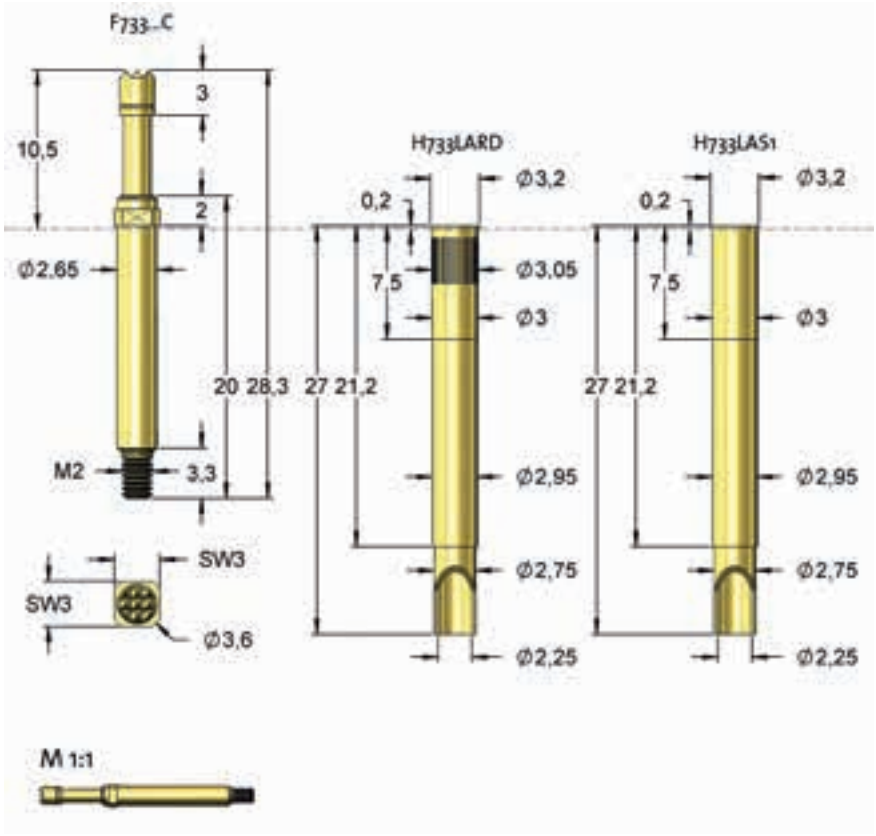
Insertion tool receptacle	FEWZ-774E0
Screw-in tool probe	FWZ733 (T)

Drill Size (mm)

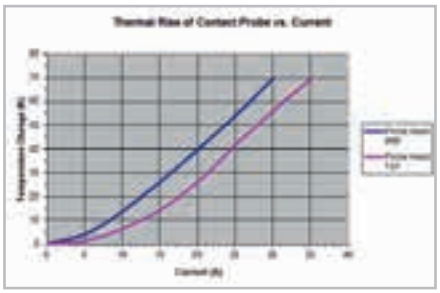
Receptacle without knurl	2,98 - 2,99
Receptacle with knurl	3,00 - 3,02

Projection Height (mm)

H733...	10,5



The connection of the plunger should be realized by a flexible wire (recommended 2,50 mm²) with sufficient space for the movement.



Type			Tip-Ø		Spring Force	
F 733	06	B	300	G	150	C
	Tip Style	Material		Finish	Special Version	

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	3,00	C
	06	B	G	1,80	C
	06	B	G	2,30	C
	06	B	G	3,00	C
	06	B	G	4,00	C
	07	B	G	3,00	C
	11	B	G	1,40	C
	12	A	U	3,00	C
	12	B	G	2,30	C
	14	B	G	2,30	C
	16	B	G	1,00	C

F762C

Threaded Probe for Contacting Flat Blade Connectors

Centers (mm/mil)	4,00 / 157
Current	40,0 A
Temperature	-40°C...+250°C
R typically	5 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
C	70	300

Travel (mm)

Version	Nominal	Maximum
C	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
Receptacle	Brass, Gold plated

Accessories

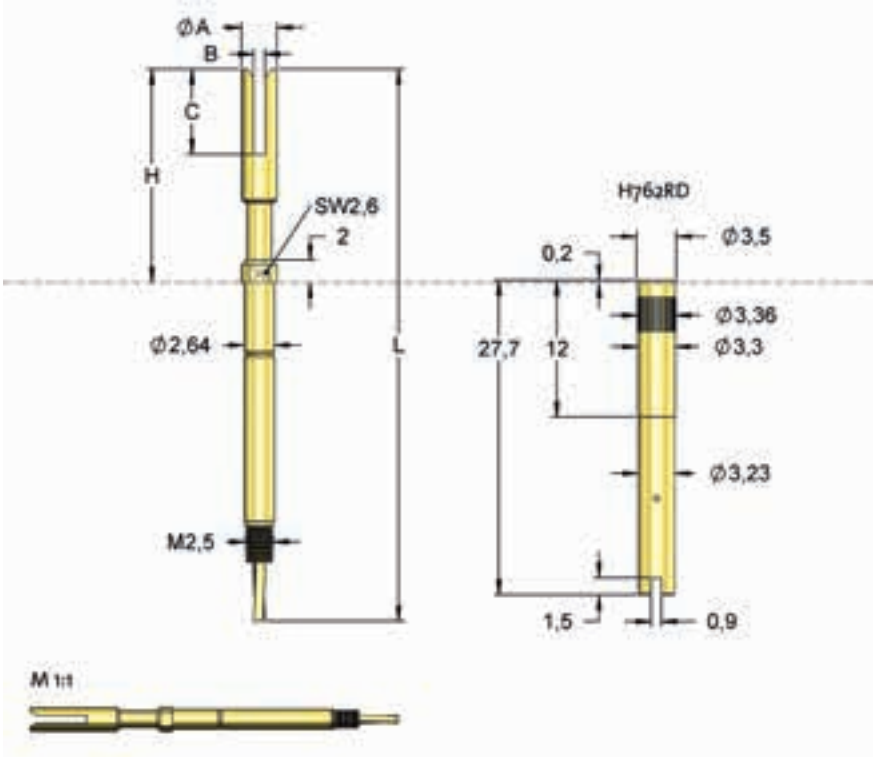
Alignment tool receptacle	FAWZ761
Screw-in tool probe	FWZ885S1 (T1)

Drill Size (mm)

H762RD	3,30 - 3,35

Projection Height (mm)

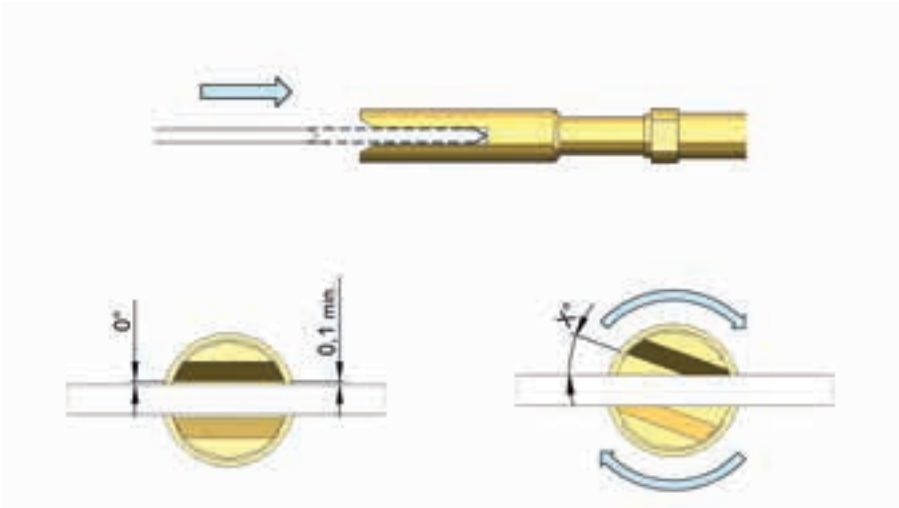
H762...	19,0



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.
For connecting the probe a flexible wire (6.0 – 10,0 mm² recommended) should be used.

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.



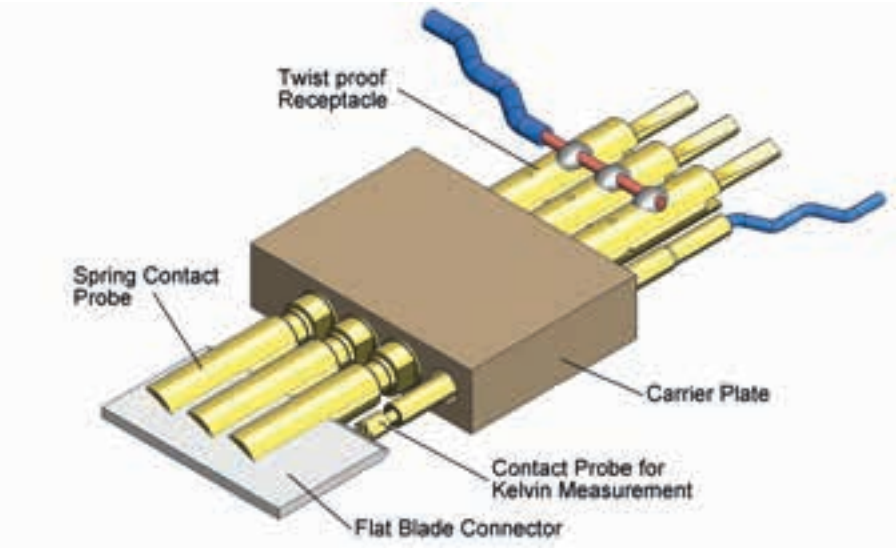
F762C

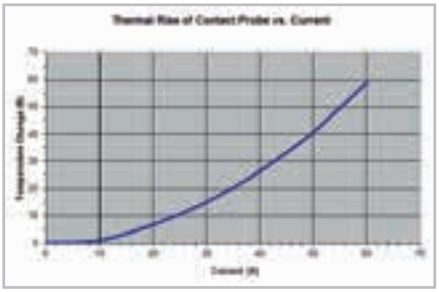
Threaded Probe for Contacting Flat Blade Connectors

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).



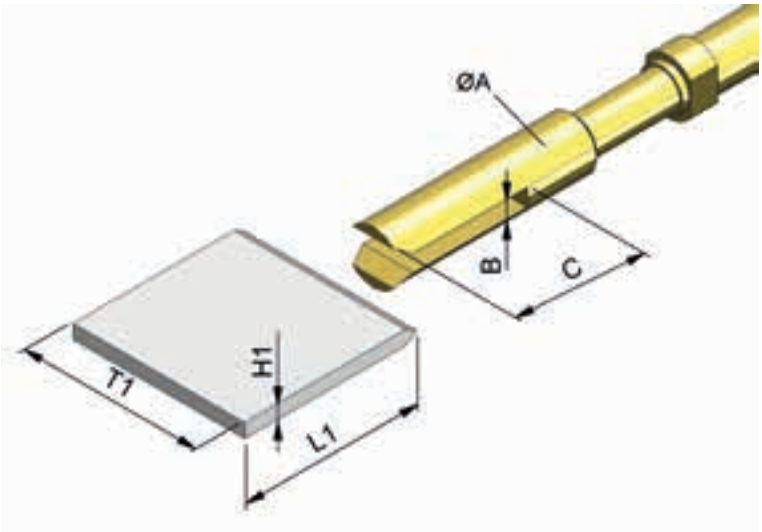


Type			number		Spring Force	
F 762	89	B	0001	G	300	C
	Tip Style	Material		Finish		Special Version

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**	**ØA [mm]**	**B [mm]**	**C [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
min. 3,2	0,5 - 0,8	min. 3,0	F76289B0005G300C	3,1	1,0	2,5	FWZ760S1; FWZ760T1

F775C

Plug-in Probe 197 mil

Centers (mm/mil)	5,00 / 197
Current	50,0 A
Temperature	-40°C...+250°C
R typically	5 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
C	150	300
C	150	500

Travel (mm)

Version	Nominal	Maximum
C	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

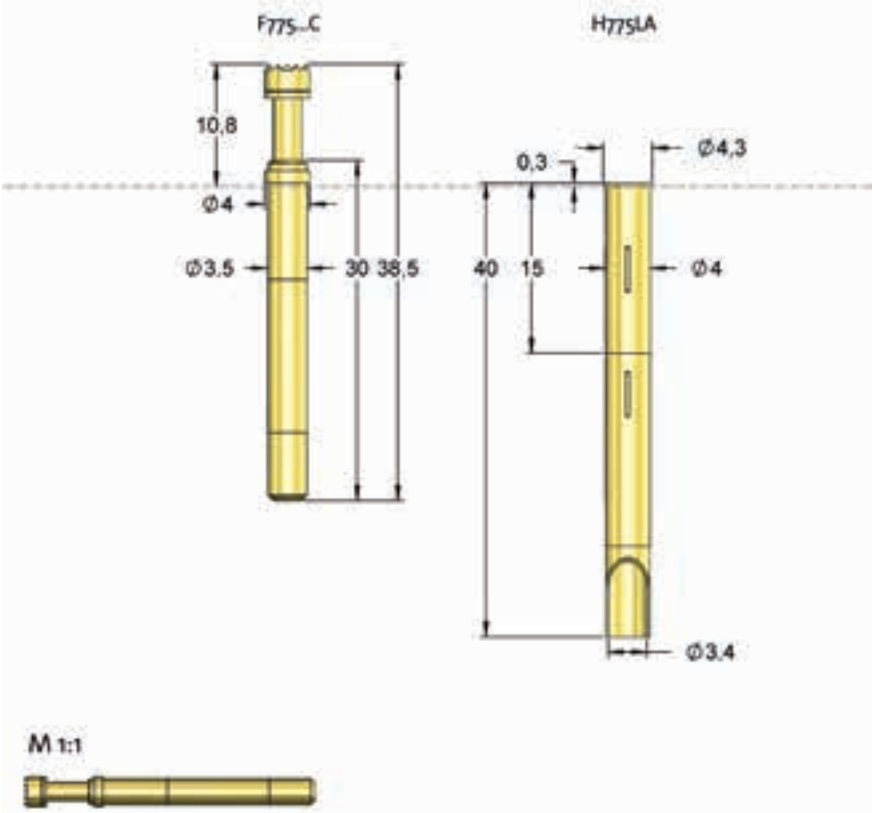
Insertion tool receptacle	FEWZ-735E0

Drill Size (mm)

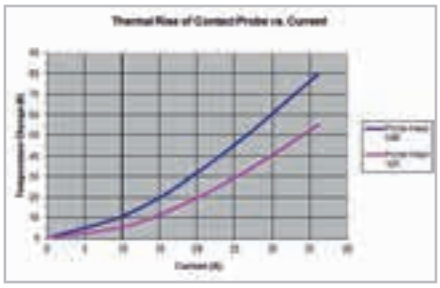
H775LA	3,98 - 3,99

Projection Height (mm)

H775...	10,8



The connection of the plunger should be realized by a flexible wire (recommended 10,0 mm²) with sufficient space for the movement.



Type		Tip-Ø	Spring Force	
F 775	06	B	400	G	300	C
	Tip Style	Material		Finish	Special Version	

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	4,00	C
	06	B	G	4,00	C
	07	B	G	3,00	C
	12	A	U	4,00	C
	17	B	G	4,00	C
	55	B	G	4,00	C

F735C

Threaded Probe 197 mil

Centers (mm/mil)	5,00 / 197
Current	50,0 A
Temperature	-40°C...+250°C
R typically	5 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
C	150	300
C	150	500

Travel (mm)

Version	Nominal	Maximum
C	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

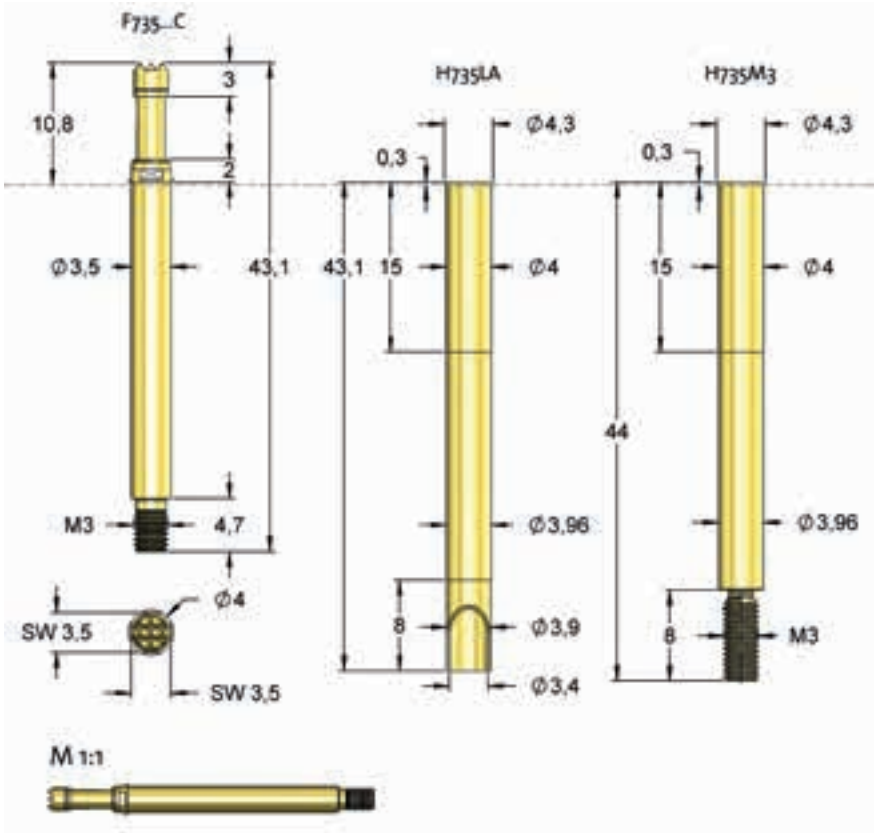
Insertion tool receptacle	FEWZ-735E0
Screw-in tool probe	FWZ735 (T)

Drill Size (mm)

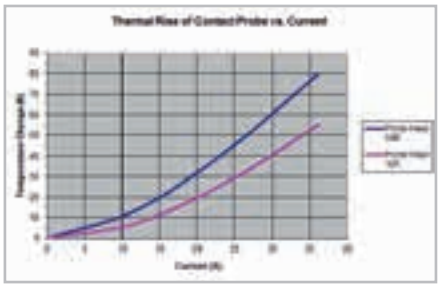
H735...	3,98 - 3,99

Projection Height (mm)

H735...	10,8



The connection of the plunger should be realized by a flexible wire (recommended 10,0 mm²) with sufficient space for the movement.



Type		Tip-Ø		Spring Force	
F 735	06	B	400	G	300	C
	Tip Style	Material		Finish	Special Version	

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	3,00	C
	06	B	G	4,00	C
	07	B	G	3,00	C
	12	A	U	4,00	C
	12	B	G	4,00	C
	17	B	G	4,00	C
	55	B	G	4,00	C

1860C007

High Current Kelvin Probe up to 60 A

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%)

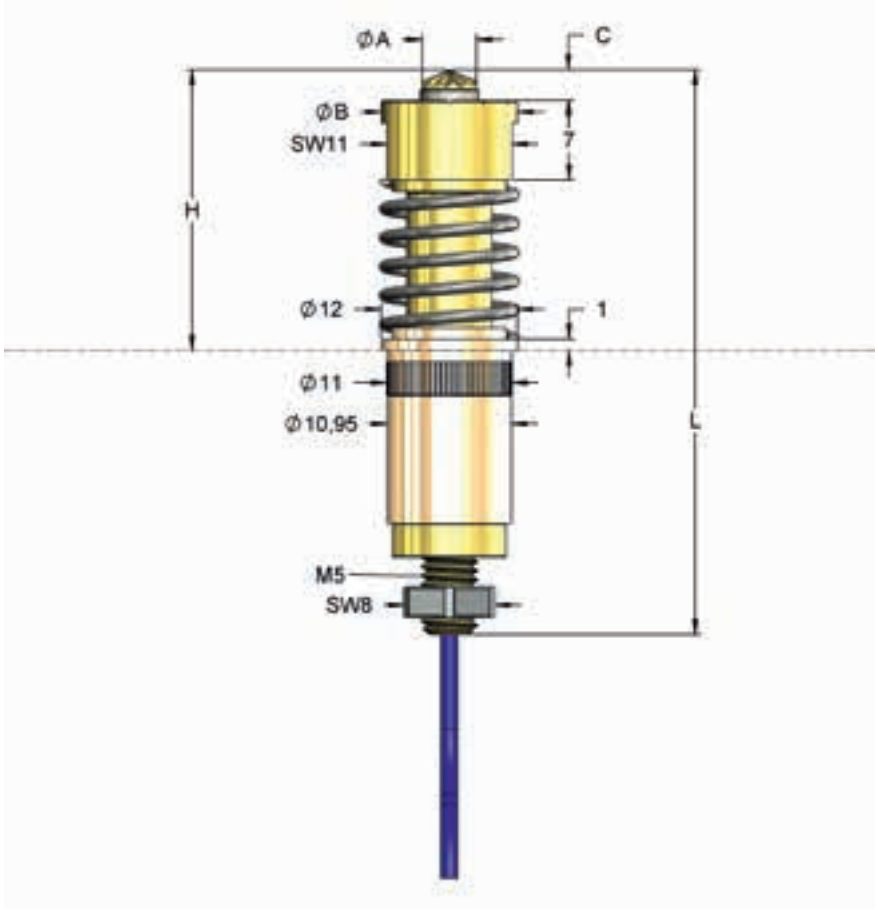
	Preload	Nominal
total	-	3100
Internal Contact	160	300
Circular Contact	1900	2800

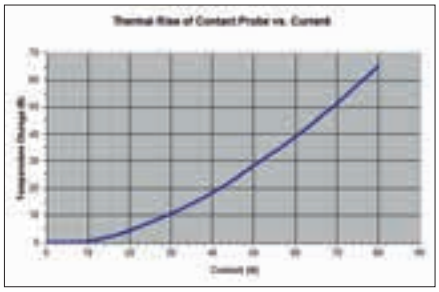
Travel (mm)

	Nominal	Maximum
Internal Contact	1,5	3,0
Circular Contact	5,0	8,0
Wrench Size	10,0	
Thread	M5	

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





Part Number	Typ Style	Typ Style	Ø A	Ø B	C	H	L	Version	Screw-in Tool
1860C007		07	4,80	12,00	2,70	24,70	49,70	-	-

1860C004

High Current Kelvin Probe up to 150 A

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%)

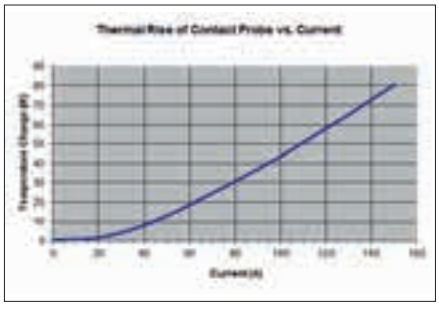
	Preload	Nominal
total	-	3150
Internal Contact	130	300
Circular Contact	1000	2850

Travel (mm)

	Nominal	Maximum
Internal Contact	2,8	3,5
Circular Contact	5,6	7,0
Wrench Size	19,0	
Thread	M10	

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

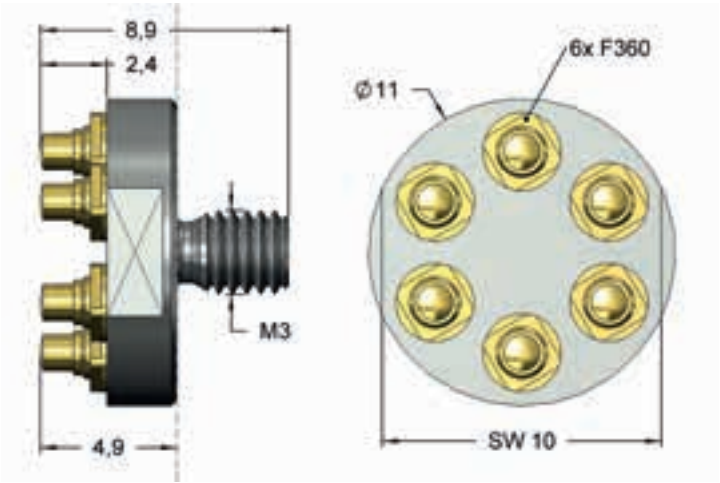


Part Number	Typ Style	Typ Style	Ø A	Ø B	C	H	L	Version	Screw-in Tool
1860C004		07	7,40	20,00	3,50	30,50	61,80	-	-

1860C001

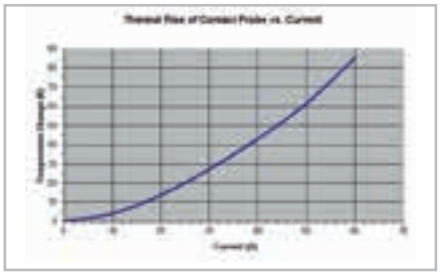
High Current Test Head up to 50 A

Centers (mm/mil)	12,0 / 472
Current	50,0 A
Temperature	-40°C...+250°C
R typically	<4 mOhm



Spring Force (cN ±20%)

Version	Preload	Nominal
C	300	480



Travel (mm)

Version	Nominal	Maximum
C	1,0	1,2
Thread (M)		3,0
Wrench Size		10,0

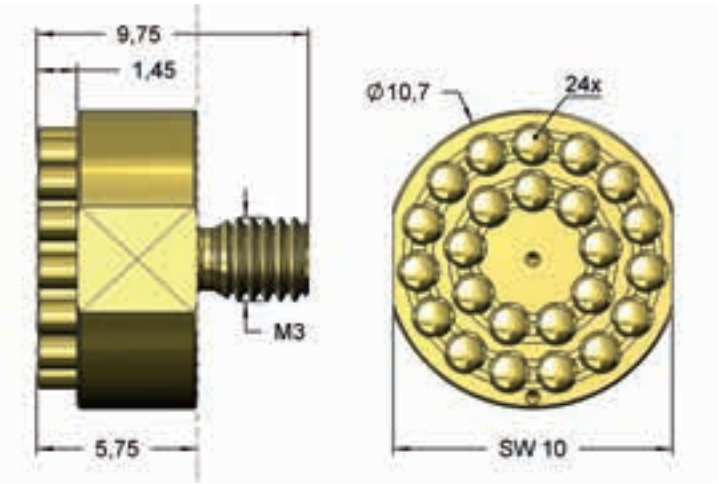
Materialien und Oberflächen

Plunger	BeCu, gold plated
Barrel	Brass, nickel plated
Spring	Stainless steel, unplated

1860C006

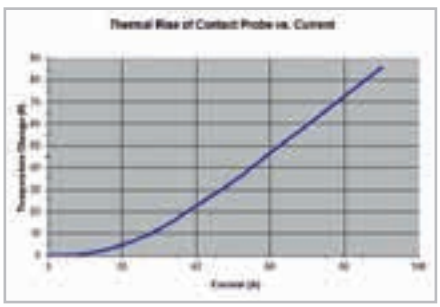
High Current Test Head up to 75 A

Centers (mm/mil)	12,0 / 472
Current	75,0 A
Temperature	-40°C...+250°C
R typically	2 mOhm



Spring Force (cN ±20%)

Version	Preload	Nominal
C	960	1920



Travel (mm)

Version	Nominal	Maximum
C	0,9	1,2
Thread (M)		3,0
Wrench Size		10,0

Materials and Plating

Plunger	BeCu, gold plated
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. The connection of the plunger should be realized by a flexible wire (recommended 16,0 mm²) with sufficient space for the movement.

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).

Kinds of Switch Probes

Standard Switch Probes

Standard switch probes are available in plug-in and threaded versions. The switch function can work as opener (NC, normally closed) or as closer (NO, normally open). Standard switch probes are available in many different diameters and lengths for a great variety of applications.

Switch Probes for Backward Assembly

Switch probes for backward assembly have been designed for applications with difficult access of the probes from the front.

Potential-free Switch Probes

Potential-free switch probes have an electrically separated switch circuit.
This allows building short-circuit-proof fixtures of modules with electrically isolated circuits for logic and test current.

Switch Probe with Ball Head

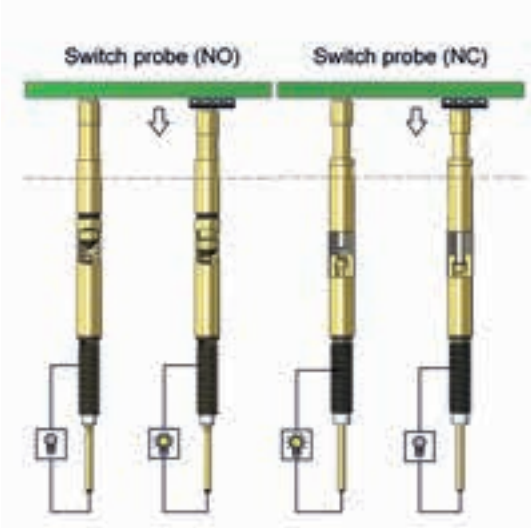
Switch probes with ball head have a rolling ball as contact element which makes them immune to lateral forces and avoids scratches at the contact surface. The most common application is the lateral presence test of connector housings in test modules.

Switch Probe with Off-On-Off Characteristic

The new special FEINMETALL switch probes allow realizing exact position tests of components or connector elements with little effort. While common switch probes only have one switch point after a specific travel, the new special switch probes have two different integrated switch points in the distance of exactly 1 mm. When pushing the plunger after a certain travel the switch circuit is closed and after a further millimeter travel it is opened again – and this with a switch point accuracy of ± 0,2 mm. This so called Off-On-Off-Characteristic enables to test correct positions just by using one single switch probe. Typical applications are e.g. detecting the correct length of connector pins or the correct depth of holes in a DUT.

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:

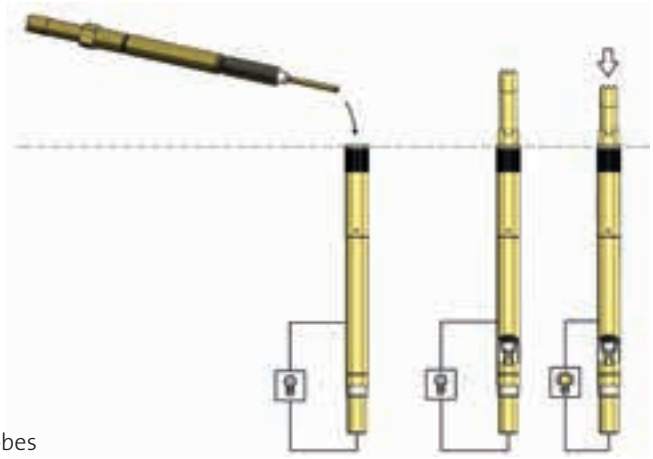
- → presence test of components or connectors
- → voltage-free detection with synthetic heads
- → short-cicuit-proof modules by electrically isolated switch elements (voltage-free system)
- → installation of intrinsically save circuits (only with NC-versions, e.g.F873, F883)

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.



