FEINMETALL
Contact Technologies

E-MOBILITY & POGO SOLUTIONS

Advanced solutions for Testing,
Formation and Non-Test applications

> FEINMETALL.COM

TESTING THE FUTURE

CONTENT

PASSION FOR FINEST TECHNOLOGY

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 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 milestones in the world of test engineering.

Broad competence in-house

The development and manufacturing of spring contact probes, special contact solutions and Semiconductor Wafer Test 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 acting in the international hightech industry and our processes are aligned accordingly. With nine subsidiaries worldwide and a strong network of well trained partners we are always connected 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 to 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 customer and have a deep knowledge of the practical applications. Our know-how is your advantage!

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

OVERVIEW OF 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)

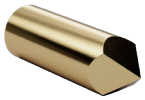
42 
5-point crown stepped

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 TIP STYLES AND APPLICATIONS

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.

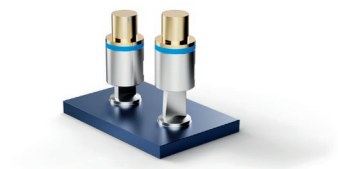
TYPICAL TIP STYLES AND APPLICATIONS

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.

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.

Max. Operating voltage

Voltmeters must always be connected in parallel with the electrical device or component on which the voltage is to be 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*.

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.

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.

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 comes into play in all our products with electrically insulating functions, e.g. switching probes, switching receptacles, combination receptacles, coaxial probes and insulating caps.

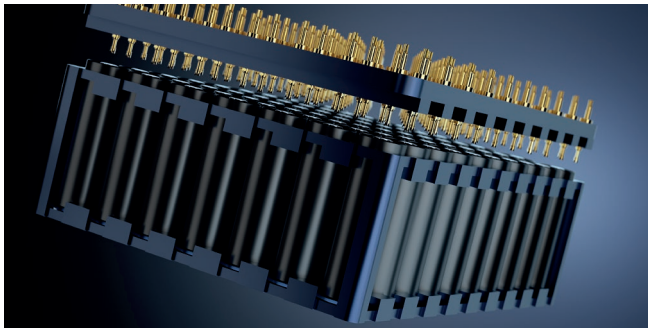
APPLICATIONS

Battery Testing

Testing is a crucial process in the development and production of battery cells to ensure that the battery cells meet the required performance, safety and quality standards. Among other things, voltage, current and resistance tests are carried out for this purpose. In addition, charging and discharging cycles as well as the heat development of the battery cells must be monitored.

Battery Formation

The purpose of the forming process is to stabilize and optimize the chemical and electrical properties of the battery cell. During this process, the battery cell is charged and discharged several times.
A constant and low-resistance contact is crucial for the quality of the cell.



High Current Test

High current contacting refers to the technology and methods used to make electrical connections that can carry particularly high currents. High current contacting is used in many industries, including the automotive industry, electric vehicles, renewable energy (such as wind turbines), heavy industry, electric welding, high-performance electronics and other applications where high electrical currents flow.

Pogo Connectors

Pogo Connectors are the hidden champions in the world of contacting. They are particularly suitable as charging contacts and as interfaces for data transmission. But Pogo Connectors are also used in many end products where low-wear electrical contacts are required. Wherever quick-release electrical connections are needed, Pogo Connectors can be a clever solution. From charging rechargeable batteries to applications in medical technology, all the way to use in the furniture and lighting industry.

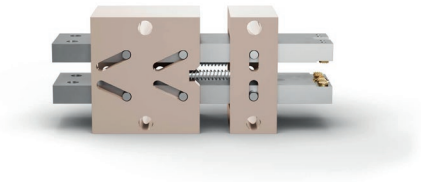
TYPES OF HIGH CURRENT SOLUTIONS

High Current Blocks
By integrated spring loaded contact elements this block allows contacting uneven or inclined surfaces with a very low contact resistance. The block should be mounted directly into conductive material to make use of the whole contact surface.

High Current Block

Solutions for contacting flat blade connectors
Due to the twist proof design the plunger can be moved to the test item well aligned. As soon as the plunger meets the blade and is pushed in, it makes a twist movement of up to 20°. Therefore it adapts to the surface and creates a line contact without causing any scratching or damaging of the DUT.

Contacting of flat blades



High Current Probes with bias ball design
These probes are designed to optimize the electrical contact between plunger and barrel by an integrated ball between spring and inclined plunger. As soon as the plunger is compressed, the mechanical force leads to an optimal contact to the barrel.

Bias ball design

High Current Probes with split plunger design
These probes are designed to optimize the contact between plunger and barrel as soon as they are pushed in. The result is an optimized current flow through the barrel, with a minimized current flow through the spring.

Split Plunger Design / Special tip with silver alloy

High Current Probes with continuous plunger
They have the lowest internal resistance and therefore allow the highest currents. If the connection is made at the end of the plunger, this connection is moving synchronously with the plunger. Therefore such a connection wire needs to be flexible to avoid damages of the wire.

Continuous plunger

High Current Probes with coaxial design
For charging and discharging of accumulator and battery cells with simultaneous measuring of the voltage special coaxial High Current Probes have been developed.

Coaxial design

BATTERY CELL TEST AND FORMATION

Enhanced Quality and Efficiency

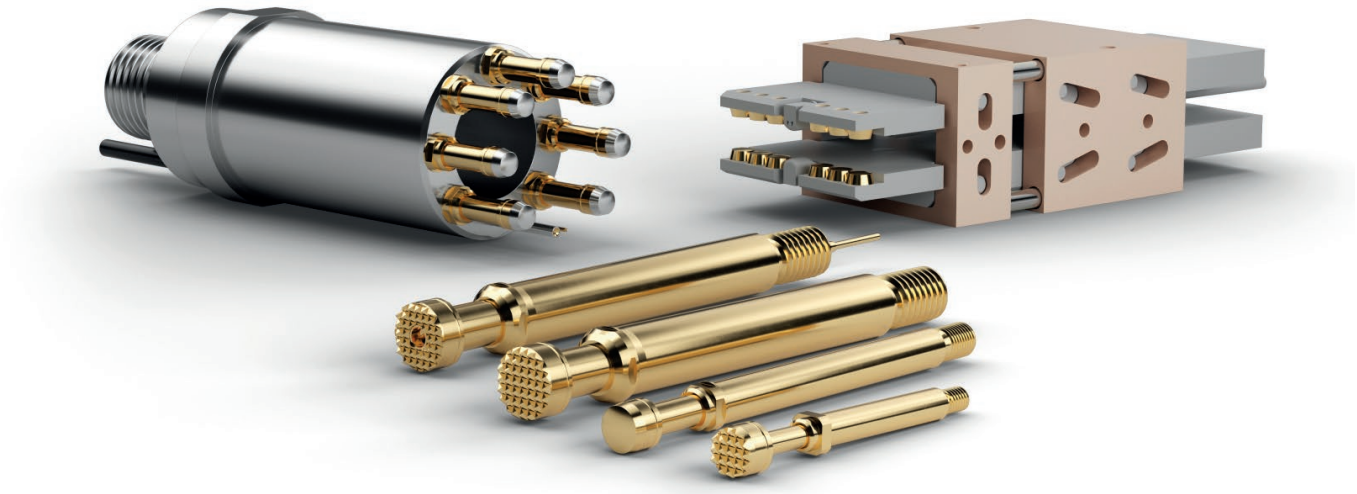
Reliable and high-quality battery cell production requires complex high performance contacting during several steps of the production. The quality of battery cells is reflected in a wide variety of parameters such as electrochemical stability, capacity, performance or service life.

End-of-line quality assessment of battery cells in the form of quality determination and evaluation in cell production helps to identify optimization potential at an early stage, minimize reject rates and thus reduce production costs.

We help you with the best contact solutions for your battery production. In development and test of battery cells, the challenges for contacting technology are enormous.

On the one hand, the charging and discharging processes require very high currents, often over a long period of time. On the other hand, the contacts must be adapted to the geometry of the battery cells to allow many battery cells to be contacted next to each other.

In addition, voltage measurement must usually be carried out in parallel with the charging or discharging current. Temperature monitoring directly at the contact point is also often required. These challenges demand innovative solutions.



REQUIREMENTS

Self-heating

The self-heating caused by the power loss in a contact probe is measured in an own laboratory by increasing the current step by step and measuring the respective temperatures at the contact probe plating after reaching a stable state. As the ambient temperature may vary during the measurement, its value is also detected and subtracted from the measured temperature value. This results in the chart showing only the temperature rise ΔT in Kelvin versus the current, starting at zero.

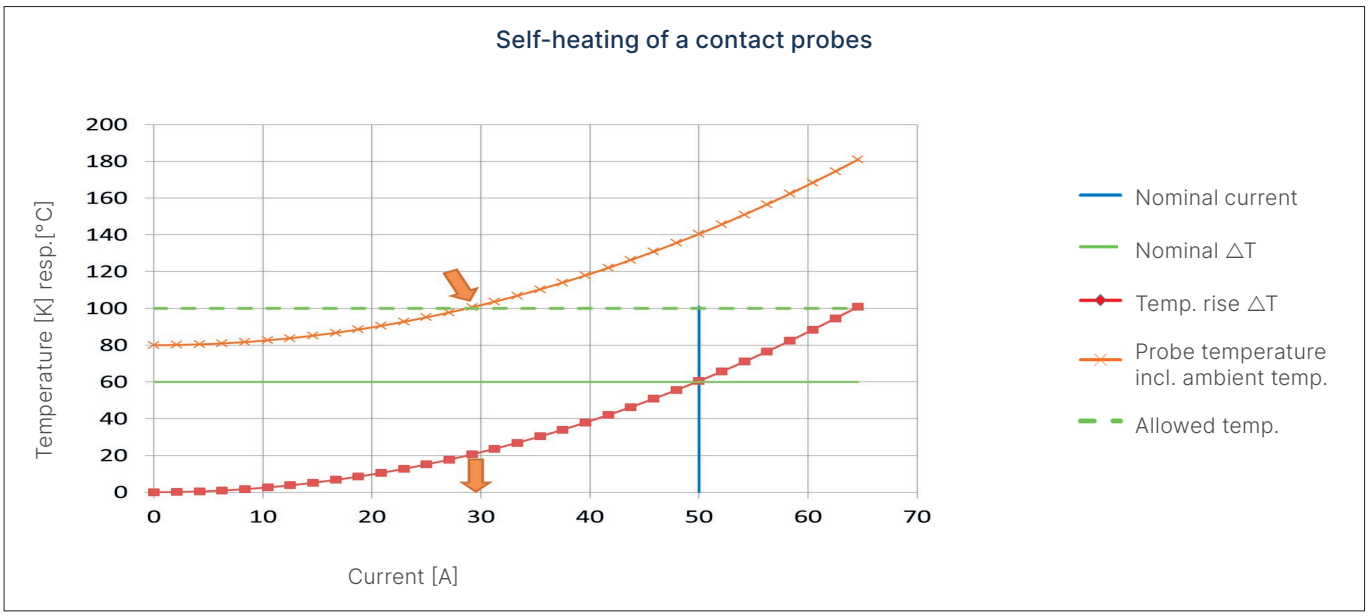
On the basis of these measurement results the nominal current of a contact probe is defined by a certain degree of heating. This value (nominal ΔT) is not a fix value and varies depending on the probe series and functionality between 0 K and 70 K. In the example (diagram on the left) this value was 60 K, leading to a nominal current of 50 A.

At ideal operating conditions as in the laboratory (ambient temperature, heat dissipation by DUT and cables, sufficient thermal convection etc.), the contact probe can generally be used securely with the nominal current. It has to be considered, that in the application many factors differ from the ideal conditions (e.g. close-by current-carrying contact probes, contaminations, higher ambient temperatures).

Especially the higher ambient temperature is visualized in the derating behavior (diagram on the right). A safety factor of minimum 20% is recommended.

Relevant for the temperature rise of a High Current Probe is power loss. This power loss needs to be as low as possible. This is why a High Current Probe needs a special design to minimize the internal and contact resistance of the probe. The internal resistance is directly depending on the design and the materials of the probe. FEINMETALL springs for High Current Probes are suitable for up to 200°C without any risk of damages or reduced life cycles. Independently from the probe design, the contact resistance can be minimized by using high contact forces or by choosing tips made of silver alloy.

The maximum current values in the specifications refer to a maximum continuous current (DC). It is mainly limited by the maximum allowed temperature rise of the contact probe. The maximum alternating current is defined as the root mean square of the current.



FEINMETALL standard High Current Test for creating the measurement curve and the defining the maximum current.

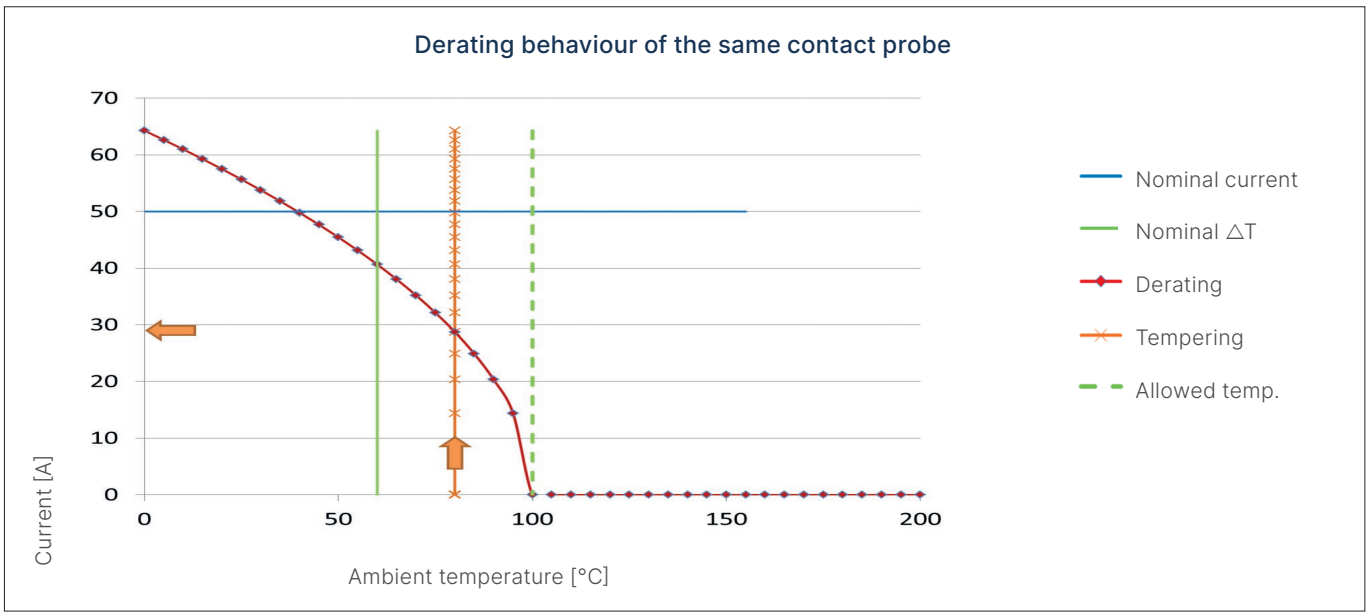
REQUIREMENTS

Derating

The derating describes the necessary reduction of the operating current at increasing temperatures of the contact probe and its ambiance. The basis of a correct derating curve is the definition of a maximum allowed temperature of the contact probe. This value needs to be lower than the maximum temperature of the probe specifications (in most cases 200°C) and is often limited by application related factors such as fixture materials.

In the shown example the temperature limit is 100°C. That means at an ambient temperature of 100°C no further current flow is allowed, because this would lead to additional heating beyond the limit. At the nominal current of 50 A the self-heating would result in 60°C and so an ambient temperature of 40°C would be allowed until the limit of 100°C is reached.

A different scenario is the assumption that theambient temperature is e.g. 80°C. The heating curve is shifted of this value (diagram on the left). The intersection with the limit of 100°C results in an allowed current flow of only 30 A. The same current value can be identified in the diagram on the right as intersection of temperature and derating curve. So, the derating behavior is also determined by the self-heating diagrams shown in the catalog specifications.



Derating behavior and connection with self-heating of a contact probe.

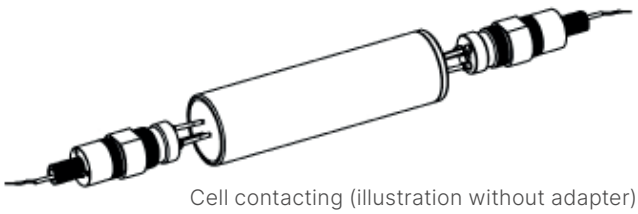
SCRATCH PRINCIPLE

Solution for challenging conditions

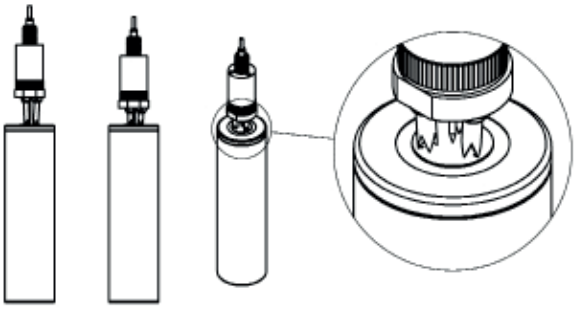
A typical application of the coaxial probe is the contacting of cylindrical or Pouch cells in battery production and test applications, but also various other high current applications.

The scratch contact is ideally suited for reliable contacting under difficult conditions. It not only contacts axially, but also generates a lateral movement due to the axially symmetrical inclination of the contact probes.

This scratch movement on the surface significantly increases the contact aggressiveness compared to standardhigh-current probes.

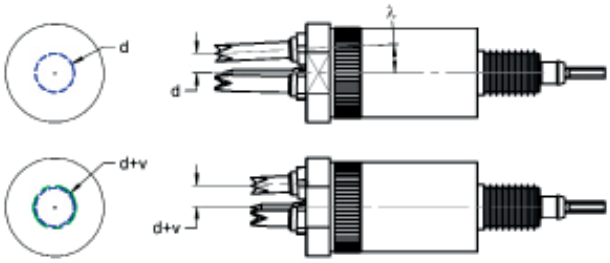


Cell contacting (illustration without adapter)



Function

The probe tips are contacting at spring travel 0 mm in a distance d to the central axis. During the travel the probe tips move outwards by the offset v.



Advantages

- Continuous current carrying capacity up to 100 A on cell pole < 6 mm
- Individually spring-loaded plungers with estab lished scratch contact for current path for opti mum contact on the typical cell coductors of LIB cells, also for uneven, passivated or contaminated contact surfaces
- Equipped with spring-loaded sense pin for the voltage path of the four-pole measuring and temperature sensor (Typ K)
- Low heating of less than 50K at full load
- Configurable variants from the modular system available
- Electrical connections via M5 thread
- Mounting by pressing into Ø10 mounting hole in contact direction universally possible (can also be laterally fixed)
- More effective penetration of passivation layers or contaminants.
- Deeper penetration into the surface.
- Simultaneous compensation of unevenness.
- Improved current carrying capacity
- Permanently lower contact resistance
- Significant increase in contact safety with critical surfaces such as aluminum or nickel.

Comparative test from the test institute ISEA/RWTH Aachen university

Target:	The testing and comparison of various designs of FEINMETALL High Current Blocks under application-oriented conditions in cell production, in particular during the formation process.
Test setup:	Contacting of 2 blocks (PLUS and MINUS) to mating an uncoated copper contact.
Diagram above:	Typical temperature curve over 1h continuous current. Heating due to power loss at various measuring points on the High Current Block HC01 as well as on its terminals and on the mating contact.
Diagram below:	Voltage drop via contacting PLUS- and MINUS-pole.

Result in direct comparison with scratch principle to without:

- Lower contact resistance
- More constant contact resistance over the current stages.
- More constant contact resistance over time.
- Lower temperature increase
- Smoother heating - no wetting current effect
- More stable, lower impedance contact behaviour.

Diagram 1 - temperature progression

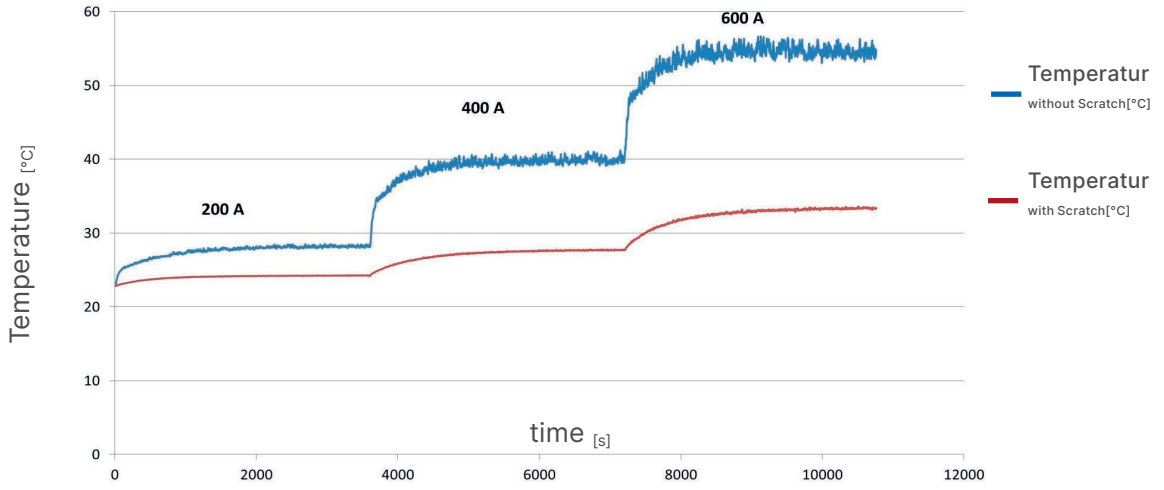
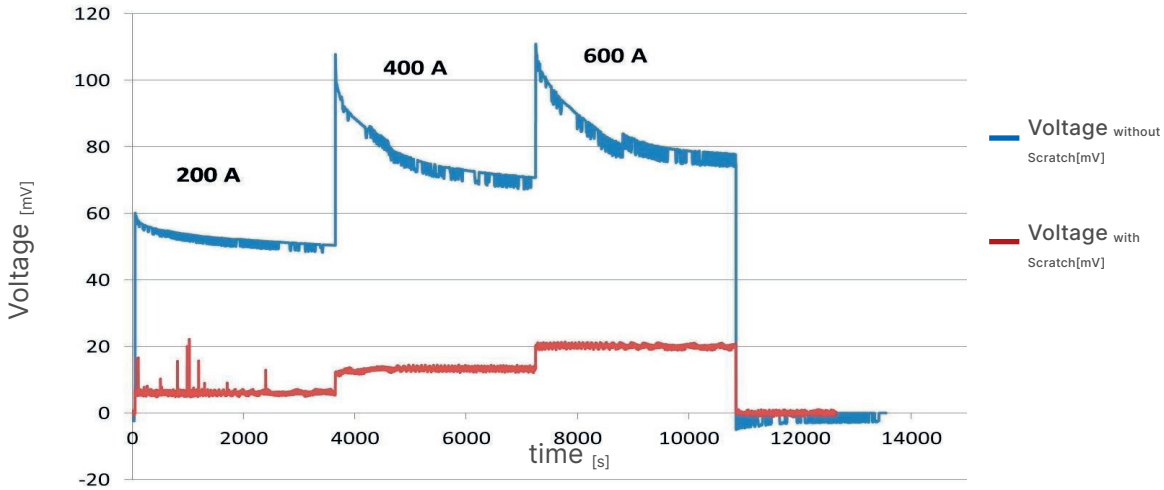


Diagram 2 - power dissipation

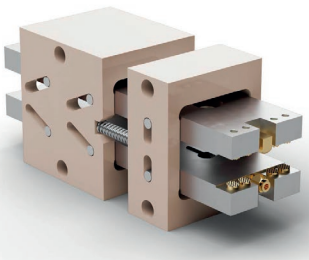


SOLUTIONS AT A GLANCE

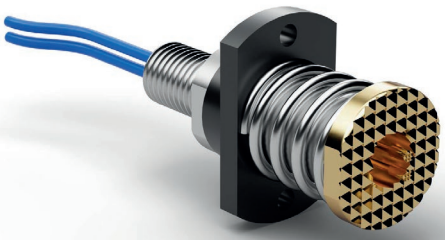
POGO CONNECTORS
3A - 50A

HIGH CURRENT PROBES
10A - 50A

CLAMP CONTACTS
150A - 250A



HIGH CURRENT COAXIAL PROBES
100A - 300A

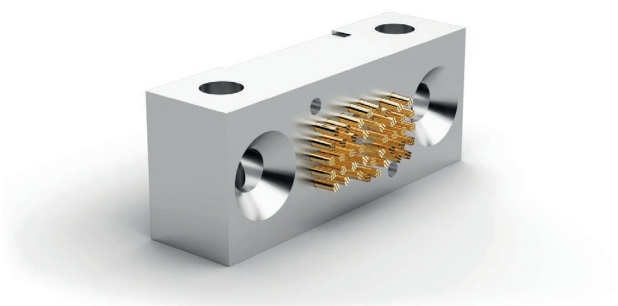


SCRATCH CONTACTS
50A - 100A

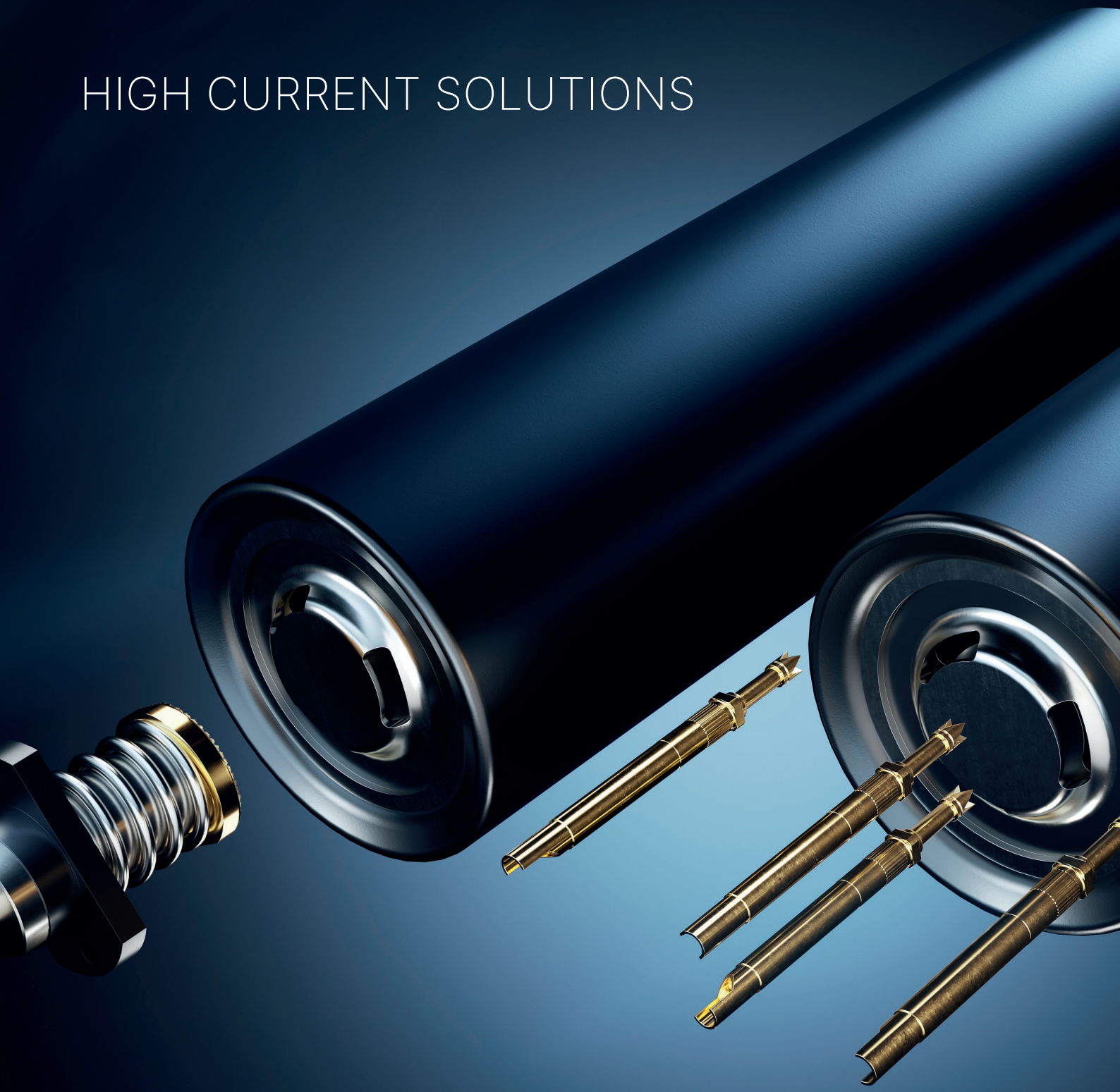
E-MOBILITY PROBES
60A - 250A

HIGH CURRENT COAXIAL PROBES
300A - 600A

HIGH CURRENT BLOCKS
100A - 1000A



HIGH CURRENT SOLUTIONS



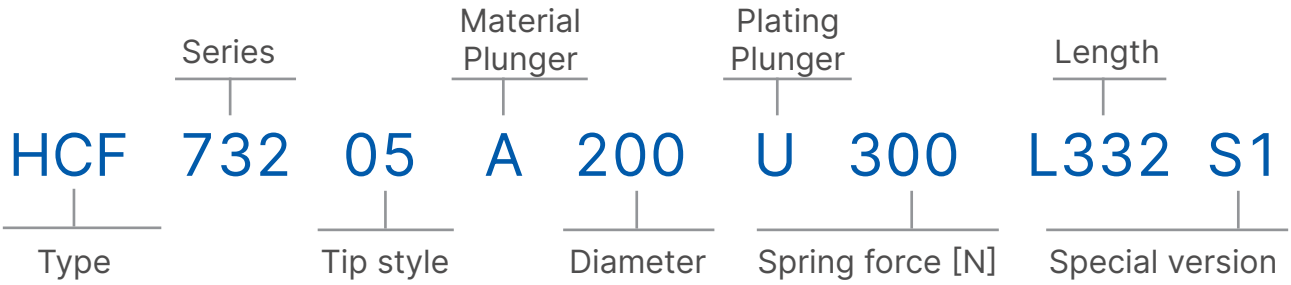
OVERVIEW HIGH CURRENT SOLUTIONS

Type	Current	Round Cell		Pouch Cell		Prismatic Cell		Connector	Notes
	[A]	Formation	Test	Formation	Test	Formation	Test	Test	
High Current Probes									
HCF360	15	x		x		x			Screwable
HCF732	20	x		x		x			Screwable
HCF772	20	x		x		x			Pluggable
HCF723	25	x		x		x			Screwable
HCF713	25	x		x		x			Pluggable
HCF733	25	x		x		x			Screwable
HCF773	25	x		x		x			Pluggable
HCF566	35	x		x		x			Pluggable
HCF762	40	x		x		x			Scratch function by serrated head
HCF725	50	x		x		x			Screwable
HCF735	50	x		x		x			Screwable
HCF775	50	x		x		x			Pluggable
HC060	50	x		x		x			Screwable
HCF348	100			x	x	x	x		Screwable
High Current Coaxial Probes									
HC050	60			x	x	x	x		Coaxial
HCF349	100			x	x	x	x		Coaxial
HC160	200			x		x			Probe formation
HC04	300			x	x	x	x		Probe formation
High Current Blocks									
HCB045	70	x		Contacting screws					Round block
HCB056	50		x		x		x		Scratch function
HCB063	100		x		x		x		Scratch function
HCB085	50		x		x		x		Round block
HCB095	100		x		x		x		Round block
HCB190	400			Inverter Test					Round block
HCB280	600				x		x		Scratch function
High Current E-Mobility Probes									
HCE04-M	50							x	For pin Ø4 mm
HCE04-F	50							x	For socket Ø4 mm
HCE06-M	100							x	For pin Ø6 mm
HCE06-F	100							x	For socket Ø6 mm
HCE08-M	200							x	For pin Ø6 mm
HCE08-F	200							x	For socket Ø8 mm
High Current Clamps									
HCC150	200			x	x				Scratch free
HCC220	250							x	Scratch free

PRODUCT NAME

Number code system

In order to improve the clarity of the material designations, the self-explanatory number code has been further developed. Therefore, all High Current Probes have been redefined according to the order code shown below.



