FEINMETALL
Contact Technologies



WIRE HARNESS TESTING

Widest product variety combined with unique solutions

> FEINMETALL.COM

LARGEST PORTFOLIO WORLDWIDE FOR TESTING OF WIRE HARNESSES AND CONNECTORS

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FM Choice

What is FM Choice?

FM Choice is our specially curated selection of the most reliable and frequently used probes in the market. Based on our expertise and experience, we have pre-selected the top-performing probes, so you don't have to choose from hundreds of options. With FM Choice, we make your decision easier by offering the most trusted solutions that meet your needs.

One of the greatest advantages of FM Choice is high availability and fast delivery, as we can often ship directly from our stock. This enables us to meet your demands whenever you need them. Plus, FM Choice offers competitive pricing, even for smaller quantities, making it an attractive solution for all kinds of projects.

Our portfolio includes over 700 contact probes for pitches between 6 and 100 mil, covering a wide range of applications and ensuring we meet most technical requirements quickly and efficiently.

Benefits at a glance



Most trusted solutions



Competitive prices



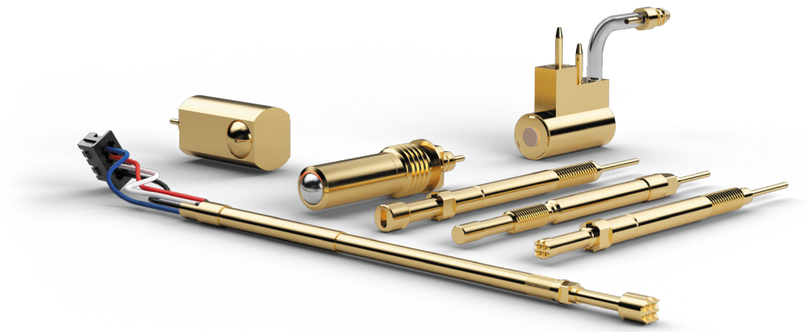
Fast delivery & high availability

Discover FM Choice products online

With our new Product Finder, we offer you a complete overview of all FM Choice products that you can easily search through. This high-performance tool allows you to search for specific products and compare them based on their technical features.

In addition to the FM Choice products, we invite you to explore the other categories to discover our complete product portfolio. Start your selection now and experience the variety and quality of our products.

> FEINMETALL.COM/PRODUCT-FINDER



OUR EXPERTISE

Competence

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 tests or high-current applications with individual and intelligent solutions.

Innovative capacity

Since more than 60 years FEINMETALL represents a high level of innovation. Many patent-registered solutions have been mile-stones in the world of test engineering.

Broad competence in-house

The development and manufacturing of spring contact probes, special contact solutions and Semiconductor Test products in one company are a wide basis for our competence in precision technology and micro-mechanics. This combination is unique at the market and represents "German Technology" at its best.

International customer service

We are operating in a high-tech industry that presents us with constantly increasing demands. At FEINMETALL, we understand these demands and manage to adapt our processes accordingly. With 15 subsidiaries worldwide and a strong network of well trained partners we are always connected closely to the markets and to our customers, wherever they are. Local stocks and special customs certificates provide a high delivery performance.
(e.g. AEO - Authorised Economic Operator).

Quality

Quality controls all process steps at FEINMETALL. From product development and construction up to manufacturing and delivery all operation steps are perfectly aligned.

FEINMETALL is certified according to DIN ISO 9001. Additionally a wide range of measures like e.g. risk analysis by FMEA during the whole product development process ensure a maximum of technical as well as delivery reliability.

Environment and health protection

FEINMETALL is committed to the goals of the up-to-date legislation regarding environment as well as health protection and conformance to all necessary measures. The current statements regarding the various European environment and health regulations are available on our homepage.

Customer focus

Our engineers and technicians work closely together with our customers and have a deep knowledge of the practical applications. Our know-how is your advantage!

TIP STYLES

01 
Conical 90°

02 
Conical 90° stepped

03 
Conical 60°

04 
Conical 60° stepped

05 
Concave stepped

06 
Serrated stepped

07 
Hexagonal 90° stepped

08 
Hexagonal 60° stepped

09 
6-point crown stepped

10 
Flexible needle

11 
Spherical

12 
Spherical stepped

14 
4-point crown stepped (self-cleaning)

15 
Triangular 45° stepped

16 
Flat

17 
Flat stepped

18 
Conical 30°

19 
Flat stepped with lens

20 
4-point crown stepped (self-cleaning)

21 
4-point crown (self-cleaning)

22 
Special version for contacting into conn.-housings

27 
Conical 120° stepped

28 
4-point crown stepped

29 
4-point crown

30 
Triangular 45°

31 
Flat stepped with drill hole

32 
Rigid needle 10°

33 
Square lance 38°

34 
Rigid needle 15° stepped

35 
3-point crown stepped (self-cleaning)

36 
6-point crown stepped, middle pin longer

37 
4-point crown stepped

38 
Square lance 140°

39 
Conical flat 30°

40 
6-point crown

41 
6-point crown stepped (self-cleaning)

42 
5-point crown stepped

43 
Square lance 90°

44 
Rigid needle with eccentric-cut

45 
Conical 120° with eccentric-cut

46
W-profile

47
Square 70°

50
Concave with drill hole stepped

51
Concave Head with special type inside

52
Concave stepped & annular spring inside

53
Square lance 55°

54
Square lance stepped

55
Concave stepped (self-cleaning)

60
3-point crown stepped

61
Special Head for VG Connectors (female)

62
Triangular 30°

63
8-point crown stepped (self-cleaning)

64
Mini-serrated stepped

65
Conical 45°

66
Serrated stepped (self-cleaning)

67
3-point needle stepped

68
6-point crown stepped, with middle pin

70
Hexagonal 90° stepped

90
Rolling ball

Spade versions

71
Half Moon

72
Half Crown

80
SpadeØ < plungerØ

81
SpadeØ < plungerØ stepped

82
SpadeØ = plungerØ

83
SpadeØ > plungerØ

84
SpadeØ > plungerØ stepped

85
Square Spade

86
Square Spade not centric

89
Special version of spade tips

Special versions

A
Silver alloy for high current

IK
Insulating cap

11 SP
Step Probe

12 SP
Step Probe with round plate

IP
Insulating pin

17K
Synthetic head

17K
Synthetic head with slot

17H
Synthetic head with slot and metall ring

17
Metall head with slot

17T
Metall head insulated with slot

TYPICAL APPLICATIONS FOR TIP STYLES



Spherical (11,12)
For testing clean contact surfaces, does not leave marks or scratches.



Flat (16,17)
Suitable for solder pads and contact pins.



Conical (01,02,03,10,18,32,34,35)
Universal tip style with different angles of 10°, 15°, 30°, 60°, 90° or 120° for contacting solder pads and vias.



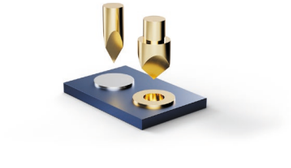
Concave (05,50,55)
For a smooth contact of pins and wire wrap posts. The risk of contamination can be minimized by using a self cleaning version.



Serrated, W-profile (06,46,64,66)
Universal tip style for contacting wires, pins and wire wrap posts, even suitable for bent contacts.



Crown with inner pin (36,68)
Used for reliable contacting of plated or filled vias.



Triangular stepped (15,30,62)
For via holes and solder pads. The sharp edges penetrate flux residues and oxide layers.



Square lance (33,38,43,53)
For via holes and solder pads. The sharp edges penetrate flux residues and oxide layers.

TYPICAL APPLICATIONS FOR TIP STYLES



Hexagonal (07,08)
For testing plated vias and pads. The sharp edges penetrate contamination and oxide layers.



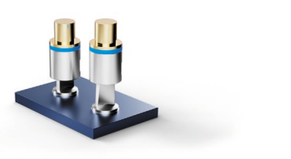
4-point crown (14,20,21,28,29,37)
For pad surfaces and soldered pins. The sharp edges penetrate flux residues and oxide layers.



Crown (09,35,40,41,42,60,63)
For wire wrap posts, even if the contacts are bent or twisted.



Insulation cap (IK) (05,06,17,41)
For detecting the correct length and straightness of pins.



Slotted insulation cap for position test (PT) (06,17)
For detecting the correct length and straightness of flat pins.



Spade (80,81,82,83,84,85,86,89)
For twist proof contacting of connector elements.



Step probe (06,11,12,16,89)
For position and presence tests of connectors.



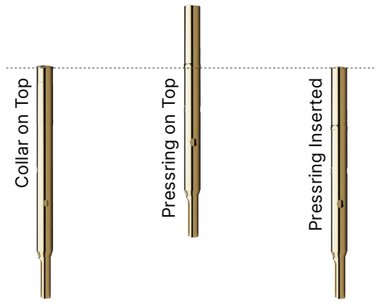
Coaxial design
Tip styles of coaxial probes are used for contacting standard connectors or for contacting PCB test points, SMD mini coax and switch connectors.

RECEPTACLES FOR CONTACT PROBES

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

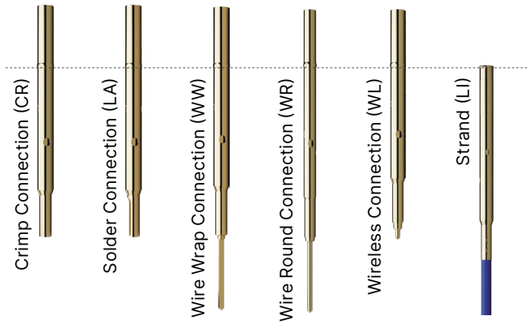
Mounting

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.



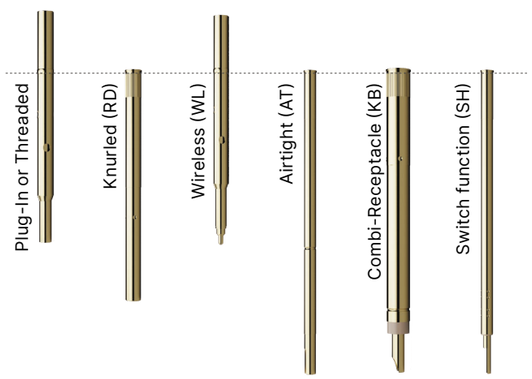
Connection of Receptacles

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 pre-assembled wires. Additionally, 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. Airtight receptacles are also used in adaptations where vacuum or negative pressure is used.



Airtightness for receptacles

If the air tightness class is specified for FM receptacles, it is defined as follows:

Airtightness I corresponds to a leakage rate < 0.7 cm³/min.

Airtightness II corresponds to a leakage rate 0.7 - 7.0 cm³/min.

SPACERS

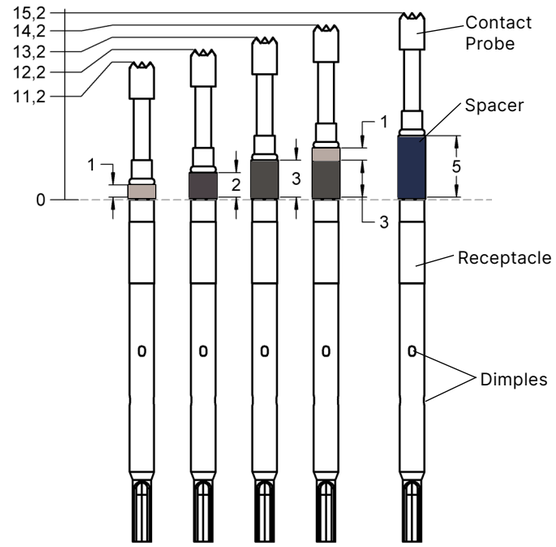
By using spacers, different projection heights can be achieved without the need for new probes or receptacles. They can also be used for tolerance compensation. They are usually made of uncoated brass, as they have only a mechanical function and no electrical function.

Spacer sleeves are inserted between the receptacle and the pluggable contact probe mounted.

It is also possible to use several spacer sleeves in combination to reach other projection heights.

Always make sure that the dimples of the mounting receptacle still hold the contact probe. Therefore a maximum distance of 5.0mm is possible.

Even with screwed versions, always ensure that the thread grips sufficiently.

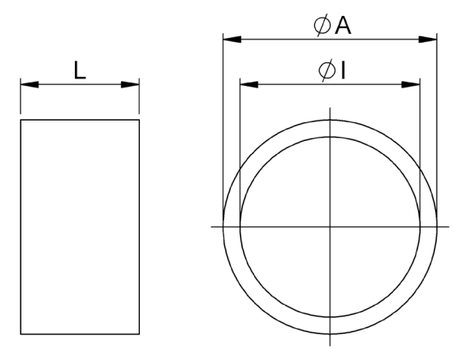


Spacers H772DS/xx for 100mil Probes

Order Code	Outer-Ø	Inner-Ø	Length
H772DS/10	2.20	1.70	1.00
H772DS/20	2.20	1.70	2.00
H772DS/30	2.20	1.70	3.00
H772DS/50	2.20	1.70	5.00

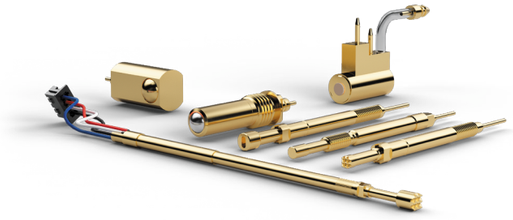
Spacers H773DS/xx for 138mil Probes

Order Code	Outer-Ø	Inner-Ø	Length
H773DS/01	3.20	2.70	0.10
H773DS/05	3.20	2.70	0.50
H773DS/10	3.20	2.70	1.00
H773DS/20	3.20	2.70	2.00
H773DS/30	3.20	2.70	3.00
H773DS/50	3.20	2.70	5.00



CATEGORIES OF WIRE HARNESS SOLUTIONS AT A GLANCE

Switch Probes



Threaded Probes



Step Probes



Twist Proof Probes



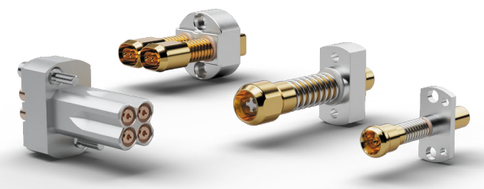
Push Back Probes



Kelvin Probes



Radio Frequency Probes



Tools



ELECTRICAL INFORMATION

Electrical conductivity

In a contact probe the primary current flow typically leads through the plunger, the barrel and the receptacle. A secondary current flow leads through the plunger, the spring and the barrel. The transition points cause certain transfer resistances 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. The maximum continuous currents (referred to the FEINMETALL standard high current test) and the typical resistances of each probe are shown in the data sheets. A pulse current can be higher depending on pulse and rest time, cooling and various other influences.

Maximum Operating Voltage

Voltmeters have to be connected in parallel with the electrical device or component on which the voltage is being measured. This is necessary in order to measure the voltage applied to this component, because for the parallel connection the voltage in both branches is the same. If the user operates our probes with a higher voltage than defined by DIN VDE 0100, part 410 as low voltage not dangerous to touch, *FEINMETALL does not assume any liability. Furthermore, the user himself is obliged to determine and implement the legally required protective measures for people and equipment*.

Dielectric / electric strength of bipolar probes

The dielectric strength (usually stated in kV/mm) of an insulator is the maximum electric field strength that may prevail in the material (including air) without a voltage breakdown (arc or spark) occurring. The creepage distances must be much longer, especially when exposed to dirt and moisture.

The dielectric strength depends on the geometry of the probe, the material (dielectric), the ambient conditions and the degree of contamination. This is reflected in all of our products with electrically insulating functions, e.g. switching probes, switching receptacles, combination receptacles, coaxial probes and insulating caps.

Electrical protection class

According to VDE0100 part 410, our probes are only to be operated with low voltage that is not dangerous to touch (25 V rms AC, 60 V DC). These values include all occurring surge voltages, e.g. due to overvoltage, switching peaks, etc.

If the user operates our probes with a higher voltage than defined by DIN VDE 0100, part 410 as low voltage not dangerous to touch, *FEINMETALL does not assume any liability. Furthermore, the user himself is obliged to determine and implement the legally required protective measures for people and equipment*.

Temperature operating range

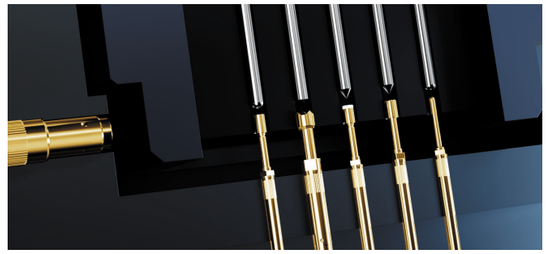
Depending on the electrical load, self-heating occurs as a result of power loss. The permissible environmental temperature decreases accordingly (derating).

Exposure to additional loads such as high humidity, rapid and extreme temperature changes (thermal shock) and extreme loads (e.g. far above nominal travel) can lead to a shortened lifetime. For high current applications where temperature can rise up to +200°, our FEINMETALL High current products are designed to withstand this challenge and remain constant performance.

TEST APPLICATIONS

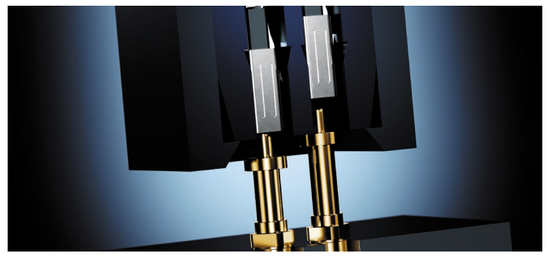
Presence Testing

The Presence Test is necessary to check if all needed parts were mounted on the wire harness. For example, the clips to fix the harness on the chassis or secondary locks, which are locking the connector. For these tests FEINMETALL offers a wide range of ball Switch Probes, NO or NC Switch Probes, pneumatic Switch Probes or Off-On-Off Switch Probes, depending on the requirement.



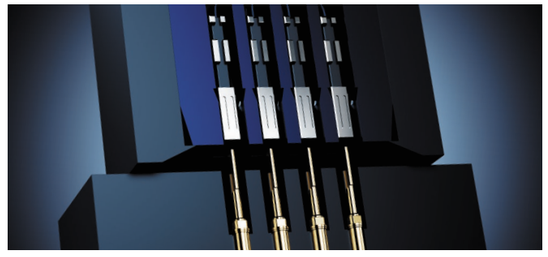
Position Testing

For the Position Test Step Probes are used. They allow the testing of the correct terminal position inside of the connector housing. If a terminal is not mounted correctly, the plate of the step probe blocks at the housing. As a result, the probe does not create an electrical contact.



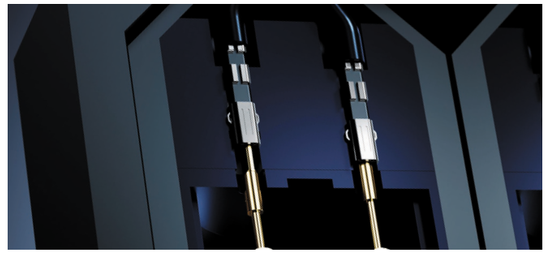
Continuity Testing

For a standard Continuity Test mainly Threaded and Twist Proof Probes are used to ensure a secure seat in the receptacle even if vibrations or unintentional side forces occur. In addition, their function is to check three basic errors: open wires, shorts between wires or miswires.



Push Back Testing

Push Back Probes have a very high spring force to test if the connector terminals are mounted correctly. If so, they will withstand the pressure and compress the probe. Through this, a switch function will get activated and the correct mounting is confirmed. Push Back Probes combine mechanical and electrical tests within one probe.



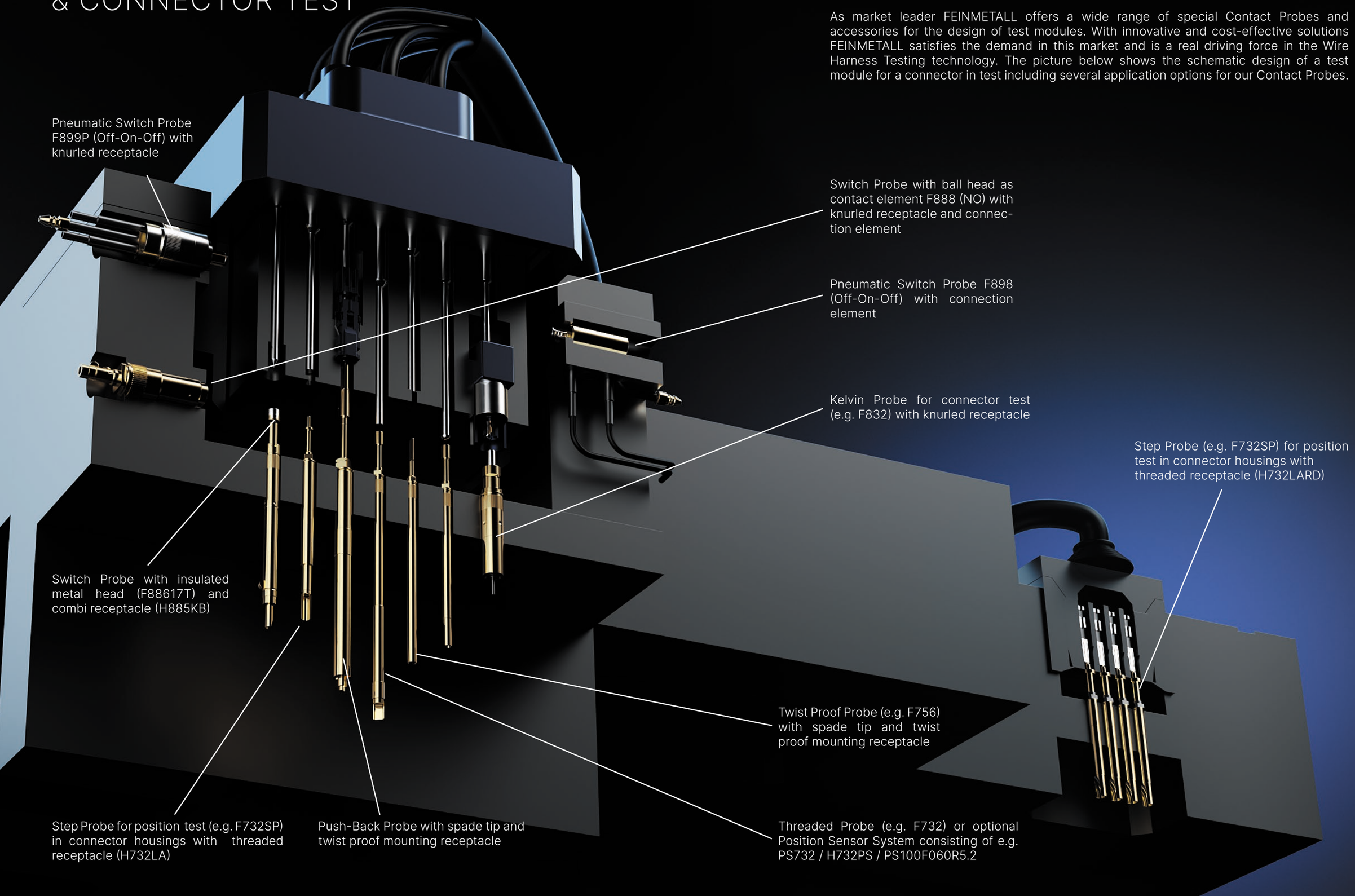
Connector Testing

The connector market is changing rapidly as it is adapting to the technology progress in new sectors such as autonomous driving or electric vehicles. Because of the wide range of possible applications there are different connectors available. For standard and customized connectors FEINMETALL has various solutions available to cover the specific test requirements (for example high voltage, radio frequency, high current, kelvin test).



CONTACT PROBES FOR WIRE HARNESS & CONNECTOR TEST

As market leader FEINMETALL offers a wide range of special Contact Probes and accessories for the design of test modules. With innovative and cost-effective solutions FEINMETALL satisfies the demand in this market and is a real driving force in the Wire Harness Testing technology. The picture below shows the schematic design of a test module for a connector in test including several application options for our Contact Probes.



HIGH VOLTAGE PROBES

Application for contacting e-mobility plugs and sockets

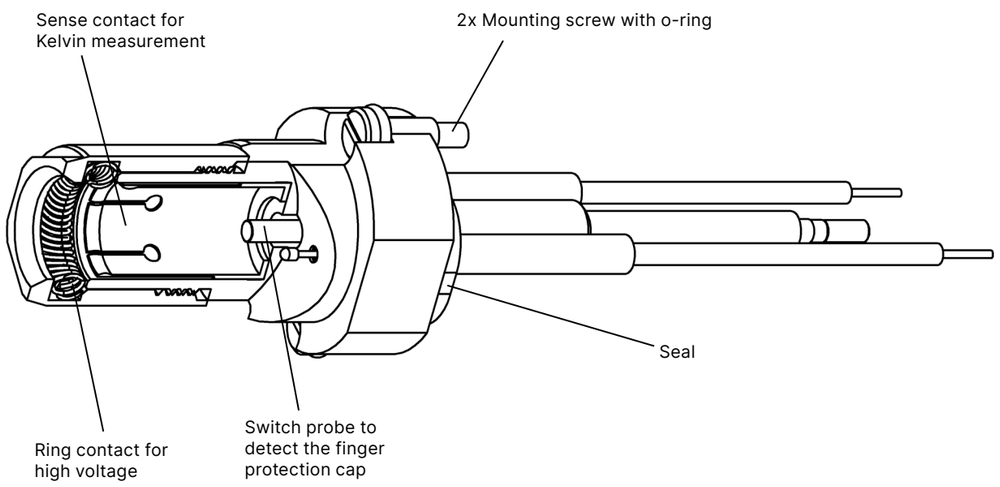
FEINMETALL high-voltage contacts were developed for contacting e-mobility plugs and sockets in the automotive sector. The connectors are used for contacting pin, socket & shield contacts under high voltage up to 5000V DC. The measured specifications refer to the new condition of probes under laboratory conditions with high voltage ramp 0.2s over 10s.

Technical design and application

- contacting of sockets-/ plug contacts
- parallel contact for Kelvin measurement
- parallel monitoring of the isolated finger protection function under high voltage conditions
- airtight versions available

Important safety note:

If the product is operated with voltages greater than 60V, the country-specific standards, norms and applicable laws and regalations for the protection of people and machine must be observed. This responsibility is taken over by the operator and manufacturer of equipment using these contact probes.



Modular design

- Easy contacting of the high voltage supply by interface contact probes

Assembly and maintenance

- Less maintenance required:
  The contact socket including spring element and switching probe can be changed easily from the assembly side
- The HV contacts are fixed from the test side (DUT side) by two screws. A desired tolerance compensation is made by O-rings under the screws.



HV01

up to 5 kV (DC) | 670 mil/16.50 mm | for Ø8mm round pins

Electrical specifications

Temperature [°C]	-45°...+80°
Voltage [kV]	up to 5 (DC)

Force

Version	Nominal
Insertion force	600cN +30%
Pulling force	400cN +30%

Mechanical specifications

Insertion depth	Nom.	Max.
Standard [mm]	20.5	21.1
Thread [M]	M2	
Wrench size contact head	SW12	
Switch point [mm]	1.7 ±0.2	
Wobble range	± 1°	
Centering range [mm]	± 0.5	

Materials and plating

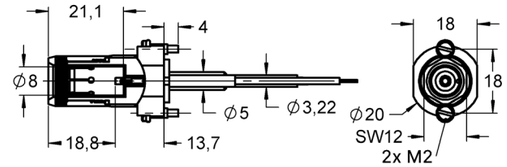
Contact head	Brass	nickel plated
Calyx spring	BeCu	nickel plated
Garter spring	BeCu	silver plated
Flange	Synthetic	unplated

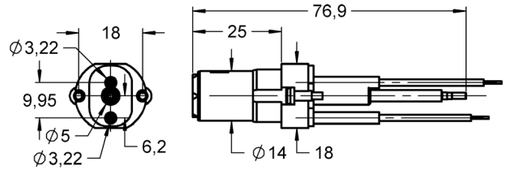
Inclueded in delivery

High voltage probe
Mounting screw M2 (2 pcs)

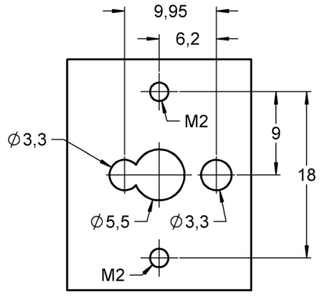
Series drawing

All measurements are in mm.





The high-voltage probe allows compensation of tolerances up to ±1°. The wobble range is ±0.5mm.



Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1142227	HV01G52B080N205-M	52	14.00	B / N	-	-	-	-



HV02

up to 5 kV (DC) | 530 mil/13.46 mm | for Ø6mm round pins

Electrical specifications

Temperature [°C]	-45°...+80°
Voltage [kV]	up to 5 (DC)

Force

Version	Nominal
Insertion force	500cN +30%
Pulling force	300cN +30%

Mechanical specifications

Insertion depth	Nom.	Max.
Standard [mm]	19.0	19.6
Thread [M]	M2	
Wrench size contact head	SW10	
Switch point [mm]	1.5 ±0.2	
Wobble range	± 1°	
Centering range [mm]	± 0.5	

Materials and plating

Contact head	Brass	nickel plated
Calyx spring	BeCu	nickel plated
Garter spring	BeCu	gold plated
Flange	Synthetic	unplated

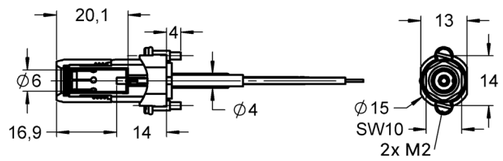
Inclueded in delivery

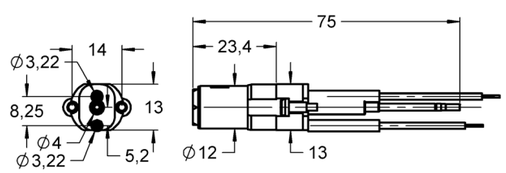
High voltage probe

Mounting screw M2 (2 pcs)

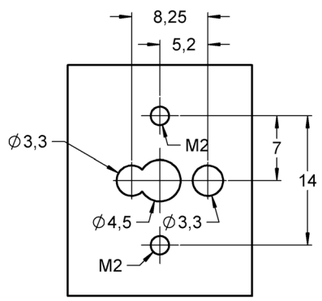
Series drawing

All measurements are in mm.





The high-voltage probe allows compensation of tolerances up to ±1°. The wobble range is ±0.5mm.



Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1119426	HV02G52B060N190-M	52 	12.00	B / N	-	-	-	-



NEW

HV330

5 A | 138 mil/3.50 mm | Rigid probe

Electrical specifications

Temperature [°C]	-45°...+150°
Current [A]	5
R TYP [mOhm]	<10

Materials and plating

Spring element	Bronze	nickel plated
Plunger	Brass	nickel plated

Drill size recommendation (mm)

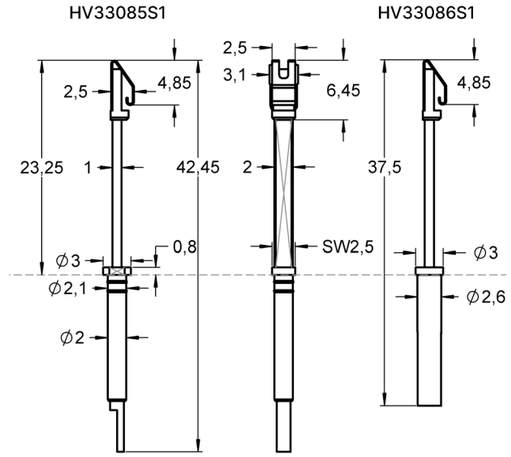
1145678	HV33085S1	2.02 - 2.07

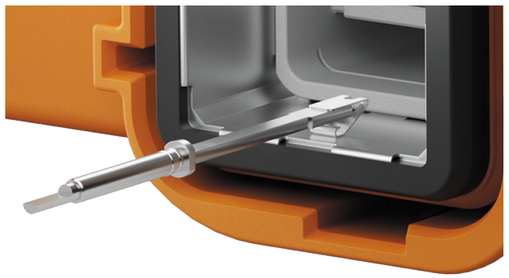
Accessories

1165158	H773LAS1	Receptacle for HV33086S1
1161993	FWZ860S348	Insertion tool probe

Series drawing

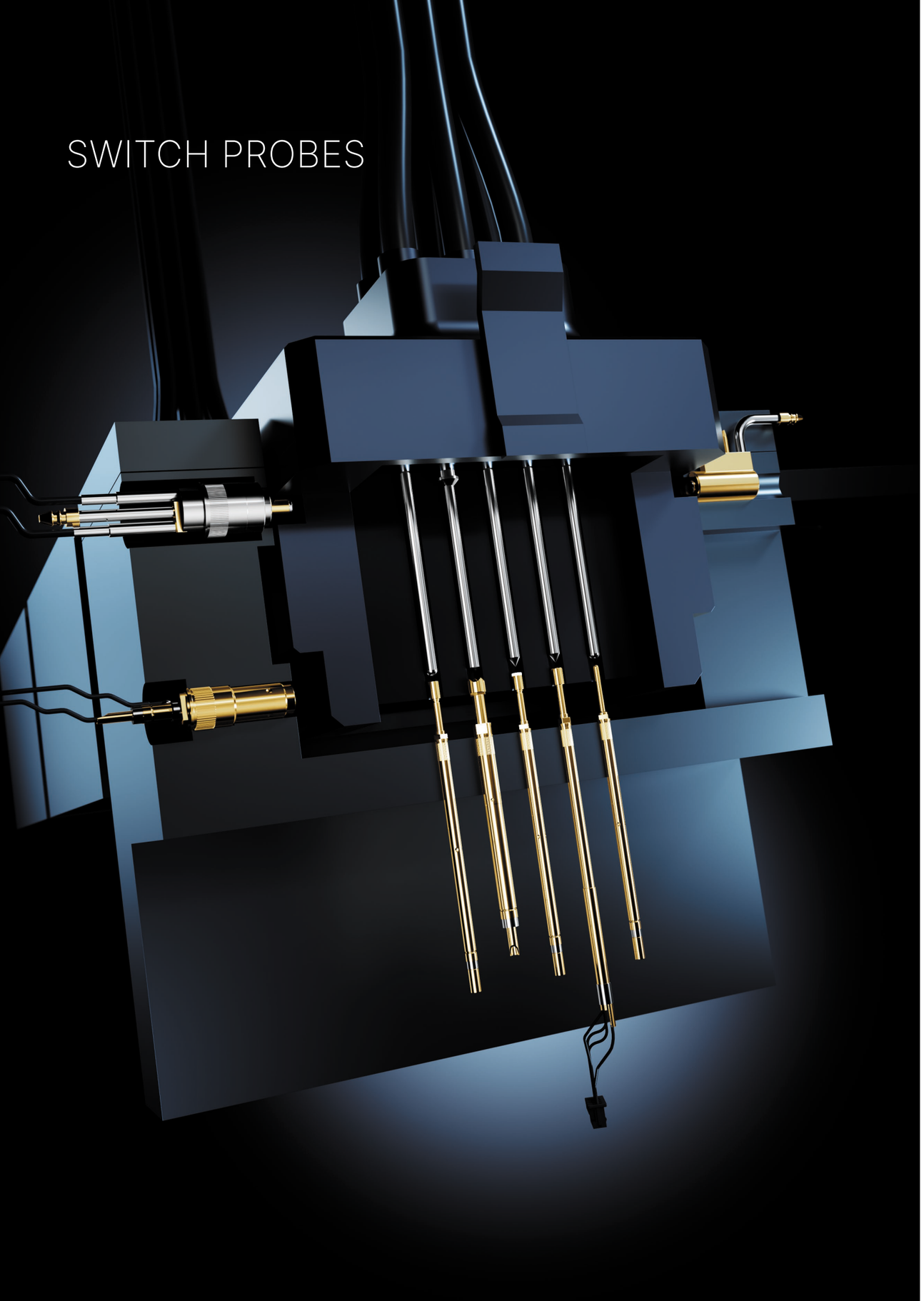
All measurements are in mm.





HV33085S1 and HV33086S1 are rigid probes with a flexible spring element that enables (High Voltage) contacting of e.g. shields of E-Mobility connectors or lateral, flat surfaces. The probes are designed to overcome housing steps to reach the offset terminal with relibility. The rigid probe HV33086S1 can be mounted in the receptacle H773LAS1 for solder connection.

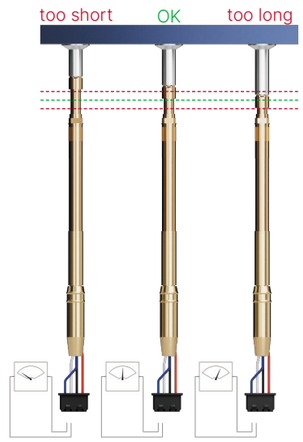
Order code	Product name	Tip Style	Tip [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1145678	HV33085S1		2.5x2.5	M / N	-	-	-	-
1160839	HV33086S1		2.5x2.5	M / N	-	-	-	-



SOLUTIONS TYPES

Different Solutions for Presence and Position Tests

The pictures below show different categories of FEINMETALL solutions with increasing accuracy. Simple solutions like using standard Switch Probes or Step Probes only allow a statement of OK or NOT OK. With the Off-On-Off Switch Probe with two switch points the result is more precise. With the position sensor system the exact position of a DUT can be measured and documented. The following pages include detailed information about corresponding probes and applications.

	Standard Switch Probes	Off-On-Off Switch Probes	Position Sensor System
Situation:	FAIL OK	too short OK too long	too short OK too long
			
Result:	NOK OK	NOK OK NOK	3 exact measuring results

Standard Switch Probes Switch

Probes with one switch point open or close a switch circuit after a defined switch travel.

NO – „normally open“ = closer
NC – „normally closed“= opener

Off-On-Off Switch Probes

Switch Probes with Off-On-Off function have two switch points. After a defined travel the switch circuit is closed and after a further travel (e.g. 1,0 mm) the switch circuit is opened again.

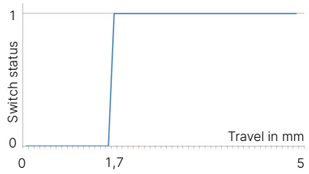
Off-On-Off - 2 switch points

Position Sensor System

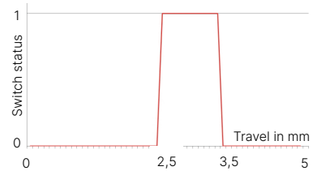
The position sensor system has a sensor element with integrated potentiometer, that allows an exact measurement of the travel.

Travel measurement

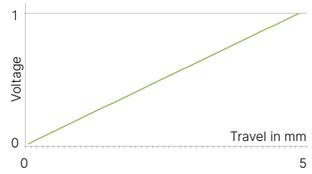
Switch Characteristic



Switch Characteristic



Measurement



VARIANTS OF SWITCH PROBES

Standard Switch Probe

Standard Switch Probes are available in plug-in and threaded versions. The switch function can work as an opener or as a closer. Standard Switch Probes are available in various diameters and lengths.



For backward assembly

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



Potential-free

Potential-free Switch Probes have a galvanically isolated switch circuit. This allows building short-circuit-proof fixtures or modules with separate electrical circuits for logic and test currents.



With ball head

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



With Off-On-Off Function

The special Switch Probes with Off-On-Off function allow realizing more precise position tests of components or connector elements with little effort. While common Switch Probes only have one switch point after a specific travel, the special switch probes have two integrated switch points in a certain distance.



HANDLING OF SWITCH PROBES

Presence Test with Switch Probes

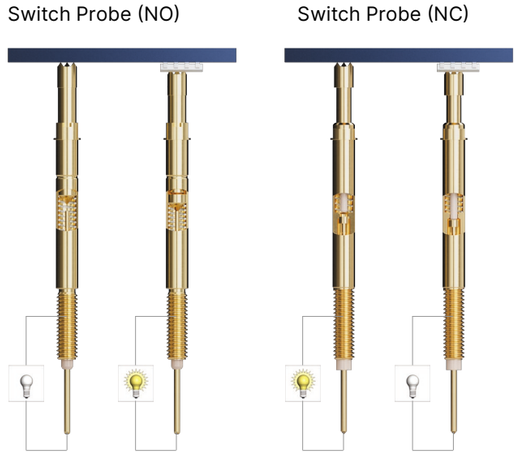
Switch Probes are contact elements which open or close an electric circuit after a defined switch travel. This condition persists beyond the switching point. FEINMETALL offers special combi-receptacles for the solderless exchange of Switch Probes (see below).