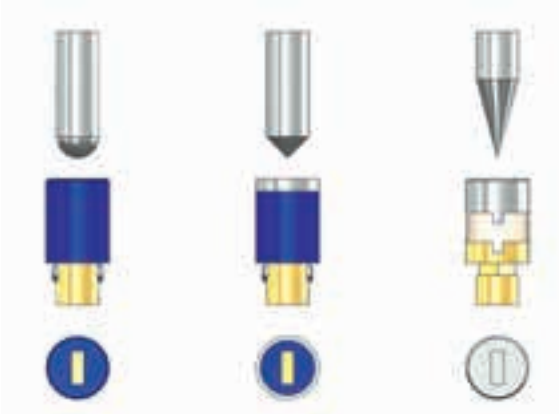
Advantages of the combi receptacle

- → 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.



K	H	T

F863

NEW

Standard Switch Probe Closer (NO), threaded

Centers (mm/mil)	1,90 / 75
Current	2,0 A
Current (Switch)	1,0 A
Temperature	-20°C...+80°C
R typically	65 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
L	50	150
standard	20	80
standard	50	150

Federwege (mm)

Version	Nominal	Maximum
L	4,0	5,0
standard	4,0	5,0
Switch Travel (mm)		3,5
Thread (M)		1,0
Wrench Size		1,0
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

Zubehör

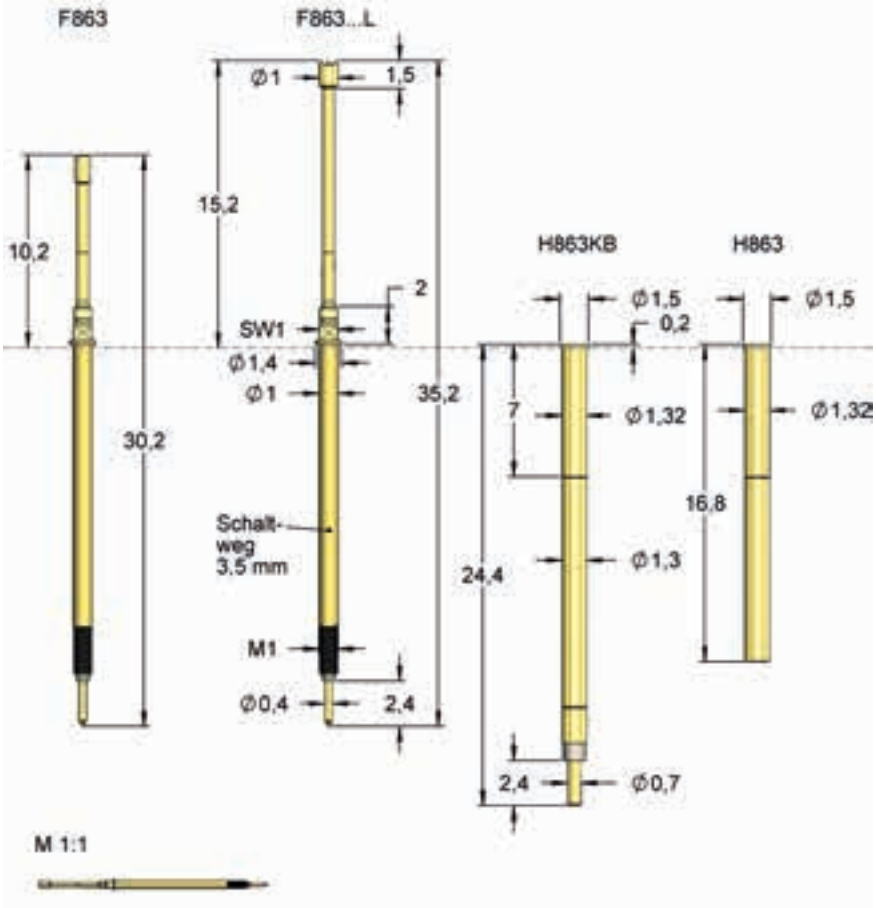
Insertion tool receptacle	FEWZ-100E0
Insertion tool probe	FWZ730 (T) max. <Ø0,9 mm
Insertion tool probe	FWZ730S1 (T1) max. <Ø1,5 mm

Drill Size (mm)

H863...	1,32 - 1,34

Projection Height (mm)

H863... (F863)	10,2
H863... (F863...L)	15,2



Smallest threaded Switch Probe. For applications in modules down to 75 mil centers. Ideal in combination with combi-receptacle.

Type			Tip-Ø		Spring Force	
F 863	06	B	100	G	150	L
	Tip Style	Material		Finish	Special Version	

Material:	B = BeCu
Tip-Ø:	100 = 1.00 mm (e.g.)
Finish:	G = Gold
Special Version:	L = Longtime gold plated
Receptacle:	Order Code according drawing

ORDER EXAMPLE

Tip Style	Number	Material	Plating	Ø in mm	Version
	06	B	G	1,00	L
	11	B	G	0,50	-
	11	B	G	0,64	L
	12	B	G	0,75	L
	17	B	G	0,80	-

F864

NEW

Standard Switch Probe Closer (NO)

Centers (mm/mil)	2,54 / 100
Current	1,0 A
Current (Switch)	1,0 A
Temperature	-20°C...+80°C
R typically	25 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	60	200

Travel (mm)

Version	Nominal	Maximum
standard	5,0	6,3
Switch Travel (mm)		4,0
Pointing Accuracy		±0,08 mm

Materials and Plating

Plunger	see tip style
Barrel	Nickel silver, gold plated
Spring	Music wire, gold plated
Receptacle	Nickel silver, Gold plated

Accessories

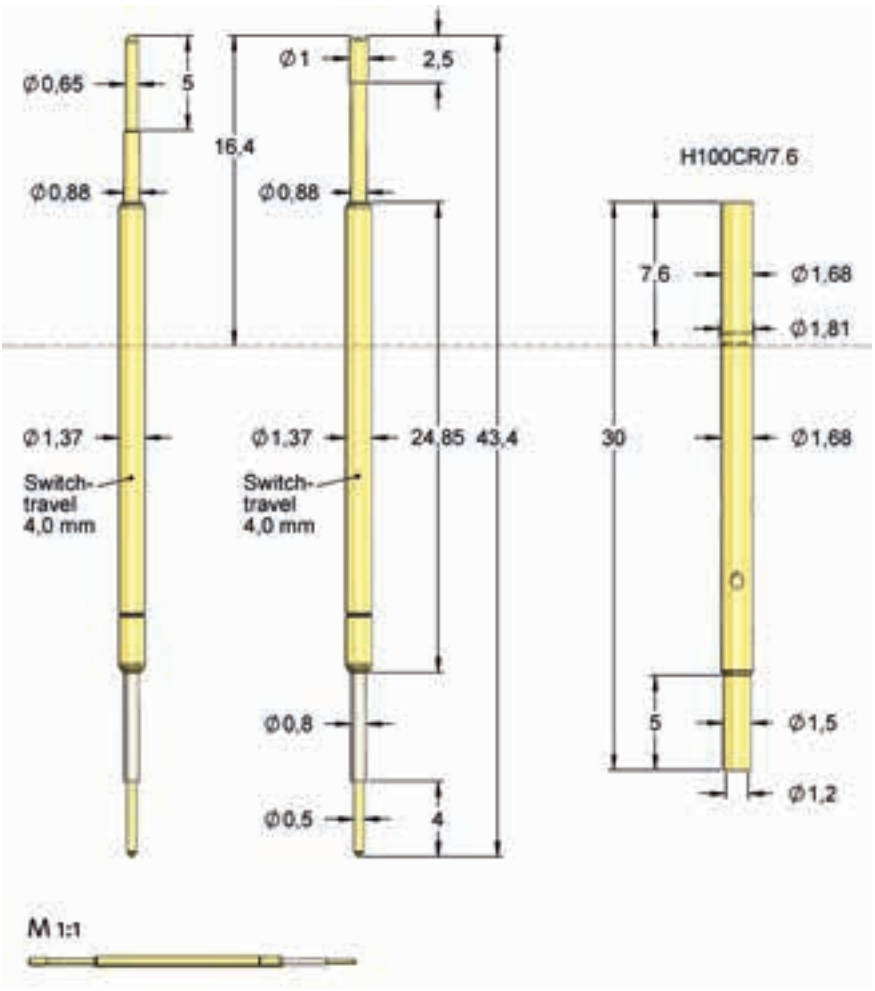
Insertion tool receptacle	FEWZ-100E0
Insertion tool probe	FDWZ-100

Drill Size (mm)

H100 Press ring as stop	1,67 -1,69
H100 Press ring inserted	1,70 - 1,75

Projection Height (mm)

H100CR/7.6	16,4



Type			Tip-Ø		Spring Force	
F 864	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	1,30	-
	11	B	G	1,00	-

F879

Short Switch Probe Closer (NO)

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%)

Version	Preload	Nominal
standard	50	200

Travel (mm)

Version	Nominal	Maximum
standard	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
Receptacle	Brass, Gold plated

Accessories

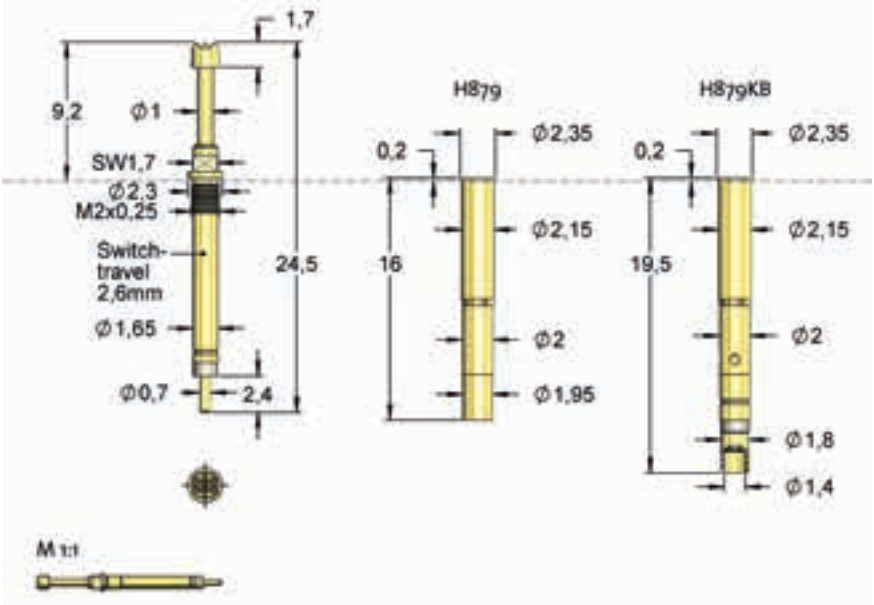
Insertion tool receptacle	FEWZ-772E0
Screw-in tool probe	FWZ732 (T)

Drill Size (mm)

Receptacle without knurl	2,14 - 2,16

Projection Height (mm)

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 = isulated 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	1,80	-
	11	B	G	1,00	-
	16	B	G	1,00	-
	17	B	G	1,80	-
	17	T	N	2,00	-

H875

Receptacles for Switch Probe Families F875, F873 and F375

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

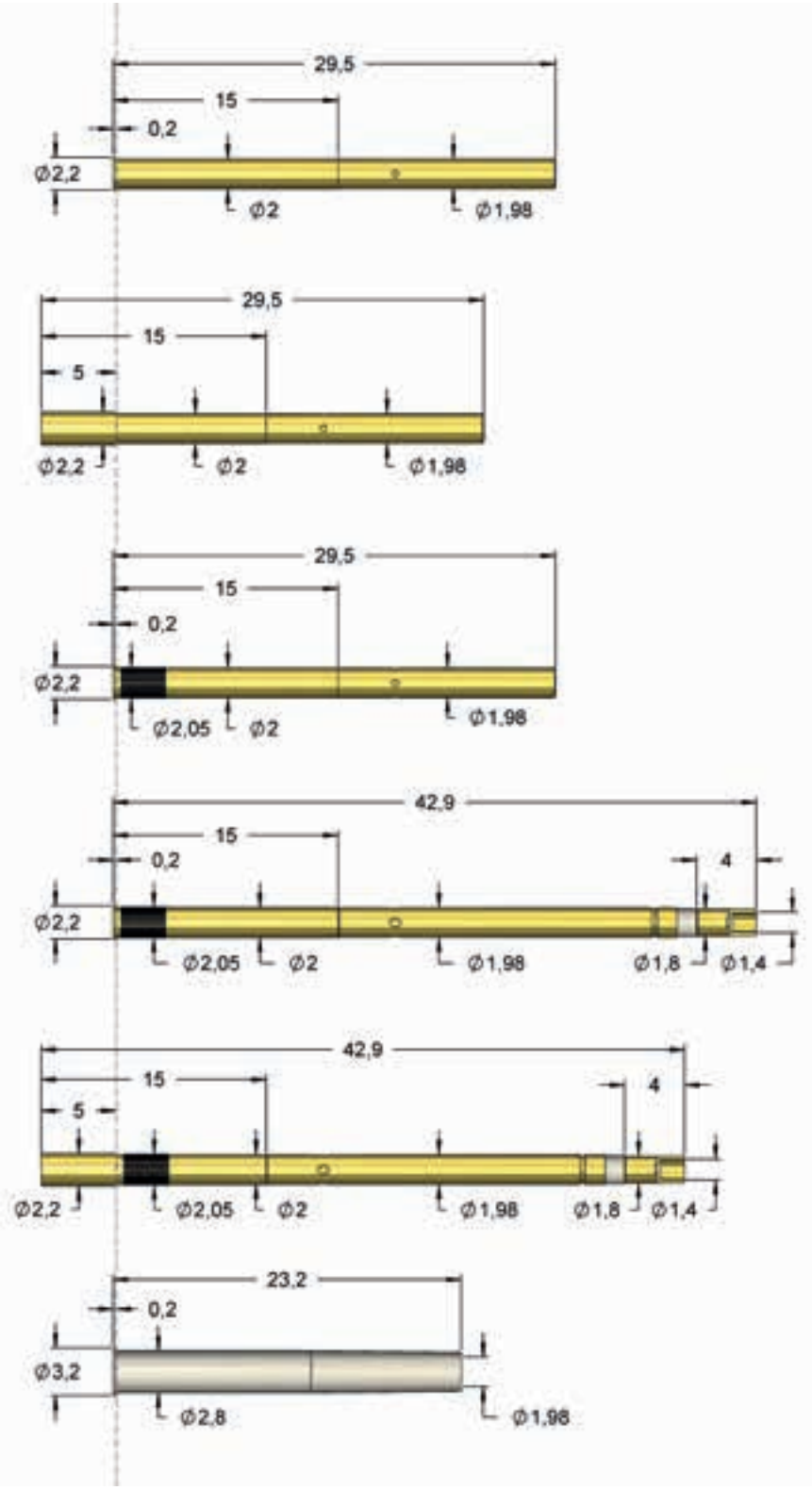
By usage of the combi-receptacle H875KB the switch probes can be replaced solder less, saving time and cost for maintenance. The projection height is also variable as for H785:
F873: 10,4 – 15,4 mm F875: 10,4 – 15,4 mm
F375: 15,0 – 20,0 mm F875 ... L: 16,9 – 21,9 mm
Max. solder temperature 300˚C.
Material: 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). Due to the sleeve collar the projection height is increase by 0,2 mm.
Maximum temperature: 300˚C
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.

F875

Standard Switch Probe Closer (NO)

UTILITY MODEL

Centers (mm/mil)	2,54 / 100
Current	5,0 A
Current (Switch)	1,0 A
Temperature	-20°C...+80°C
R typically	65 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
L	30	135
L	60	200
L	60	300
L	80	350
standard	20	80
standard	30	135
standard	60	200
standard	60	300
standard	80	350
standard	170	500

Travel (mm)

Version	Nominal	Maximum
L	4,0	5,0
standard	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

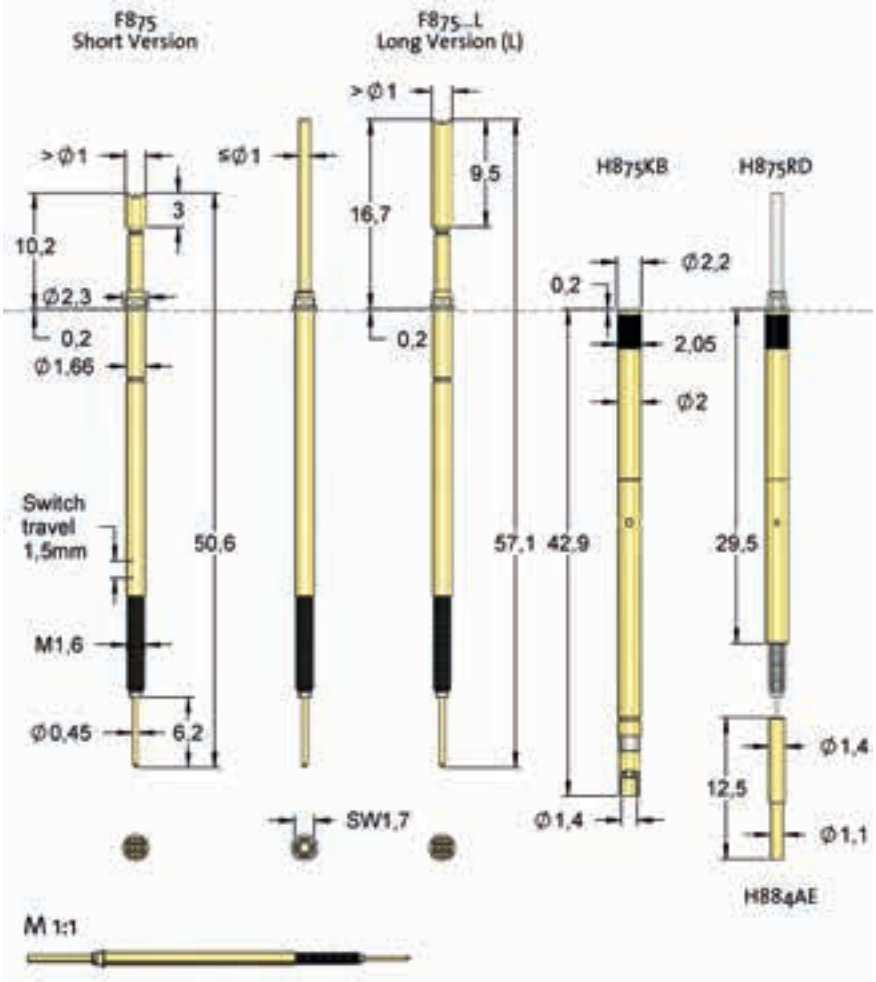
Plunger	see tip style
Barrel	Brass, gold plated
Spring	Music wire, silver plated
Receptacle	Brass, Gold plated

Accessories

Insertion tool receptacle	FEWZ-772E0
Screw-in tool probe	FWZ732 (T) max. Ø 2,0 mm
Screw-in tool probe	FWZ732S1 (T1) max. Ø 2,7 mm

Projection Height (mm)

(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



Drill Size (mm)

Receptacle without knurl	1,99 - 2,00
Hülse mit Receptacle with knurl	2,02 - 2,03

Tip Style	Number	Material	Plating	Ø in mm	Version
	05	B	G	1,80	-
	06	B	G	1,00	L
	06	B	G	1,30	-
	06	B	G	1,40	L
	06	B	G	1,50	-
	06	B	G	1,80	-
	06	B	G	1,80	L
	06	B	G	2,00	-
	06	B	G	2,30	-
	11	B	G	0,64	-
	11	B	G	1,00	-
	11	B	G	1,00	L
	16	B	G	0,60	-

F875

Standard Switch Probe Closer (NO)

Type			Tip-Ø		Spring Force	
F 875	16	B	100	G	135	L
	Tip Style	Material		Finish		Special Version

Material:	B = BeCu, K = Syntetic, T = isulated 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

Tip Style	Number	Material	Plating	Ø in mm	Version
	16	B	G	0,64	-
	16	B	G	0,70	-
	16	B	G	0,80	-
	16	B	G	1,00	-
	16	B	G	1,00	L
	17	B	G	1,80	-
	17	B	N	1,80	-
	17	B	G	2,00	-
	17	K	U	1,80	-
	17	K	U	2,30	-

F873

Standard Switch Probe Opener (NC)

UTILITY MODEL

Centers (mm/mil)	2,54 / 100
Current	5,0 A
Current (Switch)	1,0 A
Temperature	-20°C...+80°C
R typically	65 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	50	250

Travel (mm)

Version	Nominal	Maximum
standard	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

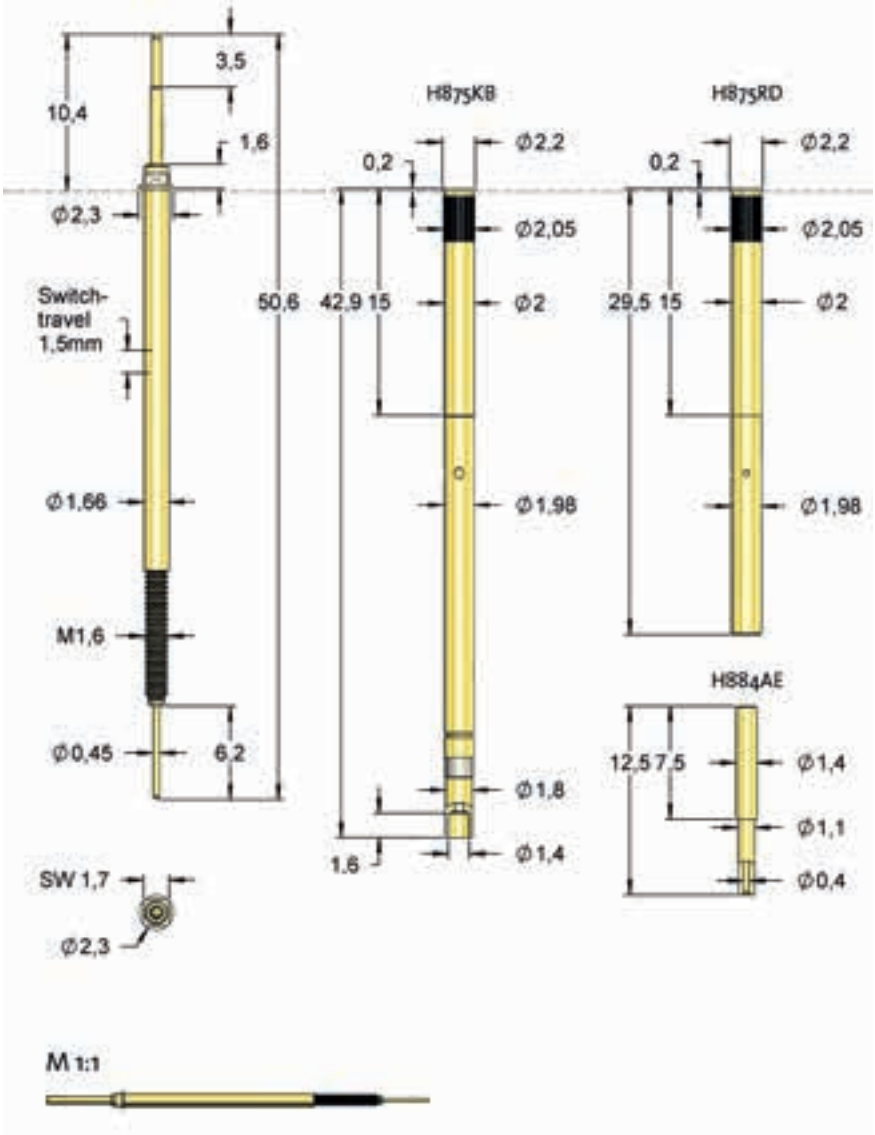
Insertion tool receptacle	FEWZ-772E0
Screw-in tool probe	FWZ732 (T) max. Ø 2,0 mm
Screw-in tool probe	FWZ732S1 (T1) max. Ø 2,7 mm

Drill Size (mm)

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

Projection Height (mm)

(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	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
	11	B	G	0,64	-
	16	B	G	1,00	-

F375

Long Travel Switch Probe Closer (NO)

Centers (mm/mil)	2,54 / 100
Current	5,0 A
Current (Switch)	1,0 A
Temperature	-20°C...+80°C
R typically	50 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	30	200

Travel (mm)

Version	Nominal	Maximum
standard	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

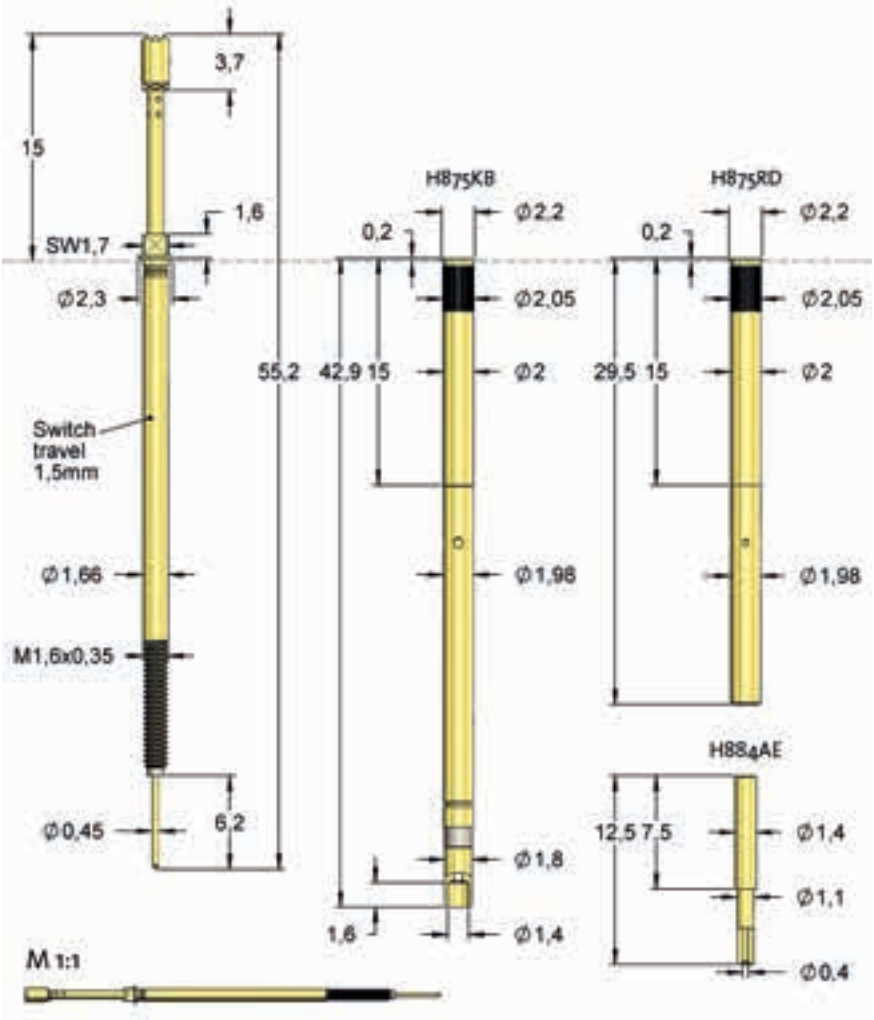
Insertion tool receptacle	FEWZ-772E0
Screw-in tool probe	FWZ732 (T) max. Ø2,0 mm
Screw-in tool probe	FWZ732S1 (T1) max. Ø2,7 mm

Drill Size (mm)

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

Projection Height (mm)

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	Special Version

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	1,80	-
	17	B	G	1,80	-

F885

Standard Switch Probe Closer (NO)

UTILITY MODEL

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%)

Version	Preload	Nominal
LM	50	200
LM	80	350
LM	120	550
LM	220	900
LM	300	1250
SM	30	70
SM	50	200
SM	80	350
SM	120	550
SM	220	900
SM	300	1250

Travel (mm)

Version	Nominal	Maximum
LM	4,0	5,0
SM	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

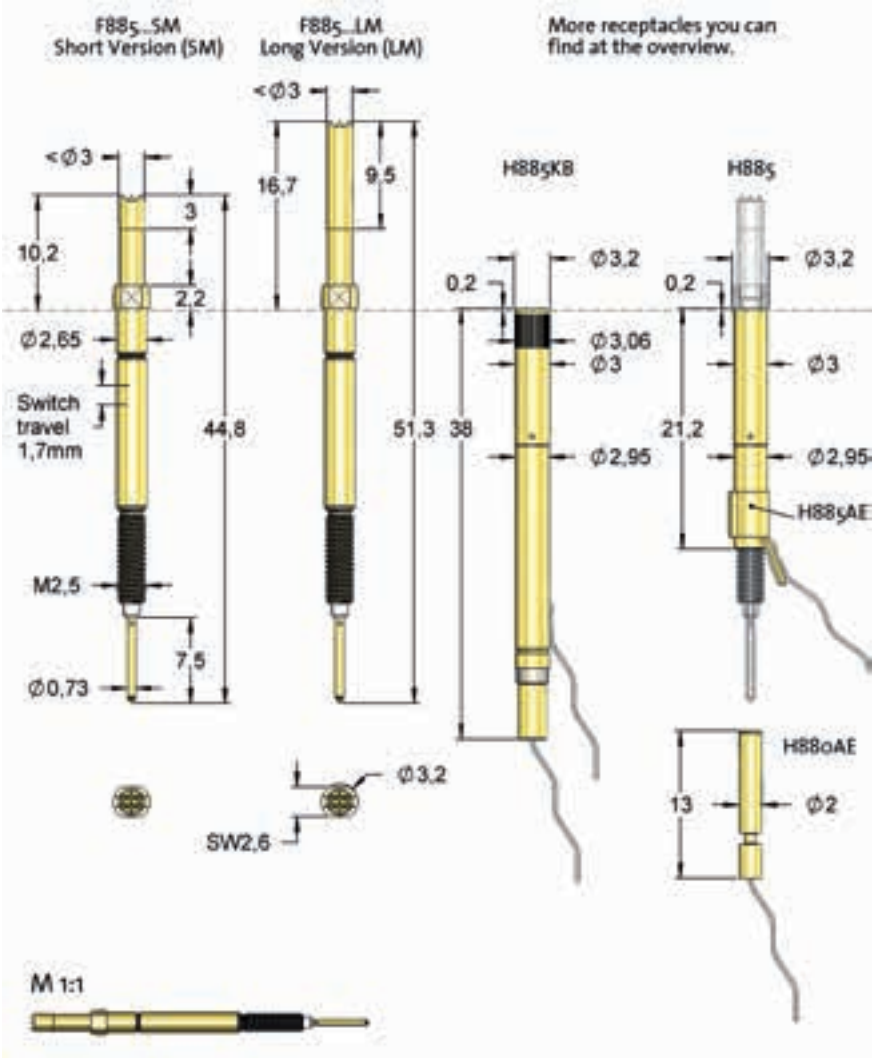
Plunger	see tip style
Barrel	Brass, gold plated
Spring	Music wire, silver plated
Receptacle	Brass, Gold plated

