



FEINMETALL

Contact Technologies



E-MOBILITY & POGO SOLUTIONS

Advanced solutions for Testing,
Formation and Non-Test applications

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SOLUTIONS AT A GLANCE

Pogo Connectors
3A - 50A



High Current Probes
10A - 50A



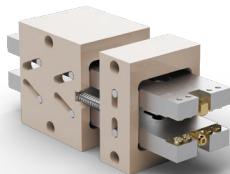
Scratch Contacts
50A - 100A



E-Mobility Probes
60A - 250A



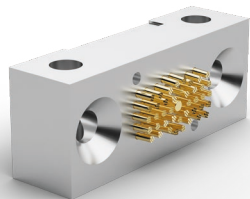
Clamp Contacts
150A - 250A



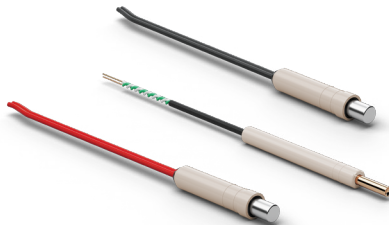
High Current Coaxial Probes
100A - 600A



High Current Blocks
100A - 1000A



Temperature Sensors



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. For maximum conductivity and optimal surface contact, the block should be mounted directly into conductive material.

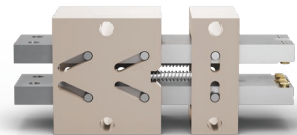
High Current Block



Solutions for contacting flat blade connectors

Our HCC-solution operates like a clamp, providing highly reliable high-current contact. Its compact design makes it ideal for series connection of pouch cells. The clamping mechanism ensures maximum safety, speed, and durability throughout the testing process.

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 ensure an optimal connection between plunger and barrel the moment they are engaged. This smart design enables efficient current flow through the barrel while minimizing current through the spring. In addition, the silver alloy enhances performance with excellent conductivity and a gentle, reliable contact that protects sensitive surfaces.

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 design



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

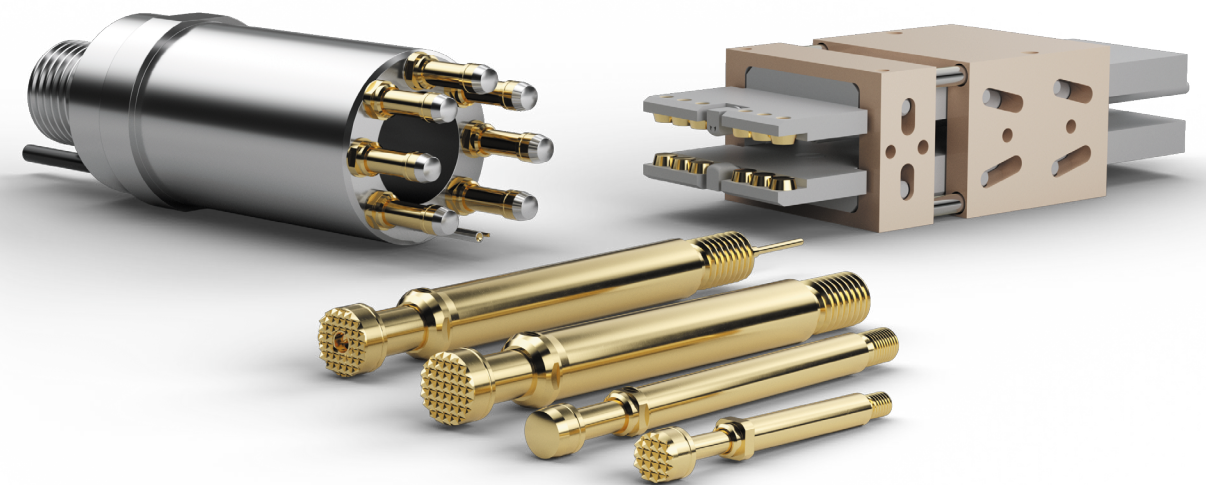
Reliable and high-quality battery cell production requires complex high performance contacting during several steps of the production. The quality of battery cells is reflected in a wide variety of parameters such as electrochemical stability, capacity, performance or service life.

