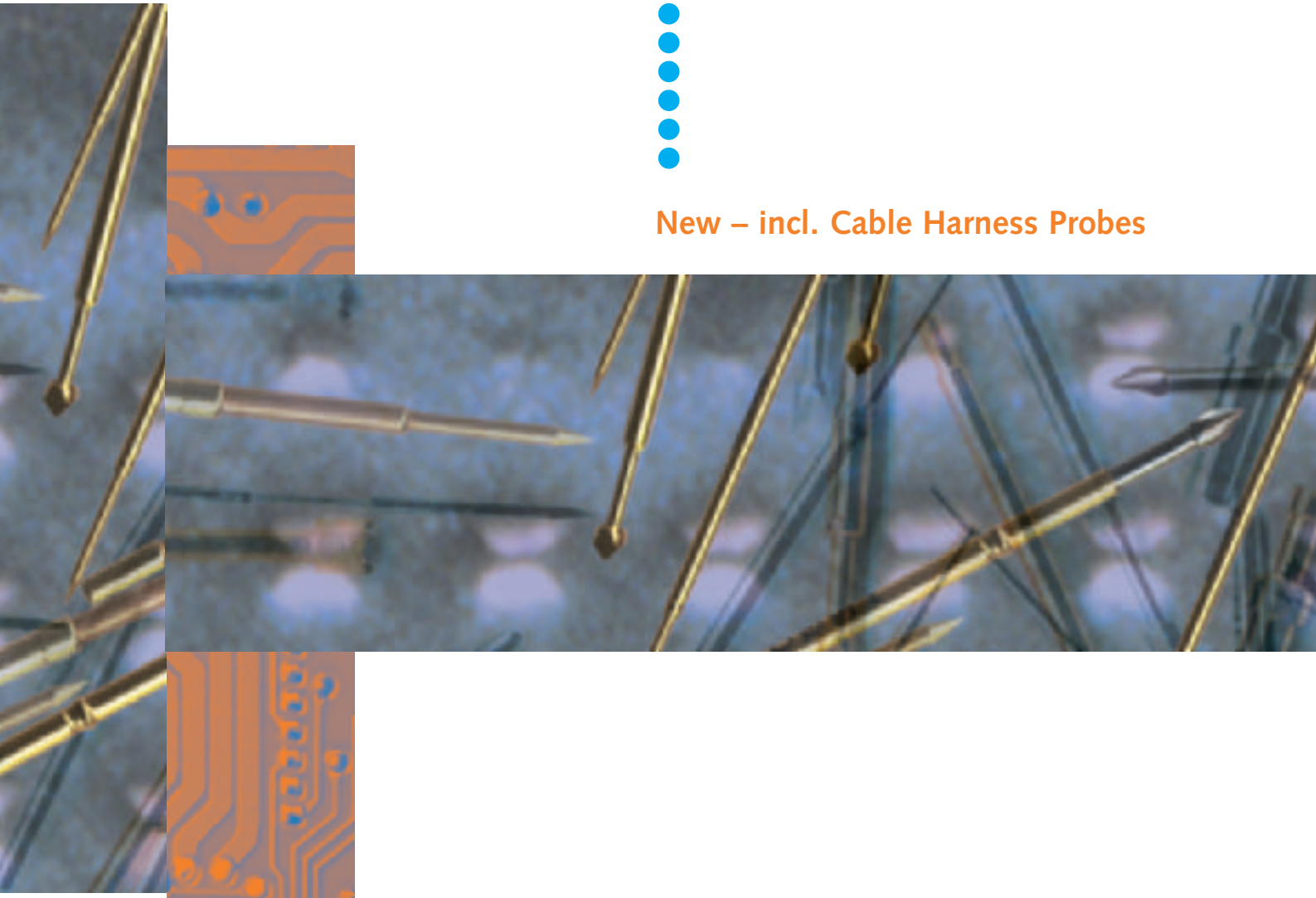
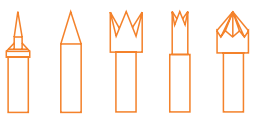
Test Probes
Catalog 2003/2004

New – incl. Cable Harness Probes

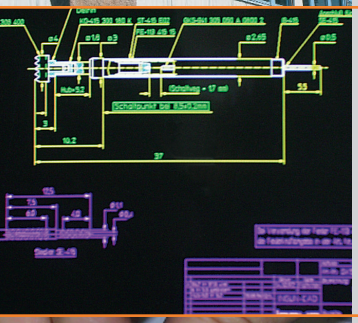




ingun®

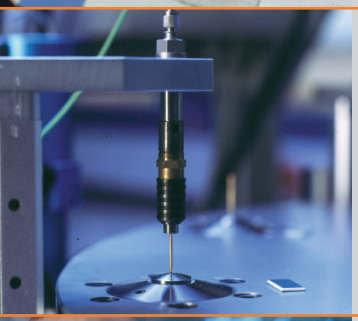
An Eye for Precision

Administration and Production Building



Computer-aided Production Planning and Control

Manual Assembly



Fully-automatic Assembly

Quality Control

Decades of successful co-operation with renowned customers world-wide …

…have proven, that the motto of our company "Quality through Precision" is a fact. Because it is indispensable to test the quality of the increasingly complex PCB Technology with quality.

Wolfgang Karl
Managing Director

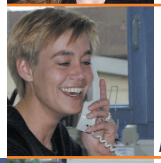
The solution comes with consulting

Ingun, a German company, was founded in 1971, and within just a few years, has grown to be recognised as one of the leading international suppliers of Test Probes, Test Fixtures and Test Systems.

Skilled and experienced employees will help you to solve all your testing requirements and demands. The Ingun consulting team offers you competence and flexibility in all technical, price and delivery aspects.

General Sales Manager

Marketing



International Sales

R&D/Production

International Sales-Support

Design Dept.

Reception

Call us!
Reception: +49 75 31 / 81 05-0

www.ingun.com

From Standard to customised

Ingun has designed a specific Test Probe for every testing demand. Standard spring-loaded and Pneumatic Probes, Switching Probes, High-Frequency or High-Current Probes, Rotating or Non-Rotating Probes – with a total of over 50 Tip Styles.