Drill Size (mm)

Receptacle without knurl	2,98 -2,99
Receptacle with knurl	3,00 -3,02

Projection Height (mm)

(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



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	0,80	SM
	05	B	G	2,30	LM
	05	B	G	2,30	SM
	05	B	G	3,00	LM
	05	B	G	3,00	SM
	06	B	G	0,70	SM
	06	B	G	1,00	LM
	06	B	G	1,00	SM
	06	B	G	1,30	SM
	06	B	G	1,40	LM
	06	B	G	1,80	LM
	06	B	G	1,80	SM
	06	B	G	2,30	LM
	06	B	G	2,30	SM

F885

Standard Switch Probe Closer (NO)

UTILITY MODEL

Accessories

Insertion tool receptacle	FEWZ-774E0
Screw-in tool probe	FWZ885 (T) max. Ø2,5 mm
Screw-in tool probe	FWZ885S1 (T1) max. Ø3,1 mm

Type			Tip-Ø		Spring Force	
F 885	06	B	230	G	1250	SM 35
	Tip Style	Material		Finish		Special Version

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

Tip Style	Number	Material	Plating	Ø in mm	Version
	16	B	G	1,00	LM
	16	B	G	1,00	SM
	16	B	G	1,20	LM
	16	B	G	1,40	SM
	16	B	G	1,80	SM
	17	B	G	2,30	SM
	17	K	U	2,30	LM
	17	K	U	2,30	SM
	55	B	G	2,30	LM

F886

Standard Switch Probe Closer (NO)

UTILITY MODEL

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%)

Version	Preload	Nominal
LM	34	70
LM	30	120
LM	50	200
LM	80	350
LM	220	900
SM	34	70
SM	30	120
SM	50	200
SM	80	350
SM	220	900

Travel (mm)

Version	Nominal	Maximum
LM	4,0	4,2
SM	4,0	4,2
Switch Travel (mm)		1,7
Thread (M)		2,5
Wrench Size		2,6
Pointing Accuracy		±0,09 mm

Materials and Plating

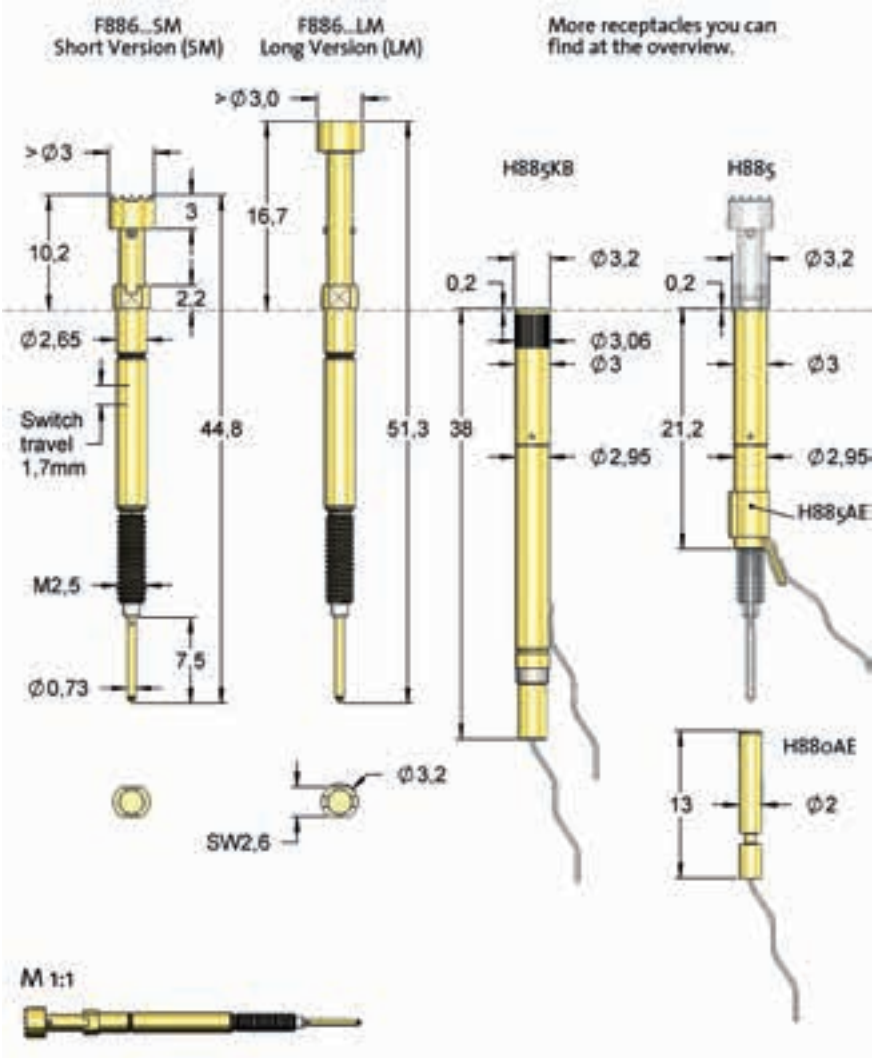
Plunger	see tip style
Barrel	Brass, gold plated
Spring	Music wire, silver plated
Receptacle	Brass, Gold plated

Accessories

Insertion tool receptacle	FEWZ-774E0
Screw-in tool probe	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



Variants with a switch travel of 3,5 mm available on request.
(e.g.F88617B300G900SM35 available).

Tip Style	Number	Material	Plating	Ø in mm	Version
	06	B	G	3,00	LM
	06	B	G	3,00	SM
	06	B	G	4,00	SM
	17	B	G	3,00	LM
	17	B	G	3,00	SM
	17	B	G	3,50	LM
	17	B	G	3,50	SM
	17	B	G	4,00	LM
	17	B	G	4,00	SM
	17	B	G	4,50	LM
	17	B	G	4,50	SM
	17	B	G	5,00	SM
	17	B	G	5,50	SM
	17	B	G	5,90	LM
	17	B	G	5,90	SM

F886

Standard Switch Probe Closer (NO)

Projection Height (mm)

(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

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, H = Synthetic Head with Ring, T = BeCu-Head isulated, 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, E14 = Projection Height 14 mm
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
	17	H	U	3,00	LM
	17	H	U	3,00	SM
	17	H	U	3,50	LM
	17	H	U	3,50	SM
	17	H	U	4,00	LM
	17	H	U	4,00	SM
	17	H	U	4,50	LM
	17	H	U	4,50	SM
	17	H	U	5,00	LM
	17	H	U	5,00	SM
	17	H	U	5,50	SM
	17	H	U	6,00	SM
	17	K	U	3,00	LM
	17	K	U	3,00	SM
	17	K	U	3,50	LM
	17	K	U	3,50	SM
	17	K	U	4,00	SM
	17	K	U	4,50	SM
	17	K	U	5,00	SM
	17	K	U	5,50	SM
	17	K	U	5,90	SM
	17	T	N	3,00	SM
	17	T	N	3,50	SM
	17	T	N	5,00	SM

H885

Receptacles for Switch Probe Families F883, F885, F886 and F385

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 F885F886 ... 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.
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
Max. solder temperature 300˚C.

Material: Brass, Gold plated

Receptacle H885KB /5 - for solderless exchange

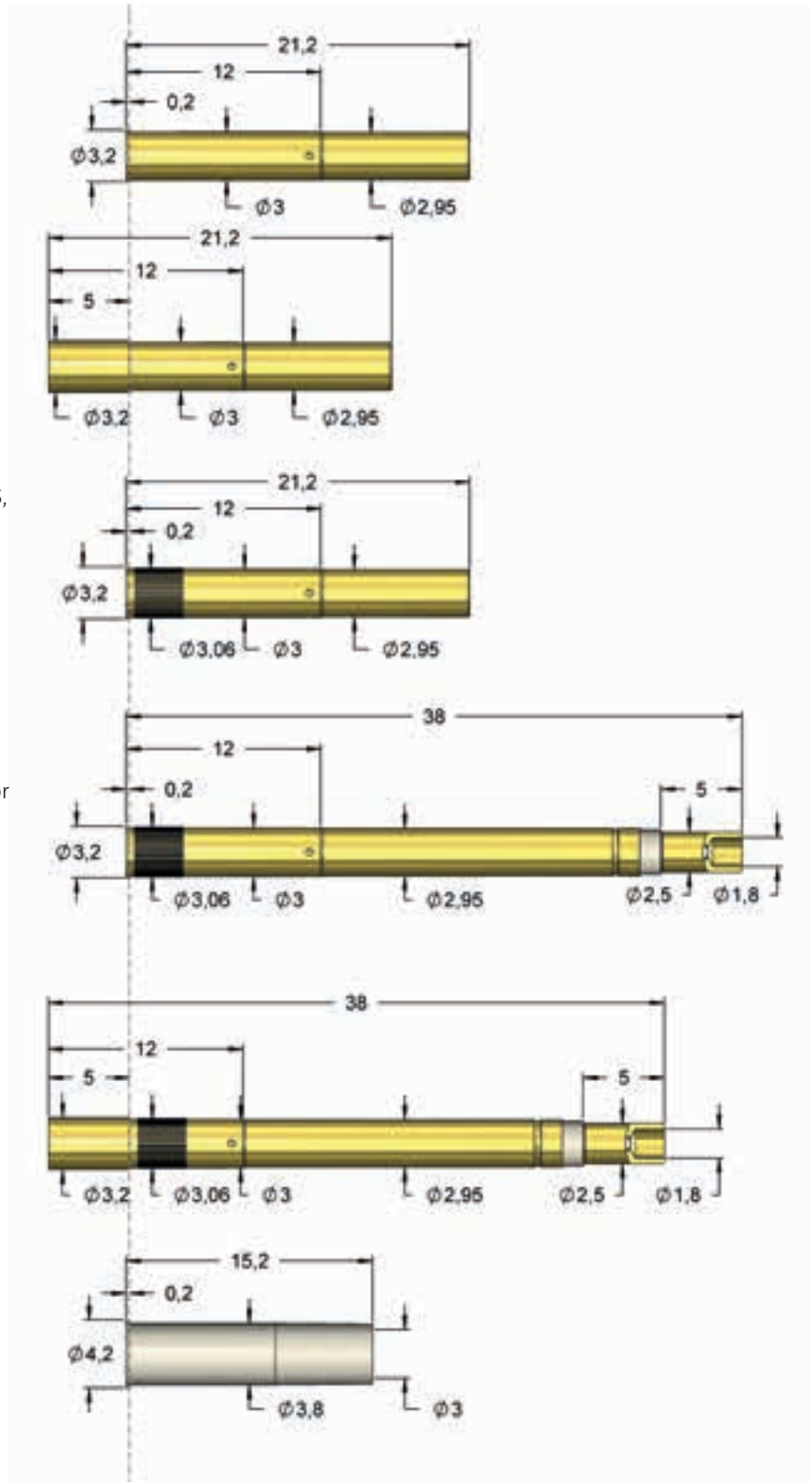
This receptacle has the same design like H885KB, but with a 5 mm collar for extended projection height.
F883: 15,2 – 20,2 mm F885/F886 ... SM: 15,2 – 20,2 mm
F385: 21,8 – 27,3 mm F885/F886 ... LM: 21,5 – 27,0 mm
Solder temperature: max. 300 ˚C

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). Due to the sleeve´s collar the projection height is increase by 0,2 mm.
Maximum temperature: 300˚C

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.

F385

Long Travel Switch Probe Closer (NO)

Centers (mm/mil)	4,00 / 157
Current	10,0 A
Current (Switch)	1,0 A
Temperature	-20°C...+80°C
R typically	50 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	40	200

Travel (mm)

Version	Nominal	Maximum
standard	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
Receptacle	Brass, Gold plated

Accessories

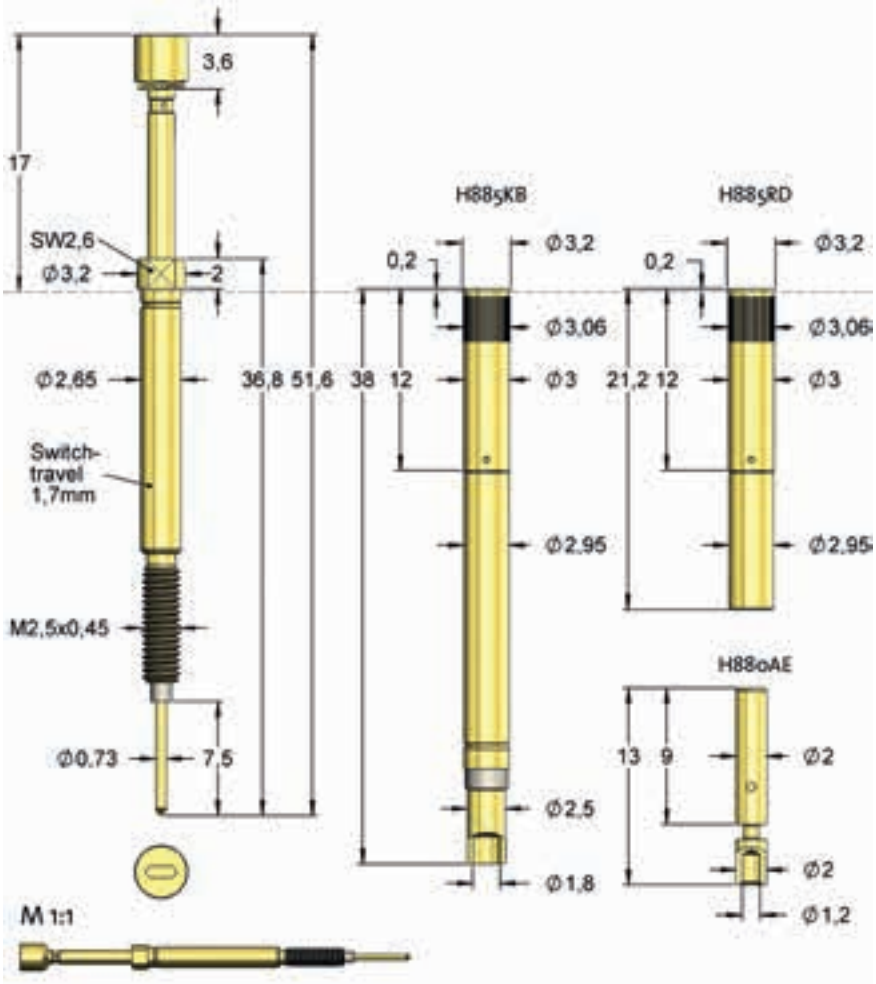
Insertion tool receptacle	FEWZ-774E0
Screw-in tool probe	FWZ760S1

Drill Size (mm)

Receptacle without knurl	2,98 - 2,99
Receptacle with knurl	3,00 - 3,02

Projection Height (mm)

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	Special Version

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	3,50	-
	17	B	G	3,50	-

F883

Standard Switch Probe Opener (NC)

UTILITY MODEL

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%)

Version	Preload	Nominal
LM	40	230
SM	40	230

Travel (mm)

Version	Nominal	Maximum
LM	4,0	5,0
SM	4,0	5,0
Switch Travel (mm)		1,7
Thread (M)		2,5
Wrench Size		2,6
Pointing Accuracy		±0,09 mm

Materials and Plating

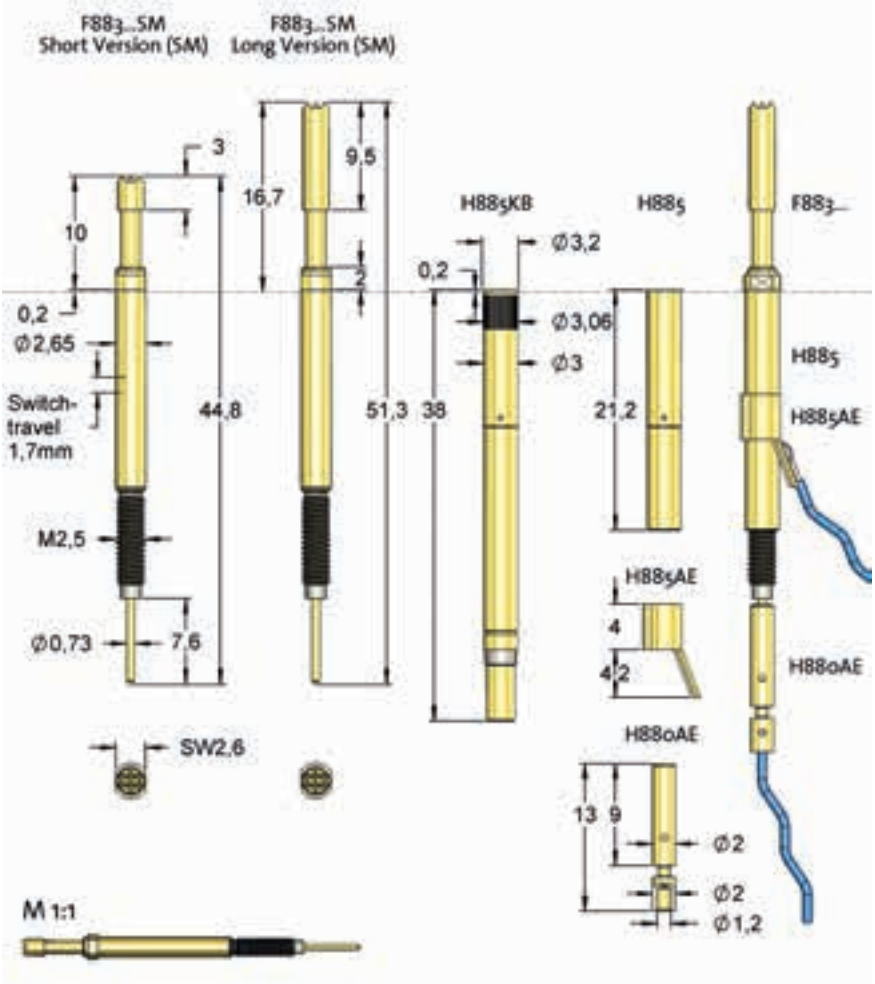
Plunger	see tip style
Barrel	Brass, gold plated
Spring	Music wire, silver plated
Receptacle	Brass, Gold plated

Accessories

Insertion tool receptacle	FEWZ-774E0
Screw-in tool probe	FWZ885 (T) max. Ø2,5 mm
Screw-in tool probe	FWZ885S1 (T1) max. Ø3,1 mm

Projection Height (mm)

(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



Variants with a switch travel of 0,5 mm available on request.
The nominal travel is reduced to 2.8 mm.

Drill Size (mm)

Receptacle without knurl	2,98 - 2,99
Receptacle with knurl	3,00 - 3,02

Type			Tip-Ø		Spring Force	
F 883	17	B	230	G	170	SM 05
	Tip Style	Material		Finish		Special Version

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
	05	B	G	2,30	SM
	06	B	G	2,30	LM
	06	B	G	2,30	SM
	16	B	G	1,80	SM
	17	B	G	2,30	SM
	17	K	U	2,30	SM

F884

Plug-in Switch Probe Closer (NO)

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%)

Version	Preload	Nominal
LM	50	200
LM	80	350
SM	50	200
SM	80	350
SM	50	900

Travel (mm)

Version	Nominal	Maximum
LM	4,0	5,0
SM	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

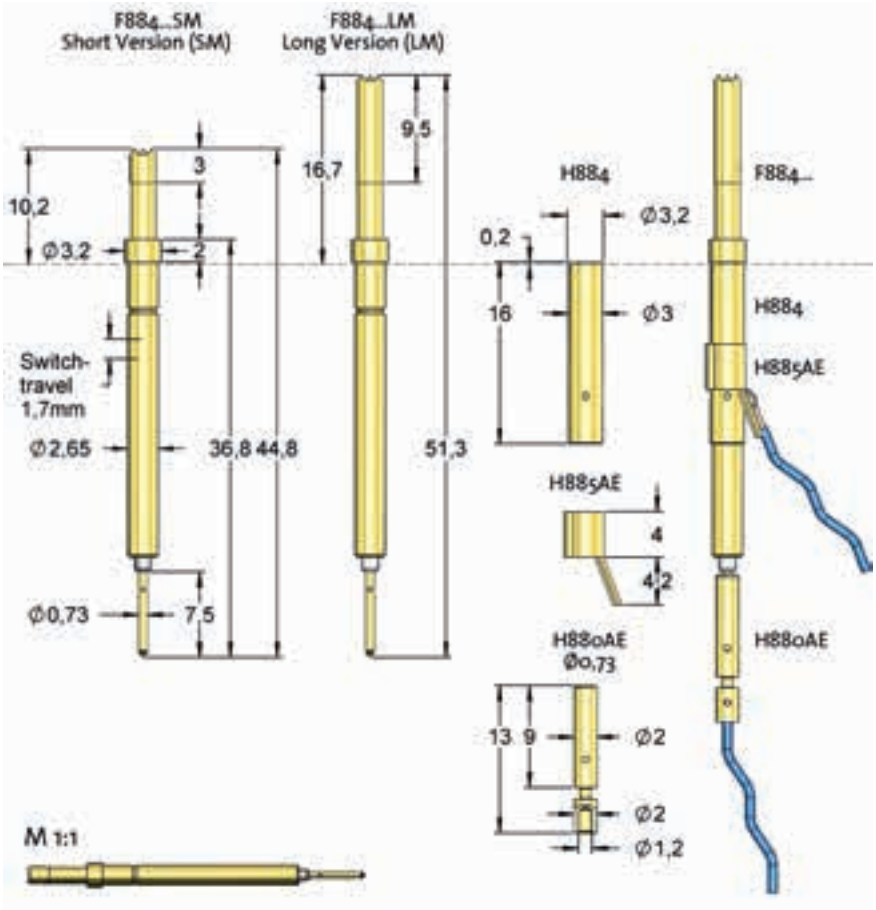
Insertion tool receptacle	FEWZ-774E0

Drill Size (mm)

Receptacle without knurl	2,98 -2,99

Projection Height (mm)

(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		Special Version

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	1,00	SM
	06	B	G	2,30	LM
	06	B	G	2,30	SM
	17	B	G	2,30	SM
	17	B	G	3,00	SM
	17	K	U	3,00	SM

F880

Switch Probe for Backward Assembly, Closer (NO)

UTILITY MODEL

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%)

Version	Preload	Nominal
L	50	150
L	80	350
standard	80	350

Travel (mm)

Version	Nominal	Maximum
L	4,0	5,0
standard	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

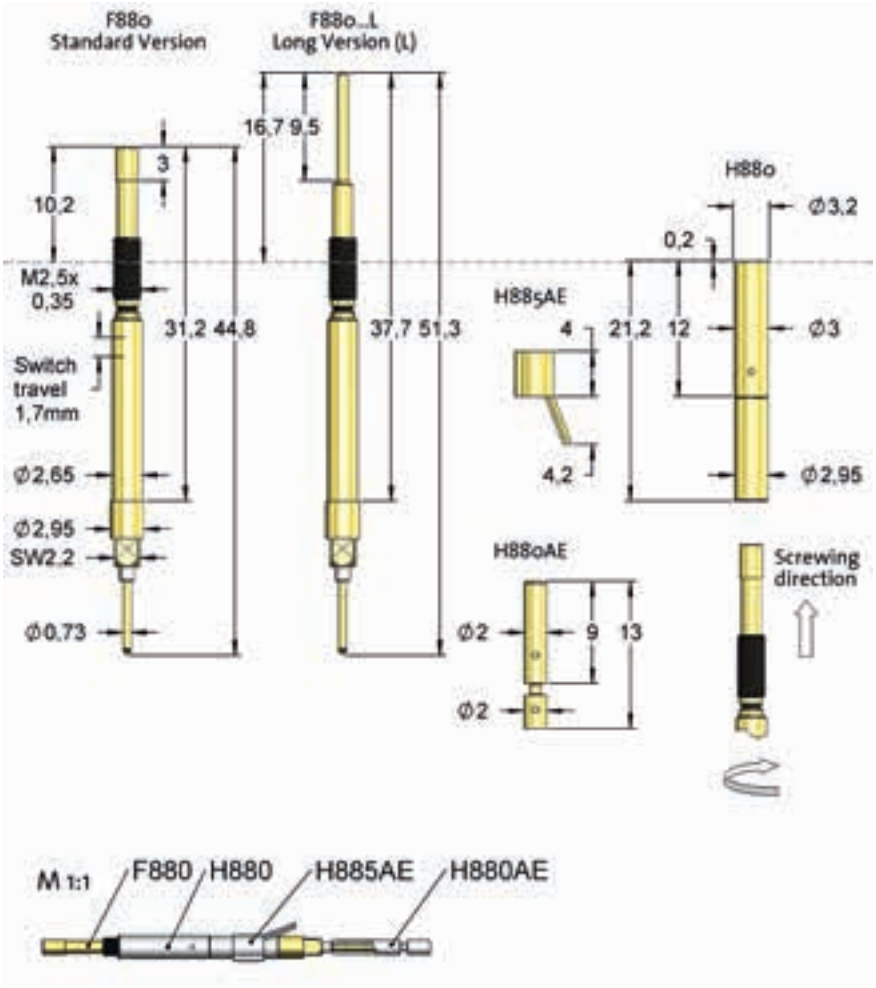
Insertion tool receptacle	FEWZ-774E0
Screw-in tool probe	FWZVF3 (T)
Screw-in tool with LED	FWZ880SA

Drill Size (mm)

H880	2,98 - 2,99

Projection Height (mm)

(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	Special Version	

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	1,00	L
	17	B	G	2,00	-

F881

Switch Probe (NO)
Electrically Isolated

UTILITY MODEL

Centers (mm/mil)	3,50 / 138
Current	10,0 A
Current (Switch)	1,0 A
Temperature	-20°C...+80°C
R typically	25 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	80	380

Travel (mm)

Version	Nominal	Maximum
standard	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
Receptacle	Brass, Gold plated

Accessories

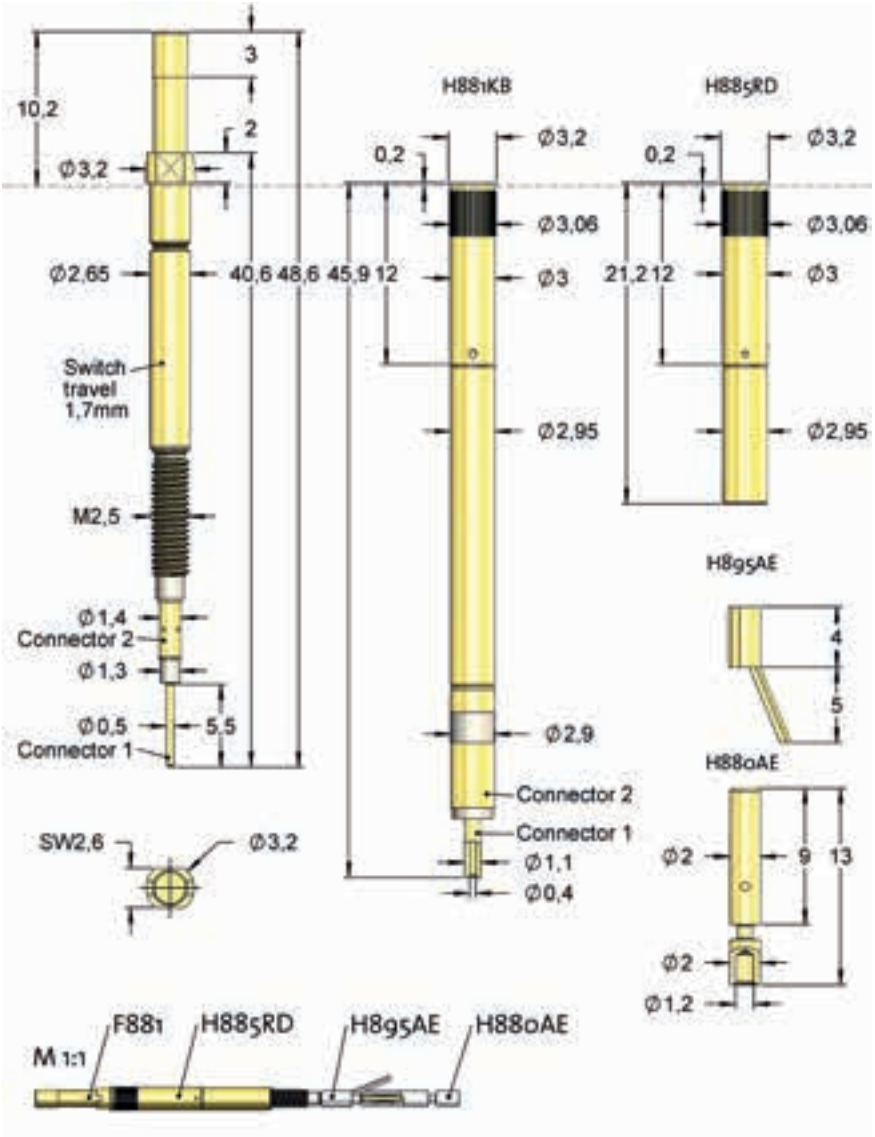
Insertion tool receptacle	FEWZ-774E0
Screw-in tool probe	FWZ885 (T) max. Ø2,5 mm
Screw-in tool probe	FWZ885S1 (T1) max. Ø3,1 mm

Drill Size (mm)

Receptacle with knurl	3,00 -3,02

Projection Height (mm)

H881KB	10,2
H885 / H885RD	10,2
H885/5	15,0



Type			Tip-Ø		Spring Force
F 881	17	B	230	G	380
	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
	05	B	G	2,30	-
	05	B	G	3,00	-
	06	B	G	2,30	-
	06	B	G	3,00	-
	17	B	G	2,30	-
	17	B	G	3,00	-

F887

Short Switch Probe Closer (NO)

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%)

Version	Preload	Nominal
standard	50	150
standard	50	200
standard	50	300

Travel (mm)

Version	Nominal	Maximum
standard	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