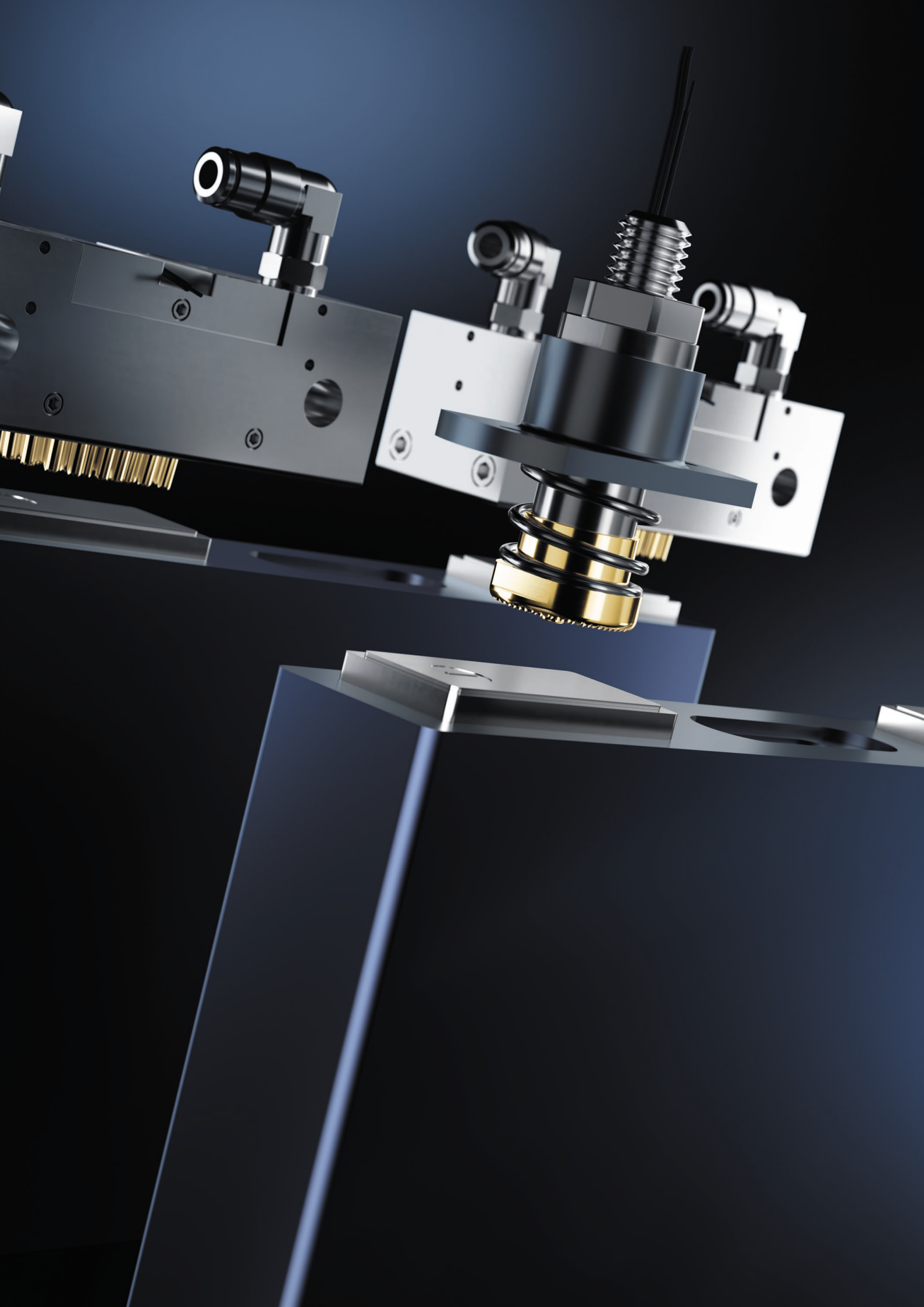
End-of-line quality assessment of battery cells in the form of quality determination and evaluation in cell production helps to identify optimization potential at an early stage, minimize reject rates and thus reduce production costs.

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.





BATTERY TESTING

HIGH RUNNER PRODUCTS

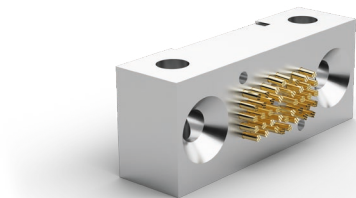
Testing battery cells for performance, safety, and quality

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.

Methods such as ACIR and DCIR are critical for testing adherence to performance, safety, and quality standards for battery cells. These standards ensure batteries will perform to specification under real-world conditions.