Ingun supplies Test Probes for micro-contacting in mini-grids, as well as for standard grids from 25mil (.635mm), 50mil (1.27mm), 100mil (2.54mm) and up to 250mil (6.35mm). And should our vast standard product range still not satisfy your requirements, please contact our specialists and ask for your own customised Test Probe solution.

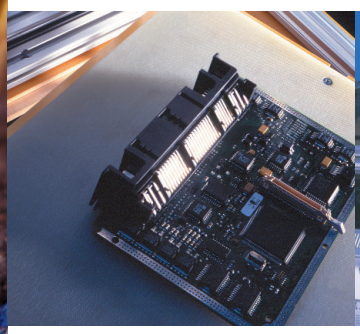
Manufacturing Quality „Made in Germany“

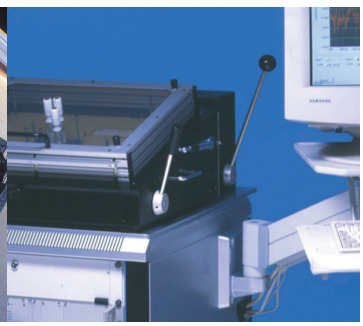
Computer-aided design and manufacturing together with automatic assembly are a guarantee for high standards. Whether for large volumes or for customised demands, Ingun Test Probes are continuously tested under laboratory conditions using computer-controlled, fully automatic life-expectancy test stations.

Success due to integrative all-round concepts

A good Test Probe is by far still no guarantee for an ideal testing concept. For this reason, Ingun also offers a wide range of Test Fixtures (with or without interface panel) suitable for all renowned ATE Test Systems. Whether tailor-made or as a modular extendable base system, we combine individual testing equipment to a total concept.

Ask our consultants, or request us to send you our product catalogs for Test Fixtures and Test Systems. And of course all our product information can also be downloaded from our homepage under www.ingun.com





Contents

Grid in mm (Mil)	Max. Stroke in mm	Current Rating in A	ICT / FCT	Combined ICT / FCT-Test	Cable Harness Probes	Solderable Probes	Battery Probes	Micro-Contacting	RF-Applications	High-Current Applications	High Temperature Range	Component Presence Check	Individually controllable	Interface Probes	Low Installation Height	High Installation Height	Short-stroke Probes	Long-stroke Probes	Through (continuous) Plunger	Non Rotating Probes	High Spring Forces	Stroke-measurement Probes	Series	Page
Pneumatic Probes																								
1,91 (75)	10	2											x										PKS-171	39
2,54 (100)	10	2											x										PKS-200	40
2,54 (100)	10	3											x										PKS-220	41
3,5 (140)	20	3								x			x										PKS-299	42
3,5 (140)	10	3								x			x										PKS-300	43
4,5 (180)	20	3											x										PKS-399	44
4,5 (180)	10	3											x										PKS-420	45
-	-	-																					PKS Accessories	46/47
Switching Probes																								
2,54 (100)	5	3										x											SKS-215	48
3,5 (140)	5,2	5										x											SKS-415	49
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7,5 (300)	14	5										x											SKS-419	51
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High-Frequency Probes																								
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5,08 (200)	5	3							x											x			HFS-810	54
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High-Current Probes																								
2,54 (100)	5,3	16			x					x	x												HSS-118 / M	68
5,08 (200)	5,3	24			x					x	x												HSS-120 / M	69
5,08 (200)	5,5	50			x					x	x										x		HSS-150 / M	70
≥12 (470)	≥9	≥50			x					x											x		HSS-2259-2532	71
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																							KT	57
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Screw-in Probes / Cable Harness Probes																								
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Design of INGUN Test Probes

Plating Materials
Hard Gold, chemical (Electro-less) Nickel and Rhodium are used. The choice of the Plating Materials is dependant on the functional aspects.

Hard Gold: good chemical resistance, hardness 150-200 HV (13-17 HRC). Good protection against oxidation and corrosion.

Rhodium: very good resistance to wear. Hardness 600-1000 HV (55-72 HRC); very brittle. Used when special demands against re-sistance to wear are put on the plungers. However, due to the brittleness, not suitable for aggressive tip-styles in combination with high spring-forces.

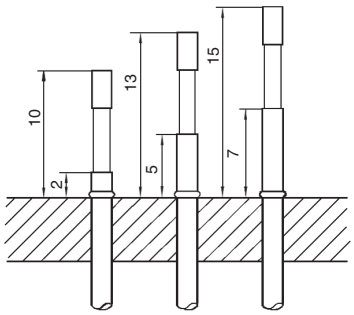
Chemical (Electro-less) Nickel: very good chemical resistance, hardness 400-600 HV (40-55 HRC). An important feature is the accurate deposit on the contours of the tip (no "dog-bone" effect). Very suitable as wear-resistant coating for plungers, and due to it's relatively high ductility, also suitable for aggressive tip-styles.

Aurun: a Gold alloy which was especially developed for the plungers of Test Probes, with very good chemical resistance and hardness 300-350 HV (30-35 HRC). Recommended for aggressive tip-styles when testing unwashed PC Boards.

Due to the very low specific resistance values of 4-8 µΩ, all coating materials guarantee a maximum of contact reliability.

Collar Height and Installation Height
The Installation Height is the distance between the tip of the non-compressed Test Probe and the surface of the Probe Plate. To regulate the Installation Height, the Test Probes, and/or sometimes also the Receptacles, are available with different Collar Heights. Some Receptacles are also available with a press-ring. Insertion of the press-ring into the assembly hole offers variable Installation Heights.

Furthermore, for some series, Distance Sleeves are available which enable further fine adjustment of the Installation Height.



Design of INGUN Test Probes

Spring-loaded Test Probes (GKS) basically consist of three components, i.e. the Plunger, the Barrel and the Spring. All Test Probe components must be manufactured with a very high-precision, as is normally demanded in the micro-electronics industry.