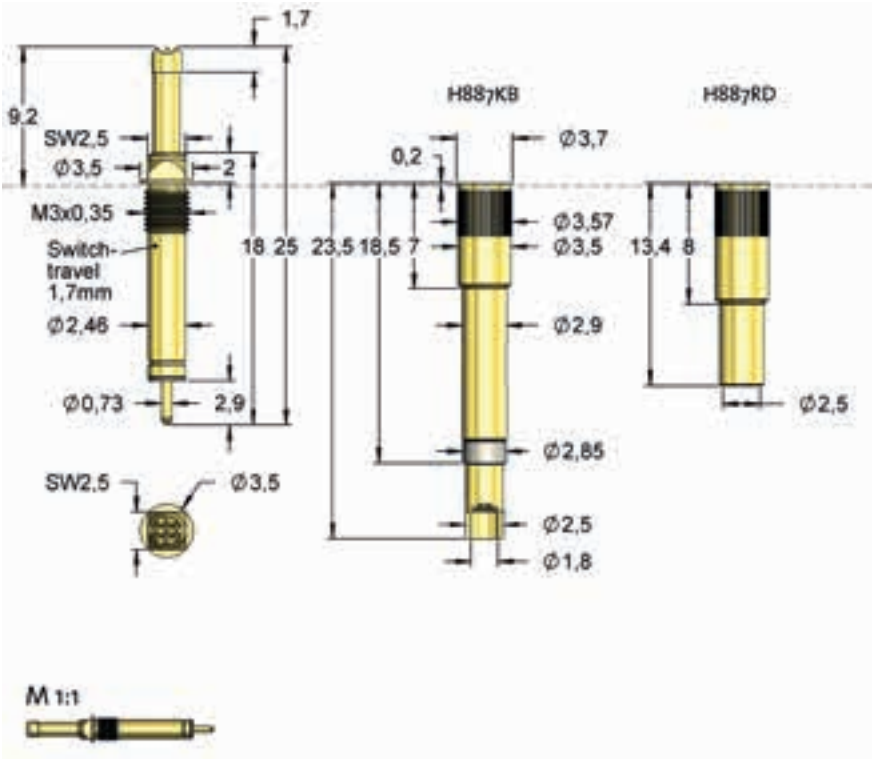
Insertion tool receptacle	FEWZ-340E0
Screw-in tool probe	FWZVF4 (T)

Drill Size (mm)

Receptacle with knurl	3,50 - 3,52

Projection Height (mm)

H887...	9,2



Type		Tip-Ø		Spring Force
F 887	06	B	300	G 150
	Tip Style	Material	Finish	Special Version

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	1,00	-
	06	B	G	2,00	-
	06	B	G	3,00	-
	16	B	G	1,00	-
	17	B	G	2,00	-
	17	B	G	3,00	-

F487

NEW

Switch Probe (Off-On-Off) threaded

Centers (mm/mil)	4,00 / 157
Current	10,0 A
Current (Switch)	1,0 A
Temperature	-20°C...+80°C
R typically	20 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	120	300

Travel (mm)

Version	Nominal	Maximum
standard	4,0	5,0
Switch Travel (mm)		2,5
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

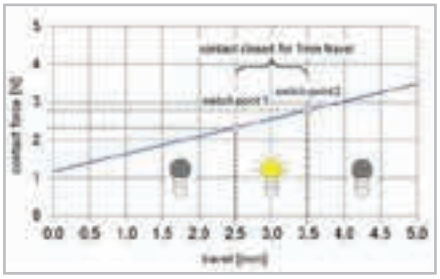
Insertion tool receptacle	FEWZ-340E0
Screw-in tool probe	FWZVF4 (T)

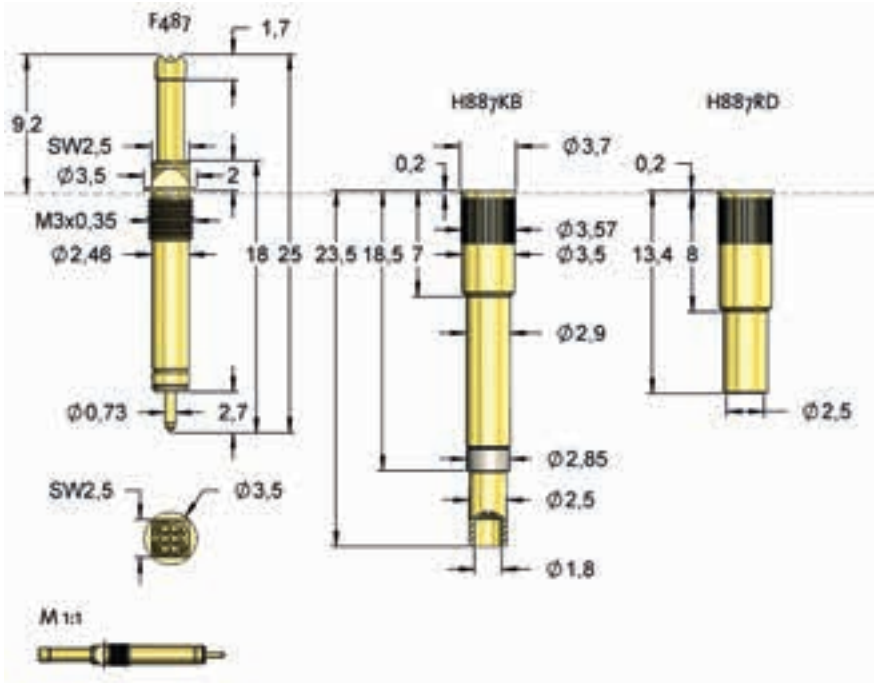
Drill Size (mm)

Receptacle with knurl	3,50 - 3,52

Projection Height (mm)

H887...	9.2





The F487 allows a simple testing of lengths or deepness. The switch probe has been developed for a mechanical detecting of a DUT at limited space. The movement of the plunger enable testing of the correct position of a DUT, a Pin or a borehole. The F487 can be used in standard receptacles like H887RD or H887KB. The combi-receptacle H887KB, enables a solder-less exchange of the probes.

Type			Tip-Ø		Spring Force
F 487	06	B	200	G	300
	Tip Style	Material		Finish	Special Version

Material:	B = BeCu
Tip-Ø:	200 = 2,00 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	2,00	-

F88890S1101U200S05

Switch Probe (NO) with Ball Head, Threaded

UTILITY MODEL

Centers (mm/mil)	7,00 / 275
Current	10,0 A
Current (Switch)	1,0 A
Temperature	-20°C...+80°C
R typically	25 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	100	200

Travel (mm)

Version	Nominal	Maximum
standard	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

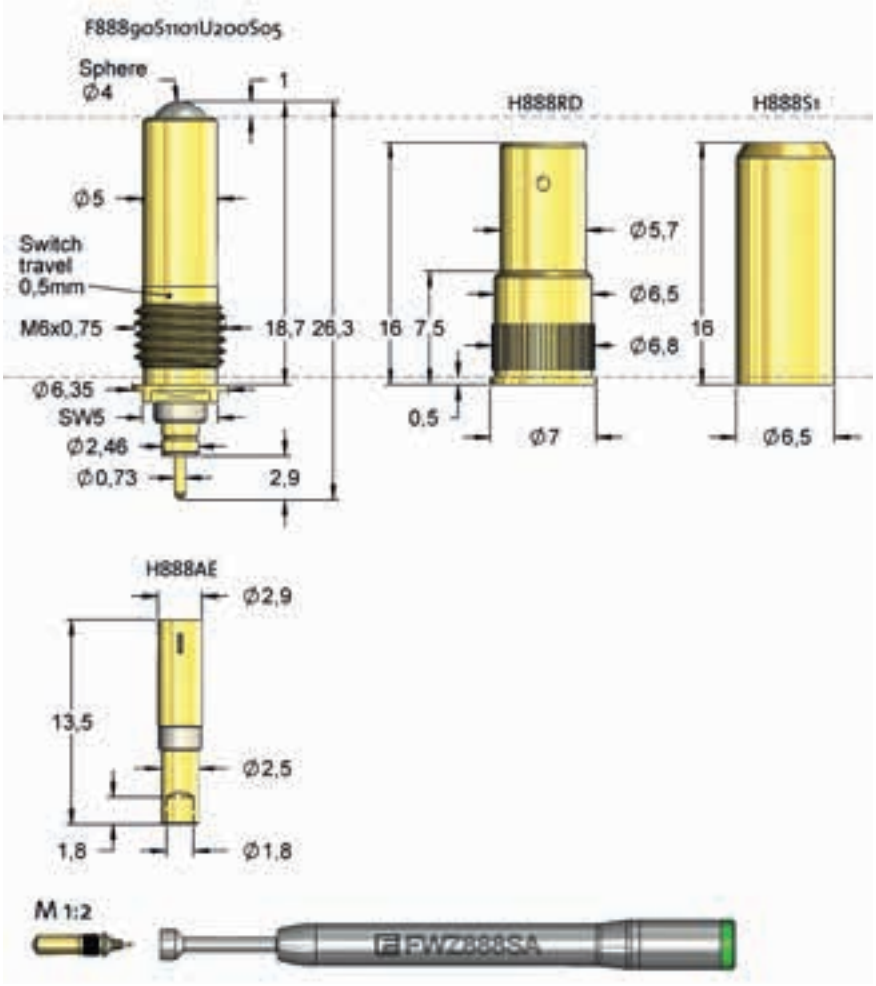
Screw-in tool	FWZ888
Screw-in tool with LED	FWZ888SA
Connecting element	H888AE

Drill Size (mm)

F88890S1101U200S05	M6x0,75
H888RD	6,55 - 6,70
H888S1	6,50

Projection Height (mm)

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	Special Version	

Material:	S = Steel
Number:	
1. digit:	0 = switch not isolated 1 = switch electrically isolated 2 = without switch
2. digit:	0 = without thread 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	4,00	-

F88890S1102U100S07

Switch Probe (NO) with Ball Head, Threaded

UTILITY MODEL

Centers (mm/mil)	9,00 / 354
Current	10,0 A
Current (Switch)	1,0 A
Temperature	-20°C...+80°C
R typically	25 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	70	100

Travel (mm)

Version	Nominal	Maximum
standard	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

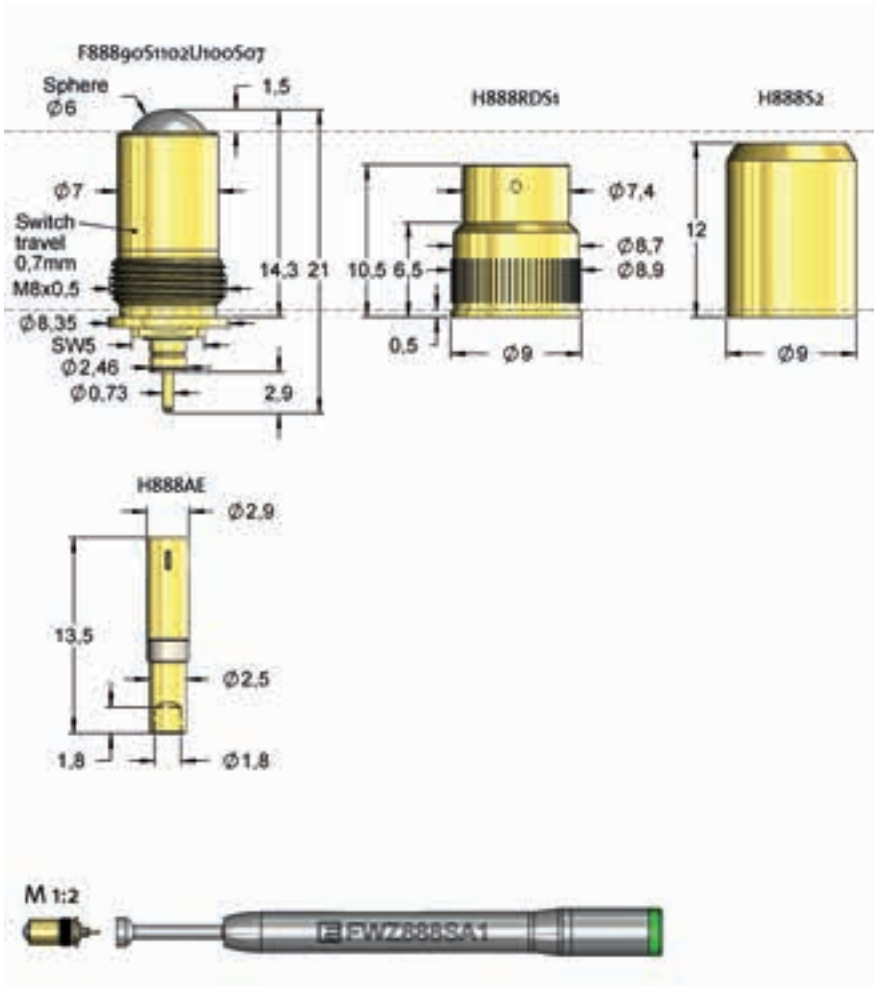
Screw-in tool	FWZ888
Screw-in tool with LED	FWZ888SA1
Connecting element	H888AE

Drill Size (mm)

F88890S1102U100S07	M8x0,5
H888RDS1	8,75 - 8,85
H888S2	9,00

Projection Height (mm)

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	Special Version	

Material:	S = Steel
Number:	
1. digit:	0 = switch not isolated 1 = switch electrically isolated 2 = without switch
2. digit:	0 = without thread 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	6,00	-

F88890S0003U100S08

Switch Probe (NO) with Ball Head, Plug-in

Centers (mm/mil)	6,50 / 256
Current	10,0 A
Current (Switch)	1,0 A
Temperature	-20°C...+80°C
R typically	25 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	70	100

Travel (mm)

Version	Nominal	Maximum
standard	1,4	1,4
Switch Travel (mm)		0,8

Materials and Plating

Plunger	see tip style
Barrel	Brass, gold plated
Spring	Stainless steel, unplated
Receptacle	-

Accessories

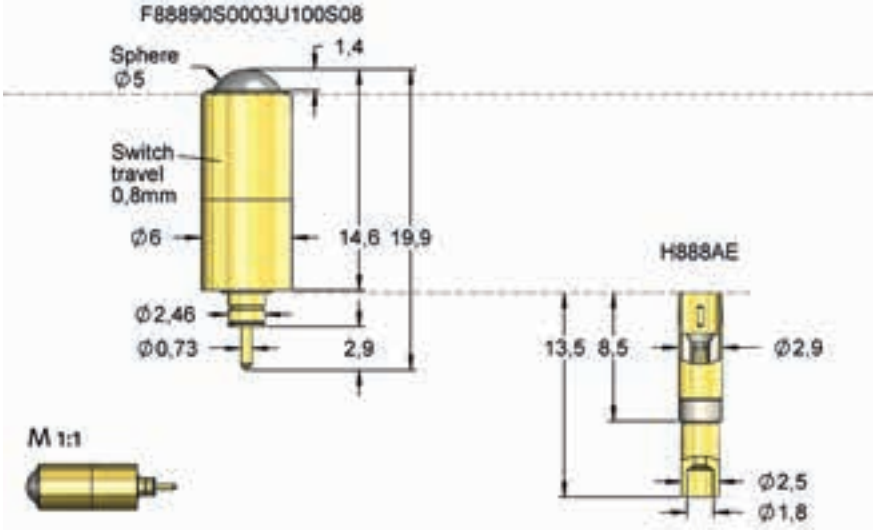
Connecting element	H888AE

Drill Size (mm)

F88890S0003U100S08	6,00

Projection Height (mm)

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	
F888	90	S	0003	U	100	S08
	Tip Style	Material		Finish	Special Version	

Material:	S = Steel
Number:	
1. digit:	0 = switch not isolated 1 = switch electrically isolated 2 = without switch
2. digit:	0 = without thread 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	5,00	-

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.

F756

Threaded Version 100 mil

Centers (mm/mil)	2,54 / 100
Current	5,0 A
Temperature	-40°C...+250°C
R typically	30 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	60	150
standard	100	300

Travel (mm)

Version	Nominal	Maximum
standard	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

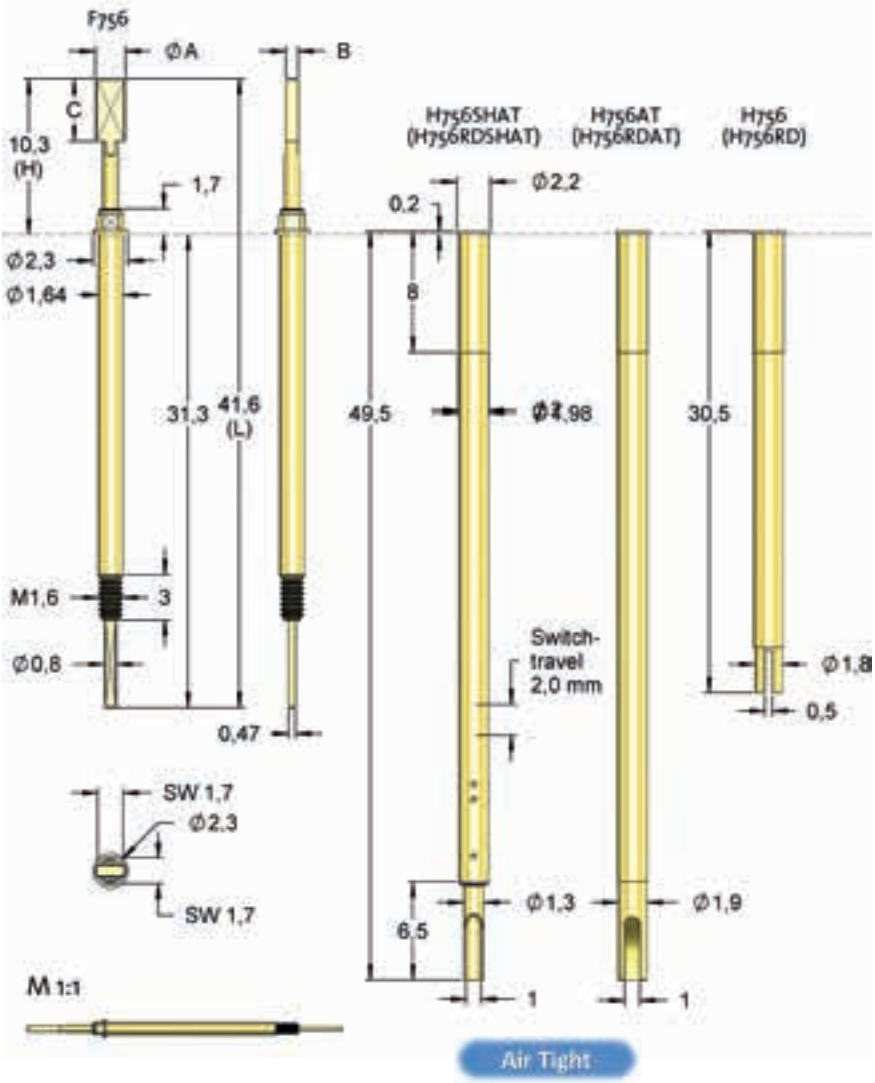
Alignment tool receptacle	FAWZ756
Screw-in tool probe	FWZ732 (T)

Drill Size (mm)

H756	1,99 - 2,00

Projection Height (mm)

H756...	10,5

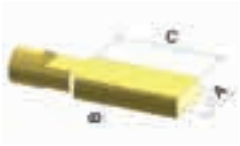


Further information about F75106B0001G150PT50 with twist-proof insulating cap under Applications.

Type			Number	Spring Force	
F 756	84	B	0007	G	080	PT
	Tip Style	Material		Finish	Special Version	

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



Part Number	Typ Style	Ø A	B	C	H	L	Version	Screw-in Tool
F75682B0001G150	82	1,10	0,45	5,00	10,30	41,60	-	FWZ732;FWZ732T
F75684B0001G150	84	1,50	0,50	4,15	10,30	41,60	-	FWZ732;FWZ732T
F75684B0001G300	84	1,50	0,50	4,15	10,30	41,60	-	FWZ732;FWZ732T
F75684B0004G150	84	1,50	1,00	4,15	10,30	41,60	-	FWZ732;FWZ732T
F75684B0004G300	84	1,50	1,00	4,15	10,30	41,60	-	FWZ732;FWZ732T
F75684B0003G150	84	2,00	0,80	4,15	10,30	41,60	-	FWZ732;FWZ732T
F75684B0003G300	84	2,00	0,80	4,15	10,30	41,60	-	FWZ732;FWZ732T
F75684B0006G300	84	2,00	0,80	4,15	10,30	41,60	-	FWZ732;FWZ732T

F760

Threaded Version 138 mil

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

Spring Force (cN ±20%)

Version	Preload	Nominal
L	50	150
L	80	300
S	50	150
S	80	300

Travel (mm)

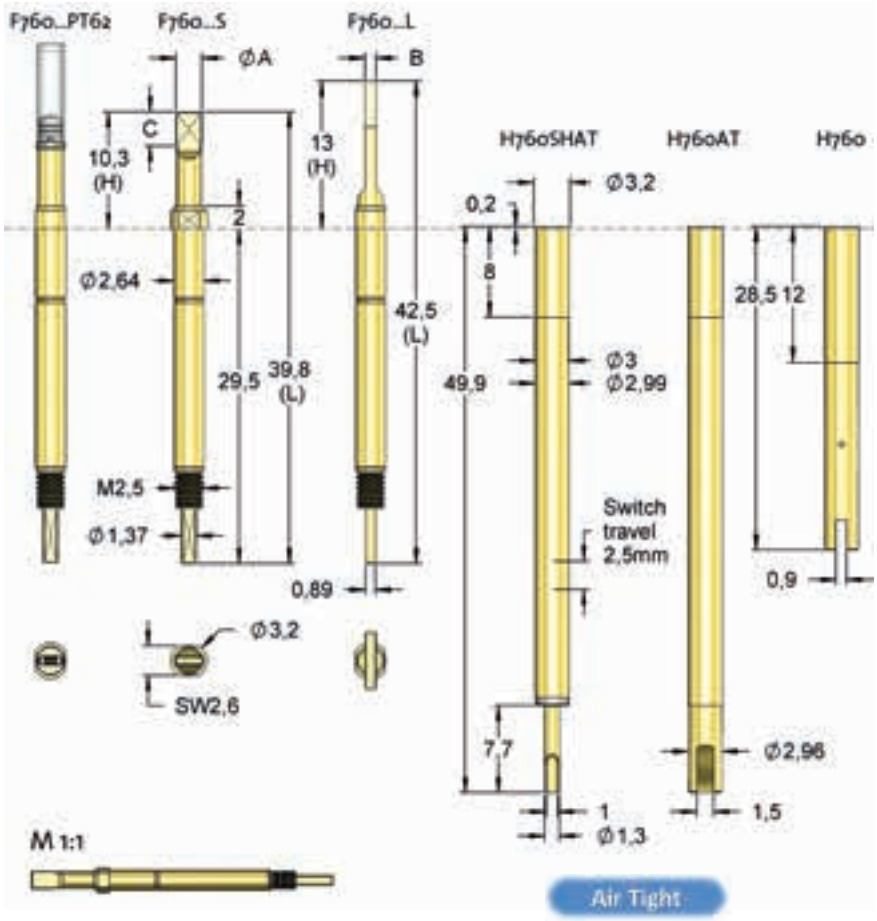
Version	Nominal	Maximum
L	4,0	5,0
S	4,0	5,0
Thread (M)		2,5
Wrench Size		2,6
Pointing Accuracy		±0,08 mm

Materials and Plating

Plunger	see tip style
Barrel	Brass, gold plated
Spring	Music wire, silver plated
Receptacle	Brass, Gold plated

Drill Size (mm)

H760	2,98- 2,99



Further information about F75106B0001G150PT50 with twist-proof insulating cap under Applications.

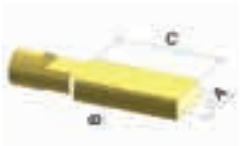
Accessories

Alignment tool receptacle	FAWZ761
Screw-in tool probe	FWZ760S1 max. Ø4,0 mm
Screw-in tool probe	FWZ760S2 max. Ø4,9 mm

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



Part Number	Typ Style	Ø A	B	C	H	L	Version	Screw-in Tool
F76081B0002G300L	81	1,50	0,60	6,00	13,00	42,50	L	FWZ760S1;FWZ760T1
F76081B0001G150S	81	2,00	0,80	4,15	10,30	39,80	S	FWZ760S1;FWZ760T1
F76081B0001G300S	81	2,00	0,80	4,15	10,30	39,80	S	FWZ760S1;FWZ760T1
F76084B0003G300S	84	2,30	0,80	3,00	10,30	39,80	S	FWZ760S1;FWZ760T1
F76084B0002G150L	84	2,50	0,80	4,00	13,00	42,50	L	FWZ760S1;FWZ760T1
F76084B0002G300L	84	2,50	0,80	4,00	13,00	42,50	L	FWZ760S1;FWZ760T1
F76084B0001G300L	84	2,80	0,50	6,00	13,00	42,50	L	FWZ760S1;FWZ760T1
F76084B0004G150L	84	5,00	1,00	4,00	13,00	42,50	L	FWZ760S2; FWZ760T2
F76084B0004G300L	84	5,00	1,00	4,00	13,00	42,50	L	FWZ760S2; FWZ760T2

F755 Spaten

Threaded Version 177 mil

Centers (mm/mil)	4,50 / 177
Current	10,0 A
Temperature	-40°C...+250°C
R typically	30 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
Exx	70	150
Exx	90	300

Travel (mm)

Version	Nominal	Maximum
Exx	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

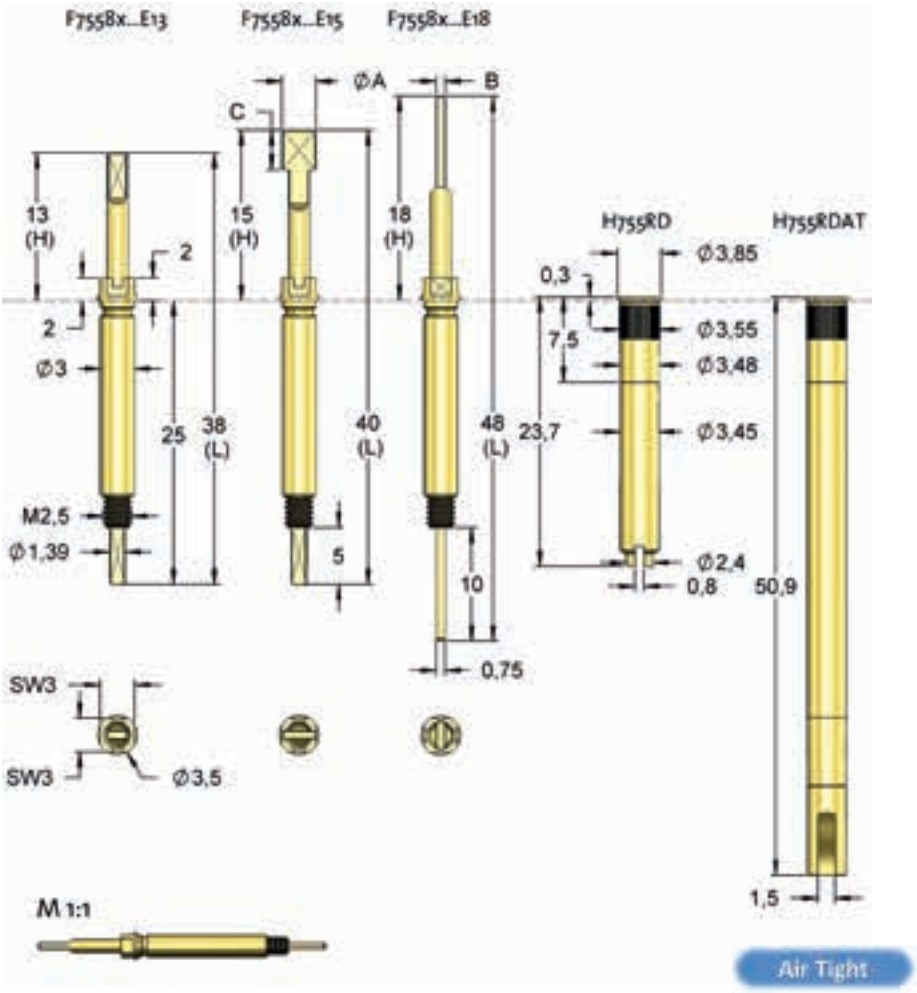
Insertion Tool receptacle (not twist proof)	FEWZ-755E0
Alignment tool recepatacle	FAWZVF4
Screw-in tool probe	FWZ733S1 (T1) max. Ø3,0 mm
Screw-in tool probe	FWZ886S1 (T1) > Ø3,1 mm with Slot

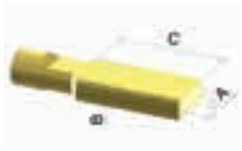
Drill Size (mm)

Receptacle with knurl	3,48 - 3,52

Projection Height (mm)

(F755...E13) H755...	13.3
(F755...E15) H755...	15.3
(F755...E18) H755...	18.3





Part Number	Typ Style	Ø A	B	C	H	L	Version	Screw-in Tool
F75582B0002G150E13	82	1,80	0,50	4,00	13,00	38,00	E13	FWZ733;FWZ733T
F75582B0001G150E13	82	1,80	0,80	4,00	13,00	38,00	E13	FWZ733;FWZ733T
F75582B0001G300E13	82	1,80	0,80	4,00	13,00	38,00	E13	FWZ733;FWZ733T
F75583B0001G150E18	83	2,50	0,80	8,00	18,00	48,00	E18	FWZ733;FWZ733T
F75583B0001G300E18	83	2,50	0,80	8,00	18,00	48,00	E18	FWZ733;FWZ733T
F75584B0002G300E15	84	2,80	0,40	6,00	15,00	40,00	E15	FWZ733;FWZ733T
F75584B0001G150E15	84	3,00	0,70	3,50	15,00	40,00	E15	FWZ733;FWZ733T
F75584B0001G300E15	84	3,00	0,70	3,50	15,00	40,00	E15	FWZ733;FWZ733T

F755

Threaded Version 177 mil

Centers (mm/mil)	4,50 / 177
Current	10,0 A
Temperature	-40°C...+250°C
R typically	30 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
Exx	70	150
Exx	90	300
Exx	120	500

Travel (mm)

Version	Nominal	Maximum
Exx	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 recepatacle	FAWZVF4
Screw-in tool probe	FWZ733S1 (T1) max. Ø3,0 mm
Screw-in tool probe	FWZ886S1 (T1) > Ø3,1 mm with Slot

Drill Size (mm)

Receptacle without knurl	3,48 - 3,49
Receptacle with knurl	3,48 - 3,52

Projection Height (mm)

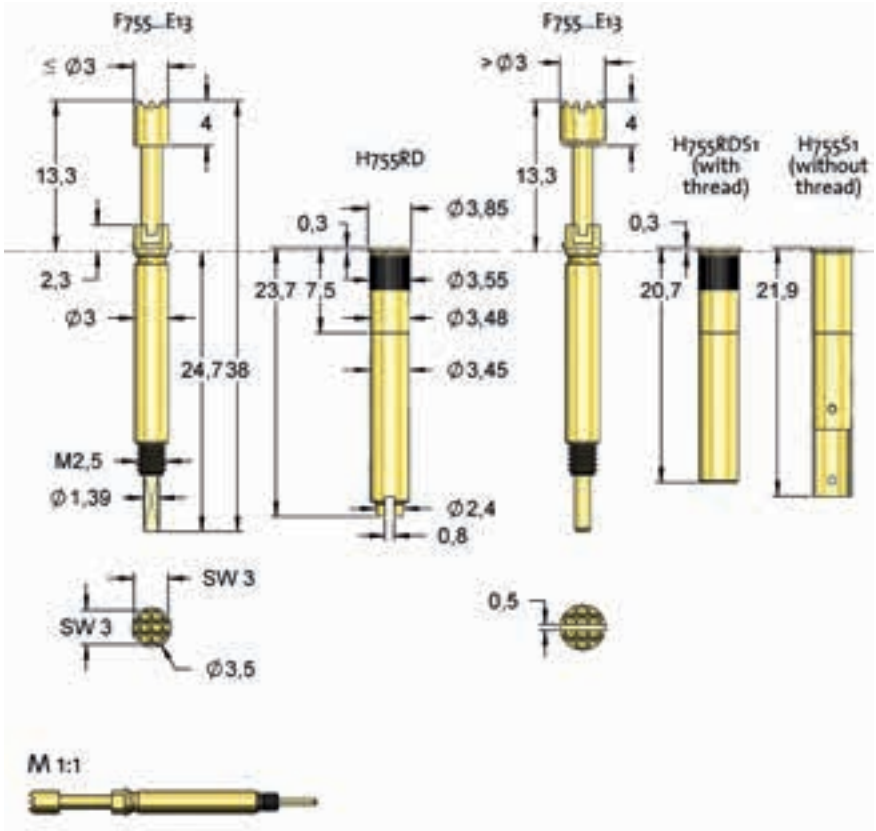
(F755...E13) H755...	13,3
(F755...E15) H755...	15,3
(F755...E18) H755...	18,3

Type			Tip-Ø		Spring Force	
F 755	06	B	400	G	300	E13
	Tip Style	Material		Finish	Special Version	

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 diamensions.