Prismatic

HCB280D6ALS245PT100 | 600A



HC200F06G75TYPK | 300A



Round

HCF34806B600G1400A | 100A

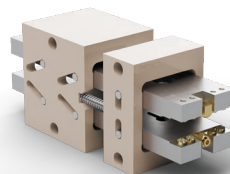


HCB063B29MS20 | 100A



Pouch

HCC150D06ALS10TYPK | 150A

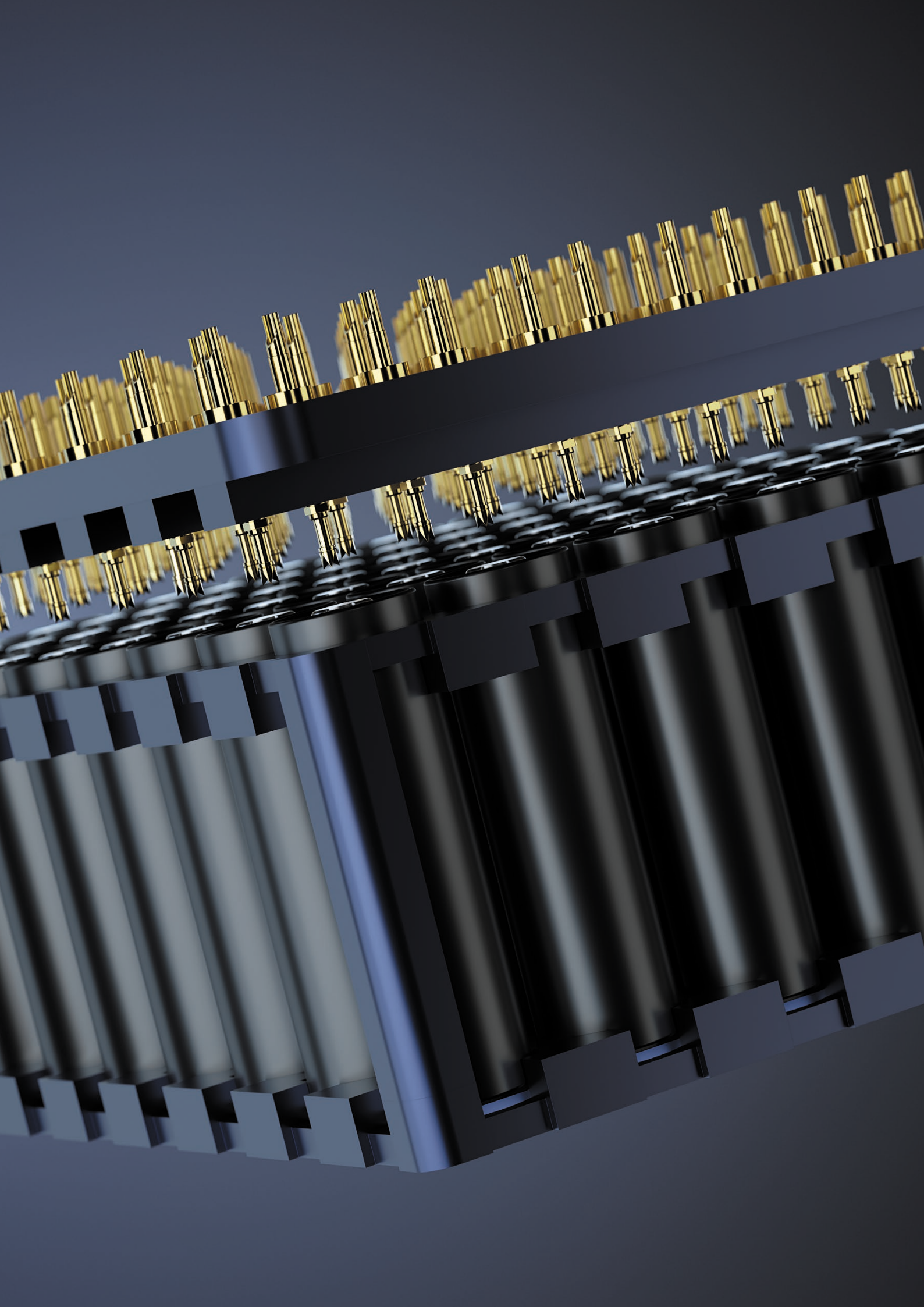


HCF73506B300G500A | 50A



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BATTERY FORMATION

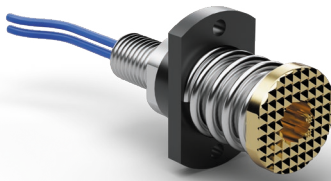
HIGH RUNNER PRODUCTS

Optimizing battery cell performance through the forming process

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.