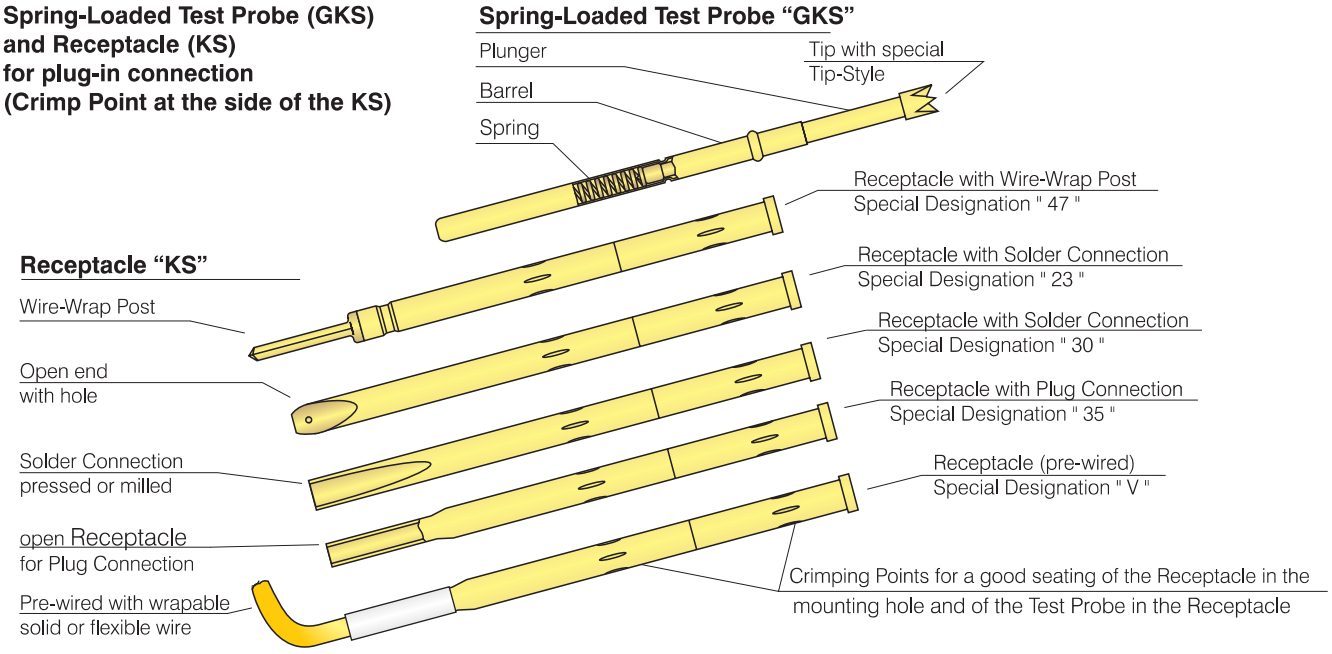
The Plunger comes with a large choice of tip-styles, and is made of either hardened Steel or hardened BeCu. For passive tip-styles however, often Brass is used. Furthermore, for some special applications, an insulated cap is assembled onto the tip of the plunger.

The Spring, being the true active component of the Test Probe, ensures the necessary contact pressure, and this even after several hundred thousand strokes. The specified spring-forces are reached with the recommended operating stroke (see data sheets) and are subject to tolerances in the range of +/- 10-15%, this due to the parameter restrictions when designing and manufacturing the springs for such small components .

The Barrel contains the Plunger and the Spring. If the diameter of the Plunger Tip is less than the diameter of the Barrel, the latter determines the smallest mounting distance (Grid) to the other Test Probes.

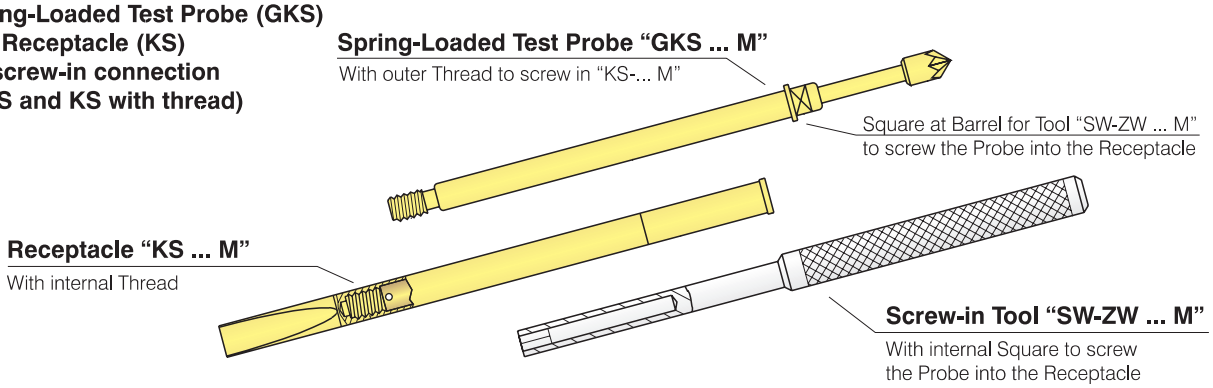
The Receptacle (KS) enables easy interchanging of the Test Probe during maintenance and servicing of the Test Fixture. Crimp points on the side of the Receptacle offer a certain gripping force and therefore enable interchanging ("snap-in") without wiring work. However, please note that the function of the crimp points is only guaranteed after the Receptacle is inserted in the assembly hole.

Spring-Loaded Test Probe (GKS) and Receptacle (KS) for plug-in connection (Crimp Point at the side of the KS)



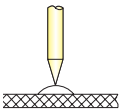
Spring-Loaded Test Probes (GKS) with a thread (special index „M") are primarily used for testing cable harnesses and connectors. For these applications the Test Probe is inserted into the Receptacle and screwed tight. For this purpose, a special insertion tool is available. This screwed connection enables reliable securing of the Test Probes under problematic application conditions (e. g. snapping effect, assembly upside down etc.). Furthermore, quick and flexible change of the Test Probes is guaranteed.

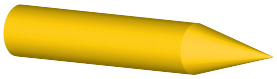
Spring-Loaded Test Probe (GKS) and Receptacle (KS) for screw-in connection (GKS and KS with thread)



Overview of Tip Styles

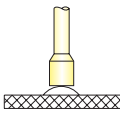
Commonly used, less aggressive tip for Testpads.

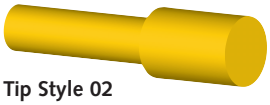




Tip Style 01
(30° tip angle)

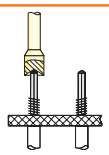
Very passive tip, for contacting clean test points such as Testpads which shouldn't be punctured, as well as connector and plug-in card terminals.