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	3,00	E13
	06	B	G	4,00	E15
	14	B	G	3,00	E13
	18	B	G	1,80	E13

F752

Plug-in Version 100 mil

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

Spring Force (cN ±20%)

Version	Preload	Nominal
L	50	150
L	50	300
S	50	150

Travel (mm)

Version	Nominal	Maximum
L	4,0	5,0
S	4,0	5,0
Pointing Accuracy		±0,1 mm

Materials and Plating

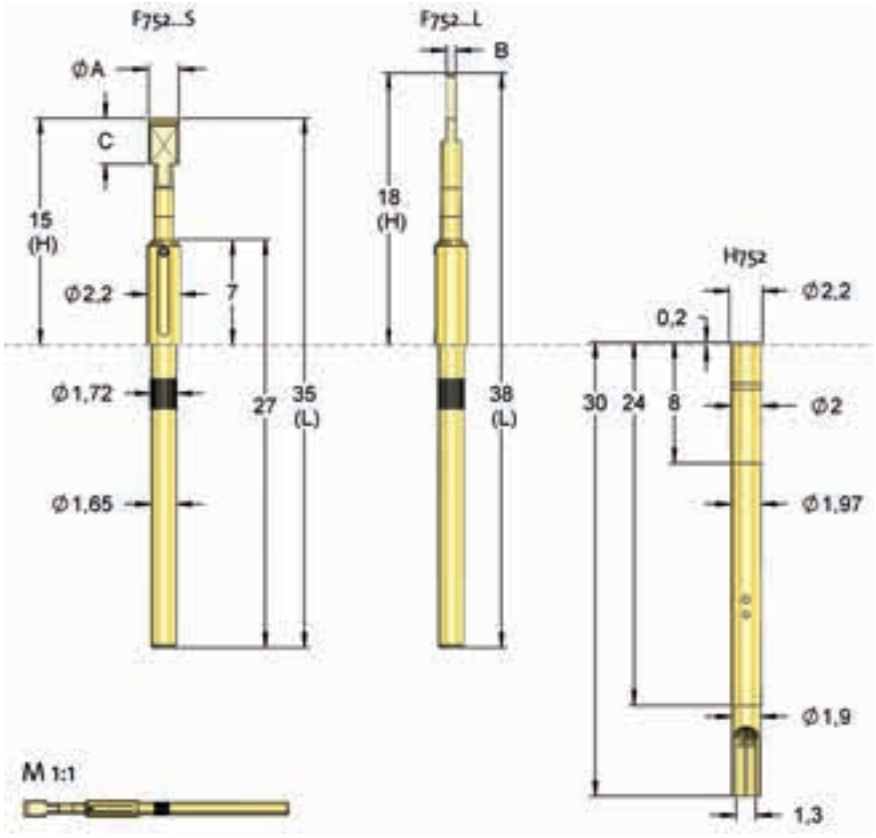
Plunger	see tip style
Barrel	Brass, gold plated
Spring	Music wire, gold plated
Receptacle	Brass, Gold plated

Accessories

Insertion tool receptacle	FEWZ-772E0

Drill Size (mm)

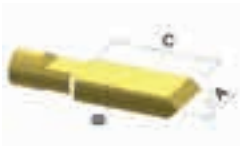
F752	1,66
H752	1,99 - 2,00

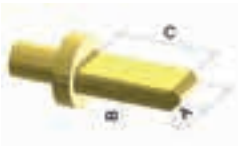


Type			number		Spring Force	
F 752	84	S	0004	L	150	L
	Tip Style	Material		Finish		Special Version

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





Part Number	Typ Style	Ø A	B	C	H	L	Version	Screw-in Tool
F75284S0005L150L	84	1,50	0,50	6,00	18,00	38,00	L	-
F75284S0002L150L	84	2,00	0,50	3,00	18,00	38,00	L	-
F75284S0004L150L	84	2,00	0,50	6,00	18,00	38,00	L	-
F75284S0004L300L	84	2,00	0,50	6,00	18,00	38,00	L	-
F75284S0001L150L	84	2,00	0,58	3,00	18,00	38,00	L	-
F75284S0003L150S	84	2,00	1,00	3,00	15,00	35,00	S	-
F75284S0007L150S	84	3,00	0,58	3,00	15,00	35,00	S	-
F75289S0001L150L	89	1,50	0,50	1,60	18,00	38,00	L	-

F754

Plug-in Version 177 mil

Centers (mm/mil)	4,50 / 177
Current	10,0 A
Temperature	-20°C...+80°C
R typically	20 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
L	30	150
L	80	300
S	30	150
S	80	300

Travel (mm)

Version	Nominal	Maximum
L	4,0	4,5
S	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

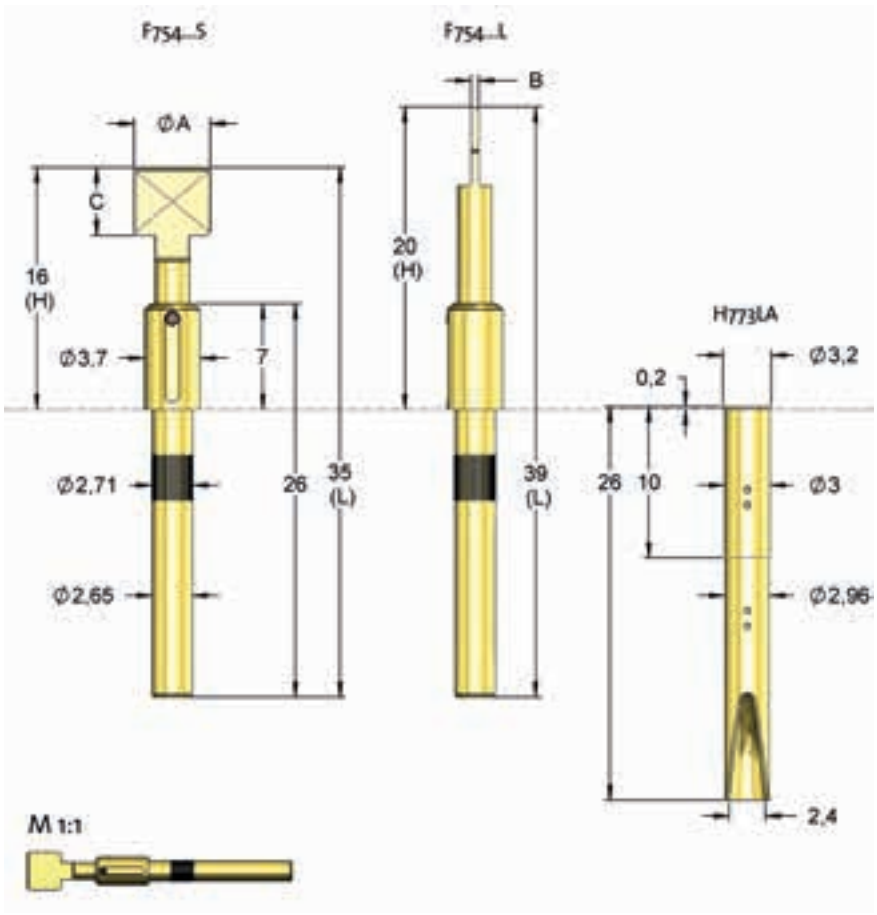
Drill Size (mm)

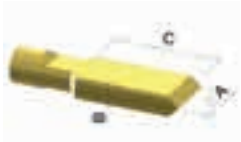
F754	2,66
H773LA	2,98 - 2,99

Type			number		Spring Force	
F 754	84	B	0002	G	150	S
	Tip Style	Material		Finish		Special Version

Material:	B = BeCu
number:	see table
Finish:	G = Gold
Special Version:	S = Short Version, L = Long Version
Receptacle:	Order Code according drawing

ORDER EXAMPLE





Part Number	Typ Style	Ø A	B	C	H	L	Version	Screw-in Tool
F75482B0001N150L	82	2,25	2,25	6,00	20,00	39,00	L	-
F75484B0004G150L	84	4,00	0,65	3,00	20,00	39,00	L	-
F75484B0002G150S	84	4,00	1,00	3,00	16,00	35,00	S	-
F75484B0002G300S	84	4,00	1,00	3,00	16,00	35,00	S	-
F75484B0005G300L	84	5,00	0,40	4,50	20,00	39,00	L	-
F75484B0005G300S	84	5,00	0,40	4,50	16,00	35,00	S	-
F75484B0003G150L	84	5,00	0,50	3,00	20,00	39,00	L	-
F75484B0003G300L	84	5,00	0,50	3,00	20,00	39,00	L	-
F75484B0001G150S	84	5,00	1,00	3,00	16,00	35,00	S	-
F75484B0001G300S	84	5,00	1,00	3,00	16,00	35,00	S	-
F75484B0006G300S	84	5,00	1,00	4,50	16,00	35,00	S	-

Twist proof insulating caps

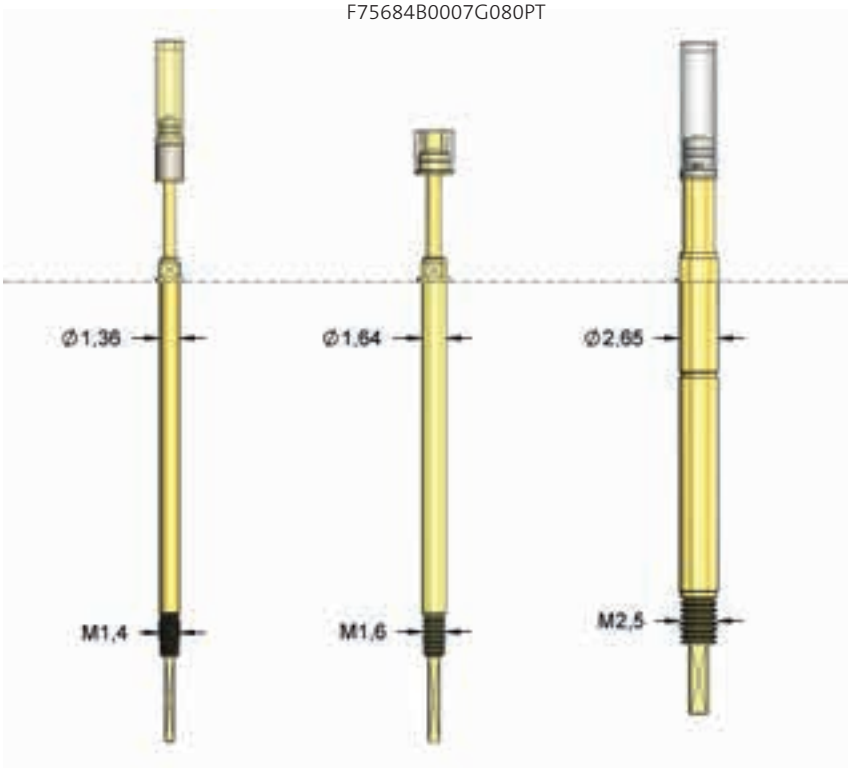
For testing the correct position and alignment of flat contact elements FEINMETALL has developed a simple and effective solution. With a slotted tip style in combination with a twist proof probe flat contact elements can be tested regarding the correct length. Additionally deformed, twisted or due too 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.

F75106B0001G150PT50

F76006B0001G300PT62

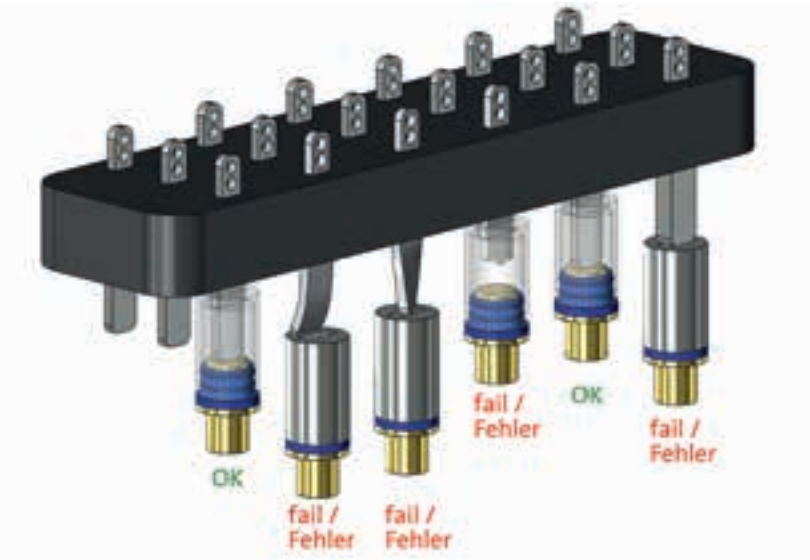
F75684B0007G080PT



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.



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.

VF100

Push Back Probe 100 mil, round tip styles

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	80	500
standard	80	1000
standard	120	1500

Travel (mm)

Version	Nominal	Maximum
standard	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
Receptacle	Brass, Gold plated

Accessories

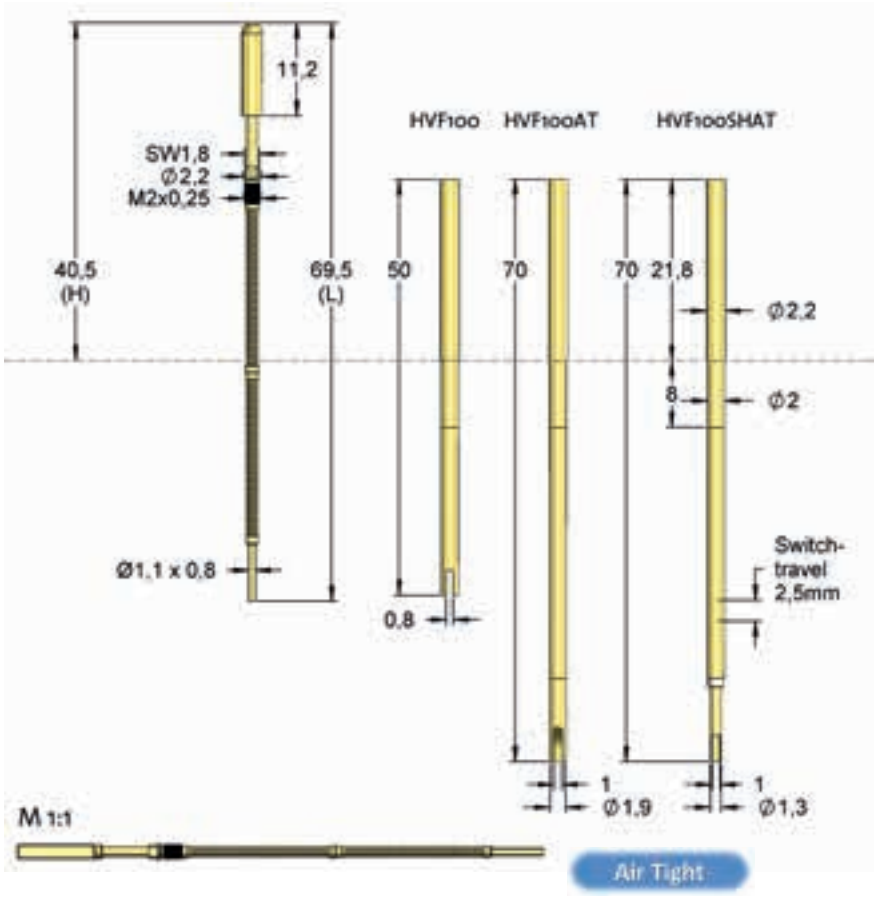
Insertion tool receptacle	FEWZ-VF100E0
Screw-in tool probe	FWZVF100 (T) max. Ø2,0 mm
Screw-in tool probe	FWZVF100S1 (T1) max. Ø2,7 mm

Drill Size (mm)

HVF100	1,99 - 2,00

Projection Height (mm)

HVF100...	40,5



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 diamensions.

ORDER EXAMPLE

Tip Style	Number	Material	Plating	Ø in mm	Version
	05	B	G	1,90	-
	05	B	G	2,20	-
	11	B	G	1,20	-
	12	B	G	2,50	-
	17	B	G	1,50	-
	17	B	G	1,80	-

VF100 Spaten

Push Back Probe 100 mil, spade tip styles

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

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	80	500
standard	80	1000
standard	120	1500

Travel (mm)

Version	Nominal	Maximum
standard	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
Receptacle	Brass, Gold plated

Accessories

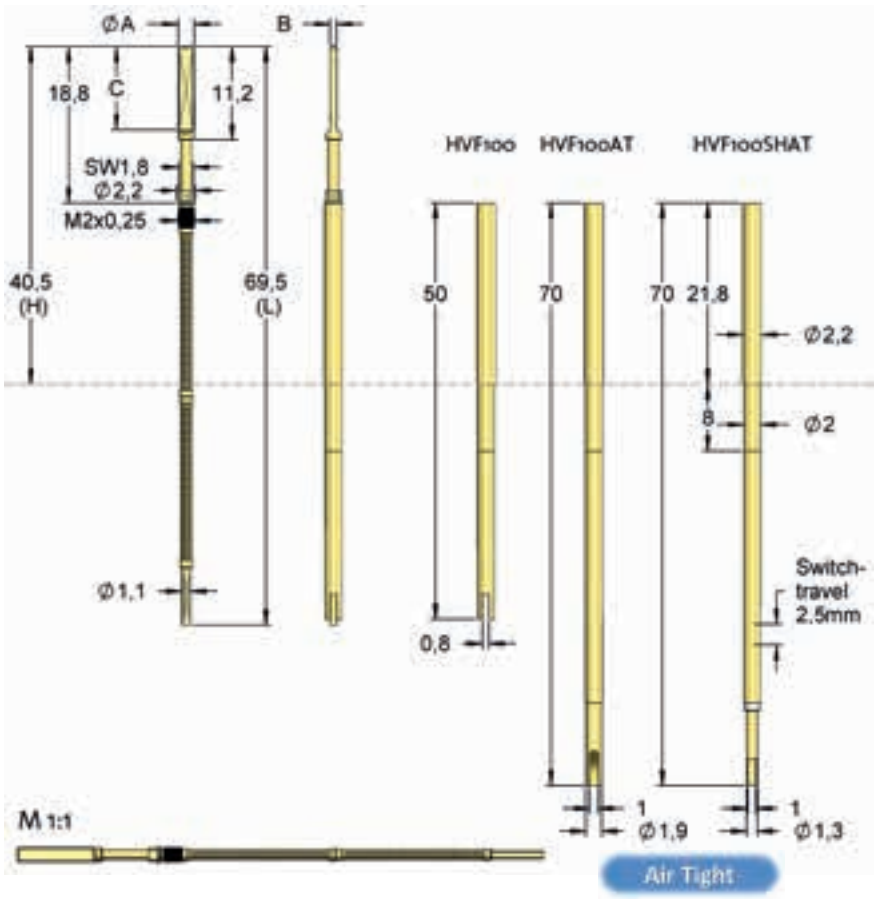
Insertion tool receptacle	FEWZ-VF100E0
Screw-in tool probe	FWZVF100 (T) max. Ø2,0 mm
Screw-in tool probe	FWZVF100S1 (T1) max. Ø2,7 mm

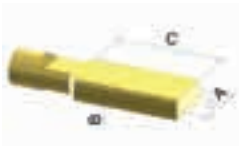
Drill Size (mm)

HVF100...	1.99 - 2.00

Projection Height (mm)

HVF100...	40.5





Part Number	Typ Style	Ø A	Ø B	C	H	L	Version	Screw-in Tool
VF10080B0001G10	80	1,60	0,50	10,00	40,50	69,50	-	FWZVF100; FWZVF100T
VF10080B0001G15	80	1,60	0,50	10,00	40,50	69,50	-	FWZVF100; FWZVF100T
VF10082B0003G05	82	1,90	0,50	10,00	40,50	69,50	-	FWZVF100; FWZVF100T
VF10082B0003G10	82	1,90	0,50	10,00	40,50	69,50	-	FWZVF100; FWZVF100T
VF10082B0003G15	82	1,90	0,50	10,00	40,50	69,50	-	FWZVF100; FWZVF100T
VF10082B0004G10	82	1,90	0,80	10,00	40,50	69,50	-	FWZVF100; FWZVF100T
VF10082B0004G15	82	1,90	0,80	10,00	40,50	69,50	-	FWZVF100; FWZVF100T
VF10082S0001L10	82	1,90	0,30	10,00	40,50	69,50	-	FWZVF100; FWZVF100T
VF10082S0001L15	82	1,90	0,30	10,00	40,50	69,50	-	FWZVF100; FWZVF100T
VF10082S0002L10	82	1,90	0,36	10,00	40,50	69,50	-	FWZVF100; FWZVF100T
VF10082S0002L15	82	1,90	0,36	10,00	40,50	69,50	-	FWZVF100; FWZVF100T
VF10084B0001G10	84	2,50	0,80	3,00	40,50	69,50	-	FWZVF100S1; FWZV-F100T1
VF10084B0001G15	84	2,50	0,80	3,00	40,50	69,50	-	FWZVF100S1; FWZV-F100T1

VF3

Push Back Probe 118 mil, round tip styles

Centers (mm/mil)	3,00 / 118
Current	8,0 A
Temperature	-20°C...+80°C
R typically	30 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	100	500
standard	200	1000
standard	300	1500

Travel (mm)

Version	Nominal	Maximum
standard	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

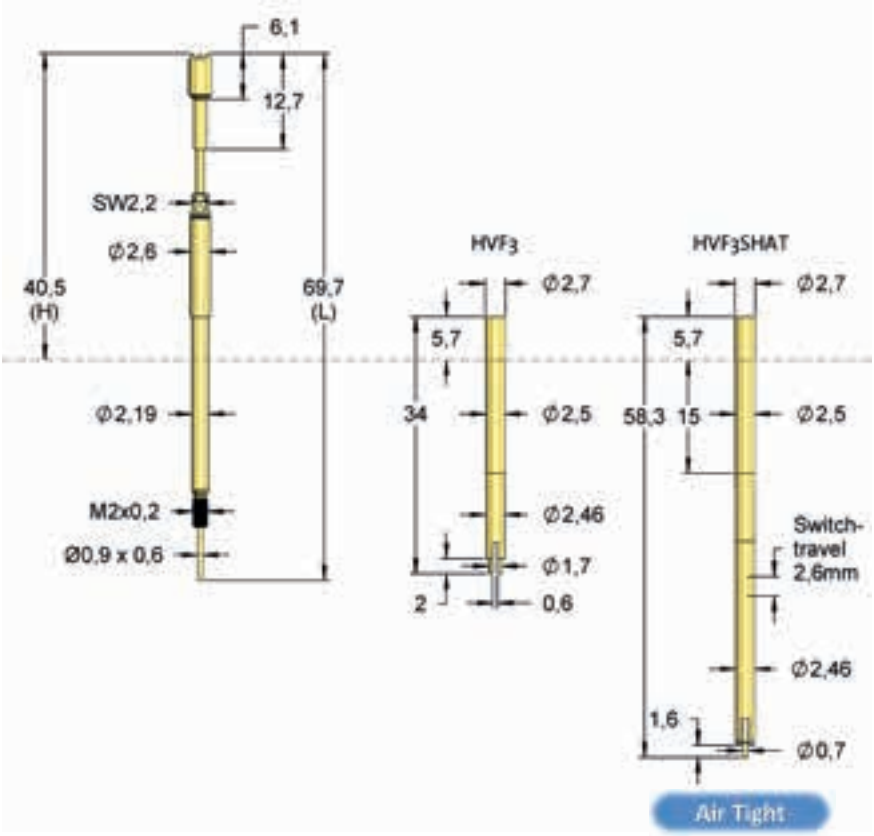
Insertion tool receptacle	FAWZVF3
Screw-in tool probe	FWZVF3 (T) max. Ø2,7 mm
Screw-in tool probe	FWZVF3S3 (T3) max. Ø4,0 mm

Drill Size (mm)

HVF3...	2,48 - 2,49

Projection Height (mm)

HVF3...	40,5



Type			Tip-Ø		Spring Force (N)
VF3	17	B	230	G	15
	Tip Style	Material		Finish	Special Version

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 diamensions.