Typical applications:

- Presence test of components or connectors
- Voltage-free detection with synthetic heads
- Short-circuit-proof modules by electrically isolated switch elements (voltage-free system)
- Installation of intrinsically save circuits (only with NC-versions, e.g.F873, F883)

Versions of Switch Probes:

- Openers (NC - normally closed)
- Closers (NO - normally open)
- Different switch travels
- Probes for a gentle lateral contacting by ball head (F888)
- Short and long versions to realize different projection heights
- Long travel versions for depth determination (F375 and F385)

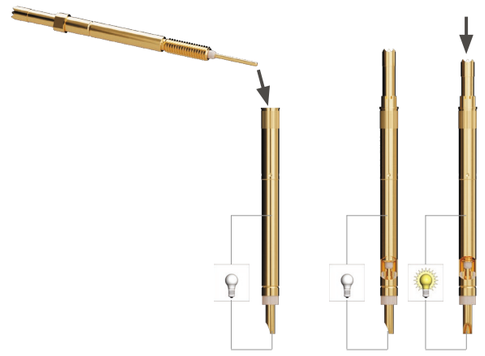


Solderless replacement of Switch- and Kelvin Probes

Combi-receptacles allow a quick and solderless 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 realized by contact elements within the receptacle.

Advantages of the combi-receptacle

- Solderless replacement of Switch Probes and Kelvin Probes
- Prevention of incorrect wirings in case of maintenance
- Saving of time and expenses in case of maintenance
- Height adaptability of Switch Probes by the probe thread and pressure marks in the receptacle
- Radio frequency capabilities in combination with coaxial Kelvin Probes



NUMBER CODE SYSTEM

Explanation of our product names

In order to show how our material description is built, the current valid number code system is explained below:

Type / Series	Tip style	Material Plunger	Diameter Plunger	Plating Plunger	Spring force [cN]	Special version
F886	17	B	400	G	200	SM

Material Plunger

B = BeCu (Beryllium Copper)
M = Brass
S = Steel
K = Synthetic blue
H = Synthetic hostacom with a brass ring
T = Metal head which is insulated against the plunger

Plating Plunger

G = Gold plating
L = Longtime gold plating
N = Nickel plating
U = Unplated
R = Rhodium plating
S = Silver plating

Diameter

400 = 4.00 mm

Spring force

200 = 200 cN

Special Version

L = Long version
S = Short version
LM = Long massive version
SM = Short massive version
IK04 = Insulation cap 0.4 mm distance
E21 = Projection height 21.0 mm
S1 = Deviation from the standard

FM Choice

F863 (NO)

2 A | 75 mil/1.90 mm | Threaded



Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	2
Current switch [A]	1
R TYP [mOhm]	<65

Mechanical specifications

Switch point [mm]	3.5		
Preload [cN]	24	20	50
Spring force [cN] at nt ±20%	40	80	150
Nominal travel [mm]	4.0	4.0	4.0
Maximum travel [mm]	5.0	5.0	5.0

Materials and plating

Plunger	BeCu	gold plated
	BeCu	insulated
Barrel	Brass	gold plated
Spring	Spring steel	silver plated
Receptacle	Brass	gold plated

Accessories

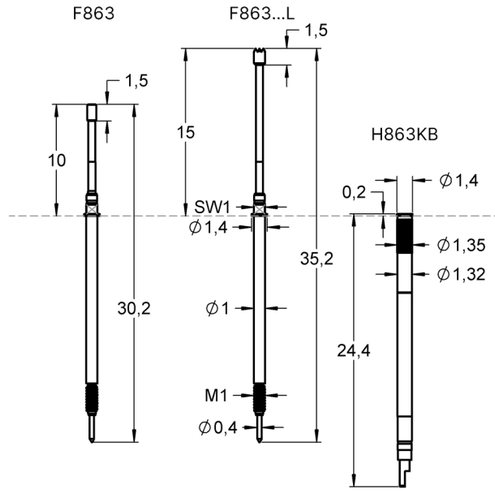
1018812	H863KB	Receptacle
1014264	FEWZ-100E0	Insertion tool receptacle
1029809	FWZ730S1T	Screw-in tool probe <Ø1.5 mm
1004895	FWZ730T	Screw-in tool probe <Ø0.9 mm

Drill size recommendation (mm)

Receptacle with knurl	1.32 - 1.34

Series drawing

All measurements are in mm.





The switch probe F86311B050G080 can also be used to test the NANO MQS connector.

Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1018852	F86306B100G150L	06	1.00	B / G	150	M1	L	FM Choice
1031267	F86311B036G080S17	11	0.36	B / G	80	M1	S17	-
1018855	F86311B050G080	11	0.50	B / G	80	M1	Nano-MQS	FM Choice
1039841	F86311B050G150	11	0.50	B / G	150	M1	-	-
1052631	F86311B064G040	11	0.64	B / G	40	M1	-	-
1051390	F86311B064G080	11	0.64	B / G	80	M1	-	-
1035111	F86311B064G080L	11	0.64	B / G	80	M1	L	-
1018854	F86311B064G150L	11	0.64	B / G	150	M1	L	-
1041898	F86312B070G080	12	0.70	B / G	80	M1	-	-
1018853	F86312B075G150L	12	0.75	B / G	150	M1	L	-
1018851	F86317B080G150	17	0.80	B / G	150	M1	-	FM Choice
1029314	F86317T080N080	17	0.80	T / N	80	M1	-	-
1029219	F86317T080N150	17	0.80	T / N	150	M1	-	-



F879 (NO)

3 A | 100 mil/2.54 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	3
Current switch [A]	1
R TYP [mOhm]	<100

Mechanical specifications

Switch point [mm]	2.6	
Preload [cN]	35	50
Spring force [cN] at nt ±20%	125	200
Nominal travel [mm]	4.0	4.0
Maximum travel [mm]	5.0	5.0

Materials and plating

Plunger	BeCu	gold plated
	BeCu	insulated
	Synthetic	unplated
Barrel	Brass	gold plated
Spring	Spring steel	silver plated
Receptacle	Brass	gold plated

Accessories

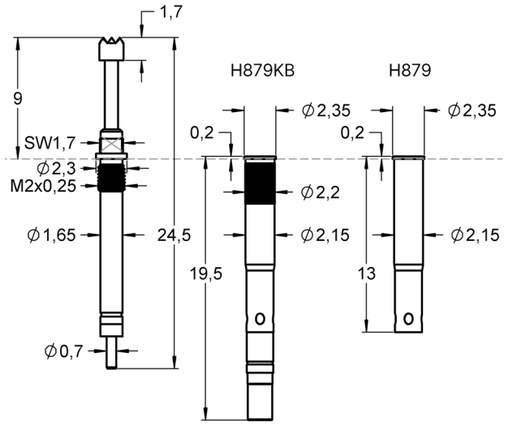
1017237	H879	Receptacle
1017092	H879KB	Receptacle
1003640	FEWZ-772E0	Insertion tool receptacle
1004610	FWZ732T	Screw-in tool probe <Ø2.0 mm

Drill size recommendation (mm)

Receptacle without knurl	2.12 - 2.14
Receptacle with knurl	2.17 - 2.20

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1017087	F87906B180G200	06	1.80	B / G	200	M2x0.25	-	-
1057672	F87906B180G200E16S1*	06	1.80	B / G	200	M2x0.25	E16S1	-
1057673	F87906B180G200S1 *	06	1.80	B / G	200	M2x0.25	S1	-
1017272	F87911B100G200	11	1.00	B / G	200	M2x0.25	-	-
1030167	F87916B050G125	16	0.50	B / G	125	M2x0.25	-	-
1017271	F87916B100G200	16	1.00	B / G	200	M2x0.25	-	-
1017236	F87917B180G200	17	1.80	B / G	200	M2x0.25	-	-
1017115	F87917K180U200	17	1.80	K / U	200	M2x0.25	-	-
1000338	F87917T200N200 **	17	2.00	T / N	200	M2x0.25	-	-

* Version S1 has a switch travel of 1.5 mm
** Version F87917T200N200 is 1,8 mm longer than standard (projection height with receptacle = 11.0 mm).



F876 (NO)

3 A | 100 mil/2.54 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	3
Current switch [A]	1
R TYP [mOhm]	<20

Mechanical specifications

Switch point [mm]	2.6	or	4.0
Preload [cN]	40		110
Spring force [cN] at nt ±20%	150		300
Nominal travel [mm]	4.0		4.0
Maximum travel [mm]	5.3		5.3

Materials and plating

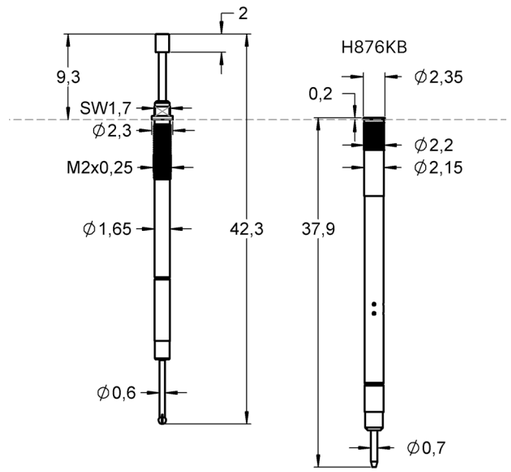
Plunger	BeCu	gold plated
	Synthetic	unplated
Barrel	Brass	gold plated
Spring	Spring steel	silver plated
Receptacle	Brass	gold plated

Accessories

1016185	H876KB	Receptacle
1003640	FEWZ-772E0	Insertion tool receptacle
1029812	FWZ732S1T	Screw-in tool probe <Ø2.7 mm
1004610	FWZ732T	Screw-in tool probe <Ø2.0 mm

Series drawing

All measurements are in mm.



Drill size recommendation (mm)

Receptacle with knurl	2.16 - 2.19

Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1016184	F87606B150G150S26	06	1.50	B / G	150	M2x0.25	S26	-
1121358	F87611B080G150S26	11	0.80	B / G	150	M2x0.25	S26	-
1016492	F87616B080G150S26	16	0.80	B / G	150	M2x0.25	S26	-
1016183	F87617B150G150S26	17	1.50	B / G	150	M2x0.25	S26	-
1016158	F87617K150U150S26	17	1.50	K / U	150	M2x0.25	S26	-
1018292	F87617K150U300S40	17	1.50	K / U	300	M2x0.25	S40	-



F878 (NO)

3 A | 100 mil/2.54 mm | Pluggable

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	3
Current switch [A]	1
R TYP [mOhm]	<20

Mechanical specifications

Switch point [mm]	2.6	
Preload [cN]	40	110
Spring force [cN] at nt ±20%	150	300
Nominal travel [mm]	4.0	4.0
Maximum travel [mm]	5.3	5.3

Materials and plating

Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Spring steel	silver plated
Receptacle	Brass	gold plated

Accessories

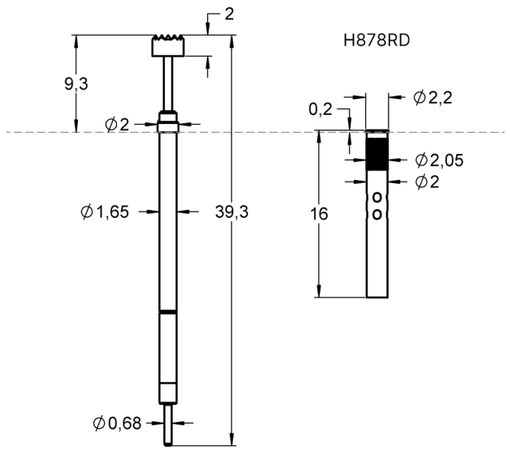
1016481	H878RD	Receptacle
1003640	FEWZ-772E0	Insertion tool receptacle
1003566	FDWZ-100	Insertion tool probe

Drill size recommendation (mm)

Receptacle with knurl	2.01 - 2.04

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1016620	F87806B150G150S26	06	1.50	B / G	150	-	S26	-
1017027	F87817B100G300S26	17	1.00	B / G	300	-	S26	-



F873 (NC)

5 A | 100 mil/2.54 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	5
Current switch [A]	1
R TYP [mOhm]	<65

Mechanical specifications

Switch point [mm]	1.5
Preload [cN]	50
Spring force [cN] at nt ±20%	250
Nominal travel [mm]	4.0
Maximum travel [mm]	5.0

Materials and plating

Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Spring steel	silver plated
Receptacle	Brass	gold plated

Accessories

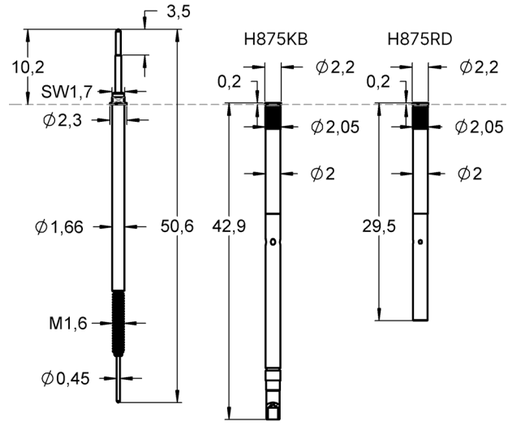
Further receptacles H875 see page 53.		
1004479	H875KB	Receptacle
1003640	FEWZ-772E0	Insertion tool receptacle
1004610	FWZ732T	Screw-in tool probe <Ø2.0 mm

Drill size recommendation (mm)

Receptacle with knurl	2.02 - 2.04

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1008837	F87311B064G250	11	0.64	B / G	250	M1.6	-	-
1009368	F87316B100G250	16	1.00	B / G	250	M1.6	-	-



FM Choice

F875 (NO)

5 A | 100 mil/2.54 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	5
Current switch [A]	1
R TYP [mOhm]	<65

Mechanical specifications

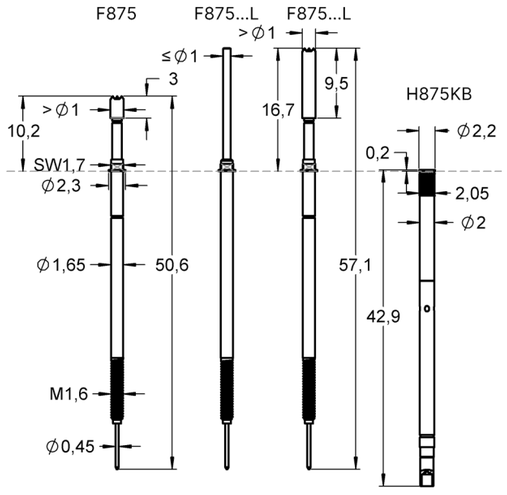
Switch point [mm]	1.5		
Preload [cN]	30	60	60
Spring force [cN] at nt ±20%	135	200	300
Nominal travel [mm]	4.0	4.0	4.0
Maximum travel [mm]	5.0	5.0	5.0

Materials and plating

Plunger	BeCu	gold plated
	BeCu	insulated
	Synthetic	unplated
Barrel	Brass	gold plated
Spring	Spring steel	silver plated
Receptacle	Brass	gold plated

Series drawing

All measurements are in mm.



Accessories

Further receptacles H875 see page 53.

1004479	H875KB	Receptacle
1003640	FEWZ-772E0	Insertion tool receptacle
1029812	FWZ732S1T	Screw-in tool probe <Ø2.7 mm
1004610	FWZ732T	Screw-in tool probe <Ø2.0 mm

Drill size recommendation (mm)

Receptacle with knurl	2.00 - 2.02

Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1001712	F87505B180G135	05	1.80	B / G	135	M1.6	-	-
1021447	F87506B100G135	06	1.00	B / G	135	M1.6	-	-
1009431	F87506B100G135L	06	1.00	B / G	135	M1.6	L	-

Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1007237	F87506B130G135	06	1.30	B / G	135	M1.6	-	FM Choice
1006828	F87506B140G135L	06	1.40	B / G	135	M1.6	L	-
1003084	F87506B150G135	06	1.50	B / G	135	M1.6	-	FM Choice
1001715	F87506B150G350	06	1.50	B / G	350	M1.6	-	FM Choice
1007937	F87506B180G080	06	1.80	B / G	80	M1.6	-	FM Choice
1001716	F87506B180G135	06	1.80	B / G	135	M1.6	-	FM Choice
1004683	F87506B180G135L	06	1.80	B / G	135	M1.6	L	FM Choice
1001717	F87506B180G200	06	1.80	B / G	200	M1.6	-	FM Choice
1003085	F87506B180G300	06	1.80	B / G	300	M1.6	-	FM Choice
1001718	F87506B180G350	06	1.80	B / G	350	M1.6	-	FM Choice
1006524	F87506B180G350L	06	1.80	B / G	350	M1.6	L	FM Choice
1008894	F87506B200G135	06	2.00	B / G	135	M1.6	-	-
1007319	F87506B200G350	06	2.00	B / G	350	M1.6	-	FM Choice
1011054	F87506B230G135	06	2.30	B / G	135	M1.6	-	FM Choice
1003993	F87506B230G350	06	2.30	B / G	350	M1.6	-	-
1008752	F87511B064G080	11	0.64	B / G	80	M1.6	-	-
1005249	F87511B064G135	11	0.64	B / G	135	M1.6	-	FM Choice
1005250	F87511B064G200	11	0.64	B / G	200	M1.6	-	-
1001719	F87511B100G135	11	1.00	B / G	135	M1.6	-	-
1001011	F87516B060G135S1	16	0.60	B / G	135	M1.6	S1	-
1001012	F87516B060G350S1	16	0.60	B / G	350	M1.6	S1	-
1005252	F87516B064G135	16	0.64	B / G	135	M1.6	-	FM Choice
1005254	F87516B064G350	16	0.64	B / G	350	M1.6	-	-
1006704	F87516B070G135	16	0.70	B / G	135	M1.6	-	FM Choice
1007334	F87516B080G135	16	0.80	B / G	135	M1.6	-	FM Choice
1008576	F87516B100G080	16	1.00	B / G	80	M1.6	-	-
1001724	F87516B100G135	16	1.00	B / G	135	M1.6	-	FM Choice
1008647	F87516B100G135E21	16	1.00	B / G	135	M1.6	E21	-
1004710	F87516B100G135L	16	1.00	B / G	135	M1.6	L	FM Choice
1001725	F87516B100G200	16	1.00	B / G	200	M1.6	-	-
1003086	F87516B100G300	16	1.00	B / G	300	M1.6	-	-
1003087	F87516B100G350	16	1.00	B / G	350	M1.6	-	FM Choice
1005676	F87516B100G350L	16	1.00	B / G	350	M1.6	L	FM Choice
1006065	F87517B180G080	17	1.80	B / G	80	M1.6	-	FM Choice
1003088	F87517B180G135	17	1.80	B / G	135	M1.6	-	FM Choice
1003089	F87517B180G200	17	1.80	B / G	200	M1.6	-	-
1003090	F87517B180G300	17	1.80	B / G	300	M1.6	-	-
1003091	F87517B180G350	17	1.80	B / G	350	M1.6	-	FM Choice
1001726	F87517K180U135	17	1.80	K / U	135	M1.6	-	FM Choice
1000628	F87517T180N135	17	1.80	T / N	135	M1.6	-	FM Choice



FM Choice

F375 (NO)

5 A | 100 mil/2.54 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	5
Current switch [A]	1
R TYP [mOhm]	<50

Mechanical specifications

Switch point [mm]	1.5
Preload [cN]	30
Spring force [cN] at nt ±20%	200
Nominal travel [mm]	8.0
Maximum travel [mm]	9.5

Materials and plating

Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Spring steel	gold plated
Receptacle	Brass	gold plated

Accessories

Further receptacles H875 see page 53.

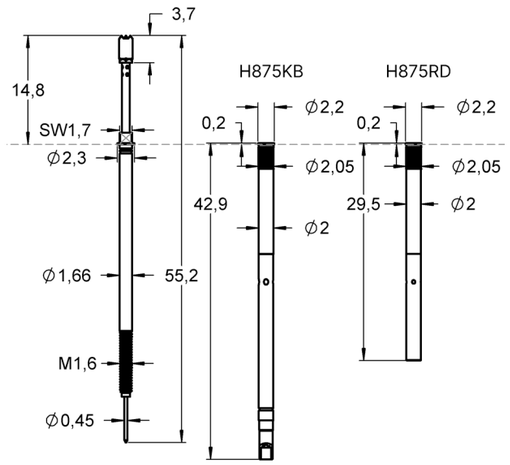
1004479	H875KB	Receptacle
1003640	FEWZ-772E0	Insertion tool receptacle
1004610	FWZ732T	Screw-in tool probe <Ø2.0 mm

Drill size recommendation (mm)

Receptacle with knurl	2.02 - 2.04

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1010954	F37506B180G200	06	1.80	B / G	200	M1.6	-	-
1017936	F37511B080G200E20	11	0.80	B / G	200	M1.6	E20	-
1011146	F37517B180G200	17	1.80	B / G	200	M1.6	-	FM Choice



FM Choice

H875

100 mil/2.54 mm | Receptacles

Materials and plating

Receptacle	Brass	gold plated

Accessories

1003640	FEWZ-772E0	Insertion tool receptacle

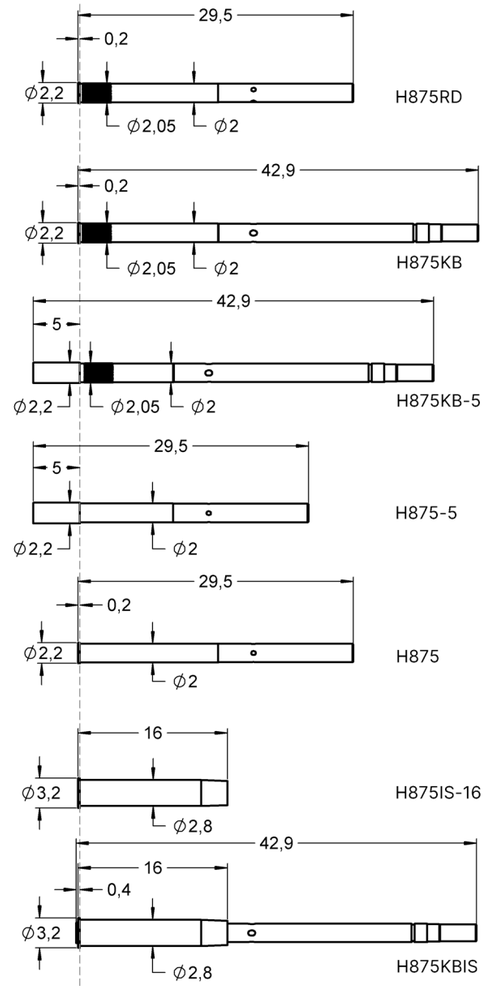
Drill size recommendation (mm)

Synthetic receptacle	2.78 - 2.79
Receptacle without knurl	1.99 - 2.00
Receptacle with knurl	2.00 - 2.02

Order code	Product name	Version	FM Choice
1006559	H875RD	RD	-
1004479	H875KB	KB	FM Choice
1002997	H875KB-5	KB	FM Choice
1001867	H875-5	-	-
1001866	H875	-	FM Choice
1103230	H875IS-16	IS	FM Choice
1038805	H875KBIS	KBIS	-

Series drawing

All measurements are in mm.





F884 (NO)

10 A | 138 mil/3.50 mm | Pluggable

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	10
Current switch [A]	1
R TYP [mOhm]	<25

Mechanical specifications

Switch point [mm]	1.7	
Preload [cN]	50	80
Spring force [cN] at nt ±20%	200	350
Nominal travel [mm]	4.0	4.0
Maximum travel [mm]	5.0	5.0

Materials and plating

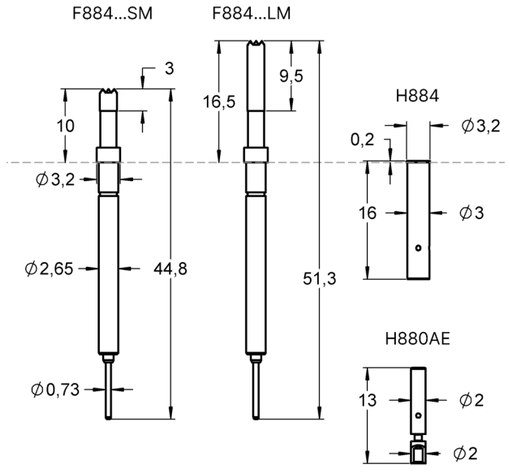
Plunger	BeCu	gold plated
	Synthetic	unplated
Barrel	Brass	gold plated
Spring	Spring steel	silver plated
Receptacle	Brass	gold plated

Accessories

1003221	H884	Receptacle
1007654	H880AE	Receptacle
1003642	FEWZ-774E0	Insertion tool receptacle
1003566	FDWZ-100	Insertion tool probe

Series drawing

All measurements are in mm.



Drill size recommendation (mm)

Receptacle without knurl	2.98 - 2.99

Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1006690	F88406B100G350LM	06	1.00	B / G	350	-	LM	-
1003791	F88406B230G200SM	06	2.30	B / G	200	-	SM	-
1006691	F88406B230G350LM	06	2.30	B / G	350	-	LM	-
1003792	F88406B230G350SM	06	2.30	B / G	350	-	SM	-
1005453	F88417B230G350SM	17	2.30	B / G	350	-	SM	-
1007566	F88417K300U200SM	17	3.00	K / U	200	-	SM	-



F883 (NC)

10 A | 138 mil/3.50 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	10
Current switch [A]	1
R TYP [mOhm]	<50

Mechanical specifications

Switch point [mm]	1.7
Preload [cN]	40
Spring force [cN] at nt ±20%	230
Nominal travel [mm]	4.0
Maximum travel [mm]	5.0

Materials and plating

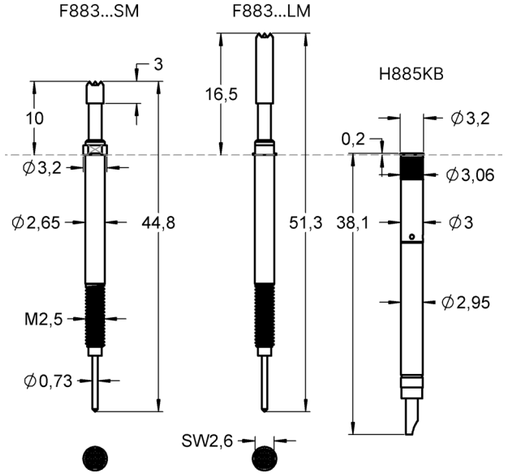
Plunger	BeCu	gold plated
	Synthetic	unplated
Barrel	Brass	gold plated
Spring	Spring steel	silver plated
Receptacle	Brass	gold plated

Accessories

Further receptacles H885 see page 64.		
1003642	FEWZ-774E0	Insertion tool receptacle
1029833	FWZ885S1T	Screw-in tool probe <Ø3.1 mm
1009781	FWZ885T	Screw-in tool probe <Ø2.5 mm

Series drawing

All measurements are in mm.



Drill size recommendation (mm)

Receptacle without knurl	2.98 - 2.99
Receptacle with knurl	3.00 - 3.02

Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1006968	F88306B230G230LM	06	2.30	B / G	230	M2.5	LM	-
1006518	F88306B230G230SM	06	2.30	B / G	230	M2.5	SM	-
1006367	F88316B180G230SM	16	1.80	B / G	230	M2.5	SM	-
1006966	F88317B230G230SM	17	2.30	B / G	230	M2.5	SM	-
1006967	F88317K230U230SM	17	2.30	K / U	230	M2.5	SM	-



FM Choice

F885 (NO)

10 A | 138 mil/3.50 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+100°	
Current [A]	10	
Current switch [A]	1	
R TYP [mOhm]	<50	

Mechanical specifications

Switch point [mm]	1.7		
Preload [cN]	20	70	140
Spring force [cN] at nt ±20%	80	200	270
Nominal travel [mm]	4.0	4.0	4.0
Maximum travel [mm]	5.0	5.0	5.0

Mechanical specifications

Switch point [mm]	1.7		
Preload [cN]	130	130	220
Spring force [cN] at nt ±20%	320	350	900
Nominal travel [mm]	3.5	4.0	4.0
Maximum travel [mm]	4.0	5.0	5.0

Materials and plating

Plunger	BeCu	gold plated
	Synthetic	unplated
Barrel	Brass	gold plated
Spring	Spring steel	silver plated
Receptacle	Brass	gold plated

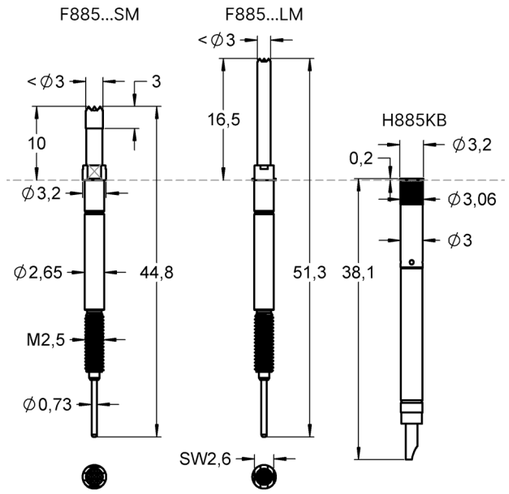
Accessories

Further receptacles H885 see page 64.

1003642	FEWZ-774E0	Insertion tool receptacle
1029833	FWZ885S1T	Screw-in tool probe <Ø3.1 mm
1009781	FWZ885T	Screw-in tool probe <Ø2.5 mm

Series drawing

All measurements are in mm.



Drill size recommendation (mm)

Receptacle without knurl	2.98 - 2.99
Receptacle with knurl	3.00 - 3.02

Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1004245	F88506B100G200SM	06	1.00	B / G	200	M2.5	SM	FM Choice
1004246	F88506B100G350LM	06	1.00	B / G	350	M2.5	LM	-
1004247	F88506B100G350SM	06	1.00	B / G	350	M2.5	SM	-
1018410	F88506B180G200E22	06	1.80	B / G	200	M2.5	E22	-
1021762	F88506B180G350E22	06	1.80	B / G	350	M2.5	E22	-
1007760	F88506B180G350SM	06	1.80	B / G	350	M2.5	SM	-
1011900	F88506B230G080SM	06	2.30	B / G	80	M2.5	SM	FM Choice
1004325	F88506B230G200LM	06	2.30	B / G	200	M2.5	LM	FM Choice
1003639	F88506B230G200SM	06	2.30	B / G	200	M2.5	SM	FM Choice
1005985	F88506B230G320S1	06	2.30	B / G	320	M2.5	S1	-
1004327	F88506B230G350LM	06	2.30	B / G	350	M2.5	LM	FM Choice
1004328	F88506B230G350SM	06	2.30	B / G	350	M2.5	SM	FM Choice
1004330	F88506B230G900SM	06	2.30	B / G	900	M2.5	SM	FM Choice
1004345	F88516B100G200S2	16	1.00	B / G	200	M2.5	S2	-
1006178	F88516B100G200SM	16	1.00	B / G	200	M2.5	SM	-
1005026	F88516B180G200SM	16	1.80	B / G	200	M2.5	SM	-
1021802	F88516B180G270E28	16	1.80	B / G	270	M2.5	E28	-
1004335	F88517B230G200SM	17	2.30	B / G	200	M2.5	SM	-
1004336	F88517B230G350SM	17	2.30	B / G	350	M2.5	SM	-
1004337	F88517K230U200SM	17	2.30	K / U	200	M2.5	SM	FM Choice
1004338	F88517K230U350SM	17	2.30	K / U	350	M2.5	SM	FM Choice



FM Choice

F886 (NO)

10 A | ≥138 mil/3.50 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+100°		
Current [A]	10		
Current switch [A]	1		
R TYP [mOhm]	<50		

Mechanical specifications

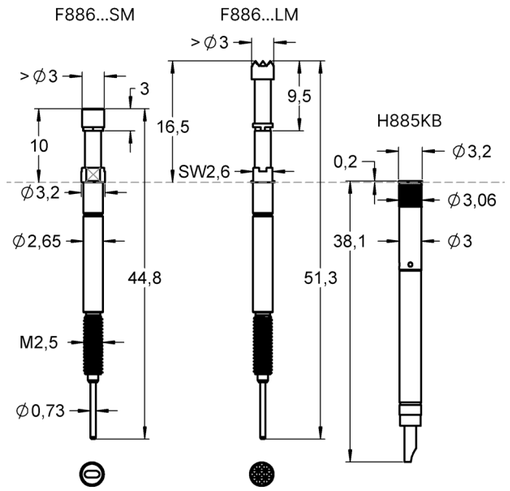
Switch point [mm]	1.7		
Preload [cN]	70	130	220
Spring force [cN] at nt ±20%	200	350	900
Nominal travel [mm]	4.0	4.0	4.0
Maximum travel [mm]	5.0	5.0	5.0

Materials and plating

Plunger	BeCu	gold plated
	Synthetic	unplated
Barrel	Brass	gold plated
Spring	Spring steel	silver plated
Receptacle	Brass	gold plated

Series drawing

All measurements are in mm.



Accessories

Further receptacles H885 see page 64.

1003642	FEWZ-774E0	Insertion tool receptacle
1007628	FWZ886S2	Screw driver
1029833	FWZ885S1T	Screw-in tool probe <Ø3.1 mm
1009781	FWZ885T	Screw-in tool probe <Ø2.5 mm

Drill size recommendation (mm)

Receptacle without knurl	2.98 - 2.99
Receptacle with knurl	3.00 - 3.02

Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1004239	F88606B300G350SM	06	3.00	B / G	350	M2.5	SM	-
1004237	F88606B400G350SM	06	4.00	B / G	350	M2.5	SM	-
1011741	F88617B300G080LM	17	3.00	B / G	80	M2.5	LM	-
1004558	F88617B300G120SM	17	3.00	B / G	120	M2.5	SM	FM Choice
1009088	F88617B300G200LM	17	3.00	B / G	200	M2.5	LM	-

Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1004236	F88617B300G200SM	17	3.00	B / G	200	M2.5	SM	FM Choice
1004235	F88617B300G350LM	17	3.00	B / G	350	M2.5	LM	FM Choice
1004234	F88617B300G350SM	17	3.00	B / G	350	M2.5	SM	FM Choice
1004232	F88617B300G900SM	17	3.00	B / G	900	M2.5	SM	FM Choice
1010277	F88617B350G080SM	17	3.50	B / G	80	M2.5	SM	FM Choice
1004231	F88617B350G120SM	17	3.50	B / G	120	M2.5	SM	-
1007345	F88617B350G200LM	17	3.50	B / G	200	M2.5	LM	-
1004230	F88617B350G200SM	17	3.50	B / G	200	M2.5	SM	FM Choice
1004229	F88617B350G350LM	17	3.50	B / G	350	M2.5	LM	FM Choice
1004228	F88617B350G350SM	17	3.50	B / G	350	M2.5	SM	FM Choice
1004226	F88617B350G900SM	17	3.50	B / G	900	M2.5	SM	FM Choice
1006140	F88617B400G120SM	17	4.00	B / G	120	M2.5	SM	FM Choice
1022109	F88617B400G200LM	17	4.00	B / G	200	M2.5	LM	-
1006506	F88617B400G200SM	17	4.00	B / G	200	M2.5	SM	FM Choice
1004225	F88617B400G350LM	17	4.00	B / G	350	M2.5	LM	FM Choice
1004224	F88617B400G350SM	17	4.00	B / G	350	M2.5	SM	FM Choice
1008305	F88617B450G200SM	17	4.50	B / G	200	M2.5	SM	-
1011555	F88617B450G350E14	17	4.50	B / G	350	M2.5	E14	-
1004222	F88617B450G350SM	17	4.50	B / G	350	M2.5	SM	FM Choice
1004220	F88617B500G350SM	17	5.00	B / G	350	M2.5	SM	FM Choice
1004218	F88617B550G350SM	17	5.50	B / G	350	M2.5	SM	-
1004216	F88617B590G350SM	17	5.90	B / G	350	M2.5	SM	-
1013784	F88617H300U080SM	17	3.00	H / U	80	M2.5	SM	-
1008637	F88617H300U200SM	17	3.00	H / U	200	M2.5	SM	-
1005718	F88617H300U350LM	17	3.00	H / U	350	M2.5	LM	-
1005719	F88617H300U350SM	17	3.00	H / U	350	M2.5	SM	FM Choice
1005737	F88617H350U350LM	17	3.50	H / U	350	M2.5	LM	-
1005720	F88617H350U350SM	17	3.50	H / U	350	M2.5	SM	FM Choice
1017620	F88617H350U900SM	17	3.50	H / U	900	M2.5	SM	-
1005721	F88617H400U350SM	17	4.00	H / U	350	M2.5	SM	FM Choice
1005723	F88617H450U350SM	17	4.50	H / U	350	M2.5	SM	-
1006214	F88617K300U200SM	17	3.00	K / U	200	M2.5	SM	FM Choice
1004212	F88617K300U350SM	17	3.00	K / U	350	M2.5	SM	FM Choice
1004211	F88617K300U900SM	17	3.00	K / U	900	M2.5	SM	-
1004208	F88617K350U350SM	17	3.50	K / U	350	M2.5	SM	-
1004206	F88617K400U350SM	17	4.00	K / U	350	M2.5	SM	FM Choice
1004292	F88617K500U350SM	17	5.00	K / U	350	M2.5	SM	-
1004289	F88617K590U350SM	17	5.90	K / U	350	M2.5	SM	-
1000531	F88617T300N200SM	17	3.00	T / N	200	M2.5	SM	-
1000532	F88617T300N350SM	17	3.00	T / N	350	M2.5	SM	FM Choice



FM Choice

F881 (NO)

10 A | 138 mil/3.50 mm | Threaded | Electrically Isolated

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	10
Current switch [A]	1
R TYP [mOhm]	<25

Mechanical specifications

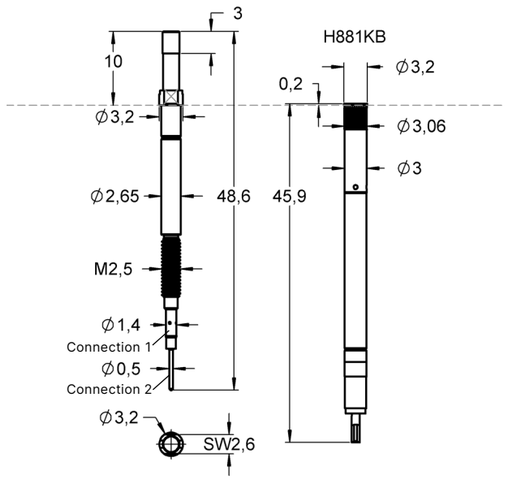
Switch point [mm]	1.7
Preload [cN]	80
Spring force [cN] at nt ±20%	380
Nominal travel [mm]	4.0
Maximum travel [mm]	5.0

Materials and plating

Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Spring steel	silver plated
Receptacle	Brass	gold plated

Series drawing

All measurements are in mm.



Accessories

1007677	H881KB	Receptacle
1001868	H885	Receptacle
1003642	FEWZ-774E0	Insertion tool receptacle
1029833	FWZ885S1T	Screw-in tool probe <Ø3.1 mm
1009781	FWZ885T	Screw-in tool probe <Ø2.5 mm

Drill size recommendation (mm)

Receptacle with knurl	3.00 - 3.02

Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1008697	F88106B230G380	06	2.30	K / U	380	M2.5	-	FM Choice
1007673	F88117B230G380	17	2.30	K / U	380	M2.5	-	-
1008935	F88117B300G380	17	3.00	K / U	380	M2.5	-	-



F385 (NO)

10 A | 157 mil/4.00 mm | Threaded | Long travel version

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	10
Current switch [A]	1
R TYP [mOhm]	<50

Mechanical specifications

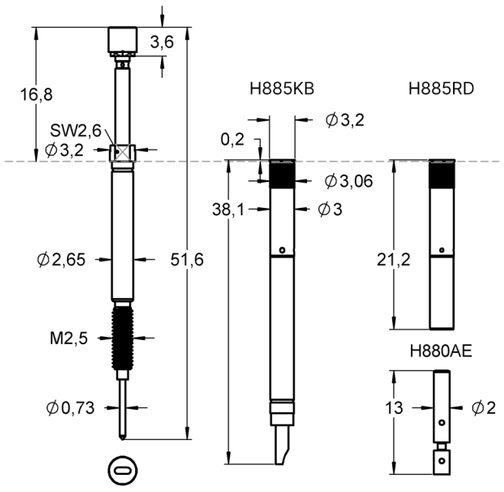
Switch point [mm]	1.7
Preload [cN]	40
Spring force [cN] at nt ±20%	200
Nominal travel [mm]	9.0
Maximum travel [mm]	11.0

Materials and plating

Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Spring steel	silver plated
Receptacle	Brass	gold plated

Series drawing

All measurements are in mm.