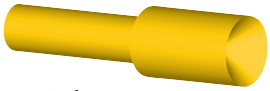




Tip Style 02
(flat)

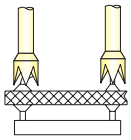
Common tip for contacting connector pins and wire-wrap posts.

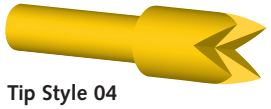




Tip Style 03
(Inverse Cone)

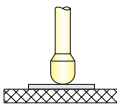
One of the most common tips for contacting component pins. Not to be recommended for unwashed PC-Boards, because tendency to contamination and clogging of solder-resin in the throat of the crown.

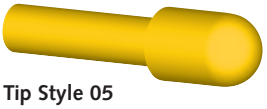




Tip Style 04
(Standard 4-point Crown)

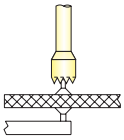
Most popular passive tip-style, for contacting clean test points such as Testpads and even tracks.

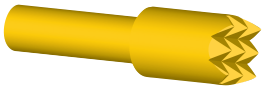




Tip Style 05
(flat)

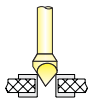
Universal tip-style for contacting practically all types of pins (e.g. connectors, WW-posts, component pins etc.).

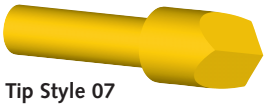




Tip Style 06
(serrated)

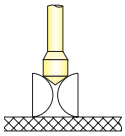
Most common tip-style for contacting both plated open-vias and Testpads. Replaces more and more the tip-style 01. Also used as interface probe tip in conjunction with an Ingun contact terminal (see page 70) for the Ingun VIN Test Fixtures.

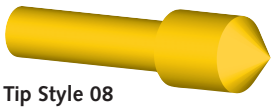




Tip Style 07
(90° tri-hedral or pyramid)

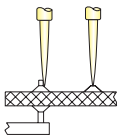
Also used for contacting plated open-vias, especially when damage to the contacting area must be avoided. Also suitable for contacting mullet-point and plug-in connectors together with low spring-forces.





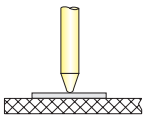
Tip Style 08
(90° conical tip)

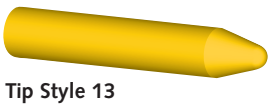
Universal tip-style for contacting practically all types of test points except plated open vias. Offers a high level of stability combined with flexibility. Often chosen for contaminated, unwashed PC Boards.



Tip Style 09
(flexi-needle)

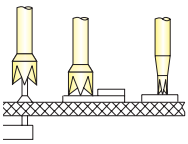
Rather passive tip, commonly used for Testpads where puncturing must be avoided. Also suitable for contacting tracks.

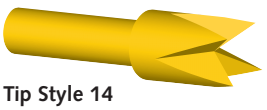




Tip Style 13
(30° tip with rounded-off nose)

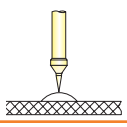
The most commonly used tip for contacting component pins. The modified 04 crown design prevents clogging of solder-resin in the throat of the crown.

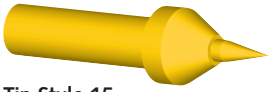




Tip Style 14
(self-cleaning 4-point Crown)

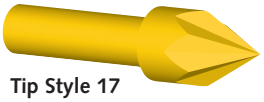
Offers a high level of stability and aggressiveness for special contacting demands as far as resistance to wear is concerned.





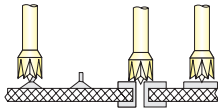
Tip Style 15
(22° pressed-in HSS-tip)

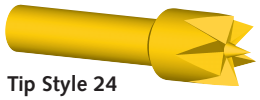
The six knife-shaped edges centre the tip when contacting plated open-vias. Similar characteristics as tip-style 07, but much more aggressive.



Tip Style 17
(90° hexagonal)

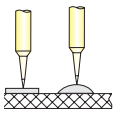
Universal usage for practically all test points.





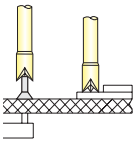
Tip Style 24
(6-point Crown with higher set middle point)

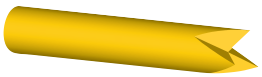
Very aggressive tip-style, offering a high level of stability, for contacting unwashed PC Boards and other specific testing demands.



Tip Style 31
(turned steel tip)

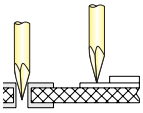
A modified version of the 4-point self-cleaning Crown (tip-style 14), manufactured with ground flanks and therefore very aggressive. Can be used both for component pins as well as Testpads.





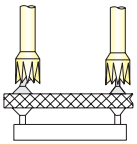
Tip Style 33
(self-cleaning 3-point Crown)

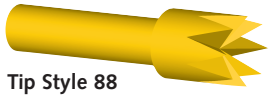
Universal usage for plated open-vias. Similar characteristics as tip-style 91 (dagger), however with three contacting edges instead of two. More stable tip, but therefore less aggressive.



Tip Style 77
(aggressive tri-hedral tip)

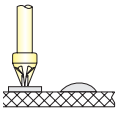
Self-cleaning Crown with good centring features. Suitable for contaminated component pins.

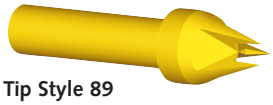




Tip Style 88
(8-point Crown)

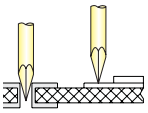
Recommended for unwashed PC Boards. The special shape of the ground steel tips ensures that any contaminating particles are "pushed" back from the contacting zone around the points.

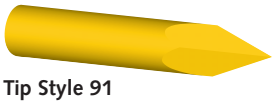




Tip Style 89
(self-cleaning 3-point Crown)

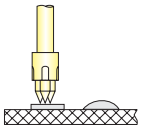
Universal usage, and by far the most popular tip-style, for not only plated open-vias but also Testpads. Very aggressive, ground flanks.

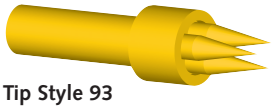




Tip Style 91
(Dagger)

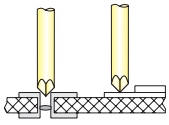
Due to the three very aggressive HSS tips, ideal for contacting unwashed PC Boards and other specific testing demand.