Material Plunger

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

Length (optional)

L332 = 33.2 mm

Plating Plunger

G = Gold plating
L = Longtime gold plating
N = Nickel plating
P = Progressive function plating
R = Rhodium plating
S = Silver plating
LX = Anodizing
M = Multiplex gold plating
U = Unplated

FM Choice

HCF360

15 A | 145 mil | Threaded

Electrical specifications

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

Mechanical specifications

Preload [cN]	50
Spring force [cN] at nt ±20%	80
Nominal travel [mm]	0.8
Maximum travel [mm]	1.2

Materials and plating

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

Accessories

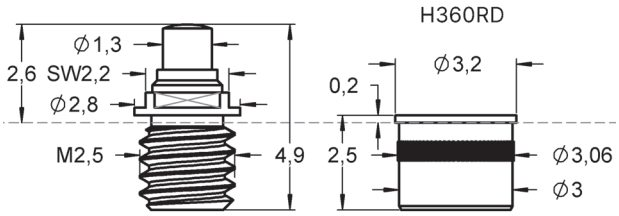
1026723	H360RD	Receptacle
1005041	FEWZ-563E0	Insertion tool receptacle
1029836	FWZVF3S2T	Screw-in tool probe

Drill size recommendation (mm)

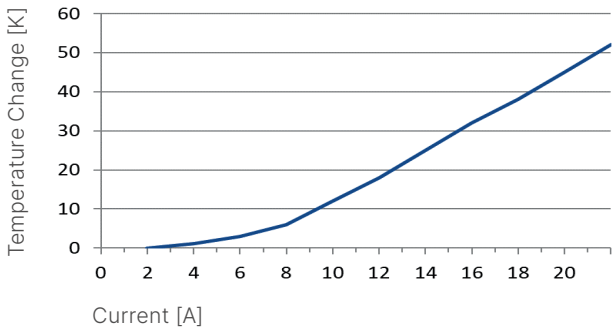
1026723	H360RD	3.00 - 3.02

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
1012191	HCF36011B130G080	11 	1,3	B / G	80	2.5	-	FM Choice

FM Choice

HCF732

20 A | 100 mil | Threaded

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	20
R TYP [mOhm]	<10

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

Accessories

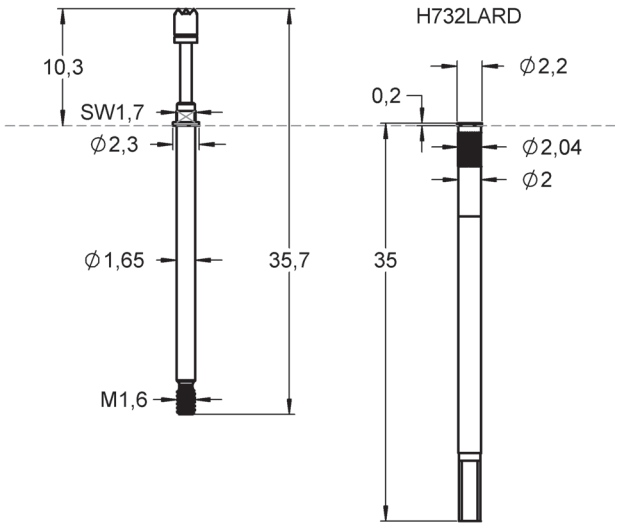
1005355	H732LARD	Receptacle
1001681	FWZ732	Screw-in tool probe
1004610	FWZ732T	Screw-in tool probe

Drill size recommendation (mm)

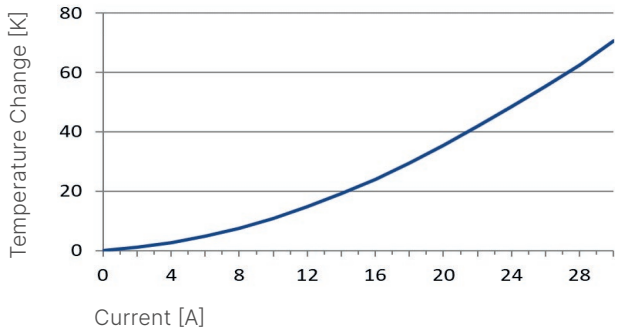
1003076	H732LAS1	1.99 - 2.00
1005355	H732LARD	2.00 - 2.02

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
1008001	HCF73205B200G300	05	2.00	B / G	300	1.6	-	-
1008140	HCF73206B180G150	06	1.80	B / G	150	1.6	-	-
1133501	HCF73211B080G150A	11	0.80	B / G	150	1.6	A	-
1010644	HCF73212A200U300	12	2.00	A / U	300	1.6	-	FM Choice

FM Choice

HCF772

20 A | 100 mil | Pluggable

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	20
R TYP [mOhm]	<10

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

Accessories

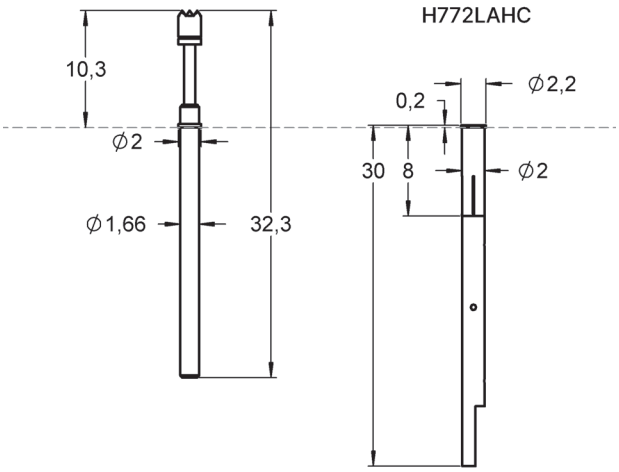
1007939	H772LAHC	Receptacle
1003640	FEWZ-772E0	Insertion tool receptacle
1003566	FDWZ-100	Insertion tool probe

Drill size recommendation (mm)

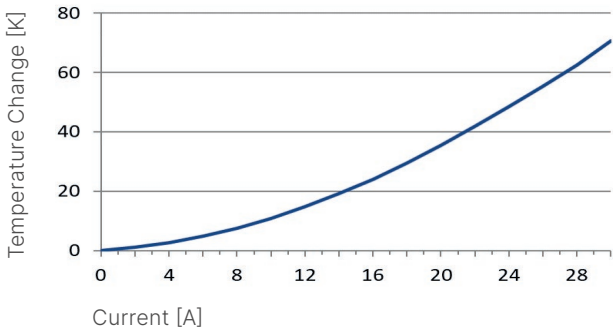
1007939	H772LAHC	1.99 - 2.00

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
1005045	HCF77206B200G300	06	2.00	B / G	300	-	-	FM Choice
1011973	HCF77207B200G300	07	2.00	B / G	300	-	-	-
1007945	HCF77214B130G300	14	1.30	B / G	300	-	-	-
1013176	HCF77246B200G300	46	2.00	B / G	300	-	-	-

HCF723

30 A | 157 mil | Threaded

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	30
R TYP [mOhm]	<8

Mechanical specifications

Preload [cN]	40	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

Accessories

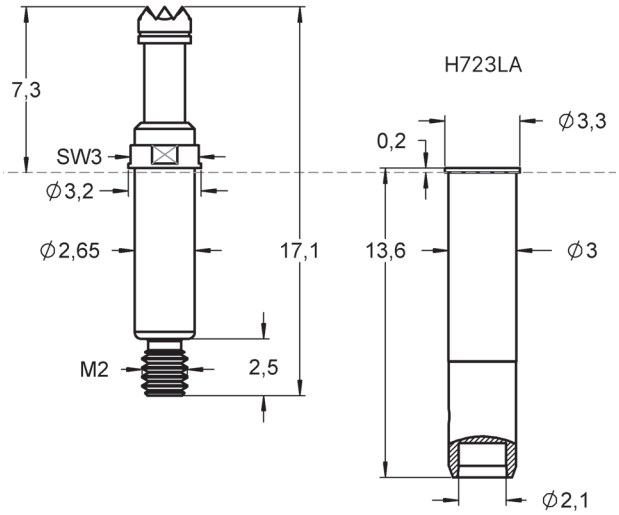
1009981	H723LA	Receptacle
1030014	FEWZ-713E0	Insertion tool receptacle
1003954	FWZ733S1	Screw-in tool probe
1029813	FWZ733S1T	Screw-in tool probe

Drill size recommendation (mm)

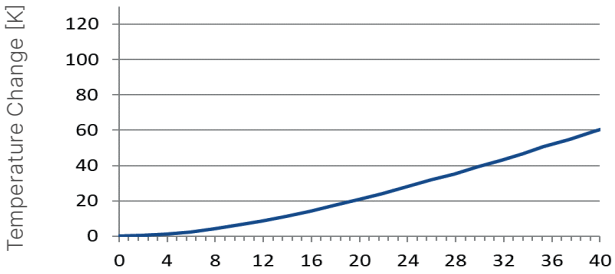
1009981	H723LA	2.98 - 2.99

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
1009987	HCF72306B230G080	06	2.30	B / G	80	2.0	-	-
1019851	HCF72306B230G150	06	2.30	B / G	150	2.0	-	-
1132082	HCF72306B350G150	06	3.50	B / G	150	2.0	-	-
1010607	HCF72312B230G150	12	2.30	B / G	150	2.0	-	-
1091459	HCF72314B230G150	14	2.30	B / G	150	2.0	-	-

HCF713

30 A | 157 mil | Pluggable

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	30
R TYP [mOhm]	<8

Mechanical specifications

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

Materials and plating

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

Accessories

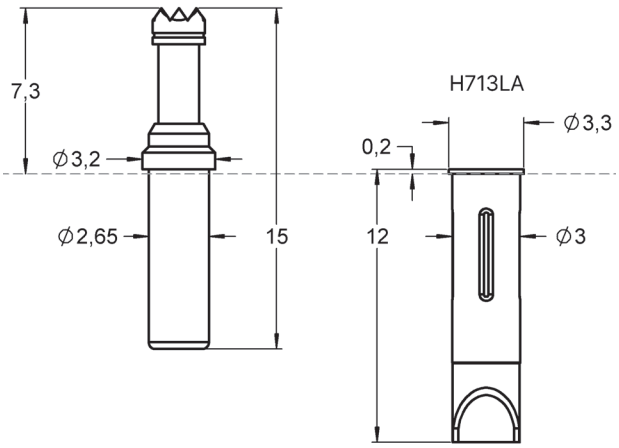
1018232	H713LA	Receptacle
1030014	FEWZ-713E0	Insertion tool receptacle
1003566	FDWZ-100	Insertion tool probe

Drill size recommendation (mm)

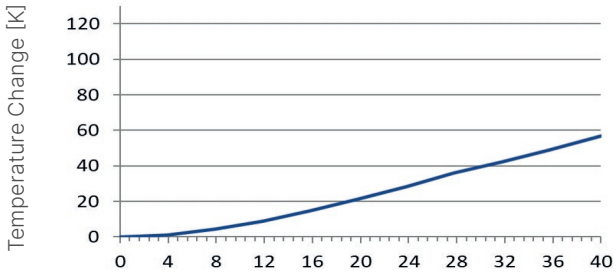
1018232	H713LA	2.98 - 2.99

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
1024197	HCF71306B230G150	06	2.30	B / G	150	-	-	-
1135313	HCF71306B350G150	06	3.50	B / G	150	-	-	-
1024198	HCF71312B230G150	12	2.30	B / G	150	-	-	-
1024199	HCF71314B230G150	14	2.30	B / G	150	-	-	-

FM Choice

HCF733

30 A | 157 mil | Threaded

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	30
R TYP [mOhm]	<8

Mechanical specifications

Preload [cN]	60	60	170
Spring force [cN] at nt ±20%	150	300	600
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	Stainless steel	unplated
Receptacle	Brass	gold plated

Accessories

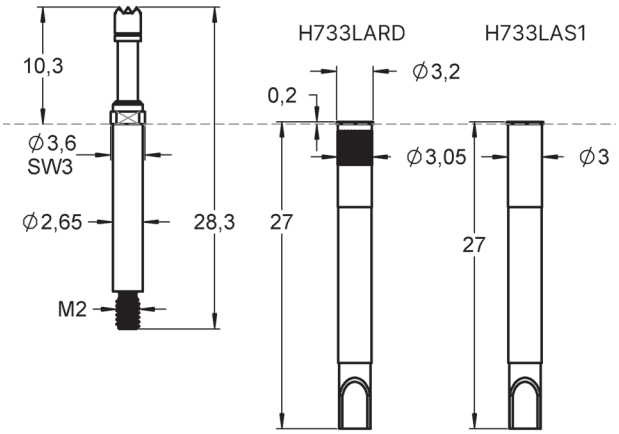
1005514	H733LARD	Receptacle
1003077	H733LAS1	Receptacle
1003642	FEWZ-774E0	Insertion tool receptacle
1001682	FWZ733	Screw-in tool probe
1004611	FWZ733T	Screw-in tool probe

Drill size recommendation (mm)

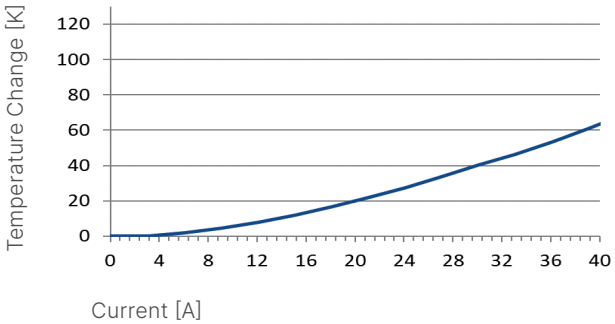
1003077	H733LAS1	2.98 - 2.99
1005514	H733LARD	3.00 - 3.02

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
1023044	HCF73305B300G150	05	3.00	B / G	150	2.0	-	-
1008578	HCF73306B230G300	06	2.30	B / G	300	2.0	-	-
1009767	HCF73306B400G300	06	4.00	B / G	300	2.0	-	-
1057667	HCF73314B230G500S1	14	2.30	B / G	500	2.0	S1	FM Choice

FM Choice

HCF773

30 A | 157 mil | Pluggable

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	30
R TYP [mOhm]	<8

Mechanical specifications

Preload [cN]	60	60	170
Spring force [cN] at nt ±20%	150	300	600
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	Stainless steel	unplated
Receptacle	Brass	gold plated

Accessories

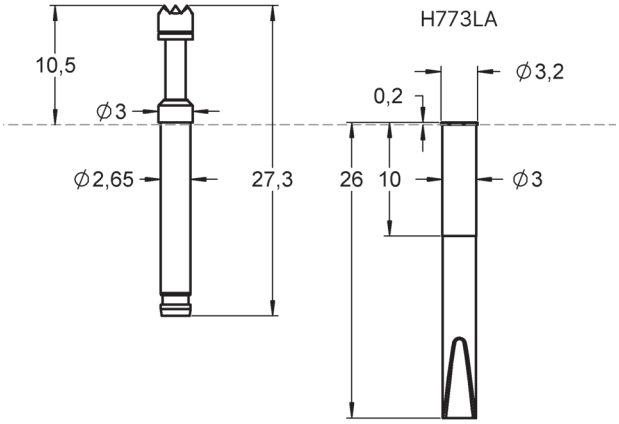
1008142	H773LA	Receptacle
1003642	FEWZ-774E0	Insertion tool receptacle

Drill size recommendation (mm)

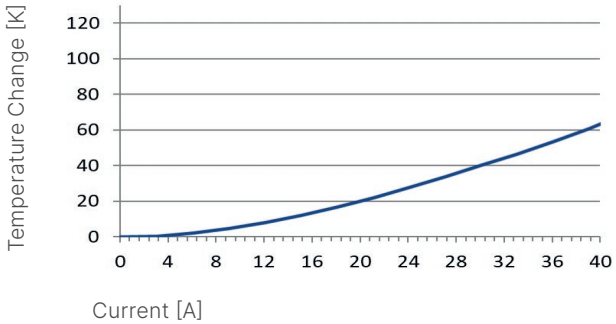
1008142	H773LA	2.98 - 2.99

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
1011372	HCF77306B230G300	06	2.30	B / G	300	-	-	-
1005047	HCF77306B300G300	06	3.00	B / G	300	-	-	FM Choice
1139213	HCF77317B400G150	17	4.00	B / G	150	-	-	FM Choice
1016560	HCF77355B300G300	55	3.00	B / G	300	-	-	-

HCF762

40 A | 157 mil | 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

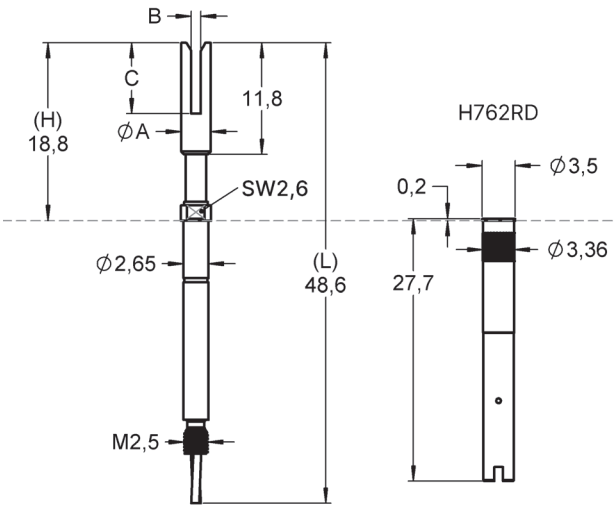
1009947	H762RD	Receptacle
1004180	FAWZ761	Insertion tool receptacle
1008822	FWZ885S1	Screw-in tool probe
1029833	FWZ885S1T	Screw-in tool probe

Drill size recommendation (mm)

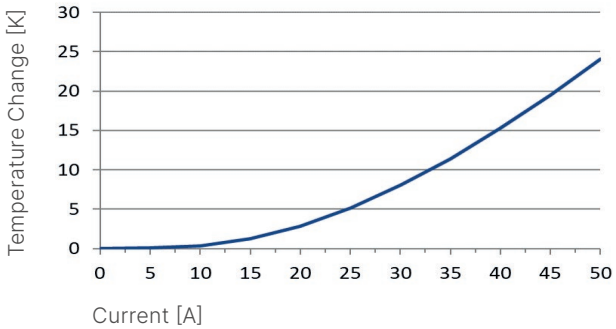
1009947	H762RD	3.30 - 3.35

Series drawing

All measurements are in mm.



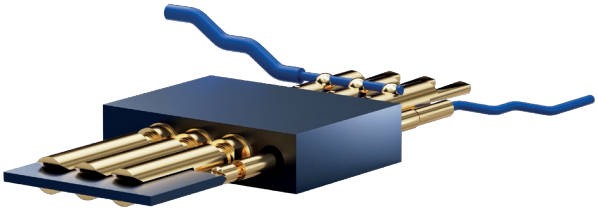
Thermal Rise of Contact Probe vs. Current



CONNECTING FLAT BLADE CONNECTORS

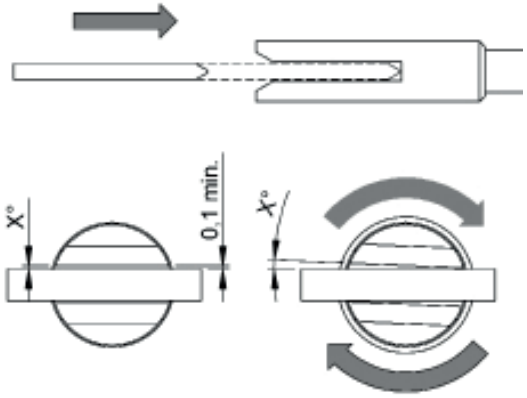
Application note
Higher currents can be realized by using several probes in parallel, e.g. 120 A in this example. In applications with Kelvintests a normal contact probe can be used for the voltage (sense signal).

Cable connection
Optional connection possibility for large cable cross-sections > e.g. integration in block with connection thread >M5.

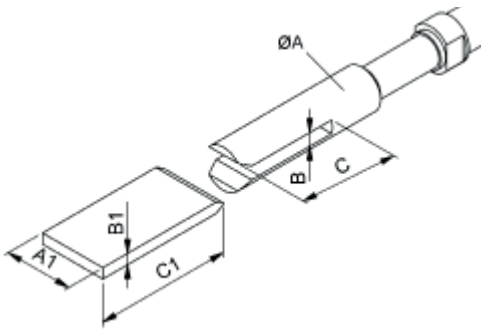


Functional principle
Due to the twist proof design the plunger is always brought to the test item well aligned. Once the plunger is compressed by contacting the blade connector, it is twisted up to a maximum of 20°. This results in a good electrical contact without damaging or scratching the tested item.

Important:
The probe needs to be moved axially to the blade connector. A chamfer at the contact probe enables an optimum guiding.



Spring Contact Probe						Suitable for blades		
Order code	Product name	Tip style	Ø A [mm]	B [mm]	C [mm]	A1 [mm]	B1 [mm]	C1 [mm]
1039129	HCF76206B230G300	06	2.3	-	-	-	-	-
1009831	HCF76289B310100750G300	89	3.1	1.0	7.5	min 3.2	0.5 - 0.8	min 8.0
1015017	HCF76289B310150750G300	89	3.1	1.5	7.5	min 3.2	1.0 - 1.3	min 8.0
1015093	HCF76289B310150400G300	89	3.1	1.5	4.0	min 3.2	1.0 - 1.3	min 4.5
1015094	HCF76289B400200750G300	89	4.0	2.0	7.5	min 3.2	4.0 - 2.0	min 8.0
1018509	HCF76289B310100250G300	89	3.1	1.0	2.5	min 3.2	0.5 - 0.8	min 3.0
1023602	HCF76289B310100620G300	89	3.1	1.0	6.2	min 3.2	0.5 - 0.8	min 6.7
1023603	HCF76289B218100750G300	89	2.2	0.8	5.7	min 3.2	0.3 - 0.6	min 6.2



HCF566

40 A | 177 mil | Pluggable

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	40
R TYP [mOhm]	<15

Mechanical specifications

Preload [cN]	300
Spring force [cN] at nt ±20%	500
Nominal travel [mm]	4.3
Maximum travel [mm]	6.4

Materials and plating

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

Accessories

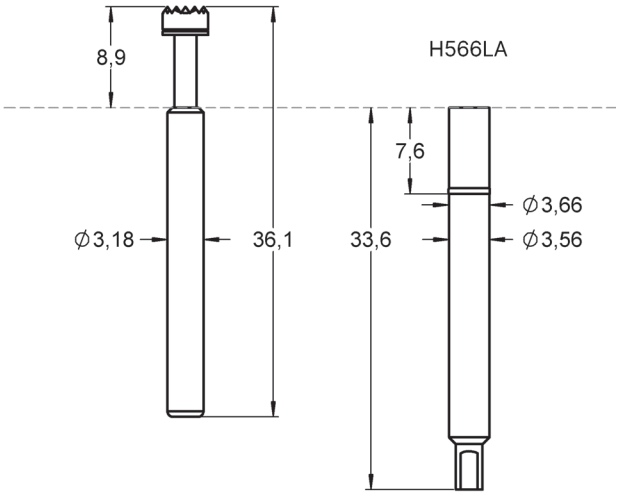
1001827	H566LA	Receptacle
1003642	FEWZ-774E0	Insertion tool receptacle
1003566	FDWZ-100	Insertion tool probe

Drill size recommendation (mm)

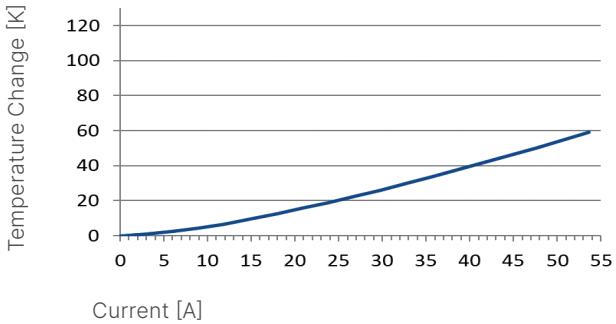
1001827	H566LA	3.30 - 3.35

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
1029496	HCF56606B400G500	06	4.00	B / G	500	-	-	-
1029497	HCF56612B400G500	12	4.00	B / G	500	-	-	-
1029498	HCF56614B300G500	14	3.00	B / G	500	-	-	-
1056581	HCF56618B200G300	18	2.00	B / G	300	-	-	-

HCF725

50 A | 197 mil | Threaded

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	50
R TYP [mOhm]	<5

Mechanical specifications

Preload [cN]	100
Spring force [cN] at nt ±20%	250
Nominal travel [mm]	2.0
Maximum travel [mm]	2.5

Materials and plating

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

Accessories

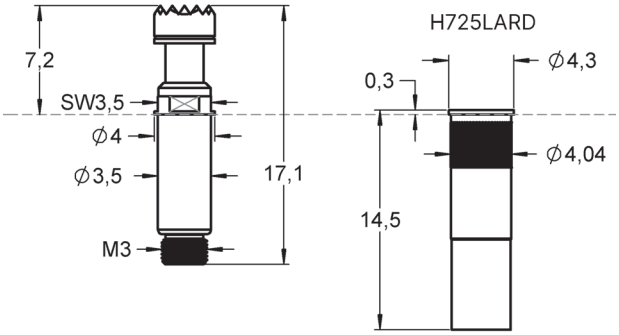
1031263	H725LARD	Receptacle
1005027	FEWZ-735E0	Insertion tool receptacle
1005063	FWZ735	Screw-in tool probe
1009775	FWZ735T	Screw-in tool probe

Drill size recommendation (mm)

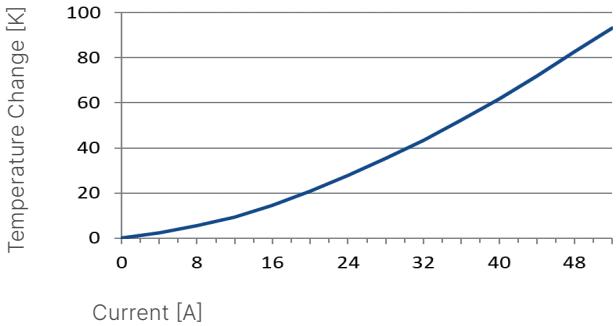
1031263	H725LARD	3.98 - 3.99

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
1029512	HCF72506B400G250	06	4.00	B / G	250	M3	-	-
1029513	HCF72512B400G250	12	4.00	B / G	250	M3	-	-
1029514	HCF72514B400G250	14	4.00	B / G	250	M3	-	-

FM Choice

HCF735

50 A | 197 mil | Threaded

Electrical specifications

Temperature [°C]	-45°...+200°	
Current [A]	50	
R TYP [mOhm]	<5	

Mechanical specifications

Preload [cN]	150	150	500
Spring force [cN] at nt ±20%	300	500	1000
Nominal travel [mm]	4.4	4.4	4.4
Maximum travel [mm]	5.5	5.5	5.5

Materials and plating

Plunger	BeCu	gold plated
Barrel	Brass	gold plated
	Brass	silver plated (A)
Spring	Stainless steel	unplated
Receptacle	Brass	gold plated

Accessories

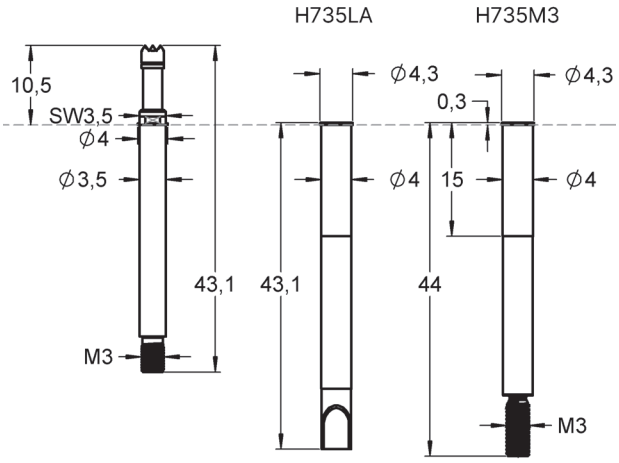
1005065	H735LA	Receptacle
1019242	H735M3	Receptacle
1005027	FEWZ-735E0	Insertion tool receptacle
1005063	FWZ735	Screw-in tool probe
1009775	FWZ735T	Screw-in tool probe

Drill size recommendation (mm)

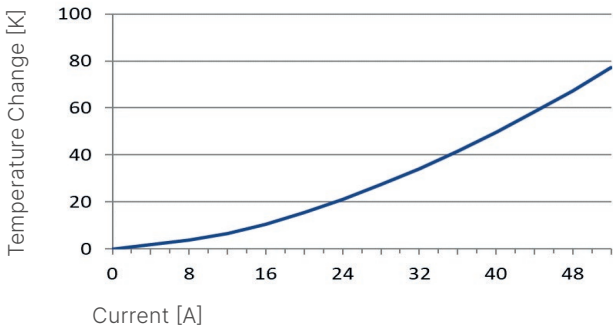
1005065	H735LA	3.98 - 3.99

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
1090970	HCF73506B400G300A	06	4.00	B / G	300	3.0	A	FM Choice
1019871	HCF73507B300G300	07	3.00	B / G	300	3.0	-	-
1044962	HCF73512A300U1000	12	3.00	A / U	1000	3.0	-	-
1016207	HCF73517B400G500	17	4.00	B / G	500	3.0	-	-