Accessories

Further receptacles H885 see page 64.		
1003642	FEWZ-774E0	Insertion tool receptacle
1029831	FWZ760S1T	Screw-in tool probe

Drill size recommendation (mm)

Receptacle without knurl	2.98 - 2.99
Receptacle with knurl	3.00 - 3.02

Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1011154	F38506B350G200	06	3.50	B / G	200	M2.5	-	-
1010902	F38517B350G200	17	3.50	B / G	200	M2.5	-	FM Choice



FM Choice

F880 (NO)

10 A | 138 mil/3.50 mm | Threaded |
For backward assembly

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	10
Current switch [A]	1
R TYP [mOhm]	<50

Mechanical specifications

Switch point [mm]	1.7	
Preload [cN]	50	120
Spring force [cN] at nt ±20%	150	350
Nominal travel [mm]	4.0	4.0
Maximum travel [mm]	5.0	5.0

Materials and plating

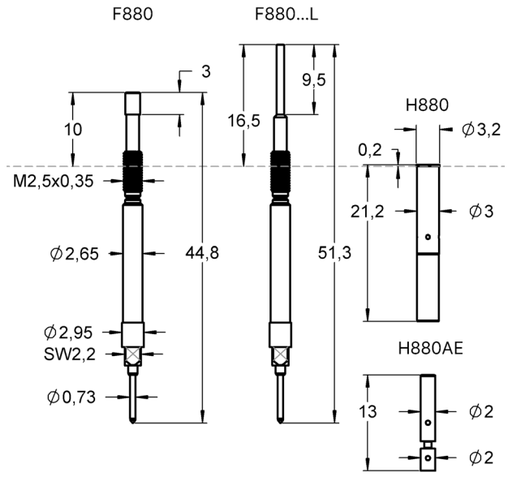
Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Spring steel	silver plated
Receptacle	Brass	gold plated

Accessories

1006696	H880	Receptacle
1007654	H880AE	Connecting element
1003642	FEWZ-774E0	Insertion tool receptacle
1006124	FWZVF3T	Screw-in tool probe <Ø3.1 mm
1009980	FWZ880SA	Adjustment tool for probes

Series drawing

All measurements are in mm.



Drill size recommendation (mm)

Receptacle without knurl	2.98 - 2.99

Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1009474	F88016B100G150L	16	1.00	B / G	150	M2.5x0.35	L	-
1004352	F88016B100G350L	16	1.00	B / G	350	M2.5x0.35	L	-
1006697	F88017B200G350	17	2.00	B / G	350	M2.5x0.35	-	FM Choice



FM Choice

F485 (NO)

10 A | 138 mil/3.50 mm | Threaded
Off-On-Off

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	10
Current switch [A]	1
R TYP [mOhm]	<20

Mechanical specifications

Switch point 1 [mm]	2.5
Switch point 2 [mm]	3.5
Preload [cN]	80
Spring force [cN] at nt ±20%	300
Nominal travel [mm]	4.0
Maximum travel [mm]	5.0

Materials and plating

Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Spring steel	silver plated
Receptacle	Brass	gold plated

Accessories

Further receptacles H885 see page 64.

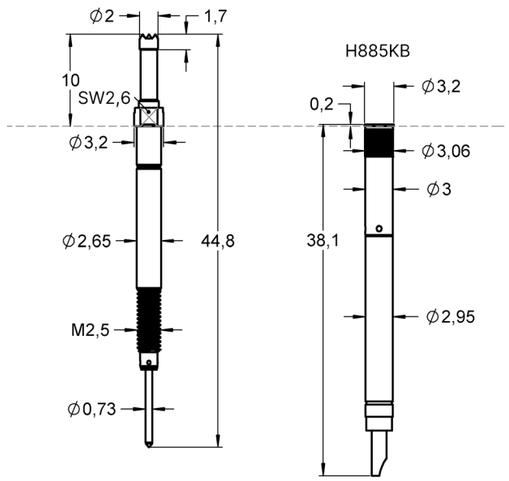
1003642	FEWZ-774E0	Insertion tool receptacle
1009781	FWZ885T	Screw-in tool probe <Ø2.5 mm

Drill size recommendation (mm)

Receptacle without knurl	2.98 - 2.99
Receptacle with knurl	3.00 - 3.02

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1019876	F48506B200G300	06	2.00	B / G	300	M2.5	-	FM Choice



FM Choice

H885

138 mil/3.50 mm | Receptacles

Materials and plating

Receptacle	Brass	gold plated

Accessories

1003642	FEWZ-774E0	Insertion tool receptacle

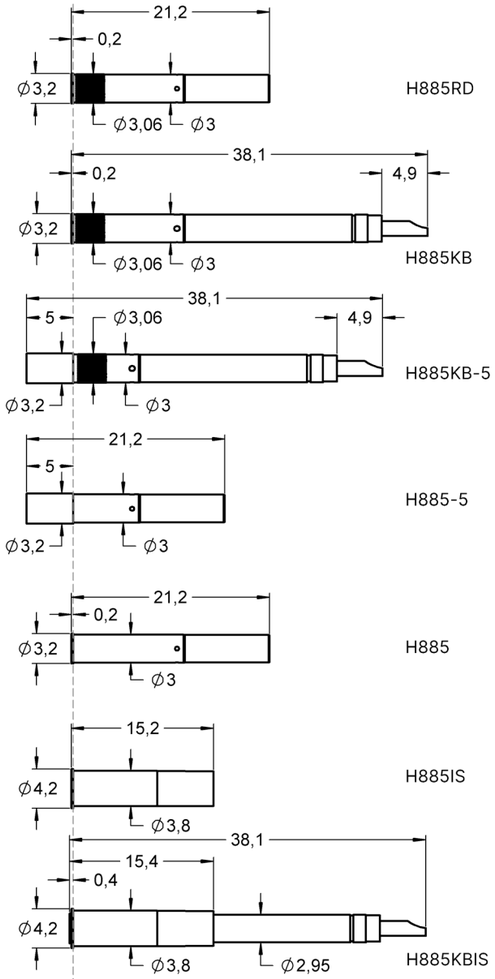
Drill size recommendation (mm)

Synthetic receptacle	3.78 - 3.79
Receptacle without knurl	2.99 - 3.00
Receptacle with knurl	3.00 - 3.02

Order code	Product name	Version	FM Choice
1003793	H885RD		-
1003080	H885KB	KB	FM Choice
1002935	H885KB-5	KB	FM Choice
1001869	H885-5		-
1001868	H885		FM Choice
1003079	H885IS	IS	FM Choice
1036356	H885KBIS	KBIS	-

Series drawing

All measurements are in mm.





F487 (NO)

10 A | 157 mil/4.00 mm | Threaded Off-On-Off

Electrical specifications

Temperature [°C]	-45°...+100°	
Current [A]	10	
Current switch [A]	1	
R TYP [mOhm]	<20	

Mechanical specifications

Switch point 1 [mm]	2.5	
Switch point 2 [mm]	3.5	
Preload [cN]	40	120
Spring force [cN] at nt ±20%	100	300
Nominal travel [mm]	4.0	4.0
Maximum travel [mm]	5.0	5.0

Materials and plating

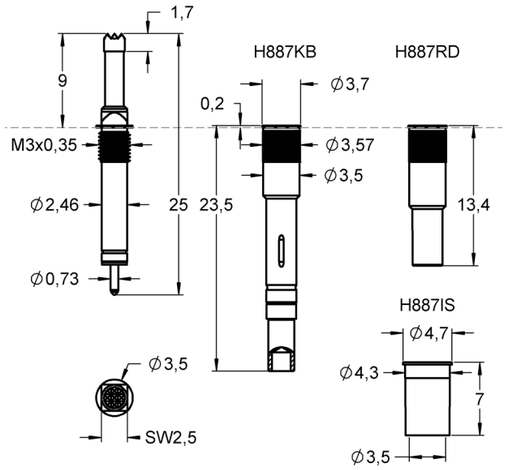
Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Spring steel	silver plated
Receptacle	Brass	gold plated

Accessories

1001758	H887KB	Receptacle
1004903	H887RD	Receptacle
1011006	H887IS	Receptacle
1005040	FEWZ-340E0	Insertion tool receptacle
1006748	FWZVF4T	Screw-in tool probe <Ø4.0 mm

Series drawing

All measurements are in mm.



Drill size recommendation (mm)

Synthetic Receptacle	4.28 - 4.29
Receptacle with knurl	3.50 - 3.52

Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1018703	F48706B200G300	06	2.00	B / G	300	M3x0.35	-	-
1031031	F48716B180G100E12	16	1.80	B / G	100	M3x0.35	E12	-
1023463	F48717B300G300	17	3.00	B / G	300	M3x0.35	-	-



FM Choice

F887 (NO)

10 A | 157 mil/4.00 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+100°	
Current [A]	10	
Current switch [A]	1	
R TYP [mOhm]	<40	

Mechanical specifications

Switch point [mm]	1.7		
Preload [cN]	60	60	140
Spring force [cN] at nt ±20%	150	200	300
Nominal travel [mm]	4.0	4.0	4.0
Maximum travel [mm]	5.0	5.0	5.0

Materials and plating

Plunger	BeCu	gold plated
	Synthetic	unplated
Barrel	Brass	gold plated
Spring	Spring steel	silver plated
Receptacle	Brass	gold plated

Accessories

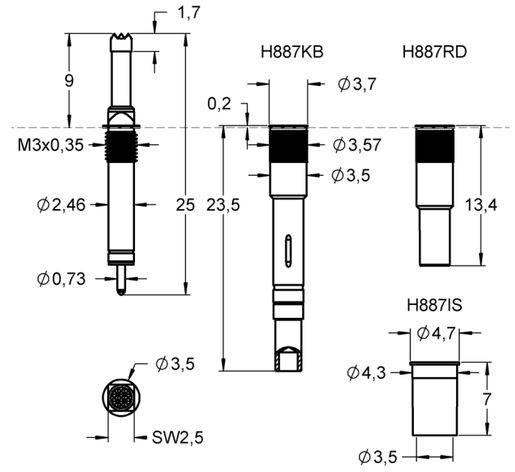
1001758	H887KB	Receptacle
1004903	H887RD	Receptacle
1011006	H887IS	Receptacle
1005040	FEWZ-340E0	Insertion tool receptacle
1006748	FWZVF4T	Screw-in tool probe <Ø4.0 mm

Drill size recommendation (mm)

Synthetic Receptacle	4.28 - 4.29
Receptacle with knurl	3.50 - 3.52

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1004963	F88706B100G150	06	1.00	B / G	150	M3x0.35	-	FM Choice
1026801	F88706B100G150S1	06	1.00	B / G	150	M3x0.35	S1	-
1034623	F88706B100G150S2	06	1.00	B / G	150	M3x0.35	S2	FM Choice
1004908	F88706B100G200	06	1.00	B / G	200	M3x0.35	-	-
1012006	F88706B180G150S1	06	1.80	B / G	150	M3x0.35	S1	-
1004964	F88706B200G150	06	2.00	B / G	150	M3x0.35	-	FM Choice
1004900	F88706B200G200	06	2.00	B / G	200	M3x0.35	-	-
1004988	F88706B200G300	06	2.00	B / G	300	M3x0.35	-	FM Choice
1004965	F88706B300G150	06	3.00	B / G	150	M3x0.35	-	FM Choice
1004980	F88716B100G150	16	1.00	B / G	150	M3x0.35	-	FM Choice
1004981	F88717B200G150	17	2.00	B / G	150	M3x0.35	-	FM Choice
1004982	F88717B300G150	17	3.00	B / G	150	M3x0.35	-	FM Choice
1006907	F88717B300G300	17	3.00	B / G	300	M3x0.35	-	-
1027072	F88717K200U150	17	2.00	K / U	150	M3x0.35	-	FM Choice
1130588	F88717K240U150	17	2.40	K / U	150	M3x0.35	-	-
1030478	F88717K300U150	17	3.00	K / U	150	M3x0.35	-	-



F899P0001 (NO)

Off-On-Off | 394 mil/10.0 mm | Pneumatic

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	3
Current switch [A]	1
R TYP [mOhm]	<100

Mechanical specifications

	Working travel [mm]	Contact force at 6 bar [cN]
Switch Point 1 F899P0001	2.0	±0,2
Switch Point 1 F899P0002	3.0	±0,2
Nominal travel [mm]	3.8	350 ±20%
Switch Point 2	4.0	±0,2
Maximum travel [mm]	5.0	
Operating pressure	5-7 bar Change 75cN/bar	
Operating medium	Compressed air (dried & filtered)	
Allowed leakage rate	5 cm³/min.	

Materials and plating

Plunger	Synthetic	unplated
Barrel	Brass	gold plated
	Synthetic	unplated
Spring	Spring steel	silver plated
Receptacle	Brass	nickel plated

Accessories

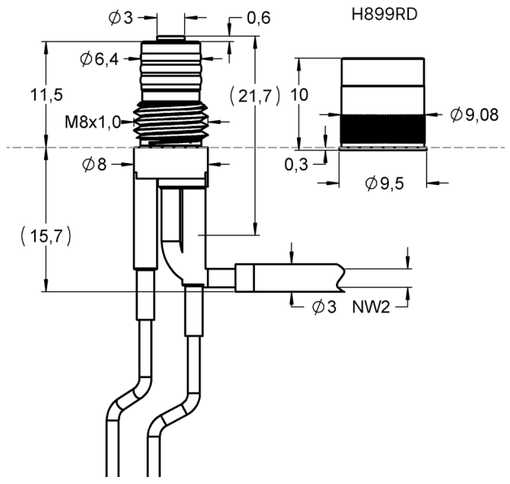
1002634	2100782 (NW2)	Pneumatic tube
1023938	H899RD	Receptacle
1004180	FAWZ761	Insertion tool receptacle
1023929	FWZ899	Screw-in tool probe

Drill size recommendation (mm)

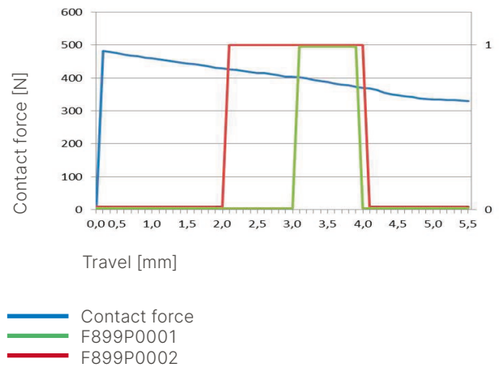
1023938	H899RD	9.02 - 9.06

Series drawing

All measurements are in mm.



Switch-Characteristic

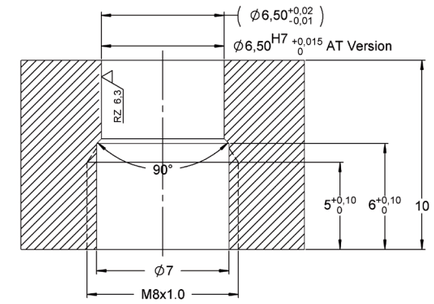


Special solution for pneumatic position tests at limited space. The pneumatic micro switch probe F899P with two switch points (Off-On-Off) allows an exact determination of the DUT position.

Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1021585	F899P0001	17	3.00	K / U	350	M8x1	-	-
1022307	F899P0002	17	3.00	K / U	350	M8x1	-	-

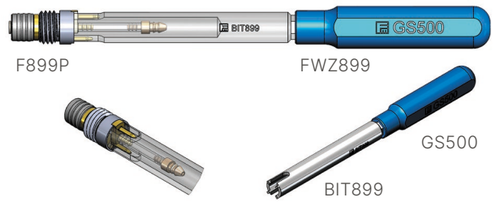
Drilling recommendations for the use without receptacle

For mounting the probe F899P without receptacle a precise drilling is mandatory to hold the probe in its position. It is essential to consider if the module with the mounted probe needs to be airtight or not. An airtight module needs extremely precise drilling dimensions. As the ideal drilling diameters depend on the material, the recommendations here are only a guideline for your own drilling tests.



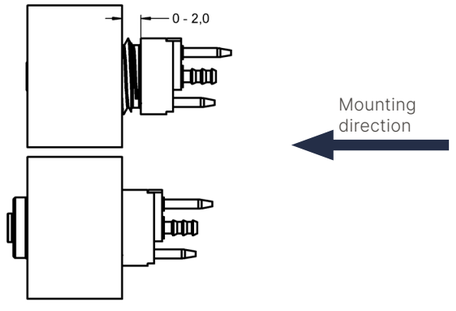
Mounting tool FWZ899

The mounting tool fits into the corresponding notch of the probe and allows to screw in and position the probe securely from backwards.



Longitudinal Adjustment

The probe F899P can be mounted either on stop or it can be adjusted for up to 2,0 mm in longitudinal direction. This is realized by the thread of the probe. One full turn of the probe leads to 1,0 mm adjustment.





FM Choice NEW

F898 (NO)

Off-On-Off | 244 mil/6.20 mm | Pneumatic

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	3
Current switch [A]	1
R TYP [mOhm]	<100

Mechanical specifications

	Working travel [mm]	Contact force at 6 bar [cN]
Switch Point 1	3.5	±0,3
Nominal travel [mm]	3.7	450 ±20%
Switch Point 2	4.5	±0,2
Maximum travel [mm]	4.8	
Operating pressure	5-7 bar Change 130cN/bar	
Operating medium	Compressed air (dried & filtered)	
Allowed leakage rate	5 cm³/min.	

Materials and plating

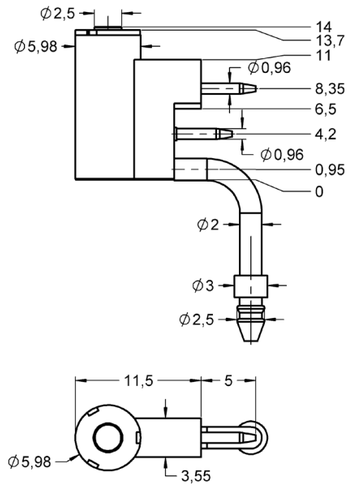
Plunger	Synthetic	unplated
Barrel	Brass	gold plated
Spring	Spring steel	silver plated

Accessories

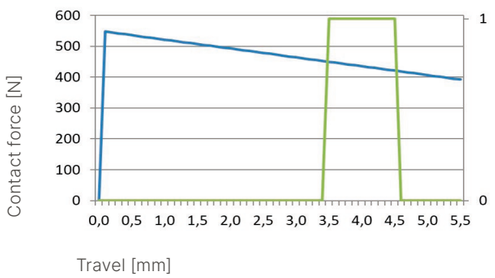
1021542	2104456	Connecting plug
1002634	2100782 (NW2)	Pneumatic tube

Series drawing

All measurements are in mm.



Switch-Characteristic



Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1142368	F89817K250U450	17	2.50	K / U	450	-	-	FM Choice

Application and Mounting

Special solution for a pneumatic presence test at limited space. An integrated switch function allows to detect the exact position of the test item. For an adjustable position of the F898 in axial direction a lateral setscrew (M2, max. torque 8 cNm) can be used. For a fix and secure position the F898 can be mounted by an axial setscrew (M8).

NUMBER CODE SYSTEM

Explanation of our product names of Switch Probes with ball head

In order to show how our material description is built, the current valid number code system is explained below:

Type		Material Ball		Plating Ball		Switch travel
F888	90	S	1101	U	100	S05
	Tip style		Number / Digit		Spring force [cN]	

Material Ball

B = BeCu
M = Brass
S = Steel

Plating Ball

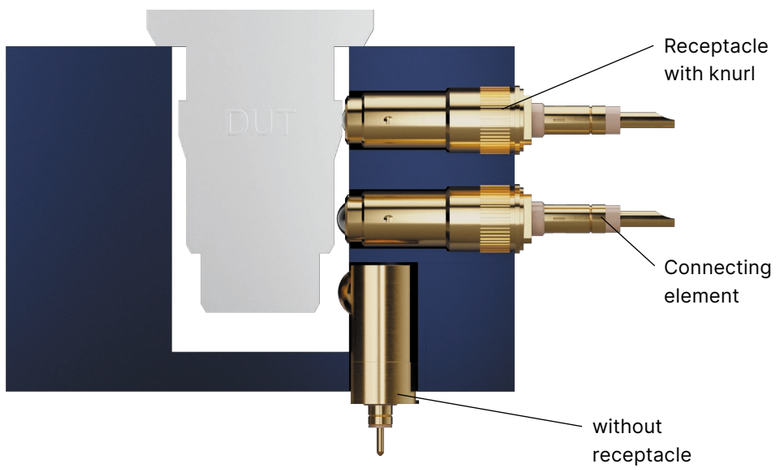
G = Gold
N = Nickel
U = Unplated

Number / Digit

1. Digit 0 = Switch not galvanically isolated
1 = Switch galvanically isolated
2 = Without switch
2. Digit 0 = Without thread
1 = With thread
3.+4. Digit = Running number

Switch travel

S05 = e.g.switch travel 0.5 mm





NEW

F888 (NO)

197 mil/5.00 mm | With ball head | Threaded

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	5
Current switch [A]	1
R TYP [mOhm]	<25

Mechanical specifications

Switch point [mm]	0.35
Preload [cN]	90
Spring force [cN] at nt ±20%	130
Nominal travel [mm]	0.80
Maximum travel [mm]	0.85

Materials and plating

Ball	Steel	unplated
Barrel	Brass	gold plated
Spring	Spring steel	unplated
Receptacle	Brass	gold plated

Accessories

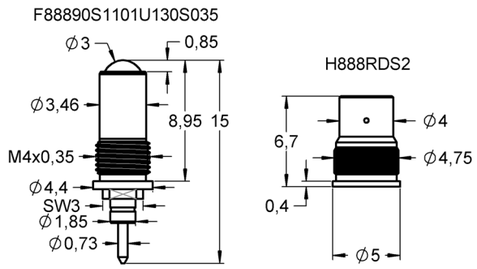
1143202	H888RDS2	Receptacle
1005027	FEWZ-735E0	Insertion tool receptacle
1155754	H888AES1	Connecting element
1001682	FWZ733	Screw-in tool probe

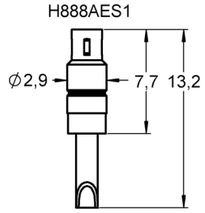
Drill size recommendation (mm)

1143202	H888RDS2	4.67 - 4.71

Series drawing

All measurements are in mm.





Due to a rolling ball as contact element probes of the series F888 are insensitive against lateral forces. A common application is the lateral presence test of connector housings in test modules. F88890S1101U130S035 is the smallest ball switch solution on the market and is especially designed for modules with limited space.

Pluggable version available.

Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1132733	F88890S1101U130S035	90	3.00	S / U	130	M4x0.35	S035	-



F888 (NO)

256 mil6.50 mm | With ball head | Pluggable

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	5
Current switch [A]	1
R TYP [mOhm]	<25

Mechanical specifications

Switch point [mm]	0.5	0.8
Preload [cN]	70	70
Spring force [cN] at nt ±20%	100	100
Nominal travel [mm]	1.4	1.4
Maximum travel [mm]	1.4	1.4

Materials and plating

Ball	Steel	unplated
Barrel	Brass	gold plated
Spring	Stainless steel	unplated
Connecting element	Brass	gold plated

Accessories

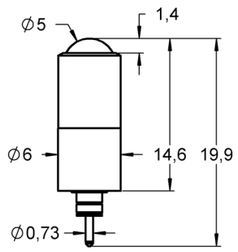
1007794	H888AE	Connecting element

Drill size recommendation (mm)

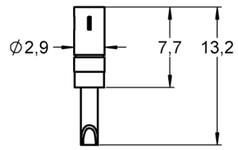
Barrel diameter	6.00

Series drawing

All measurements are in mm.



H888AE



Due to a rolling ball as contact element probes of the series F888 are insensitive against lateral forces. A common application is the lateral presence test of connector housings in test modules. With the F88890S0003U100S05, the switching circuit of this probe is not galvanically isolated against the barrel.
With the F88890S1003U100S05, on the other hand, the switching circuit is galvanically isolated from the barrel and the ball head, meaning that it can be used potential-free.

Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1024113	F88890S0003U100S05	90	5.00	S / U	100	-	S05	-
1009589	F88890S0003U100S08	90	5.00	S / U	100	-	S08	-
1035689	F88890S1003U100S05	90	5.00	S / U	100	-	S05	-



FM Choice

F888 (NO)

275 mil/7.00 mm | With ball head | Threaded

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	5
Current switch [A]	1
R TYP [mOhm]	<25

Mechanical specifications

Switch point [mm]	0.5
Preload [cN]	100
Spring force [cN] at nt ±20%	200
Nominal travel [mm]	1.0
Maximum travel [mm]	1.0

Materials and plating

Ball	Steel	unplated
Barrel	Brass	gold plated
Spring	Spring steel	gold plated
Receptacle	Brass	gold plated

Accessories

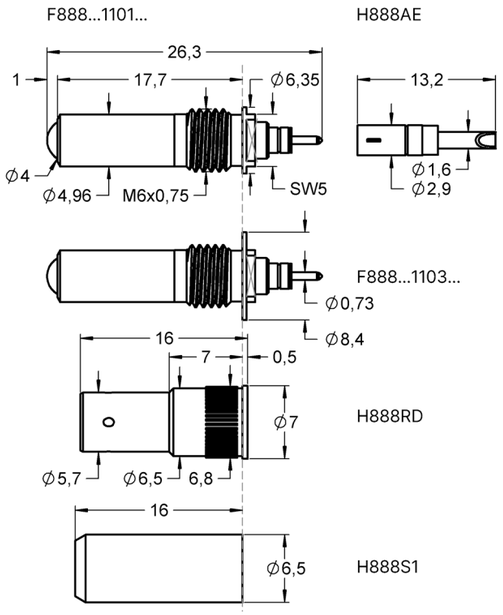
1007756	H888RD	Receptacle
1007758	H888S1	Receptacle
1035560	FEWZ-888	Insertion tool receptacle
1009978	FWZ888SA	Adjustment tool for probes
1007788	FWZ888	Screw-in tool probe

Drill size recommendation (mm)

1007758	H888S1	6.50
1143202	H888RD	6.55 - 6.70

Series drawing

All measurements are in mm.



Due to a rolling ball as contact element probes of the series F888 are insensitive against lateral forces. A common application is the lateral presence test of connector housings in test modules. The switch circuit of this probe is galvanically isolated against the barrel.

The same probe just with a larger collar of 8,4 mm instead of 6,35 mm is available by order code F88890S1103U200S05.

Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1009596	F88890S1101U200S05	90	4.00	S / U	200	M6x0.75	S05	FM Choice
1010552	F88890S1103U200S05	90	4.00	S / U	200	M6x0.75	S05	-



FM Choice

F888 (NO)

354 mil/9.00 mm | With ball head | Threaded

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	5
Current switch [A]	1
R TYP [mOhm]	<25

Mechanical specifications

Switch point [mm]	0.7
Preload [cN]	70
Spring force [cN] at nt ±20%	100
Nominal travel [mm]	1.5
Maximum travel [mm]	1.5

Materials and plating

Ball	Steel	unplated
Barrel	Brass	gold plated
Spring	Stainless steel	unplated
Receptacle	Brass	gold plated

Accessories

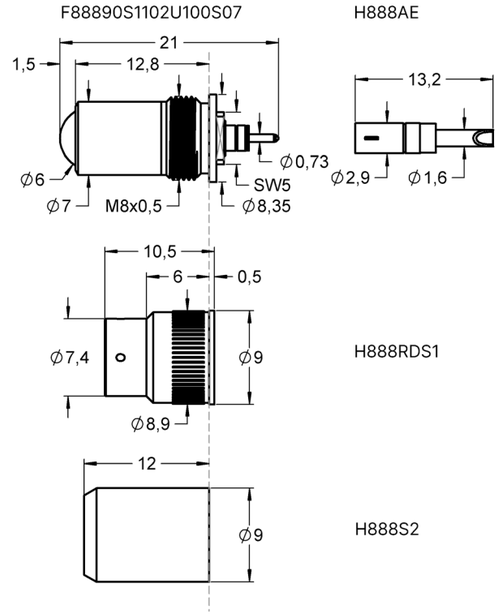
1007756	H888RD	Receptacle
1007758	H888S1	Receptacle
1035561	FEWZ-888S1	Insertion tool receptacle
1009979	FWZ888SA1	Adjustment tool for probes
1007788	FWZ888	Screw-in tool probe

Drill size recommendation (mm)

1009650	H888S2	9.0
1009858	H888RDS1	8.75 - 8.85

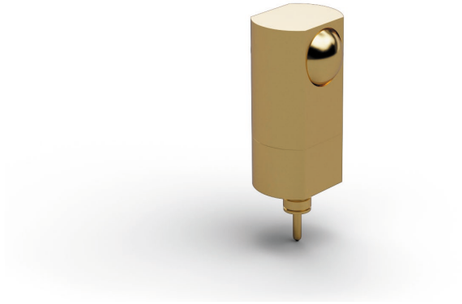
Series drawing

All measurements are in mm.



Due to a rolling ball as contact element probes of the series F888 are insensitive against lateral forces. A common application is the lateral presence test of connector housings in test modules. The switch circuit of this probe is galvanically isolated against the barrel.

Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1009601	F88890S1102U100S07	90	6.00	S / U	100	M8x0.5	S07	FM Choice



NEW

F889 (NO)

244 mil/6.20 mm | Ball head | Pluggable

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	3
Current switch [A]	1
R TYP [mOhm]	<100

Mechanical specifications

Switch point [mm]	0.4
Preload [cN]	100
Spring force [cN] at nt ±20%	120
Nominal travel [mm]	1.0
Maximum travel [mm]	1.3

Materials and plating

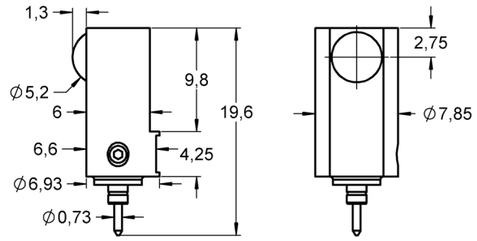
Ball	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Stainless steel	unplated

Accessories

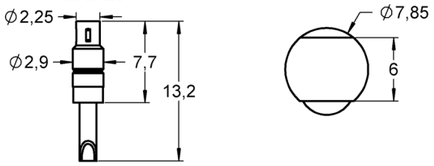
1155754	H888AES1	Connecting element

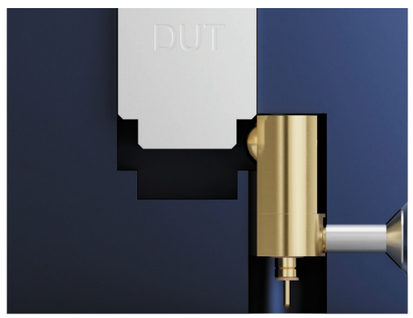
Series drawing

All measurements are in mm.



H888AES1





Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1142364	F88990S0001U120S06	90	5.20	B / G	120	-	S06	-

Application and Mounting

In contrast to the F888 (axial contacting), the new development of the F889 has a round contact element on the side. This design allows a space-saving assembly of test modules and easy interrogation of connector profiles. The mounting of the F889 can be fixed by a screw (M2/M3) after the final position and alignment is done.

POSITION SENSOR SYSTEM

System for precise plunger travel measurement

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

The system has a modular design and consists of a contact probe, a receptacle and a sensor element with integrated potentiometer. The potentiometer is galvanically isolated from the probe.

After applying an operating voltage, the sensor supplies a measurement voltage that is linear to the travel of the plunger (potentiometric operation). Alternatively, with restrictions regarding accuracy and life cycle, also the resulting resistance can be used as measurement value (resistive operation). FEINMETALL recommends the potentiometric operation for all Position Sensor Systems. The measurement results can be analyzed by the available tester environment, commonly.

Modular design of the Position Sensor System



Probe



Receptacle



Sensor element



Contact probe - Receptacle - Sensor element

Variants

The Position Sensor System is available for different centers of 75 mil, 100 mil and 157 mil. For 100 mil centers a twist proof version is available (PS756). The system for 157 mil is suitable for airtight modules or fixtures (i.e. leakage rate < 0,5 cm³ / min at 0,7 bar).

Reference measurement

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

Measuring ranges

PS175:	0 ... 6.4 mm	(75 mil)
PS756:	0 ... 4.4 mm	(100 mil)
PS732:	0 ... 5.0 mm	(100 mil)
PS733:	0 ... 5.0 mm	(157 mil)

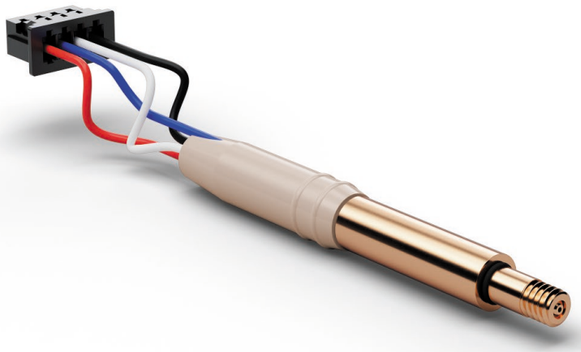
Calibration

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.

FEINMETALL recommends periodic calibration and zeroing of the system.



Specification sensor element

Measuring principle	potentiometric
Accuracy	≤ 2%
Reproducibility	typ. ≤ ±0,05 mm
Therm. resist. coeff	5x10-5/K
Preload [cN]	40
Nominal spring force [cN]	60
Nominal travel [mm]	4.0

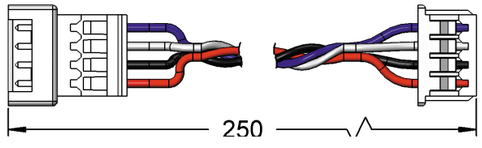
Caption

U_0	Operating voltage (maximum 10 VDC)
U_m	Measuring voltage (potentiometric op.) ($U_1 < U_m < U_P - U_3$)
R_m	Measuring resistance (resistive op.) ($R_1 < R_m < R_P - R_3$)
R_1	Initial resistance
U_1	Initial voltage ($U_1 = I * R_1$)
R_3	Final resistance
U_3	Final voltage ($U_3 = I * R_3$)
R_P	Potentiometric resistance (4,5 kOhm ± 20%) ($R_P = R_1 + R + R_3$)
R_S	Slider resistance
R_L	Load resistor (opt. to protect against over-current at the slider)

Order code

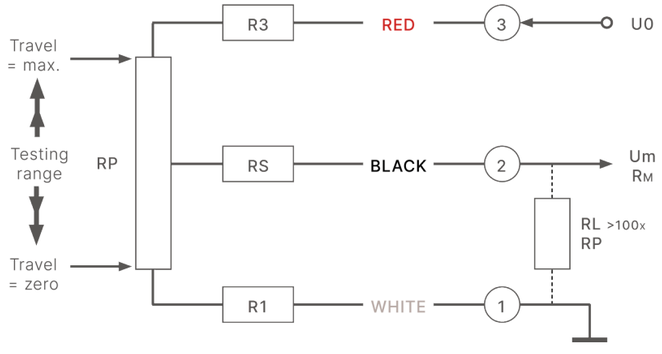
1024149	PS075F060R6.5	Sensor
1013618	PS100F060R5.2	Sensor
1023745	PS157F060R5.2	Sensor
1025376	2112221	250mm extension cable for Molex connector

Extension cable



Connections of sensor element

RED	Operating voltage U_0
BLACK	Measuring signal U_m or R_m
WHITE	Mass
BLUE	Test point of contact probe tip (maximum current 1 A)





PS175

4 A | 75 mil/1.90 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+100°
Current Probe [A]	4
Current Sensor [A]	1
R TYP [mOhm]	<20

Mechanical specifications

Preload [cN]	50
Spring force [cN] at nt ±20%	100
Nominal travel [mm]	4.3
Maximum travel [mm]	6.4

Materials and plating

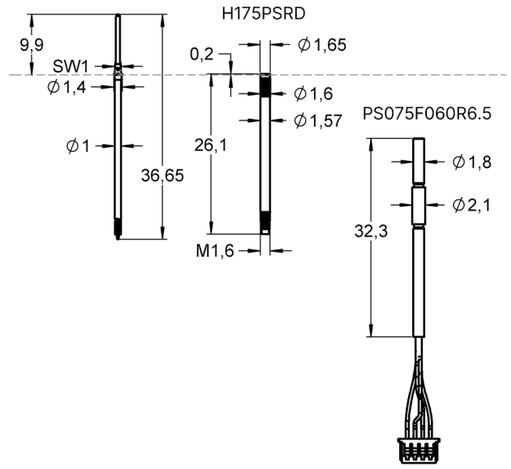
Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Spring steel	silver plated
Receptacle	Brass	unplated

Accessories

1024149	PS075F060R6.5	Sensor
1025376	2112221	250mm extension cable for Molex connector
1035257	FWZPS075T	Screw-in tool sensor
1024148	H175PSRD	Receptacle
1014311	FEWZ-075E0	Insertion tool receptacle
1029809	FWZ730S1T	Screw-in tool probe

Series drawing

All measurements are in mm.



Drill size recommendation (mm)

1024148	H175PSRD	1.59 - 1.60

The Position Sensor System consists of a special spring contact probe PS175..., a receptacle H175PSRD and a sensor element PS075.... These three elements are mounted into a fixture plate. The Position Sensor is screwed at the receptacle from backwards after the receptacle is mounted.
* The values for current and resistance are only valid for a soldered connection at the receptacle. The blue wire of the Molex connector only allows a maximum current of 1,0 A and R typ 500 mOhm.

Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1026924	PS17506B120G100	06	1.20	B / G	100	M1	-	-
1024150	PS17511B064G100	11	0.64	B / G	100	M1	-	-
1034926	PS17512B100G100	12	1.00	B / G	100	M1	-	-
1026925	PS17517B120G100	17	1.20	B / G	100	M1	-	-



PS732

5 A | 100 mil/2.54 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+100°
Current Probe [A]	5
Current Sensor [A]	1
R TYP [mOhm]	<25

Mechanical specifications

Preload [cN]	60
Spring force [cN] at nt ±20%	90
Nominal travel [mm]	4.0
Maximum travel [mm]	5.0

Materials and plating

Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Spring steel	silver plated
Receptacle	Brass	unplated

Accessories

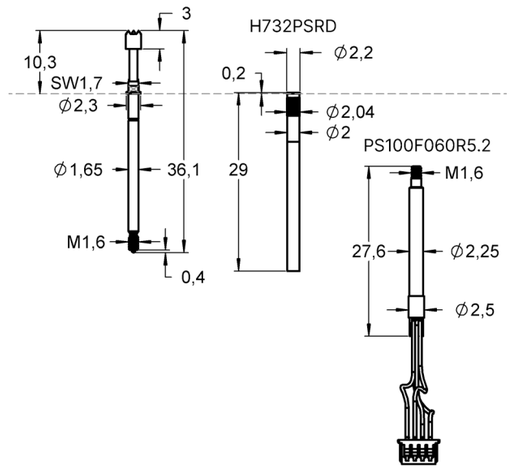
1013618	PS100F060R5.2	Sensor
1025376	2112221	250mm extension cable for Molex connector
1015329	FWZPS100	Screw-in tool sensor
1024184	H732PSRD	Receptacle
1014264	FEWZ-100E0	Insertion tool receptacle
1004610	FWZ732T	Screw-in tool probe

Drill size recommendation (mm)

1024184	H732PSRD	2.00 - 2.02

Series drawing

All measurements are in mm.



The Position Sensor System consists of a special spring contact probe PS732..., a receptacle H732PSRD and a sensor element PS100.... These three elements are mounted into a fixture plate. The Position Sensor is screwed at the receptacle from backwards after the receptacle is mounted.

* The values for current and resistance are only valid for a soldered connection at the receptacle. The blue wire of the Molex connector only allows a maximum current of 1,0 A and R typ 500 mOhm.
** Center differing from standard.

Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1013602	PS73205B180G090	05	1.80	B / G	90	M1.6	-	-
1013603	PS73206B150G090	06	1.50	B / G	90	M1.6	-	-
1013604	PS73206B180G090	06	1.80	B / G	90	M1.6	-	-
1013605	PS73206B200G090	06	2.00	B / G	90	M1.6	-	-
1013606	PS73206B250G090	06	2.50	B / G	90	M1.6	-	-
1013612	PS73211B064G090	11	0.64	B / G	90	M1.6	-	-
1013613	PS73211B080G090	11	0.80	B / G	90	M1.6	-	-
1013614	PS73211B100G090	11	1.00	B / G	90	M1.6	-	-
1013608	PS73216B100G090	16	1.00	B / G	90	M1.6	-	-
1030426	PS73216B120G090	16	1.20	B / G	90	M1.6	-	-
1013609	PS73217B140G090	17	1.40	B / G	90	M1.6	-	-
1000093	PS73217B200G090	17	2.00	B / G	90	M1.6	-	-
1024960	PS73217B300G090	17	3.00	B / G	90	M1.6	-	-



PS756

5 A | 100 mil/2.54 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+100°
Current Probe [A]	5
Current Sensor [A]	1
R typ [mOhm]	<30

Mechanical specifications

	Probe	Sensor
Preload [cN]	60	40
Spring force [cN] at nt ±20%	150	60
Nominal travel [mm]	4.0	-
Maximum travel [mm]	4.4	-

Materials and plating

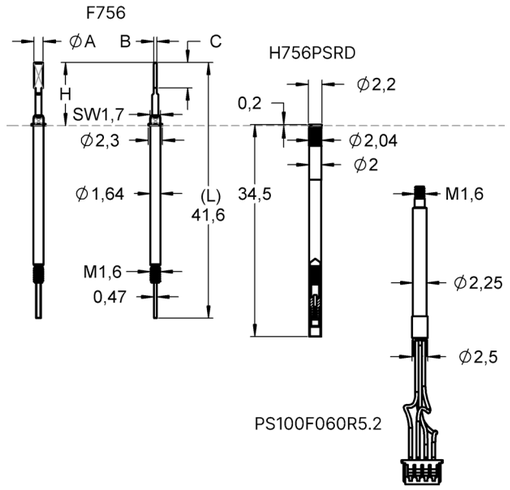
Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Spring steel	gold plated
Receptacle	Brass	unplated

Accessories

1013618	PS100F060R5.2	Sensor
1025376	2112221	250mm extension cable for Molex connector
1015329	FWZPS100	Screw-in tool sensor
1028154	H756PSRD	Receptacle
1003611	FAWZ756	Insertion tool receptacle
1004610	FWZ732T	Screw-in tool probe

Series drawing

All measurements are in mm.



The Position Sensor System consists of a twist proof threaded probe F756..., a receptacle H756... and a sensor element PS100.... These three elements are mounted into a fixture plate. The Position Sensor is screwed at the receptacle from backwards after the receptacle is mounted.

* The values for current and resistance are only valid for a soldered connection at the receptacle. The blue wire of the Molex connector only allows a maximum current of 1,0 A and R typ 500 mOhm.

Drill size recommendation (mm)

Receptacle with knurl	2.00 - 2.02

Order code	Product name	Tip Style	Ø A	B	C	H	L	Thread [M]	FM Choice
1012102	F75682B0001G150	82	1.1	0.45	5.00	10.3	41.6	M1.6	-

Further variants see F756. Each variant of F756 can be used in combination with the H756PSRD and PS100F060R5.2 sensor system.



PS733

5 A | 157 mil/4.00 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+200°
Current Probe [A]	5
Current Sensor [A]	1
R typ [mOhm]	<15

Mechanical specifications

	Probe	Sensor
Preload [cN]	50	40
Spring force [cN] at nt ±20%	250	60
Nominal travel [mm]	4.0	-
Maximum travel [mm]	5.0	-

Materials and plating

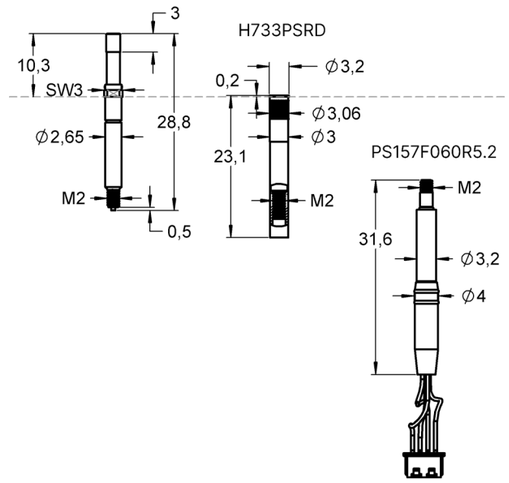
Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Stainless steel	unplated
Receptacle	Brass	unplated

Accessories

1023745	PS157F060R5.2	Sensor
1025376	2112221	250mm extension cable for Molex connector
1023742	H733PSRD	Receptacle
1003642	FEWZ-774E0	Insertion tool receptacle
1029813	FWZ733S1T	Screw-in tool probe (max. Tip-Ø 3 mm)

Series drawing

All measurements are in mm.



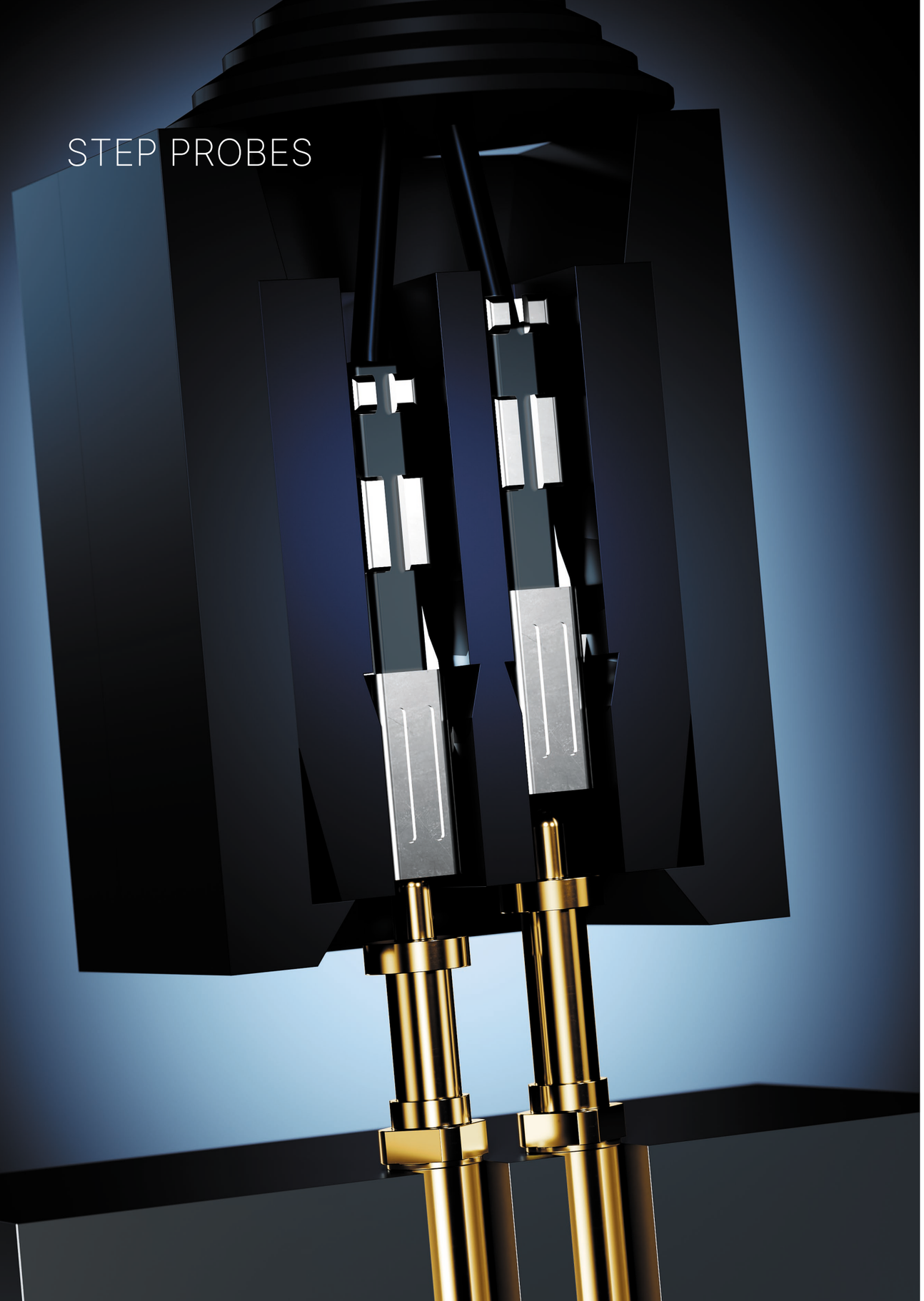
The Position Sensor System PS733 can be used in vacuum fixtures or modules (max. leakage rate <0,5 cm³/min at 0,7bar). It consists of a special contact probe PS733..., a receptacle H733PSRD and a sensor element PS157... . These three elements are mounted into a fixture plate. The Position Sensor is screwed at the receptacle from backwards after the receptacle is mounted.

* The values for current and resistance are only valid for a soldered connection at the receptacle. The blue wire of the Molex connector only allows a maximum current of 1,0 A and R typ 500 mOhm.

Drill size recommendation (mm)

Receptacle with knurl	3.01 - 3.05

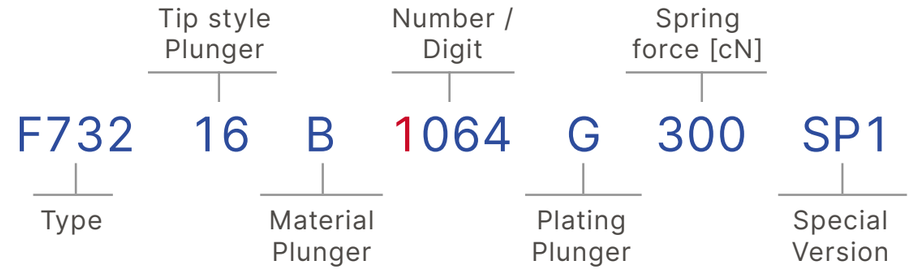
Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1023713	PS73306B200G250	06	2.00	B / G	250	M2	-	-
1023717	PS73317B230G250	17	2.30	B / G	250	M2	-	-



NUMBER CODE SYSTEM

Explanation of our product names

In order to show how our material description is built, the current valid number code system is explained below:



Material Plunger

B = BeCu
M = Brass
S = Steel

Plating Plunger

G = Gold
N = Nickel
U = Unplated

Number / Digit

1. Digit
0 = Plate Standard
1 = Plate oversized
2 = Plate Standard, insulated pin
3 = Plate oversized, insulated pin
4 = Plate Standard, fully insulated pin
5 = Plate oversized, fully insulated pin
2. -4. Digit = Running number

Spring force

080 = 80 cN
300 = 300 cN

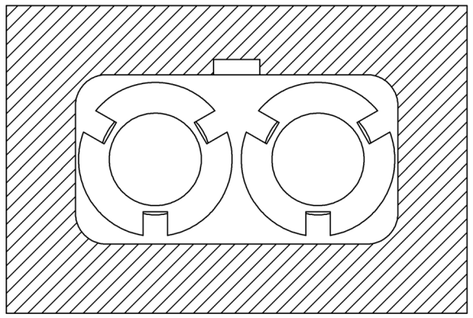
Special version

SP = Step Probe
SP1 = Step Probe with oversized plate

Innovative 3-point screw-in tool

For Step Probes with oversized plates (plate-Ø larger than probe-Ø or wrench size), FEINMETALL has developed a 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.





Applications with limited space



FM Choice

F730SP

3 A | 50 mil/1.27 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	3
R TYP [mOhm]	<50

Mechanical specifications

Preload [cN]	55
Spring force [cN] at nt ±20%	110
Nominal travel [mm]	4.0
Maximum travel [mm]	5.0

Materials and plating

Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Spring steel	gold plated
Receptacle	Bronze	gold plated

Accessories

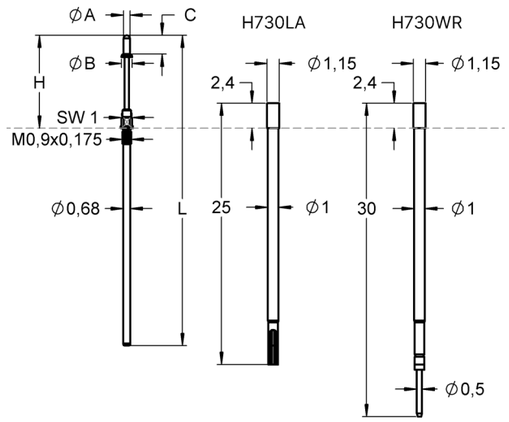
1003227	H730LA	Receptacle
1109766	H730LARD	Receptacle
1030396	H730WR	Receptacle
1000180	FEWZ-040E0	Insertion tool receptacle
1004895	FWZ730T	Screw-in tool probe <Ø0.9 mm

Drill size recommendation (mm)

Receptacle without knurl	0.96 - 0.99
Receptacle with knurl	1.04 - 1.07

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Ø A	Ø B	C	H	L	Thread [M]	FM Choice
1044991	F73011B0018G110SP	11	0.4	1.0	1.5	8.8	29.6	M0.9x0.175	-
1056588	F73011B0019G110SP	11	0.4	1.0	3.8	12.2	33.0	M0.9x0.175	-
1029612	F73011B0016G110SP	11	0.4	1.35	5.1	12.2	33.0	M0.9x0.175	-

See next page for further variants.

Order code	Product name	Tip Style	Ø A	Ø B	C	H	L	Thread [M]	FM Choice
1019091	F73011B0006G110SP	11	0.5	1.0	3.6	10.7	31.5	M0.9x0.175	FM Choice
1023866	F73011B0014G110SP	11	0.5	1.0	4.0	11.1	31.9	M0.9x0.175	FM Choice
1039195	F73012B0012G110SP	12	0.35	0.8	3.5	10.7	31.5	M0.9x0.175	-
1027299	F73012B0006G110SPS1	12	0.4	0.8	3.5	10.7	31.5	M0.9x0.175	FM Choice
1000578	F73012B0004G110SP	12	0.5	0.9	1.1	8.2	29.0	M0.9x0.175	-
1030754	F73012B0017G110SP	12	0.5	0.9	4.2	11.3	32.1	M0.9x0.175	FM Choice
1009293	F73012B0003G110SP	12	0.5	0.9	1.4	8.5	29.3	M0.9x0.175	FM Choice
1020783	F73012B0010G110SP	12	0.5	0.9	3.5	10.6	31.4	M0.9x0.175	FM Choice
1019894	F73012B0008G110SP	12	0.5	0.9	2.0	9.1	29.9	M0.9x0.175	-
1009166	F73012B0002G110SP	12	0.6	1.0	2.6	9.7	30.5	M0.9x0.175	FM Choice
1009165	F73012B0001G110SP	12	0.6	1.0	1.8	8.9	29.7	M0.9x0.175	FM Choice



F720SP

3 A | 50 mil/1.27 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	3
R TYP [mOhm]	<50

Mechanical specifications

Preload [cN]	50
Spring force [cN] at nt ±20%	110
Nominal travel [mm]	4.0
Maximum travel [mm]	4.8

Materials and plating

Plunger	BeCu	gold plated
Barrel	Bronze	gold plated
Spring	Spring steel	gold plated
Receptacle	Brass	gold plated

Accessories

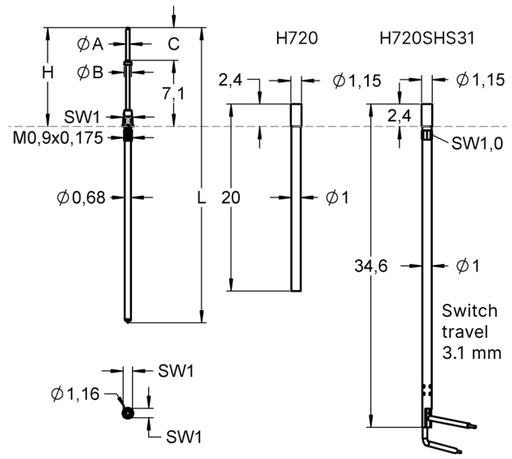
1027405	H720	Receptacle
1142394	H720SHS31	Receptacle
1003643	FEWZ-511E0	Insertion tool receptacle
1004895	FWZ730T	Screw-in tool probe <Ø0.9 mm

Drill size recommendation (mm)

1027405	H720	0.96 - 0.99
1142394	H720SHS31	1.04 - 1.07

Series drawing

All measurements are in mm.





The step probe F72012B0001G110SP can also be used to test the NANO MQS connector. By means of continuous plunger of the F720 and a second contact probe in the 2nd level, a switch function can be realized.

Order code	Product name	Tip Style	Ø A	Ø B	C	H	L	Thread [M]	FM Choice
1043616	F72012B0001G110SP	12 	0.4	0.8	3.5	10.6	31.4	M0.9x0.175	-



FM Choice

F176SP

4 A | 75 mil/1.90 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	4
R TYP [mOhm]	<20

Mechanical specifications

Preload [cN]	30
Spring force [cN] at nt ±20%	80
Nominal travel [mm]	2.4
Maximum travel [mm]	3.0

Materials and plating

Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Spring steel	silver plated
Receptacle	Brass	gold plated

Accessories

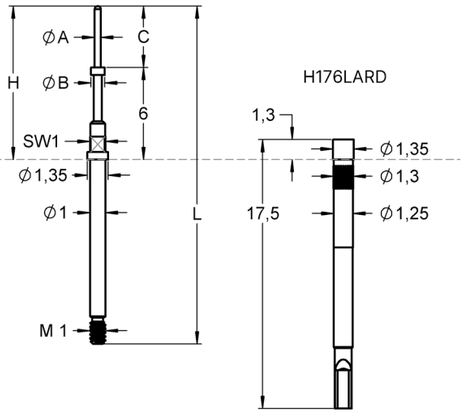
1000148	H176LARD	Receptacle
1014311	FEWZ-075E0	Insertion tool receptacle
1029809	FWZ730S1T	Screw-in tool probe <Ø1.5 mm

Drill size recommendation (mm)

1000148	H176LARD	1.25 - 1.27

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Ø A	Ø B	C	H	L	Thread [M]	FM Choice
1141025	F17611B0004G080SP	11 	0.4	0.9	2.0	8.0	20.0	M1	-
1041929	F17611B0003G080SP	11 	0.4	0.9	2.5	8.5	20.5	M1	-
1039205	F17611B0002G080SP	11 	0.4	0.9	3.0	9.0	21.0	M1	FM Choice
1031258	F17611B0001G080SP	11 	0.4	0.9	4.0	10.0	22.0	M1	FM Choice



FM Choice

F175SP

4 A | 75 mil/1.90 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	4
R TYP [mOhm]	<20

Mechanical specifications

Preload [cN]	43	50	70
Spring force [cN] at nt ±20%	60	100	150
Nominal travel [mm]	2.4	4.3	4.3
Maximum travel [mm]	3.0	6.4	6.4

Materials and plating

Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Spring steel	silver plated
Receptacle	Brass	gold plated

Accessories

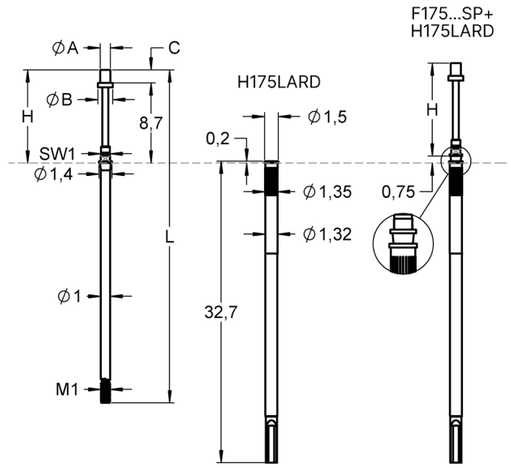
1009615	H175LARD	Receptacle
1014311	FEWZ-075E0	Insertion tool receptacle
1029809	FWZ730S1T	Screw-in tool probe <Ø1.5 mm

Drill size recommendation (mm)

1009615	H175LARD	1.32 - 1.34

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Ø A	Ø B	C	H	L	Thread [M]	FM Choice
1028054	F17511B0013G100SP	11	0.43	1.5	2.5	11.6	37.6	M1	-
1024234	F17511B0011G100SP	11	0.50	1.0	1.5	10.6	36.6	M1	-
1025045	F17511B0012G150SP	11	0.60	1.2	2.0	11.1	37.1	M1	-
1019059	F17511B0006G100SP	11	0.60	1.5	4.1	13.2	39.2	M1	FM Choice
1019061	F17511B0008G100SP	11	0.60	1.5	5.1	14.2	40.2	M1	FM Choice

See next page for further variants.

Order code	Product name	Tip Style	Ø A	Ø B	C	H	L	Thread [M]	FM Choice
1019081	F17511B0003G100SP	11	0.60	1.5	2.5	11.6	37.6	M1	FM Choice
1019058	F17511B0005G100SP	11	0.60	1.5	3.6	12.7	38.7	M1	FM Choice
1019060	F17511B0007G100SP	11	0.60	1.5	4.6	13.7	39.7	M1	FM Choice
1019074	F17511B0002G100SP	11	0.60	1.5	2.0	11.1	37.1	M1	FM Choice
1019082	F17511B0004G100SP	11	0.60	1.5	3.0	12.1	38.1	M1	FM Choice
1040641	F17511B0025G060SPS1	11	0.40	1.0	2.5	7.8	33.8	M1	-
1040642	F17511B0027G060SPS1	11	0.40	1.0	3.5	8.8	34.8	M1	-
1040643	F17511B0028G060SPS1	11	0.40	1.0	4.0	9.3	35.3	M1	-
1040371	F17511B0029G060SPS1	11	0.40	1.0	4.5	9.8	35.8	M1	-
1040644	F17511B0030G060SPS1	11	0.40	1.0	5.0	10.3	36.3	M1	-
1033276	F17512B0023G150SPS1	12	0.60	0.9	1.5	9.9	35.9	M1	-
1018407	F17516B0001G150SP	16	1.10	1.6	1.4	10.1	36.1	M1	-
1019088	F17516B0010G150SP	16	0.60	1.4	0.6	9.3	35.3	M1	-



FM Choice

F731SP

4 A | 94 mil/2.40 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	4
R TYP [mOhm]	<20

Mechanical specifications

Preload [cN]	50	50	50
Spring force [cN] at nt ±20%	100	150	300
Nominal travel [mm]	3.5	3.5	3.5
Maximum travel [mm]	4.4	4.4	4.4

Materials and plating

Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Spring steel	gold plated
Receptacle	Brass	gold plated

Accessories

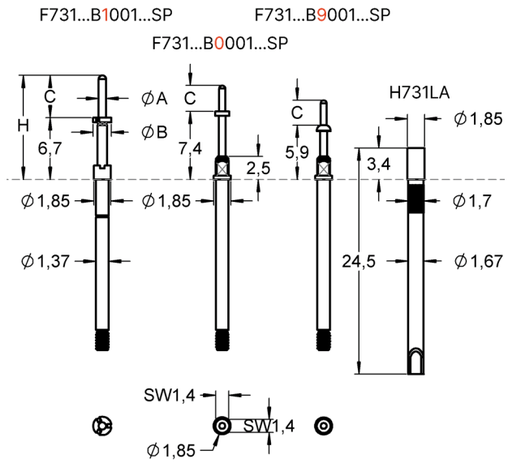
1001844	H731LA	Receptacle
1011671	H731LAST	Receptacle
1014264	FEWZ-100E0	Insertion tool receptacle
1029810	FWZ731T	Screw-in tool probe <Ø2.0 mm

Drill size recommendation (mm)

Receptacle with knurl	1.67 - 1.68

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Ø A	Ø B	C	H	L	Thread [M]	FM Choice
1032529	F73111B0029G100SP	11	0.60	1.5	2.5	9.9	28.4	M1.4	-
1032523	F73111B0030G100SP	11	0.60	1.5	3.0	10.4	28.9	M1.4	-
1032524	F73111B0031G100SP	11	0.60	1.5	3.5	10.9	29.4	M1.4	-
1032525	F73111B0032G100SP	11	0.60	1.5	4.0	11.4	29.9	M1.4	-
1032526	F73111B0033G100SP	11	0.60	1.5	4.5	11.9	30.4	M1.4	-
1032527	F73111B0034G100SP	11	0.60	1.5	5.0	12.4	30.9	M1.4	-
1008720	F73111B0004G150SP	11	0.65	1.4	5.5	12.9	31.4	M1.4	FM Choice
1013746	F73111B0006G300SP	11	0.65	1.5	2.1	9.5	28.0	M1.4	-
1012496	F73111B0012G300SP	11	0.65	1.5	2.5	9.9	28.4	M1.4	-
1005152	F73111B0002G150SP	11	0.65	1.5	2.8	10.2	28.7	M1.4	FM Choice
1000951	F73111B0017G300SP	11	0.65	1.5	3.0	10.4	28.9	M1.4	FM Choice
1021760	F73111B0007G080SP	11	0.65	1.5	3.4	10.8	29.3	M1.4	-
1009912	F73111B0007G150SP	11	0.65	1.5	3.4	10.8	29.3	M1.4	FM Choice
1013709	F73111B0007G300SP	11	0.65	1.5	3.4	10.8	29.3	M1.4	FM Choice
1005151	F73111B0001G150SP	11	0.65	1.5	4.0	11.4	29.9	M1.4	FM Choice
1014639	F73111B0001G300SP	11	0.65	1.5	4.0	11.4	29.9	M1.4	-
1000957	F73111B0015G300SP	11	0.65	1.5	4.5	11.9	30.4	M1.4	FM Choice
1024832	F73111B0015G150SP	11	0.65	1.5	4.5	11.9	30.4	M1.4	FM Choice
1000954	F73111B0016G300SP	11	0.65	1.5	5.0	12.4	30.9	M1.4	-
1081808	F73111B0016G150SP	11	0.65	1.5	5.0	12.4	30.9	M1.4	-
1011579	F73111B0010G150SP	11	0.70	1.5	3.5	10.9	29.4	M1.4	-
1007777	F73111B0003G150SP	11	0.70	1.5	4.0	11.4	29.9	M1.4	FM Choice
1010716	F73111B1009G150SP	11	0.80	2.0	4.6	11.3	29.8	M1.4	-
1021523	F73112B0019G150SP	12	0.65	1.4	4.2	11.6	30.1	M1.4	-
1010720	F73112B9008G110SP	12	0.65	1.5	2.7	8.6	27.1	M1.4	-
1010718	F73112B9007G110SP	12	0.65	1.5	3.4	9.3	27.8	M1.4	FM Choice
1008862	F73116B0006G150SP	16	0.65	1.5	2.1	9.5	28.0	M1.4	-



FM Choice

F732SP

5 A | 100 mil/2.54 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	5
R TYP [mOhm]	<25

Mechanical specifications

Preload [cN]	60	60
Spring force [cN] at nt ±20%	150	300
Nominal travel [mm]	4.0	4.0
Maximum travel [mm]	5.0	5.0

Materials and plating

Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Spring steel	silver plated
Receptacle	Brass	gold plated

Accessories

Further receptacles H732 see page 101.

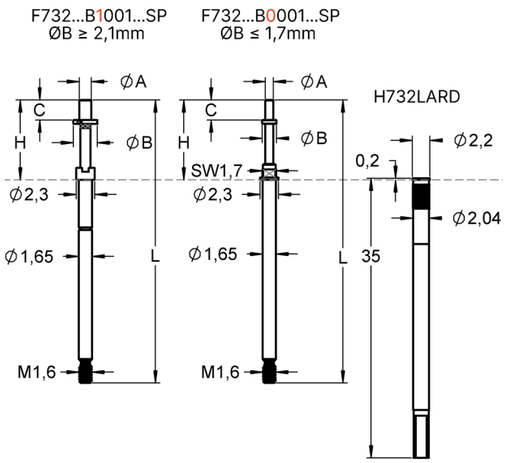
1005355	H732LARD	Receptacle
1003640	FEWZ-772E0	Insertion tool receptacle
1029811	FWZ732SP1T	Screw-in tool probe <Ø6.0
1029812	FWZ732S1T	Screw-in tool probe <Ø2.7 mm
1004610	FWZ732T	Screw-in tool probe <Ø2.0 mm

Drill size recommendation (mm)

Receptacle without knurl	1.98 - 1.99
Receptacle with knurl	2.00 - 2.02

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Ø A	Ø B	C	H	L	Thread [M]	FM Choice
1006902	F73211B0045G150SP	11	0.64	1.5	3.0	10.5	35.9	M1.6	FM Choice
1007336	F73211B0048G150SP	11	0.65	1.0	3.0	10.5	35.9	M1.6	-
1005697	F73211B0029G150SP	11	0.65	1.5	2.7	10.2	35.6	M1.6	FM Choice
1005484	F73211B0024G150SP	11	0.65	1.5	4.3	11.8	37.2	M1.6	FM Choice
1005267	F73211B0018G150SP	11	0.65	1.5	5.0	12.5	37.9	M1.6	FM Choice
1008914	F73211B1041G150SP	11	0.65	2.1	2.5	10.0	35.4	M1.6	FM Choice
1009066	F73211B1054G150SP	11	0.65	2.1	3.0	10.5	35.9	M1.6	FM Choice
1008897	F73211B1051G150SP	11	0.65	2.1	3.4	10.9	36.3	M1.6	FM Choice
1008925	F73211B1042G150SP	11	0.65	2.1	3.6	11.1	36.5	M1.6	FM Choice
1025276	F73211B1092G150SP	11	0.65	2.1	4.0	11.5	36.9	M1.6	FM Choice
1006400	F73211B1005G150SP	11	0.65	3.0	3.4	10.9	36.3	M1.6	FM Choice
1040584	F73211B0093G150SP	11	0.75	2.0	5.5	13.0	38.4	M1.6	-
1005769	F73211B0030G150SP	11	0.8	1.4	5.3	12.8	38.2	M1.6	-
1000933	F73211B0082G300SP	11	0.8	1.8	2.5	10.0	35.4	M1.6	-
1000934	F73211B0083G300SP	11	0.8	1.8	2.5	10.0	35.4	M1.6	-
1033195	F73211B0084G150SP	11	0.8	1.8	3.5	11.0	36.4	M1.6	-
1000935	F73211B0084G300SP	11	0.8	1.8	3.5	11.0	36.4	M1.6	FM Choice
1000936	F73211B0036G300SP	11	0.8	1.8	4.0	11.5	36.9	M1.6	-
1000937	F73211B0085G300SP	11	0.8	1.8	4.5	12.0	37.4	M1.6	-
1000938	F73211B0086G300SP	11	0.8	1.8	4.5	12.0	34.4	M1.6	-
1008474	F73211B1037G150SP	11	0.8	2.1	2.8	10.3	35.7	M1.6	-
1008473	F73211B1036G150SP	11	0.8	2.1	4.0	11.5	36.9	M1.6	FM Choice
1006398	F73211B1007G150SP	11	0.8	2.3	3.2	10.7	36.1	M1.6	-
1009917	F73211B1058G150SP	11	0.8	2.5	3.4	10.9	36.3	M1.6	-
1006399	F73211B1006G150SP	11	0.8	2.5	4.0	11.5	36.9	M1.6	FM Choice
1006401	F73211B1004G150SP	11	0.8	2.5	4.6	12.1	37.5	M1.6	-
1006397	F73211B1008G150SP	11	0.8	2.8	5.3	12.8	38.2	M1.6	FM Choice
1011016	F73211B1063G300SP	11	1.0	2.1	1.3	8.8	34.2	M1.6	-
1008924	F73211B1038G150SP	11	1.0	2.1	2.0	9.5	34.9	M1.6	FM Choice
1008946	F73211B1050G150SP	11	1.0	2.1	2.6	10.1	35.5	M1.6	-
1008944	F73211B1045G150SP	11	1.0	2.1	4.2	11.7	37.1	M1.6	FM Choice
1008945	F73211B1047G150SP	11	1.0	2.1	4.9	12.4	37.8	M1.6	-
1009694	F73211B1056G150SP	11	1.0	2.3	2.6	10.1	35.5	M1.6	-
1006402	F73211B1003G150SP	11	1.0	2.5	2.6	10.1	35.5	M1.6	-
1009084	F73211B1013G150SP	11	1.0	2.5	3.5	11.0	36.4	M1.6	-
1014032	F73211B0073G150SP	11	0.65	1.5	4.0	11.5	36.9	M1.6	FM Choice
1010775	F73211B0053G150SP	11	0.65	1.7	3.6	11.1	36.5	M1.6	FM Choice
1010711	F73211B0052G150SP	11	0.65	1.7	4.7	12.2	37.6	M1.6	FM Choice
1005266	F73212B0017G150SP	12	0.65	1.5	2.7	10.3	35.7	M1.6	FM Choice

See next page for further variants.

Order code	Product name	Tip Style	Ø A	Ø B	C	H	L	Thread [M]	FM Choice
1030627	F73216B0099G300SP	16	0.70	1.8	1.50	9.0	34.4	M1.6	-
1032314	F73216B0043G300SP	16	0.70	1.8	2.0	9.5	34.9	M1.6	-
1030599	F73216B0093G300SP	16	0.70	1.8	2.5	10.0	35.4	M1.6	-
1030613	F73216B0094G300SP	16	0.70	1.8	3.0	10.5	35.9	M1.6	-
1030612	F73216B0095G300SP	16	0.70	1.8	3.5	11.0	36.4	M1.6	-
1030616	F73216B0096G300SP	16	0.70	1.8	4.0	11.5	36.9	M1.6	-
1008399	F73216B1033G150SP	16	0.70	2.1	1.5	9.0	34.4	M1.6	-
1013044	F73216B1070G150SP	16	0.70	2.1	1.7	9.2	34.6	M1.6	-
1008937	F73216B1043G150SP	16	0.70	2.1	2.0	9.5	34.9	M1.6	FM Choice
1008899	F73216B1052G150SP	16	0.80	2.1	3.2	10.7	36.1	M1.6	FM Choice
1009918	F73216B1059G150SP	16	0.80	2.5	2.5	10.0	35.4	M1.6	FM Choice
1000992	F73216B0076G300SP	16	1.00	1.8	2.0	9.5	34.9	M1.6	FM Choice
1000998	F73216B0027G300SP	16	1.00	1.8	2.5	10.0	35.4	M1.6	-
1000999	F73216B0041G300SP	16	1.00	1.8	3.0	10.5	35.9	M1.6	-
1001000	F73216B0077G300SP	16	1.00	1.8	3.5	11.0	36.4	M1.6	-
1000824	F73216B0074G300SP	16	1.00	1.8	4.0	11.5	36.9	M1.6	-
1008507	F73216B1038G150SP	16	1.00	2.1	2.0	9.5	34.9	M1.6	FM Choice
1008940	F73216B1046G150SP	16	1.00	2.1	2.5	10.0	35.4	M1.6	-
1006280	F73216B1012G150SP	16	1.00	2.3	3.3	10.8	36.2	M1.6	-
1004115	F73216B1029G150SP	16	1.00	2.5	1.7	9.7	35.1	M1.6	-
1006975	F73216B1027G150SP	16	1.00	2.5	1.8	9.8	35.2	M1.6	-
1006391	F73216B1010G150SP	16	1.00	2.5	2.0	10.0	35.4	M1.6	FM Choice
1006279	F73216B1013G150SP	16	1.00	2.5	3.5	11.0	36.4	M1.6	-
1009031	F73216B1049G150SP	16	1.20	2.1	2.0	9.5	34.9	M1.6	-
1007054	F73216B1030G150SP	16	1.20	2.5	1.2	8.7	34.1	M1.6	-
1006996	F73216B1028G150SP	16	1.30	2.5	2.1	9.6	35.0	M1.6	-
1006396	F73216B1009G150SP	16	1.30	2.5	3.0	10.5	35.9	M1.6	-
1029785	F73216B1092G150SP	16	1.50	2.6	2.5	10.0	35.4	M1.6	-
1009916	F73216B1057G150SP	16	1.50	3.0	2.3	9.8	35.2	M1.6	-
1006278	F73216B1014G150SP	16	1.50	3.0	2.5	10.0	35.4	M1.6	FM Choice
1012678	F73216B1014G300SP	16	1.50	3.0	2.5	10.0	35.4	M1.6	-
1006277	F73216B1015G150SP	16	1.50	3.5	2.0	9.5	34.9	M1.6	FM Choice
1018463	F73216B1064G300SP1	16	2.00	4.0	2.0	9.5	34.9	M1.6	-
1011268	F73216B1066G300SP1	16	2.00	4.0	2.3	9.8	35.2	M1.6	-



FM Choice

F756SP

5 A | 100 mil/2.54 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	5
R TYP [mOhm]	<25

Mechanical specifications

Preload [cN]	60
Spring force [cN] at nt ±20%	150
Nominal travel [mm]	4.0
Maximum travel [mm]	4.4

Materials and plating

Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Spring steel	silver plated
Receptacle	Brass	gold plated

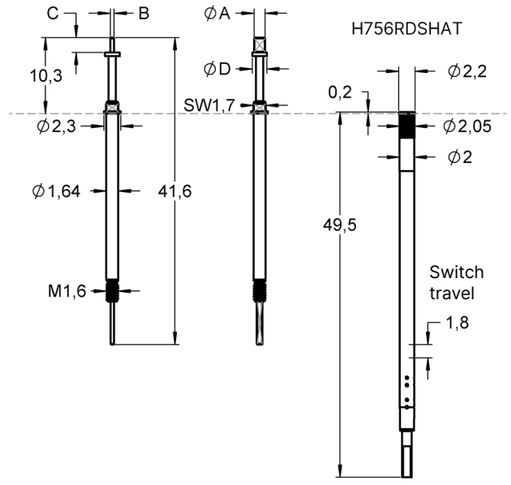
Accessories

Further receptacles H756 see page 107.

1003611	FAWZ756	Insertion tool receptacle
1140764	FWZ756T	Screw-in tool probe <Ø2.0 mm

Series drawing

All measurements are in mm.