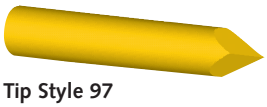




Tip Style 93
(Tri-needle, 22° pressed-in HSS-tip)

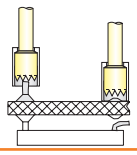
A modified version of the standard dagger (No. 91), also for universal usage. Designed for plated open-vias which have been closed with sealing lacquer.





Tip Style 97
(Passive Dagger)

Standard serrated tip with higher set outer nylon ring, designed for component presence-check.The designation "0" is for nylon material, the designation 06 for the inner tip-style.



Tip Style 006
(serrated, with higher set outer nylon ring)

General Definitions and Criteria

Wobble and minimum Test Point Size
Due to the necessary play between the Plunger and the Barrel of a Test Probe, the tip can be deflected away from the ideal, vertical position. This deviation, the so-called "wobble", has been measured by Ingun by means of an apparatus which was developed especially for this purpose. The Test Fixture tolerances have also been taken into consideration for determination of the minimum Test Point Size.
The minimum Test Point Size is specified for all commonly used standard Test Probes - the values stated are in regard to the use of Ingun Test Fixture kits.

Current Rating
The maximum recommended current which can be transferred by standard Test Probes depends upon the size of the Probe components, the spring force and the base material of the plunger. Generally, the materials Beryllium-Copper and Brass can transfer higher currents than steel. The allowed nominal currents for each series are highlighted on the product data sheet. These values are valid for DC. For AC, the values must be reduced by Factor √ 2.

Mounting Hole Tolerances
When drilling the mounting holes in the Probe Plate, one must distinguish between the hole diameter and the drill diameter. The specifications in this catalog refer to the mounting hole diameter, the diameter of which can easily be measured with use of a mandrel. Depending on the material and the thickness of the Probe Plate, the chosen drill must be 0.01 - 0.03mm (.0004 - .0012") larger than the hole diameter. Please note however, that other parameters such as drill-speed and drill-feed also play a substantial role in determining the end result. Basically, pre-trials are unavoidable.

Life-expectancy of INGUN Test Probes
In order to determine the life-expctancy of the Test Probes, Ingun continuously carries out long-term tests with computer-controlled test stations. Here, important parameters such as transition resistance, current load and spring force can be observed and recorded throughout the life of a Test Probe. The knowledge gained from these tests constantly flows back into our R&D dept. and thus into future developments.
The life-expectancy of Test Probes can be improved when the following conditions are fulfilled:

- no current load at the time of contacting
- abiding the max. allowed nominal current
- abiding the recommended working stroke
- usage of the spring force stated under "spring force at working stroke"
- Temperature range between +10° and +40°C
- minimum amount of side-loading (cannot be completely avoided)
- dust and oil free testing environment conditions
- avoiding of corrossive testing environment conditions
- avoiding surpluse solder flux
- avoiding general contaminants

The following table is based on results of duration tests carried out in the Ingun R&D dept. These tests were carried out observing the above listed, ideal conditions. The results are intended to give an approximate reference point of the life-expectancy of INGUN Test Probes.

Grid size 50 mil (1,27 mm):	1 x 10^5 Strokes
Grid size 75 mil (1,91 mm):	1 x 10^5 Strokes
Grid size ≥ 100 mil (2,54 mm):	1 x 10^6 Strokes
Rotating and non-rotating Probes:	1 x 10^5 Strokes
Pneumatic Probes:	1 x 10^5 Strokes
Switching Probes:	1 x 10^5 Strokes
High-current and high-frequency Probes:	1 x 10^5 Strokes

Temperature Range
Ingun Test Probes can be used at a temperature range of -40°C to +80°C. For lower or higher temperature ranges, special solutions are available on request (see Contents on page 3,4 & 59 as well as "Temperature Ranges" listed by the various Test Probe series). Especially the usage by minus temperatures and temperatures above 100°C can have a strong influence on the life-expectancy of the Test Probe.

INGUN Part Numbers
Due to the logical structure of the Ingun part nos., prompt and detailed identification of the Test Probes specification is possible. Individual designations specify the series, the base material of tip, the tip-style, the spring force and also the installation dimensions. The various combination possibilities within a particular series are shown on the corresponding catalog pages. After choosing the necessary components, the order no. can be put together according to the following system:

GKS	-	100	2	91	090	A	20	00
1		2	3	4	5	6	7	8

1	Type of Probe	GKS Standard spring-loaded Test-Probe
		HFS High-frequency Probe
		HSS High-current Probe
		PKS Pneumatic Probe
		SKS Switching Probe
2	Series	
3	Tip Material	0 = Delrin (Nylon)
		1 = Brass
		2 = Steel
		3 = BeCu
4	Tip-Style	(see overview on pages 6 & 7)
5	Tip Diameter	(in mm/100; e.g. 090 = 0,90 mm)
6	Tip Plating	A = Gold
		G = Aurun (special Gold-Alloy)
		N = Nickel
		R = Rhodium
7	Spring Force	(in N/10, e.g. 20 = 2,0 N)
8	Collar Height	measured on the barrel in mm
		(Note: type 00 = no collar)

Available Tip Styles

Series E-050

Material	Tip Style	Plating
2	91  Ø 0,50 (.020)	A

E-075

Material	Tip Style	Plating
2	91  Ø 0,64 (.025)	A

E-100

Material	Tip Style	Plating
2	91  Ø 0,90 (.035)	A

Mechanical Data

Working Stroke: 4,30 mm (.169)
Maximum Stroke: **5,00** mm (.197)

Spring Forces at Working Stroke

Series	Designation	Pre-Load	Force at Working Stroke
E-050	20	1,4 N (5.1 oz.)	2,0 N (7.2 oz.)
E-075	20	1,1 N (4.0 oz.)	2,0 N (7.2 oz.)
E-075	28	1,5 N (5.4 oz.)	2,8 N (10.1 oz.)
E-100	20	1,3 N (4.7 oz.)	2,0 N (7.2 oz.)
E-100	30	2,0 N (7.2 oz.)	3,0 N (10.8 oz.)