FM Choice

HCF775

50 A | 197 mil | Pluggable

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	50
R TYP [mOhm]	<5

Mechanical specifications

Preload [cN]	150	150	500
Spring force [cN] at nt ±20%	300	500	1000
Nominal travel [mm]	4.4	4.4	4.4
Maximum travel [mm]	5.5	5.5	5.5

Materials and plating

Plunger	BeCu	gold plated
Barrel	Brass	gold plated
	Brass	silver plated (A)
Spring	Stainless steel	unplated
Receptacle	Brass	gold plated

Accessories

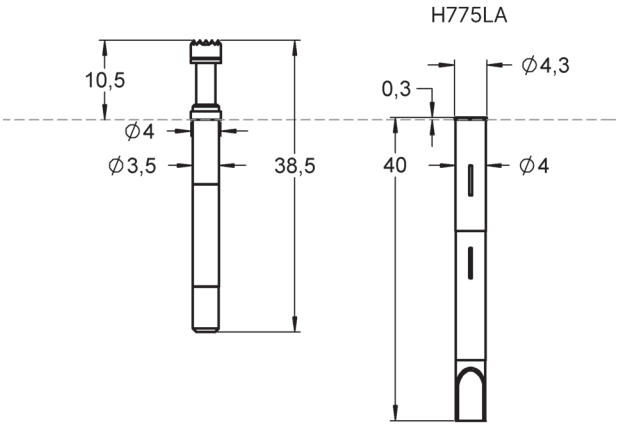
1005064	H775LA	Receptacle
1005027	FEWZ-735E0	Insertion tool receptacle

Drill size recommendation (mm)

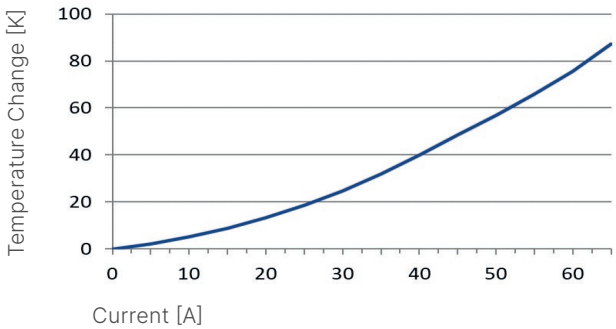
1005064	H775LA	3.98 - 3.99

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
1021669	HCF77504B300G1000	04	3.00	B / G	1000	-	-	-
1005050	HCF77506B400G300A	06	4.00	B / G	300	-	A	FM Choice
1035576	HCF77506B400G500L418	06	4.00	B / G	500	-	L418	-
1030816	HCF77512A300U500HP	12	3.00	A / U	1000	-	HP	-
1005051	HCF77517B400G300	17	4.00	B / G	300	-	-	-

HCF348

100 A | 300 mil | Threaded

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	100
R TYP [mOhm]	<5

Mechanical specifications

Preload [cN]	400
Spring force [cN] at nt ±20%	700
Nominal travel [mm]	4.4
Maximum travel [mm]	5.5

Materials and plating

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

Accessories

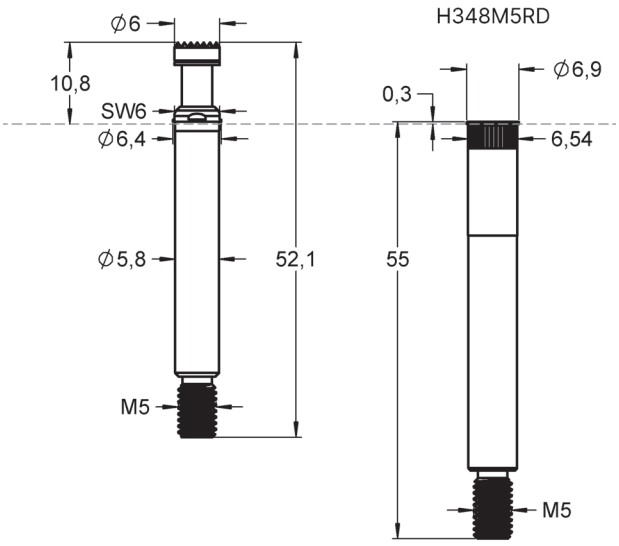
1023187	H348M5RD	Receptacle
1023693	FEWZ-348E0	Insertion tool receptacle
1023246	FWZ348	Screw-in tool probe
1031601	FWZ348T	Screw-in tool probe

Drill size recommendation (mm)

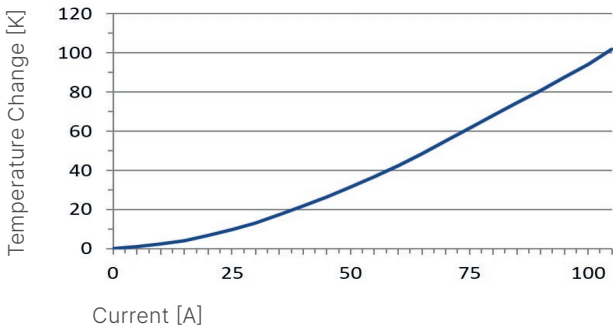
1023187	H348M5RD	6.51 - 6.53

Series drawing

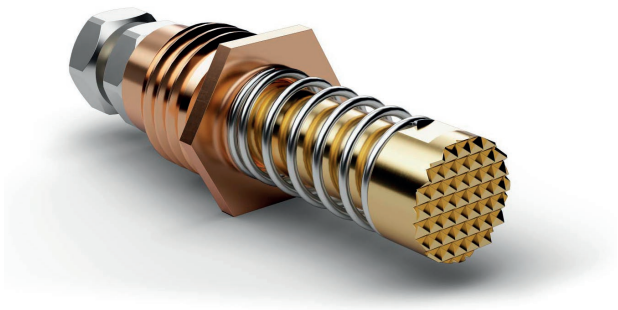
All measurements are in mm.



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
1133491	HCF34806B600G07A	06	6.00	B / G	700	5.0	A	-
1089311	HCF34806B600G14A	06	6.00	B / G	1400	5.0	A	-
1133197	HCF34812A600G07A	12	6.00	A / U	700	5.0	A	-
1133494	HCF34812A600G15A	12	6.00	B / G	1500	5.0	A	-



HC060

50 A | 433 mil | Threaded

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	50
R TYP [mOhm]	<6

Mechanical specifications

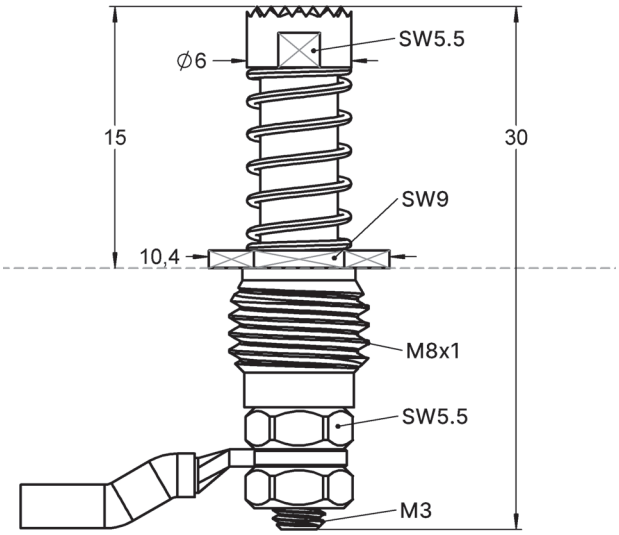
Preload [cN]	200
Spring force [cN] at nt ±20%	530
Nominal travel [mm]	5.0
Maximum travel [mm]	7.0

Materials and plating

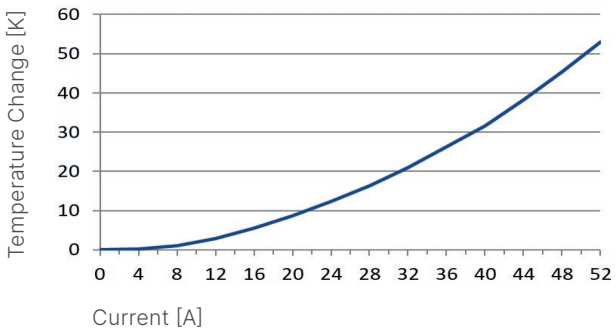
Plunger	BeCu	gold plated
Barrel	Brass	unplated
Spring	Stainless steel	unplated

Series drawing

All measurements are in mm.



Thermal Rise of Contact Probe vs. Current

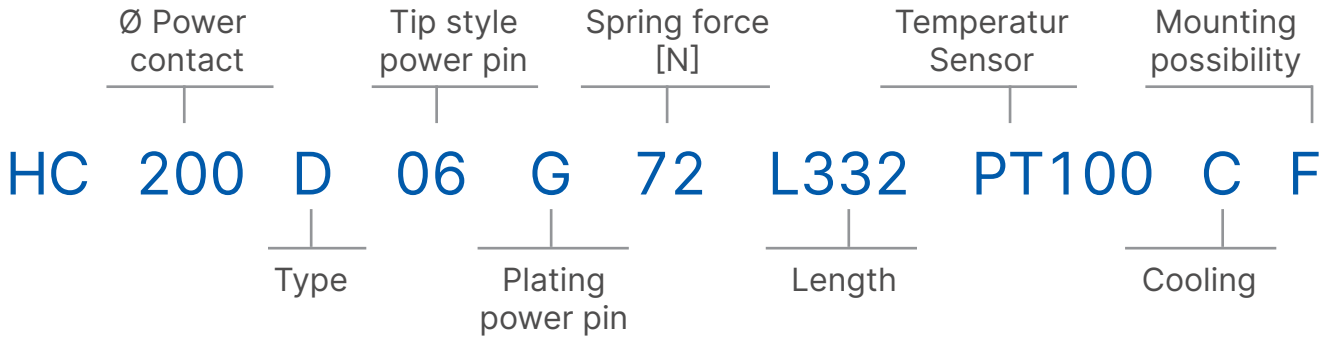


Order code	Product name	Tip Style	Tip Ø [mm]	Material/ Plating	Force [cN]	Thread [M]	Version	FM Choice
1014587	HC060A06G5	06	6.00	B / G	530	8.0x1.0	-	-

PRODUCT NAME COAXIAL PROBES

Number code system

In order to improve the clarity of the material designations, the self-explanatory number code has been further developed. Therefore, all coaxial probes have been redefined according to the order code shown below.



Type

A = HS (high current probe)
B = HS+Sense
C = HS+Temp.sensor
D = HS+Sense+Temp.sensor
E = HS+Sense+Sense
F = HS+Sense+Sense+Temp.sensor

Plating Plunger

G = Gold plating
L = Longtime gold plating
N = Nickel plating
P = Progressive function plating
R = Rhodium plating
S = Silver plating
LX = Anodizing
M = Multiplex gold plating
U = Unplated

Length (optional)

L332 = 33.2 mm

Temperature Sensor (optional)

PT100
PT1000
NTC
Typ K

Cooling (optional)

C = Cooling connection

Mounting possibility (optional)

P = Pluggable
S = Screwable
F = Flange

HC050

60 A | 275 mil | Plugged

Electrical specifications

Temperature [°C]	-45°...+200°	
	Sense	Power
Current [A]	5	60
R typ [mOhm]	20	<2

Mechanical specifications

	Sense	Power
Preload [cN]	35	300
Spring force [cN] at nt ±20%	60	1500
Nominal travel [mm]	4.5	5.0
Maximum travel [mm]	6.5	5.5

Materials and plating

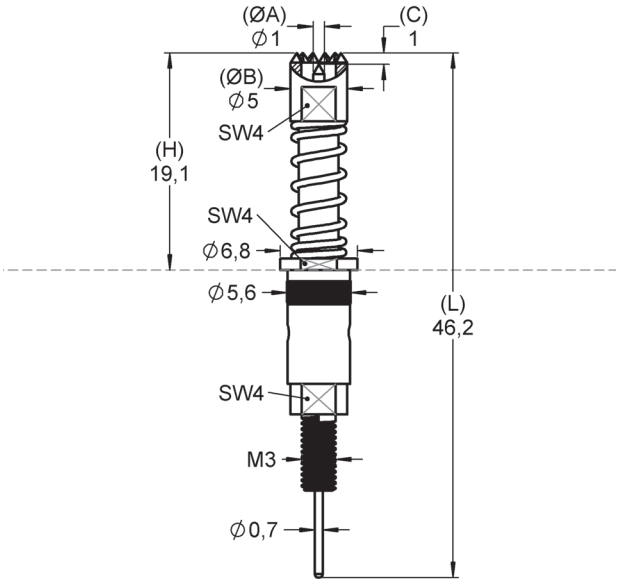
Contact Sense	BeCu	gold plated
Contact Power	BeCu	unplated
Barrel	Brass	gold plated
Spring Sense	Stainless steel	unplated
Spring Power	Stainless steel	unplated

Drill size recommendation (mm)

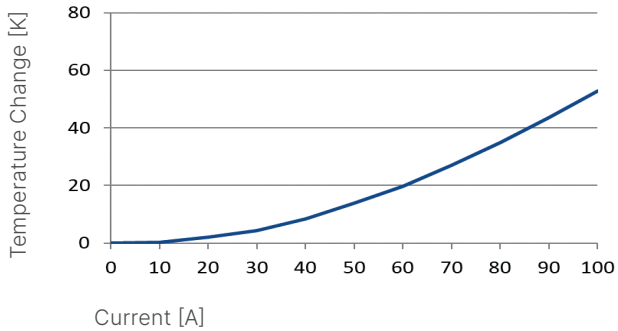
1045305	HC050B06G15	5.53 - 5.58

Series drawing

All measurements are in mm.



Thermal Rise of Contact Probe vs. Current



Order code	Product name	Power	Sense 1	Ø A	Ø B	C	H	Thread [M]	Version	FM Choice
1045305	HC050B06G15	06	18	1.0	5.0	1.0	19.1	M3	-	-

HCF349

100 A | 300 mil | Threaded

Electrical specifications

Temperature [°C]	-45°...+200°	
	Sense	Power
Current [A]	4	100
R typ [mOhm]	100	<4

Mechanical specifications

	Sense	Power
Preload [cN]	60	500
Spring force [cN] at nt ±20%	160	1400
Nominal travel [mm]	4.3	4.4
Maximum travel [mm]	6.4	5.5

Materials and plating

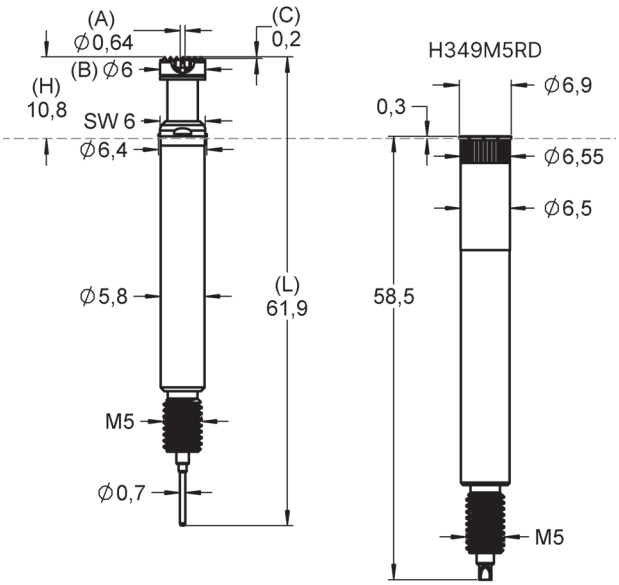
Contact Sense	BeCu	gold plated
Contact Power	BeCu	unplated
Barrel	Brass	gold plated
	Brass	silver plated (A)
Spring Sense	Stainless steel	unplated
Spring Power	Stainless steel	unplated
Receptacle	Brass	silver plated

Accessories

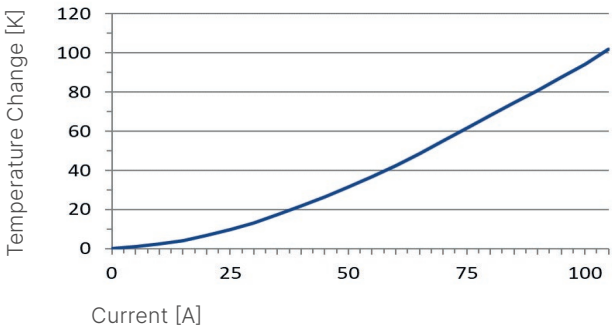
1024195	H349M5KB	Receptacle
1023693	FEWZ-348E0	Insertion tool receptacle
1031601	FWZ348T	Screw-in tool probe

Series drawing

All measurements are in mm.



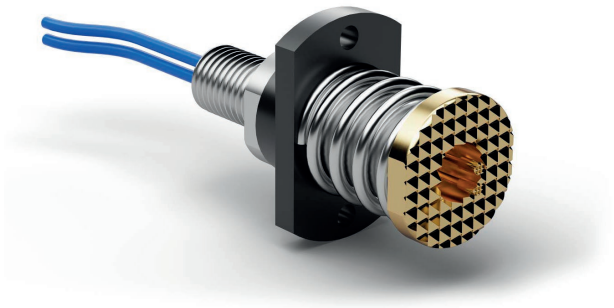
Thermal Rise of Contact Probe vs. Current



Drill size recommendation (mm)

1024195	H349M5KB	6.51 - 6.53

Order code	Product name	Power	Sense 1	Ø A	Ø B	C	H	Thread [M]	Version	FM Choice
1024193	HCF34906B600G1500	06	18	0.64	6.0	0.2	10.8	M5	-	-
1030724	HCF34906B500G1500	06	18	0.64	6.0	0.2	10.8	M5	-	-
1090823	HCF34906B600G1500A	06	18	0.64	6.0	0.2	10.8	M5	A	-



HC160

200 A | 708 mil | Flanged

Electrical specifications

Temperature [°C]	-45°...+200°	
	Sense	Power
Current [A]	20	200
R typ [mOhm]	30	<3

Mechanical specifications

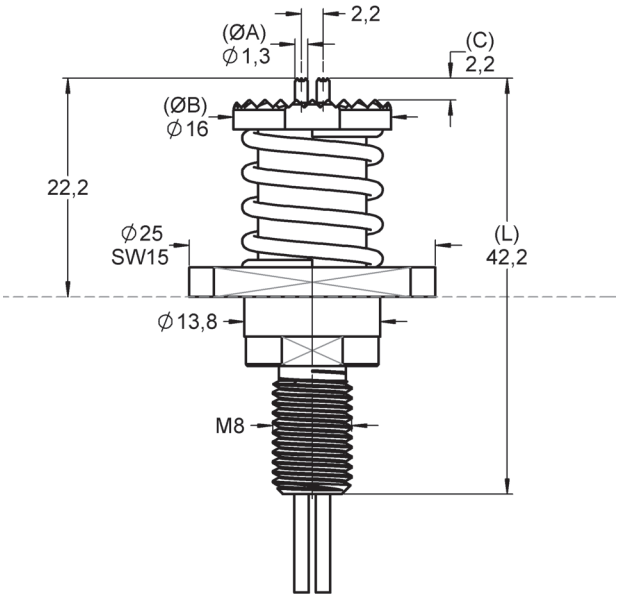
	Sense	Power	Sensor
Preload [cN]	130	3500	-
Spring force [cN] at nt ±20%	400	7200	-
Nominal travel [mm]	2.2	5.0	-
Maximum travel [mm]	4.4	7.0	-

Materials and plating

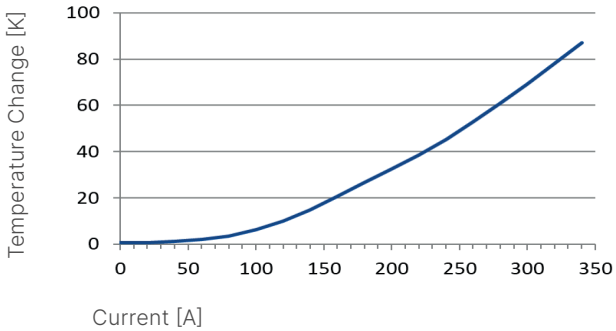
Contact Sense	BeCu	gold plated
Contact Power	BeCu	gold plated
Barrel	Brass	silver plated
Spring Sense	Stainless steel	unplated
Spring Power	Stainless steel	unplated
Flange	Brass	nickel plated

Series drawing

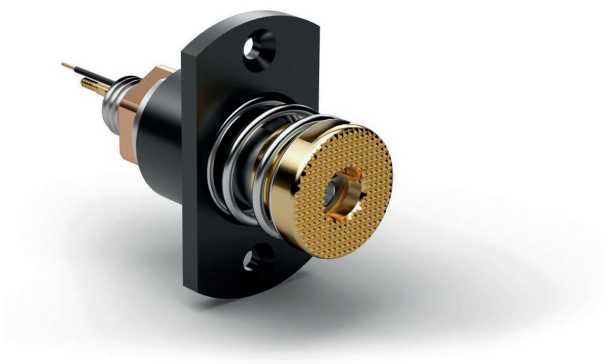
All measurements are in mm.



Thermal Rise of Contact Probe vs. Current



Order code	Product name	Power	Sense 1	Ø A	Ø B	C	H	Thread [M]	Version	FM Choice
1116866	HC160D06G80	06	06	1.3	16.0	2.2	22.2	M8	-	-



HC200

300 A | 984 mil | Plugged/ Flanged

Electrical specifications

Temperature [°C]	-45°...+200°

	Sense	Power
Current [A]	20	300
R typ [mOhm]	30	<1

Mechanical specifications

	Sense	Power	Sensor
Preload [cN]	60	3500	70
Spring force [cN] at nt ±20%	150	7000	200
Nominal travel [mm]	4.0	5.6	3.0
Maximum travel [mm]	5.0	7.0	4.0

Materials and plating

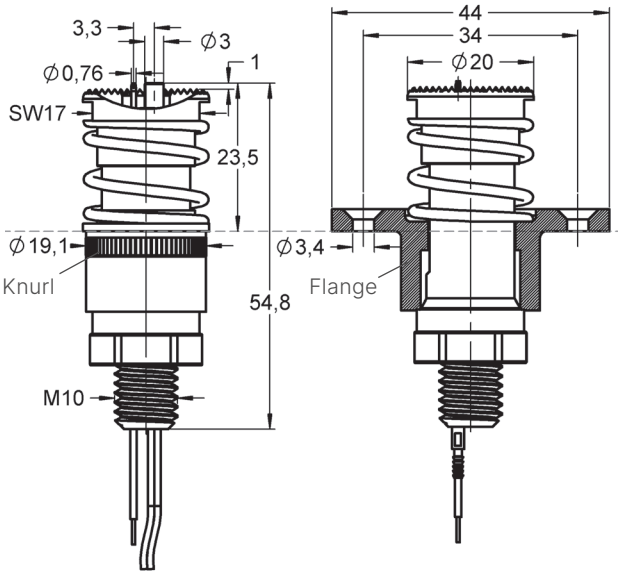
Contact Sense	BeCu	gold plated
Contact Power	BeCu	gold plated
Barrel	Brass	unplated
Spring Sense	Stainless steel	unplated
Spring Power	Stainless steel	unplated

Drill size recommendation (mm)

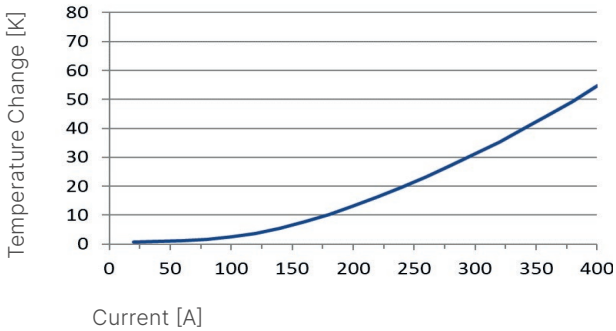
Probe	HC200	19.03 - 19.08

Series drawing

All measurements are in mm.



Thermal Rise of Contact Probe vs. Current

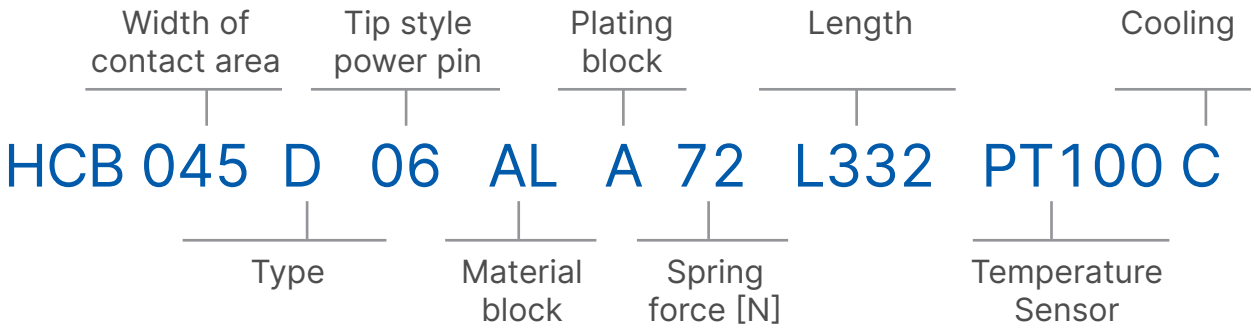


Order code	Product name	Power	Sense 1	Sense 2	Sensor	Cooling	Thread [M]	Version	FM Choice
1120150	HC200B06G71CF	06	21	-	-	x	M10	CF	-
1033974	HC200B06G71	06	21	-	-	-	M10	-	-
1034018	HC200C06G72TYPK	06	-	-	Typ K	-	M10	-	-
1120646	HC200D06G73TYPKC	06	21	-	Typ K	x	M10	C	-
1125166	HC200D06G73TYPKCF	06	21	-	Typ K	x	M10	CF	-
1083894	HC200F06G75TYPK	06	21	21	Typ K	-	M10	-	-

PRODUCT NAME BLOCKS

Number code system

In order to improve the clarity of the material designations, the self-explanatory number code has been further developed. Therefore, all High Current Blocks have been redefined according to the order code shown below.



Width of contact area

045 = 4.5 mm
150 = 15.0 mm

Type

A = HS (high current probe)
B = HS+Sense
C = HS+Temp.sensor
D = HS+Sense+Temp.sensor
E = HS+Sense+Sense
F = HS+Sense+Sense+Temp.sensor

Block material

AL = Aluminium
CU = Copper
M = Brass

Length (optional)

L332 = 33.2 mm

Block Plating

G = Gold plating
L = Longtime gold plating
N = Nickel plating
P = Progressive function plating
R = Rhodium plating
S = Silver plating
LX = Anodizing
M = Multiplex gold plating
U = Unplated

Temperature Sensor (optional)

PT100
PT1000
NTC
Typ K

Cooling (optional)

C = Cooling connection

HCB085

50 A | High Current Block

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	50
R TYP [mOhm]	<4

Mechanical specifications

Preload [cN]	300
Spring force [cN] at nt ±20%	480
Nominal travel [mm]	0.8
Maximum travel [mm]	1.2

Materials and plating

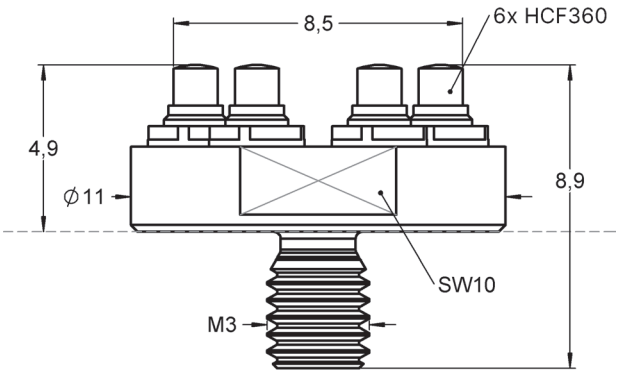
Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Block	Brass	nickel plated
Spring POWER	Stainless steel	gold plated

Accessories

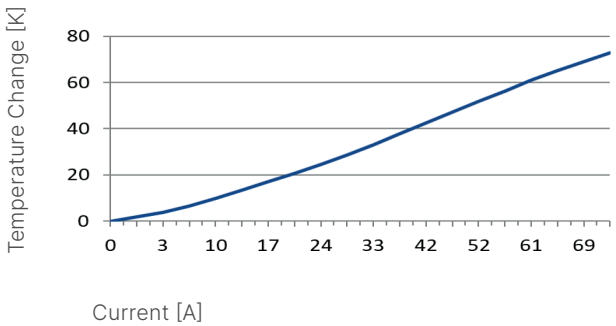
1005893	FWZVF3S2	Screw-in tool probe
1029836	FWZVF3S2T	Screw-in tool probe

Series drawing

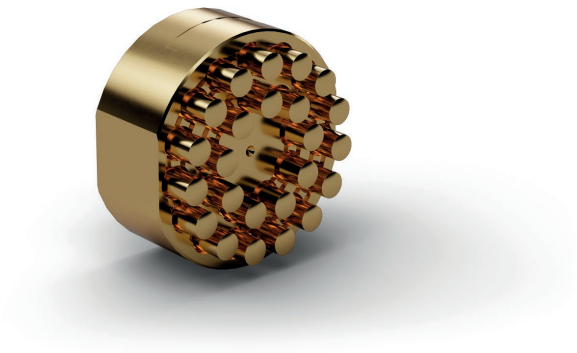
All measurements are in mm.