Prismatic

HC160E06G80F | 150A



HC200F06G75TYPK | 300A



Round

HCF73314B230G500S1 | 30A

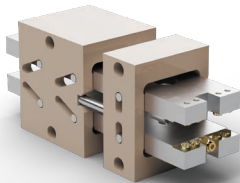


HCB056D29MS11TYPK | 50A



Pouch

HCC150B06ALS10 | 150A



HCF33812A400U500A | 75A



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HIGH RUNNER PRODUCTS

Ensuring reliable electrical connections for demanding applications

High current contacting refers to the techno-logy 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.

Safe and constant transmission of high currents despite intense heat generation is key. High Current Testing including high-current contacting is how we create electrical connections that live up to every challenge.

HCB195D12MS68TYPK | 400A



HC050B06G15 | 60A



HC060A06G5 | 50A



HCF77512A400U500 | 50A



HCF76206B230G300 | 40A



HCF71306B350G150 | 30A



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SENSOR TYPES

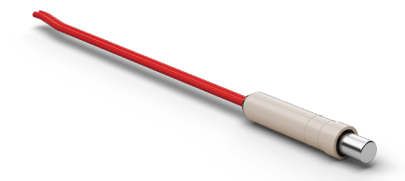
Temperature monitoring, directly at the contact point

Temperature sensors are used to measure the temperature in contact with the object, as with a thermometer. Resistance thermometers are based on a change in resistance, for example a platinum resistor.

Temperature sensors Type PTC

e.g. PT100 (100Ω)
PTC thermistor sensors increase their resistance as the temperature rises. Platinum measuring resistors are specified by their material and the nominal resistance R_0 at 0 °C. It is a fast-response, water-proof miniature temperature sensor suitable for universal temperature measurement even in small of spaces.

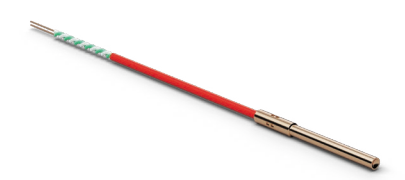
PT100 - Spring loaded temperature sensor



Temperature sensors Type PTC

e.g. PT1000 (1000Ω)
PTC thermistor sensors increase their resistance as the temperature rises. Platinum measuring resistors are specified by their material and the nominal resistance R_0 at 0 °C. It is a fast-response, water-proof miniature temperature sensor suitable for universal temperature measurement even in small of spaces.

PT1000 - Rigid temperature sensor



SENSOR TYPES

Temperature monitoring, directly at the contact point

Temperature sensors are used to measure the temperature in contact with the object, as with a thermometer. Resistance thermometers are based on a change in resistance, for example a platinum resistor.

Temperature sensors Type NTC

NTC thermistors reduce their resistance when the temperature rises; they are based on metal oxides or semiconductors and, when used for measuring purposes, are also called thermistors. The NTC sensor (NTC = Negative Temperature Coefficient) is a temperature-dependent component. If the temperature rises, the resistance of the NTC sensor decreases exponentially.

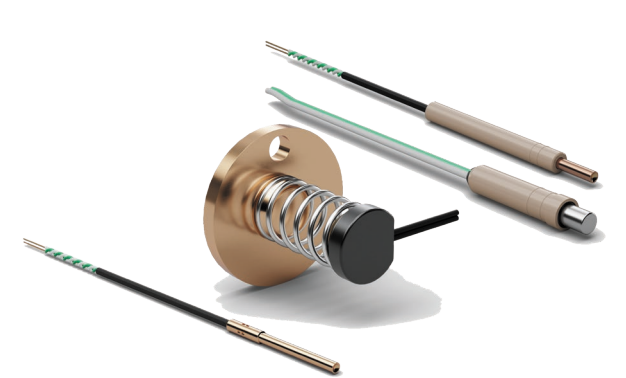
NTC - Spring loaded temperature sensor



Temperature sensors Type Thermocouple

e.g. Type K
The thermocouple Type K is the most common thermocouple type with a large measuring range which is used in industrial measurement technology. It was mainly developed for oxidizing environments and must be specially protected in other types of environments. Thanks to its compact construction, the Type K sensor is available in a wide variety of designs and diameters, making it suitable for numerous applications.