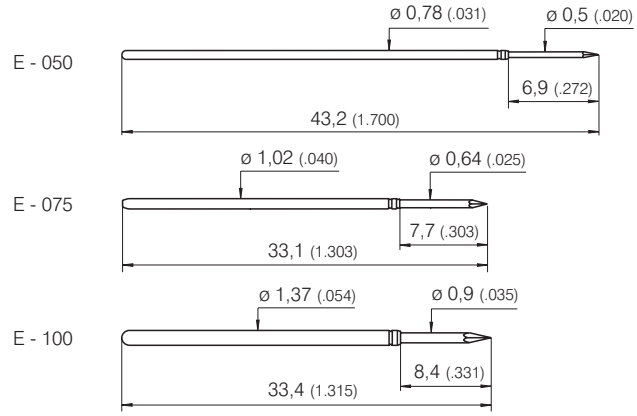
Collar Height and Installation Height, Receptacles, Electrical Data, Mounting Hole Sizes and Materials

> see compatible standard Probe series!

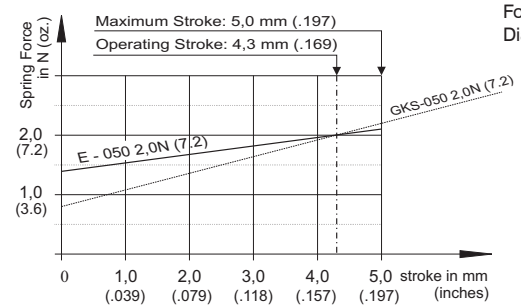
E-Type	compatible Probe	Page
E-050:	GKS-050	16
E-075	GKS-075	18
E-100	GKS-100	22/23

Tools:
Insertion and Extraction Tools for GKS and KS > see Page 58.

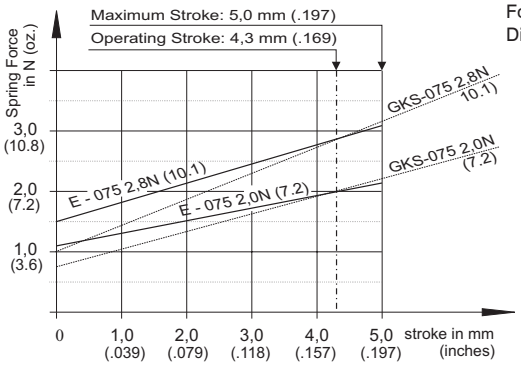
Mounting and Functional Dimensions



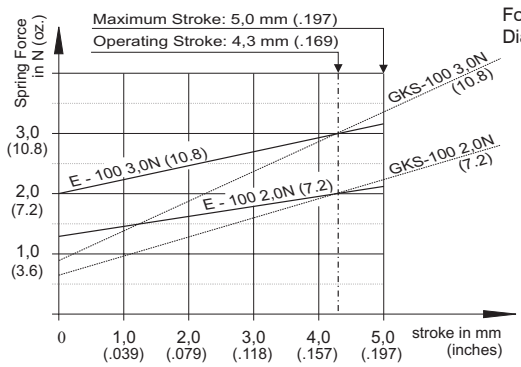
Force/Stroke Diagram E-050



Force/Stroke Diagram E-075



Force/Stroke Diagram E-100



Ordering Example:

Series	Tip Material 2 = Steel	Tip Style	Tip Diameter ($^1/_{100}$ mm)	Plating A = Gold	Spring Force (dN)	Collar Height (mm)
Test Probes:						
E	0 5 0	2	9 1	0 5 0	A	2 0	0 0
E	0 7 5	2	9 1	0 6 4	A	2 0	0 0
E	1 0 0	2	9 1	0 9 0	A	3 0	0 0

GKS 038

Grid:
≥ 0,635 mm
≥ 25 Mil

Micro Contacting
Installation Height: 4,0 mm (.157)
Recommended Stroke: 2,0 mm (.079)

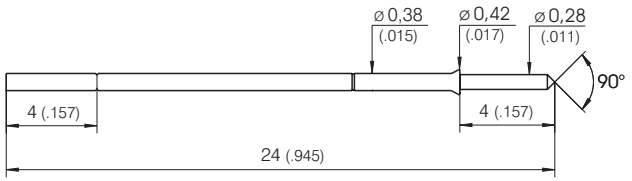
Available Tip Styles
for GKS-038

Material	Tip Style	Standard Plating	Special Versions Ø (mm)	Special Versions Ø (inch)
3	02  Ø 0,28 (.011)	A		
3	08  Ø 0,28 (.011)	A		

Note:
This Test Probe is available pre-wired, with Wire AWG 30 (see Ordering Example).

Mechanical and Electrical Data: see below

Mounting and Functional Dimensions



Materials

Plunger:	BeCu, gold-plated
Barrel:	Bronze, gold-plated
Spring:	Steel, gold-plated
Plug:	Brass, gold-plated

GKS 041

NEW

Grid:
≥ 0,7 mm
≥ 28 Mil

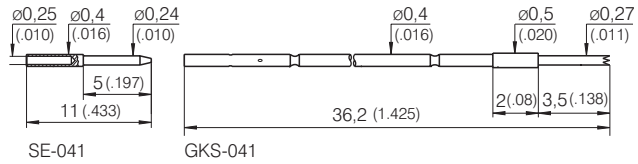
Micro Contacting
Installation Height: 5,5 mm (.217)
Recommended Stroke: 3,5 mm (.138)

Available Tip Styles
for GKS-041

Material	Tip Style	Standard Plating	Special Versions Ø (mm)	Special Versions Ø
(inch) 3	04  Ø 0,27 (.011)	A		

Materials: see GKS-038

Mounting and Functional Dimensions



GKS 061

NEW

Grid:
≥ 0,8 mm
≥ 30 Mil

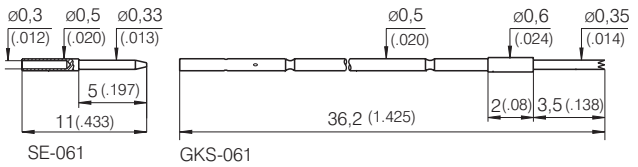
Micro Contacting
Installation Height: 5,5 mm (.217)
Recommended Stroke: 3,5 mm (.138)

Available Tip Styles
for GKS-061

Material	Tip Style	Standard Plating	Special Versions Ø (mm)	Special Versions Ø
(inch) 3	04  Ø 0,35 (.014)	A		