Thermal Rise of Contact Probe vs. Current



Order code	Product name	Power	Sense 1	Sense 2	Sensor	Cooling	Thread M]	FM Choice
1012158	HCB085A11MA48	11	-	-	-	-	M3	-



HCB095

100 A | High Current Block

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	100
R TYP [mOhm]	<2

Mechanical specifications

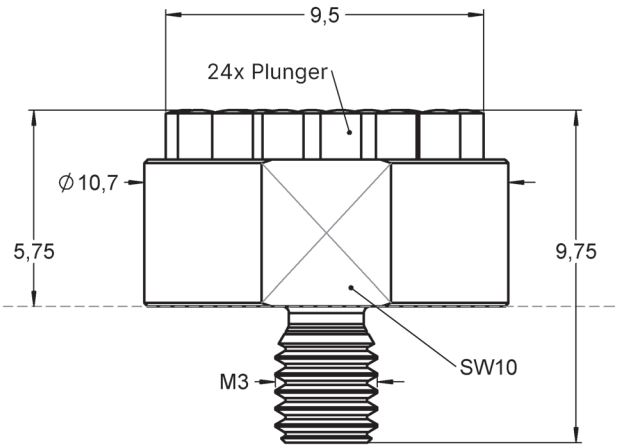
Preload [cN]	960
Spring force [cN] at nt ±20%	1920
Nominal travel [mm]	1.1
Maximum travel [mm]	1.4

Materials and plating

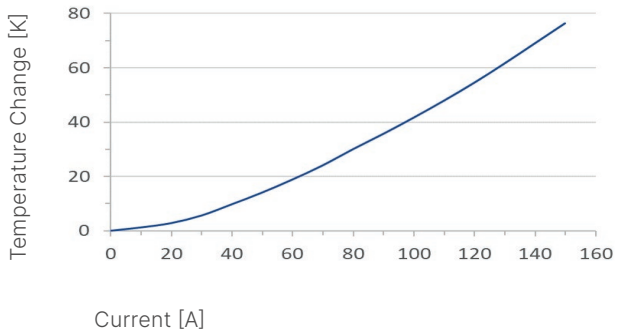
Plunger	Brass	gold plated
Block	Copper	gold plated
Spring POWER	Stainless steel	unplated

Series drawing

All measurements are in mm.



Thermal Rise of Contact Probe vs. Current



Order code	Product name	Power	Sense 1	Sense 2	Sensor	Cooling	Thread M]	FM Choice
1015191	HCB095A11CUG19	11	-	-	-	-	M3	-

HCB056

50 A | High Current Scratch Block

Electrical specifications

Temperature [°C]	-45°...+200°	
	Sense	Power
Current [A]	1	50
R typ [mOhm]	<20	<3

Mechanical specifications

	Sense	Power	Sensor
Preload [cN]	40	150	-
Spring force [cN] at nt ±20%	80	900	130
Nominal travel [mm]	4.3	4.0	3.5
Maximum travel [mm]	6.4	5.0	4.3

Materials and plating

Contact Sense	BeCu	gold plated
Contact Power	BeCu	gold plated
Barrel	Brass	gold plated
Block	Brass	silver plated
Spring Sense	Stainless steel	unplated
Spring Power	Stainless steel	unplated

Accessories

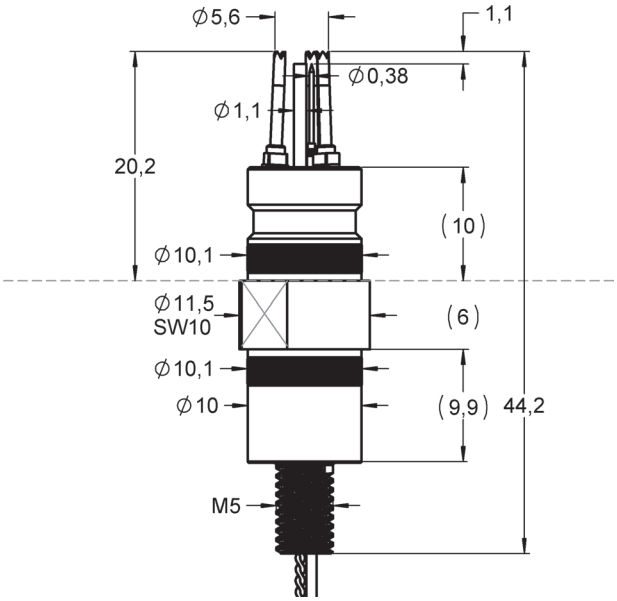
1024541	FDWZ-860C009	Insertion tool block
1003576	FDWZ-050	Insertion tool sense pin
1029814	FWZ732	Screw-in tool power pin

Drill size recommendation (mm)

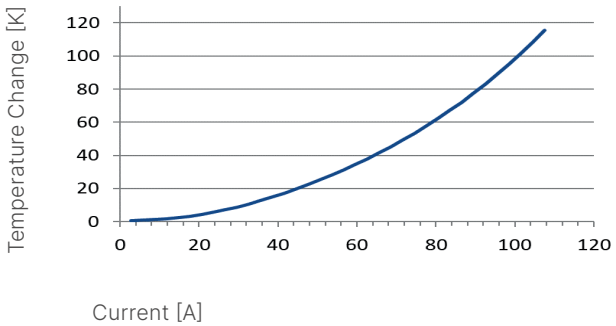
HCB056	Block	10.00 - 10.05

Series drawing

All measurements are in mm.



Thermal Rise of Contact Probe vs. Current



Order code	Product name	Power	Sense 1	Sense 2	Sensor	Cooling	Thread M]	FM Choice
1034100	HCB056A29MS9	29	-	-	-	x	M5	-
1034108	HCB056D29MS11TYPK	29	18	-	Typ K	-	M5	-

HCB063

100 A | High Current Scratch Block

Electrical specifications

Temperature [°C]	-45°...+200°	
	Sense	Power
Current [A]	1	100
R typ [mOhm]	<20	<2

Mechanical specifications

	Sense	Power	Sensor
Preload [cN]	90	510	-
Spring force [cN] at nt ±20%	200	1800	-
Nominal travel [mm]	4.3	4.0	-
Maximum travel [mm]	6.4	5.0	-

Materials and plating

Contact Sense	BeCu	gold plated
Contact Power	BeCu	gold plated
Barrel	Brass	gold plated
Block	Brass	silver plated
Spring Sense	Stainless steel	unplated
Spring Power	Stainless steel	unplated

Accessories

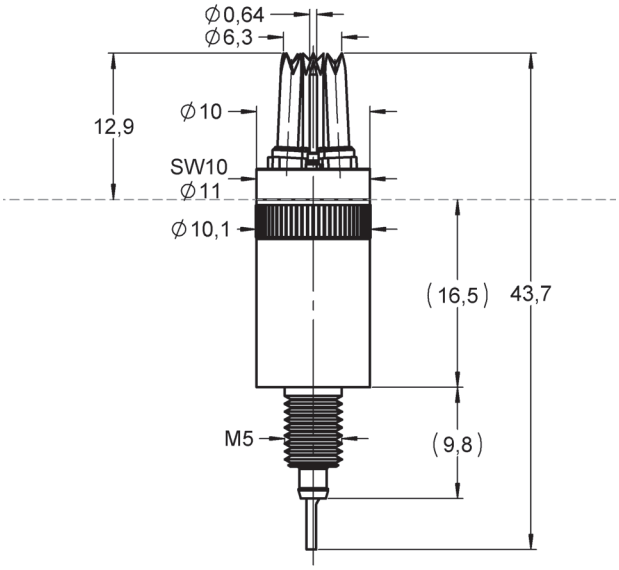
1024541	FDWZ-860C009	Insertion tool block
1029809	FWZ730S1T	Screw-in tool probe
1029814	FWZ733S2T	Screw-in tool probe

Drill size recommendation (mm)

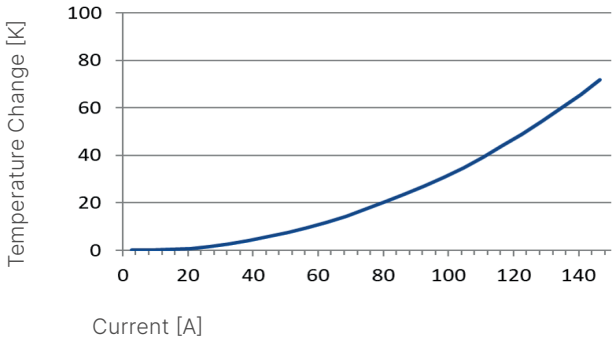
HCB063	Block	10.00 - 10.05

Series drawing

All measurements are in mm.



Thermal Rise of Contact Probe vs. Current



Order code	Product name	Power	Sense 1	Sense 2	Sensor	Cooling	Thread M]	FM Choice
1033703	HCB063A29MS18C	21	-	-	-	x	M5	-
1033312	HCB063B29MS20	21	18	-	-	-	M5	-

HCB045

70 A | High Current Block

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	70
R TYP [mOhm]	<3

Mechanical specifications

	Sense	Power	Sensor
Preload [cN]	200	250	-
Spring force [cN] at nt ±20%	1200	1500	-
Nominal travel [mm]	4.0	4.0	-
Maximum travel [mm]	5.0	5.0	-

Materials and plating

Plunger Power	BeCu	gold plated
Barrel	Brass	gold plated
Block	Brass	silver plated
Spring Power	Stainless steel	unplated

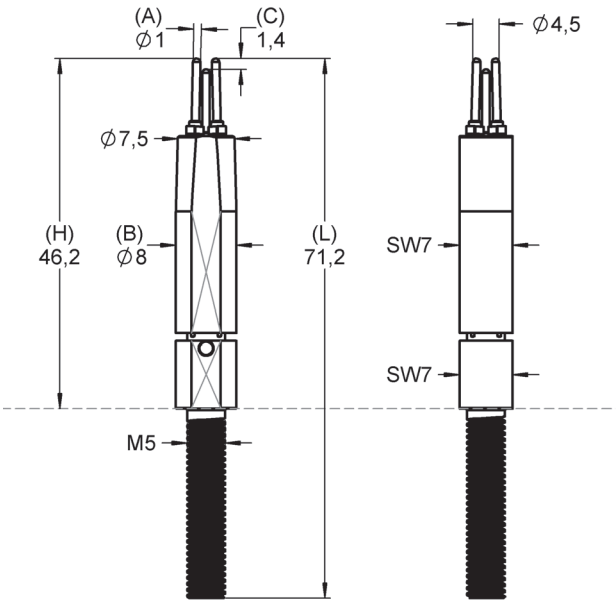
Accessories

1001681	FWZ732	Screw-in tool probe
1004610	FWZ732T	Screw-in tool probe

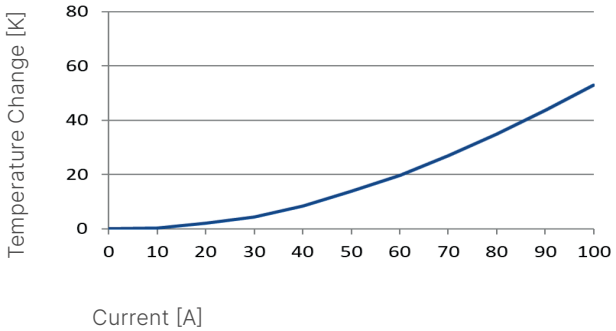
Suitable for contacting cylindrical contacts or screws.

Series drawing

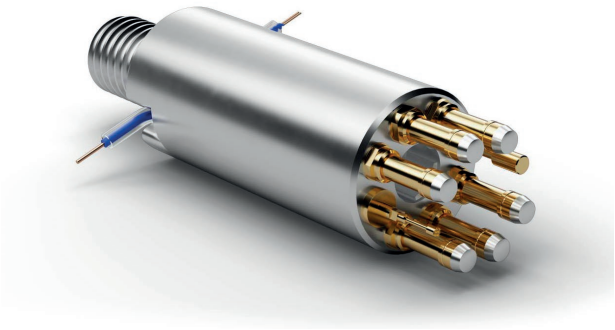
All measurements are in mm.



Thermal Rise of Contact Probe vs. Current



Order code	Product name	Power	Sense 1	Ø A	Ø B	C	H	Thread [M]	Version	FM Choice
1040030	HCB045A11MS12	11	-	1.0	8.0	-	46.2	M5	-	-
1056616	HCB045A11MS15	11	-	1.0	8.0	1.4	46.2	M5	-	-
1089466	HCB045A11MS15	11	-	1.0	8.0	1.5	46.3	M5	-	-



HCB190

400 A | High Current Block

Electrical specifications

Temperature [°C]	-45°...+200°	
	Sense	Power
Current [A]	2 - 20	450
R typ [mOhm]	10 - 30	<0.5

Mechanical specifications

	Sense	Power	Sensor
Preload [cN]	130	3500	-
Spring force [cN] at nt ±20%	400	7200	-
Nominal travel [mm]	2.2	5.0	-
Maximum travel [mm]	4.4	7.0	-

Materials and plating

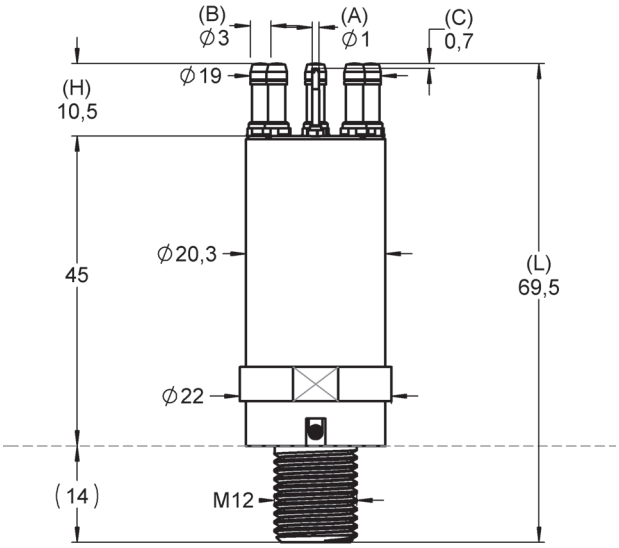
Plunger Sense	BeCu	gold plated
Plunger Power	BeCu	silver plated
Barrel	Brass	gold plated
Block	Brass	silver plated
Spring Sense	Stainless steel	unplated
	Spring steel	gold plated
Spring Power	Stainless steel	unplated

Accessories

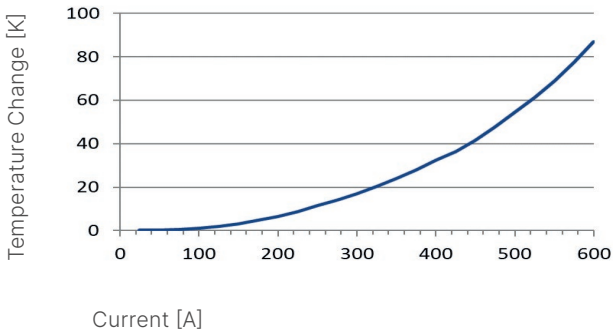
1029836	FWZVF3S2T	Screw-in tool probe

Series drawing

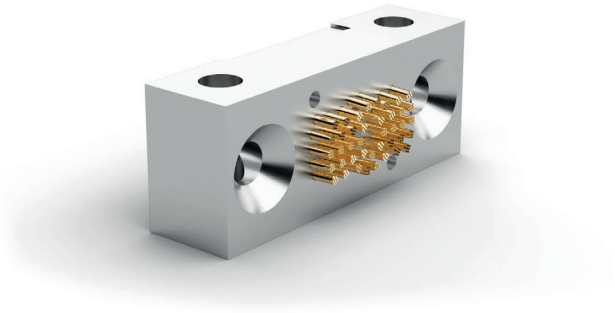
All measurements are in mm.



Thermal Rise of Contact Probe vs. Current



Order code	Product name	Power	Sense 1	Ø A	Ø B	C	H	Thread [M]	Version	FM Choice
1135082	HCB190B12MS73	12	29	1.0	3.0	-0.5	10.5	M12	-	-
1136614	HCB155D12MS62TYPK	12	06	1.0	3.0	-1.2	10.5	M12	TYPK	-
1115528	HCB195D12MS68TYPK	12	29	0.38	3.0	-1.2	10.5	M12	TYPK	-
1139214	HCB175D12MS72TYPK	12	06	1.0	3.0	-1.2	10.5	M12	TYPK	-



HCB280

600 A | High Current Block

Electrical specifications

Temperature [°C]	-45°...+200°	
	Sense	Power
Current [A]	20	600
R typ [mOhm]	<10	<0.5

Mechanical specifications

	Sense	Power	Sensor
Preload [cN]	50	7000	70
Spring force [cN] at nt ±20%	300	24500	200
Nominal travel [mm]	4.0	4.0	4.0
Maximum travel [mm]	5.0	5.0	5.0

Materials and plating

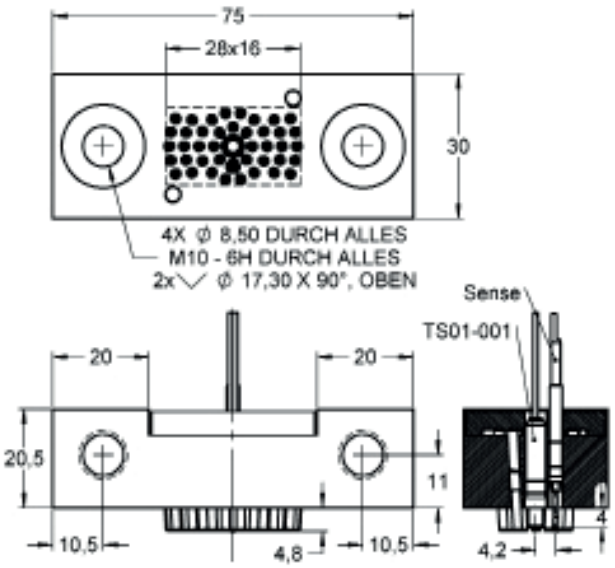
Contact Sense	BeCu	gold plated
Contact Power	BeCu	gold plated
Block	Brass	silver plated
Spring Sense	Stainless steel	unplated
Spring Power	Stainless steel	unplated

Accessories

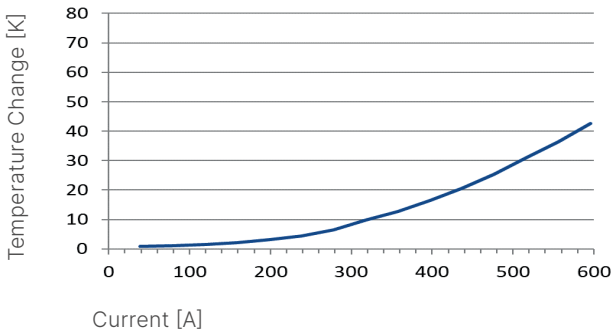
1013790	pneumatic	connection

Series drawing

All measurements are in mm.



Thermal Rise of Contact Probe vs. Current



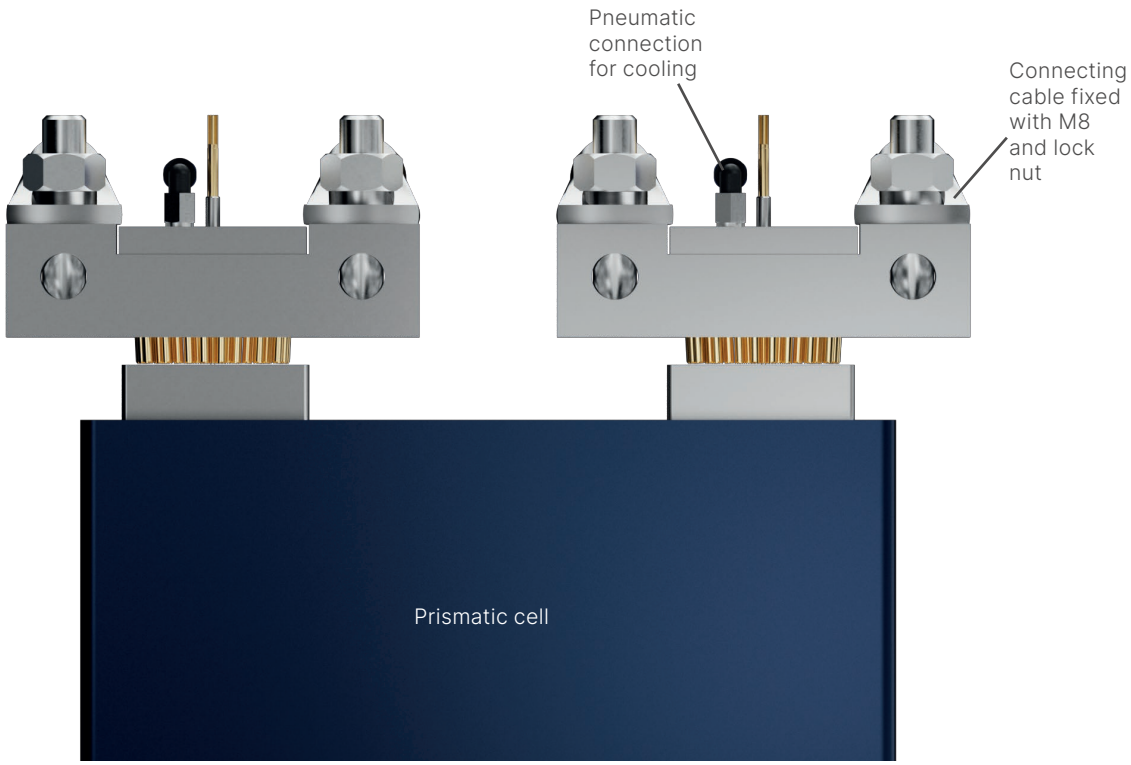
Order code	Product name	Power	Sense 1	Sense 2	Sensor	Cooling	Thread [M]	Version	FM Choice
1033721	HCB280A6ALS245	06	-	-	-	x	M8 / M10	A	-
1037718	HCB280B6ALS245	06	29	-	-	x	M8 / M10	B	-
1033727	HCB280D6ALS245PT100	06	29	-	PT100	x	M8 / M10	D	-
1033726	HCB280D6ALS245PT1000	06	29	-	PT1000	x	M8 / M10	D	-
1033725	HCB280D6ALS245NTC	06	29	-	NTC	x	M8 / M10	D	-
1033475	HCB280D6ALS245TYPK	06	29	-	Typ K	x	M8 / M10	D	-

FUNCTION & ADVANTAGES

Application

In this application, the HC01 is shown with sense contact, temperature sensor and a pneumatic connection. The High Current Block can be fixed with an M8 and lock nut or screwed directly to M10 in the thread. The additional M3 hole can always be used for cooling, regardless of the design.

A pneumatic connection piece 1013790 is provided for this purpose (not included in the scope of delivery). Connection recommendation Cable diameter 120 mm² + 50 mm².



Benefits

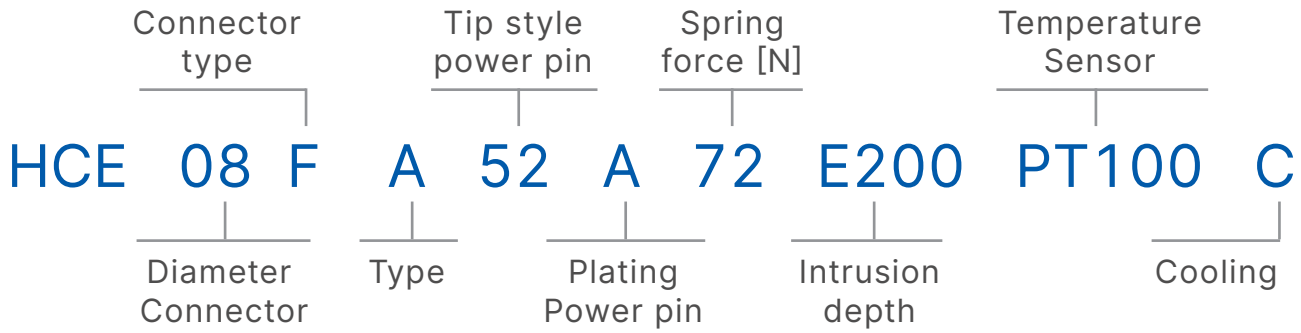
- Continuous current carrying capacity up to 600A
- Individually spring-loaded plungers with proven scratch contact for current path for optimum contact on typical cell arresters of LIB cells
- Equipped with spring-loaded sense contact probe for voltage path of four-pole measurement
- Additional sense contact probe can be retro fitted via contact insert with encoderinterface
- Integrated spring-loaded temperature sensor (4 types) directly at the contact point
- Low heating of less than 50K at full load
- Connection for additional cooling possibility of contact point integrated
- Universal design of electrical connections and mechanical mounting (M8/M10 vertical and horizontal)

E-MOBILITY PROBES

PRODUCT NAME E-MOBILITY PROBES

Number code system

In order to improve the clarity of the material designations, the self-explanatory number code has been further developed. Therefore, all E-Mobility probes have been redefined according to the order code shown below.



Diameter Connector

08 = 8.0 mm

Connector type

M = Male
F = Female

Type

A = HS (high current probe)
B = HS+Sense
G = HS+Sense+ Finger protection query

Intrusion depth

E200 = 20.0 mm

Plating Power pin

A = Silver alloy
G = Gold
L = Longtime gold
N = Nickel
U = Unplated
P = Progressive
R = Rhodium
S = Silver

Temperature Sensor (optional)

PT100
PT1000
NTC
Typ K

Cooling (optional)

C = Cooling connection

HCE04-M

50 A | For socket Ø4mm

Electrical specifications

Temperature [°C]	-45°...+200°	
	Sense	Power
Current [A]	2	50
Dielectric strength [kV]	3	

Mechanical specifications

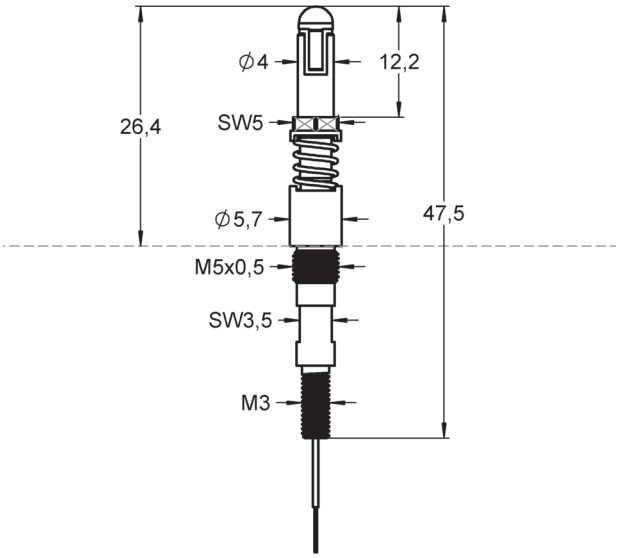
Preload [cN]	800
Spring force [cN] at nt ±20%	1125
Nominal travel [mm]	4.4
Maximum travel [mm]	5.0

Materials and plating

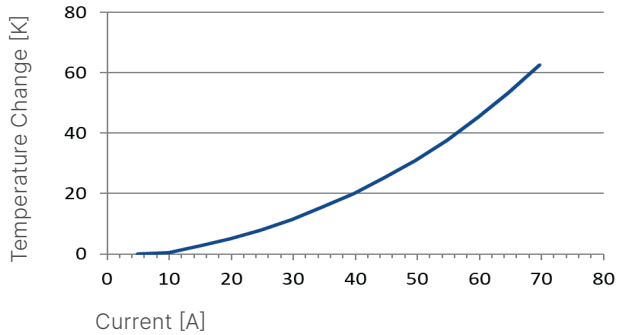
Plunger	Brass	gold plated
Barrel	Brass	unplated
Spring	Stainless steel	unplated

Series drawing

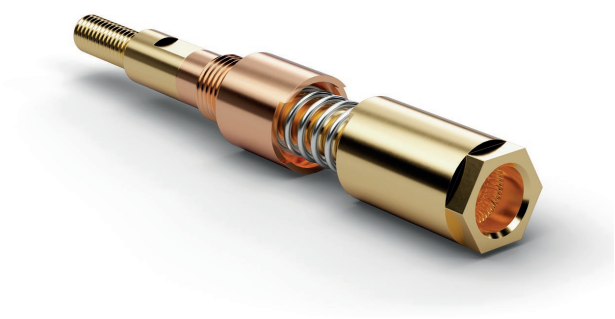
All measurements are in mm.



Thermal Rise of Contact Probe vs. Current



Order code	Product name	Tip style	Type	Pin length	Total length	Thread [M]	Version	FM Choice
1040861	HCE04MB11G11E122	11	B	12.2	47.5	M3	-	-



HCE04-F

50 A | For pin Ø4mm

Electrical specifications

Temperature [°C]	-45°...+200°	
	Sense	Power
Current [A]	2	50
Dielectric strength [kV]	3	

Mechanical specifications

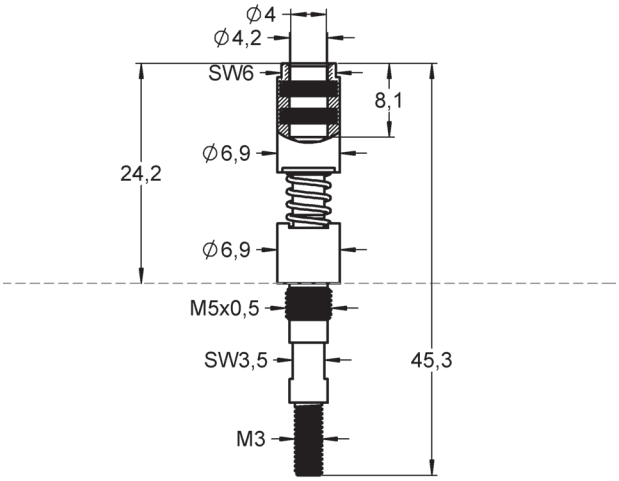
Preload [cN]	600
Spring force [cN] at nt ±20%	1000
Nominal travel [mm]	4.4
Maximum travel [mm]	5.0

Materials and plating

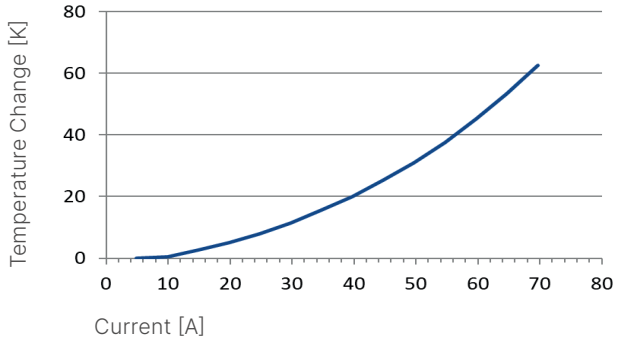
Plunger	Brass	gold plated
Barrel	Brass	unplated
Spring	Stainless steel	unplated

Series drawing

All measurements are in mm.