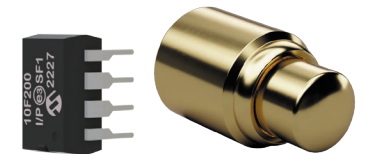
Type K - Spring loaded temperature sensor



APPLICATION SAMPLES

Smallest Pogo Connector in the world

- Smallest Pogo Connector with a diameter of 0.6 mm and a total length of 1.0 mm
- 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

Our solution ensures cost-effective and time-saving assembly without interrupting the production process with manual operations. Using block units also makes probe centering and positioning much easier and more reliable. We offer a wide range of block configurations, such as 2×3, 4×6, and many others tailored to our customer's needs.



Taped Pogo Connectors

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



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MOUNTING OPTIONS

Flexible and versatile solutions

Pogo Connectors are compact and direct solder-able 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 Connectors allow easy insertion and removal of 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	++++	++++	+++	++	+

Basic plunger

The standard plunger has a conical end on which the spring can center itself. This also prevents the spring end from getting stuck between the plunger and the barrel or scratching the coating.

The maximum possible spring diameter enables high spring forces, while the precise plunger guidance ensures excellent centering and smooth operation.

Drill hole plunger

The drill hole in the plunger allows better adapta-tion 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 design

The bias design features an offset force that ensures directional contact and improves alignment on angled or uneven surfaces. This design provides stable, reliable connections and consistent

electrical performance across a wide range of applications. Ideal for situations where precise contact is needed without compromising durability.

Bias ball design

The bias ball design combines the offset force of the bias design with a precision ball tip. This provides excellent adaptability to uneven surfaces, reduces contact resistance, and protects sensitive

DUTs. It also improves reliability under vibration and shock, while minimizing wear to extend the lifetime of the Pogo Connector. Perfect for high-precision or demanding applications.

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 positio-ning.

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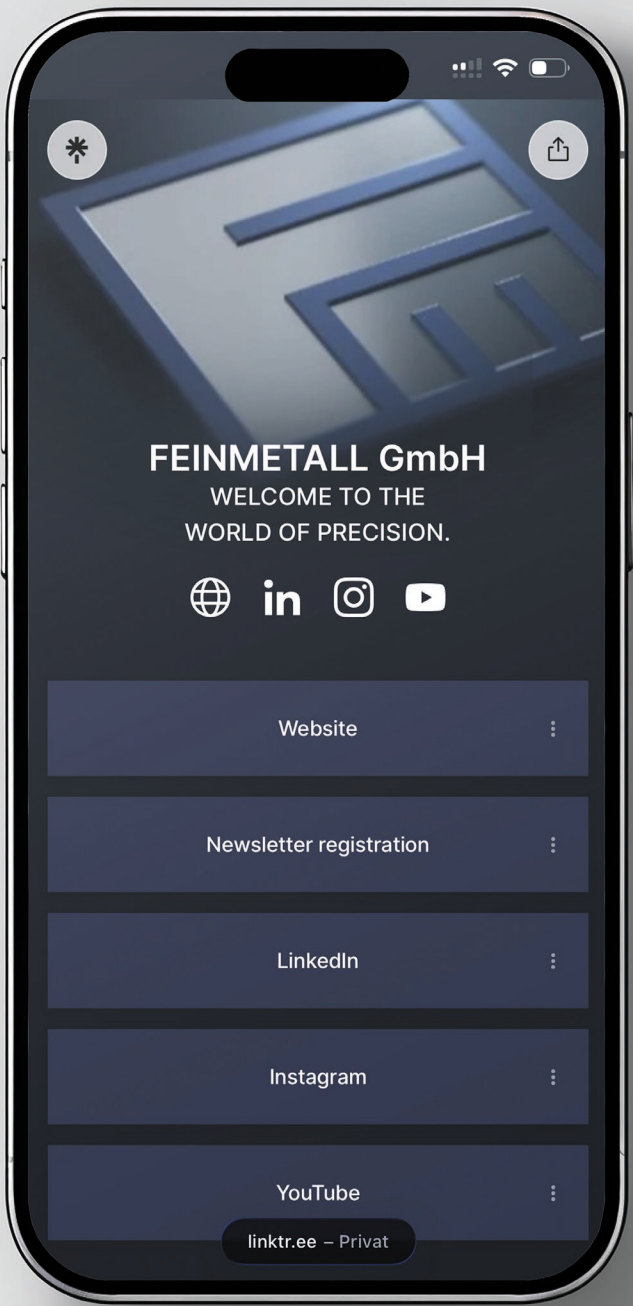


Instagram: Insights & Impressions



YouTube: Watch & Experience

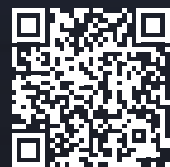
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