ORDER EXAMPLE

Tip Style	Number	Material	Plating	Ø in mm	Version
	05	B	G	1,90	-
	05	B	G	2,20	-
	05	B	G	3,00	-
	06	B	G	2,70	-
	06	B	G	3,00	-
	12	B	G	2,30	-
	17	B	G	1,50	-
	17	B	G	1,80	-
	17	B	G	2,30	-
	17	B	G	3,00	-

VF3 Spaten

Push Back Probe 118 mil, spade tip styles

Centers (mm/mil)	3,00 / 118
Current	8,0 A
Temperature	-20°C...+80°C
R typically	30 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
L	300	1500
standard	100	500
standard	200	1000
standard	300	1500

Travel (mm)

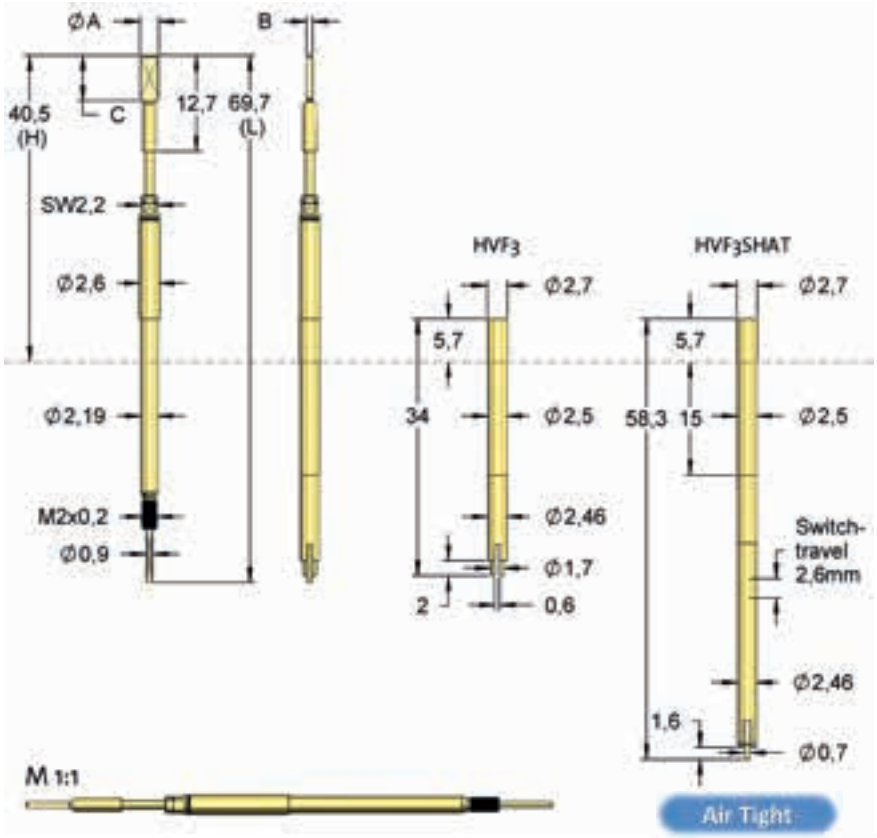
Version	Nominal	Maximum
standard	5,0	5,5
Thread (M)		2,0x0,2
Wrench Size		2,2
Pointing Accuracy		±0,1 mm

Materials and Plating

Plunger	see tip style
Barrel	Brass, gold plated
Spring	Music wire, gold plated
Receptacle	Brass, Gold plated

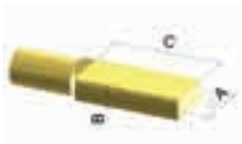
Drill Size (mm)

HVF3...	2.48 - 2.49



Accessories

Insertion tool receptacle	FAWZVF3
Screw-in tool probe	FWZVF3 (T) max. Ø2,7 mm
Screw-in tool probe	FWZVF3S3 (T3) max. Ø4,0 mm



Part Number	Typ Style	Ø A	Ø B	C	H	L	Version	Screw-in Tool
VF380B0002G10	80	1,40	0,50	6,00	40,50	69,70	-	FWZVF3;FWZVF3T
VF380B0002G15	80	1,40	0,50	6,00	40,50	69,70	-	FWZVF3;FWZVF3T
VF380B0001G10	80	1,60	0,50	6,00	40,50	69,70	-	FWZVF3;FWZVF3T
VF380B0001G15	80	1,60	0,50	6,00	40,50	69,70	-	FWZVF3;FWZVF3T
VF383B0004G10	83	1,90	0,50	6,00	40,50	69,70	-	FWZVF3;FWZVF3T
VF383B0004G15	83	1,90	0,50	6,00	40,50	69,70	-	FWZVF3;FWZVF3T
VF383B0004G15L	83	1,90	0,50	12,00	46,50	75,70	L	FWZVF3;FWZVF3T
VF383S0004L05	83	1,90	0,50	6,00	40,50	69,70	-	FWZVF3;FWZVF3T
VF383B0005G10	83	1,90	0,80	6,00	40,50	69,70	-	FWZVF3;FWZVF3T
VF383B0005G15	83	1,90	0,80	6,00	40,50	69,70	-	FWZVF3;FWZVF3T
VF383B0009G15L	83	2,10	0,70	12,00	46,50	75,70	L	FWZVF3;FWZVF3T
VF383B0007G15	83	2,20	1,20	6,00	40,50	69,70	-	FWZVF3;FWZVF3T
VF383B0002G15	83	2,50	0,50	6,00	40,50	69,70	-	FWZVF3;FWZVF3T
VF383B0001G10	83	2,50	0,80	6,00	40,50	69,70	-	FWZVF3;FWZVF3T
VF383B0001G15	83	2,50	0,80	6,00	40,50	69,70	-	FWZVF3;FWZVF3T
VF383B0003G15	83	2,50	1,50	6,00	40,50	69,70	-	FWZVF3;FWZVF3T
VF383B0008G10	83	2,70	0,80	6,00	40,50	69,70	-	FWZVF3;FWZVF3T
VF383B0008G15	83	2,70	0,80	6,00	40,50	69,70	-	FWZVF3;FWZVF3T
VF383B0010G15	83	2,70	0,80	10,00	44,50	73,70	S1	FWZVF3;FWZVF3T
VF383B0006G15	83	4,00	0,60	10,00	44,50	73,70	S1	FWZVF3S3; FWZVF3T3

V03

Push Back Probe 118 mil
Plug-in with Switch Function

Centers (mm/mil)	3,00 / 118
Current	8,0 A
Current (Switch)	1,0 A
Temperature	-20°C...+80°C
R typically	30 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
standard	300	1500

Travel (mm)

Version	Nominal	Maximum
standard	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
Receptacle	-

Accessories

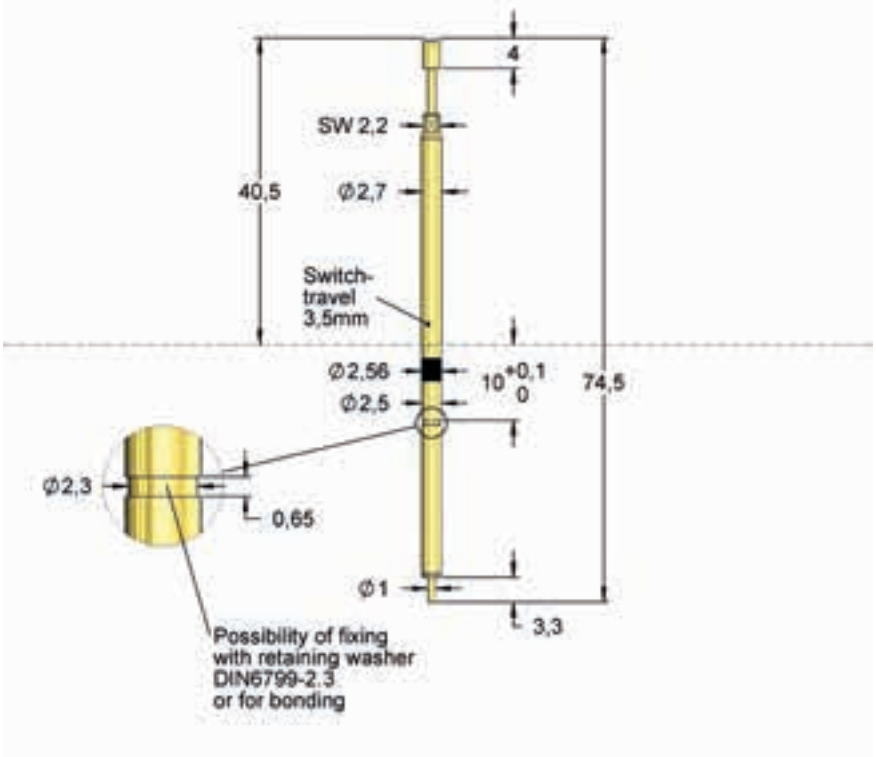
Screw-in tool	FWZVF3S2 (T2)

Drill Size (mm)

V03	2,50 - 2,52

Projection Height (mm)

V03	40,5



Type			Tip-Ø		Spring Force (N)
V03	06	B	230	G	15
	Tip Style	Material		Finish	Special Version

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	2,30	-
	17	B	G	2,30	-

V04

Push Back Probe 157 mil
Plug-in with Switch Function

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%)

Version	Preload	Nominal
L	400	1500
standard	150	600
standard	200	900
standard	400	1500

Travel (mm)

Version	Nominal	Maximum
L	9,5	10,0
standard	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
Receptacle	-

Accessories

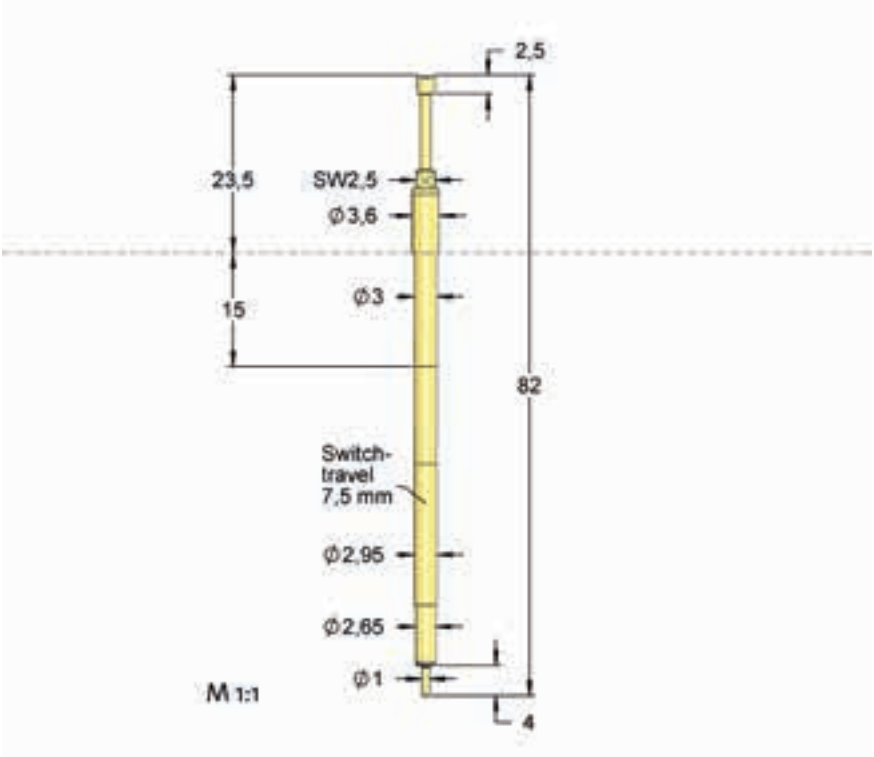
Screw-in tool	FWZVF4

Drill Size (mm)

V04	2,98 - 2,99

Projection Height (mm)

V04	40,5



Type			Tip-Ø		Spring Force (N)
V04	17	B	180	G	15
	Tip Style	Material		Finish	Special Version

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	1,80	-
	06	B	G	2,30	-
	06	B	G	3,00	-
	17	B	G	1,80	L

VF4

Push Back Probe 157 mil, round tip styles

Centers (mm/mil)	4,00 / 157
Current	10,0 A
Temperature	-20°C...+80°C
R typically	30 mOhm

Spring Force (cN ±20%)

Version	Preload	Nominal
L	300	1500
standard	80	300
standard	100	500
standard	300	1000
standard	300	1500
standard	300	2000
standard	300	2500

Travel (mm)

Version	Nominal	Maximum
L	5,0	5,5
standard	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) max. Ø4,0 mm
Screw-in tool probe	FWZVF4S1 (T1) max. Ø3,1 mm

Drill Size (mm)

HVF4...	3.48 - 3.49

Projection Height (mm)

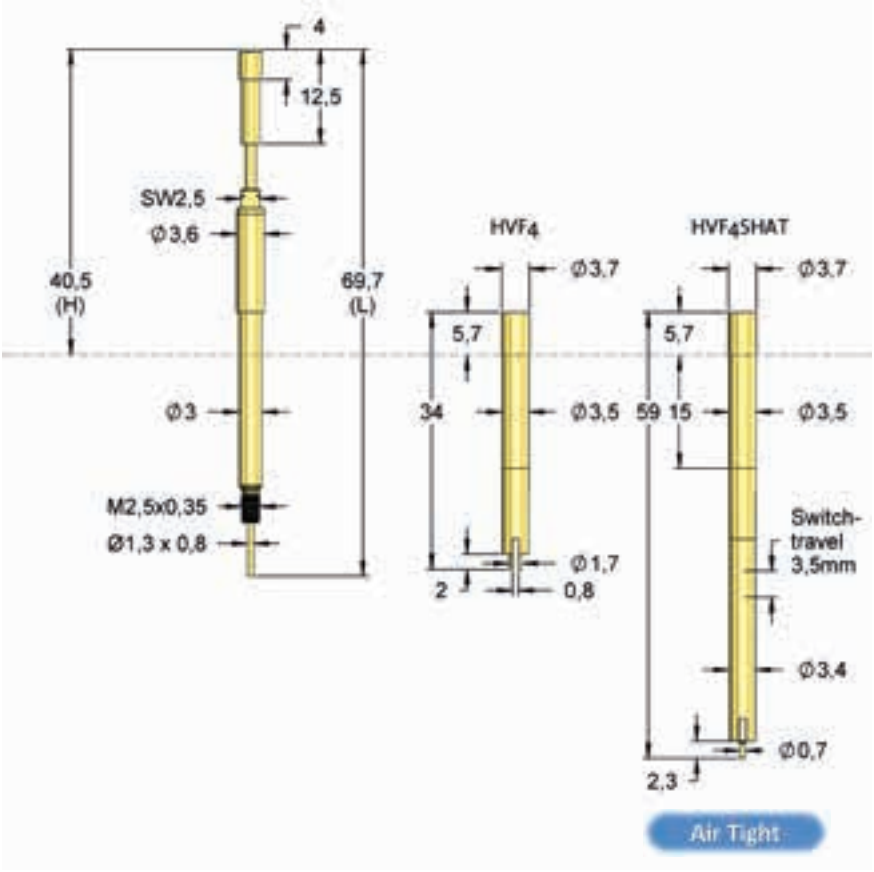
HVF4...	40,5

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 diamensions.

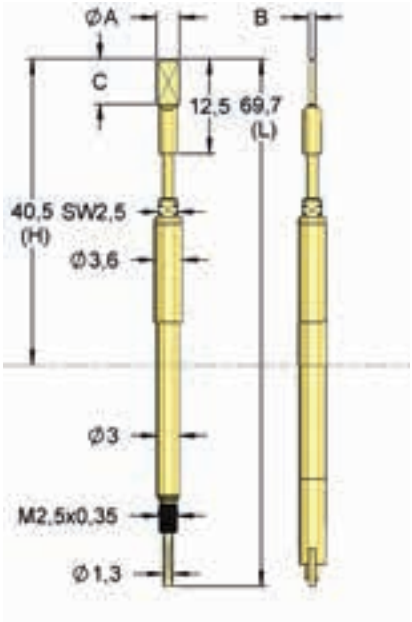
ORDER EXAMPLE

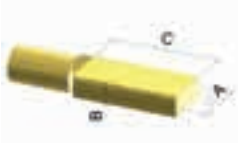


Tip Style	Number	Material	Plating	Ø in mm	Version
	05	B	G	2,30	-
	05	B	G	3,00	-
	05	B	G	4,00	-
	06	B	G	2,40	-
	06	B	G	3,00	-
	06	B	G	4,00	-
	06	B	G	4,80	-
	11	B	G	1,80	-
	11	B	G	2,00	-
	11	B	G	2,30	-
	11	B	G	3,00	-
	11	B	G	3,70	-
	14	S	L	3,00	-
	16	B	G	1,00	-
	16	B	G	1,00	L
	16	B	G	1,40	-
	16	B	G	1,80	-
	16	B	G	2,00	-
	16	B	G	2,30	-
	17	B	G	3,00	-
	17	B	G	4,00	-
	50	B	G	3,00	-

VF4 Spaten

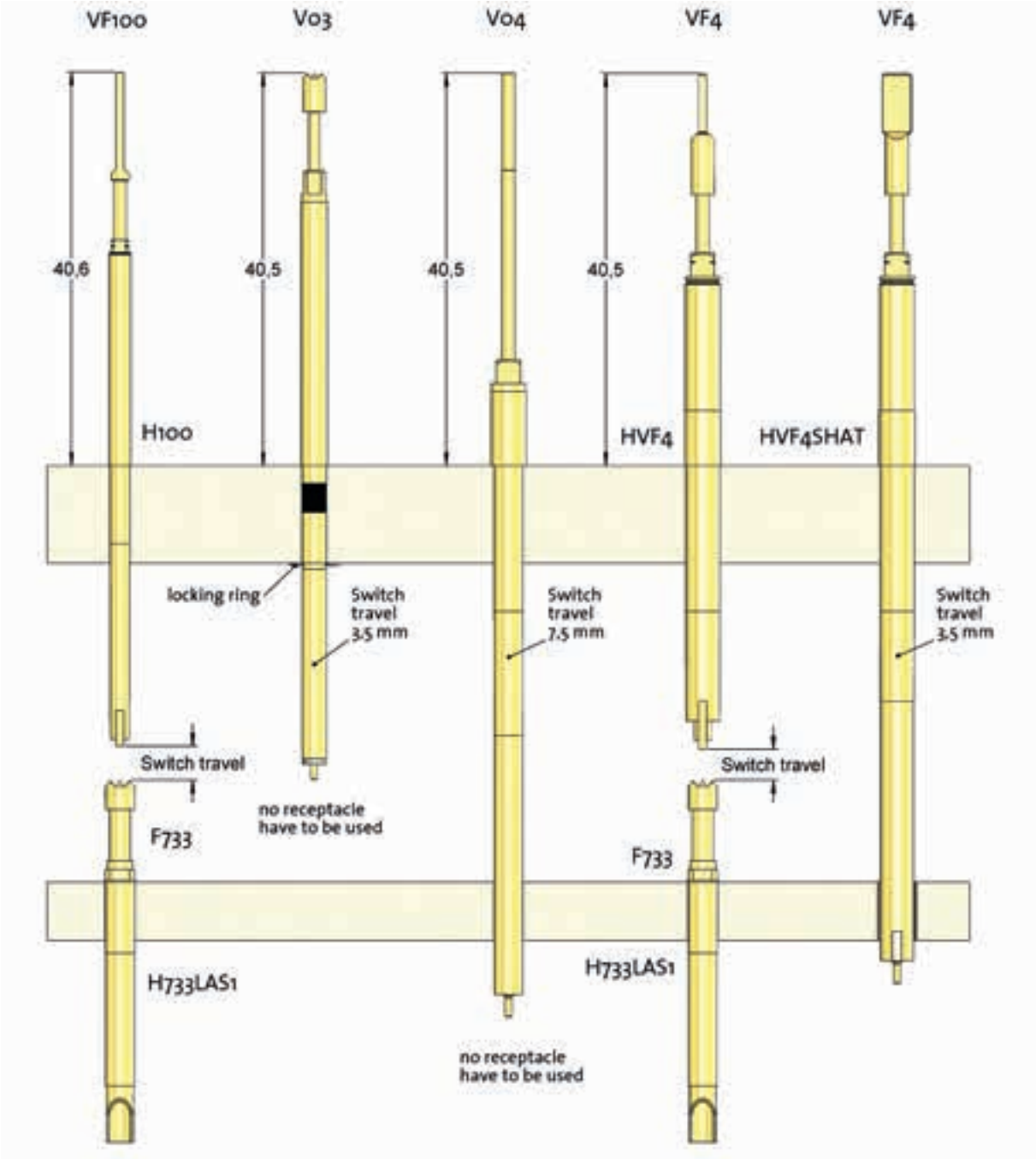
Push Back Probe 157 mil, spade tip styles





Part Number	Typ Style	Ø A	Ø B	C	H	L	Version	Screw-in Tool
VF481B0001G15	81	2,00	0,80	6,00	40,50	69,70	-	FWZVF4;FWZVF4T
VF481B0001G10	81	2,00	0,80	6,00	40,50	69,70	-	FWZVF4;FWZVF4T
VF483B0009G15	83	2,20	1,30	6,00	40,50	69,70	-	FWZVF4;FWZVF4T
VF483B0007G15L	83	2,25	1,30	16,00	50,50	79,70	L	FWZVF4S1; FWZVF4T1
VF483B0008G20	83	2,25	1,40	6,00	40,50	69,70	-	FWZVF4;FWZVF4T
VF483B0003G25	83	2,25	1,60	6,00	40,50	69,70	-	FWZVF4;FWZVF4T
VF483B0003G20	83	2,25	1,60	6,00	40,50	69,70	-	FWZVF4;FWZVF4T
VF483B0003G15	83	2,25	1,60	6,00	40,50	69,70	-	FWZVF4;FWZVF4T
VF483B0003G10	83	2,25	1,60	6,00	40,50	69,70	-	FWZVF4;FWZVF4T
VF483B0003G05	83	2,25	1,60	6,00	40,50	69,70	-	FWZVF4;FWZVF4T
VF483B0005G20	83	2,25	1,80	5,00	40,50	69,70	-	FWZVF4;FWZVF4T
VF483B0005G15	83	2,25	1,80	5,00	40,50	69,70	-	FWZVF4;FWZVF4T
VF483B0005G03	83	2,25	1,80	5,00	40,50	69,70	-	FWZVF4;FWZVF4T
VF483B0005G25	83	2,25	1,80	5,00	40,50	69,70	-	FWZVF4;FWZVF4T
VF483B0005G10	83	2,25	1,80	5,00	40,50	69,70	-	FWZVF4;FWZVF4T
VF483B0006G15	83	2,50	0,60	6,00	40,50	69,70	-	FWZVF4;FWZVF4T
VF483B0006G20	83	2,50	0,60	6,00	40,50	69,70	-	FWZVF4;FWZVF4T
VF483B0006G25	83	2,50	0,60	6,00	40,50	69,70	-	FWZVF4;FWZVF4T
VF483B0001G20	83	2,50	0,80	6,00	40,50	69,70	-	FWZVF4;FWZVF4T
VF483B0001G15	83	2,50	0,80	6,00	40,50	69,70	-	FWZVF4;FWZVF4T
VF483B0001G10	83	2,50	0,80	6,00	40,50	69,70	-	FWZVF4;FWZVF4T
VF483B0001G05	83	2,50	0,80	6,00	40,50	69,70	-	FWZVF4;FWZVF4T
VF483B0001G25	83	2,50	0,80	6,00	40,50	69,70	-	FWZVF4;FWZVF4T
VF483B0002G25	83	3,00	0,80	6,00	40,50	69,70	-	FWZVF4;FWZVF4T
VF483B0002G05	83	3,00	0,80	6,00	40,50	69,70	-	FWZVF4;FWZVF4T
VF483B0002G03	83	3,00	0,80	6,00	40,50	69,70	-	FWZVF4;FWZVF4T
VF483B0002G15	83	3,00	0,80	6,00	40,50	69,70	-	FWZVF4;FWZVF4T
VF483B0002G10	83	3,00	0,80	6,00	40,50	69,70	-	FWZVF4;FWZVF4T
VF483B0002G20	83	3,00	0,80	6,00	40,50	69,70	-	FWZVF4;FWZVF4T
VF483B0004G25	83	3,00	1,60	6,00	40,50	69,70	-	FWZVF4;FWZVF4T
VF483B0004G20	83	3,00	1,60	6,00	40,50	69,70	-	FWZVF4;FWZVF4T
VF483B0004G15	83	3,00	1,60	6,00	40,50	69,70	-	FWZVF4;FWZVF4T
VF483B0004G10	83	3,00	1,60	6,00	40,50	69,70	-	FWZVF4;FWZVF4T
VF483B0004G05	83	3,00	1,60	6,00	40,50	69,70	-	FWZVF4;FWZVF4T

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.

Kelvin and Radio Frequency Probes

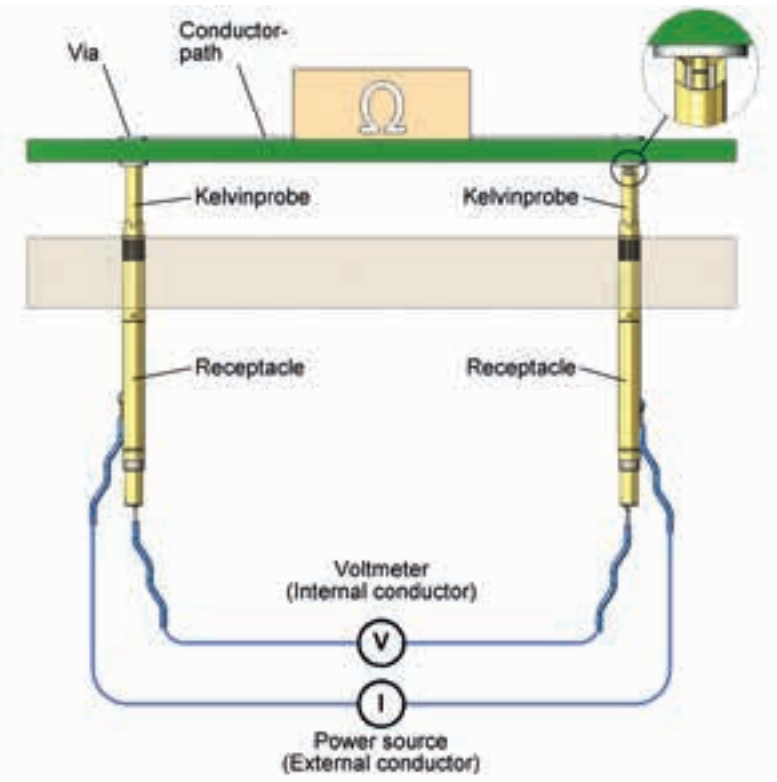
Very low resistances of components are measured by the „Kelvin 4-wire measurement“. For this application the connection of the current source and the voltmeter need to be very close to the component. Otherwise the resistances of the conductors are leading to false results. These connections can be realized 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.

4-Wire-Resistance-Measurement by

Kelvin Coaxial Probes

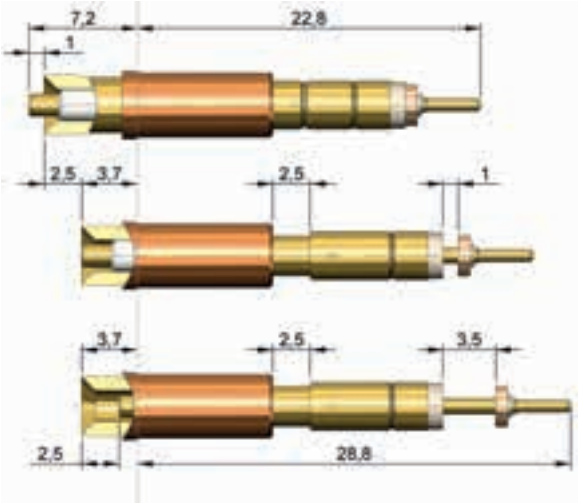
The Kelvin Method

A Kelvin probe is a coaxial contact probe with two electrically insulated measuring circuits. The typical 4-wire-methode 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=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 F822

Depending on the shape of the DUT the travel of inner contact and Circular contact might be different. As soon as the Circular contact is pushed in, the inner contact is carried along. This might lead to other travels and spring forces than the nominal values.



F805

NEW

Kelvin Probe 87 mil Plug-in

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
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

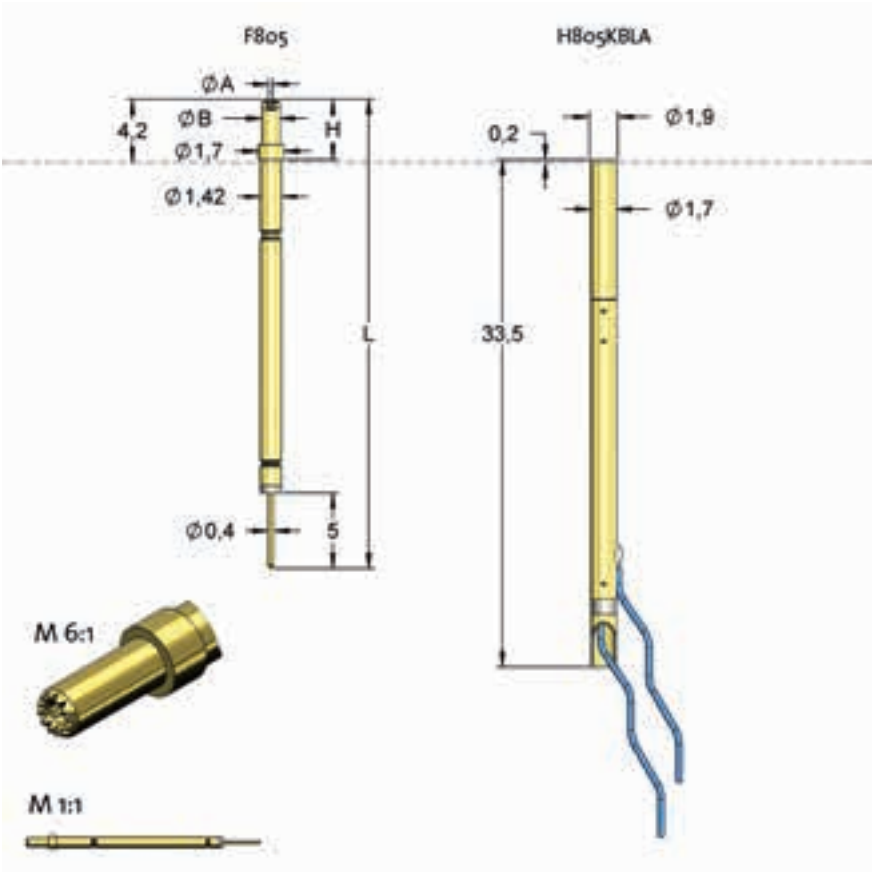
Internal Contact	BeCu, gold plated
Circular Contact	BeCu, gold plated
Barrel	Bronze, gold plated
Spring Internal Contact	Music Wire, gold plated
Spring Circular Contact	Stainless Steel, unplated
Receptacle	Bronze, gold plated

Accessories

Insertion tool Receptacle	FEWZ-100E0

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

Part Number	Typ Style	Typ Style	Ø A	Ø B	C	H	L	Version	Screw-in Tool
F80518B0001G250180		18	0,27	1,20	0,00	4,00	31,00	-	-

F810

Kelvin Probe 100 mil Plug-in

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
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, versilbert
Spring Internal Contact	Music Wire, versilbert
Spring Circular Contact	Music Wire, versilbert
Receptacle	Bronze, gold plated

Accessories

Insertion tool Receptacle	FEWZ-772E0

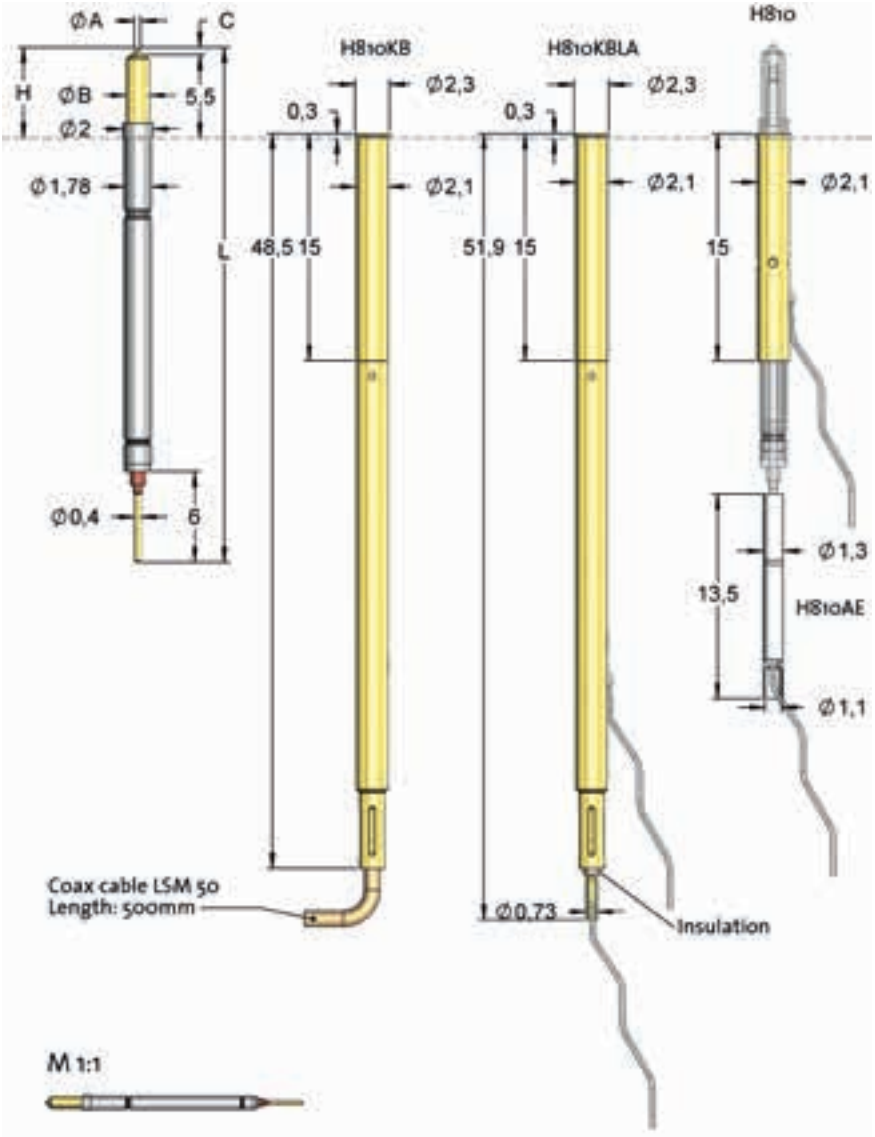
Drill Size (mm)