Thermal Rise of Contact Probe vs. Current



Order code	Product name	Tip style	Type	Socket depth	Total length	Thread [M]	Version	FM Choice
1037085	HCE04FA52G10E081	52 	A	8.1	45.3	M3	-	-
1039767	HCE04FB52G10E081	52 	B	8.1	45.3	M3	-	-

HCE06-M

100 A | For socket Ø6mm

Electrical specifications

Temperature [°C]	-45°...+200°	
	SENSE	POWER
Current [A]	2	100
R TYP [mOhm]	10	5

Mechanical specifications

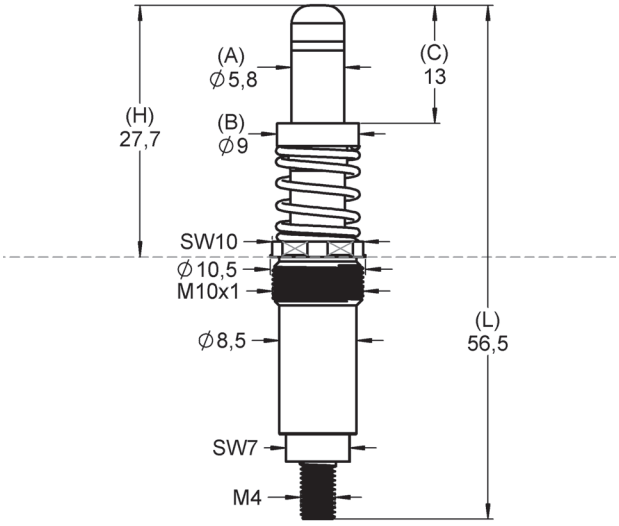
Preload [cN]	1400
Spring force [cN] at nt ±20%	2400
Nominal travel [mm]	4.0
Maximum travel [mm]	5.0

Materials and plating

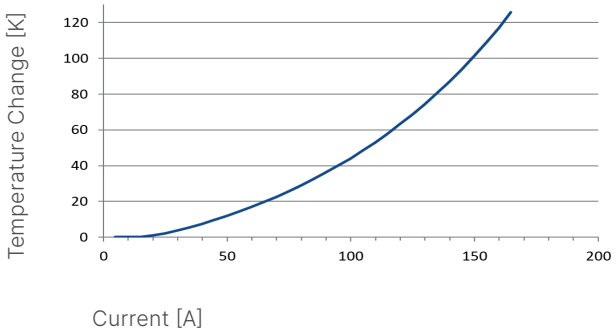
Plunger	Brass	silver plated
Barrel	Brass	unplated
Spring	Stainless steel	unplated

Series drawing

All measurements are in mm.



Thermal Rise of Contact Probe vs. Current



Order code	Product name	Tip style	Type	Pin length	Total length	Thread [M]	Version	FM Choice
1040075	HCE06MB11S24E130	11	B	13.0	56.5	M4	-	-

HCE06-F

100 A | For pin Ø6mm

Electrical specifications

Temperature [°C]	-45°...+200°	
	SENSE	POWER
Current [A]	2	100
R TYP [mOhm]	10	5

Mechanical specifications

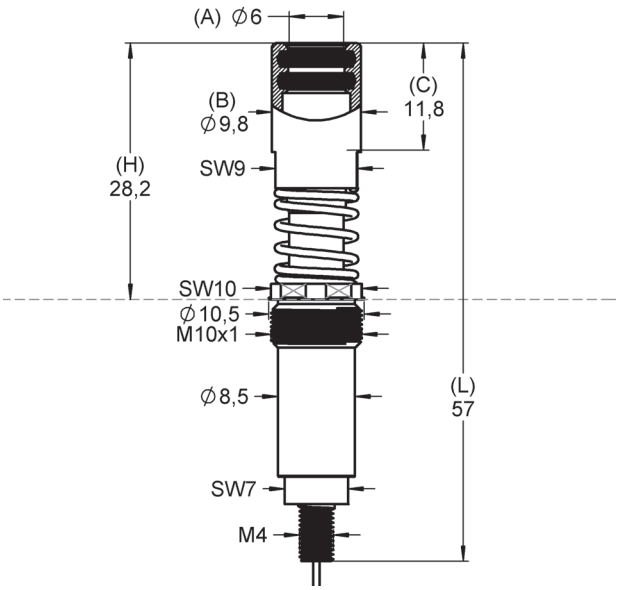
Preload [cN]	1400
Spring force [cN] at nt ±20%	2400
Nominal travel [mm]	4.0
Maximum travel [mm]	5.0

Materials and plating

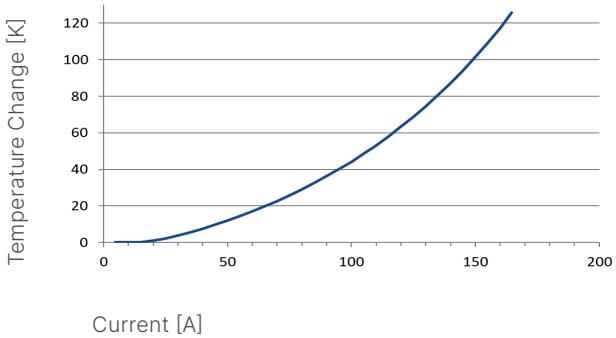
Plunger	Brass	silver plated
Barrel	Brass	unplated
Spring	Stainless steel	unplated

Series drawing

All measurements are in mm.



Thermal Rise of Contact Probe vs. Current



Order code	Product name	Tip style	Type	Socket depth	Total length	Thread [M]	Version	FM Choice
1040353	HCE06FB52S24E118	52	B	11.8	57.0	M4	-	-
1039758	HCE06FG52S24E107	52	G	10.7	57.0	M4	-	-

HCE08-M

200 A | For socket Ø8mm

Electrical specifications

Temperature [°C]	-45°...+200°	
	SENSE	POWER
Current [A]	2	200
R TYP [mOhm]	10	1

Mechanical specifications

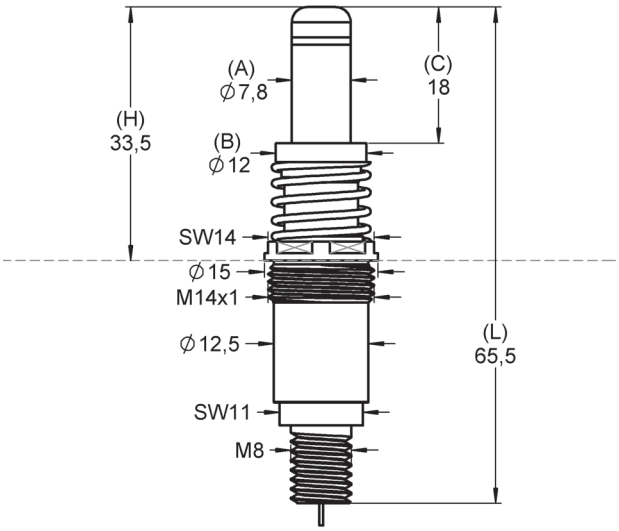
Preload [cN]	2320
Spring force [cN] at nt ±20%	2800
Nominal travel [mm]	4.0
Maximum travel [mm]	5.0

Materials and plating

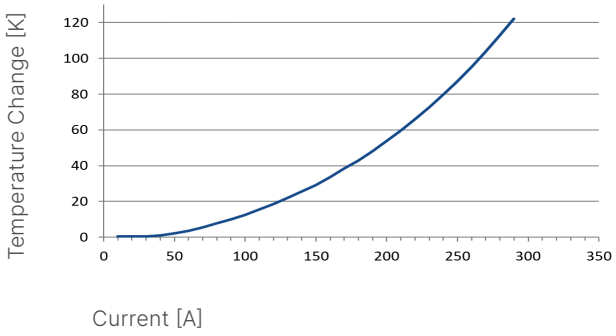
Plunger	Brass	silver plated
Barrel	Brass	unplated
Spring	Stainless steel	unplated

Series drawing

All measurements are in mm.



Thermal Rise of Contact Probe vs. Current



Order code	Product name	Tip style	Type	Pin length	Total length	Thread [M]	Version	FM Choice
1057694	HCE08MB11S24E180	11	B	18.0	65.5	M6	-	-

HCE08-F

200 A | For pin Ø8mm

Electrical specifications

Temperature [°C]	-45°...+200°	
	SENSE	POWER
Current [A]	2	200
R TYP [mOhm]	10	1

Mechanical specifications

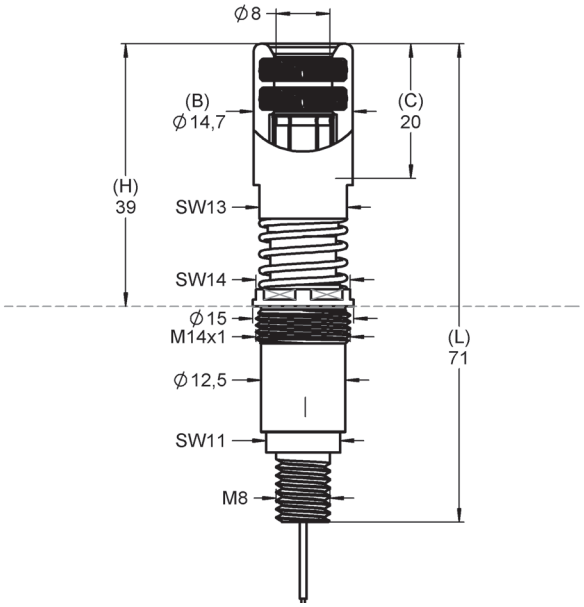
Preload [cN]	2320
Spring force [cN] at nt ±20%	2800
Nominal travel [mm]	4.0
Maximum travel [mm]	5.0

Materials and plating

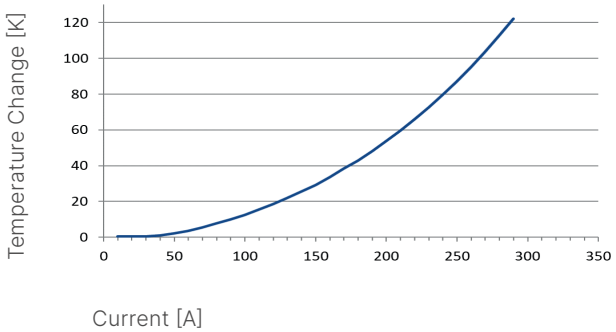
Plunger	Brass	silver plated
Barrel	Brass	unplated
Spring	Stainless steel	unplated

Series drawing

All measurements are in mm.



Thermal Rise of Contact Probe vs. Current

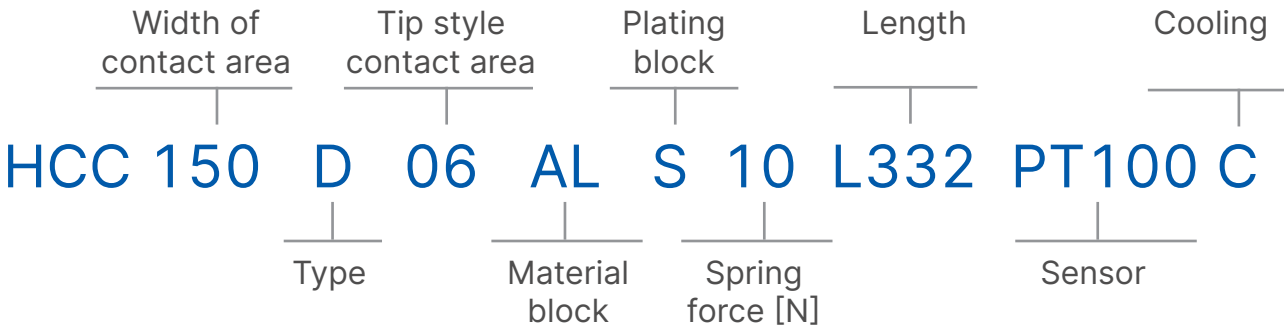


Order code	Product name	Tip style	Type	Socket depth	Total length	Thread [M]	Version	FM Choice
1040337	HCE08FA52S28E200	52	A	20.0	39.0	M6	-	-
1040083	HCE08FB52S28E200	52	B	20.0	39.0	M6	-	-
1052667	HCE08FB52S28E260	52	B	26.0	45.0	M6	-	-

PRODUCT NAME CLAMPS

Number code system

In order to improve the clarity of the material designations, the self-explanatory number code has been further developed. Therefore, all High Current Clamps have been redefined according to the order code shown below.



Width of contact area

15.0 mm = 150

Type

A = HS (high current probe)
B = HS+Sense
C = HS+Temp.sensor
D = HS+Sense+Temp.sensor
E = HS+Sense+Sense
F = HS+Sense+Sense+Temp.sensor

Material block

Al = Aluminium
Cu = Copper
M= Brass

Length (optional)

L332 = 33.2 mm

Plating block

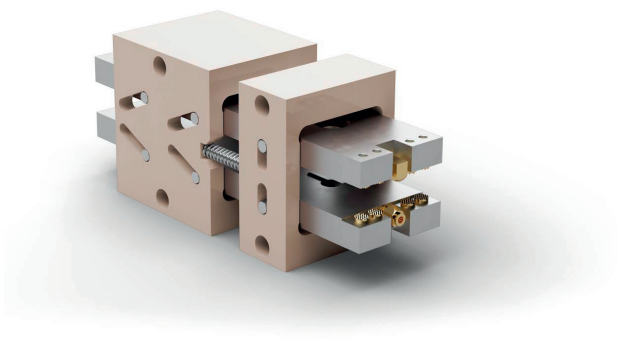
G = Gold
L = Longtime gold
N = Nickel
U = Unplated
P = Progressive
R = Rhodium
S = Silver

Temperature Sensor (optional)

PT100
PT1000
NTC
Typ K

Cooling (optional)

C = Cooling connection



HCC150

150 A | High Current Clamps for contacting pouch cells

Electrical specifications

Temperature [°C]	-45°...+200°	
	Sense	Power
Current [A]	2	150
R typ [mOhm]	<1	<0.3

Mechanical specifications

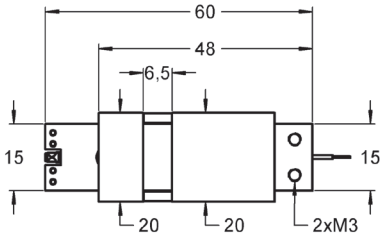
	Sense	Power	Sensor
Preload [cN]	-	400	-
Spring force [cN] at nt ±20%	-	1000	-
Nominal travel [mm]	-	4.0	-
Maximum travel [mm]	-	5.0	-

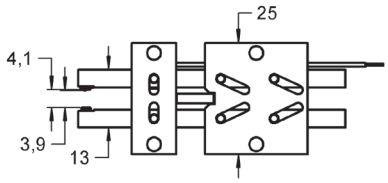
Materials and plating

Contact Sense	BeCu	gold plated
Contact Power	BeCu	silver plated
Carrier plate	Aluminium	silver plated
Housing	Syntetic	unplated
Spring Sense	Stainless steel	unplated
Spring Power	Stainless steel	unplated

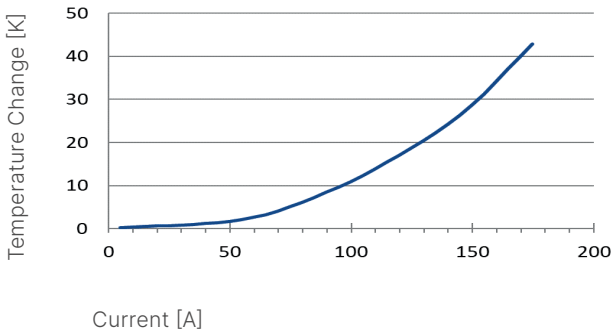
Series drawing

All measurements are in mm.

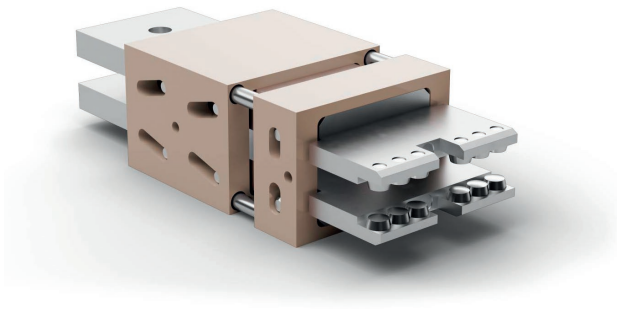




Thermal Rise of Contact Probe vs. Current



Order code	Product name	Power	Type	max. Spade thickness	Sensor	Thread [M]	Version	FM Choice
1129268	HCC150B06ALS10	06	B	3.7	-	M3	-	-
1114189	HCC150D06ALS10TYPK	06	D	3.7	Typ K	M3	-	-



HCC220

250 A | High Current Clamps for flat blade connectors

Electrical specifications

Temperature [°C]	-45°...+200°	
	Sense	Power
Current [A]	-	250
R typ [mOhm]	-	<0.2

Mechanical specifications

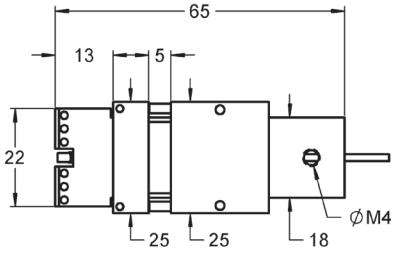
	Sense	Power	Sensor
Preload [cN]	-	800	-
Spring force [cN] at nt ±20%	-	5000	-
Nominal travel [mm]	-	2.5	-
Maximum travel [mm]	-	3.5	-

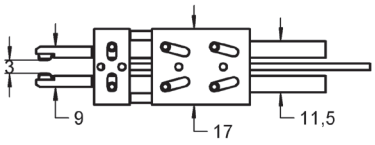
Materials and plating

Contact Sense	BeCu	gold plated
Contact Power	BeCu	silver plated
Carrier plate	Aluminium	silver plated
Housing	Syntetic	unplated
Spring Sense	Stainless steel	unplated
Spring Power	Stainless steel	unplated

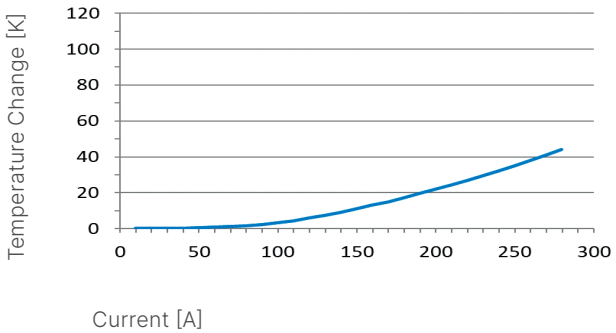
Series drawing

All measurements are in mm.





Thermal Rise of Contact Probe vs. Current

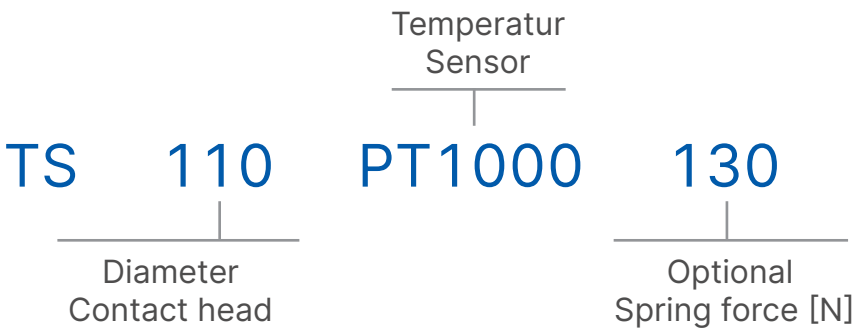


Order code	Product name	Power	Type	max. Spade thickness	Sensor	Thread [M]	Version	FM Choice
1103548	HCC220A12ALS50	12	A	2.8	-	M4	-	-
1103549	HCC220B12ALS50	12	B	2.8	-	M4	-	-
1093633	HCC220D12ALS50TYPK	12	D	2.8	Typ K	M4	-	-

PRODUCT NAME TEMPERATURE SENSORS

Number code system

In order to improve the clarity of the material designations, the self-explanatory number code has been further developed. Therefore, all Temperature Sensors have been defined according to the order code shown below.



Diameter Contact head

110 = 1.10 mm

Description sensor types

Spezifikationen	PT100	PT1000	NTC	TYPK
Application	Platinum measuring resistors are designated according to their material and their nominal resistance R0 at a temperature of 0 °C (PT100 = R0 = 100 Ω). The PT100 is a fast-response, waterproof miniature temperature sensor suitable for universal temperature measurement even in small of spaces.	Platinum measuring resistors are designated according to their material and their nominal resistance R0 at a temperature of 0 °C (PT1000 = R0 = 1000 Ω). The PT1000 is a fast-response, waterproof miniature temperature sensor and suitable for universal temperature measurement even in small of spaces.	The NTC sensor (NTC = Negative Temperature Coefficient) is a temperature-dependent component. If the temperature rises, the resistance of the NTC sensor decreases. Its characteristic curve is non-linear.	Thermocouple Typ K is the most common thermocouple type with a large measuring range. Thermocouple connector not included in scope of delivery.

FM Choice

TS110TYPK0

Rigid temperature sensor

Thermocouple typ K is the most common thermocouple type with a large measuring range. Thermocouple connector not included in scope of delivery.

General information

Pitch [mm/mil]	1.90 / 75
Temperature [°C]	-45°C...+250°C
Sensor type	Typ K

Materials and plating

Sensor head	Bronze, unplated

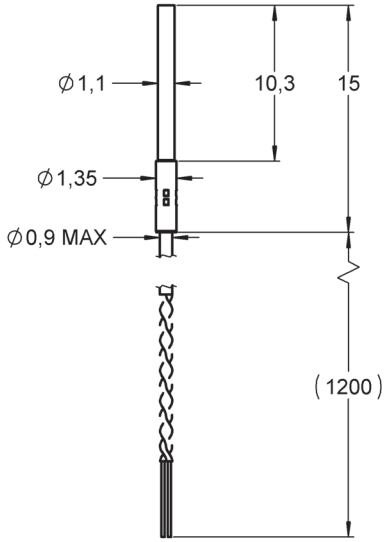
Sensor Specifications

Measuring principle	thermocouple
Accuracy / grade	±2°C
Response time t63 related to medium water	ca. 2 sec.
Response time t63 related to metal contact in air	ca. 1 sec.
Switching type	2-wire
Cable diameter	ca. 0.9 mm
Cable length	1.2 m (not extendable)
Cable insulation	Teflon
Cable end	unassebled
Protection class	watertight IP65

Order code	Product name	FM Choice
1034107	TS110TYPK0	FM Choice

Series drawing

All measurements are in mm.



TS110TYPK130

Spring-loaded temperature sensor

Thermocouple typ K is the most common thermocouple type with a large measuring range. Thermocouple connector not included in scope of delivery.

General information

Pitch [mm/mil]	2.54 / 100
Temperature [°C]	-45°C...+250°C
Sensor type	Typ K

Mechanical specifications

Preload [cN]	50
Spring force [cN] at nt	130
Nominal travel [mm]	3.5
Maximum travel [mm]	4.3

Materials and plating

Sensor head	Bronze, unplated
Barrel	Syntetic, unplated
Spring	Stainless steel, unplated

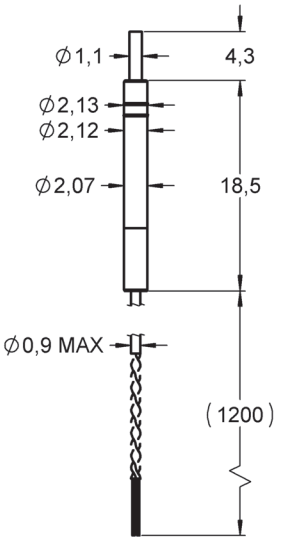
Sensor Specifications

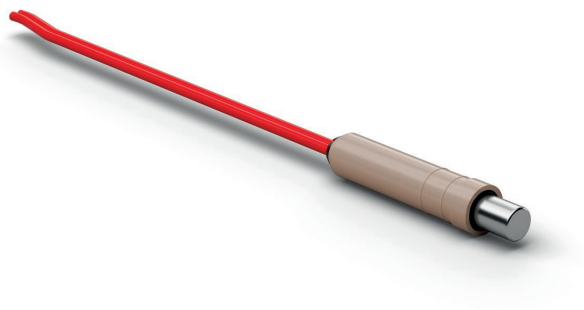
Measuring principle	thermocouple
Accuracy / grade	±2°C
Response time t63 related to medium water	ca. 0.2 - 0.3 sec.
Response time t63 related to metal contact in air	ca. 1-2 sec.
Switching type	2-wire
Receptacle potential-free / galvanically isolated	yes
Cable diameter	ca. 0.9 mm
Cable length	1.2 m (not extendable)
Cable insulation	Teflon
Cable end	unassebled
Protection class	watertight IP65

Order code	Product name	FM Choice
1040284	TS110TYPK130	-

Series drawing

All measurements are in mm.

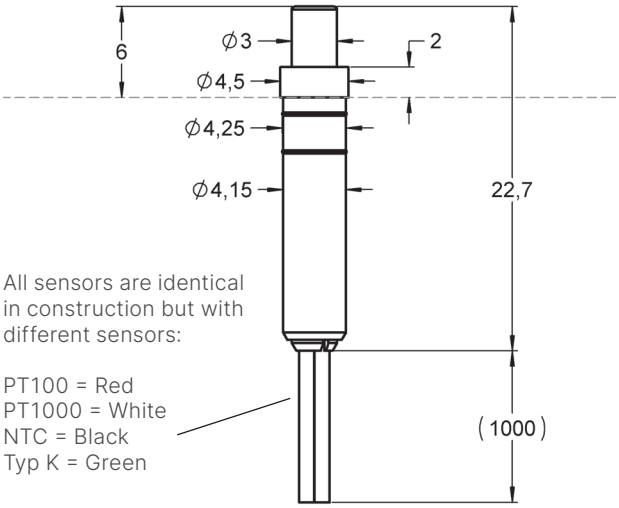




FM Choice

TS300

Spring-loaded temperature sensor



General information

Pitch [mm/mil]	5.00 / 197
Temperature [°C]	-45°C...+200°C

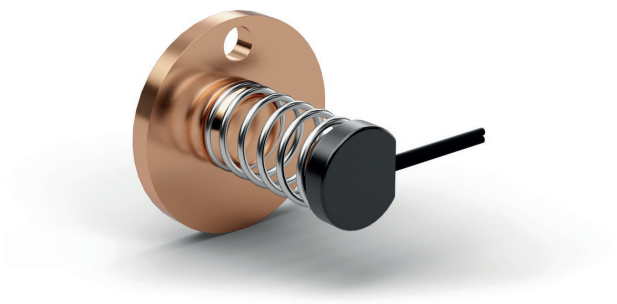
Mechanical specifications

Preload [cN]	70
Spring force [cN] at nt	200
Nominal travel [mm]	3.0
Maximum travel [mm]	4.0

Materials and plating

Sensor head	Stainless steel, unplated
Barrel	Syntetic, unplated
Spring	Stainless steel, unplated

Spezifikationen	TS300PT100200	TS300PT1000200	TS300NTC200	TS300TYPK200
Order code	1033230	1125763	1033193	1033232
Sensor Type	PT100	PT1000	NTC	Typ K
Measuring principle	resistance	resistance	thermistor	thermocouple
Accuracy / grade	B	A	B	2
Response time t63 (related to medium water)	ca. 2 sec.	ca. 2 sec.	ca. 2 sec.	ca. 2 sec.
Response time t63 (related to metal contact in air)	ca. 30 sec.	ca. 30 sec.	ca. 30 sec.	ca. 30 sec.
Switching type	2-wire	2-wire	2-wire	2-wire
Receptacle potential-free / galvanically isolated	yes	yes	yes	yes
Cable diameter	ca. 2,0 mm	ca. 2,0 mm	ca. 2,0 mm	ca. 1,0 mm
Cable length	1,0 m (extendable)	1,0 m (extendable)	1,0 m (extendable)	1,2 m (not extendable)
Cable insulation	Teflon	Teflon	Teflon	Teflon
Cable end	stripped	stripped	stripped	unassembled
Protection class	watertight IP67	watertight IP67	watertight IP67	watertight IP67
Sensor cable colour	red	white	black	green
Drill size [mm]	4,2 H7	4,2 H7	4,2 H7	4,2 H7



TS650TYPK200

Spring-loaded temperature sensor

Thermocouple typ K (NiCr/Ni), electrically insulated to the sensor head Thermocable teflon insulated, length 1800mm Miniature TE plug typ K at free end.

General information

Pitch [mm/mil]	15.0 / 590
Temperature [°C]	-45°C...+120°C
Sensor type	Typ K (NiCr/Ni)

Mechanical specifications

Preload [cN]	0
Spring force [cN] at nt	200
Nominal travel [mm]	3.0
Maximum travel [mm]	6.0

Materials and plating

Sensor head	Nickel, unplated
Barrel	Bronze, unplated
Spring	Stainless steel, unplated

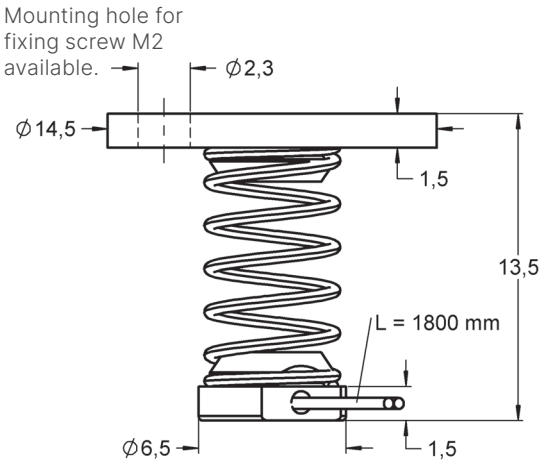
Sensor Specifications

Measuring principle	thermocouple
Accuracy / grade	2
Response time t63 related to medium water	ca. 2 sec.
Response time t63 related to metal contact in air	ca. 30 sec.
Switching type	2-wire
Cable diameter	ca. 1.0 mm
Cable length	1.8 m (not extendable)
Cable insulation	Teflon
Cable end	Thermo-plug yellow

Order code	Product name	FM Choice
1035034	TS650TYPK200	-

Series drawing

All measurements are in mm.