Materials: see GKS-038

Mounting and Functional Dimensions



Mechanical and Electrical Data

Type	Working Stroke (mm / inch)	Max. Stroke (mm / inch)	Spring Forces at Working Stroke (N)	Current Rating (A)	R_i typical (mΩ)	Installation Height (mm/inch)	Mounting Hole Size (mm / inch)
GKS 038	2 / .080	2,5 / .100	0,4 (1.4 oz.)	1	100	4 / .157	0,38 / .015
GKS 041	2,5 / .100	3,5 / .138	0,4 (1.4 oz.)	2	50	5,5 / .217	0,4 / .016
GKS 061	2,5 / .100	3,5 / .138	0,6 (2.2 oz.)	2	50	5,5 / .217	0,5 / .020

Ordering Example:

Series	Tip Material 3 = BeCu	Tip Style	Tip Diameter ($^1/_{100}$ mm)	Plating A = Gold	Spring Force (dN)	Collar Height (mm)	Special Designation
GKS	038	308	028	A	04	00	
GKS	038	308	028	A	04	00	V
GKS	041	304	027	A	04	02	
GKS	061	304	035	A	06	02	

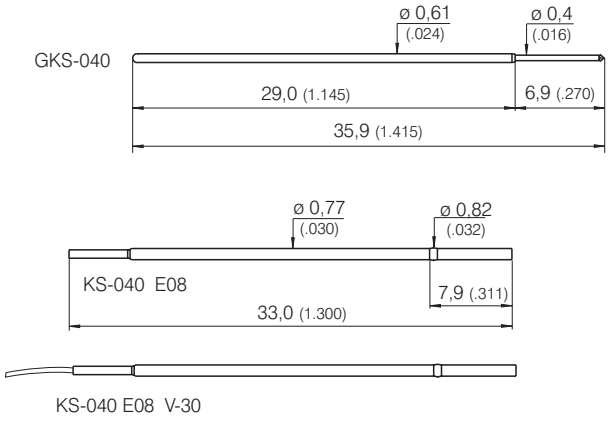
Plugs for GKS: SE-041 SE-061

All specifications are subject to change without prior notification

Available Tip Styles

Material	Tip Style	Standard Plating	Special Versions Ø (mm)	Special Versions Ø (inch)
2	97  Ø 0,40 (.016)	A		

Mounting and Functional Dimensions



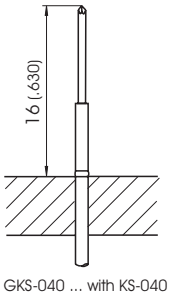
Note:
The KS–040 is available pre-wired, with Wire AWG 30 (see Ordering Example).

Mechanical Data

Working Stroke:	4,3 mm (.169)
Maximum Stroke:	6,35 mm (.250)
Spring Force at Work. Stroke:	0,8 N (2.9 oz.)
Test Point Size:	≥ Ø 0,60 mm (.024)
when using Guide Plate:	≥ Ø 0,50 mm (.020)

Collar Height and Installation Height

To adjust the Installation Height, Receptacles with a Press-ring are used. The Receptacles can be inserted up to the Press-ring (i.e. acting as a collar-stop) or with the Press-ring being pressed into the mounting hole.



GKS-040 ... with KS-040

Electrical Data

Current Rating:	2 A
R_i typical:	< 20 mΩ

Mounting Hole Size

in CEM 1:	Ø 0,79-0,80 mm (.031)
in FR 4:	Ø 0,79-0,80 mm (.031)

Materials

Plunger:	Steel, gold-plated
Barrel:	Bronze, gold-plated
Spring:	Steel, gold-plated
Receptacle:	Nickel-Silver, gold-plated

Ordering Example:

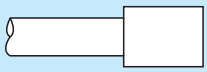
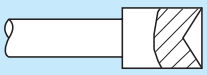
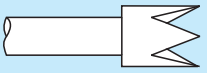
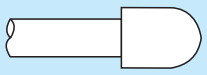
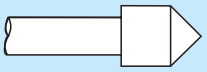
	Series	Tip Material 2 = Steel	Tip Style	Tip Diameter ($^1/_{100}$ mm)	Plating A = Gold	Spring Force (dN)	Collar Height (mm)
Test Probe:	GKS	040	2	97	040	A	08	00
Receptacles:	KS – 040 E08				KS-040 E08 V-30			

GKS 080

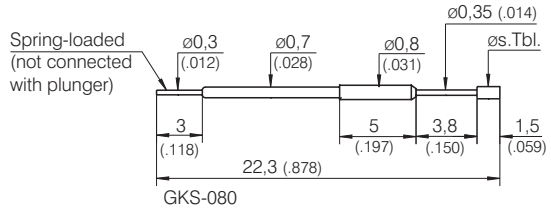
Grid:
≥ 1,00 mm
≥ 40 Mil

Test Probe for contacting in SMD Technology
Installation Height: 10,5 mm (.413)
Recommended Stroke: 3,0 mm (.118)

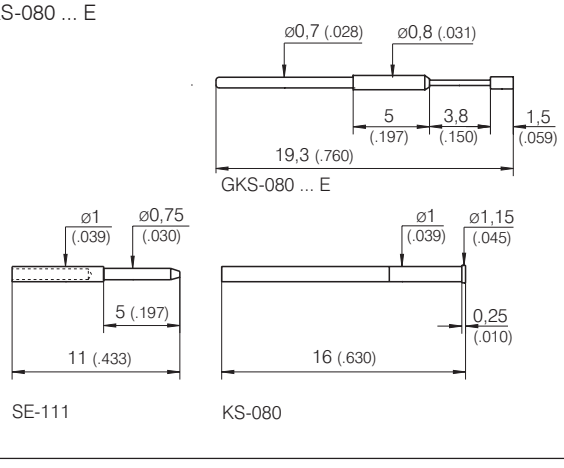
Available Tip Styles

Material	Tip Style	Standard Plating	Special Versions Ø (mm)	Special Versions Ø (inch)
3	01  Ø 0,35 (.014)	A		
3	02  Ø 0,80 (.031)	A		
3	03  Ø 0,80 (.031)	A		
3	04  Ø 0,80 (.031)	A	0,50	(.020)
3	05  Ø 0,80 (.031)	A		
3	08  Ø 0,80 (.031)	A		

Mounting and Functional Dimensions

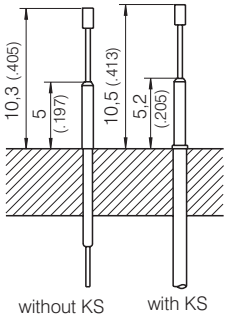


GKS-080 ... E



Mechanical Data

Working Stroke: 3,0 mm (.118)
Maximum Stroke: 3,8 mm (.150)
Force at Working Stroke: 0,8 N (2.9oz)
Test Point Size: ≥ Ø 0,80 mm (.031)



Collar Height and Installation Height

The Installation Height of the Tip (Dimension without KS) is defined by the Collar Height of the Test Probe.