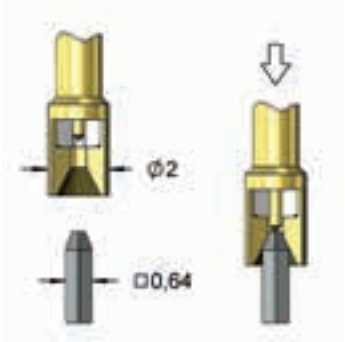
H810...	2,08 - 2,09

Type			Tip-Ø		Spring Force	
F810	01	S	040	L	230	S1
	Tip Style	Material		Finish		Special Version

Material:	S = Steel; B = BeCu
Tip-Ø:	040 = 0,40 mm (e.g.)
Finish:	L = Longtime Gold plated; G = Gold plated
Special Version:	S1 = Version for contacting wire-wrap-pins
Receptacle:	Order Code according drawing

ORDER EXAMPLE





Special version for connecting Wire-Wrap-Pins.
Order Code: F81001S040L230S1

Part Number	Typ Style	Typ Style	Ø A	Ø B	C	H	L	Version	Screw-in Tool
F81001S040L170		01	0,40	1,50	0,50	6,30	34,00	-	-
F81001S040L230S1		01	0,40	2,00	-1,20	7,80	35,80	S1	-
F81006B080G230S1		06	0,80	2,00	-1,20	7,80	35,80	S1	-
F81016S040L170		16	0,40	1,50	0,50	6,30	34,00	-	-

F835

Kelvin Probe 138 mil Threaded

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
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

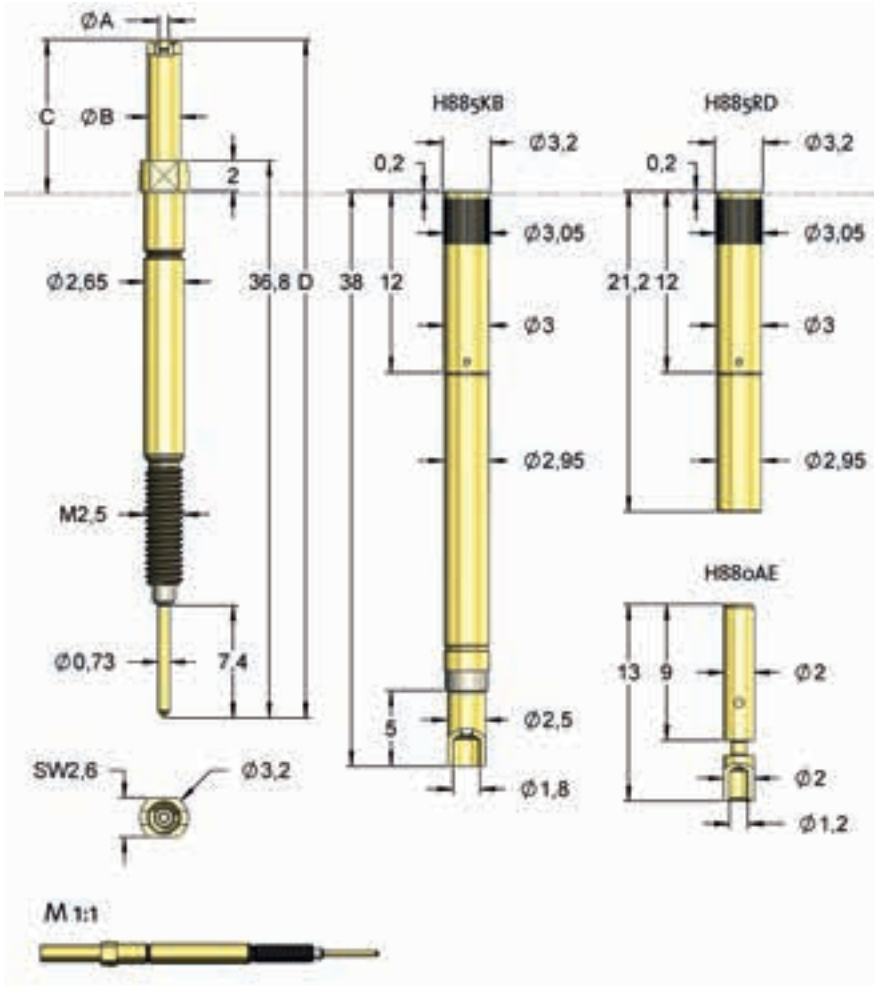
Internal Contact	BeCu, gold plated
Circular Contact	BeCu, gold plated
Barrel	Brass, gold plated
Spring Internal Contact	Music Wire, versilbert
Spring Circular Contact	Music Wire, versilbert
Receptacle	Brass, gold plated

Accessories

Insertion tool Receptacle	FEWZ-774E0

Drill Size (mm)

Receptacle without knurl	2,98 - 2,99
Receptacle with knurl	3,00 - 3,02

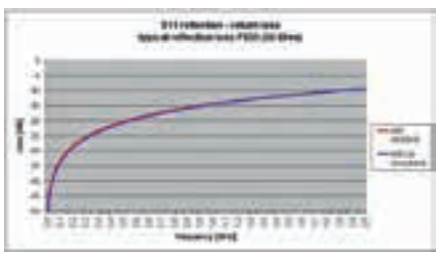


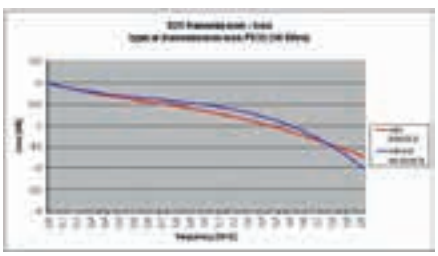
Type			number		Spring Force
F 835	16	B	0001	G	410
	Tip Style	Material		Finish	Special Version

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 diamensions.

ORDER EXAMPLE





Part Number	Typ Style	Typ Style	Ø A	Ø B	C	H	L	Version	Screw-in Tool
F83509B0001G180		09	0,64	2,17	0,00	10,20	44,80	-	FWZ885; FWZ885T
F83516B0001G410		16	0,64	2,17	0,00	10,20	44,80	-	FWZ885; FWZ885T
F83527B0002G410		27	0,64	2,17	9,00	19,20	53,80	-	FWZ885; FWZ885T

F830

Kelvin Probe 157 mil Plug-in

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
total	-	320
Internal Contact	60	160
Circular Contact	60	160

Travel (mm)

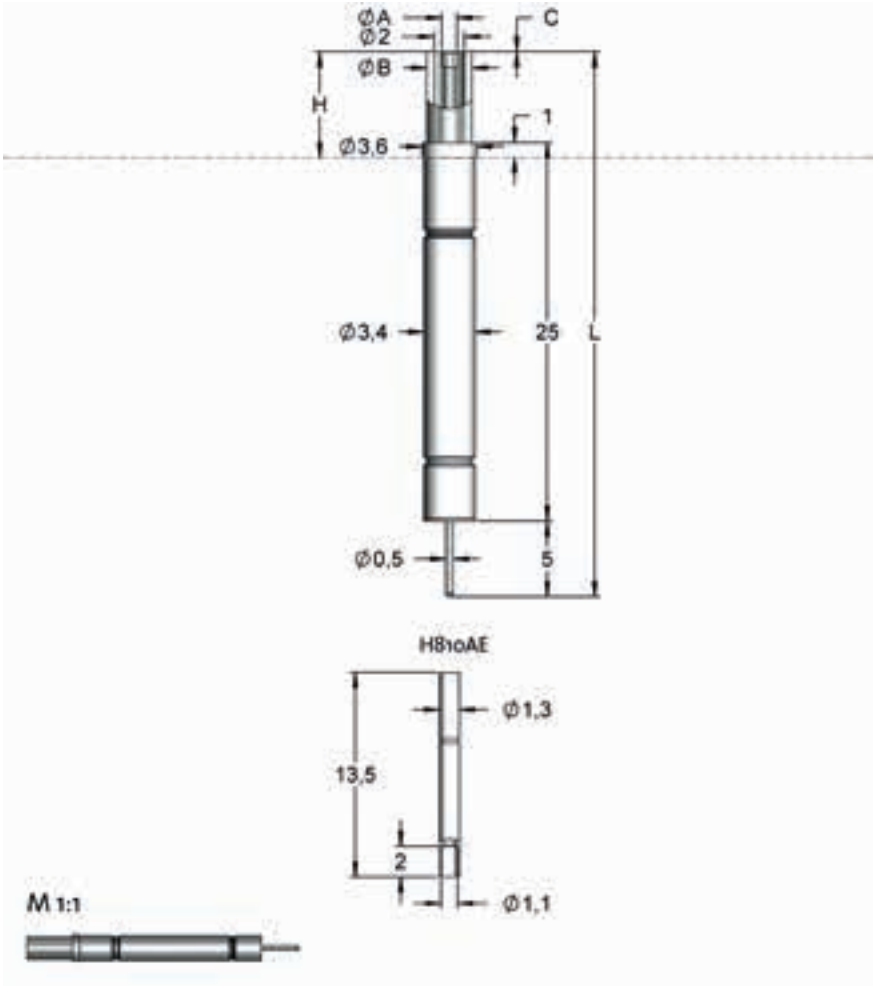
	Nominal	Maximum
Internal Contact	4,0	4,2
Circular Contact	4,0	4,2

Materials and Plating

Internal Contact	Steel, vernickelt
Circular Contact	BeCu, vernickelt
Barrel	Bronze, versilbert
Spring Internal Contact	Music Wire, versilbert
Spring Circular Contact	Music Wire, versilbert

Drill Size (mm)

F830	3,39 - 3,40



Type			number		Spring Force
F830	09	S	100	N	320
	Tip Style	Material		Finish	Special Version

Material:	S = Steel
Tip-Ø:	100 = 1,0 mm (e.g.)
Finish:	N = Nickel plated
Receptacle:	Order Code according drawing

ORDER EXAMPLE

Part Number	Typ Style	Typ Style	Ø A	Ø B	C	H	L	Version	Screw-in Tool
F83002S100N320		02	1,00	3,00	0,00	7,00	36,00	-	-
F83009S100N320		09	1,00	3,00	0,00	7,00	36,00	-	-
F83017S100N320		17	1,00	3,00	0,00	7,00	36,00	-	-

F822

Kelvin Probe 216 mil Plug-in

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%)

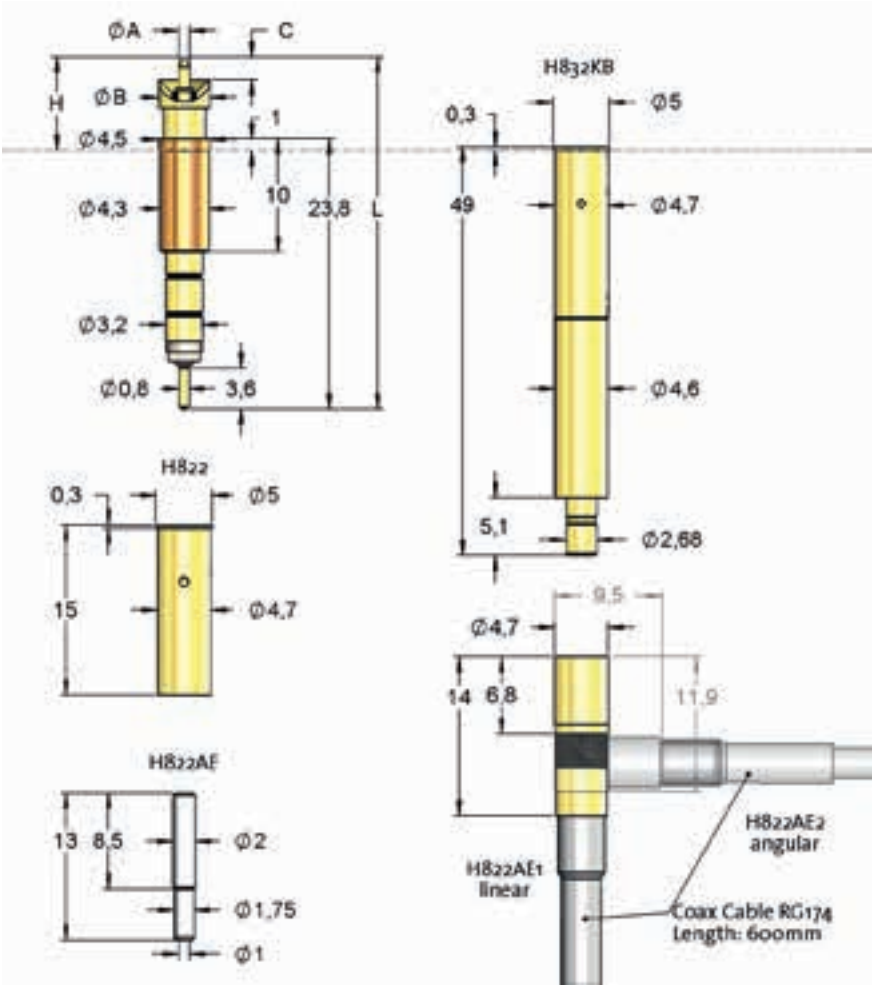
	Preload	Nominal
total	-	650
Internal Contact	100	200
Circular Contact	250	450

Travel (mm)

	Nominal	Maximum
Internal Contact	3,0	3,5
Circular Contact	2,0	2,6

Materials and Plating

Internal Contact	Steel, longtime gold plated
Circular Contact	BeCu, gold plated
Barrel	Bronze, unplated
Spring Internal Contact	Stainless Steel, unplated
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

Part Number	Typ Style	Typ Style	Ø A	Ø B	C	H	L	Version	Screw-in Tool
F82202S0016L650		02	1,50	4,00	1,00	7,50	30,00		-
F82203S0011L650		03	0,50	4,00	2,00	8,50	31,00		-
F82203S0001L650		03	1,00	4,00	2,00	8,50	31,00		-
F82203S0014L650		03	1,00	4,00	3,50	10,00	32,50		-
F82203S0003L650		03	1,00	4,50	2,00	8,50	31,00		-
F82203S0015L650		03	1,00	4,50	3,50	10,00	32,50		-
F82205S0007L650IK25		05	0,60	4,00	-2,50	10,80	33,30	IK	-
F82205S0001L650		05	1,00	4,00	2,00	8,50	31,00		-
F82205S0003L650		05	1,00	4,50	2,00	8,50	31,00		-
F82205S0005L650		05	1,50	4,00	4,50	11,00	33,50		-
F82209S0016L650		09	1,50	4,00	1,00	7,50	30,00		-
F82211S0012L650		11	0,64	4,50	3,50	10,00	32,50		-
F82217S0006L650		17	0,64	4,00	2,00	8,50	31,00		-
F82217S0002L650		17	1,50	4,00	4,50	11,00	33,50		-
F82217S0016L650		17	1,50	4,00	1,00	7,50	30,00		-
F82217S0004L650		17	1,50	4,50	4,50	11,00	34,00		-
F82241S0009L650S2		41	1,50	5,00	0,70	11,00	33,50	Sonder	-
F82241S0008L650S1		41	1,50	5,70	-1,80	12,80	35,30	Sonder	-

F832

Kelvin Probe 216 mil Threaded

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
total	-	650
Internal Contact	100	200
Circular Contact	250	450

Travel (mm)

	Nominal	Maximum
Internal Contact	3,0	3,5
Circular Contact	2,0	2,6
Thread	4,0x0,5	

Materials and Plating

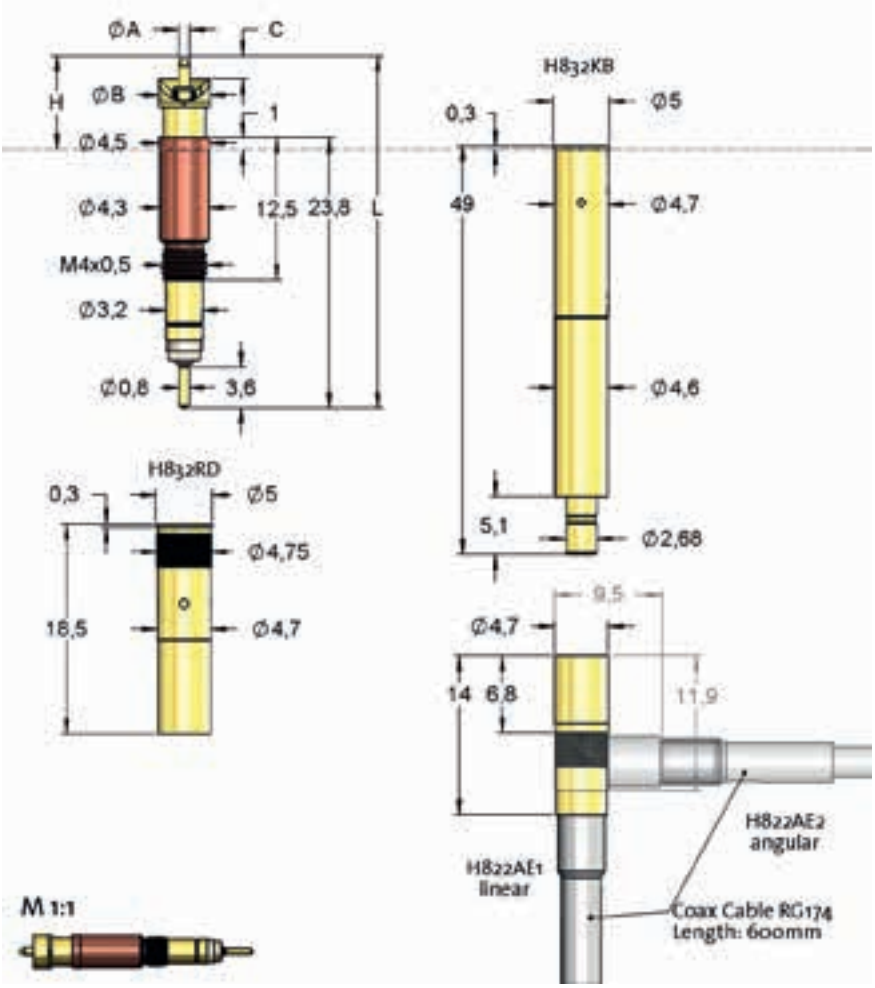
Internal Contact	Steel, longtime gold plated
Circular Contact	BeCu, gold plated
Barrel	Brass, unplated
Spring Internal Contact	Stainless Steel, unplated
Spring Circular Contact	Stainless Steel, unplated
Receptacle	Bronze, gold plated

Accessories

Insertion tool Receptacle	FEWZ-822E0
Einschraubwerkzeug Stift	FWZ832 (T)

Drill Size (mm)

Receptacle without knurl	4,68 - 4,69
Receptacle with knurl	4,70 - 4,72



Part Number	Typ Style	Typ Style	Ø A	Ø B	C	H	L	Version	Screw-in Tool
F83203S0001L650		03	1,00	4,00	2,00	8,50	31,00	-	FWZ832; FWZ832T
F83203S0004L650		03	1,00	4,50	2,00	8,50	31,00	-	FWZ832; FWZ832T
F83203S0005L650		03	1,00	4,50	3,50	10,00	32,50	-	FWZ832; FWZ832T
F83205S0008L650IK10		05	0,60	4,00	2,80	9,30	31,80	IK	FWZ832; FWZ832T
F83205S0001L650		05	1,00	4,00	2,00	8,50	31,00	-	FWZ832; FWZ832T
F83205S0003L650		05	1,00	4,50	2,00	8,50	31,00	-	FWZ832; FWZ832T
F83217S0002L650		17	1,50	4,00	4,50	11,00	33,50	-	FWZ832; FWZ832T

F840

High Current-Kelvin Probe up to 30 A

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
total	-	1780
Internal Contact	200	280
Circular Contact	100	1500

Travel (mm)

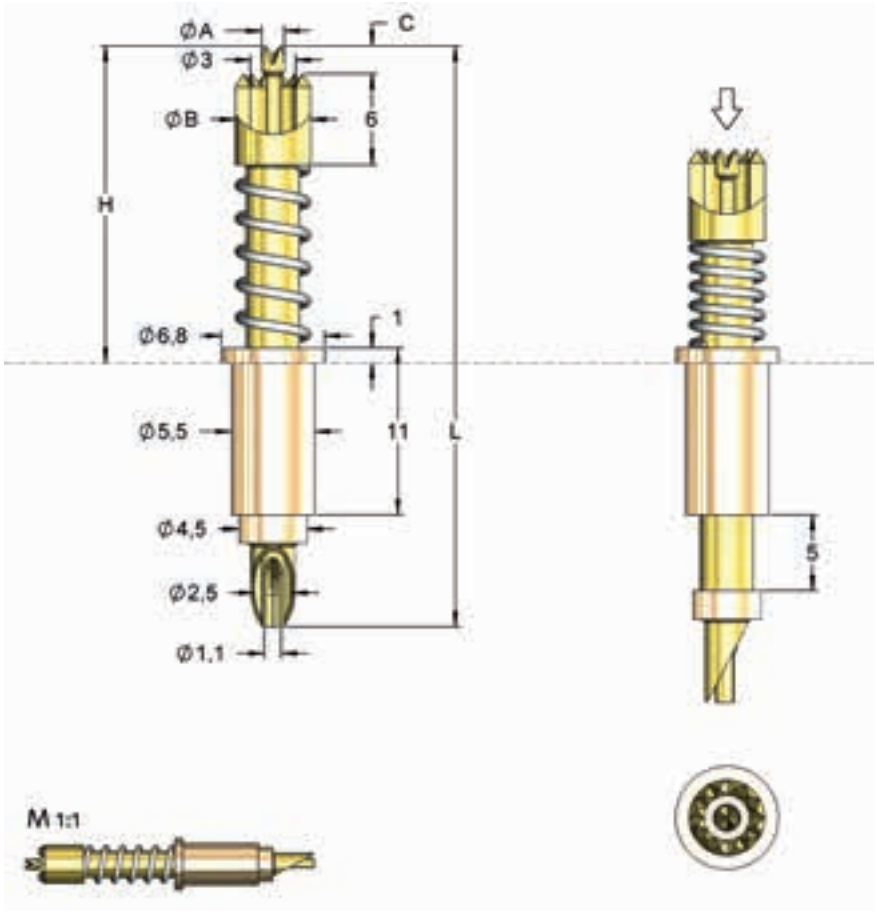
	Nominal	Maximum
Internal Contact	1,9	6,4
Circular Contact	5,0	5,5

Materials and Plating

Internal Contact	Steel, longtime gold plated
Circular Contact	Steel, longtime gold plated
Barrel	Brass, unplated
Spring Internal Contact	Music Wire, versilbert
Spring Circular Contact	Music Wire, versilbert

Drill Size (mm)

F840	5,50



Type			Tip-Ø		Spring Force	
F840	14	S	150	L	1780	
	Tip Style	Material		Finish		Special Version

Material: S = Steel
Tip-Ø: 150 = 1,5 mm (e.g.)
Finish: L = Longtime Gold plated

ORDER EXAMPLE

Part Number	Typ Style	Typ Style	Ø A	Ø B	C	H	L	Version	Screw-in Tool
F84014S150L1780		14	1,50	5,00	1,85	21,00	38,85	-	-

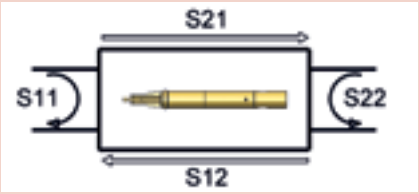
Radio Frequency Probes from FEINMETALL

Design of RF-Probes
Spring contact probes for RF-applications are coaxial probes. The inner and outer conductors are designed and dimensioned according 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.

HF86002B0001G530

Contacting of SMA-Female

Centers (mm/mil)	6,50 / 256
Temperature	-20°C...+80°C
Current (Circular)	10,0 A
Current (Internal)	3,0 A
Z	50 Ohm
Frequency	8,0 GHz

Spring Force Total (cN ±20%)

	Preload	Nominal Force
total	-	530
Internal Contact	75	130
Circular Contact	90	400

Travel (mm)

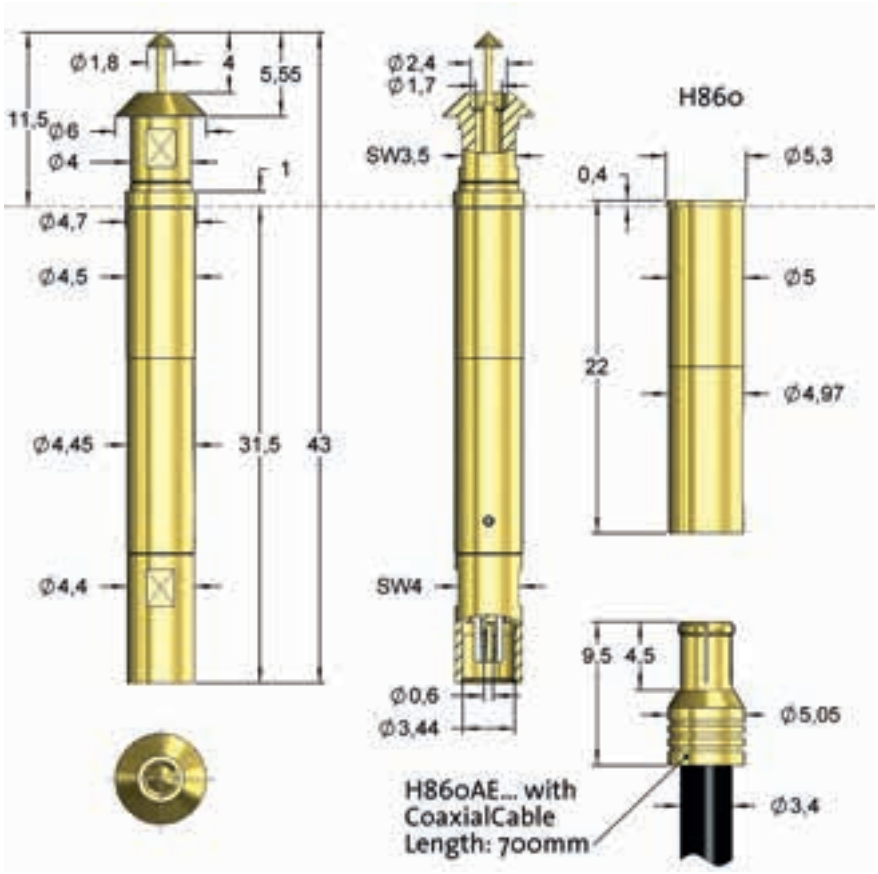
	Nominal	Maximum
Internal Contact	2,0	3,7
Circular Contact	4,0	5,0
Wrench Size	3,5/4,0	

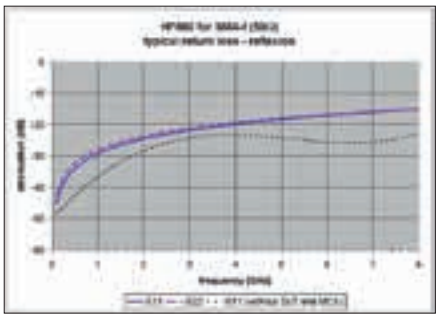
Materials and Plating

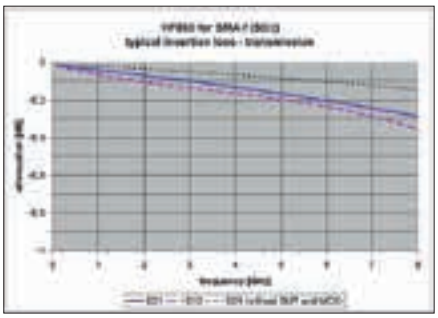
Internal Contact	BeCu, gold plated
Circular Contact	BeCu, gold plated
Barrel	Brass, gold plated
Spring Internal Contact	Music wire, gold plated
Spring Circular Contact	Stainless steel, unplated
Receptable	Brass, gold plated

Drill Size (mm)

H860	4,99 - 5,00







SMA-Female

BESTELL-NR.	Tip Style	Number	Material	Plating	Ø in mm	Version
HF86002B0001G530 (SMA-Female)		02	B	G	1,8	-

HF86005B0004G530

Contacting of SMB-Male

Centers (mm/mil)	6,00 / 236
Temperature	-20°C...+80°C
Current (Circular)	10,0 A
Current (Internal)	3,0 A
Z	50 Ohm
Frequency	5,0 GHz

Spring Force Total (cN ±20%)

	Preload	Nominal Force
total	-	530
Internal Contact	75	130
Circular Contact	90	400

Travel (mm)

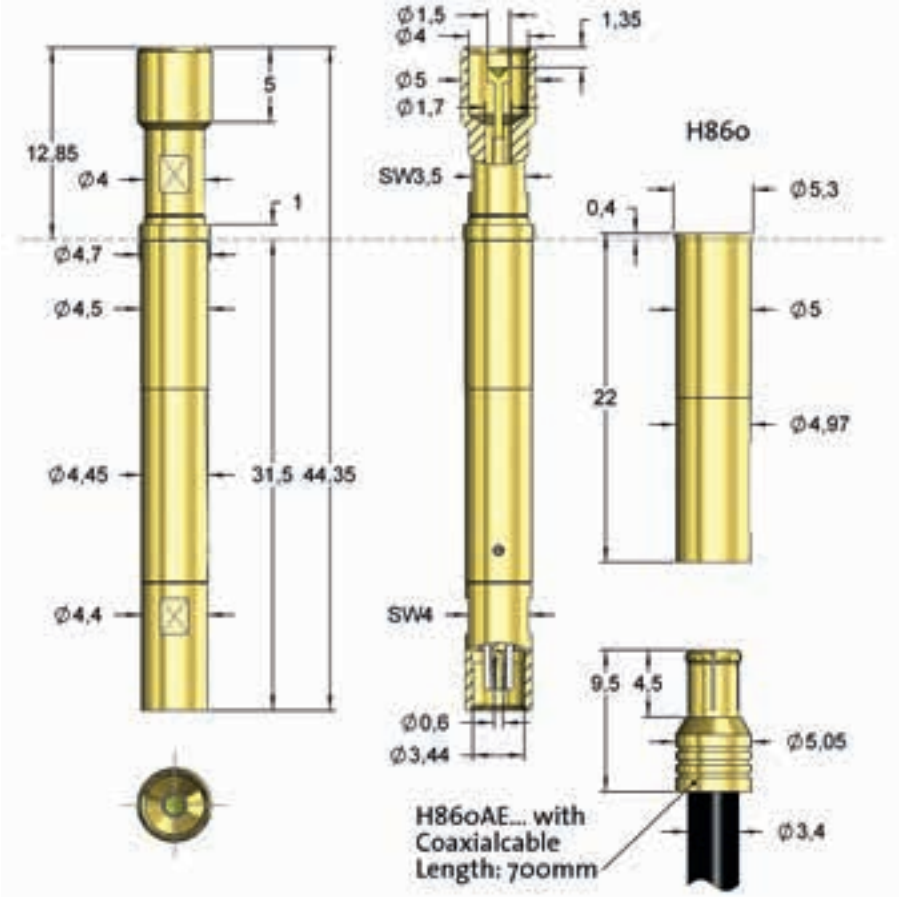
	Nominal	Maximum
Internal Contact	2,0	3,7
Circular Contact	4,0	5,0
Wrench Size	3,5/4,0	