POGO CONNECTORS

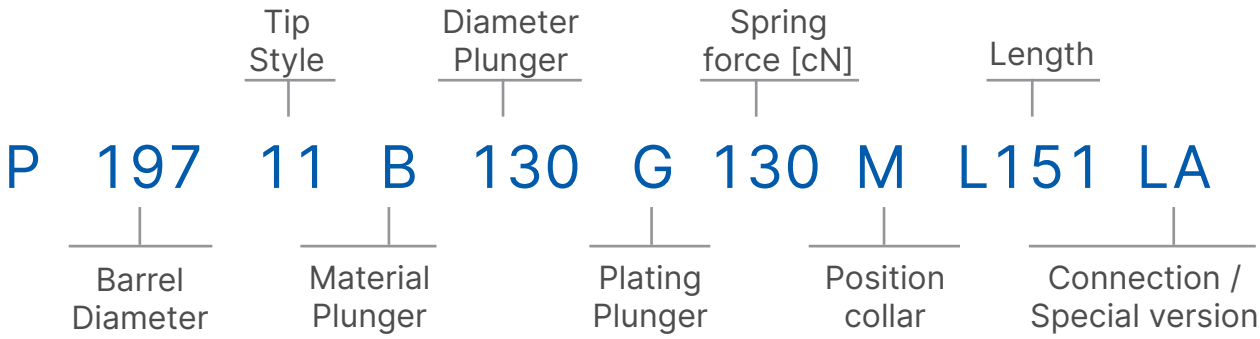
OVERVIEW POGO CONNECTORS

Type	Current [A]	Resistance [mOhm]	Notes
P067-L085	4	<20	
P067-L114	4	<70	
P070M-L060	3	<20	Solder tight
P090T-L053	5	<30	
P118M-L065	5	<20	
P125B-L027	4	<30	Solder tight
P137-L095	8	<20	
P140T-L053	8	<100	Solder tight
P140T-L080	8	<100	Solder tight
P146-L062	10	<60	Non-magnetic
P150B-L057	5	<100	Solder tight
P150B-L077	5	<100	Solder tight
P150-L213	5	<50	
P150T-L222	8	<30	Solder tight
P150B-L280	5	<25	
P162T-L160	8	<30	
P165T-L103	8	<30	Solder tight
P165T-L126	8	<30	Solder tight
P170M-L136	5	<30	
P176T-L082	5	<30	Pogo Tower applications
P197T-L053	9	<30	Solder tight

Type	Current [A]	Resistance [mOhm]	Notes
P197M-L074	10	<100	Solder tight
P197T-L080	9	<100	Solder tight
P197B-L085	9	<100	Solder tight
P197M-L100	9	<30	Solder tight
P197T-L106	9	<100	Solder tight
P197M-L114	10	<100	Solder tight
P197M-L130	9	<100	Solder tight
P197M-L150	9	<30	Solder tight
P214T-L090	9	<20	Solder tight
P228M-L065	9	<30	Solder tight
P230T-L078	9	<120	Solder tight
P265M-L150	10	<100	Solder tight
P275M-L050	10	<30	Solder tight
P400T-L135	30	<100	Continous plunger
P400T-L135	30	<20	Continous plunger
P410M-L104	10	<30	Solder tight
P500-L115	20	<30	Wobbling function
P500T-L160	20	<30	Solder tight
P500T-L210	30	<30	Solder tight
HC040	50	<5	Solder tight

PRODUCT NAME POGO CONNECTORS

Number code system



Barrel Diameter

197 = 1.97 mm

Material Plunger

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

Plunger Diameter

130 = 1.30 mm

Plating Plunger

G = Gold plated
L = Longtime gold
N = Nickel
U = Unplated
P = Progressive
R = Rhodium
S = Silver
LX = Anodizing
M = Multiplex gold

Position collar

Empty = no collar
T = Collar on top of the barrel
M = Collar in the middle of the barrel
B = Collar at the end of the barrel

Length

L151 = 15,1 mm

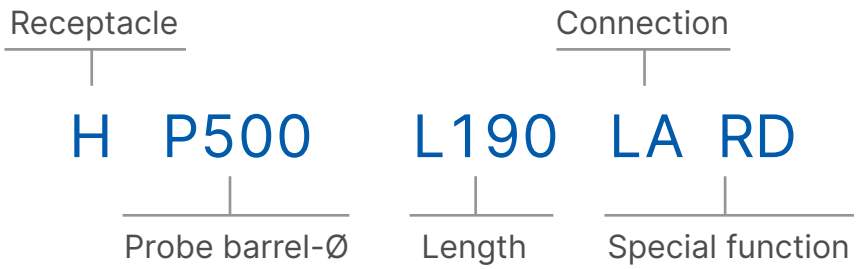
Connection / Special version

Empty = no connection
LA = Solder connection
CR = Crimp connection
WR = Round pin
WW = Wire wrap pin
S = Screwable
H = High temperatur
ST = Solder tight, high temperatur
C = Cooling
NM = Non-magnetic
S(1) = Special version (continuous number)

PRODUCT NAME RECEPTACLES

Number code system

In order to improve the clarity of the material designations, the self-explanatory number code has been further developed. Therefore, all Pogo Connectors and the matching receptacles have been redefined according to the ordering code shown below.



Connection

Empty = no connection
LA = Solder connection
CR = Crimp connection
WR = Round pin
WW = Wire wrap pin
WL = Wireless connection
S = Screwable

Special function

NM = Non-magnetic
RD = Knurl
S(1) = Special version (continuous number)

Length

L190 = 19,0 mm

MOUNTING OF POGO CONNECTORS

Flexible & versatile solutions

Pogo Connectors are compact and direct solderable contact probes. Their application range is extremely versatile and reaches far beyond pure test applications. Wherever detachable electrical connections are required, they can be a smart solution.

For this reason, there are a large number of different variants. And there are also a wide variety of mounting options to suit all applications. These options are explained in more detail below.

Pressed-Fit
Pogo Connectors can be pressed directly into a hole using barbs or as a press fit with the outer diameter of the barrel.

Soldering
The most common way is to solder our Pogo Connectors directly on curcuit boards or other conductive surfaces using their design which benefits easy and precise soldering using solder paste.

Floated mounting
This methode allows some degree of lateral or angular movement due to its collar. Further it benefits self-positioning of the probe in the application to reduced the risk of damages due to misalaginment.

Screw mounting
Screw mounting secures Pogo Connectors by fastening them using the attached thread, providing a strong and stable connections to mechanical stress or vibration.

Receptacles
These receptacles for Pogo Connector allow an easy instertion and removal of the pressed-in probes. Wires are soldered or crimped directly to the receptacle.

PLUNGER DESIGNS

	Basic plunger	Drill hole plunger	Bias design	Bias Ball design	Split plunger design
Contact safety	+	+	++	+++	++++
Continous current	+	+	++	+++	++++
Mechanical life	+++	+++	++	++	+
Manufacturing costs	++++	++	++	+	+
Spring force	+++	++	+++	+	+
Travel	++++	++++	+++	++	+

Drill hole

The drill hole in the plunger allows better adaptation to different insertion and tolerance conditions due to the longer spring travel. Increased spring force can be achieved by using a longer spring. A higher spring force can provide a stronger electrical connection and improve contact stability.

The hollow plunger allows better flexibility and adaptability to different surfaces or application environments. It can better compensate for vibration, shock and unevenness, increasing the reliability of the contact.

Bias ball design

The bias ball design can provide improved electrical performance, especially in applications with higher currents or demanding environments. The ball provides a more reliable and stable electrical connection. By using a ball in the bias design, Pogo Connectors can be better protected against vibration and shock, which increases the reliability of the connection. The bias ball design can help minimize contact wear and extend the life of the Pogo Connector.

Split plunger design

The split plunger design is often used when precise alignment and stable contact are required. It allows better adaptation to different tilt angles or surface adjustments and minimizes probe wear or degradation. The split plunger design is especially useful in applications that require high data transfer rates, sensitive measurements or accurate positioning.

Specific requirements

It is important to consider the specific requirements of the application. This includes i.a. current, data transfer rates, environmental factors and mechanical adaptability. Certain plunger designs may be more suitable than others, the comparison on several factors may vary from case to case. Furthermore, cost, space requirements and electrical performance should be considered.

UNIQUE POSSIBILITIES

Compact and smart solutions

Pogo Connectors are compact and direct solderable contact probes. Their application range is extremely versatile and reaches far beyond pure test applications. Wherever detachable electrical connections are required, they can be a smart solution.

For this reason, there are a large number of different variants. And there are also a wide variety of mounting options to suit all applications. These options are explained in more detail below.

Smallest Pogo Connector in the world

- Smallest Pogo Connector with a diameter of 0.6mm and a total length of 1.0mm
- Limited space applications
- Non Test applications
- Perfect for high frequency applications with a performance up to 80 GHz
- Advantages of battery contacts
- Compact design, short travel for limited mounting space
- Long mechanical lifetime
- High contact reliability and good transmission of high currents
- Constant pressure, ensuring a stable connection even in environments with vibrations or shocks

Pogo Connectors in Block Units

This solution allows cost effective and time saving assembly without the need to interrupt the production process by manual operations. Using block units also simplifies the centering and positioning of the probes.

Taped Pogo Connectors

This solution allows cost effective and time saving assembly without the need to interrupt the production process by manual operations.

P060-L010

0.70 mm / 28 mil Pitch | R<100 mOhm

Electrical specifications

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

Mechanical specifications

Preload [cN]	15
Spring force [cN] at nt ±20%	35
Nominal travel [mm]	0.20
Maximum travel [mm]	0.22

Materials and plating

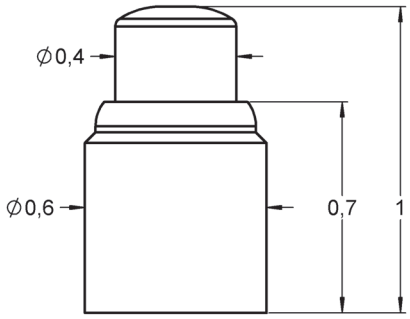
Plunger	BeCu	gold plated
Barrel	Bronze	gold plated
Spring	Spring steel	gold plated

Drill size recommendation (mm)

Equal barrel-Ø	0.59 - 0.61

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1111356	P06011B040G035L010	11	B	0.40	G	-

P067-L085

1.27 mm / 50 mil Pitch | R<20 mOhm

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	4
R TYP [mOhm]	<20

Mechanical specifications

Preload [cN]	34
Spring force [cN] at nt ±20%	60
Nominal travel [mm]	0.6
Maximum travel [mm]	1.1

Materials and plating

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

Accessories

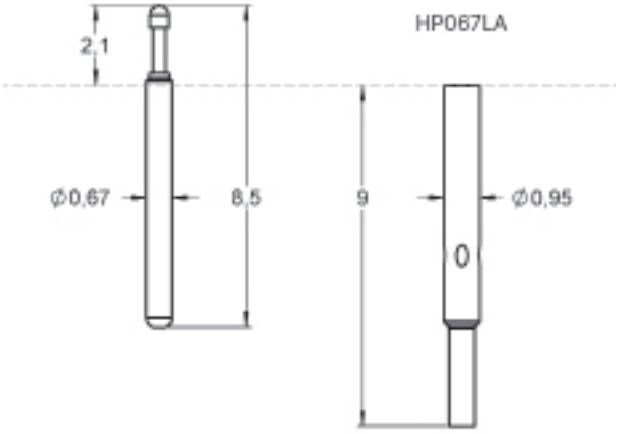
1006006	HP067LA	Receptacle
1003643	FEWZ-511E0	Insertion tool receptacle
1003576	FDWZ-050	Insertion tool probe

Drill size recommendation (mm)

1001828	HP067WW09	0.92 - 0.94

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1006012	P06712B050G060L085H	11	B	0.50	G	-

P067-L114

1.27 mm / 50 mil Pitch | R<70 mOhm

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	4
R TYP [mOhm]	<70

Mechanical specifications

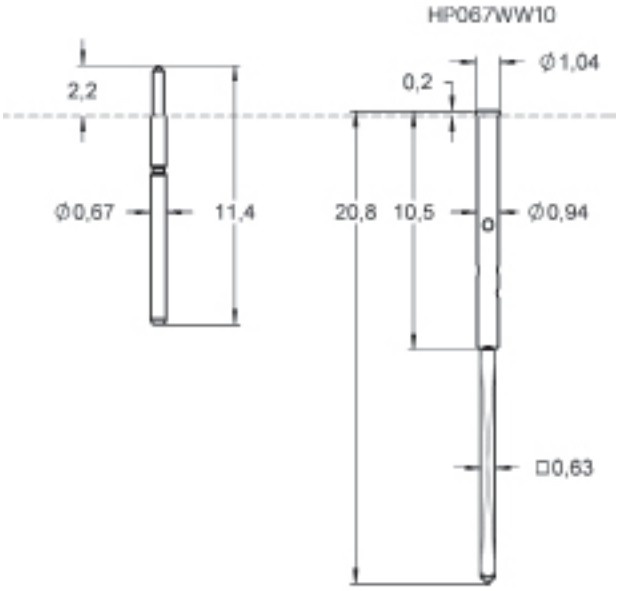
Preload [cN]	15	30
Spring force [cN] at nt ±20%	50	75
Nominal travel [mm]	0.8	0.8
Maximum travel [mm]	1.2	1.2

Materials and plating

Plunger	BeCu	gold plated
	Steel	longtime gold plated
Barrel	Bronze	silver plated
Spring	Spring steel	silver plated
	Stainless steel	unplated (ST)
Receptacle	Brass	gold plated

Series drawing

All measurements are in mm.



Accessories

1001828	HP067WW10	Receptacle
1003576	FDWZ-050	Insertion tool probe

Drill size recommendation (mm)

1001828	HP067WW10	0.92 - 0.94

Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1003071	P06701S048L050L114	01	S	0.48	L	-
1001479	P06701S048L075L114	01	S	0.48	L	-
1003072	P06705S100L075L114	05	S	1.00	L	-
1022459	P06707S100L050L114	07	S	1.00	L	-
1001480	P06707S100L075L114	07	S	1.00	L	-
1001481	P06711S048L075L114	11	S	0.48	L	-
1016085	P06712B100G075L114ST	12	B	1.00	G	-

P070M-L060

1.27 mm / 50 mil Pitch | R<20 mOhm | Solder tight

Electrical specifications

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

Mechanical specifications

Preload [cN]	10
Spring force [cN] at nt ±20%	30
Nominal travel [mm]	1.0
Maximum travel [mm]	1.25

Materials and plating

Plunger	BeCu	gold plated
Barrel	Bronze	gold plated
Spring	Spring steel	silver plated

Accessories

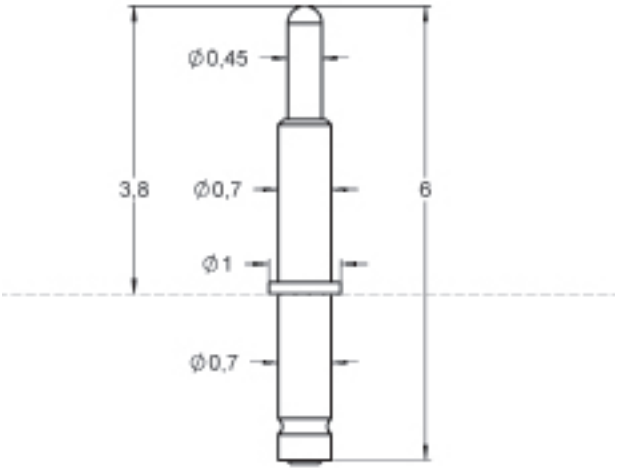
1003576	FDWZ-050	Insertion tool probe

Drill size recommendation (mm)

Equal barrel-Ø	0.68 - 0.70

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1013931	P07011B045G030ML060ST	11	B	0.45	G	-

FM Choice

P090M-L053

1.70 mm / 67 mil Pitch | R<30 mOhm

Electrical specifications

Temperature [°C]	-45°...+100°	
	-45°...+200°	(H,ST)
Current [A]	5	
R TYP [mOhm]	<30	

Mechanical specifications

Preload [cN]	10	10
Spring force [cN] at nt ±20%	20	40
Nominal travel [mm]	1.0	1.0
Maximum travel [mm]	1.2	1.2

Materials and plating

Plunger	BeCu	gold plated
Barrel	Bronze	gold plated
Spring	Spring steel	silver plated
	Stainless steel	unplated
Receptacle	Bronze	gold plated

Accessories

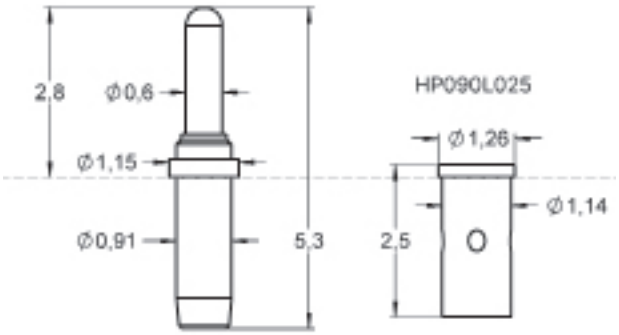
1008705	HP090L025	Receptacle
1008331	DSP090L005	Distance sleeve
1020511	FEWZ-702E0	Insertion tool receptacle
1003576	FDWZ-050	Insertion tool probe

Drill size recommendation (mm)

Equal barrel-Ø	0.68 - 0.70
Receptacle	1.12 - 1.14

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1008332	P09011B060G040ML053	11	B	0.60	G	FM Choice
1014092	P09011B060G020ML053H	11	B	0.60	G	FM Choice
1009512	P09011B060G020ML053ST	11	B	0.60	G	FM Choice

P118M-L065

1.90 mm / 75 mil Pitch | R<20 mOhm

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	5
R TYP [mOhm]	<20

Mechanical specifications

Preload [cN]	30
Spring force [cN] at nt ±20%	100
Nominal travel [mm]	1.0
Maximum travel [mm]	1.2

Materials and plating

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

Accessories

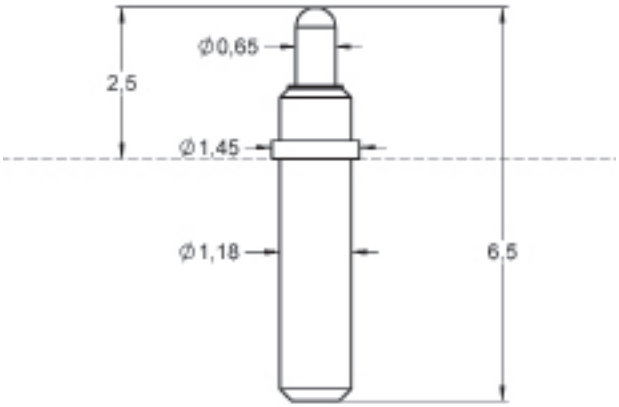
1003576	FDWZ-050	Insertion tool probe

Drill size recommendation (mm)

Equal barrel-Ø	1.16 - 1.18

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1013915	P11811B065G100ML065	11	B	0.65	G	-

P125B-L027

1.90 mm / 75 mil Pitch | R<30 mOhm | Solder tight

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	4
R TYP [mOhm]	<30

Mechanical specifications

Preload [cN]	25
Spring force [cN] at nt ±20%	30
Nominal travel [mm]	0.15
Maximum travel [mm]	0.60

Materials and plating

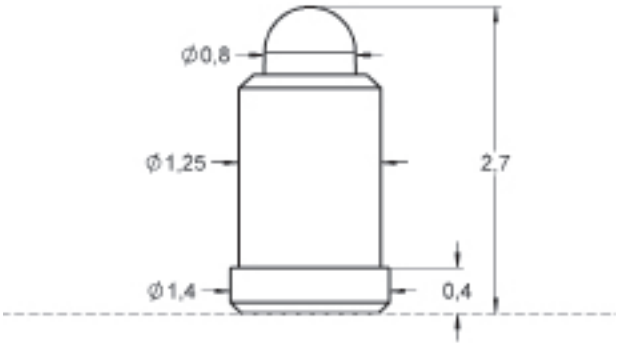
Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Stainless steel	unplated

Drill size recommendation (mm)

Equal barrel-Ø	1.23 - 1.25

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1023476	P12511M080G030BL027ST	11	M	0.80	G	-

FM Choice

P137-L095

2.54 mm / 100 mil Pitch | R<20 mOhm

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	8
R TYP [mOhm]	<20

Mechanical specifications

Preload [cN]	40	95
Spring force [cN] at nt ±20%	85	185
Nominal travel [mm]	0.8	0.8
Maximum travel [mm]	1.2	1.2

Materials and plating

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

Accessories

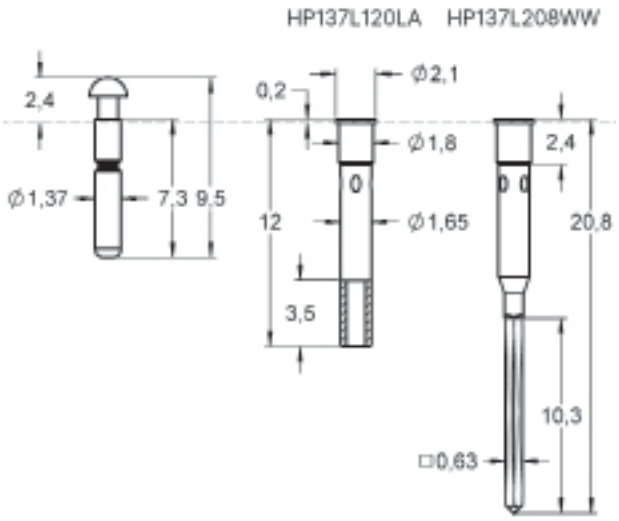
1001829	HP137L208WW	Receptacle
1012134	HP137L120LA	Receptacle
1032995	HP137L100LA	Receptacle
1014264	FEWZ-100E0	Insertion tool receptacle
1001486	FDWZ-100	Insertion tool probe

Drill size recommendation (mm)

Receptacles	without knurl	1.78 - 1.79

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1018098	P13706B200G085L095	06	B	2.00	G	FM Choice
1001486	P13711B105G085L095	11	B	1.05	G	
1001487	P13712B200G085L095	12	B	2.00	G	
1001488	P13715B200G085L095	15	B	2.00	G	FM Choice

P137-L102

2.54 mm / 100 mil Pitch | R<20 mOhm

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	8
R TYP [mOhm]	<20

Mechanical specifications

Preload [cN]	60
Spring force [cN] at nt ±20%	100
Nominal travel [mm]	1.25
Maximum travel [mm]	1.55

Materials and plating

Plunger	BeCu	gold plated
Barrel	Bronze	gold plated
Spring	Stainless steel	silver plated
Receptacle	Bronze	gold plated

Accessories

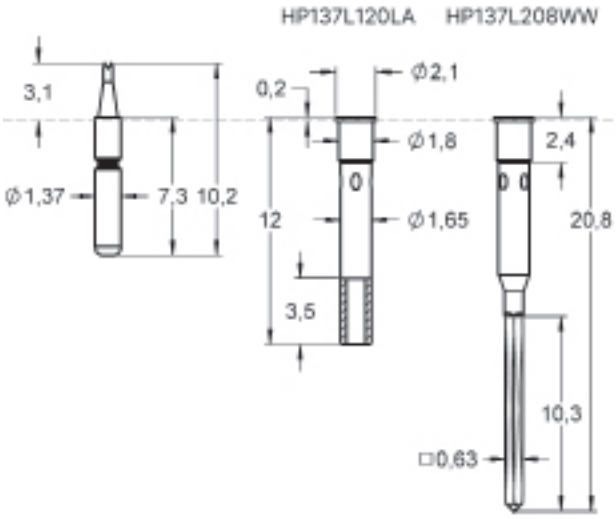
1001829	HP137L208WW	Receptacle
1012134	HP137L120LA	Receptacle
1032995	HP137L100LA	Receptacle
1014264	FEWZ-100E0	Insertion tool receptacle
1001486	FDWZ-100	Insertion tool probe

Drill size recommendation (mm)

Receptacles	without knurl	1.78 - 1.79

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1053981	P13729B050G100L102H	29	B	0.50	G	-

P137-L122

2.54 mm / 100 mil Pitch | R<20 mOhm

Electrical specifications

Temperature [°C]	-45°...+100°
Current [A]	8
R TYP [mOhm]	<20

Mechanical specifications

Preload [cN]	10
Spring force [cN] at nt ±20%	85
Nominal travel [mm]	2.0
Maximum travel [mm]	2.5

Materials and plating

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

Accessories

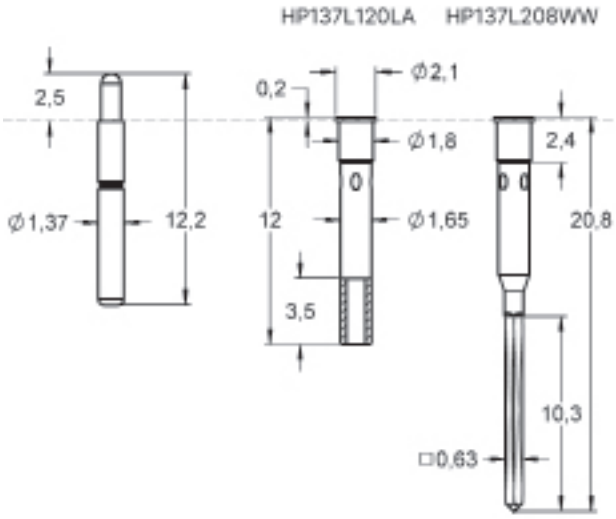
1001829	HP137L208WW	Receptacle
1012134	HP137L120LA	Receptacle
1032995	HP137L100LA	Receptacle
1014264	FEWZ-100E0	Insertion tool receptacle
1001486	FDWZ-100	Insertion tool probe

Drill size recommendation (mm)

Receptacles	without knurl	1.78 - 1.79

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1004510	P13711B106G085L122	11	B	1.06	G	-

FM Choice

P140T-L053

2.20 mm / 87 mil Pitch | R<100 mOhm | Solder tight

Electrical specifications

Temperature [°C]	-45°...+200°	
Current [A]	8	
R TYP [mOhm]	<100	

Mechanical specifications

Preload [cN]	22	20	40
Spring force [cN] at nt ±20%	50	80	100
Nominal travel [mm]	1.0	1.0	1.0
Maximum travel [mm]	1.2	1.2	1.2

Materials and plating

Plunger	BeCu	gold plated
	Steel	longtime gold plated
Barrel	Bronze	gold plated
Spring	Stainless steel	unplated
Receptacle	Bronze	gold plated

Accessories

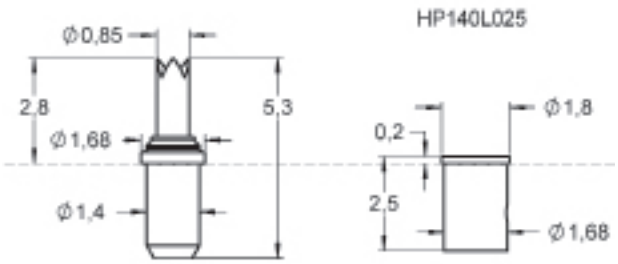
1003104	HP140L025	Receptacle
1006464	HP140L080	Receptacle
1014264	FEWZ-100E0	Insertion tool receptacle
1003587	FDWZ-075	Insertion tool probe

Drill size recommendation (mm)

Equal barrel-Ø		1.38 - 1.39
Receptacle	HP140L025	1.66 - 1.68

Series drawing

All measurements are in mm.