Drill size recommendation (mm)

Receptacle without knurl	1.98 - 1.99
Receptacle with knurl	2.00 - 2.02

Order code	Product name	Tip Style	Ø A	B	C	Ø D	H	Thread [M]	FM Choice
1038241	F75689B0007G150SP	89	1.0	0.5	1.5	1.8	10.3	M1.6	-
1038991	F75689B0008G150SP	89	1.5	0.3	2.0	2.0	10.3	M1.6	FM Choice
1031685	F75689B0006G150SP	89	1.5	0.5	1.2	2.0	10.3	M1.6	-
1056590	F75689B0009G150SP	89	1.5	0.5	1.4	2.0	10.3	M1.6	-
1031662	F75689B0004G150SP	89	1.5	0.5	1.5	2.0	10.3	M1.6	FM Choice
1031659	F75689B0001G150SP	89	1.5	0.5	1.5	2.7	10.3	M1.6	-
1031661	F75689B0003G150SP	89	1.5	0.5	2.0	2.0	10.3	M1.6	FM Choice
1031663	F75689B0005G150SP	89	1.5	0.5	2.5	2.0	10.3	M1.6	FM Choice



FM Choice

F733SP

10 A | 157 mil/4.00 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	10
R TYP [mOhm]	<15

Mechanical specifications

Preload [cN]	50	80
Spring force [cN] at nt ±20%	150	300
Nominal travel [mm]	4.0	4.0
Maximum travel [mm]	5.0	5.0

Materials and plating

Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Stainless steel	unplated
Receptacle	Brass	gold plated

Accessories

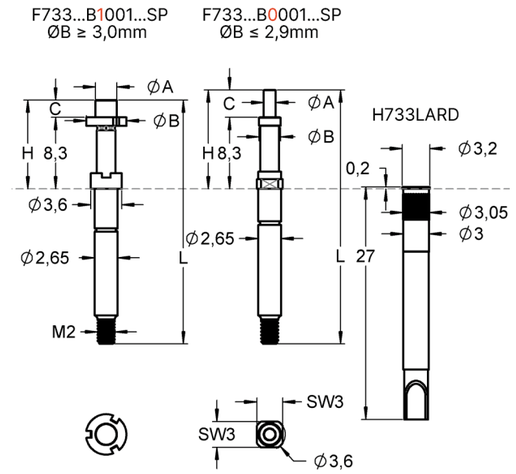
1003077	H733LAS1	Receptacle
1005514	H733LARD	Receptacle
1022713	H733LARDS1	Receptacle
1003642	FEWZ-774E0	Insertion tool receptacle
1029813	FWZ733S1T	Screw-in tool probe <Ø3 mm
1004611	FWZ733T	Screw-in tool probe <Ø4 mm

Drill size recommendation (mm)

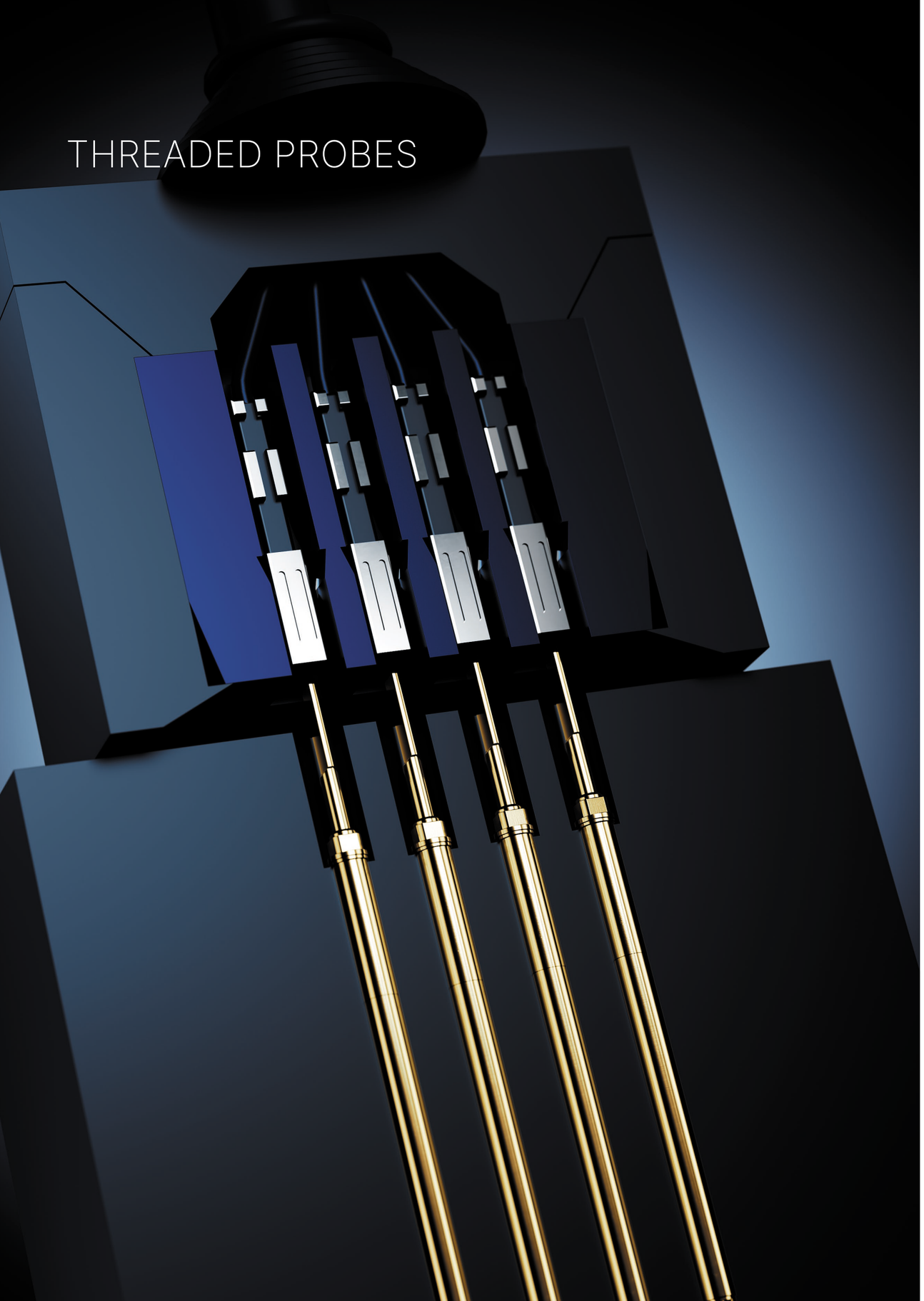
Receptacle without knurl	2.98 - 2.99
Receptacle with knurl	3.00 - 3.02

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Ø A	Ø B	C	H	L	Thread [M]	FM Choice
1008982	F73311B1028G150SP1	11	1.4	3.5	4.0	12.3	30.3	M2	-
1006289	F73316B1005G150SP	16	1.3	4.7	2.7	11.0	29.0	M2	FM Choice
1009005	F73316B1031G150SP1	16	1.4	3.5	1.7	10.0	28.0	M2	-
1007154	F73316B1016G150SP1	16	1.4	3.5	2.0	10.3	28.3	M2	-
1009021	F73316B1027G150SP1	16	1.4	3.5	2.4	10.7	28.7	M2	-
1009010	F73316B1032G150SP1	16	1.4	3.5	3.0	11.3	29.3	M2	FM Choice
1000945	F73316B0060G300SP	16	1.5	3.0	1.5	9.8	27.8	M2	FM Choice
1000947	F73316B0061G300SP	16	1.5	3.0	2.0	10.3	28.3	M2	FM Choice
1000969	F73316B0062G300SP	16	1.5	3.0	2.5	10.8	28.8	M2	-
1000970	F73316B0063G300SP	16	1.5	3.0	3.0	11.3	29.3	M2	-
1000971	F73316B0064G300SP	16	1.5	3.0	3.5	11.8	29.8	M2	FM Choice
1000973	F73316B0066G300SP	16	1.5	3.0	4.5	12.8	30.8	M2	-
1000974	F73316B0067G300SP	16	1.5	3.0	5.0	13.3	31.3	M2	FM Choice
1009014	F73316B1036G150SP1	16	1.8	3.5	1.6	9.9	27.9	M2	-
1007136	F73316B1015G150SP1	16	1.8	3.5	2.2	10.5	28.5	M2	FM Choice
1000880	F73316B1074G300SP1	16	2.0	4.0	1.5	9.8	27.8	M2	-
1000881	F73316B1075G300SP1	16	2.0	4.0	2.0	10.3	28.3	M2	-
1000882	F73316B1076G300SP1	16	2.0	4.0	2.5	10.8	28.8	M2	-
1009526	F73316B1043G150SP1	16	2.2	3.5	2.0	10.3	28.3	M2	-



NUMBER CODE SYSTEM

Explanation of our product names

In order to show how our material description is built, the current valid number code system is explained below:

Type / Series		Material Plunger		Plating Plunger		Special version
F732	06	B	250	G	300	IK04
	Tip style		Diameter Plunger		Spring force [cN]	

Material Plunger

B = BeCu (Beryllium Copper)
M = Brass
S = Steel
P = Palladium alloy

Plating Plunger

G = Gold plating
L = Longtime gold plating
N = Nickel plating
U = Unplated
R = Rhodium plating
S = Silver plating

Diameter

250 = 2.50 mm

Spring force

300 = 300 cN

Special Version

L = Long version
S = Short version
H = High temperature version
HP = Progressive series
IK04 = Insulation cap 0.4 mm distance
S1 = Deviation from the standard



FM Choice

F730

3 A | 50 mil/1.27 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+100°		
Current [A]	3		
R TYP [mOhm]	<50		

Mechanical specifications

Preload [cN]	30	50	55
Spring force [cN] at nt ±20%	50	100	110
Nominal travel [mm]	4.0	3.0	4.0
Maximum travel [mm]	5.0	4.5	5.0

Materials and plating

Plunger	BeCu	gold plated
	BeCu	rhodium plated
	Steel	longtime gold plated
Barrel	Brass	gold plated
Spring	Spring steel	gold plated
Receptacle	Brass	gold plated

Accessories

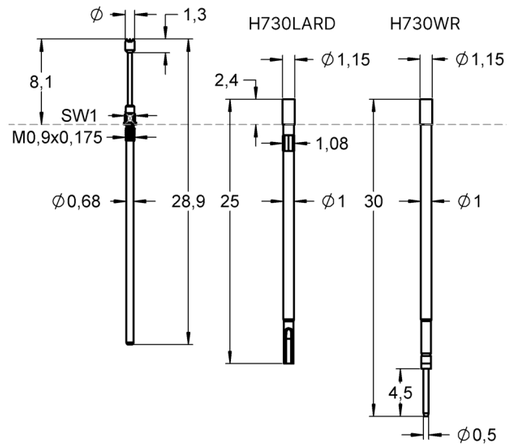
1003227	H730LA	Receptacle
1109766	H730LARD	Receptacle
1030396	H730WR	Receptacle
1000180	FEWZ-040E0	Insertion tool receptacle
1004895	FWZ730T	Screw-in tool probe <Ø0.9 mm

Drill size recommendation (mm)

Receptacle without knurl	0.96 - 0.99
Receptacle with knurl	1.04 - 1.07

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1037948	F73005B080G100HS1	05	0.80	B / G	100	M0.9x0.175	HS1	FM Choice
1030988	F73006B090G050	06	0.90	B / G	50	M0.9x0.175	-	-
1003222	F73006B090G110	06	0.90	B / G	110	M0.9x0.175	-	FM Choice
1000860	F73006B120R110	06	1.20	B / R	110	M0.9x0.175	-	-
1030587	F73011B040G110	11	0.40	B / G	110	M0.9x0.175	-	FM Choice
1011909	F73011B040G110S1	11	0.40	B / G	110	M0.9x0.175	S1	FM Choice
1003223	F73012B064G110	12	0.64	B / G	110	M0.9x0.175	-	-
1020310	F73012B075G110	12	0.75	B / G	110	M0.9x0.175	-	-
1041021	F73016B040G050	16	0.40	B / G	50	M0.9x0.175	-	-
1016689	F73016B040G110	16	0.40	B / G	110	M0.9x0.175	-	FM Choice
1007624	F73017B064G110	17	0.64	B / G	110	M0.9x0.175	-	-
1003224	F73018B040G110	18	0.40	B / G	110	M0.9x0.175	-	FM Choice
1003417	F73018S040L110	18	0.40	S / L	110	M0.9x0.175	-	-



F720

3 A | 50 mil/1.27 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	3
R TYP [mOhm]	<50

Mechanical specifications

Preload [cN]	22	50
Spring force [cN] at nt ±20%	40	110
Nominal travel [mm]	4.0	4.0
Maximum travel [mm]	4.8	4.8

Materials and plating

Plunger	BeCu	gold plated
Barrel	Bronze	gold plated
Spring	Spring steel	gold plated
Receptacle	Brass	gold plated

Accessories

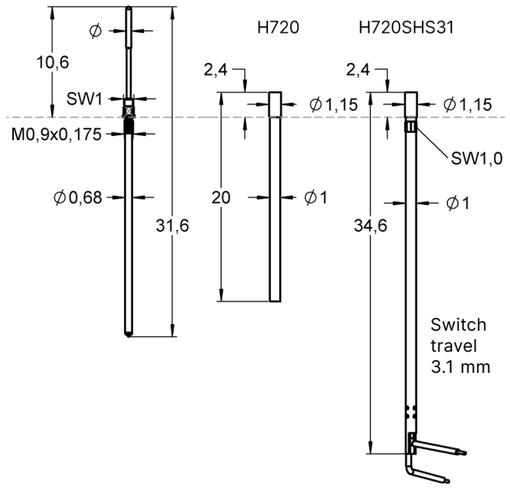
1027405	H720	Receptacle
1142394	H720SHS31	Receptacle
1003643	FEWZ-511E0	Insertion tool receptacle
1004895	FWZ730T	Screw-in tool probe <Ø0.9 mm

Drill size recommendation (mm)

1027405	H720	0.96 - 0.99
1142394	H720SHS31	1.04 - 1.07

Series drawing

All measurements are in mm.



The H720SHS31 receptacle is available with flexible wire (AWG30 length 1000 mm).

Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1137712	F72011B050G040	11	0.5	B / G	40	M0.9x0.175	-	-
1054915	F72011B050G110	11	0.5	B / G	110	M0.9x0.175	-	-



F176

4 A | 75 mil/1.90 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	4
R TYP [mOhm]	<20

Mechanical specifications

Preload [cN]	30	85
Spring force [cN] at nt ±20%	80	150
Nominal travel [mm]	2.4	2.4
Maximum travel [mm]	3.0	3.0

Materials and plating

Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Spring steel	silver plated
Receptacle	Brass	gold plated

Accessories

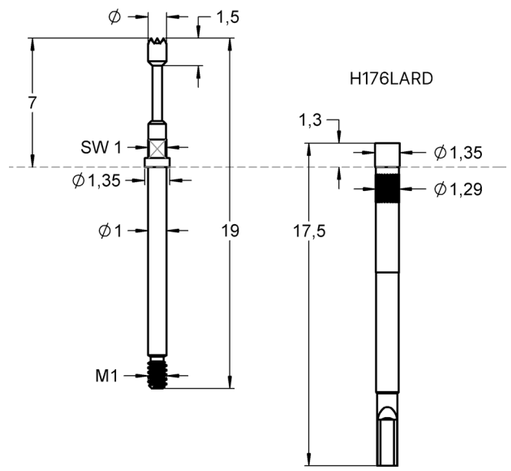
1000148	H176LARD	Receptacle
1014311	FEWZ-075E0	Insertion tool receptacle
1029809	FWZ730S1T	Screw-in tool probe <Ø1.5 mm

Drill size recommendation (mm)

1000148	H176LARD	1.25 - 1.27

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1000070	F17606B100G080	06	1.00	B / G	80	M1	-	FM Choice
1024806	F17606B100G150	06	1.00	B / G	150	M1	-	FM Choice
1000071	F17611B040G080	11	0.40	B / G	80	M1	-	-
1000948	F17611B040G150S1	11	0.40	B / G	150	M1	S1	FM Choice
1000072	F17611B050G080	11	0.50	B / G	80	M1	-	FM Choice
1000073	F17612B065G080	12	0.65	B / G	80	M1	-	FM Choice
1138559	F17612B100G150	12	1.00	B / G	150	M1	-	-
1000074	F17617B100G080	17	1.00	B / G	80	M1	-	-
1128680	F17617B100G150	17	1.00	B / G	150	M1	-	-
1000069	F17618B045G080	18	0.45	B / G	80	M1	-	-
1033147	F17655B100G080	55	1.00	B / G	80	M1	-	-



FM Choice

F175

4 A | 75 mil/1.90 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	4
R TYP [mOhm]	<20

Mechanical specifications

Preload [cN]	50	70	110
Spring force [cN] at nt ±20%	100	150	280
Nominal travel [mm]	4.3	4.3	4.3
Maximum travel [mm]	6.4	6.4	6.4

Materials and plating

Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Spring steel	silver plated
Receptacle	Brass	gold plated

Accessories

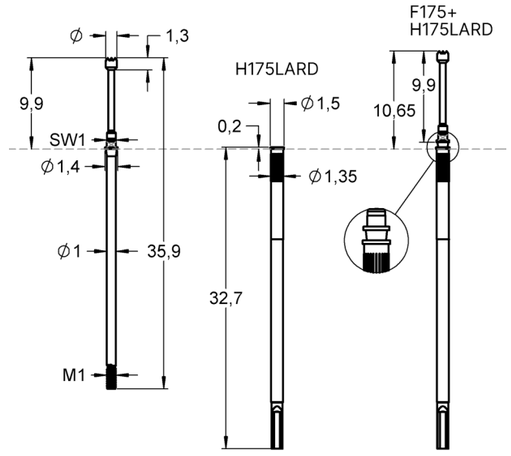
1009615	H175LARD	Receptacle
1014311	FEWZ-075E0	Insertion tool receptacle
1029809	FWZ730S1T	Screw-in tool probe <Ø1.5 mm

Drill size recommendation (mm)

1009615	H175LARD	1.32 - 1.34

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1017324	F17505B120G150	05	1.20	B / G	150	M1	-	FM Choice
1021022	F17506B100G150	06	1.00	B / G	150	M1	-	FM Choice
1020971	F17506B120G100	06	1.20	B / G	100	M1	-	-
1017325	F17506B120G150	06	1.20	B / G	150	M1	-	FM Choice
1024537	F17511B050G100	11	0.50	B / G	100	M1	-	-
1017290	F17511B050G150	11	0.50	B / G	150	M1	-	FM Choice
1014835	F17511B050G280	11	0.50	B / G	280	M1	-	-
1017278	F17511B064G100	11	0.64	B / G	100	M1	-	FM Choice
1017291	F17511B064G150	11	0.64	B / G	150	M1	-	FM Choice
1017292	F17512B078G150	12	0.78	B / G	150	M1	-	-
1017293	F17517B120G150	17	1.20	B / G	150	M1	-	-
1017294	F17518B064G150	18	0.64	B / G	150	M1	-	-
1017295	F17518B078G150	18	0.78	B / G	150	M1	-	-



FM Choice

F731

4 A | 94 mil/2.40 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	4
R TYP [mOhm]	<20

Mechanical specifications

Preload [cN]	50	50	50
Spring force [cN] at nt ±20%	100	150	300
Nominal travel [mm]	3.5	3.5	3.5
Maximum travel [mm]	4.4	4.4	4.4

Materials and plating

Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Spring steel	silver plated
Receptacle	Brass	gold plated

Accessories

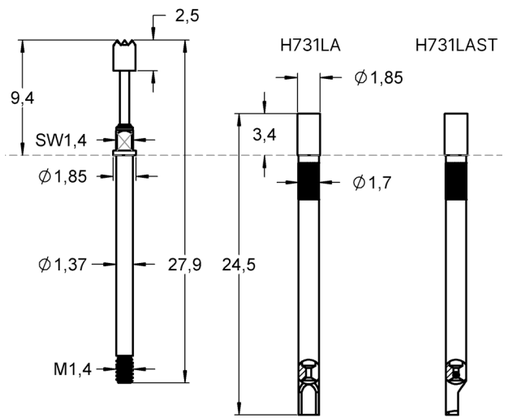
1001844	H731LA	Receptacle
1011671	H731LAST	Receptacle
1014264	FEWZ-100E0	Insertion tool receptacle
1004609	FWZ731T	Screw-in tool probe <Ø2.0 mm
1029810	FWZ731S1T	Screw-in tool probe <Ø1.3 mm

Drill size recommendation (mm)

Receptacle with knurl	1.67 - 1.68

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1007201	F73105B180G150	05	1.80	B / G	150	M1.4	-	FM Choice
1004714	F73106B100G150	06	1.00	B / G	150	M1.4	-	FM Choice
1004997	F73106B100G300	06	1.00	B / G	300	M1.4	-	-
1001416	F73106B130G100	06	1.30	B / G	100	M1.4	-	-
1001417	F73106B130G150	06	1.30	B / G	150	M1.4	-	FM Choice
1001419	F73106B130G300	06	1.30	B / G	300	M1.4	-	FM Choice
1001420	F73106B180G100	06	1.80	B / G	100	M1.4	-	-
1001421	F73106B180G150	06	1.80	B / G	150	M1.4	-	FM Choice
1001423	F73106B180G300	06	1.80	B / G	300	M1.4	-	-
1008893	F73111B050G150	11	0.50	B / G	150	M1.4	-	-
1025992	F73111B060G100	11	0.60	B / G	100	M1.4	-	-
1025392	F73111B061G100LS1	11	0.61	B / G	100	M1.4	LS1	FM Choice
1006681	F73111B061G100S1	11	0.61	B / G	100	M1.4	S1	FM Choice
1001424	F73111B065G100	11	0.65	B / G	100	M1.4	-	FM Choice
1001425	F73111B065G150	11	0.65	B / G	150	M1.4	-	FM Choice
1002730	F73111B065G150S1	11	0.65	B / G	150	M1.4	S1	FM Choice
1001427	F73111B065G300	11	0.65	B / G	300	M1.4	-	FM Choice
1001428	F73111B075G100	11	0.75	B / G	100	M1.4	-	-
1024993	F73111B075G100L	11	0.75	B / G	100	M1.4	L	-
1001429	F73111B075G150	11	0.75	B / G	150	M1.4	-	FM Choice
1001431	F73111B075G300	11	0.75	B / G	300	M1.4	-	FM Choice
1002940	F73111B075G300L	11	0.75	B / G	300	M1.4	L	FM Choice
1010893	F73116B075G150	16	0.75	B / G	150	M1.4	-	FM Choice
1004971	F73117B150G150	17	1.50	B / G	150	M1.4	-	FM Choice
1011455	F73118B075G150	18	0.75	B / G	150	M1.4	-	-



F722

5 A | 100 mil/2.54 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	5
R TYP [mOhm]	<25

Mechanical specifications

Preload [cN]	40
Spring force [cN] at nt ±20%	100
Nominal travel [mm]	1.5
Maximum travel [mm]	2.2

Materials and plating

Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Spring steel	silver plated
Receptacle	Brass	gold plated

Accessories

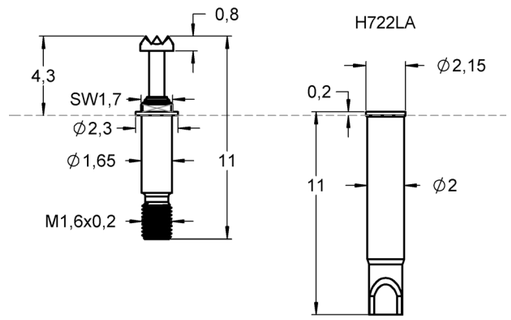
1005355	H722LA	Receptacle
1014264	FEWZ-100E0	Insertion tool receptacle
1004610	FWZ732T	Screw-in tool probe <Ø2.0 mm

Drill size recommendation (mm)

1006777	H722LA	1.99 - 2.00

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1014956	F72205B180G100	05	1.80	B / G	100	M1.6x0.2	-	-
1035121	F72206B100G100	06	1.00	B / G	100	M1.6x0.2	-	-
1006775	F72206B180G100	06	1.80	B / G	100	M1.6x0.2	-	-
1007927	F72211B064G100	11	0.64	B / G	100	M1.6x0.2	-	-
1006789	F72211B085G100	11	0.85	B / G	100	M1.6x0.2	-	-
1006945	F72217B180G100	17	1.80	B / G	100	M1.6x0.2	-	-



FM Choice

F724

5 A | 100 mil/2.54 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	5
R TYP [mOhm]	<25

Mechanical specifications

Preload [cN]	50
Spring force [cN] at nt ±20%	150
Nominal travel [mm]	1.5
Maximum travel [mm]	2.2

Materials and plating

Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Spring steel	gold plated
Receptacle	Brass	gold plated

Accessories

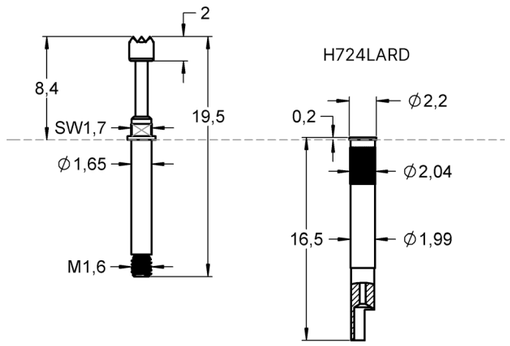
1041908	H724LARD	Receptacle
1014264	FEWZ-100E0	Insertion tool receptacle
1004610	FWZ732T	Screw-in tool probe <Ø2.0 mm

Drill size recommendation (mm)

1041908	H724LARD	2.00 - 2.02

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1051111	F72406B200G150	06	2.00	B / G	150	M1.6	-	FM Choice



FM Choice

F732

5 A | 100 mil/2.54 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+100°		
Current [A]	5		
R TYP [mOhm]	<25		

Mechanical specifications

Preload [cN]	50	60	60
Spring force [cN] at nt ±20%	100	150	300
Nominal travel [mm]	4.0	4.0	4.0
Maximum travel [mm]	5.0	5.0	5.0

Materials and plating

Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Spring steel	silver plated
Receptacle	Brass	gold plated

Accessories

Further receptacles H732 see page 101.

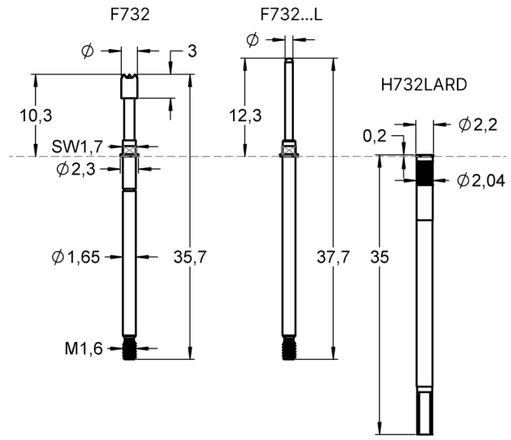
1005355	H732LARD	Receptacle
1003640	FEWZ-772E0	Insertion tool receptacle
1029812	FWZ732S1T	Screw-in tool probe <Ø2.7 mm
1004610	FWZ732T	Screw-in tool probe <Ø2.0 mm

Drill size recommendation (mm)

1005355	H732LARD	2.00 - 2.02

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1025044	F73205B180G080	05	1.80	B / G	80	M1.6	-	-
1007508	F73205B180G150	05	1.80	B / G	150	M1.6	-	FM Choice
1001434	F73205B200G150	05	2.00	B / G	150	M1.6	-	-

Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1004798	F73206B130G150	06	1.30	B / G	150	M1.6	-	FM Choice
1005561	F73206B130G300	06	1.30	B / G	300	M1.6	-	FM Choice
1009585	F73206B140G150	06	1.40	B / G	150	M1.6	-	-
1003342	F73206B150G150	06	1.50	B / G	150	M1.6	-	FM Choice
1001437	F73206B150G300	06	1.50	B / G	300	M1.6	-	FM Choice
1001438	F73206B180G150	06	1.80	B / G	150	M1.6	-	FM Choice
1001440	F73206B180G300	06	1.80	B / G	300	M1.6	-	FM Choice
1001442	F73206B200G150	06	2.00	B / G	150	M1.6	-	FM Choice
1001444	F73206B200G300	06	2.00	B / G	300	M1.6	-	FM Choice
1001445	F73206B200G300H	06	2.00	B / G	300	M1.6	H	-
1001446	F73206B250G150	06	2.50	B / G	150	M1.6	-	FM Choice
1001448	F73206B250G300	06	2.50	B / G	300	M1.6	-	FM Choice
1142337	F73211B060G100E14S1	11	0.60	B / G	100	M1.6	E14S1	-
1001455	F73211B064G150	11	0.64	B / G	150	M1.6	-	FM Choice
1017901	F73211B064G150S6	11	0.64	B / G	150	M1.6	S6	-
1001457	F73211B064G300	11	0.64	B / G	300	M1.6	-	FM Choice
1019874	F73211B070G150S1	11	0.70	B / G	150	M1.6	S1	FM Choice
1026897	F73211B080G100	11	0.80	B / G	100	M1.6	-	-
1001458	F73211B080G150	11	0.80	B / G	150	M1.6	-	FM Choice
1001459	F73211B080G300	11	0.80	B / G	300	M1.6	-	-
1014208	F73211B080G300S1	11	0.80	B / G	300	M1.6	S1	-
1024992	F73211B100G100L	11	1.00	B / G	100	M1.6	L	-
1001460	F73211B100G150	11	1.00	B / G	150	M1.6	-	FM Choice
1008263	F73211B100G150L	11	1.00	B / G	150	M1.6	L	-
1001465	F73211B100G300	11	1.00	B / G	300	M1.6	-	FM Choice
1004483	F73211B100G300L	11	1.00	B / G	300	M1.6	L	-
1001466	F73211B130G150	11	1.30	B / G	150	M1.6	-	FM Choice
1006709	F73212B140G150	12	1.40	B / G	150	M1.6	-	FM Choice
1006926	F73212B160G150	12	1.60	B / G	150	M1.6	-	FM Choice
1003184	F73212B180G150	12	1.80	B / G	150	M1.6	-	-
1001469	F73212B200G150	12	2.00	B / G	150	M1.6	-	-

See next page for further variants.

Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1024987	F73216B064G100	16	0.64	B / G	100	M1.6	-	-
1005107	F73216B064G150	16	0.64	B / G	150	M1.6	-	-
1005108	F73216B064G300	16	0.64	B / G	300	M1.6	-	-
1004420	F73216B080G150	16	0.80	B / G	150	M1.6	-	FM Choice
1001461	F73216B100G150	16	1.00	B / G	150	M1.6	-	FM Choice
1001462	F73216B100G300	16	1.00	B / G	300	M1.6	-	-
1001463	F73217B150G150	17	1.50	B / G	150	M1.6	-	FM Choice
1003256	F73217B200G150	17	2.00	B / G	150	M1.6	-	-
1003757	F73217B200G300	17	2.00	B / G	300	M1.6	-	FM Choice
1001632	F73218B130G150	18	1.30	B / G	150	M1.6	-	-
1001633	F73218B130G300	18	1.30	B / G	300	M1.6	-	-



FM Choice

H732

100 mil/2.54 mm | Receptacles

Materials and plating

H732...	Brass	gold plated
H875IS	Synthetic	unplated

Accessories

1003640	FEWZ-772E0	Insertion tool receptacle

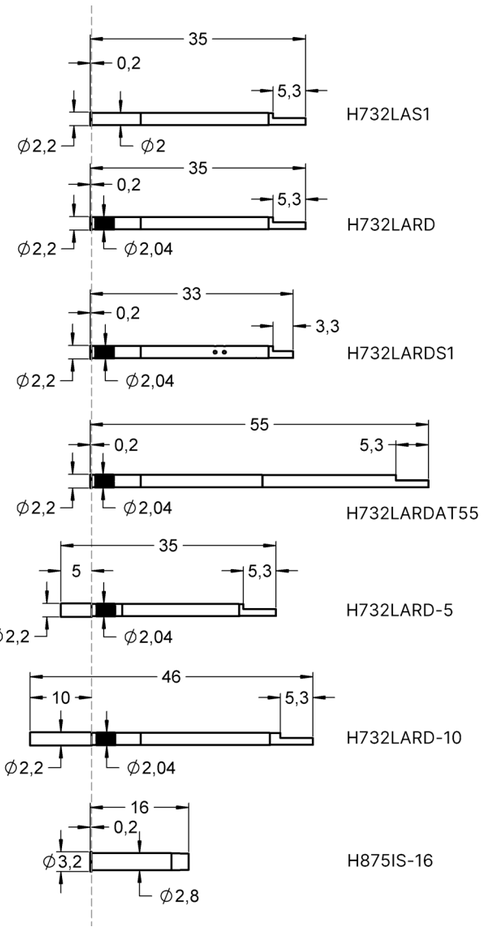
Drill size recommendation (mm)

Synthetic receptacle	2.78 - 2.79
Receptacle without knurl	1.99 - 2.00
Receptacle with knurl	2.00 - 2.02

Order code	Product name	Version	FM Choice
1003076	H732LAS1	-	FM Choice
1005355	H732LARD	-	FM Choice
1005992	H732LARD-5	-	FM Choice
1007332	H732LARD-10	-	FM Choice
1011672	H732LARDST	-	FM Choice
1031768	H732LARDAT55	-	-
1022710	H732LARDS1	-	-
1103230	H875IS-16	IS	FM Choice
1036355	H732LARDIS (H732LARD + H875IS)	-	-

Series drawing

All measurements are in mm.





F727

5 A | 100 mil/2.54 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	5
R TYP [mOhm]	<25

Mechanical specifications

Preload [cN]	50	110
Spring force [cN] at nt ±20%	150	300
Nominal travel [mm]	12.0	12.0
Maximum travel [mm]	14.5	14.5

Materials and plating

Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Spring steel	silver plated
Receptacle	Brass	gold plated

Accessories

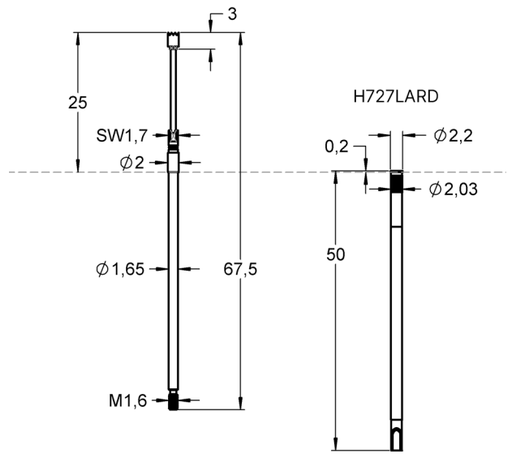
1015757	H727LA	Receptacle
1014264	FEWZ-100E0	Insertion tool receptacle
1004610	FWZ732T	Screw-in tool probe <Ø2.0 mm

Drill size recommendation (mm)

1015757	H727LA	2.00 - 2.02

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1027514	F72706B200G150	06	2.00	B / G	150	M1.6	-	-
1015738	F72706B200G300	06	2.00	B / G	300	M1.6	-	-
1021907	F72712B140G300	12	1.40	B / G	300	M1.6	-	-
1018329	F72715B200G300	15	2.00	B / G	300	M1.6	-	-



F723

10 A | 157 mil/4.00 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	10
R TYP [mOhm]	<15

Mechanical specifications

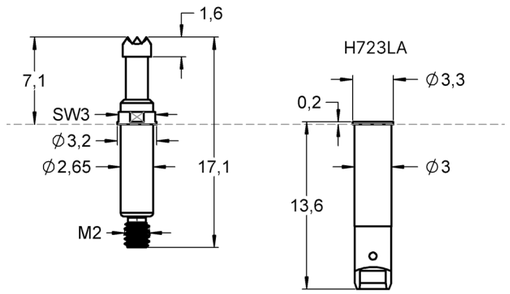
Preload [cN]	60	70
Spring force [cN] at nt ±20%	80	150
Nominal travel [mm]	2.8	2.8
Maximum travel [mm]	3.5	3.5

Materials and plating

Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Stainless steel	unplated
Receptacle	Brass	gold plated

Series drawing

All measurements are in mm.



Accessories

1009981	H723LA	Receptacle
1003642	FEWZ-774E0	Insertion tool receptacle
1029813	FWZ-733S1T	Screw-in tool probe <Ø3 mm

Drill size recommendation (mm)

1009981	H723LA	2.98 - 2.99

Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1010103	F72302B230G080	02	2.30	B / G	80	M2	-	-
1025378	F72302B230G150	02	2.30	B / G	150	M2	-	-
1010056	F72306B230G080	06	2.30	B / G	80	M2	-	-
1016611	F72306B230G150	06	2.30	B / G	150	M2	-	-
1010094	F72312B230G080	12	2.30	B / G	80	M2	-	-
1010093	F72317B230G080	17	2.30	B / G	80	M2	-	-



FM Choice

H733

157 mil/4.00 mm | Receptacles

Materials and plating

Receptacle	Brass	gold plated

Accessories

1003642	FEWZ-774E0	Insertion tool receptacle

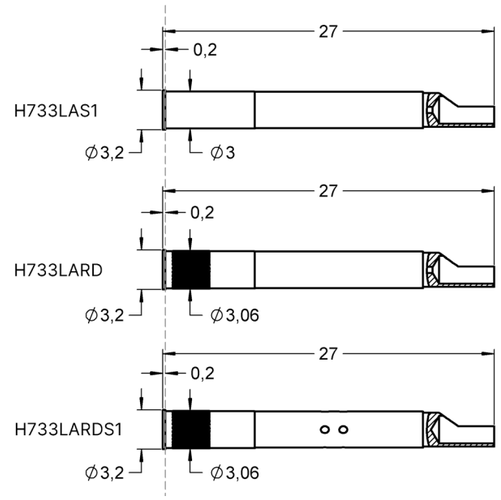
Drill size recommendation (mm)

Receptacle with knurl	3.00 - 3.02
Receptacle without knurl	2.98 - 2.99

Order code	Product name	Version	FM Choice
1005514	H733LARD	LARD	FM Choice
1022713	H733LARDS1 (Solder+airtight)	LARDS1	-
1003077	H733LAS1	LAS1	FM Choice

Series drawing

All measurements are in mm.





FM Choice

F733

10 A | 157 mil/4.00 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	10
R TYP [mOhm]	<15

Mechanical specifications

Preload [cN]	50	80
Spring force [cN] at nt ±20%	150	300
Nominal travel [mm]	4.0	4.0
Maximum travel [mm]	5.0	5.0

Materials and plating

Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Stainless steel	unplated
Receptacle	Brass	gold plated

Accessories

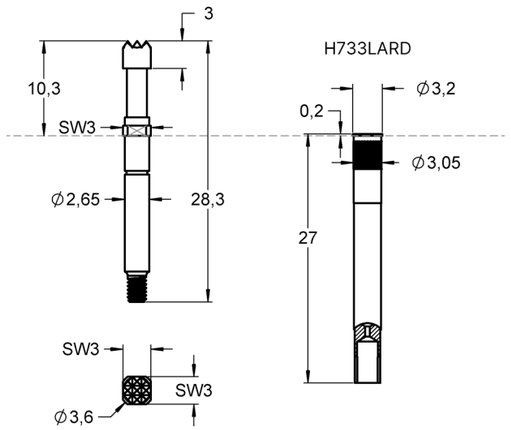
Further receptacles see page H733.		
1005514	H733LARD	Receptacle
1003642	FEWZ-774E0	Insertion tool receptacle
1029813	FWZ733S1T	Screw-in tool probe <Ø3 mm
1004611	FWZ733T	Screw-in tool probe <Ø4 mm

Drill size recommendation (mm)

Receptacle without knurl	2.98 - 2.99
Receptacle with knurl	3.00 - 3.02

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1000179	F73305B300G300	05	3.00	B / G	300	M2	-	-
1001645	F73306B230G150	06	2.30	B / G	150	M2	-	FM Choice
1001646	F73306B230G300	06	2.30	B / G	300	M2	-	FM Choice
1003836	F73306B250G300	06	2.50	B / G	300	M2	-	FM Choice
1001647	F73306B300G150	06	3.00	B / G	150	M2	-	FM Choice
1001649	F73306B300G300	06	3.00	B / G	300	M2	-	FM Choice
1001650	F73306B400G150	06	4.00	B / G	150	M2	-	-
1001651	F73306B400G300	06	4.00	B / G	300	M2	-	-
1001660	F73311B080G150	11	0.80	B / G	150	M2	-	-
1001661	F73311B140G150	11	1.40	B / G	150	M2	-	FM Choice
1001662	F73311B140G300	11	1.40	B / G	300	M2	-	-
1003458	F73311B180G150	11	1.80	B / G	150	M2	-	-
1006899	F73312B230G150	12	2.30	B / G	150	M2	-	-
1001663	F73312B300G150	12	3.00	B / G	150	M2	-	-
1001591	F73316B100G150	16	1.00	B / G	150	M2	-	-
1001596	F73316B180G150	16	1.80	B / G	150	M2	-	FM Choice
1005629	F73317B230G150	17	2.30	B / G	150	M2	-	FM Choice
1007100	F73317B230G300	17	2.30	B / G	300	M2	-	-
1005630	F73317B300G150	17	3.00	B / G	150	M2	-	-
1001598	F73318B180G150	18	1.80	B / G	150	M2	-	-
1005279	F73339B180G150	39	1.80	B / G	150	M2	-	-



F734

10 A | 157 mil/4.00 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	10
R TYP [mOhm]	<25

Mechanical specifications

Preload [cN]	60	120
Spring force [cN] at nt ±20%	150	300
Nominal travel [mm]	5.6	5.6
Maximum travel [mm]	7.0	7.0

Materials and plating

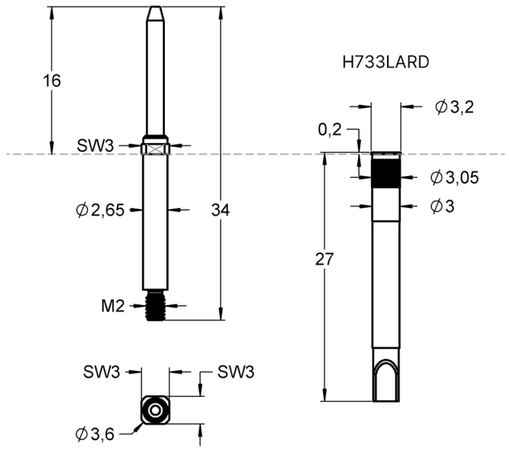
Plunger	BeCu	gold plated
	Steel	longtime gold plated
Barrel	Brass	gold plated
Spring	Spring steel	silver plated
Receptacle	Brass	gold plated

Accessories

Further receptacles see page H733.		
1005514	H733LARD	Receptacle
1003642	FEWZ-774E0	Insertion tool receptacle
1029813	FWZ733S1T	Screw-in tool probe <Ø3 mm

Series drawing

All measurements are in mm.