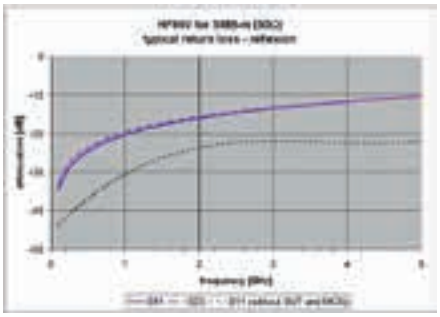
Materials and Plating

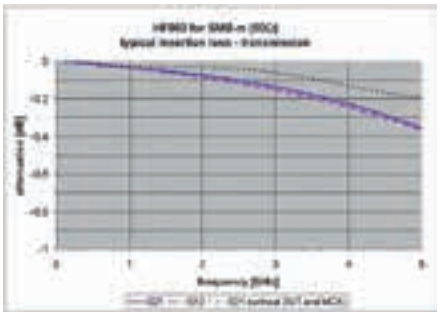
Internal Contact	BeCu, gold plated
Circular Contact	BeCu, gold plated
Barrel	Brass, gold plated
Spring Internal Contact	Music wire, gold plated
Spring Circular Contact	Stainless steel, unplated
Receptable	Brass, gold plated

Drill Size (mm)

H860	4,99 - 5,00







SMB-Male

ORDER NUMBER
HF86005B0004G530 (SMB-Male)

Tip Style	Number	Material	Plating	Ø in mm	Version
	05	B	G	1,5	-

HF86002B0005G530

Contacting of SMB-Female

Centers (mm/mil)	6,50 / 256
Temperature	-20°C...+80°C
Current (Circular)	10,0 A
Current (Internal)	3,0 A
Z	50 Ohm
Frequency	6,0 GHz

Spring Force Total (cN ±20%)

	Preload	Nominal Force
total	-	530
Internal Contact	75	130
Circular Contact	90	400

Travel (mm)

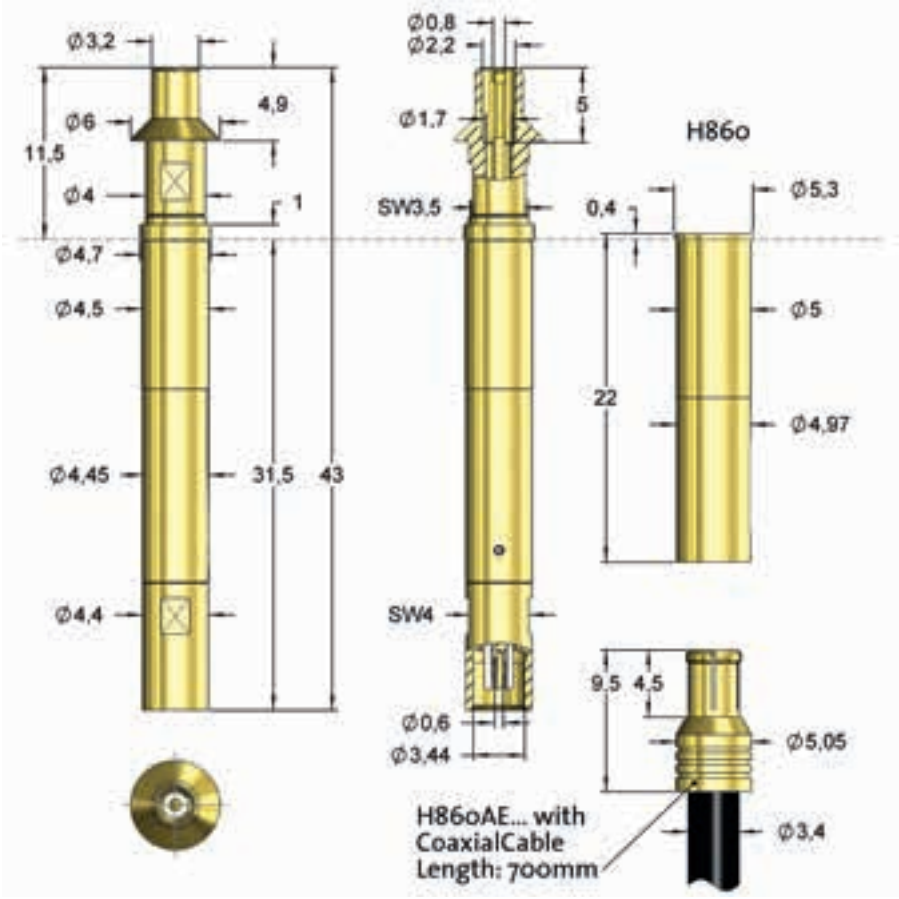
	Nominal	Maximum
Internal Contact	2,0	3,7
Circular Contact	4,0	5,0
Wrench Size	3,5/4,0	

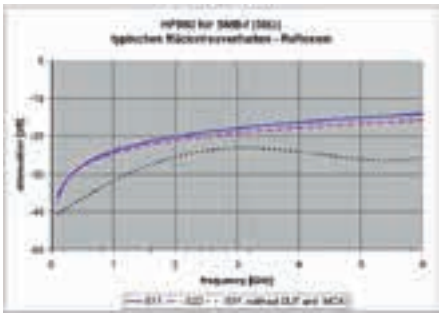
Materials and Plating

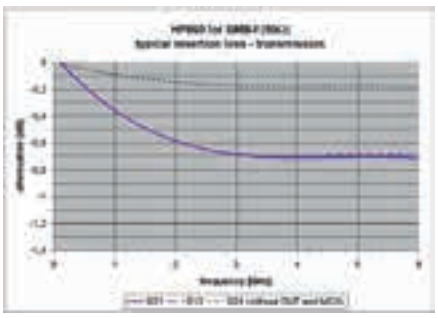
Internal Contact	BeCu, gold plated
Circular Contact	BeCu, gold plated
Barrel	Brass, gold plated
Spring Internal Contact	Music wire, gold plated
Spring Circular Contact	Stainless steel, unplated
Receptable	Brass, gold plated

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	-

HF86005B0003G530

Contacting of SMC-Male

Centers (mm/mil)	6,00 / 236
Temperature	-20°C...+80°C
Current (Circular)	10,0 A
Current (Internal)	3,0 A
Z	50 Ohm
Frequency	5,0 GHz

Spring Force Total (cN ±20%)

	Preload	Nominal Force
total	-	530
Internal Contact	75	130
Circular Contact	90	400

Travel (mm)

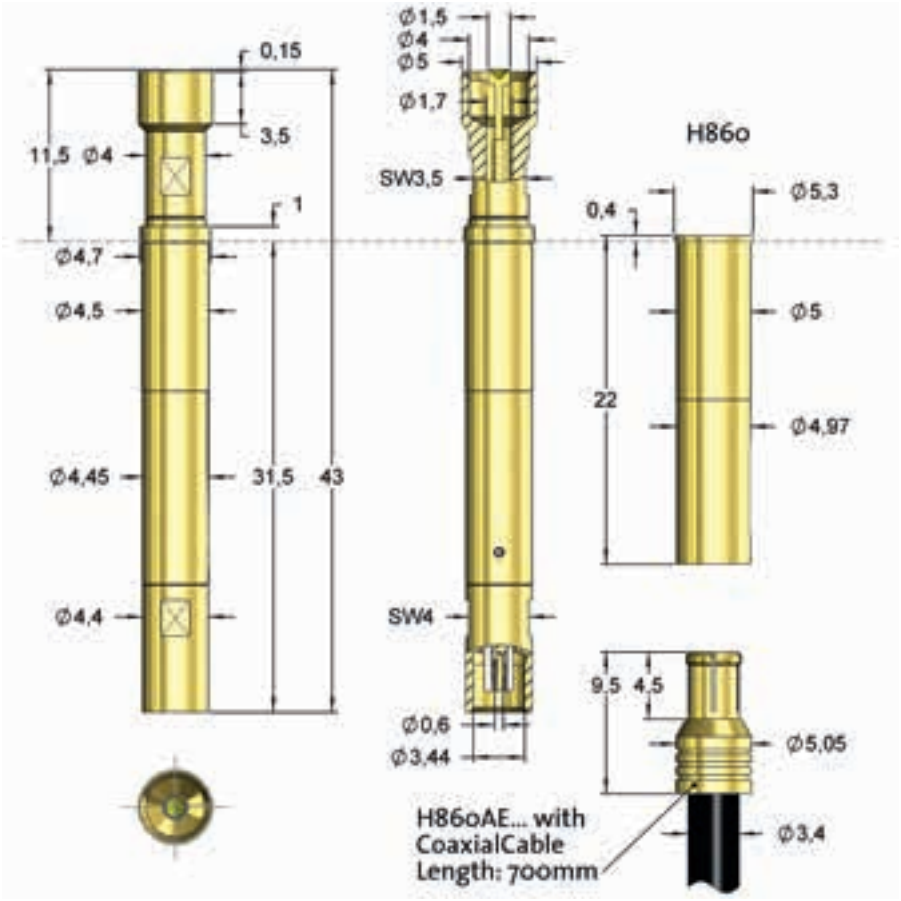
	Nominal	Maximum
Internal Contact	2,0	3,7
Circular Contact	4,0	5,0
Wrench Size	3,5/4,0	

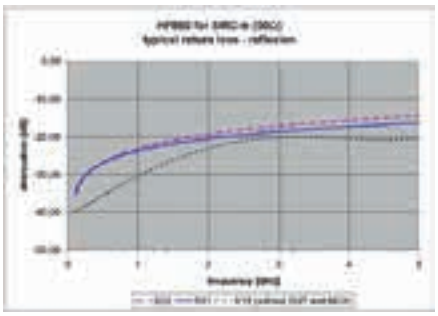
Materials and Plating

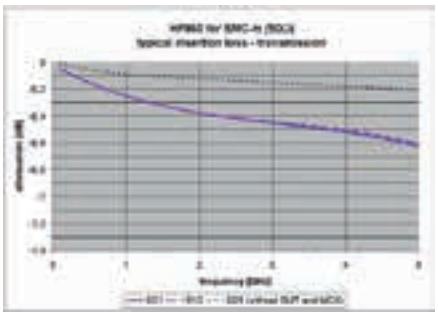
Internal Contact	BeCu, gold plated
Circular Contact	BeCu, gold plated
Barrel	Brass, gold plated
Spring Internal Contact	Music wire, gold plated
Spring Circular Contact	Stainless steel, unplated
Receptable	Brass, gold plated

Drill Size (mm)

H860	4,99 - 5,00







SMC-Male

ORDER NUMBER
HF86005B0003G530 (SMC-Male)

Tip Style	Number	Material	Plating	Ø in mm	Version
	05	B	G	1,5	-

HF86005B0002G530

Contacting of U.Fl-Male

Centers (mm/mil)	6,00 / 236
Temperature	-20°C...+80°C
Current (Circular)	10,0 A
Current (Internal)	3,0 A
Z	50 Ohm
Frequency	5,0 GHz

Spring Force Total (cN ±20%)

	Preload	Nominal Force
total	-	530
Internal Contact	75	130
Circular Contact	90	400

Travel (mm)

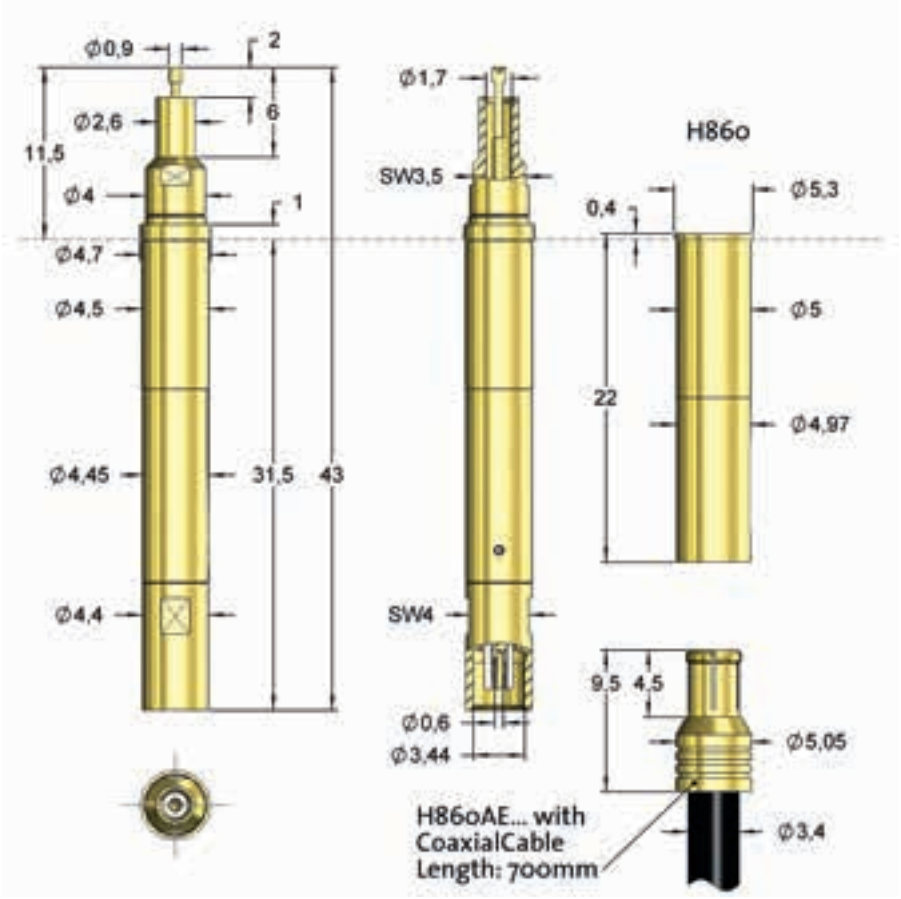
	Nominal	Maximum
Internal Contact	2,0	3,7
Circular Contact	4,0	5,0
Wrench Size	3,5/4,0	

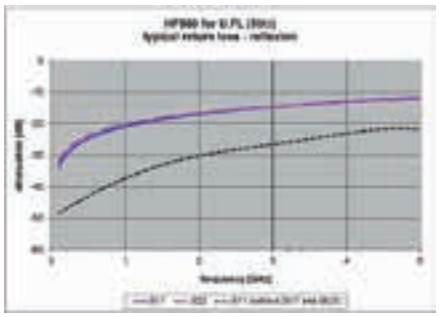
Materials and Plating

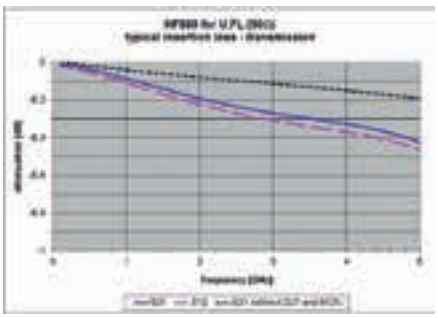
Internal Contact	BeCu, gold plated
Circular Contact	BeCu, gold plated
Barrel	Brass, gold plated
Spring Internal Contact	Music wire, gold plated
Spring Circular Contact	Stainless steel, unplated
Receptable	Brass, gold plated

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	-

HF819

Contacting of HSD Connectors

Centers (mm/mil)	12,0 / 472
Temperature	-20°C...+80°C
Current (Circular)	10,0 A
Current (Internal)	3,0 A
Z	100 Ohm
Frequency	1-2 GHz

Spring Force Total (cN ±20%)

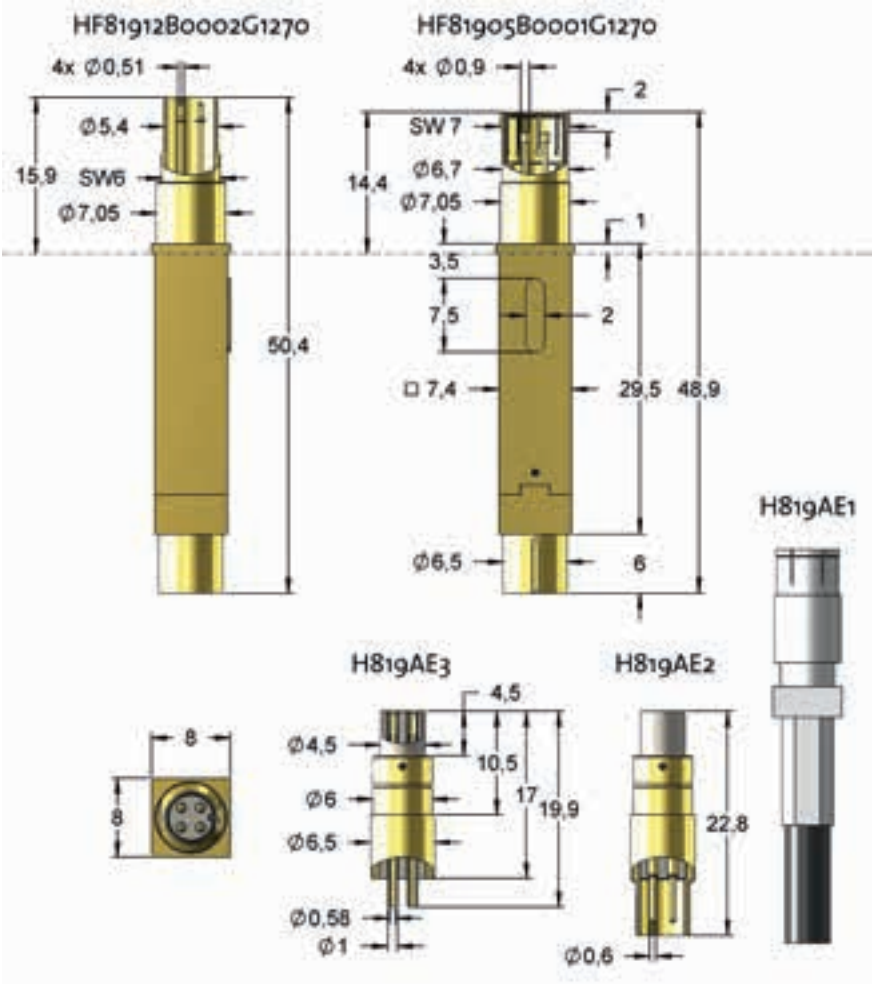
	Preload	Nominal Force
total	-	1270
Internal Contact	75	130
Circular Contact	300	750

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	Music wire, gold plated
Spring Circular Contact	Stainless steel, unplated



By combining connecting elements H819AE1 and H819AE2 the signal path can be realized without soldering. This leads to a well d**efined and reproducible measuring section.**

HF819 H819AE2 H819AE1

HF819 H819AE3 for direct soldering

HSD-Female H819AE1

HSD-Male D4S20A-40ML5-Z

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	-

F086

Inner Contact for RF-Probes

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
Receptable	Nickel silver, Gold plated

Accessories

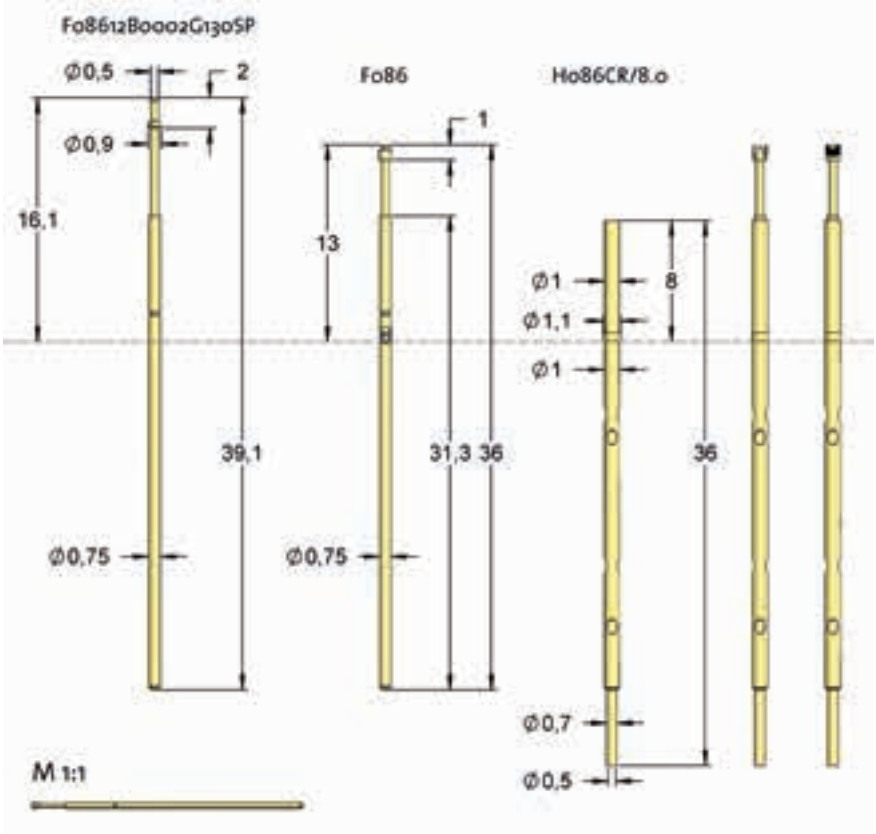
Insertion tool receptacle	FEWZ-050EV
Insertion tool receptacle	FEWZ-050E0
Insertion tool probe	FDWZ-050

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	-

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

Connecting Cables for HF860

H860AE1
Connecting cable
Pre-assembled
Type RG316

Specification RG 316
Impedance: 50 Ohm
Bandwidth: recommended up to 3 GHzStandard 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

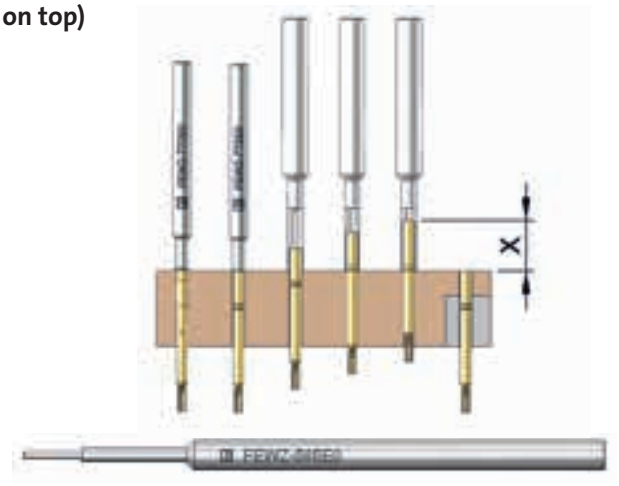
Specification Multiflex 86
Impedance: 50 Ohm
Bandwidth: recommended up to 10 GHz
Standard length: 700 mm
Standard end 1: Connector MCX-male
Standard end 2: Connector SMA-male
Further assemblies on request

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.

Insertion tool for receptacles with fixed stop (collar or press ring on top)

Receptacles	Insertion Height (mm)	PIN-AØ (mm)	Insertion Tool
H050, H787	0,0	0,8	FEWZ-050E0
H075, H703, H701	0,0	0,9	FEWZ-075E0
H100, H585, H502, H708	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, H775	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) can be inserted with tool FEWZ-...E0. Press ring at receptacles can be used also as dead stop. The guiding pin of the tool helps to stabilize and properly mount the receptacle.

Insertion tool for receptacles with press ring (inserted)

Receptacles	Insertion Height XX (mm)	I-Ø (mm)	Insertion Tool
H050, H787	xx	1,10	FEWZ-050Exx
H075	xx	1,50	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

Receptacles	Insertion Height X (mm)	Insertion Tool
H050, H787	0 - 10	FEWZ-050EV
H075	0 - 12	FEWZ-075EV
H100	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	1,50	100,0
FDWZ-075	2,50	100,0
FDWZ-100	3,50	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.

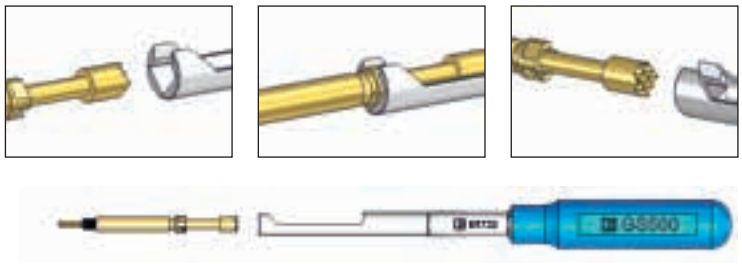
Mounting tool for twist proof receptacles

Receptacles	(BIT + Handle)	BIT	Handle
H756...	FAWZ756	AS756	GSFAWZ500
H760...	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	Schaft ØA	SW	FWZ	BIT	Handle	FWZ...T	BIT	Handle
0,9	x			1,7	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	with ratchet (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 Tellernadeln

Probe	Plate Ø	Tip-Ø				Schaft Ø A	(BIT+Handle)	BIT	Handle	with ratchet (BIT+Handle)	BIT	Handle
F730...SP	0,4 - 1,0	0,3 - 0,8			x	1,7	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			5,0	FWZ733	BIT733	GS500	FWZ733T	BIT733	GS500T
	2,2 - 2,9	0,3 - 2,7			x	5,0	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. GS300 SW 3mm GS400 SW 4mm GS500 SW 5mm

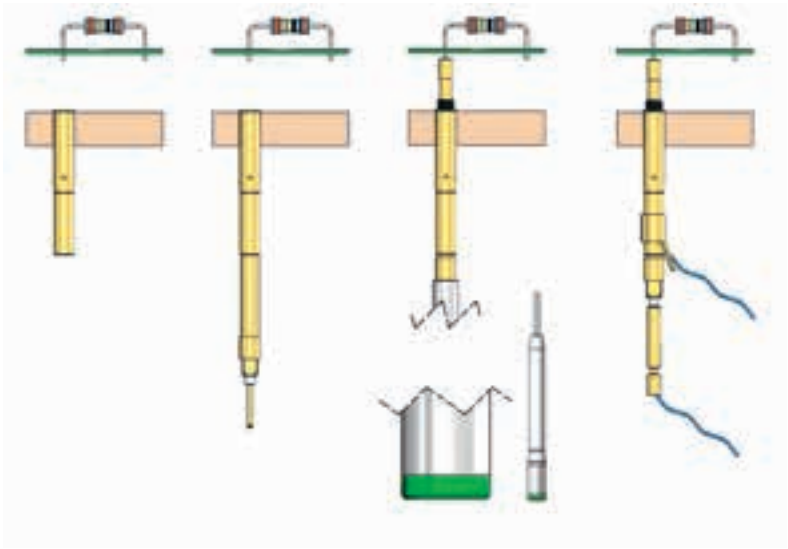
Screw-In-Tools with LED-Signal for Switch Probes

Probe		SW	Overall-Length	Schaft ØA	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**

Batterien nicht im Lieferumfang enthalten!

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.

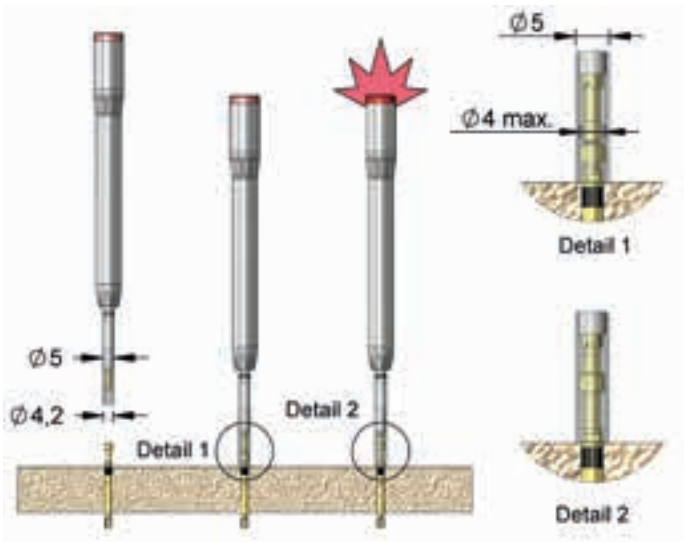


Tool for detection of blocked or tight plungers

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

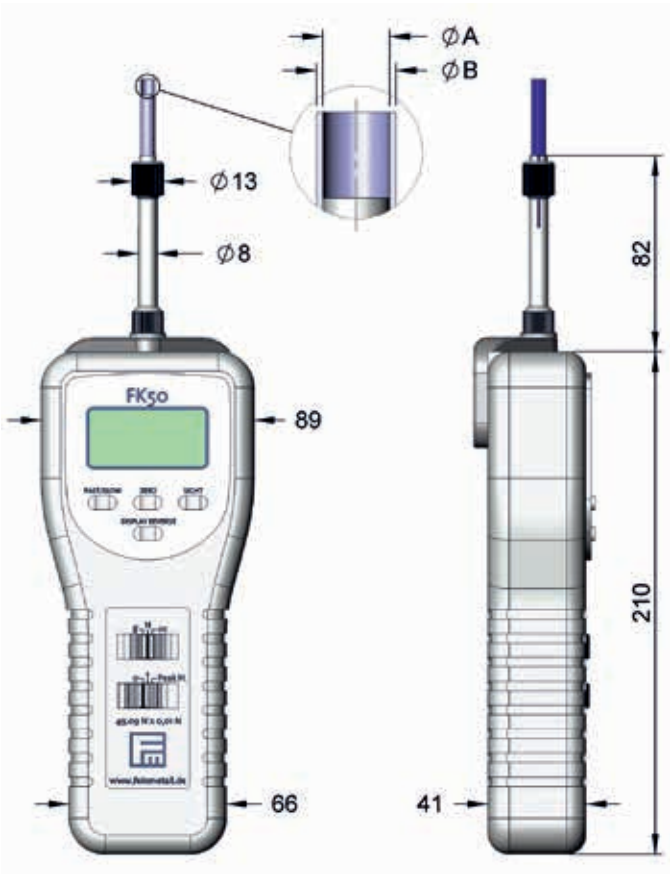
Order Code 32001



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
- calibration certificate
- carrying case

Operating manual on the homepage available.

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

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

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.

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

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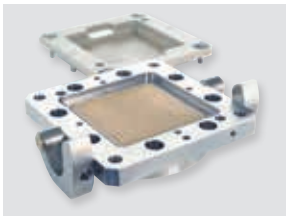
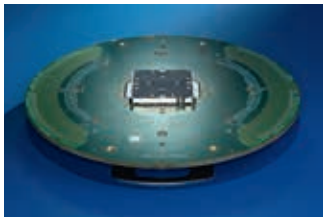
SPRING CONTACT PROBES



SPECIAL CONTACT SOLUTIONS



PROBECARDS FOR WAFERTEST

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