POGO CONNECTORS BARREL < Ø1.50 MM

Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1000225	P14003S085L080TL053ST	03 	S	0.85	L	-
1008239	P14003S085L100TL053ST	03 	S	0.85	L	-
1005412	P14011B085G050TL053ST	11 	B	0.85	G	-
1000224	P14011B085G080TL053ST	11 	B	0.85	G	FM Choice
1003075	P14011B085G100TL053ST	11 	B	0.85	G	FM Choice
1000223	P14016B085G080TL053ST	16 	B	0.85	G	-
1007798	P14016B085G100TL053ST	16 	B	0.85	G	-
1006480	P14029B085G050TL053ST	29 	B	0.85	G	-
1000211	P14029B085G080TL053ST	29 	B	0.85	G	-
1006479	P14029B085G100TL053ST	29 	B	0.85	G	-

P140T-L080

2.20 mm / 87 mil Pitch | R<100 mOhm | Solder tight

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	8
R TYP [mOhm]	<100

Mechanical specifications

Preload [cN]	10	40
Spring force [cN] at nt ±20%	60	120
Nominal travel [mm]	1.0	1.2
Maximum travel [mm]	1.2	2.0

Materials and plating

Plunger	BeCu	gold plated
Barrel	Bronze	gold plated
Spring	Stainless steel	silver plated
Receptacle	Bronze	gold plated

Accessories

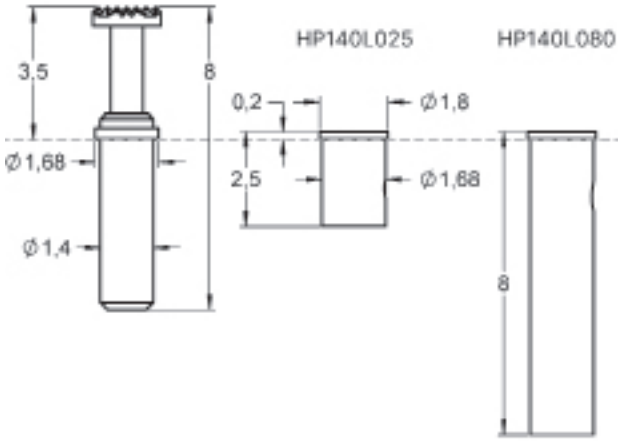
1003104	HP140L025	Receptacle
1006464	HP140L080	Receptacle
1014264	FEWZ-100E0	Insertion tool receptacle
1003587	FDWZ-075	Insertion tool probe

Drill size recommendation (mm)

Equal barrel-Ø		1.38 - 1.39
Receptacle	HP140L025	1.66 - 1.68

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1018179	P14006B180G060TL080ST	06	B	1.80	G	-
1024544	P14028B180G120TL080ST	28	B	1.80	G	-

P146-L062

2.54 mm / 100 mil Pitch | R<60 mOhm | Non-magnetic version

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	10
R TYP [mOhm]	<60

Mechanical specifications

Preload [cN]	25
Spring force [cN] at nt ±20%	70
Nominal travel [mm]	1.0
Maximum travel [mm]	1.15

Materials and plating

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

Accessories

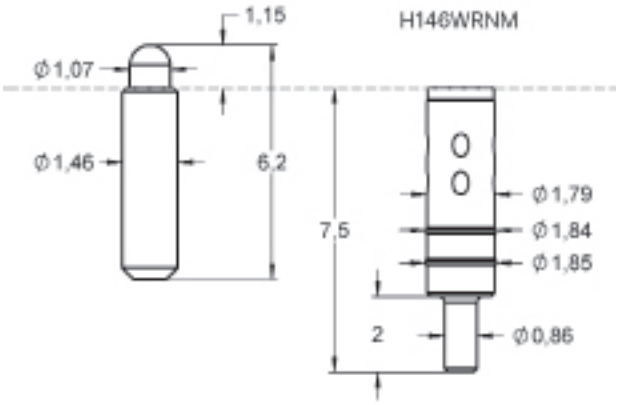
1031089	HP146WRNM	Receptacle
1001486	FDWZ-100	Insertion tool probe

Drill size recommendation (mm)

Equal barrel-Ø		1.43 - 1.45
Receptacle	HP146WRNM	1.82 - 1.85

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1031088	P14611B107G070L062NM	11	B	1.07	G	-

P149-L213 / P149-L230

1.80 mm / 71 mil Pitch | R<50 mOhm

Electrical specifications

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

Mechanical specifications

Preload [cN]	40
Spring force [cN] at nt ±20%	80
Nominal travel [mm]	3.0
Maximum travel [mm]	3.5

Materials and plating

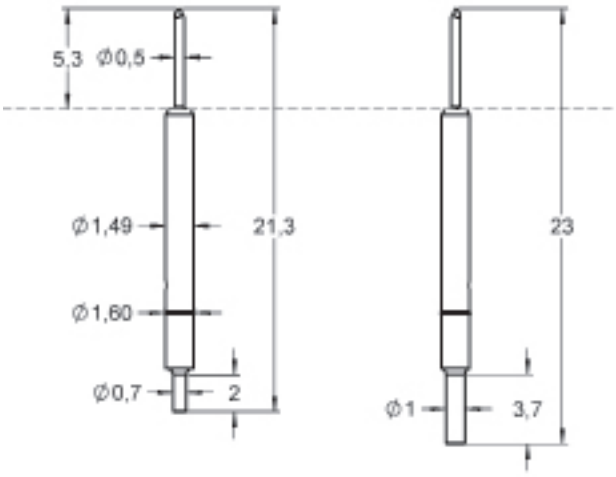
Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Spring steel	silver plated

Drill size recommendation (mm)

Equal barrel-Ø	1.52 - 1.56

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1013807	P14930B050G080L213WR	30	B	0.50	G	-
1014269	P14930B050G080L230WR	30	B	0.50	G	-

P150B-L057

3.50 mm / 138 mil Pitch | R<100 mOhm | Solder tight

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	5
R TYP [mOhm]	<100

Mechanical specifications

Preload [cN]	10
Spring force [cN] at nt ±20%	65
Nominal travel [mm]	1.0
Maximum travel [mm]	1.5

Materials and plating

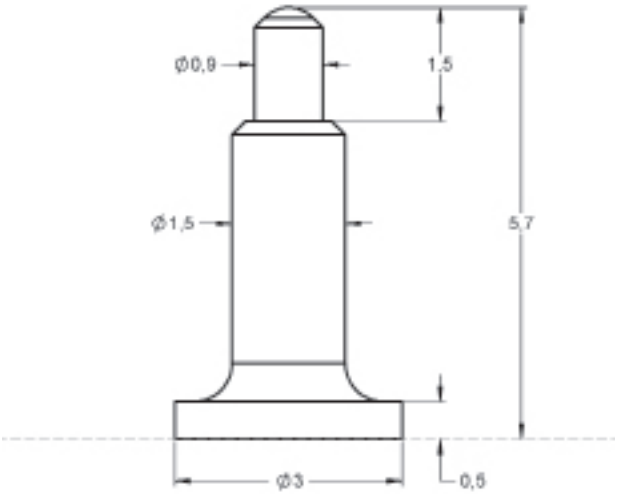
Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Stainless steel	unplated

Drill size recommendation (mm)

Equal barrel-Ø	1.51 - 1.53

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1000261	P15011B090G065BL057ST	11	B	0.90	G	-

P150B-L077

2.54 mm / 100 mil Pitch | R<100 mOhm | Solder tight

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	5
R TYP [mOhm]	<100

Mechanical specifications

Preload [cN]	10
Spring force [cN] at nt ±20%	65
Nominal travel [mm]	1.2
Maximum travel [mm]	1.5

Materials and plating

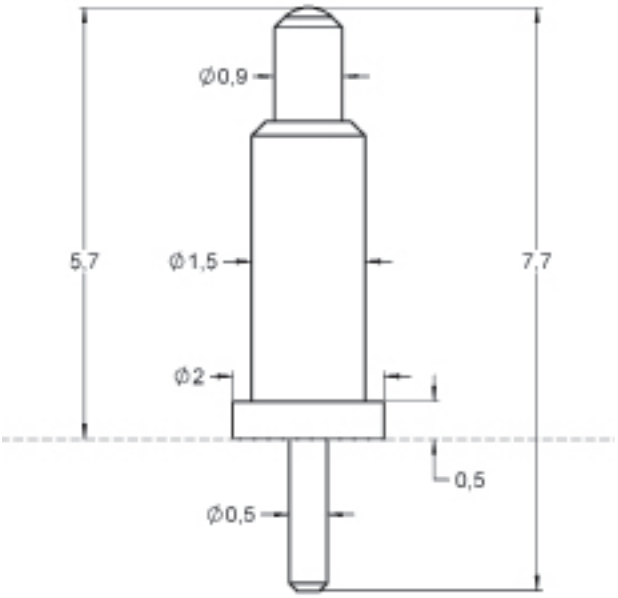
Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Stainless steel	unplated

Drill size recommendation (mm)

Equal barrel-Ø	1.96 - 1.97

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1026888	P15011B090G065BL077WR	11	B	0.90	G	-

P150B-L280

2.54 mm / 100 mil Pitch | R<25 mOhm

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	5
R TYP [mOhm]	<25

Mechanical specifications

Preload [cN]	30
Spring force [cN] at nt ±20%	65
Nominal travel [mm]	6.0
Maximum travel [mm]	6.5

Materials and plating

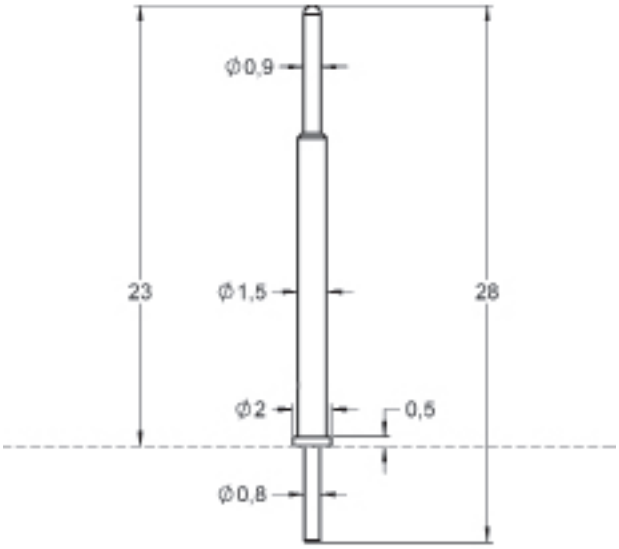
Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Stainless steel	unplated

Drill size recommendation (mm)

Equal barrel-Ø	0.77 - 0.81

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1031950	P15011B090G065BL280WR	11	B	0.90	G	-

P158T-L222

2.54 mm / 100 mil Pitch | R<30 mOhm | Solder tight

Electrical specifications

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

Mechanical specifications

Preload [cN]	40
Spring force [cN] at nt ±20%	70
Nominal travel [mm]	0.9
Maximum travel [mm]	1.3

Materials and plating

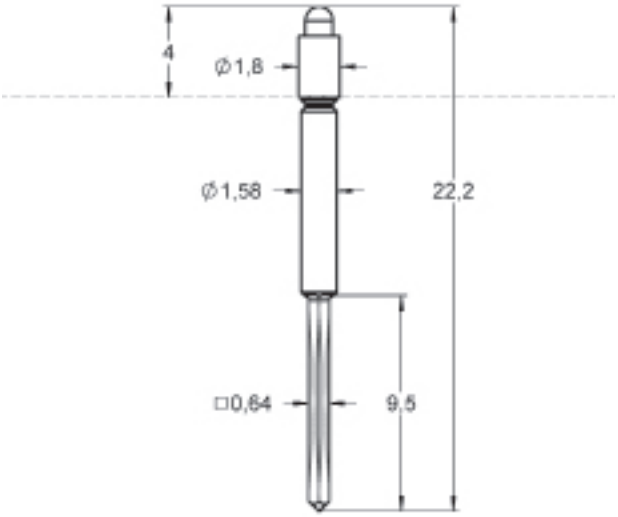
Plunger	Steel	longtime gold plated
Barrel	Brass	gold plated
Spring	Spring steel	silver plated

Drill size recommendation (mm)

Equal barrel-Ø	1.56 - 1.58

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1006311	P15811S120L070TL222WW	11	S	1.20	L	-

FM Choice

P162T-L160

2.54 mm / 100 mil Pitch | R<30 mOhm

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	8
R TYP [mOhm]	<30

Mechanical specifications

Preload [cN]	100
Spring force [cN] at nt ±20%	250
Nominal travel [mm]	2.8
Maximum travel [mm]	3.0

Materials and plating

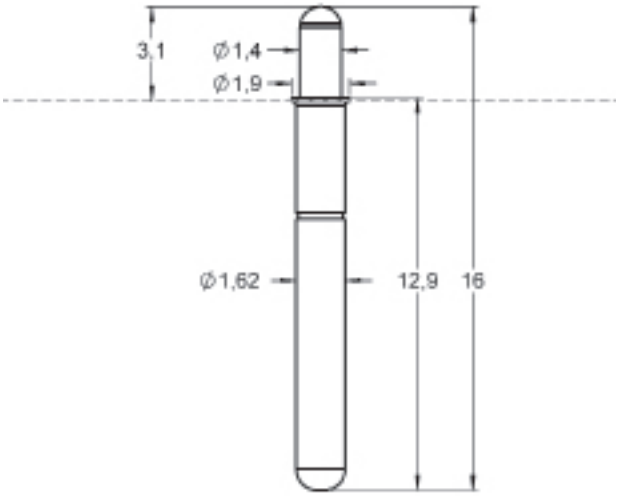
Plunger	Brass	gold plated
Barrel	Brass	gold plated
Spring	Stainless steel	unplated

Drill size recommendation (mm)

Equal barrel-Ø	1.60 - 1.62

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1014080	P16211M140G250TL160	11	M	1.40	G	FM Choice

P165T-L103

2.54 mm / 100 mil Pitch | R<30 mOhm | Solder tight

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	8
R TYP [mOhm]	<30

Mechanical specifications

Preload [cN]	50
Spring force [cN] at nt ±20%	130
Nominal travel [mm]	1.3
Maximum travel [mm]	1.6

Materials and plating

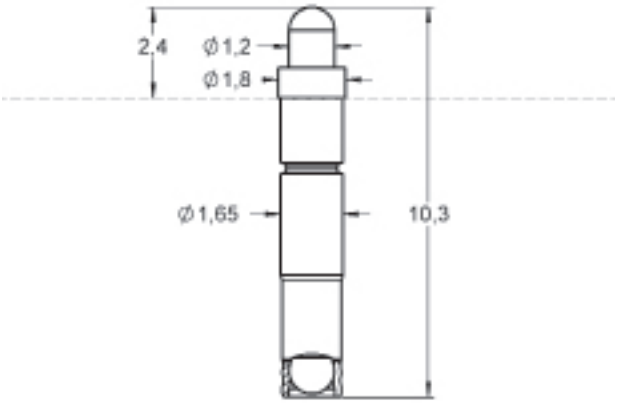
Plunger	Steel	longtime gold plated
Barrel	Bronze	gold plated
Spring	Stainless steel	silver plated

Drill size recommendation (mm)

Equal barrel-Ø	1.63 - 1.65

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1015131	P16511S120L130TL103ST	11	S	1.20	L	-

P165T-L126

2.54 mm / 100 mil Pitch | R<30 mOhm | Solder tight

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	8
R TYP [mOhm]	<30

Mechanical specifications

Preload [cN]	40	50
Spring force [cN] at nt ±20%	75	130
Nominal travel [mm]	1.3	1.3
Maximum travel [mm]	1.6	1.6

Materials and plating

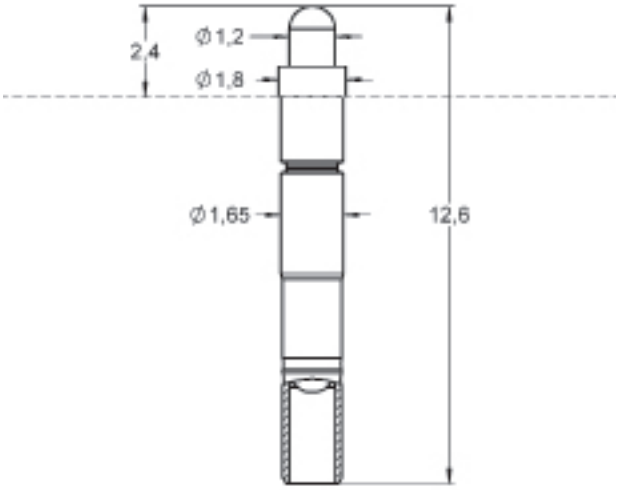
Plunger	Steel	longtime gold plated
	Steel	nickel plated
	Steel	rhodium plated
Barrel	Bronze	gold plated
Spring	Stainless steel	silver plated

Drill size recommendation (mm)

Equal barrel-Ø	1.63 - 1.65

Series drawing

All measurements are in mm.



* Different internal design allows current up to 12 Ampere.

Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1001482	P16501S120L075TL126CR	01	S	1.20	L	-
1038813	P16501S120L075TL126CRS1 *	01	S	1.20	L	-
1001483	P16511S120L075TL126CR	11	S	1.20	L	-
1005831	P16511S120L075TL126CRS1	11	S	1.20	L	-
1003067	P16511S120L130TL126CR	11	S	1.20	L	-
1001484	P16511S120N075TL126CR	11	S	1.20	N	-
1108056	P16511S120R130TL126CR	11	S	1.20	R	-

P170M-L136

2.70 mm / 106 mil Pitch | R<30 mOhm

Electrical specifications

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

Mechanical specifications

Preload [cN]	60	175
Spring force [cN] at nt ±20%	230	450
Nominal travel [mm]	2.0	1.5
Maximum travel [mm]	3.5	3.0

Materials and plating

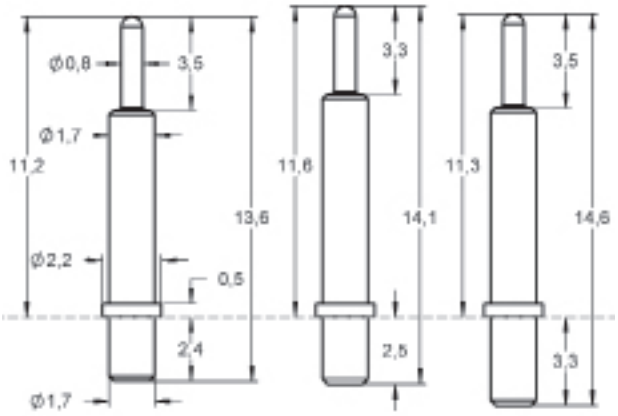
Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Spring steel	silver plated

Drill size recommendation (mm)

Equal barrel-Ø	1.68 - 1.70

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1018185	P17011B080G230ML136	11	B	0.80	G	-
1018200	P17011B080G450ML141	11	B	0.80	G	-
1018188	P17011B080G450ML146	11	B	0.80	G	-

P176T-L082

2.54 mm / 100 mil Pitch | R<30 mOhm

Electrical specifications

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

Mechanical specifications

Preload [cN]	25
Spring force [cN] at nt ±20%	60
Nominal travel [mm]	1.3
Maximum travel [mm]	1.7

Materials and plating

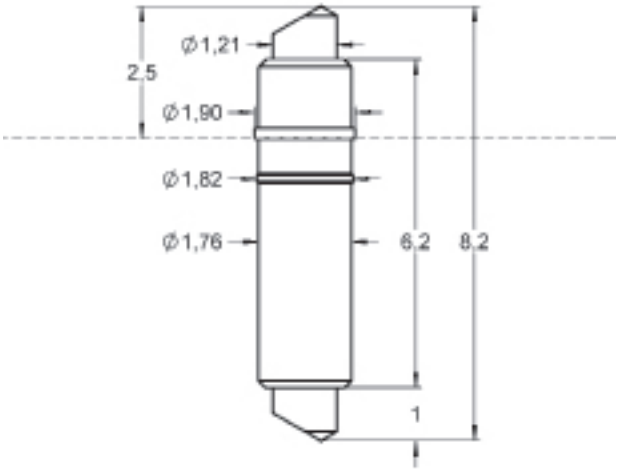
Plunger	BeCu	gold plated
Barrel	Bronze	gold plated
Spring	Spring steel	gold plated

Drill size recommendation (mm)

Equal barrel-Ø	1.79 - 1.81

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1013895	P17645B121G060ML082	45	B	1.21	G	-

P197M-L074

3.00 mm / 118 mil Pitch | R<30 mOhm | Solder tight

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	10
R TYP [mOhm]	<30

Mechanical specifications

Preload [cN]	10
Spring force [cN] at nt ±20%	20
Nominal travel [mm]	0.6
Maximum travel [mm]	1.0

Materials and plating

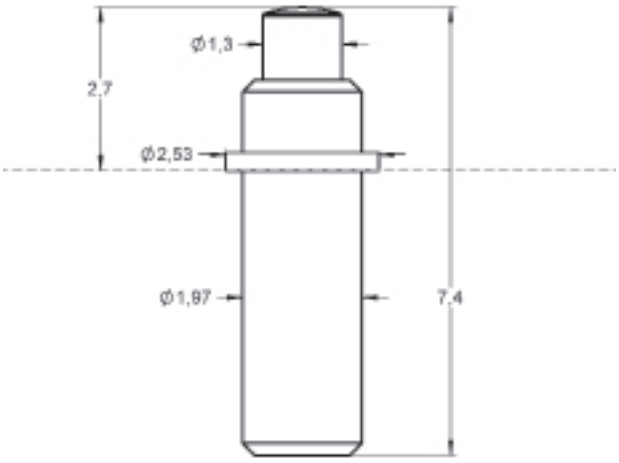
Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Stainless steel	unplated

Drill size recommendation (mm)

Equal barrel-Ø	1.96 - 1.97

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1018438	P19711B130G020ML074ST	11	B	1.30	G	-

FM Choice

P197T-L053

3.00 mm / 118 mil Pitch | R<100 mOhm | Solder tight

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	9
R TYP [mOhm]	<100

Mechanical specifications

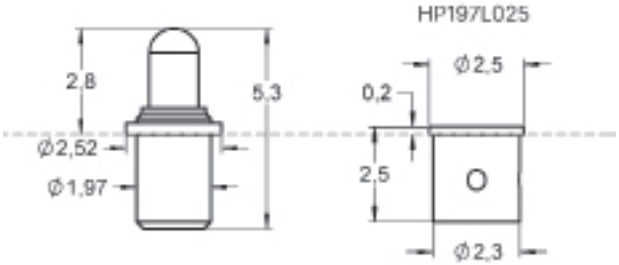
Preload [cN]	40	70	80
Spring force [cN] at nt ±20%	100	150	200
Nominal travel [mm]	1.0	1.0	1.0
Maximum travel [mm]	1.2	1.2	1.2

Materials and plating

Plunger	BeCu	gold plated
Barrel	Bronze	gold plated
Spring	Stainless steel	silver plated
Receptacle	Bronze	gold plated

Series drawing

All measurements are in mm.



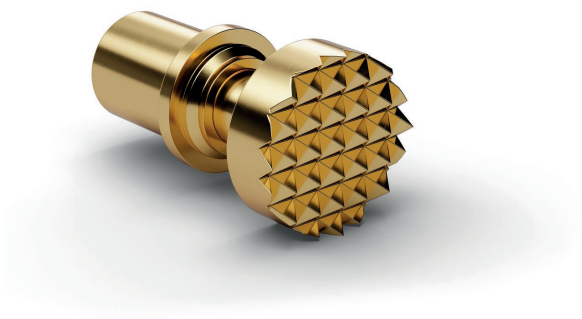
Accessories

Receptacles HP197 see page 110		Receptacle
1020511	FEWZ-702E0	Insertion tool receptacle
1003566	FDWZ-100	Insertion tool probe

Drill size recommendation (mm)

Receptacle	2.28 - 2.29
Equal barrel-Ø	1.96 - 1.98

Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1009175	P19711B130G100TL053ST	11	B	1.30	G	-
1013219	P19711B130G150TL053ST	11	B	1.30	G	FM Choice
1001499	P19711B130G200TL053ST	11	B	1.30	G	FM Choice
1013209	P19729B130G150TL053ST	29	B	1.30	G	-
1004495	P19729B130G200TL053ST	29	B	1.30	G	-



P197T-L057

3.50 mm / 138 mil Pitch | R<100 mOhm | Solder tight

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	9
R TYP [mOhm]	<100

Mechanical specifications

Preload [cN]	80
Spring force [cN] at nt ±20%	200
Nominal travel [mm]	1.0
Maximum travel [mm]	1.2

Materials and plating

Plunger	BeCu	gold plated
Barrel	Bronze	gold plated
Spring	Stainless steel	silver plated
Receptacle	Bronze	gold plated

Accessories

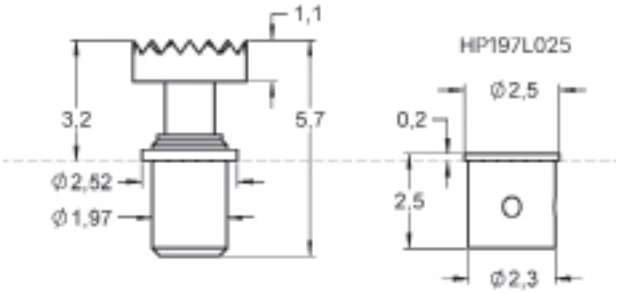
Receptacles HP197 see page 110		Receptacle
1020511	FEWZ-702E0	Insertion tool receptacle
1003566	FDWZ-100	Insertion tool probe

Drill size recommendation (mm)

Receptacle	2.28 - 2.29
Equal barrel-Ø	1.96 - 1.98

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1006308	P19706B300G200TL057ST	06	B	3.00	G	-

FM Choice

P197T-L080

3.00 mm / 118 mil Pitch | R<100 mOhm | Solder tight

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	9
R TYP [mOhm]	<100

Mechanical specifications

Preload [cN]	10	10	40
Spring force [cN] at nt ±20%	15	30	130
Nominal travel [mm]	1.5	1.5	1.5
Maximum travel [mm]	2.2	2.2	2.2

Materials and plating

Plunger	BeCu	gold plated
	Steel	longtime gold plated
Barrel	Bronze	gold plated
Spring	Stainless steel	unplated
	Stainless steel	silver plated (S1)
Receptacle	Bronze	gold plated

Accessories

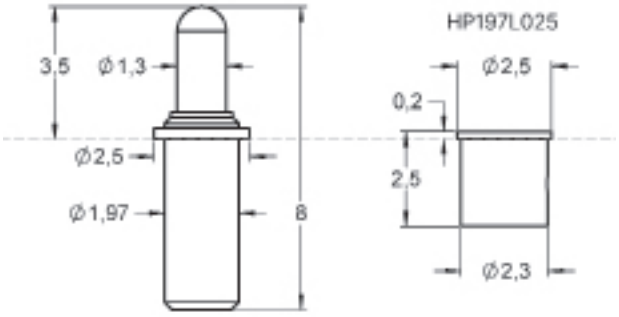
Receptacles HP197 see page 110		Receptacle
1020511	FEWZ-702E0	Insertion tool receptacle
1003566	FDWZ-100	Insertion tool probe

Drill size recommendation (mm)

Receptacle	2.28 - 2.29
Equal barrel-Ø	1.95 - 1.96

Series drawing

All measurements are in mm.



POGO CONNECTORS BARREL ≤ Ø1.97 MM

Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1003769	P19711B130G015TL080ST	11 	B	1.30	G	FM Choice
1021010	P19711B130G015TL080STS1*	11 	B	1.30	G	-
1007663	P19711B130G030TL080ST	11 	B	1.30	G	-
1001497	P19711B130G130TL080ST	11 	B	1.30	G	FM Choice
1042312	P19711B130G130TL080STS2	11 	B	1.30	G	-
1021001	P19711B130G130TL080STS1*	11 	B	1.30	G	-
1036122	P19716B130G130TL080ST	16 	B	1.30	G	-
1010516	P19729B130G015TL080ST	29 	B	1.30	G	-
1003761	P19729B130G130TL080ST	29 	B	1.30	G	FM Choice
1007721	P19734S130L130TL080ST	34 	S	1.30	L	-

* Different internal design allows current up to 12 Ampere.

P197B-L085

5.00 mm / 197 mil Pitch | R<100 mOhm | Solder tight | Direct soldering on PCB

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	8
R TYP [mOhm]	<100

Mechanical specifications

Preload [cN]	40
Spring force [cN] at nt ±20%	130
Nominal travel [mm]	1.5
Maximum travel [mm]	2.2

Materials and plating

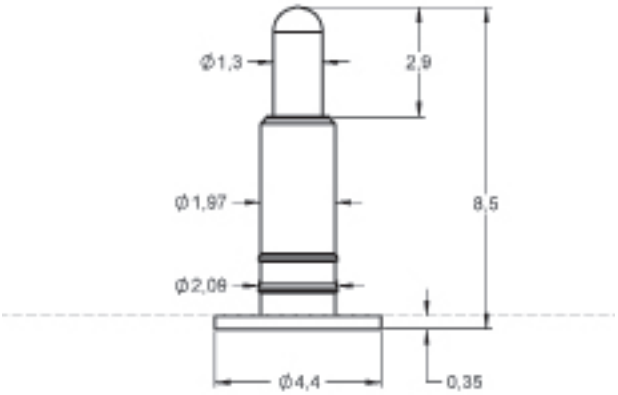
Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Stainless steel	unplated

Drill size recommendation (mm)

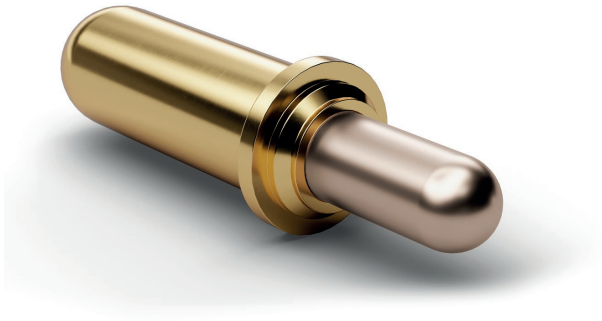
Press-fit nose Ø	2.00 - 2.05

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1021232	P19711B130G130BL085ST	11	B	1.30	G	-



P197T-L090

3.00 mm / 118 mil Pitch | R<100 mOhm

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	9
R TYP [mOhm]	<100

Mechanical specifications

Preload [cN]	40
Spring force [cN] at nt ±20%	130
Nominal travel [mm]	1.5
Maximum travel [mm]	2.2

Materials and plating

Plunger	BeCu	rhodium plated
Barrel	Bronze	gold plated
Spring	Stainless steel	unplated
Receptacle	Bronze	gold plated

Accessories

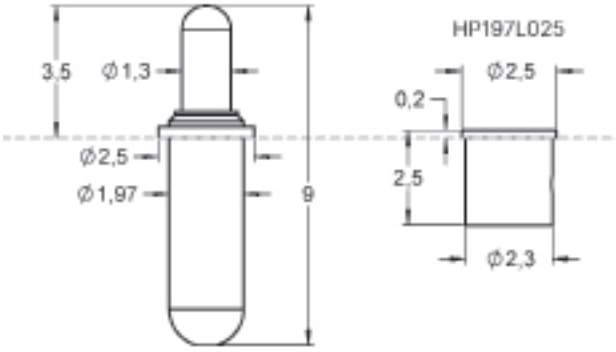
Receptacles HP197 see page 110		Receptacle
1020511	FEWZ-702E0	Insertion tool receptacle
1003566	FDWZ-100	Insertion tool probe

Drill size recommendation (mm)

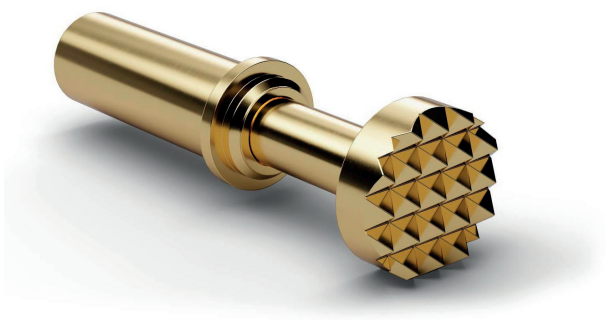
Receptacle	2.28 - 2.29
Equal barrel-Ø	1.95 - 1.96

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1003659	P19711B130R130TL090	11	B	1.30	R	-



FM Choice

P197T-L106

3.00 mm / 118 mil Pitch | R<100 mOhm | Solder tight

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	9
R TYP [mOhm]	<100

Mechanical specifications

Preload [cN]	30	80	75
Spring force [cN] at nt ±20%	50	130	200
Nominal travel [mm]	1.5	1.5	1.5
Maximum travel [mm]	3.0	3.0	3.0

Materials and plating

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

Accessories

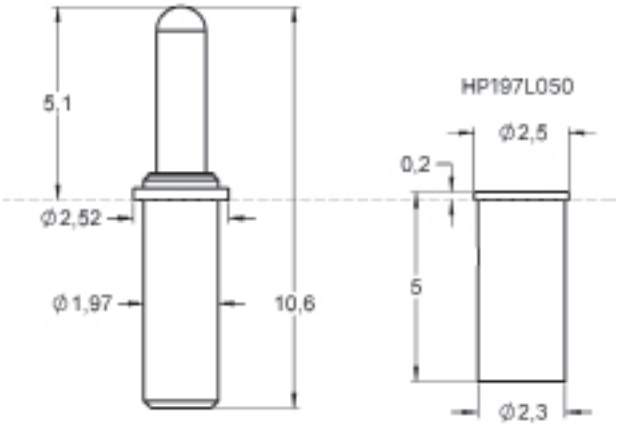
Receptacles HP197 see page 110		Receptacle
1020511	FEWZ-702E0	Insertion tool receptacle
1003566	FDWZ-100	Insertion tool probe

Drill size recommendation (mm)

Receptacle	2.28 - 2.29
Equal barrel-Ø	1.96 - 1.98

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1018015	P19706B300G050TL106ST*	06 	B	3.00	G	-
1056749	P19706B300G130TL106ST*	06 	B	3.00	G	-
1017593	P19711B130G050TL106ST	11 	B	1.30	G	-
1017591	P19711B130G130TL106ST	11 	B	1.30	G	FM Choice
1019859	P19711B130G200TL106ST	11 	B	1.30	G	-
1042316	P19711B130G130TL106STS2	11 	B	1.30	G	-
1020710	P19711B130G130TL106STS1	11 	B	1.30	G	-
1027445	P19718B130G130TL106ST	18 	B	1.30	G	-
1000015	P19729B130G050TL106ST	29 	B	1.30	G	-
1094021	P19729B130G130TL106ST	29 	B	1.30	G	-

* Center differs from the general product type due to the head diameter.