Drill size recommendation (mm)

Receptacle without knurl	2.98 - 2.99
Receptacle with knurl	3.00 - 3.02

Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1016810	F73416B180G150	16	1.80	B / G	150	M2	-	-
1018326	F73418S180L300	18	1.80	S / L	300	M2	-	-
1018234	F73439B180G150	39	1.80	B / G	150	M2	-	-
1018325	F73439B180G300	39	1.80	B / G	300	M2	-	-



F737

10 A | 157 mil/4.00 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	10
R TYP [mOhm]	<25

Mechanical specifications

Preload [cN]	60	80
Spring force [cN] at nt ±20%	150	300
Nominal travel [mm]	12.0	12.0
Maximum travel [mm]	14.3	14.3

Materials and plating

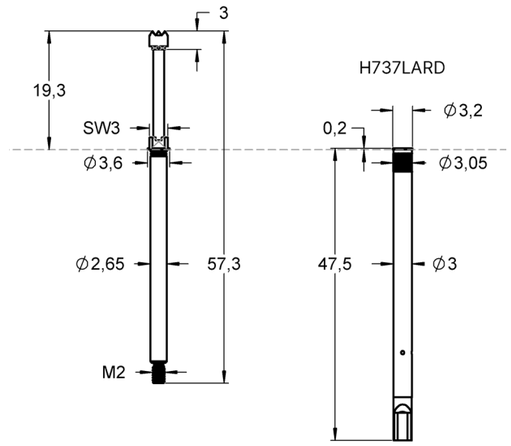
Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Spring steel	silver plated
Receptacle	Brass	gold plated

Accessories

1009411	H737LARD	Receptacle
1003642	FEWZ-774E0	Insertion tool receptacle
1029813	FWZ733S1T	Screw-in tool probe <Ø3 mm
1004611	FWZ733T	Screw-in tool probe <Ø4 mm

Series drawing

All measurements are in mm.



Drill size recommendation (mm)

1009411	H737LARD	3.00 - 3.02

Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1017111	F73706B180G300	06	1.80	B / G	300	M2	-	-
1010680	F73706B300G150	06	3.00	B / G	150	M2	-	-
1009396	F73706B300G300	06	3.00	B / G	300	M2	-	-
1009397	F73706B400G300	06	4.00	B / G	300	M2	-	-
1010679	F73716B180G300	16	1.80	B / G	300	M2	-	-



HCF762

40 A | 157 mil/4.00 mm | Rotatable

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	40
R TYP [mOhm]	<5

Mechanical specifications

Preload [cN]	70
Spring force [cN] at nt ±20%	300
Nominal travel [mm]	4.0
Maximum travel [mm]	5.0

Materials and plating

Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Stainless steel	unplated
Receptacle	Brass	gold plated

Accessories

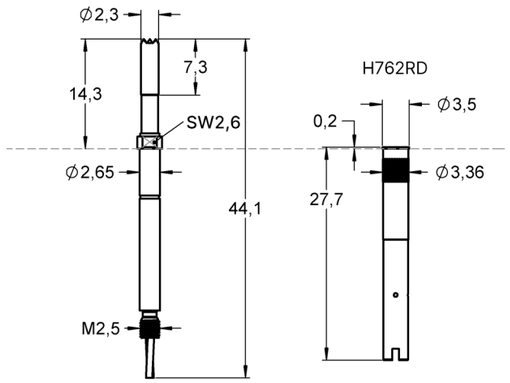
1009947	H762RD	Receptacle
1004180	FAWZ761	Insertion tool receptacle
1029833	FWZ885S1T	Screw-in tool probe <Ø3.1 mm

Drill size recommendation (mm)

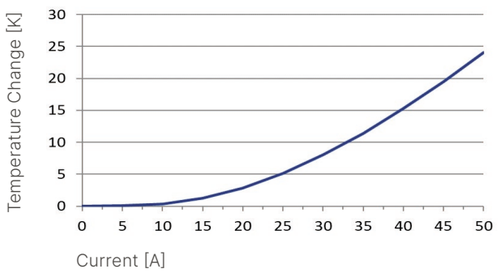
1009947	H762RD	3.30 - 3.35

Series drawing

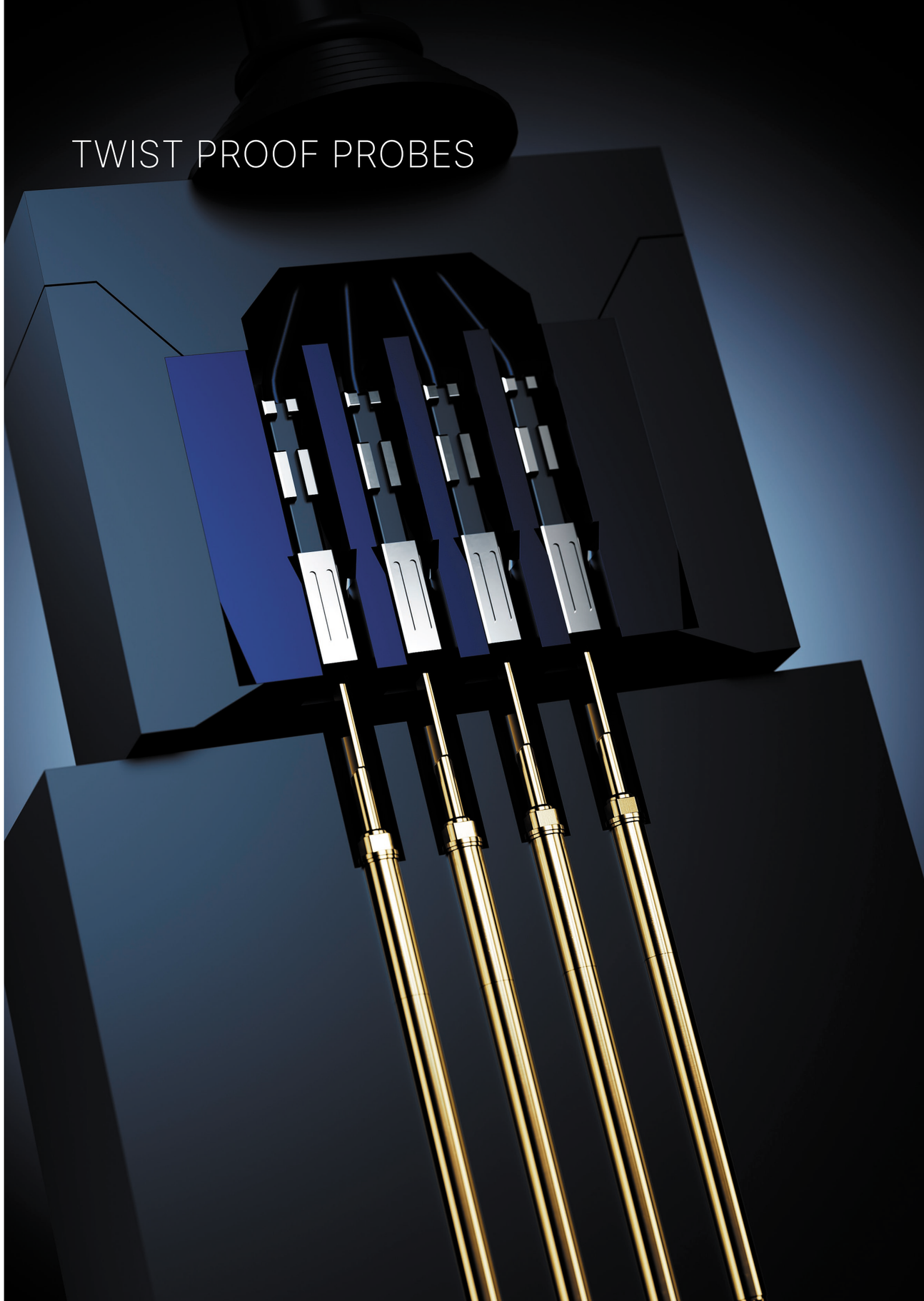
All measurements are in mm.



Thermal Rise of Contact Probe vs. Current



Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1039129	HCF76206B230G300	06 	2.30	B / G	300	M2.5	-	-



FUNCTIONAL PRINCIPLE

Twist Proof Probes are mainly used for testing connectors in rectangular cavities in which contact probes need to be inserted, or for testing contact blades. In these applications the alignment of the probe needs to have a certain direction. This alignment is realized by a twist proof design of the probe, either directly in the probe or in combination with a receptacle.

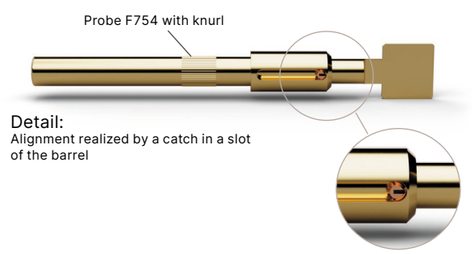
Design within a probe

When mounting a twist proof plug-in probe the correct alignment needs to be considered. If a receptacle is used, it can be mounted without alignment tool.

Advantage

Probe can be mounted without receptacle.

Example for a twist proof plug-in probe



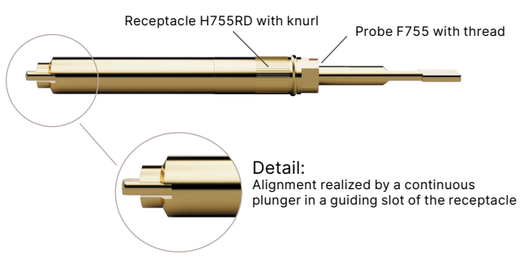
Design with guiding slot in the receptacle

In this application the correct alignment needs to be considered already when mounting the slotted receptacle. The threaded probes have a rectangular continuous plunger that is guided in a slot of the receptacle and makes sure that the probe is also aligned.

Advantage

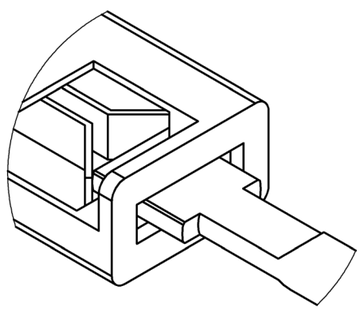
The correct alignment is already done after mounting the receptacle, there's no risk of alignment mistakes when probes are exchanged.

Example of a twist proof design with receptacle



Application Example

The twist proof spade tip moves through the hole in the plastic housing and contacts the inner connector inlay.



NUMBER CODE SYSTEM

Explanation of our product names

In order to show how our material description is built, the current valid number code system is explained below:

Type / Series		Material Plunger		Plating Plunger		Special version
F756	84	B	0011	G	300	E21
	Tip style		Number Plunger		Spring force [cN]	

Material Plunger

B = BeCu (Beryllium Copper)
M = Brass
S = Steel

Number Plunger

Indicates either a running number for several plunger dimensions or a plunger diameter

Plating Plunger

G = Gold plating
L = Longtime gold plating
N = Nickel plating
U = Unplated

Spring force

300 = 300 cN

Special Version

L = Long version
S = Short version
E21 = Projection height 21.0 mm
S1 = Deviation from the standard



F752

3 A | 100 mil/2.54 mm | Pluggable

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	3
R TYP [mOhm]	<30

Mechanical specifications

Preload [cN]	50	50
Spring force [cN] at nt ±20%	150	300
Nominal travel [mm]	4.0	4.0
Maximum travel [mm]	5.0	5.0

Materials and plating

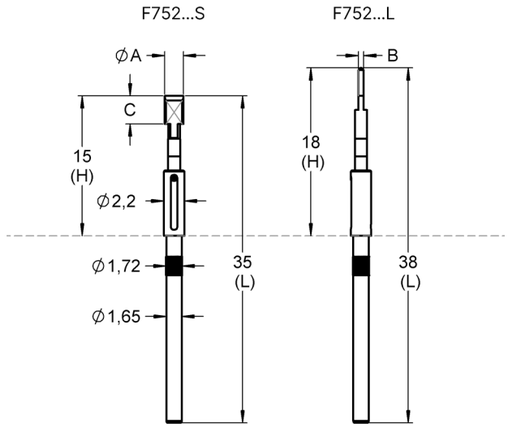
Plunger	Steel	longtime gold plated
Barrel	Brass	gold plated
Spring	Spring steel	gold plated

Drill size recommendation (mm)

Probe with knurl	1.66 - 1.70

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Ø A	B	C	H	L	Thread [M]	FM Choice
1007381	F75284S0003L150S	84	2.0	1.00	3.0	15.0	35.0	-	-
1000564	F75284S0007L150S	84	3.0	0.58	3.0	15.0	35.0	-	-
1007562	F75284S0005L150L	84	1.5	0.50	6.0	18.0	38.0	-	-
1007558	F75284S0004L150L	84	2.0	0.50	6.0	18.0	38.0	-	-
1008105	F75284S0004L300L	84	2.0	0.50	6.0	18.0	38.0	-	-
1007380	F75284S0001L150L	84	2.0	0.58	3.0	18.0	38.0	-	-
1025313	F75284S0008L150L	84	2.0	0.75	3.0	18.0	38.0	-	-
1053993	F75284S0002L150L	84	2.0	0.50	4.5	18.0	38.0	-	-



F754

10 A | 177 mil/4.50 mm | Pluggable

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	10
R TYP [mOhm]	<20

Mechanical specifications

Preload [cN]	30	80
Spring force [cN] at nt ±20%	150	300
Nominal travel [mm]	4.0	4.0
Maximum travel [mm]	4.5	4.5

Materials and plating

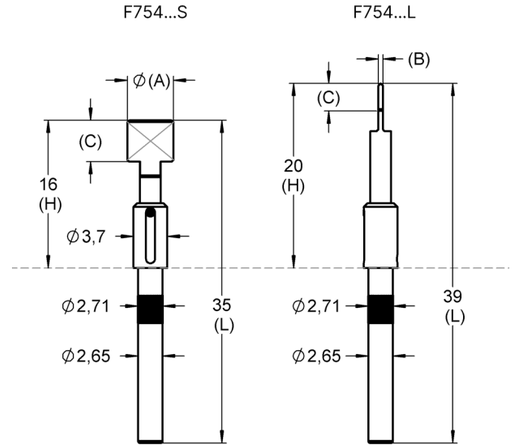
Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Spring steel	gold plated

Drill size recommendation (mm)

Probe with knurl	2.66 - 2.70

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Ø A	B	C	H	L	Thread [M]	FM Choice
1007854	F75484B0002G150S	84	4.0	1.00	3.0	16.0	35.0	-	-
1007808	F75484B0002G300S	84	4.0	1.00	3.0	16.0	35.0	-	-
1010150	F75484B0005G150S	84	5.0	0.40	4.5	16.0	35.0	-	-
1007905	F75484B0005G300S	84	5.0	0.40	4.5	16.0	35.0	-	-
1007807	F75484B0001G150S	84	5.0	1.00	3.0	16.0	35.0	-	-
1007806	F75484B0001G300S	84	5.0	1.00	3.0	16.0	35.0	-	-
1015568	F75484B0006G300S	84	5.0	1.00	6.2	16.0	35.0	-	-
1007858	F75484B0004G150L	84	4.0	0.65	3.0	20.0	39.0	-	-
1007857	F75484B0004G300L	84	4.0	0.65	3.0	20.0	39.0	-	-



FM Choice

F756

5 A | 100 mil/2.54 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+100°	
Current [A]	5	
R TYP [mOhm]	<30	

Mechanical specifications

Preload [cN]	60	100
Spring force [cN] at nt ±20%	150	300
Nominal travel [mm]	4.0	4.0
Maximum travel [mm]	4.4	4.4

Materials and plating

Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Spring steel	gold plated
Receptacle	Nickel silver	gold plated

Accessories

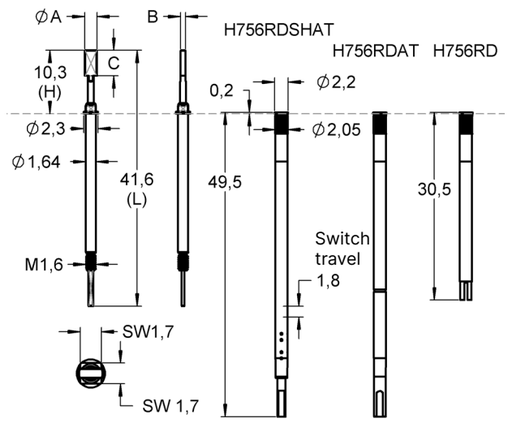
Further receptacles H756 see page 107.		
1003611	FAWZ756	Insertion tool receptacle
1140764	FWZ756T	Screw-in tool probe

Drill size recommendation (mm)

Receptacle with knurl	2.02 - 2.05

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1006114	F75611B064G150	11	0.64	B / G	150	M1.6	-	-
1095045	F75611B080G150	11	0.80	B / G	150	M1.6	-	-
1020012	F75617B150G150E14	17	1.50	B / G	150	M1.6	E14	-

Order code	Product name	Tip Style	Ø A	B	C	H	L	Thread [M]	FM Choice
1012102	F75682B0001G150	82	1.1	0.45	5.00	10.3	41.6	M1.6	-
1037570	F75683B0001G140S1	83	1.5	0.35	5.00	10.3	41.6	M1.6	FM Choice
1010405	F75684B0001G150S1	84	1.5	0.50	7.50	18.0	49.3	M1.6	-
1013619	F75684B0001G080	84	1.5	0.50	5.00	10.3	41.6	M1.6	FM Choice
1005089	F75684B0001G150	84	1.5	0.50	5.00	10.3	41.6	M1.6	-
1005088	F75684B0001G300	84	1.5	0.50	5.00	10.3	41.6	M1.6	-
1010475	F75684B0003G150	84	2.0	0.80	5.00	10.3	41.6	M1.6	-
1007009	F75684B0003G300	84	2.0	0.80	5.00	10.3	41.6	M1.6	-
1011580	F75684B0004G150	84	1.5	1.00	4.15	10.3	41.6	M1.6	-
1007754	F75684B0004G300	84	1.5	1.00	4.15	10.3	41.6	M1.6	FM Choice
1014492	F75684B0006G300	84	2.0	0.80	5.00	10.3	41.6	M1.6	-
1021189	F75684B0008G300	84	2.0	0.65	5.00	10.3	41.6	M1.6	-
1021284	F75684B0009G150	84	1.5	0.25	5.00	10.3	41.6	M1.6	-
1030356	F75684B0009G300	84	1.5	0.25	5.00	10.3	41.6	M1.6	-
1034075	F75684B0011G150E14	84	1.5	0.50	9.00	14.3	45.6	M1.6	-



FM Choice

H756

100 mil/2.54 mm | Receptacles

Materials and plating

Receptacle	Brass	gold plated

Accessories

1003611	FAWZ756	Insertion tool receptacle
1004610	FWZ732T	Screw-in tool probe

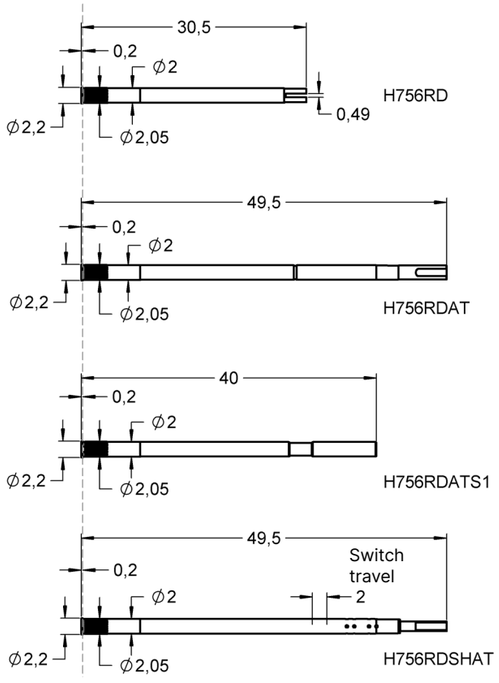
Drill size recommendation (mm)

Receptacle without knurl	1.98 - 1.99
Receptacle with knurl	2.00 - 2.02

Order code	Product name	Version	FM Choice
1001846	H756	-	-
1006670	H756AT	AT	FM Choice
1006661	H756SHAT	SHAT	-
1014219	H756RD	RD	FM Choice
1014220	H756RDAT	RDAT	FM Choice
1019498	H756RDATS1	RDATS1	-
1014221	H756RDSHAT	RDSHAT	FM Choice

Series drawing

All measurements are in mm.





F760

10 A | 138 mil/3.50 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+100°	
Current [A]	10	
R TYP [mOhm]	<30	

Mechanical specifications

Preload [cN]	50	80
Spring force [cN] at nt ±20%	150	300
Nominal travel [mm]	4.0	4.0
Maximum travel [mm]	5.0	5.0

Materials and plating

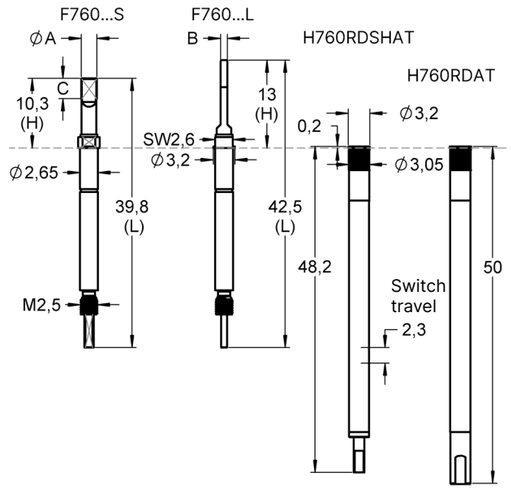
Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Spring steel	silver plated
Receptacle	Brass	gold plated

Accessories

Receptacle see H760...		
1004180	FAWZ761	Insertion tool receptacle
1029831	FWZ760S1T	Screw-in tool probe <Ø4.0
1029832	FWZ760S2T	Screw-in tool probe <Ø5.0

Series drawing

All measurements are in mm.



Drill size recommendation (mm)

Receptacle with knurl	3.02 - 3.04

Order code	Product name	Tip Style	Ø A	B	C	H	L	Thread [M]	FM Choice
1011844	F76081B0002G300L	81	1.5	0.6	9.5	13.0	42.5	M2.5	-
1005114	F76084B0003G300S	84	2.3	0.8	10.3	10.3	39.8	M2.5	-
1009922	F76084B0001G300L	84	2.8	0.5	9.5	13.0	42.5	M2.5	-
1004934	F76084B0002G150L	84	2.5	0.8	9.5	13.0	42.5	M2.5	-
1005104	F76084B0002G300L	84	2.5	0.8	9.5	13.0	42.5	M2.5	-
1005117	F76084B0004G300L	84	5.0	1.0	9.5	13.0	42.5	M2.5	-
1121861	F76084B0005G300E19	84	5.0	1.0	15.5	19.0	48.5	M2.5	-



F755

10 A | 177 mil/4.50 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+100°	
Current [A]	10	
R TYP [mOhm]	<30	

Mechanical specifications

Preload [cN]	70	90
Spring force [cN] at nt ±20%	150	300
Nominal travel [mm]	5.6	5.6
Maximum travel [mm]	7.0	7.0

Materials and plating

Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Stainless steel	unplated
Receptacle	Brass	gold plated

Accessories

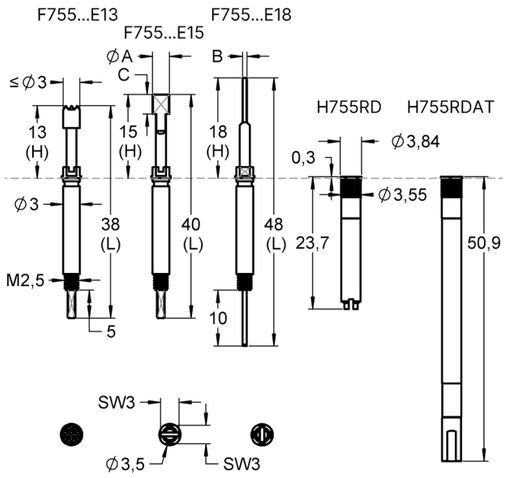
1009478	H755RD	Receptacle
1010935	H755RDAT	Receptacle (airtight)
1009479	H755RDS1	Receptacle
1009480	H755S1	Receptacle
1024631	FAWZ755	Insertion tool receptacle
1004611	FWZ733T	Screw-in tool probe

Drill size recommendation (mm)

Receptacle with knurl	3.48 - 3.52
Receptacle without knurl	3.48 - 3.49

Series drawing

All measurements are in mm.

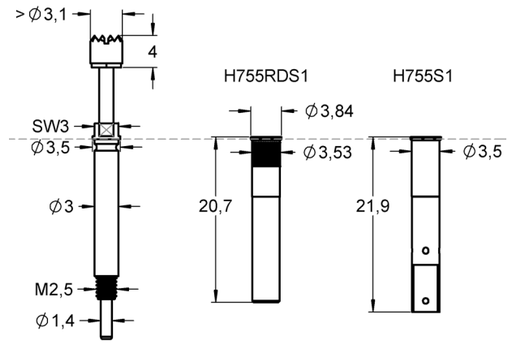


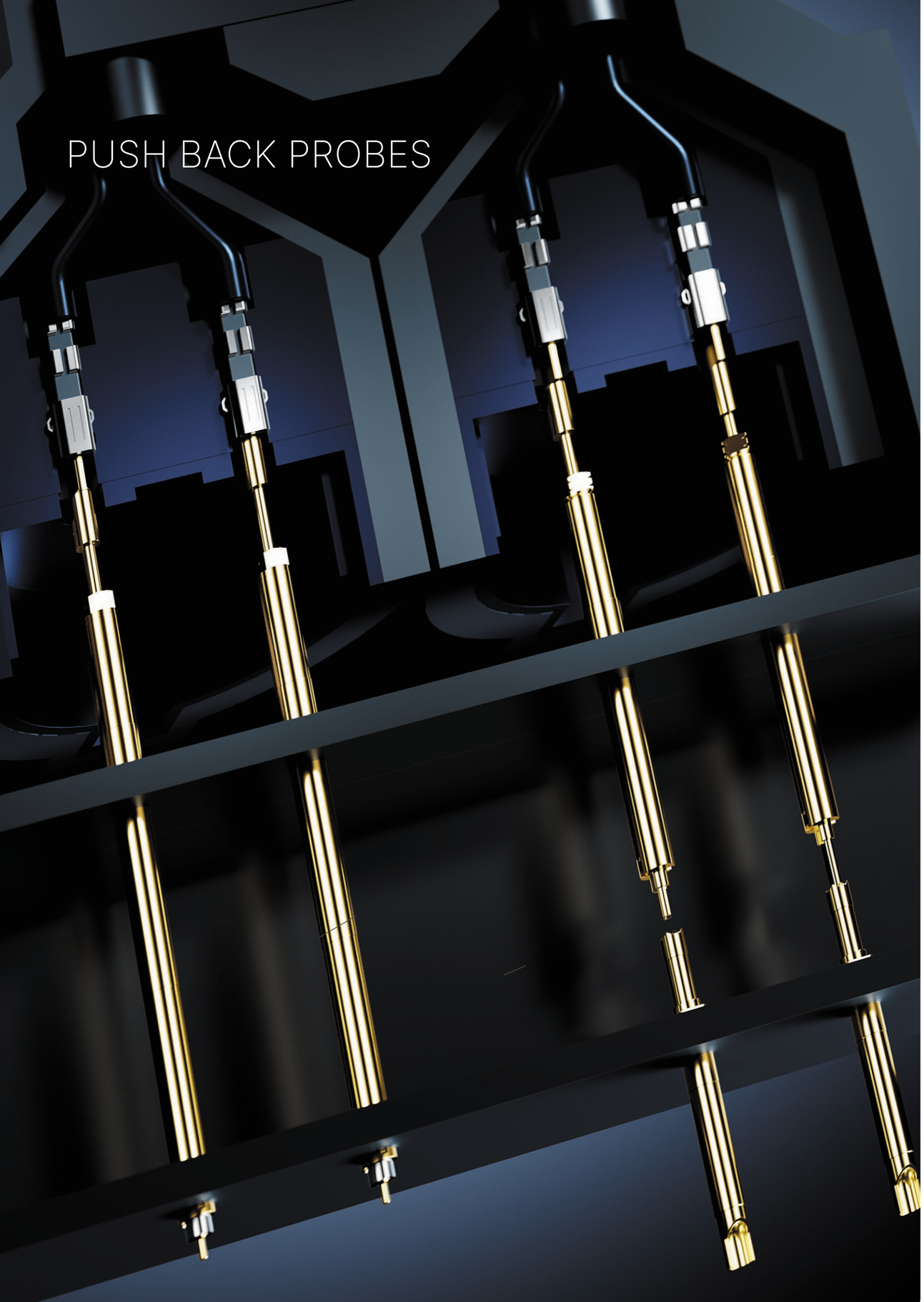
Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1010976	F75506B300G150E13	06	3.0	B / G	150	M2.5	E13	-
1009450	F75506B300G300E13	06	3.0	B / G	300	M2.5	E13	-

Order code	Product name	Tip Style	Ø A	B	C	H	L	Thread [M]	FM Choice
1011893	F75582B0001G150E13	82	1.8	0.8	4.0	13.0	38.0	M2.5	-
1010620	F75582B0002G150E13	82	1.8	0.5	4.0	13.0	38.0	M2.5	-
1009491	F75583B0001G150E18	83	2.5	0.8	8.0	18.0	48.0	M2.5	-
1011656	F75583B0001G300E18	83	2.5	0.8	8.0	18.0	48.0	M2.5	-
1010021	F75584B0001G150E15	84	3.0	0.7	6.5	15.0	40.0	M2.5	-
1009506	F75584B0001G300E15	84	3.0	0.7	6.5	15.0	40.0	M2.5	-
1011246	F75584B0002G300E15	84	2.8	0.4	6.0	15.0	40.0	M2.5	-
1009861	F75589B0001G300E13	89	1.8	0.8	2.6	13.0	38.0	M2.5	-

Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1009494	F75506B400G150E13 *	06	4.0	B / G	150	M2.5	E13	-
1009447	F75506B400G300E13 *	06	4.0	B / G	300	M2.5	E13	-
1011252	F75506B400G500E13 *	06	4.0	B / G	500	M2.5	E13	-

*** Not Twist Proof Version.**





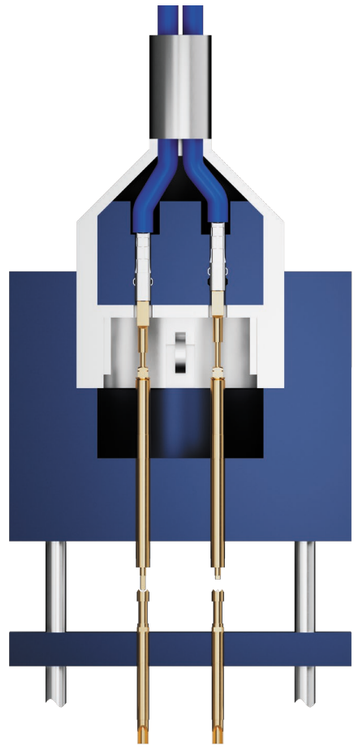
Push Back Tests of connectors

Push Back Probes are used to verify and qualify the correct mounting and locking of terminals in connectors and to make sure that they cannot be pushed out of their housings.

For these applications contact probes with very high spring forces and predefined projection heights are used. Depending on the centers the spring forces have values between 3 N and 25 N.

Usually, push back tests require Twist Proof Probes with spade tip styles.

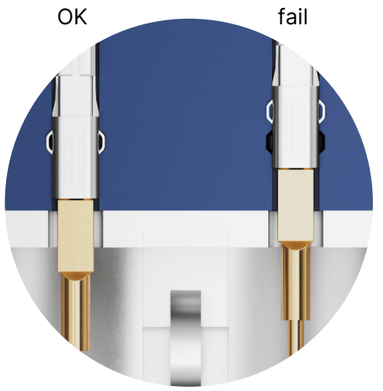
Push Back Probes are also available with round tip styles without twist proof design (series V04).



Details of contacting procedures

During the test procedure not only the electrical continuity is tested, but also the correct mounting of the connector. Without a push back test the result could be OK even if the connector is not locked properly.

The detection of the correct mounting of the connector is based on a switch function of the Push Back Probe. This switch function can be realized either by using a switch receptacle or by using an additional probe on a second level.



MODULAR PUSH BACK PROBES

Threaded probes for Push Back Tests of connectors

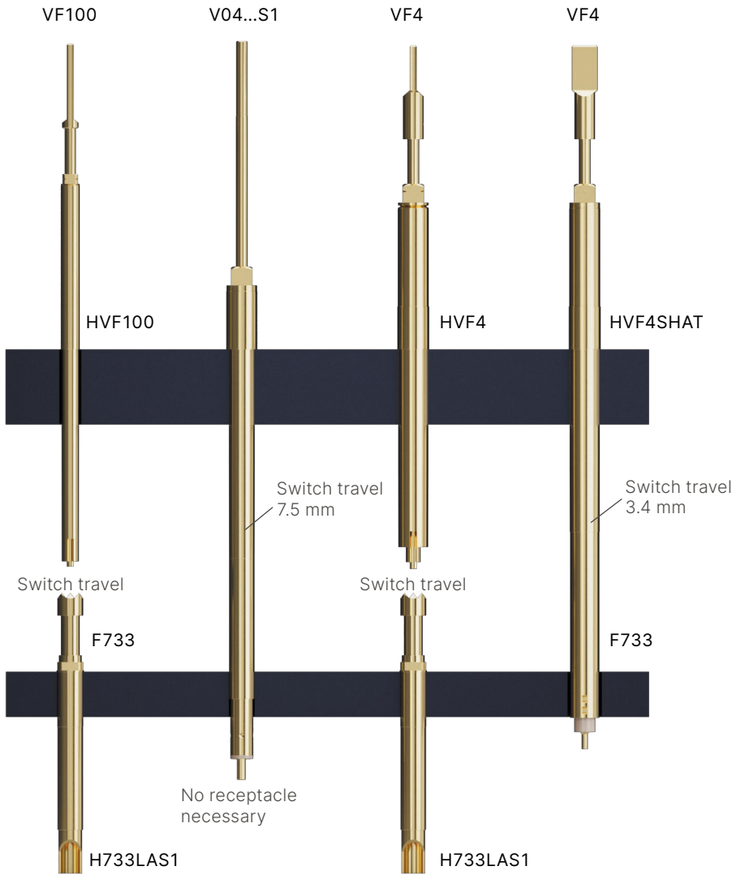
Push Back Probes are used for testing Wire Harnesses and Connectors. FEINMETALL offers a great variety of tip styles and spring forces as well as further features, for example receptacles for building up airtight modules as well as Push Back Probes that can be mounted without receptacle.

Selection of variable and fixed switch points

The modular design of FEINMETALL Push Back Probes enables a separate exchange of switch elements and Push Back Probes. This is a great economical advantage. The illustration shows different combinations of probes at different levels.

Typical combinations of Push Back Probes

In case of connecting several probes in series the resulting spring force is the sum of the single spring forces.



NUMBER CODE SYSTEM

Explanation of our product names

In order to show how our material description is built, the current valid number code system is explained below:

Type / Series		Material Plunger		Plating Plunger		Special version
VF4	84	B	0011	G	20	E21
	Tip style		Number Plunger		Spring force [N]	

Material Plunger

B = BeCu (Beryllium Copper)
M = Brass
S = Steel

Number Plunger

Indicates either a running number for several plunger dimensions or a plunger diameter

Plating Plunger

G = Gold plating
L = Longtime gold plating

Spring force

20 = 20 N

Special Version

L = Long version
S = Short version
E21 = Projection height 21.0 mm
S1 = Deviation from the standard



FM Choice

VF100

5 A | 100 mil/2.54 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+100°		
Current [A]	5		
R TYP [mOhm]	<30		

Mechanical specifications

Preload [cN]	80	80	120
Spring force [cN] at nt ±20%	500	1000	1500
Nominal travel [mm]	5.0	5.0	5.0
Maximum travel [mm]	5.5	5.5	5.5

Materials and plating

Plunger	BeCu	gold plated
	Steel	longtime gold plated
Barrel	Brass	gold plated
Spring	Spring steel	gold plated
Receptacle	Brass	gold plated

Accessories

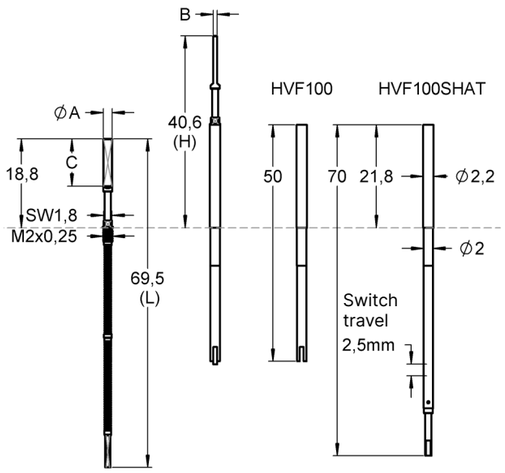
1001837	HVF100	Receptacle
1010181	HVF100SHAT	Receptacle
1014467	FAWZVF100	Insertion tool receptacle
1004984	FWZVF100T	Screw-in tool probe <Ø2.0 mm
1029834	FWZVF100S1T	Screw-in tool probe <Ø2.7 mm

Drill size recommendation (mm)

HVF100... without knurl	1.99 - 2.00

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1005076	VF10005B190G10	05	1.90	B / G	1000	M2x0.25	-	-
1005075	VF10005B190G15	05	1.90	B / G	1500	M2x0.25	-	-
1005144	VF10005B220G15	05	2.20	B / G	1500	M2x0.25	-	-
1005971	VF10011B080G10S1	11	0.80	B / G	1000	M2x0.25	S1	-
1002249	VF10017B150G10	17	1.50	B / G	1000	M2x0.25	-	-
1002250	VF10017B150G15	17	1.50	B / G	1500	M2x0.25	-	-
1010313	VF10017B180G05	17	1.80	B / G	500	M2x0.25	-	-
1002251	VF10017B180G10	17	1.80	B / G	1000	M2x0.25	-	-
1002252	VF10017B180G15	17	1.80	B / G	1500	M2x0.25	-	FM Choice

Order code	Product name	Tip Style	Ø A	B	C	H	L	Thread [M]	FM Choice
1006452	VF10080B0001G15	80	1.60	0.50	10.0	18.8	69.5	M2x0.25	-
1005141	VF10082B0003G10	82	1.90	0.50	10.0	18.8	69.5	M2x0.25	-
1005140	VF10082B0003G15	82	1.90	0.50	10.0	18.8	69.5	M2x0.25	FM Choice
1005135	VF10082B0004G15	82	1.90	0.80	10.0	18.8	69.5	M2x0.25	FM Choice
1005081	VF10082S0001L10	82	1.90	0.30	10.0	18.8	69.5	M2x0.25	-
1005128	VF10084B0001G15	84	2.50	0.80	10.0	18.8	69.5	M2x0.25	-



FM Choice

VF3

8 A | 118 mil/4.78 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+100°	
Current [A]	8	
R TYP [mOhm]	<30	

Mechanical specifications

Preload [cN]	80	80	120
Spring force [cN] at nt ±20%	500	1000	1500
Nominal travel [mm]	5.0	5.0	5.0
Maximum travel [mm]	5.5	5.5	5.5

Materials and plating

Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Spring steel	gold plated
Receptacle	Brass	gold plated

Accessories

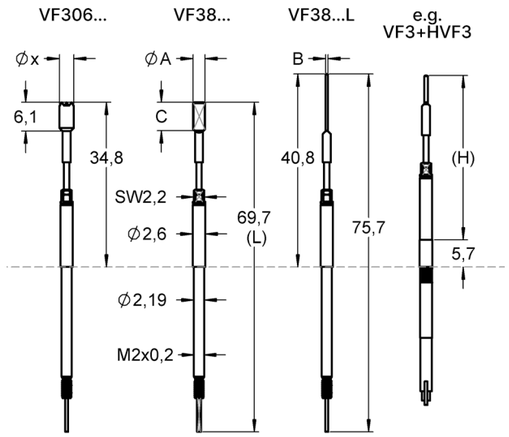
1043743	HVF3RD	Receptacle
1039491	HVF3RDSHAT	Receptacle
1007887	FAWZVF3	Insertion tool receptacle
1006124	FWZVF3T	Screw-in tool probe <Ø2.7 mm
1029835	FWZVF3S1T	Screw-in tool probe <Ø4.0 mm

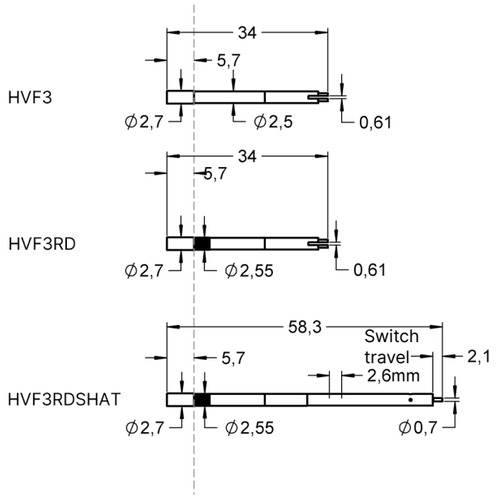
Drill size recommendation (mm)

HVF3RD... with knurl	2.52 - 2.55

Series drawing

All measurements are in mm.





Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1005903	VF305B220G15	05	2.20	B / G	1500	M2x0.2	-	FM Choice
1040765	VF306B200G15	06	2.00	B / G	1500	M2x0.2	-	-
1005906	VF306B270G15	06	2.70	B / G	1500	M2x0.2	-	FM Choice
1005907	VF306B300G15	06	3.00	B / G	1500	M2x0.2	-	-
1005900	VF317B150G15	17	1.50	B / G	1500	M2x0.2	-	-
1007660	VF317B180G10	17	1.80	B / G	1000	M2x0.2	-	-
1005301	VF317B180G15	17	1.80	B / G	1500	M2x0.2	-	FM Choice
1008136	VF317B230G05	17	2.30	B / G	500	M2x0.2	-	-
1008124	VF317B230G10	17	2.30	B / G	1000	M2x0.2	-	-
1005901	VF317B230G15	17	2.30	B / G	1500	M2x0.2	-	FM Choice

Order code	Product name	Tip Style	Ø A	B	C	H	L	Thread [M]	FM Choice
1009123	VF380B0001G15	80	1.40	0.50	6.0	34.8	69.7	M2x0.2	-
1005124	VF383B0001G15	83	1.60	0.50	6.0	34.8	69.7	M2x0.2	FM Choice
1006293	VF383B0001G15L	83	2.50	0.80	12.1	40.8	75.7	M2x0.2	-
1005896	VF383B0002G15	83	2.50	0.50	6.0	34.8	69.7	M2x0.2	FM Choice
1005897	VF383B0003G15	83	2.50	1.50	6.0	34.8	69.7	M2x0.2	-
1006647	VF383B0004G05	83	1.90	0.50	6.0	34.8	69.7	M2x0.2	-
1006648	VF383B0004G10	83	1.90	0.50	6.0	34.8	69.7	M2x0.2	-
1005898	VF383B0004G15	83	1.90	0.50	6.0	34.8	69.7	M2x0.2	FM Choice
1005899	VF383B0005G15	83	1.90	0.80	6.0	34.8	69.7	M2x0.2	FM Choice
1006292	VF383B0007G15	83	2.20	1.20	6.0	34.8	69.7	M2x0.2	-
1010202	VF383B0008G05	83	2.70	0.80	6.0	34.8	69.7	M2x0.2	-
1007117	VF383B0008G15	83	2.70	0.80	6.0	34.8	69.7	M2x0.2	FM Choice



FM Choice

VF4

10 A | 157 mil/4.00 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	10
R TYP [mOhm]	<30

Mechanical specifications

Preload [cN]	80	100	300
Spring force [cN] at nt ±20%	300	500	1000
Nominal travel [mm]	5.0	5.0	5.0
Maximum travel [mm]	5.5	5.5	5.5

Preload [cN]	300	300	300
Spring force [cN] at nt ±20%	1500	2000	2500
Nominal travel [mm]	5.0	5.0	5.0
Maximum travel [mm]	5.5	5.5	5.5

Materials and plating

Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Spring steel	gold plated
Receptacle	Brass	gold plated

Accessories

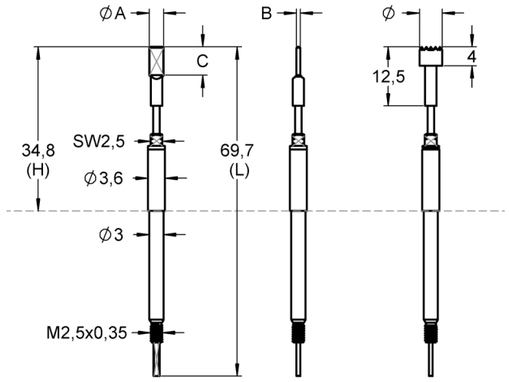
1043744	HVF4RD	Receptacle
1039492	HVF4RDSHAT	Receptacle
1008226	FAWZVF4	Insertion tool receptacle
1006748	FWZVF4T	Screw-in tool probe <Ø4.0 mm
1029838	FWZVF4S1T	Screw-in tool probe <Ø3.1 mm

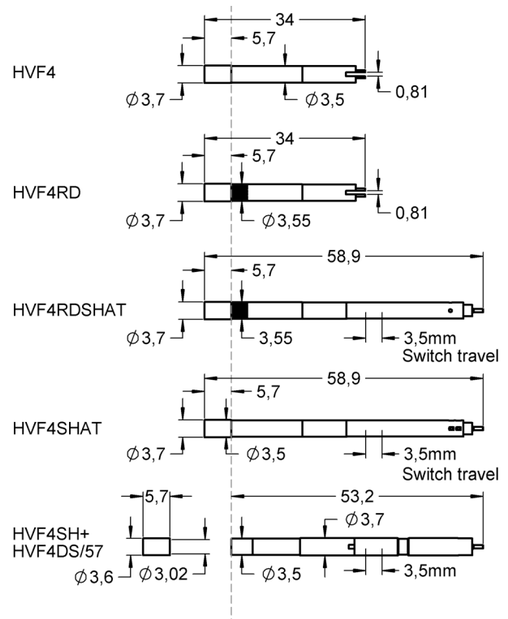
Drill size recommendation (mm)

HVF4RD... with knurl	3.52 - 3.55

Series drawing

All measurements are in mm.





Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1002313	VF405B230G15	05	2.30	B / G	1500	M2.5x0.35	-	-
1002316	VF405B300G15	05	3.00	B / G	1500	M2.5x0.35	-	-
1002326	VF406B240G15	06	2.40	B / G	1500	M2.5x0.35	-	-
1002328	VF406B240G25	06	2.40	B / G	2500	M2.5x0.35	-	-
1002330	VF406B300G15	06	3.00	B / G	1500	M2.5x0.35	-	FM Choice
1002331	VF406B300G20	06	3.00	B / G	2000	M2.5x0.35	-	-
1002332	VF406B300G25	06	3.00	B / G	2500	M2.5x0.35	-	-
1005225	VF416B140G15	16	1.40	B / G	1500	M2.5x0.35	-	-
1005149	VF416B180G10	16	1.80	B / G	1000	M2.5x0.35	-	-
1005148	VF416B180G15	16	1.80	B / G	1500	M2.5x0.35	-	FM Choice
1005147	VF416B180G20	16	1.80	B / G	2000	M2.5x0.35	-	-
1005245	VF416B200G15	16	2.00	B / G	1500	M2.5x0.35	-	FM Choice
1005244	VF416B200G20	16	2.00	B / G	2000	M2.5x0.35	-	-
1008130	VF416B230G05	16	2.30	B / G	500	M2.5x0.35	-	-
1005241	VF416B230G15	16	2.30	B / G	1500	M2.5x0.35	-	FM Choice
1005240	VF416B230G20	16	2.30	B / G	2000	M2.5x0.35	-	-
1008901	VF417B300G15	17	3.00	B / G	1500	M2.5x0.35	-	-
1014392	VF417B300G20	17	3.00	B / G	2000	M2.5x0.35	-	-

Order code	Product name	Tip Style	Ø A	B	C	H	L	Thread [M]	FM Choice
1005604	VF483B0001G05	83	2.50	0.60	6.0	34.8	69.7	M2.5x0.35	FM Choice
1005203	VF483B0001G15	83	2.50	0.60	6.0	34.8	69.7	M2.5x0.35	FM Choice
1005195	VF483B0002G15	83	3.00	0.80	6.0	34.8	69.7	M2.5x0.35	FM Choice
1005220	VF483B0003G15	83	2.25	1.60	6.0	34.8	69.7	M2.5x0.35	FM Choice
1005190	VF483B0004G15	83	3.00	1.60	6.0	34.8	69.7	M2.5x0.35	FM Choice
1009131	VF483B0009G15	83	2.20	1.30	6.0	34.8	69.7	M2.5x0.35	-
1010809	VF483B0010G05	83	2.50	0.80	12.0	34.8	69.7	M2.5x0.35	-



V04

8 A | 157 mil/4.00 mm | Pluggable | With switch function

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	8
R TYP [mOhm]	<30

Mechanical specifications

Preload [cN]	150	200	400
Spring force [cN] at nt ±20%	600	900	1500
Nominal travel [mm]	9.5	9.5	9.5
Maximum travel [mm]	10.0	10.0	10.0

Materials and plating

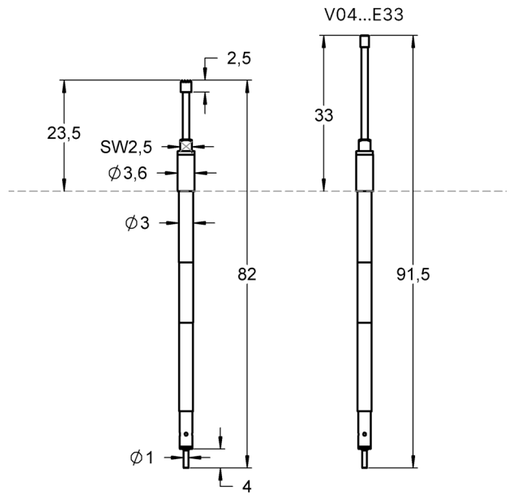
Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Spring steel	gold plated

Drill size recommendation (mm)

Barrel Ø V04	2.98 - 2.99

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1014005	V0406B230G15	06	2.30	B / G	1500	-	-	-
1014167	V0406B300G15	06	3.00	B / G	1500	-	-	-
1014004	V0406B300G09	06	3.00	B / G	900	-	-	-
1022440	V0417B180G15E33	17	1.80	B / G	1500	-	E33	-
1015843	V0417B180G15	17	1.80	B / G	1500	-	-	-



FM Choice

F78017M580U400

Push-out Probe | 256 mil/6.50 mm | For Press-in

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	10
R TYP [mOhm]	<50

Mechanical specifications

Preload [cN]	200
Spring force [cN] at nt ±20%	400
Nominal travel [mm]	6.0
Maximum travel [mm]	7.5

Materials and plating

Plunger	Brass	unplated
Barrel	Brass	unplated
Spring	Stainless steel	unplated

Accessories

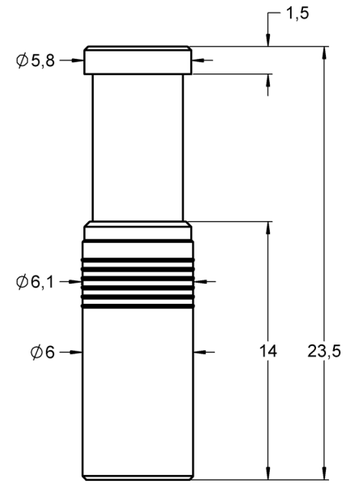
1020967	FDWZ-650	Insertion tool probe

Drill size recommendation (mm)

Probe with barbed hooks	6.08 - 6.10

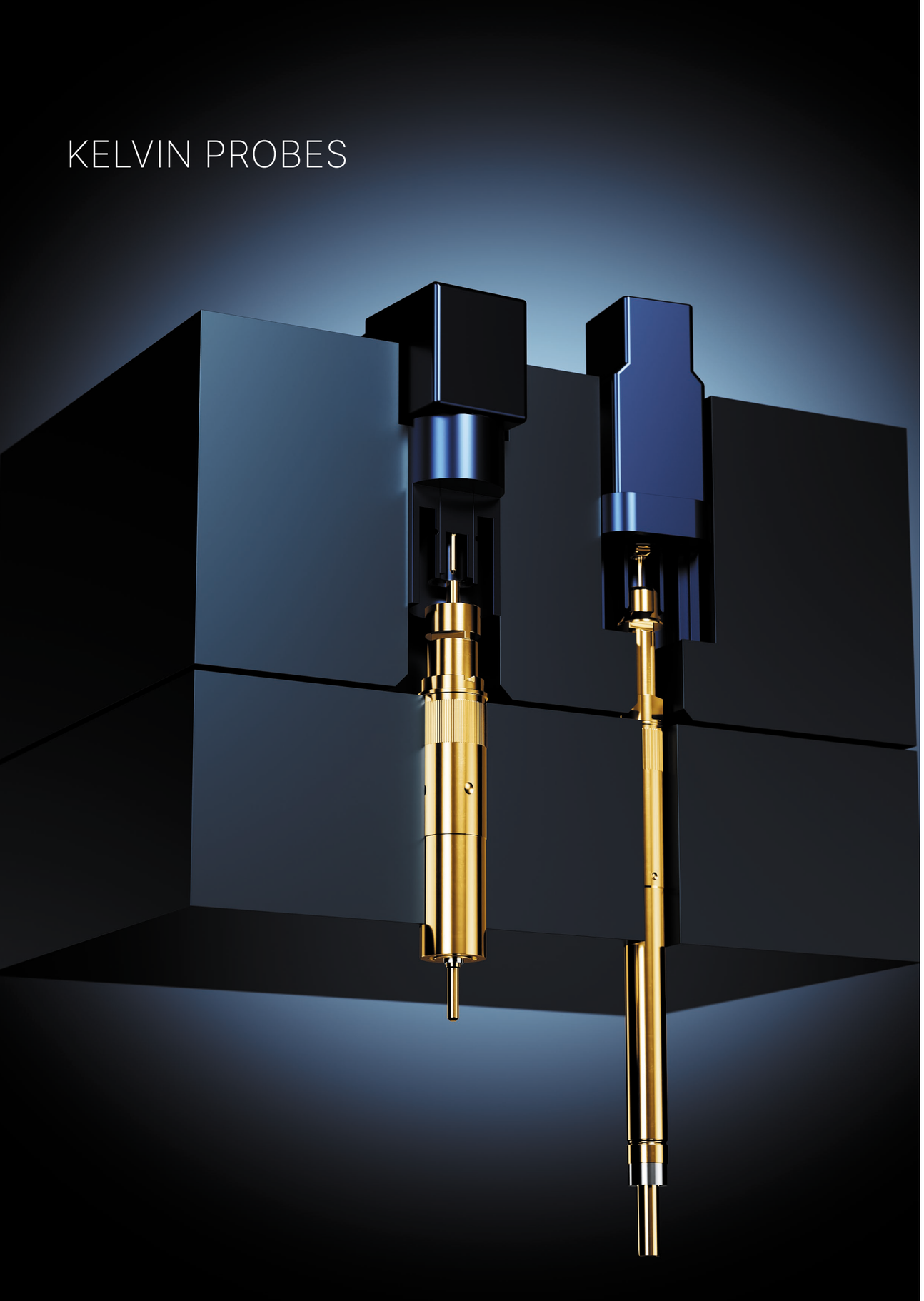
Series drawing

All measurements are in mm.



The F78017M580U400 is an unplated and cost effective probe for mechanical applications, e.g. for pushing a connector out of the module after the locking is opened.

Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1010873	F78017M580U400	17	5.80	M / U	400	-	-	FM Choice



NUMBER CODE SYSTEM

Explanation of our product names

In order to show how our material description is built, the current valid number code system is explained below:

Type / Series		Material Plunger		Plating Plunger		Special version
F832	05	S	0007	L	650	IK25
	Tip style		Number Plunger		Spring force [cN]	

Material Plunger

B = BeCu (Beryllium Copper)
M = Brass
S = Steel

Number Plunger

Indicates either a running number for several plunger dimensions or a plunger diameter

Plating Plunger

G = Gold plating
L = Longtime gold plating

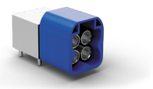
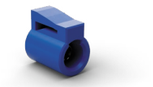
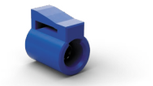
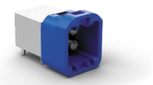
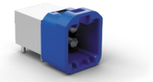
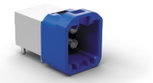
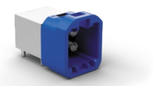
Spring force

650 = 650 cN

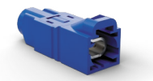
Special Version

L = Long version
S = Short version
IK04 = Insulation cap 0.4 mm distance
E21 = Projection height 21.0 mm
S1 = Deviation from the standard

OVERVIEW OF CONTACT SOLUTIONS

For DUT	Order code	Product name	Picture Probe
HFM® Male 	1028543	F83505B0005G120	
HFM® Female 	1028542	F83512B0004G120	
HFM® Female 	1161312	F83511B0015G400S1	
MateAX® Male / HFM® Male 	1147891	F83505B0011G120	
MateAX® Male 	1029805	F83505B0006G120	
MateAX® Female 	1028639	F83511B0003G120	
RMC® - Rosenberger Mini-Coax 	1139649	F83511B0009G120	
HSD Female 	1033293	F81912B0001G2020	

FOR DEFINED CONNECTORS

For DUT	Order code	Product name	Picture Probe
FAKRA Male 	1009720	F82205S0007L650IK25	
FAKRA Male 	1029303	F83205S0007L650IK25	
FAKRA Female 	1161570	F83511B0016G400S1	
FAKRA Female 	1057671	F83211S0021L650	
FAKRA Female 	1163350	F83211S2001L450	
H-MTD Male 	1167780	F83605S070L535-HMTDm	
H-MTD Female 	1167926	F83611S053L535-HMTDf	
MTD Male 	1168264	F83605S070L535-MTDm	
MTD Female 	1168297	F83611S053L535-MTDf	

FOR KELVIN (4-WIRE) MEASUREMENT

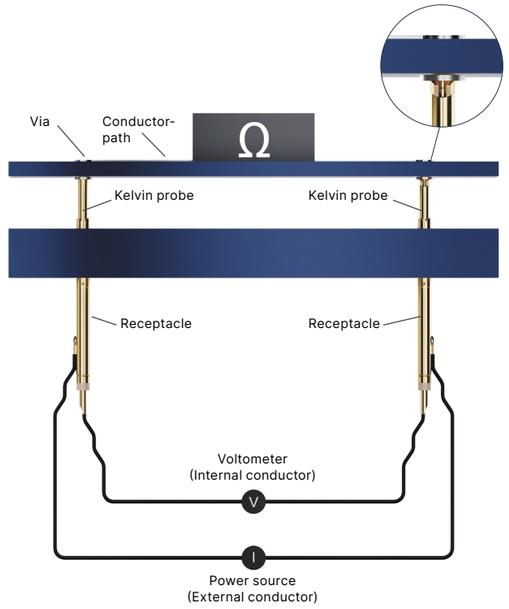
Kelvin Principle

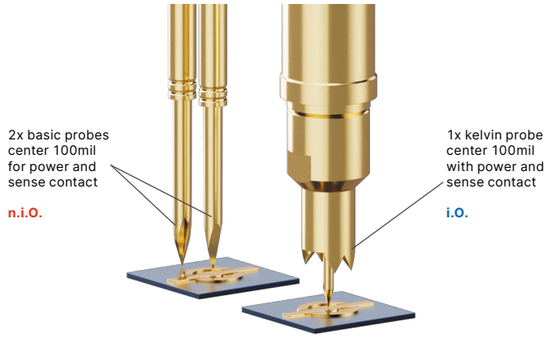
A Kelvin probe is a coaxial contact probe with two electrically insulated measuring circuits. The typical 4-wire measurement is based on a constant current, flowing through the test resistance and the measurement of the resulting drop in voltage, which is directly proportional to the resistance value. 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 realized by two Kelvin probes or four base probes, ideally located very close to the device under test.

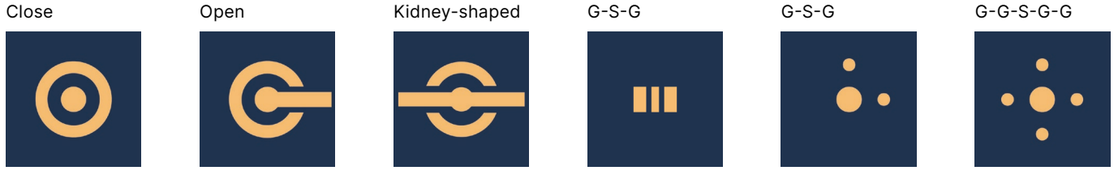
The constant current usually is carried by the outer conductor (force signal), while the voltage drop is detected by the inner conductor (sense signal). The inner and outer conductors of FEINMETALL coaxial probes are independently spring loaded in order to balance mechanical tolerances and heights.

Application example





Examples of PCB Layouts for Coaxial Contacting





F805

2.5 A | 87 mil/2.20 mm | Pluggable

Electrical specifications

Temperature [°C]	-45°...+100°	
Impedanz [Ohm]	50	
Frequenz [GHz]	1.2	
	Sense	Power
Current [A]	0.5	2.5
R typ [mOhm]	2	20

Mechanical specifications

	Sense	Power
Preload [cN]	10	80
Spring force [cN] at nt ±20%	50	200
Nominal travel [mm]	2.0	2.0
Maximum travel [mm]	2.8	2.5

Materials and plating

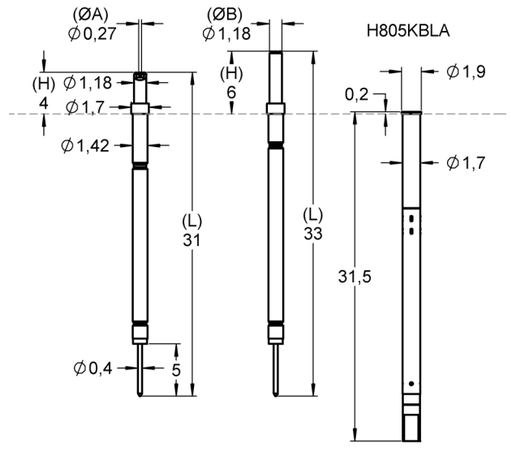
Contact Sense	BeCu	gold plated
Contact Power	BeCu	gold plated
Barrel	Bronze	gold plated
Spring Sense	Stainless steel	gold plated
Spring Power	Stainless steel	silver plated
Receptacle	Bronze	gold plated

Accessories

1000084	H805KBLA	Receptacle
1014264	FEWZ-100E0	Insertion tool receptacle
1031229	FDWZ-805	Insertion tool probe

Series drawing

All measurements are in mm.



Drill size recommendation (mm)

H805KBLA	1.68 - 1.70

Order code	Product name	Power	Sense 1	Ø A	Ø B	C	H	Thread [M]	Version	FM Choice
1000083	F80518B0001G250	06	18	0.27	1.18	0.00	4.00	-	-	-
1031155	F80518B0002G250	06	18	0.27	1.18	0.00	6.00	-	-	-
1053045	F80521B0003G250	06	21	0.27	1.18	-0.55	4.20	-	-	-



FM Choice

F810

3 A | 100 mil/2.54 mm | Pluggable

Electrical specifications

Temperature [°C]	-45°...+100°	
Impedanz [Ohm]	50	
Frequenz [GHz]	1.2	
	Sense	Power
Current [A]	0.8	3.0
R typ [mOhm]	2	20

Mechanical specifications

	Sense	Power
Preload [cN]	10; 25	40; 40
Spring force [cN] at nt ±20%	70; 75	100; 155
Nominal travel [mm]	2.8; 2.4	2.3
Maximum travel [mm]	4.0	3.5

Materials and plating

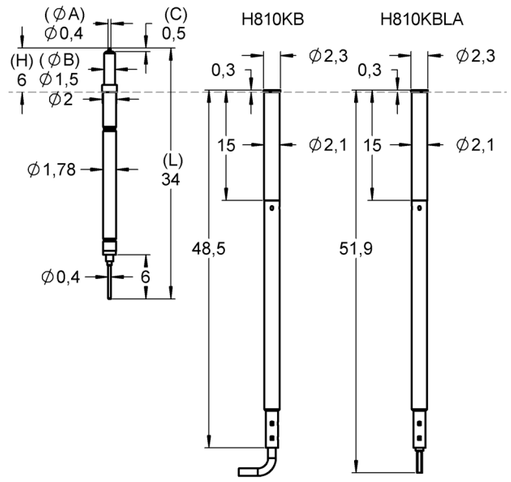
Contact Sense	Steel	longtime gold plated
Contact Power	BeCu	gold plated
Barrel	Bronze	silver plated
Spring Sense	Spring steel	silver plated
Spring Power	Spring steel	silver plated
Receptacle	Bronze	gold plated

Accessories

1008053	H810KB	Receptacle
1010108	H810KBLA	Receptacle
1001862	H810	Receptacle
1001863	H810AE	Connection element
1003640	FEWZ-772E0	Insertion tool receptacle
1003566	FDWZ-100	Insertion tool probe

Series drawing

All measurements are in mm.



Drill size recommendation (mm)

H810...	2.06 - 2.08

Order code	Product name	Power	Sense 1	Ø A	Ø B	C	H	Thread [M]	Version	FM Choice
1001710	F81001S040L170	05	01	0.40	1.50	0.50	6.00	-	-	-
1004548	F81016S040L170	05	16	0.40	1.50	0.50	6.00	-	-	-
1006621	F81001S040L230S1	05	01	0.40	2.00	-1.20	7.80	-	S1	FM Choice
1019049	F81006B080G230S1	06	06	0.80	2.00	-1.20	7.80	-	S1	-
1024032	F81016S040L230S1	05	16	0.40	2.00	-1.80	7.80	-	S1	-



FM Choice

F835

10 A | 138 mil/3.50 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+100°	
Impedanz [Ohm]	50	
Frequenz [GHz]	2	
	Sense	Power
Current [A]	2	10
R typ [mOhm]	30	120

Mechanical specifications

	Sense	Power
Preload [cN]	15; 50	30; 80
Spring force [cN] at nt ±20%	50; 110	70; 300
Nominal travel [mm]	4.0	4.0
Maximum travel [mm]	5.0	5.0

Materials and plating

Contact Sense	BeCu	gold plated
Contact Power	BeCu	gold plated
Barrel	Brass	gold plated
Spring Sense	Spring steel	silver plated
Spring Power	Spring steel	gold plated
Receptacle	Brass	gold plated

Accessories

Further receptacles H885 see page 64.

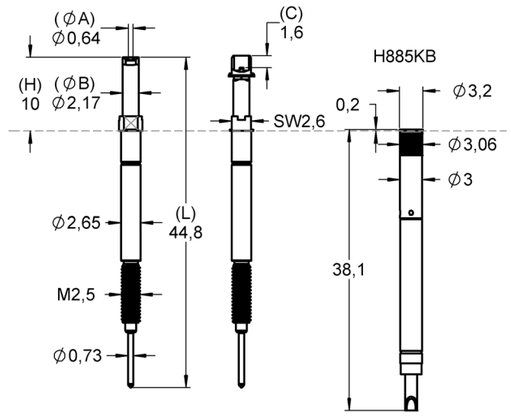
1003642	FEWZ-774E0	Insertion tool receptacle
1009781	FWZ885T	Screw-in tool probe

Drill size recommendation (mm)

Receptacle with knurl	3.00 - 3.02

Series drawing

All measurements are in mm.



Order code	Product name	Power	Sense 1	Ø A	Ø B	C	H	Thread [M]	Version	FM Choice
1028543	F83505B0005G120	50	05	0.52	2.65	-1.60	10.20	M2.5	HFM-M	FM Choice
1029805	F83505B0006G120	50	05	0.52	3.20	-1.90	10.50	M2.5	MATE AX-M	FM Choice
1016274	F83509B0001G180	50	09	0.64	2.17	0.00	10.00	M2.5	-	-
1036948	F83509B0001G410	50	09	0.64	2.17	0.00	10.00	M2.5	-	-
1028639	F83511B0003G120	50	11	0.45	2.66	-0.90	9.00	M2.5	MATE AX-F	FM Choice
1139649	F83511B0009G120	50	11	0.45	2.75	-0.90	9.00	M2.5	-	-
1161312	F83511B0015G400S1	05	11	0.46	3.00	0	10.2	2.5	HFM-F	-
1106909	F83511B0010G120	50	11	0.60	3.20	-0.40	9.20	M2.5	HFM-F	-
1028542	F83512B0004G120	50	12	0.60	3.20	-0.20	9.00	M2.5	HFM-F	FM Choice
1161570	F83511B0016G400S1	05	11	0.46	3.30	-1.05	11.2	2.5	FAKRA-F	-
1010018	F83516B0001G410	50	16	0.64	2.17	0.00	10.00	M2.5	-	-
1033225	F83527B0007G410	50	27	0.64	3.30	6.00	16.00	M2.5	-	-



FM Choice

F822

6 A | 217 mil/5.50 mm | Pluggable

Electrical specifications

Temperature [°C]	-45°...+200°	
Impedanz [Ohm]	50	
Frequenz [GHz]	1.2	
	Sense	Power
Current [A]	1.6	6
R typ [mOhm]	30	60

Mechanical specifications

	Sense	Power
Preload [cN]	100	250
Spring force [cN] at nt ±20%	200	450
Nominal travel [mm]	3.0	2.0
Maximum travel [mm]	3.5	2.6

Materials and plating

Contact Sense	Steel	longtime gold plated
Contact Power	BeCu	gold plated
Barrel	Bronze	unplated
Spring Sense	Stainless steel	unplated
Spring Power	Stainless steel	unplated
Receptacle	Brass	gold plated

Accessories

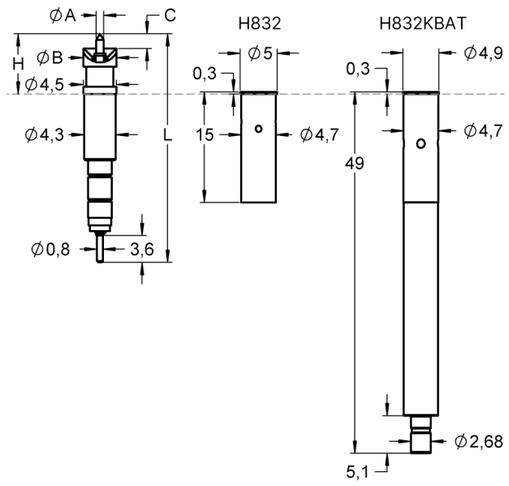
Receptacles H822 / H832 see page 144.		
1017393	FEWZ822E0	Insertion tool receptacle

Drill size recommendation (mm)

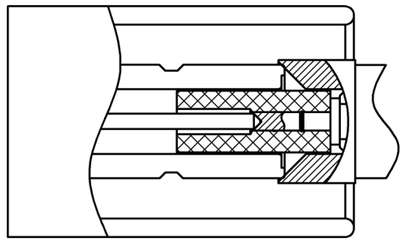
Insulation receptacle H822IS	5.56 - 5.57
Receptacle without knurl	4.68 - 4.69

Series drawing

All measurements are in mm.



The special version F82205S0007L650IK25 has a leading insulating cap at the inner contact for testing position and straightness of the FAKRA connector pin.



Order code	Product name	Power	Sense 1	Ø A	Ø B	C	H	Thread [M]	Version	FM Choice
1017244	F82202S0016L650	05	02	1.50	4.00	1.00	7.20	-	-	-
1017322	F82203S0001L650	05	03	0.60	4.00	2.00	8.20	-	-	FM Choice
1017248	F82203S0003L650	05	03	1.00	4.00	2.00	8.20	-	-	-
1017321	F82203S0011L650	05	03	0.50	4.00	2.00	8.20	-	-	FM Choice
1017249	F82203S0015L650	05	03	1.00	4.50	3.50	9.70	-	-	-
1003343	F82205S0001L650	05	05	1.00	4.00	2.00	8.20	-	-	-
1009720	F82205S0007L650IK25	05	05	0.60	4.00	-2.50	10.5	-	FAKRA Male	FM Choice
1017245	F82209S0016L650	05	09	1.50	4.00	1.00	7.20	-	-	-
1017247	F82211S0012L650	05	11	0.64	4.50	3.50	9.70	-	-	-
1004035	F82217S0006L650	05	17	1.50	4.00	1.00	7.20	-	-	FM Choice
1163350	F83211S2001L450	17	11	0.45	4.85	2.1	9.2	M4x0.5	FAKRA Female	-



FM Choice

F832

6 A | 217 mil/5.50 mm | Threaded

Electrical specifications

Temperature [°C]	-45°...+200°	
Impedanz [Ohm]	50	
Frequenz [GHz]	1.2	
	Sense	Power
Current [A]	1.6	6
R typ [mOhm]	30	60

Mechanical specifications

	Sense	Power
Preload [cN]	100	250
Spring force [cN] at nt ±20%	200	450
Nominal travel [mm]	3.0	2.0
Maximum travel [mm]	3.5	2.5

Materials and plating

Contact Sense	Steel	longtime gold plated
Contact Power	BeCu	gold plated
Barrel	BeCu	gold plated
Spring Sense	Stainless steel	unplated
Spring Power	Stainless steel	unplated
Receptacle	Brass	gold plated

Accessories

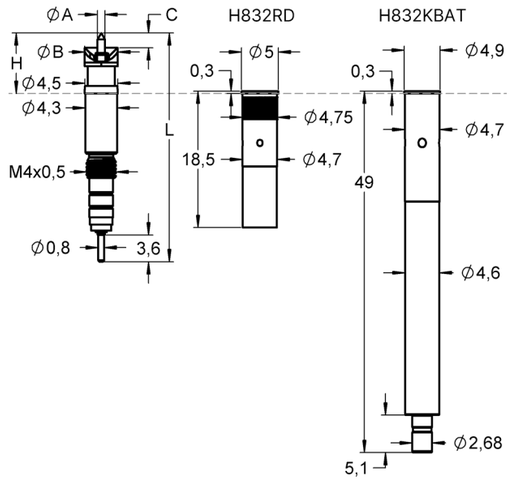
Receptacles H822 / H832 see page 144.		
1017393	FEWZ822E0	Insertion tool receptacle
1017382	FWZ832T	Screw-in tool probe

Drill size recommendation (mm)

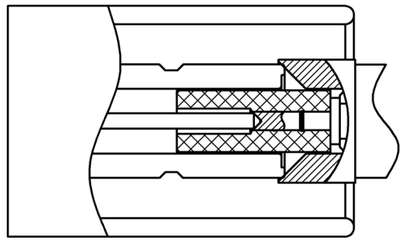
Insulation receptacle H822IS	5.56 - 5.57
Receptacle with knurl	4.70 - 4.72
Receptacle without knurl	4.68 - 4.69

Series drawing

All measurements are in mm.



The special version F82205S0007L650IK25 has a leading insulating cap at the inner contact for testing position and straightness of the FAKRA connector pin.



Order code	Product name	Power	Sense 1	Ø A	Ø B	C	H	Thread [M]	Version	FM Choice
1017306	F83203S0001L650	05	03	1.00	4.00	2.00	8.20	M4x0.5	-	FM Choice
1009719	F83205S0008L650IK10	05	05	0.60	4.00	2.80	9.00	M4x0.5	IK10	FM Choice
1029303	F83205S0007L650IK25	05	05	0.60	4.00	4.30	10.50	M4x0.5	Fakra-Male	FM Choice
1057671	F83211S0021L650	05	11	0.45	3.60	0.50	9.20	M4x0.5	Fakra-Female	FM Choice
1045235	F83211S0022L650	05	11	0.80	5.50	2.00	8.20	M4x0.5	Fakra-Female	FM Choice
1052948	F83216S0023L650	05	16	0.80	5.50	2.00	8.20	M4x0.5	-	FM Choice
1000766	F83239S0001L650	05	39	1.00	5.00	2.00	8.20	M4x0.5	-	-
1022371	F83239S0019L650	05	39	1.00	5.50	2.00	8.20	M4x0.5	-	-

ACCESSORIES FOR F832 / F822

Mounting option 1

Order code: H822
Plug-in receptacle
for soldering
suitable for F822

Order code: H832
Threaded receptacle
for soldering
suitable for F832/F822

Order code: H832RD
Threaded receptacle with knurl
for soldering
suitable for F832/F822

Order code: H822AE
Connection element
plug-in for soldering
suitable for F822/F832

Mounting option 2

Order code: H832KBAT
Threaded coax combi receptacle
with SSMB Mini Connector
suitable for F822/F832

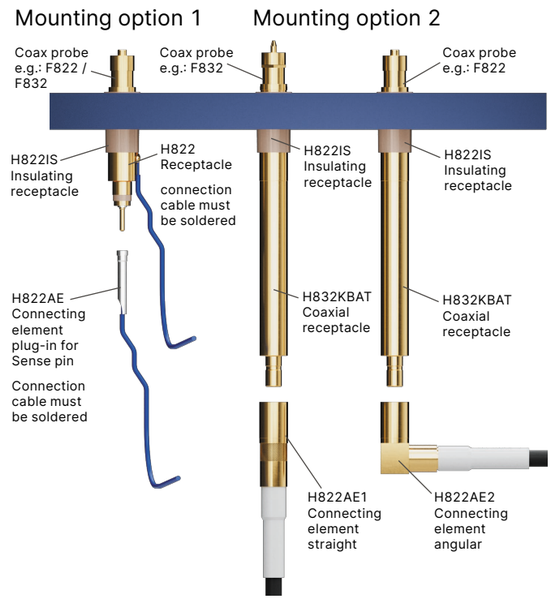
Order code: H822AE1
Connection element with pre-assembled
coaxial cable RG 174 and straight
SSMB Mini Connector
Impedance: 50 Ohm
Standard length: 600 mm

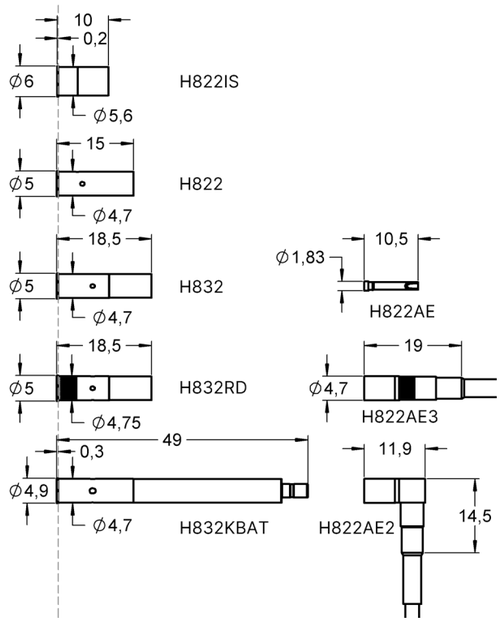
Order code: H822AE2
Connection element with pre-assembled
coaxial cable RG 174 and angled
SSMB Mini Connector
Impedance: 50 Ohm
Standard length: 600 mm

Order code: H822AE3
Connection element with pre-assembled
coaxial cable RG 174 and straight
SSMB Mini Connector
Impedance: 50 Ohm
Standard length: 2000 mm

Additional option

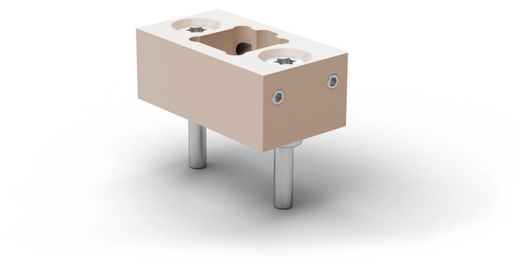
Order code: H822IS
Pluggable synthetic receptacle
(electrically insulated) fits over
mounting receptacle H822... in
electrically conductive material for
drilling of Ø5.55 mm





Drill size recommendation (mm)

Insulation receptacle H822IS	5.56 - 5.57
Receptacle with knurl	4.70 - 4.72
Receptacle without knurl	4.68 - 4.69



NEW

KT836

Mounting blocks for F836

Materials and plating

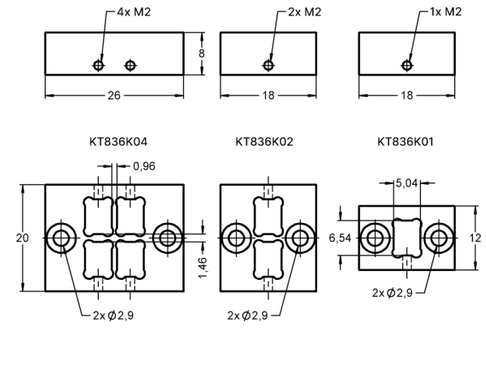
Locating bracket	Peek	unplated

Order code	Product name	For DUT
1168148	KT836K04	quad
1168149	KT836K02	double
1168150	KT836K01	single

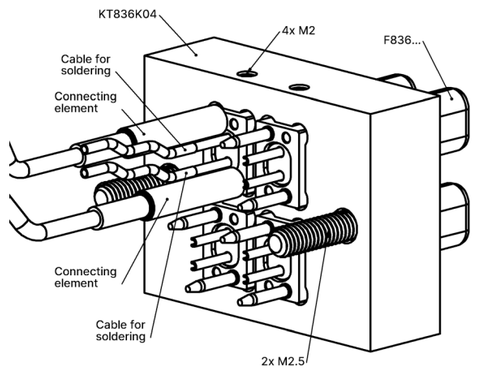
These holders allow the appropriate contact probes for the H-MTD connectors to be easily mounted and aligned. Depending on the test item (single, double, quad), 1-4 probes can be used.