P197T-L114

3.00 mm / 118 mil Pitch | R<100 mOhm | Solder tight

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	10
R TYP [mOhm]	<100

Mechanical specifications

Preload [cN]	80
Spring force [cN] at nt ±20%	130
Nominal travel [mm]	1.5
Maximum travel [mm]	2.2

Materials and plating

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

Accessories

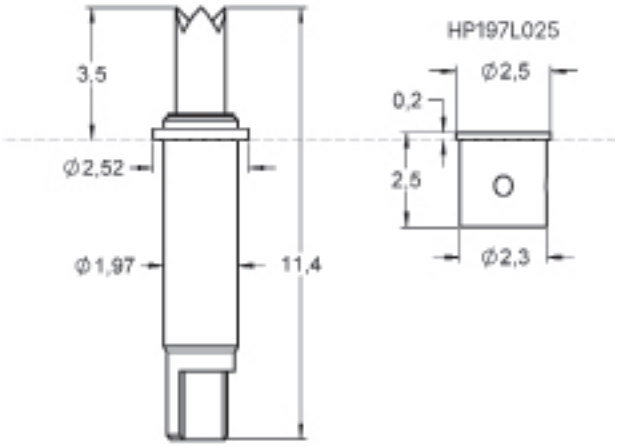
Receptacles HP197 see page 110		Receptacle
1020511	FEWZ-702E0	Insertion tool receptacle
1003566	FDWZ-100	Insertion tool probe

Drill size recommendation (mm)

Receptacle	2.28 - 2.29
Equal barrel-Ø	1.95 - 1.96

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1021811	P19729B130G130TL114LA	29	B	1.30	G	-

FM Choice

P197T-L130

3.00 mm / 118 mil Pitch | R<100 mOhm | Solder tight

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	9
R TYP [mOhm]	<100

Mechanical specifications

Preload [cN]	80
Spring force [cN] at nt ±20%	130
Nominal travel [mm]	1.5
Maximum travel [mm]	3.0

Materials and plating

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

Accessories

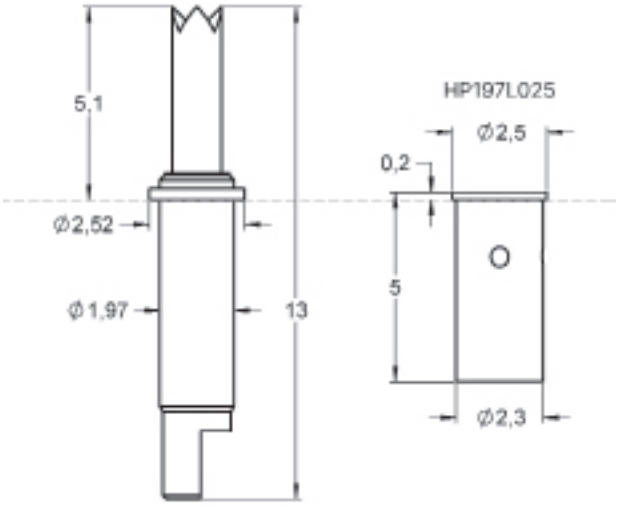
Receptacles HP197 see page 110		Receptacle
1020511	FEWZ-702E0	Insertion tool receptacle
1003566	FDWZ-100	Insertion tool probe

Drill size recommendation (mm)

Receptacle	2.28 - 2.29
Equal barrel-Ø	1.96 - 1.98

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1009105	P19711B130G130TL130LA	11	B	1.30	G	FM Choice
1027202	P19721B130G050TL130LA	21	B	1.30	G	-
1016315	P19729B130G130TL130LA	29	B	1.30	G	-
1018041	P19734B130G200TL130LA	34	B	1.30	G	-

FM Choice

HP197

3.00 mm / 118 mil Pitch | Receptacles

Mechanical specifications

Temperature [°C]	-45°...+200°

Materials and plating

Receptacle	Bronze	gold plated

Accessories

1020511	FEWZ-702E0	Insertion tool receptacle

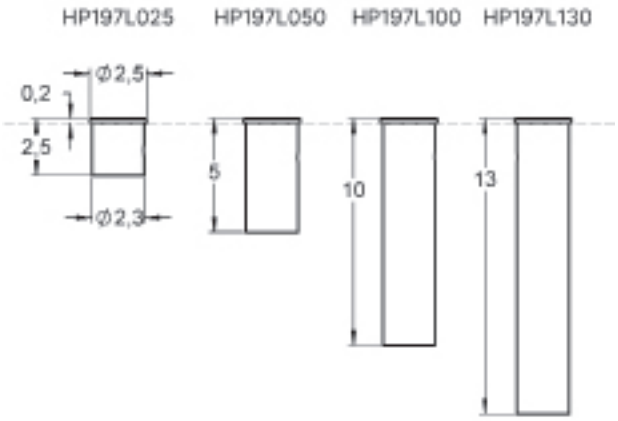
Drill size recommendation (mm)

Receptacle	2.28 - 2.29

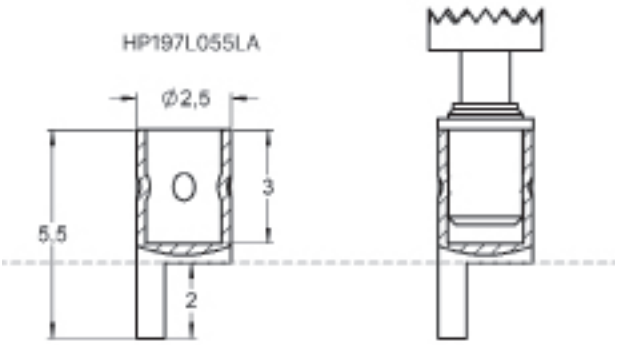
Order code	Product name	FM Choice
1001840	HP197L025	FM Choice
1004741	HP197L050	FM Choice
1004742	HP197L100	-
1004743	HP197L130	-
1008280	HP197L055LA	-

Series drawing

All measurements are in mm.



These mounting receptacles can be used with all P197 product series shown on the previous pages.



These mounting receptacles can be used with all P197 product series with a insertion depth shorter than 3.0 mm.

P197M-L100

4.50 mm / 177 mil Pitch | R<30 mOhm | Solder tight

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	9
R TYP [mOhm]	<30

Mechanical specifications

Preload [cN]	80
Spring force [cN] at nt ±20%	170
Nominal travel [mm]	1.7
Maximum travel [mm]	2.5

Materials and plating

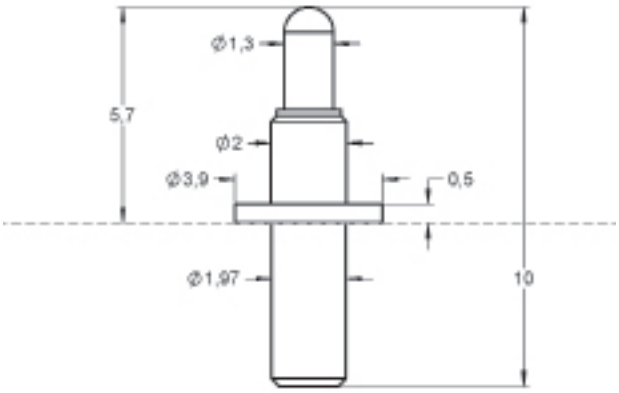
Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Stainless steel	unplated

Drill size recommendation (mm)

Equal barrel-Ø	1.96 - 1.97

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1017964	P19711B130G170ML100ST	11	B	1.30	G	-

P197M-L150

4.50 mm / 177 mil Pitch | R<30 mOhm | Solder tight

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	9
R TYP [mOhm]	<30

Mechanical specifications

Preload [cN]	20
Spring force [cN] at nt ±20%	40
Nominal travel [mm]	1.7
Maximum travel [mm]	2.5

Materials and plating

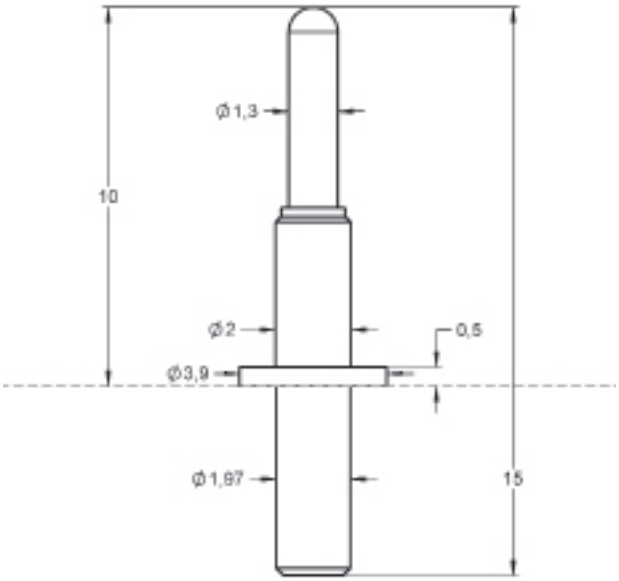
Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Spring steel	silver plated

Drill size recommendation (mm)

Equal barrel-Ø	1.96 - 1.97

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1017925	P19711B130G040ML150ST	11	B	1.30	G	-

P214T-L090

3.18 mm / 125 mil Pitch | R<20 mOhm | Solder tight

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	9
R TYP [mOhm]	<20

Mechanical specifications

Preload [cN]	10
Spring force [cN] at nt ±20%	20
Nominal travel [mm]	1.0
Maximum travel [mm]	2.8

Materials and plating

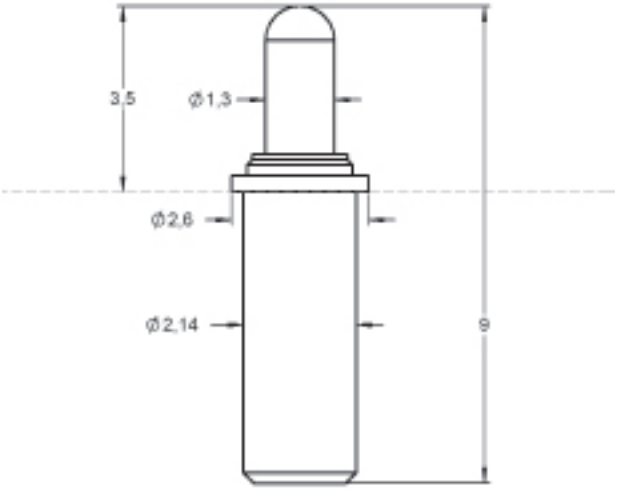
Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Stainless steel	unplated

Drill size recommendation (mm)

Equal barrel-Ø	2.14 - 2.15

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1000440	P21411B130G020TL090ST	11	B	1.30	G	

P228M-L065

3.18 mm / 125 mil Pitch | R<30 mOhm | Solder tight

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	9
R TYP [mOhm]	<30

Mechanical specifications

Preload [cN]	25
Spring force [cN] at nt ±20%	40
Nominal travel [mm]	0.4
Maximum travel [mm]	1.0

Materials and plating

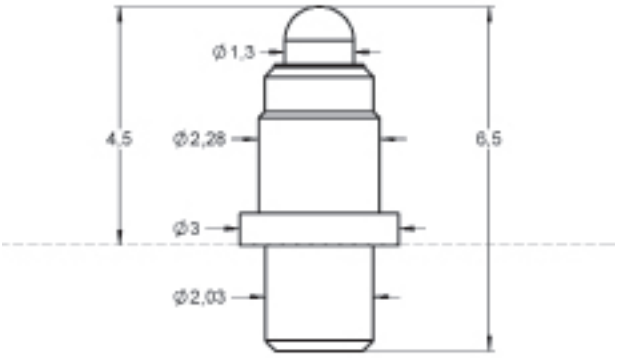
Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Stainless steel	gold plated

Drill size recommendation (mm)

Equal barrel-Ø	2.02 - 2.03

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1021818	P22811B130G040ML065ST	11	B	1.30	G	-

P230T-L078

3.00 mm / 118 mil Pitch | R<120 mOhm | Solder tight

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	9
R TYP [mOhm]	<120

Mechanical specifications

Preload [cN]	80
Spring force [cN] at nt ±20%	200
Nominal travel [mm]	1.0
Maximum travel [mm]	1.2

Materials and plating

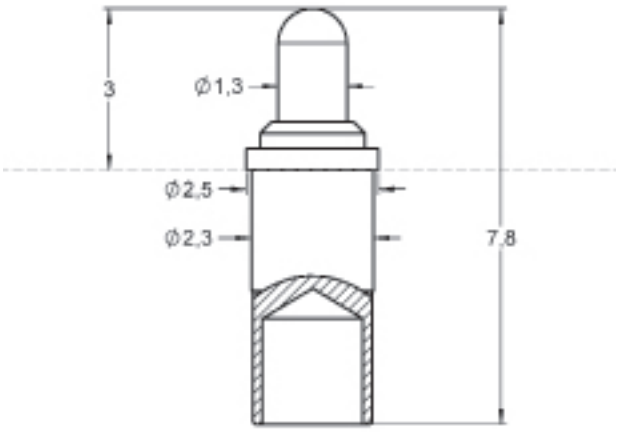
Plunger	BeCu	gold plated
Barrel	Brass	gold plated
Spring	Stainless steel	unplated

Drill size recommendation (mm)

Equal barrel-Ø	2.27 - 2.30

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1029576	P23011B130G200TL078CR	11	B	1.30	G	-

P265M-L150

4.00 mm / 157 mil Pitch | R<100 mOhm | Solder tight

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	10
R TYP [mOhm]	<100

Mechanical specifications

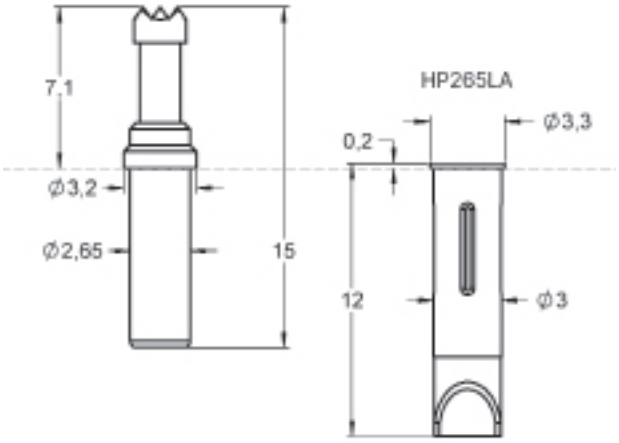
Preload [cN]	40	70
Spring force [cN] at nt ±20%	80	150
Nominal travel [mm]	2.8	2.8
Maximum travel [mm]	3.5	3.5

Materials and plating

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

Series drawing

All measurements are in mm.



Accessories

1131050	HP265LA	Receptacle
1020511	FEWZ-702E0	Insertion tool receptacle
1003566	FDWZ-100	Insertion tool probe

Drill size recommendation (mm)

Receptacle	2.98 - 2.99
Equal barrel-Ø	2.64 - 2.65

Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1043615	P26502B230G080ML150	02	B	1.30	G	-
1018267	P26506B230G080ML150	06	B	1.30	G	-
1018268	P26506B230G150ML150	06	B	1.30	G	-
1018230	P26512B230G150ML150	12	B	1.30	G	-
1020253	P26512E230U150TL150ST *	12	E	1.30	U	-
1018231	P26517B230G150ML150	17	B	1.30	G	-

* The probe P26512E230G150ML150 with plunger made of stainless steel has different electrical values. Information for a suitable threaded version is available, see F723.

P275M-L050

4.00 mm / 157 mil Pitch | R<30 mOhm | Solder tight

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	10
R TYP [mOhm]	<30

Mechanical specifications

Preload [cN]	150
Spring force [cN] at nt ±20%	250
Nominal travel [mm]	0.65
Maximum travel [mm]	0.90

Materials and plating

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

Accessories

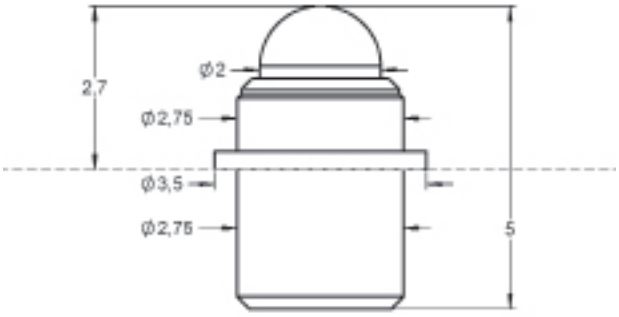
1003566	FDWZ-100	Insertion tool probe

Drill size recommendation (mm)

Equal barrel-Ø	2.72 - 2.75

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1029103	P27511M200G250ML050ST	11	M	2.00	G	-

P400T-L135

5.50 mm / 216 mil Pitch | R<100 mOhm | Continuous plunger

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	30
R TYP [mOhm]	<100

Mechanical specifications

Preload [cN]	100
Spring force [cN] at nt ±20%	150
Nominal travel [mm]	1.5
Maximum travel [mm]	2.0

Materials and plating

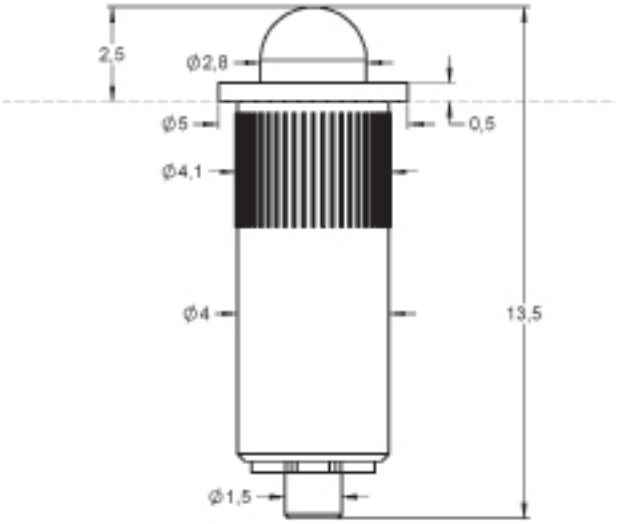
Plunger	Brass	unplated
Barrel	Brass	unplated
Spring	Stainless steel	unplated

Drill size recommendation (mm)

Knurl-Ø	4.01 - 4.08

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1000272	P40011M280U150TL135	11	M	2.80	U	-

P400T-L135

5.50 mm / 216 mil Pitch | R<20 mOhm | Continuous plunger

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	5
R TYP [mOhm]	<20

Mechanical specifications

Preload [cN]	150
Spring force [cN] at nt ±20%	200
Nominal travel [mm]	1.5
Maximum travel [mm]	2.0

Materials and plating

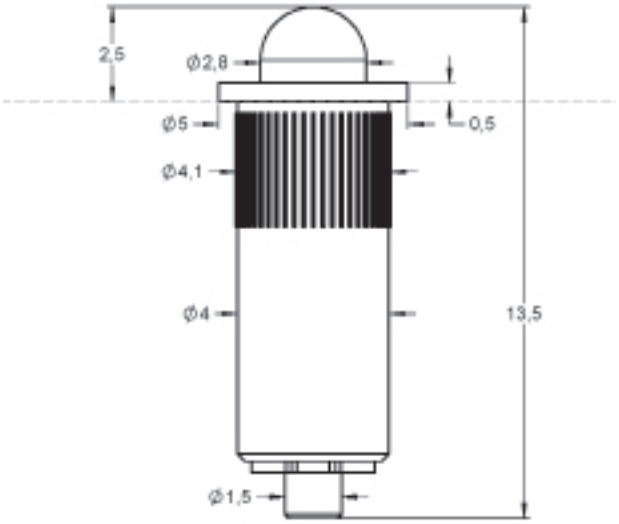
Plunger	Brass	gold plated
Barrel	Brass	gold plated
Spring	Stainless steel	unplated

Drill size recommendation (mm)

Knurl-Ø	4.01 - 4.08

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1019104	P40011M280G200TL135	11	M	2.80	G	-

P410M-L104

6.00 mm / 236 mil Pitch | R<30 mOhm | Solder tight

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	10
R TYP [mOhm]	<30

Mechanical specifications

Preload [cN]	150
Spring force [cN] at nt ±20%	300
Nominal travel [mm]	1.6
Maximum travel [mm]	2.4

Materials and plating

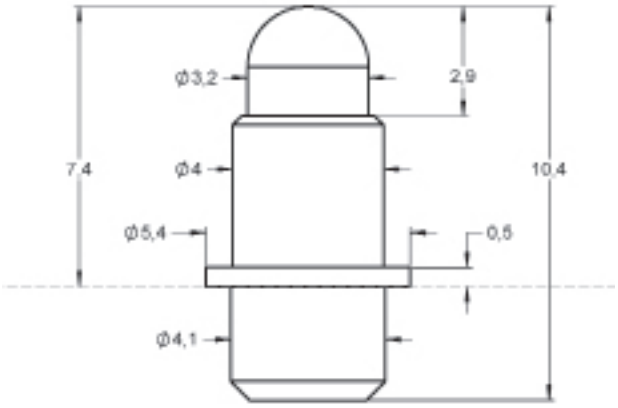
Plunger	Brass	gold plated
Barrel	Brass	gold plated
Spring	Stainless steel	gold plated

Drill size recommendation (mm)

Equal barrel-Ø	4.07 - 4.08

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1031194	P41011M320G300ML104ST	11	M	3.20	G	-

P500-L115

5.50 mm / 216 mil Pitch | R<30 mOhm | With wobbling function

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	20
R TYP [mOhm]	<30

Mechanical specifications

Preload [cN]	100
Spring force [cN] at nt ±20%	200
Nominal travel [mm]	2.0
Maximum travel [mm]	2.2

Materials and plating

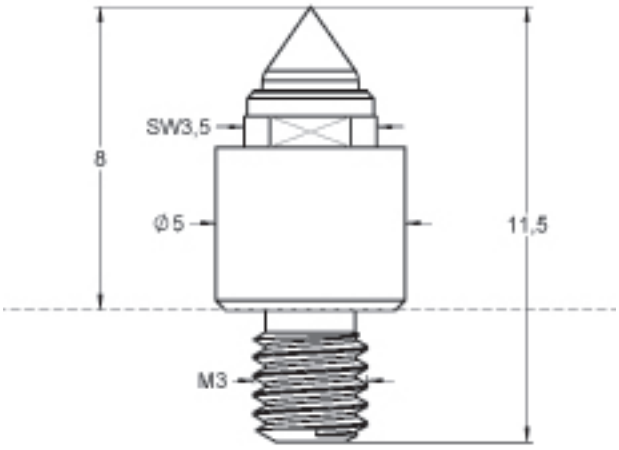
Plunger	Steel	rhodium plated
Barrel	Brass	gold plated
Spring	Stainless steel	unplated

Accessories

1005063	FWZ735	Screw-in tool probe
1009775	FWZ735T	Screw-in tool probe

Series drawing

All measurements are in mm.



The materials and a defined wobble function of up to ±0.2mm make the probe robust and wear-resistant.

Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1030455	P50003S260R200L115S	03	S	2.60	R	-

P500T-L160

6.50 mm / 256 mil Pitch | R<30 mOhm | Solder tight

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	20 *
R TYP [mOhm]	<30

Mechanical specifications

Preload [cN]	70	90
Spring force [cN] at nt ±20%	150	400
Nominal travel [mm]	3.2	3.2
Maximum travel [mm]	5.0	5.0

Materials and plating

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

Accessories

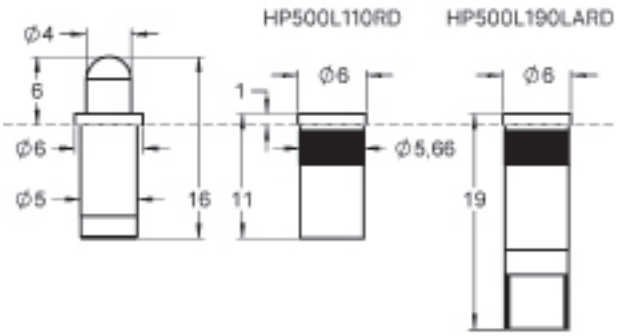
1026616	HP500L110RD	Receptacle
1026615	HP500L190LARD	Receptacle
1020967	FDWZ-650	Insertion tool probe

Drill size recommendation (mm)

Receptacle	5.62 - 5.65
Equal barrel-Ø	4.98 - 5.01

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1013796	P50011M400G150TL160ST	11	M	4.00	G	-
1026617	P50011M400G400TL160ST	11	M	4.00	G	-

* The version with 400cN can transmit up to 30 A.

P500T-L210

6.50 mm / 256 mil Pitch | R<30 mOhm | Solder tight

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	30
R TYP [mOhm]	<30

Mechanical specifications

Preload [cN]	60	100	120	150
Spring force [cN] at nt ±20%	150	300	400	500
Nominal travel [mm]	4.8	4.8	4.8	4.8
Maximum travel [mm]	7.0	7.0	7.0	7.0

Materials and plating

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

Accessories

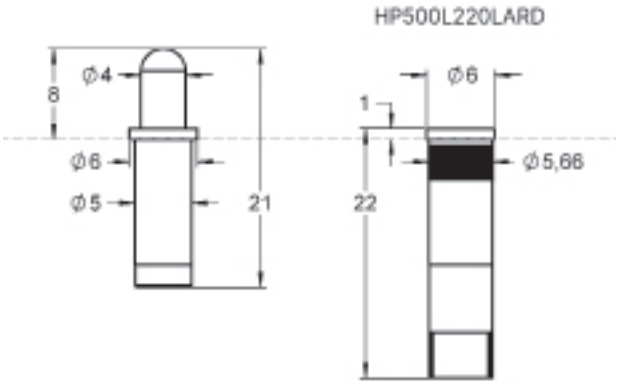
1026788	HP500L220LARD	Receptacle
1026615	HP500L190LARD	Receptacle
1020967	FDWZ-650	Insertion tool probe

Drill size recommendation (mm)

Receptacle	5.62 - 5.65
Equal barrel-Ø	4.98 - 5.01

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1026785	P50011M400G150TL210ST	11	M	4.00	G	-
1026784	P50011M400G300TL210ST	11	M	4.00	G	-
1026783	P50011M400G400TL210ST	11	M	4.00	G	-
1026719	P50011M400G500TL210ST	11	M	4.00	G	-

HC040

6.50 mm / 256 mil Pitch | R<5 mOhm | Solder tight | High current

Electrical specifications

Temperature [°C]	-45°...+200°
Current [A]	50
R TYP [mOhm]	<5

Mechanical specifications

Preload [cN]	120
Spring force [cN] at nt ±20%	400
Nominal travel [mm]	4.8
Maximum travel [mm]	7.0

Materials and plating

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

Accessories

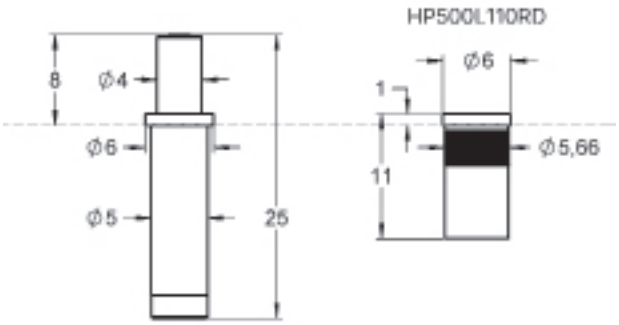
1026616	HP500L110RD	Receptacle
1020967	FDWZ-650	Insertion tool probe

Drill size recommendation (mm)

Receptacle	5.62 - 5.65
Equal barrel-Ø	4.98 - 5.01

Series drawing

All measurements are in mm.



Order code	Product name	Tip Style	Material	Ø in mm	Plating	FM Choice
1027552	HC040A11G4	11	M	4.00	G	-

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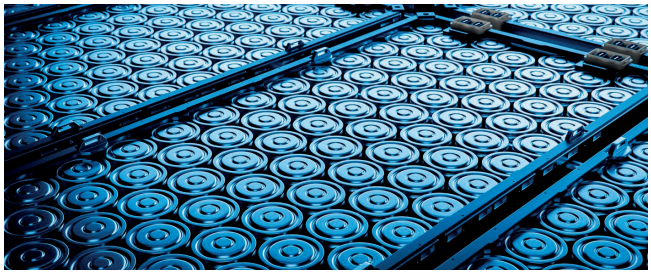
Quality assurance is the top priority in the battery cell industry. Our role here is in testing and formation during the manufacturing process to guarantee performance and safety.



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Manufacturers set high standards to guarantee the quality of their energy storage systems. Our products to test the systems' performance, efficiency, and reliability.

Electronic industry

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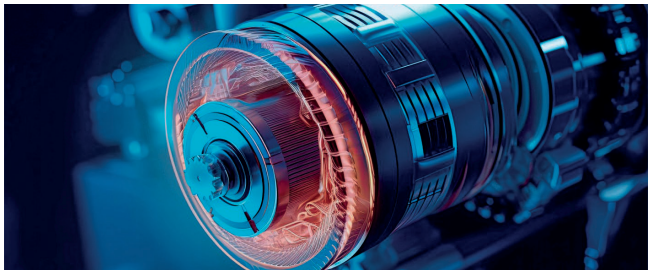

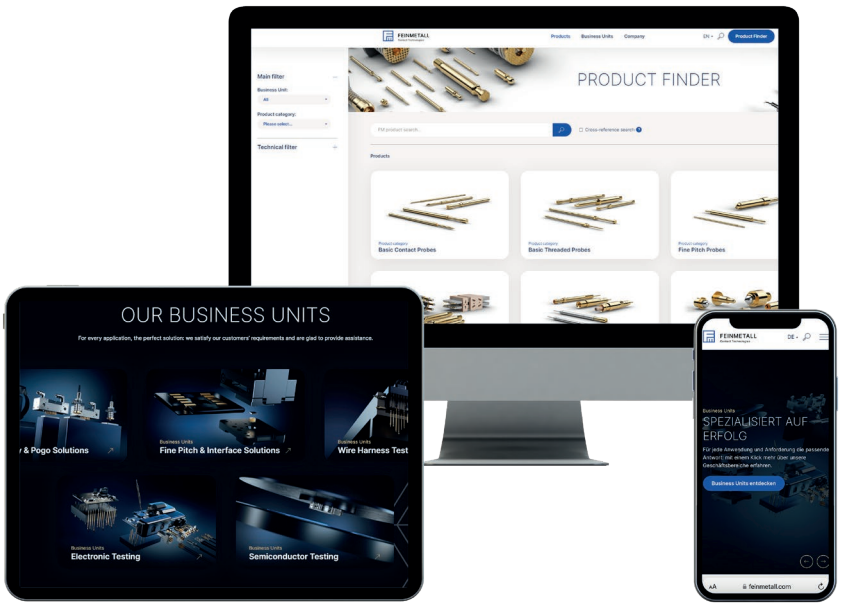

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