Series drawing

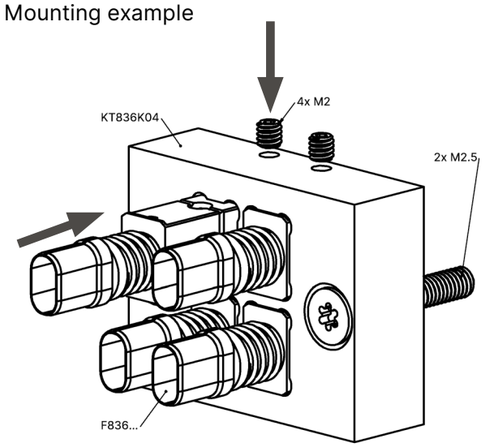
All measurements are in mm.



Connection example



Mounting example





NEW

F836

H-MTD Male 1-fold | no RF function

Electrical specifications

Temperature [°C]	-45°...+80°
Current Internal [A]	1.0
Current Circular [A]	1.0
R typ [mOhm]	100

Mechanical specifications

	2x Signal	1x Ground
Preload (cN)	20	150
Spring force at nt (cN ±20%)	85	450
Nominal travel (mm)	2.0	1.5
Maximum travel (mm)	2.8	2.0

Materials and plating

Contact Signal	Steel	Longtime gold plated
Contact Ground	Brass	gold plated
Barrel	Brass	gold plated
Spring Signal	Spring steel	silver plated
Spring Ground	Spring steel	gold plated

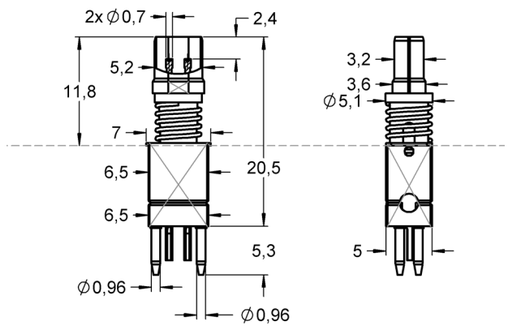
Accessories

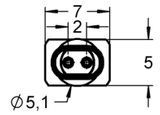
1160169	F11105S090L085S1	Inner pin
1168148	KT836K04	quad
1168149	KT836K02	double
1168150	KT836K01	single

Order code	Product name
1167780	F83605S070L535-HMTDm

Series drawing

All measurements are in mm.





The F83605S070L535-HMTDm is the first dedicated HMTD-male probe developed explicitly for the requirements of wire harness testing. Our probe is intentionally designed without RF functionality, providing a specialized and cost-optimized solution tailored to this application.In addition to being completely airtight, it ensures an exact grid fit, allowing flexible use as a single, double, or quad solution. The design also makes it possible to change the inner pins if necessary, so that the entire probe does not have to be replaced if an inner pin is defective.



NEW

F836

H-MTD Female 1-fold | no RF function

Electrical specifications

Temperature [°C]	-45°...+80°
Current Internal [A]	1.0
Current Circular [A]	1.0
R typ [mOhm]	100

Mechanical specifications

	2x Signal	1x Ground
Preload (cN)	20	150
Spring force at nt (cN ±20%)	85	450
Nominal travel (mm)	2.0	1.5
Maximum travel (mm)	2.8	2.0

Materials and plating

Contact Signal	Steel	Longtime gold plated
Contact Ground	Brass	gold plated
Barrel	Brass	gold plated
Spring Signal	Spring steel	silver plated
Spring Ground	Spring steel	gold plated

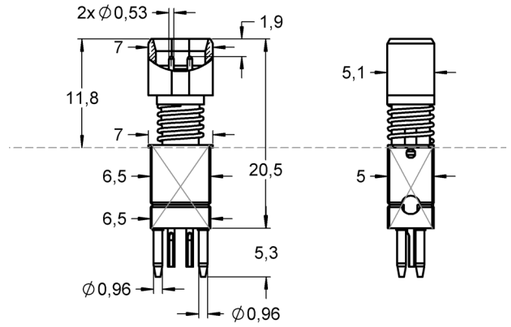
Accessories

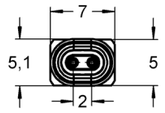
1160146	F11111S053L070S1	Inner pin
1168148	KT836K04	quad
1168149	KT836K02	double
1168150	KT836K01	single

Order code	Product name
1167926	F83611S700L535-HMTDf

Series drawing

All measurements are in mm.





The F83611S053L535-HMTDf is the first dedicated HMTD-female probe developed explicitly for the requirements of wire harness testing. Our probe is intentionally designed without RF functionality, providing a specialized and cost-optimized solution tailored to this application. In addition to being completely airtight, it ensures an exact grid fit, allowing flexible use as a single, double, or quad solution. The design also makes it possible to change the inner pins if necessary, so that the entire probe does not have to be replaced if an inner pin is defective.



NEW

F836

MTD Male 1-fold | no RF function

Electrical specifications

Temperature [°C]	-45°...+80°
Current Internal [A]	1.0
Current Circular [A]	1.0
R typ [mOhm]	100

Mechanical specifications

	2x Signal	1x Ground
Preload (cN)	20	150
Spring force at nt (cN ±20%)	85	450
Nominal travel (mm)	2.0	1.5
Maximum travel (mm)	2.8	2.0

Materials and plating

Contact Signal	Steel	Longtime gold plated
Contact Ground	Brass	gold plated
Barrel	Brass	gold plated
Spring Signal	Spring steel	silver plated
Spring Ground	Spring steel	gold plated

Accessories

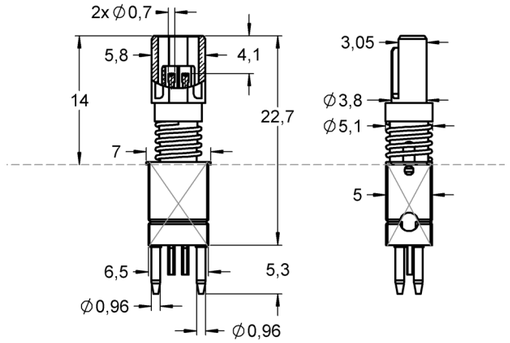
1160169	F11105S090L085S1	Inner pin

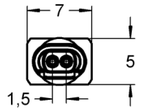
Order code | Product name

1168264	F83605S070L535-MTDm

Series drawing

All measurements are in mm.





The F83605S070L535-MTDm is the first dedicated MTD-male probe developed explicitly for the requirements of wire harness testing. Our probe is intentionally designed without RF functionality, providing a specialized and cost-optimized solution tailored to this application. In addition to being completely airtight, it ensures an exact grid fit, allowing flexible use as a single, double, or quad solution. The design also makes it possible to change the inner pins if necessary, so that the entire probe does not have to be replaced if an inner pin is defective.



NEW

F836

MTD Female 1-fold | no RF function

Electrical specifications

Temperature [°C]	-45°...+80°
Current Internal [A]	1.0
Current Circular [A]	1.0
R typ [mOhm]	100

Mechanical specifications

	2x Signal	1x Ground
Preload (cN)	20	150
Spring force at nt (cN ±20%)	85	450
Nominal travel (mm)	2.0	1.5
Maximum travel (mm)	2.8	2.0

Materials and plating

Contact Signal	Steel	Longtime gold plated
Contact Ground	Brass	gold plated
Barrel	Brass	gold plated
Spring Signal	Spring steel	silver plated
Spring Ground	Spring steel	gold plated

Accessories

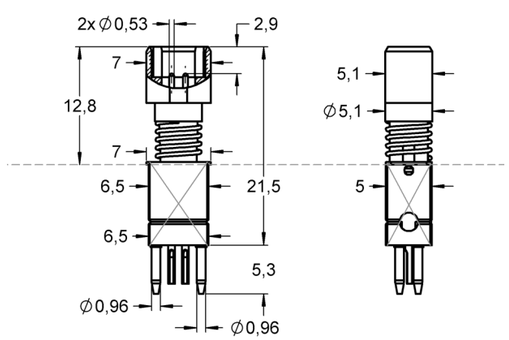
1160146	F11111S053L070S1	Inner pin

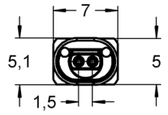
Order code | Product name

1168297	F83611S053L535-MTDf

Series drawing

All measurements are in mm.





The F83611S053L535-MTDf is the first dedicated MTD-female probe developed explicitly for the requirements of wire harness testing. Our probe is intentionally designed without RF functionality, providing a specialized and cost-optimized solution tailored to this application. In addition to being completely airtight, it ensures an exact grid fit, allowing flexible use as a single, double, or quad solution. The design also makes it possible to change the inner pins if necessary, so that the entire probe does not have to be replaced if an inner pin is defective.



NUMBER CODE SYSTEM

Explanation of our product names

In order to show how our material description is built, the current valid number code system is explained below:

Type / Series		Number of poles		Spring force [cN]		Mounting type
HF77	HMTD f	04	20G	4080	HMTDm	F
	DUT		Frequency [GHz]		Connection plug	

DUT

Connector e.g. H-MTD, FAKRA, HSD...
m = Plug (Male)
f = Jack (Female)

Number of poles

01 = 1-fold (Single)
02 = 2-fold (Double)
04 = 4-fold (Quad)
06 = 6-fold (Six)

Plating Plunger

G = Gold plating
L = Longtime gold plating

Frequency

20 = 20 GHz

Spring force

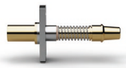
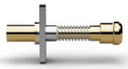
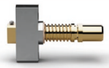
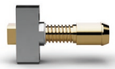
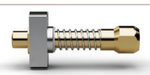
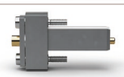
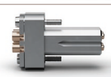
4080 = 4080 cN

Connection plug

Connector e.g. H-MTD, MCX, mSMP...
m = Plug (Male)
f = Jack (Female)

Mounting type

P = Pluggable
S = Threaded
F = Flange

For DUT	Order code	Product name	Picture Probe
FAKRA Female	1029428	HF860FAKRAf016G930MCXmP	
FAKRA Female	1142304	HF86FAKRAf016G775MCXmF	
FAKRA Male	1037623	HF66FAKRAm016G775MCXfF	
FAKRA Male	1033408	HF860FAKRAm016G550MCXmP	
HFM® Female	1051503	HF77HFMf0112G540MSMPmF	
HFM® Female	1050858	HF77HFMf0412G2160MSMPmF	
HFM® Male	1036171	HF77HFMm0112G540MSMPmFV01	
HFM® Male	1034901	HF77HFMm0412G2160MSMPmF	
H-MTD Female	1104600	HF77HMTDf0120G1020HMTDmF	
H-MTD Female	1110047	HF77HMTDf0420G4080HMTDmF	
H-MTD Male	1051338	HF77HMTDm0114G1020HMTDmF	
H-MTD Male	1050859	HF77HMTDm0414G4080HMTDmF	
HSD Female	1033153	HF819HSDf011G2020H819AEPP	
HSD Male	1044571	HF829HSDm013G1860HSDmF	
MateAX® Female	1056232	HF77MATEAXf0112G540MSMPmP	
MateAX® Female	1051198	HF77MATEAXf0412G2160MSMPmF	
MateAX® Male	1116970	HF77MATEAXm0112G540MSMPmFV02	
MateAX® Male	1035528	HF77MATEAXm0412G2160MSMPmF	

TOOLS & ACCESSORIES



INSERTION TOOLS FEWZ

Insertion tool for receptacles with fixed stop
All receptacles with a so-called „dead stop“ (the collar) can be inserted with tool FEWZ-...E0. Receptacles with a press ring can also be used as a dead stop.
The guiding pin of the tool offers stabilization and a prober mounting of the receptacle.



Order code	Product name	Pin Ø [mm]	For receptacle
1054103	FEWZ-109E0	0,5	H109
1000180	FEWZ-040E0	0,63	H040, H111, H112, H511, H605, H665, H730
1014313	FEWZ-050E0	0,8	H050, H787, H051
1014311	FEWZ-075E0	0,9	H075, H175, H176, H310, H701
1014264	FEWZ-100E0	1,3	H100, H320, H502, H708, H731, H805, H863, H865
1003640	FEWZ-772E0	1,6	H772, H727, H732, H752, H875, H876, H877, H878, H879
1005041	FEWZ-563E0	2,0	H563
1003642	FEWZ-774E0	2,6	H774, H566, H713, H723, H733, H735, H737, H773, H810, H866, H867, H880, H881, H884, H885,
1005027	FEWZ-735E0	3,5	H735, H725, H775
1017393	FEWZ-822E0	4,2	H822, H832, H860
1035560	FEWZ-888	5,2	H888RD
1035561	FEWZ-888S1	6,4	H888RDS1

Variable insertion tool for receptacles
In case of different height levels of the receptacles with a inserted press ring, the tool FEWZ-...EV is recommended. The required insertion height can be adjusted at the tool.



Order code	Product name	Insertion height	For receptacle
1008393	FEWZ-050EV	0 - 10	H050; H787
1008325	FEWZ-075EV	0 - 12	H075
1008392	FEWZ-100EV	0 - 12	H100
1008394	FEWZ-772EV	0 - 10	H772

INSERTION TOOLS FAWZ / FDWZ

Insertion tool FAWZ for twist proof receptacles
In order to ensure that the anti-twist protection of the probes is really effective, the receptacle must be loaded into the test fixture already aligned during assembly. This can be done with an alignment tool of FEINMETALL (FAWZ...).
The alignment tool can also be clamped in a hand lever press.



Advantage:
One-time alignment of the Alignment tool in the fixture.

Order code	Product name	BIT	Handle	Length [mm]	For receptacle
1018321	FAWZ751	AS751	GSFAWZ500	118	H751
1024631	FAWZ755	AS755	GSFAWZ500	118	H755
1003611	FAWZ756	AS756	GSFAWZ500	118	H756
1004180	FAWZ761	AS761	GSFAWZ500	118	H760, H762
1007887	FAWZVF3	ASVF3	GSFAWZ500	139,6	HVF3
1008226	FAWZVF4	ASVF4	GSFAWZ500	124	HVF4
1014467	FAWZVF100	ASVF100	GSFAWZ500	129	HVF100

Insertion tools FDWZ for plug-in contact probes
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.



Order code	Product name	Length [mm]	Shank Ø [mm]
1052633	FDWZ-039	67.5	A-Ø=1.0; I-Ø=0.55
1003576	FDWZ-050	100.0	1.5
1003587	FDWZ-075	100.0	2.5
1003566	FDWZ-100	100.0	3.5
1020967	FDWZ-500	100.0	A-Ø= 6.0; I-Ø= 4.1

SCREW-IN TOOLS FWZ

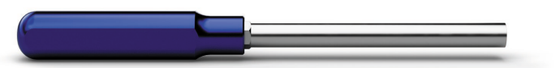
Hook wrench
The hook wrench is the standard tool for all probes with square wrench sizes even if the head diameter is larger than the wrench size.







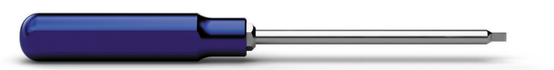
Socket wrench
The socket wrench can be used for square wrench sizes if the head diameter is smaller than the wrench size. The tool helps to assemble probes within small centers.

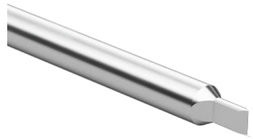






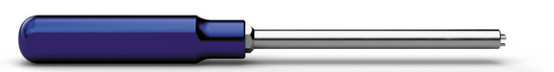
Screw driver
Screw drivers can be used if the contact area has any support (e.g. serrated honeycomb or slit) and the head has an integrated locking system.







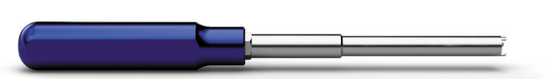
Tool for Coaxial Probes
For the mounting of large outer conductors FEINMETALL has developed a special tool that enables applications with limited space between the probes.







Tool for Step Probes
For assembly of oversized Step Probes we has developed a special tool for applications with very limited space between the probes.







MODULAR DESIGN OF SCREW-IN TOOLS

Combination Options of Screw-in Tools

Bits and handles can be ordered separately. The handles are color marked due to the wrench size (SW). For each bit a standard handle as well as a handle with ratchet and a bit holder for usage in the cordless screw-driver are available. Each handle can be used with the same bits that are available for all contact probes.

	Bit holder for cordless screwdriver		Handle with ratchet		Handle		BIT
SW3	1022398	GS300TA	1006554	GS300T	1008816	GS300	
SW4	1022399	GS400TA	1006555	GS400T	1008809	GS400	
SW5	1022397	GS500TA	1006169	GS500T	1007865	GS500	

SCREW-IN TOOLS FOR THREADED PROBES




SW [mm]	Tip Ø max. [mm]	Shank Ø [mm]	Bit type	FWZ	Handle	Bit	FWZ...T	Handle	Used for (e.g.)
1.0	0.9	1.4	Socket wrench	FWZ730	GS300	BIT730	FWZ730T	GS300T	F730
1.0	1.5	2.0	Hook wrench	FWZ730S1		BIT730S1	FWZ730S1T		F175, F176, F730, PS175




SW [mm]	Tip Ø max. [mm]	Shank Ø [mm]	Bit type	FWZ	Handle	Bit	FWZ...T	Handle	Used for (e.g.)
1.4	1.3	2.4	Socket wrench	FWZ731S1	GS400	BIT731S1	FWZ731S1T	GS400T	F731
1.4	2.0	2.8	Hook wrench	FWZ731		BIT731	FWZ731T		F731
1.4	2.0	2.8	Hook wrench	FWZ731L		BIT731L	FWZ731LT		F731
1.7	1.8	2.7	Socket wrench	FWZ732S2		BIT732S2	FWZ732S2T		F732 (C)
1.7	2.0	2.8	Socket wrench	FWZ732		BIT732	FWZ732T		F722, F732 (C), F727, F756, F873, F875
1.7	2.0	2.8	Hook wrench	FWZ732L		BIT732L	FWZ732LT		F722, F732 (C), F727, F756, F873, F875
1.7	2.7	3.5	Hook wrench	FWZ732S1		BIT732S1	FWZ732S1T		F722, F732 (C), F727, F756, F873, F875
1.8	1.9	2.8	Socket wrench	FWZVF100		BITVF100	FWZVF100T		VF100
1.8	2.7	3.5	Hook wrench	FWZVF100S1		BITVF100S1	FWZ-VF100S1T		VF100

SCREW-IN TOOLS FOR THREADED PROBES




SW [mm]	Tip Ø max. [mm]	Shank Ø [mm]	Bit type	FWZ	Handle	Bit	FWZ...T	Handle	Used for (e.g.)
2.2	2.3	3.5	Socket wrench	FWZVF3S4	GS500	BITVF3S4	FWZVF3S4T	GS500T	VF3
2.2	2.7	3.5	Hook wrench	FWZVF3		BITVF3	FWZVF3T		VF3
2.2	3.1	4.0	Hook wrench	FWZVF3S1		BITVF3S1	FWZVF3S1T		VF3
2.2	2.3	3.5	Socket wrench	FWZVF3S2		BITVF3S2	FWZVF3S2T		VF3, F880
2.2	4.0	5.0	Hook wrench	FWZVF3S3		BITVF3S3	FWZVF3S3T		VF3
2.5	3.1	4.0	Hook wrench	FWZVF4S1		BITVF4S1	FWZVF4S1T		VF4, F887
2.5	4.0	5.0	Hook wrench	FWZVF4		BITVF4	FWZVF4T		VF4, F887
2.6	2.5	3.8	Socket wrench	FWZ885		BIT885	FWZ885T		F835, F881, F883, F885
2.6	2.5	3.8	Socket wrench	FWZ885L		BIT885L	FWZ885LT		F835, F881, F883, F885
2.6	3.1	4.0	Hook wrench	FWZ885S1		BIT885S1	FWZ885S1T		F835, F881, F883, F885, F886
2.6	4.0	5.0	Hook wrench	FWZ760S1		BIT760S1	FWZ760S1T		F760, F835, F881, F883, F885, F886
2.6	4.9	6.5	Hook wrench	FWZ760S2		BIT760S2	FWZ760S2T		F760, F835, F881, F883, F885, F886
3.0	3.0	5.0	Socket wrench	FWZ733S1		BIT733S1	FWZ733S1T		F723 (C), F733 (C), F737, F755
3.0	4.0	5.0	Hook wrench	FWZ733		BIT733	FWZ733T		F723 (C), F733 (C), F737, F755
3.0	4.0	5.0	Hook wrench	FWZ733L		BIT733L	FWZ733LT		F723 (C), F733 (C), F737, F755
3.5	4.4	5.5	Hook wrench	FWZ735		BIT735	FWZ735T		F735 (C), F725 (C)
5.0	-	8.0	Hook wrench	FWZ888		BIT888	FWZ888T		F888
6.0	5.9	8.0	Socket wrench	FWZ348		BIT348	FWZ348T		F348, F349
-	-	4.0	3-point tool	FWZ832		BIT832	FWZ832T		F832
-	-	3.0	Screw driver	FWZ886		BIT886	FWZ886T		F88617...

SCREW-IN TOOLS FOR STEP PROBES




Probe	Tip Ø max. [mm]	Plate Ø max. [mm]	Shank Ø [mm]	Bit type	FWZ	Handle	Bit	FWZ...T	Handle
F730...SP	0.3 - 0.9	0.4 - 1.0	1.7	Socket wrench	FWZ730		BIT730	FWZ730T	
	0.3 - 1.5	0.4 - 1.5	2.0	Hook wrench	FWZ730S1	GS300	BIT730S1	FWZ730S1T	GS300T
F175...SP	0.3 - 1.5	0.4 - 1.5	2.0	Hook wrench	FWZ730S1		BIT730S1	FWZ730S1T	




Probe	Tip Ø max. [mm]	Plate Ø max. [mm]	Shank Ø [mm]	Bit type	FWZ	Handle	Bit	FWZ...T	Handle
F731...SP	0.3 - 1.4	0.4 - 1.4	2.4	Socket wrench	FWZ731S1		BIT731S1	FWZ731S1T	
	0.3 - 1.4	0.4 - 1.4	2.4	Socket wrench	FWZ731S1L		BIT731S1L	FWZ731S1LT	
	0.3 - 2.0	0.4 - 2.0	2.8	Hook wrench	FWZ731		BIT731	FWZ731T	
	0.3 - 2.0	0.4 - 2.0	2.8	Hook wrench	FWZ731L		BIT731	FWZ731LT	
	0.3 - 1.0	1.8 - 3.0	1.85	3-point tool	FWZ731SP		BIT731SP	FWZ731SPT	
F732...SP	0.3 - 1.6	0.4 - 1.7	2.7	Socket wrench	FWZ732S2		BIT732S2	FWZ732S2T	
	0.3 - 2.0	0.4 - 2.0	2.8	Hook wrench	FWZ732		BIT732	FWZ732T	
	0.3 - 2.0	0.4 - 2.0	2.8	Hook wrench	FWZ732L	GS400	BIT732L	FWZ732LT	GS400T
	0.3 - 2.7	0.4 - 1.7	3.5	Hook wrench	FWZ732S1		BIT732S1	FWZ732S1T	
	0.3 - 1.5	2.1 - 6.0	2.4	3-point tool	FWZ732SP		BIT732SP	FWZ732SPT	
	0.3 - 1.5	2.1 - 6.0	2.4	3-point tool	FWZ732SPL		BIT732SPL	FWZ732SPLT	
F732...SP1	1.51 - 2.2	2.8 - 6.0	3.1	3-point tool	FWZ732SP1		BIT732SP1	FWZ732SP1T	
F733...SP	3.31 - 6.8	3.5 - 7.0	2.4	3-point tool	FWZ732SP		BIT732SP	FWZ732SPT	
F733...SP1	0.3 - 2.2	3.0 - 4.0	3.1	3-point tool	FWZ732SP1		BIT732SP1	FWZ732SP1T	



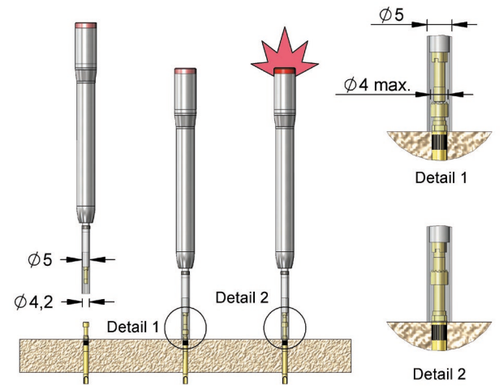

Probe	Tip Ø max. [mm]	Plate Ø max. [mm]	Shank Ø [mm]	Bit type	FWZ	Handle	Bit	FWZ...T	Handle
F733...SP	0.3 - 2.9	0.4 - 3.0	5.0	Socket wrench	FWZ733S1		BIT733S1	FWZ733S1T	
	0.3 - 3.3	3.31 - 7.0	4.2	3-point tool	FWZ733SP		BIT733SP	FWZ733SPT	
	0.3 - 3.3	3.31 - 7.0	4.2	3-point tool	FWZ733SPL	GS500	BIT733SPL	FWZ733SPLT	GS500T
	0.3 - 4.0	0.4 - 4.0	5.0	Hook wrench	FWZ733		BIT733	FWZ733T	
	0.3 - 4.0	0.4 - 4.0	5.0	Hook wrench	FWZ733L		BIT733L	FWZ733LT	
F737...SP	0.3 - 3.0	0.4 - 3.0	5.0	Socket wrench	FWZ733S1		BIT733S1	FWZ733S1T	

SCREW-IN TOOLS WITH SIGNAL INDICATOR

Tool for detection of blocked or tight plunger

With this tool the correct function of contact probes built in at test modules or fixtures can be tested very quickly (max. spring force 600 cN). Thereby a potential damage of connector elements can be avoided.

- Simple tool with integrated switch probe (F885) and light signal
- Test height (nominal travel) adjustable by threaded sleeve
- Spring force adjustment possible by exchange of the integrated switch probe





Order code	Product name	max. Tip Ø [mm]	Batteries *
1012276	32001 Blocking Tester	4.1	2x AAAA 1,5 V
1026119	32002 Blocking Tester	2.2	2x AAAA 1,5 V
1026100	32003 Blocking Tester Set	Set composed of: 32001 + adaption for 32002	

* Batteries not included in delivery

Screw-in Tools with Signal Indicator

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 light signal which is illuminated as soon as the switch circuit is closed.





Order code	Product name	SW [mm]	Shank Ø [mm]	Batteries *	For contact probe
1009980	FWZ880SA	2.2	3.7	2x AAAA 1,5 V	F880...
1009978	FWZ888SA	5.0	8.0	2x AAAA 1,5 V	F88890S1101U200S05
1009979	FWZ888SA1	5.0	8.0	2x AAAA 1,5 V	F88890S1102U100S07

* Batteries not included in delivery



FZWZ-SET-001

1147833 - Removal tool for receptacles with basic equipment

With the removal tool, receptacles can be removed from a bore without damaging it. This is also possible with broken receptacles or if you do not have the possibility to knock the receptacles out from the back.

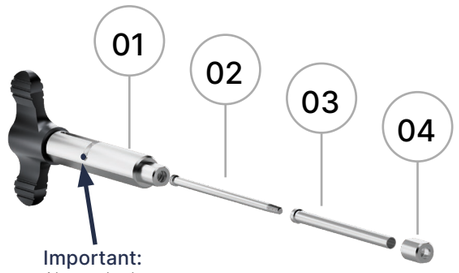
Included in delivery of basic kit FZWZ-SET-001

1030290	GSFZWZ	Handle and screw nut
1006304	1VERP0048	Box for single parts
1030237	2105149	Pliers
1030296	HZ-100-01-1	Guiding sleeve
1030295	BZ-100-01-1	Thread inserts

Order code	Product name
1147833	FZWZ-SET-001

Assembly

01 - Handle (GSFZWZ)
02 - Thread insert (BZ)
03 - Guiding sleeve (HZ)
04 - Screw-nut



Important:
Always lock the tool before mounting!

Available guiding sleeves (HZ) and thread inserts (BZ)

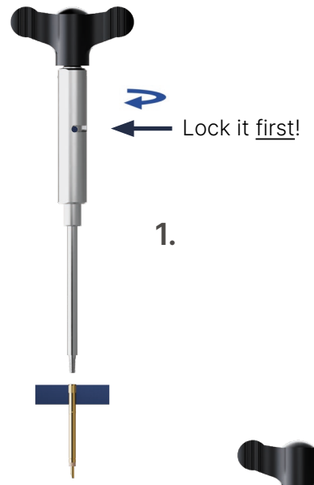
Combination Thread inserts & Guiding sleeve					For receptacles
1124669	BZ-050-01-1	&	1127507	HZ-050-01-1	H720; H730, H050, H787
1030405	BZ-075-01-1	&	1030294	HZ-075-01-1	H121; H075; H175; H176; H310; H561; H701; H863
1030295	BZ-100-01-1	&	1030296	HZ-100-01-1	H722; H727; H732; H752; H756; H757; H772; H875; H878
1030297	BZ-100-02-1	&	1030296	HZ-100-01-1	H320; H610; H865
1030297	BZ-100-02-1	&	1030298	HZ-100-02-1	H100; H502; H708; H731; H751; H805
1043575	BZ-118-01-1	&	1043745	HZ-118-01-1	H563, HVF3
1030291	BZ-157-01-1	&	1030292	HZ-157-01-1	H762; H866; H867; H887
1030291	BZ-157-01-1	&	1030293	HZ-157-01-2	H723; H733; H737; H760; H761; H773; H774; H880; H881; H884; H885, HVF4

Further variants are updated on the homepage under feinmetall.com/produkt-finder

OPERATING INSTRUCTIONS FZWZ

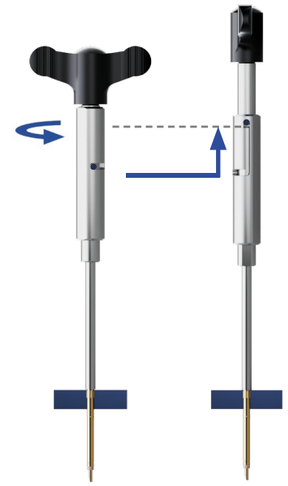
Step-by-step-Instruction

1. Make sure that the handle is locked! Screw the tool clockwise into the mounted receptacle until a few turns are cut. This is the case when the screwing in becomes stiffer or the guiding sleeve (03) touches the module.



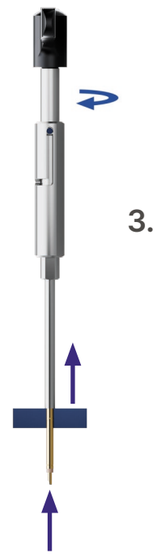
2. Release the lock: Turn the entire tool back slightly counterclockwise so that the lock can be released more easily. Then hold the flattened surfaces and turn the handle counterclockwise.

3. Continue turning the tool clockwise. The receptacle pulls upwards from the mounting plate, into the guiding sleeve and can be removed.



4. Remove the receptacle from the tool with the nipper by screwing it counterclockwise from the tool. The sleeve can be bent by 30°- 90°.

5. For reuse, the thread insert must be screwed all the way down so that the lock can be set.





FK50

Spring force gauge up to 50N

The Spring Force Gauge allows force measurements of all types of spring contact probes up to 50 N. 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.

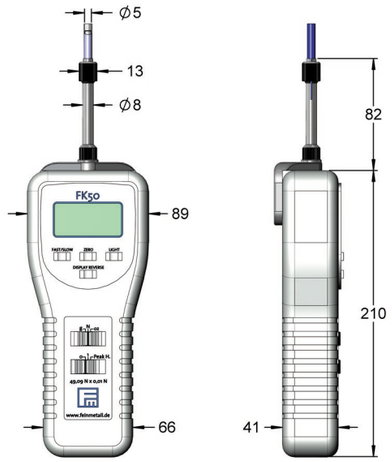
Technical specifications

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 (order code 2111810)
Power supply	6 x 1,5V AA (UM-3 batteries) (Batteries not included in delivery)

Order code	Product name
1147834	FK50-SET-001
1010424	Data cable RS232

Included in delivery

1x Spring Force Gauge with receptacle for measuring sleeve
1x Measuring sleeve Ø 5,0mm
1x Calibration certificate
1x Carrying case



Operating manual available on request. Further rigid measuring sleeves with different diameters and fixed projection heights are available on the homepage.

Example for height adjustment at measuring sleeve



Projection height of probe (e.g. F732)	=	10.5 mm
Nominal travel	=	4.0 mm
Projection height - Nominal travel	=	10.5 mm - 4.0 mm
Setting value	=	6.5 mm

FK50

Further accessories

Adjustable measuring sleeves

The adjustable measuring sleeves can be adjusted to a defined dimension using a locking screw.



Order code	Product name	Discription	Inner ØA [mm]	Outer ØB [mm]	Projection height [mm]
1041981	MS300	Measuring sleeve Ø 3 mm	3.0	4.0	0 - 40.5
1041978	MS400	Measuring sleeve Ø 4 mm	4.0	5.0	0 - 40.5
1041979	MS500	Measuring sleeve Ø 5 mm	5.0	6.0	0 - 40.5

Rigid measuring sleeves with fixed stop

Rigid measuring sleeves for repeating measurements at probes with fixed projection heights are available with different diameters.

Order code	Product name	For series	Inner ØA [mm]	Outer ØB [mm]	Projection height [mm]	Nominal travel [mm]
1011310	MS230E065	F732	2.3	2.7	10.5	4.0
1011322	MS360E065	F733	3.6	4.0	10.5	4.0
1011323	MS270E355	VF3	2.7	3.2	40.5	5.0
1011324	MS370E355	VF4	3.7	4.2	40.5	5.0



BOXES

Wide range of tools

FEINMETALL offers a full selection of tools and accessories designed specifically for assembly and maintenance of contact probes and receptacles. These tools and accessories ensure effective installation and flawless contact functionality.

FM-SAMPLEBOX-07

1028164 - Samplebox with Step Probes

Sample box with a large variety of Step Probes

3D-models of our Step Probes on request on USB data carrier available.



FM-TOOLBOX-SET-001

1010467 - Toolbox for Mounting Tools

Included:

22 x Bits
3 x Handles (standard)
3 x Handles (witch ratched)
2 x Alignment tools witch 1x handle
2 x Screwdriver



* 1004750 - Only Toolbox (empty)

FM-TOOLBOX-SET-002

1022852 - Cordless Screwdriver set

Included:

1 x Cordless screwdriver (shape changeable from pistol to straight shape)
1 x Power connector for 230V
3 x Magnetic holder with different ratchets
2 x Empty boxes for probes and accessories
1 x Bit box with 15 empty slots for bits



FK50

1147834 - Toolbox with Spring Force Gauge

Included:

1 x Spring force gauge with receptacle for measuring sleeves
1 x Measuring sleeve Ø5,0 mm
1 x Calibration certificate



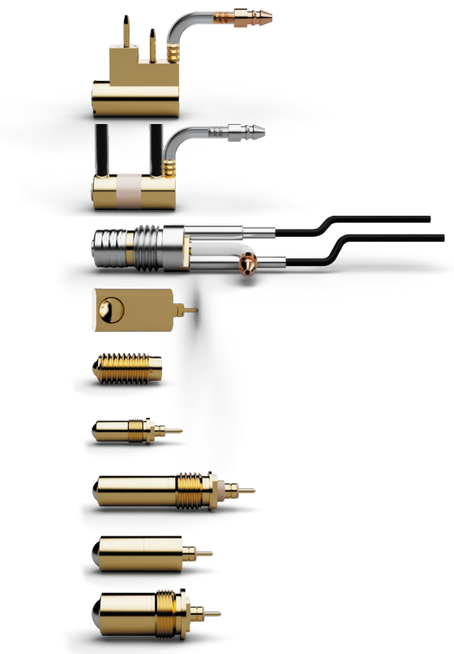
Different Probes

Type	Barrel-Ø [mm]	Length [mm]
PS175	1.00	36.7
PS756	1.64	41.6
PS732	1.65	36.1
PS733	2.65	28.8
HV33085S1 (RIGID PIN)	1.65	36.1
HV33086S1 (RIGID PIN)	2.65	28.8
HV01	1.00	36.7
HV02	1.64	41.6



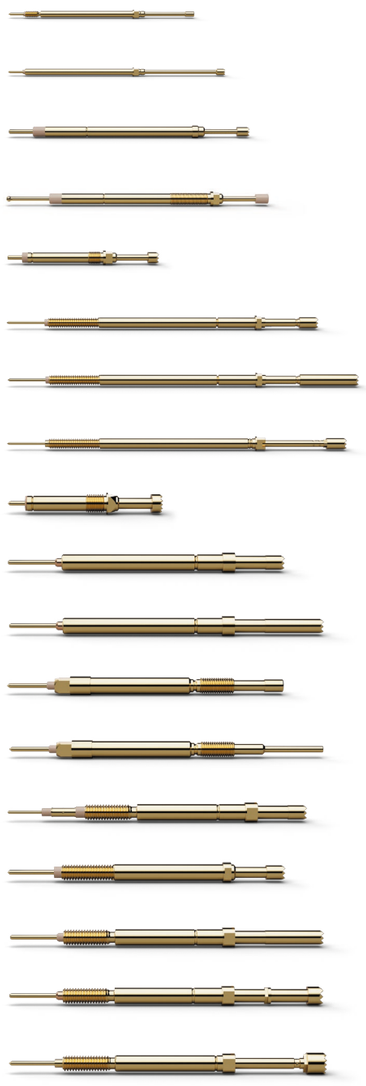
Switch Probes (Ball head/Pneumatic)

Type	Barrel-Ø [mm]	Length [mm]
F898	6.0	14.0
F899	6.0	min. 13.9
F899Pxxx	M8	21.7
F88990S0001U120S06	7.85	19.3
F88890M2104G150	M5	11.0
F88890S1101U130S035	3.46	15.0
F88890S1101U200S05	4.96	26.3
F88890Sx003U100S	6.00	19.9
F88890S1102U100S07	7.0	21.0



Switch Probes

Type	Barrel-Ø [mm]	Length [mm]
F863	1.00	30.2
F863L	1.00	35.2
F878	1.65	39.3
F876	1.65	42.3
F879	1.65	24.5
F873 / F875	1.65	50.6
F875L	1.65	57.1
F375	1.66	55.2
F887 / F487	2.46	25.0
F884SM	2.65	44.8
F884LM	2.65	51.3
F880	2.65	44.8
F880L	2.65	51.3
F881	2.65	48.6
F883 / F885 / F485	2.65	44.8
F883L / F885L	2.65	51.3
F886/ F886L	2.65	44.8 / 51.3
F385	2.65	51.6



Extractor Probe

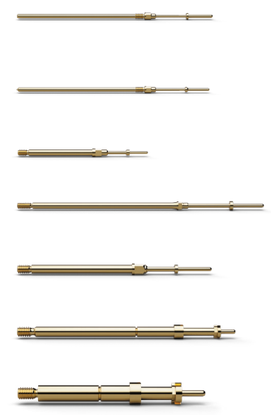
Type	Barrel-Ø [mm]	Length [mm]
F78017M580U400	6.0	23.5



PRODUCT PRESENTATION ON A SCALE OF 1:1

Step Probes

Type	Barrel-Ø [mm]	Length [mm]
F730SP	0.68	28.9
F720SP	0.68	31.6
F176SP	1.00	19.0
F175SP	1.00	35.9
F731SP	1.37	27.9
F732SP	1.65	35.7
F733SP	2.65	28.3



Threaded Probes

Type	Barrel-Ø [mm]	Length [mm]
F730	0.68	28.9
F720	0.68	31.6
F176	1.00	19.0
F175	1.00	35.9
F731	1.37	27.9
F722	1.65	11.0
F724	1.65	19.5
F732	1.65	35.7
F727	1.65	67.5
F723	2.65	17.1
F733	2.65	28.3
F734	2.65	34.0
F737	2.65	57.3

Twist Proof- / Push Back Probes

Type	Barrel-Ø [mm]	Length [mm]
F752S	1.65	35.0
F752L	1.65	38.0
F754S	2.65	35.0
F754L	2.65	39.0
F756	1.64	41.6
F760S	1.65	35.0
F760L	1.65	38.0
F755...E13	2.65	38.0
F755...E15	2.65	40.0
V04	3.00	82.0
VF100	2.20	69.5
VF3	2.19	69.7
VF4	3.00	69.7



Kelvin Probes

Type	Barrel-Ø [mm]	Length [mm]
F800	1.65	35.0 / 38.0
F805	1.42	31.0
F810	1.78	34.0
F835	2.65	44.8
F822	2.65	31.0
F832	2.65	31.0
F840	5.50	44.85



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