Collar Height 05: Installation Height 10,3 mm (.405) (without Receptacle)

Note:
When using Receptacles, choose Probe version GKS-080 ... E (Version without Solder-cup).

The Receptacle can be used from Grid Size 1,27 (50 Mil) up.

Tools:
Insertion and Extension Tools for GKS and KS > see Page 58.

Electrical Data

Current Rating: 3 A
R_i typical: 20 mΩ

Mounting Hole Size

with Receptacle: Ø 0,99-1,00 mm (.039)
without Receptacle: Ø 0,70 mm (.028)

Materials

Plunger: BeCu, gold-plated
Barrel: Brass, gold-plated
Spring: Steel, gold-plated
Receptacle: Brass, gold-plated

Ordering Example:

Series	Tip Material 3 = BeCu	Tip Style	Tip Diameter ($^1/_{100}$ mm)	Plating A = Gold	Spring Force (dN)	Collar Height (mm)	Special Designation
GKS	080	3	01	035	A	08	05	

Test Probe: GKS 080 3 01 035 A 08 05
Receptacle: KS-080
Plug for Receptacle: SE-111

All specifications are subject to change without prior notification

Test Probe for Contacting in SMD Technology
Installation Height: 10,5 / 13,0 / 16,0 mm (.413/ .512/ .630)
Recommended Stroke: 5,5 mm (.217)

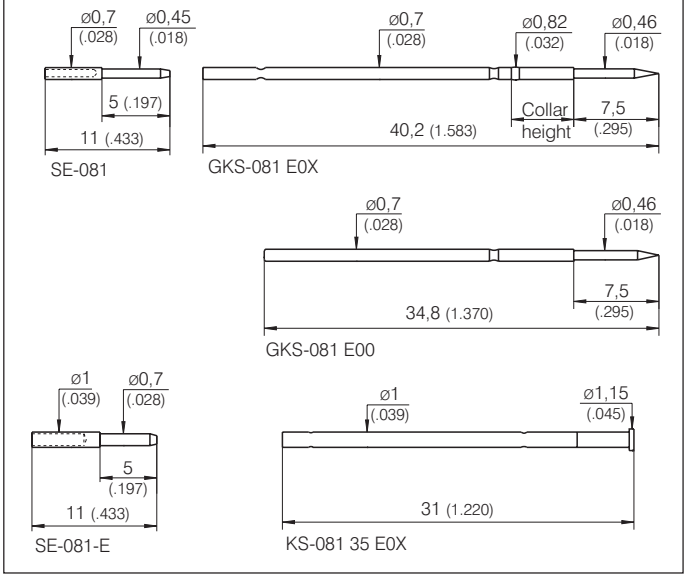
Grid:
≥ 1,00 mm
≥ 40 Mil

GKS 081

Available Tip Styles

Material (inch)	Tip Style		Standard Plating	Special Versions Ø (mm)	Special Versions Ø
3	51	Ø 0,50 (.020)	A		
3	54	Ø 0,50 (.020)	A		
2	91	Ø 0,50 (.020)	A		

Mounting and Functional Dimensions



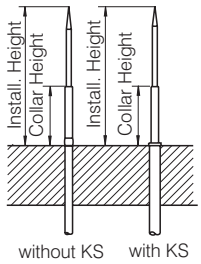
Mechanical Data

Working Stroke:	5,50 mm (.217)
Maximum Stroke:	7,50 mm (.295)
Spring Force at Working Stroke:	0,8 N (2.9 oz)
Test Point Size:	≥ Ø 0,80 mm (.031)
when using Guide Plate:	≥ Ø 0,60 mm (.024)

Collar Height and Installation Height

To adjust the Installation Height of the Test Probes, Receptacles with various Collar Heights are available.

Collar Height	Installation Height
03	10,5 mm (.413)
05	13,0 mm (.512)
08	16,0 mm (.630)



Electrical Data

Current Rating:	3 A
R_i typical:	30 mΩ

Mounting Hole Size

with Receptacle:	Ø 0,99-1,00 mm (.039)
without Receptacle:	Ø 0,70 mm (.028)

Materials

Plunger:	BeCu, gold-plated
Barrel:	Brass, gold-plated
Spring:	Steel, gold-plated
Receptacle:	Brass, gold-plated

Note:
The Receptacle can be used from Grid 1,27 (50 Mil) up.

Tools:
Insertions and Extraction Tools for GKS and KS > see Page 58.

Ordering Example:

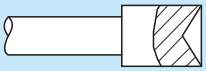
	Series	Tip Material 3 = BeCu	Tip Style	Tip Diameter ($^1/_{100}$ mm)	Plating A = Gold	Spring Force (dN)	Collar Height (mm)
Test Probe for usage **without** Receptacle:	GKS	081	3	54	050	A	08	03
Test Probe for usage **with** Receptacle:	GKS	081	3	54	050	A	08	00
Receptacles:	KS – 081 35 E 03		KS – 081 35 E 05		KS – 081 35 E 08			
Plug for direct connection to Probe (GKS):	SE – 081							
Plug for Receptacle:	SE – 081 E							

GKS 069

Grid:
≥ 1,27 mm
≥ 50 Mil

Short-stroke Test Probe
Installation Height: 6,7 mm (.264)/variable
Recommended Stroke: 2,2 mm (.087)

Available Tip Styles

Material	Tip Style	Standard Plating	Special Versions Ø (mm)	Special Versions Ø (inch)
2	01  Ø 0,51 (.020)	N		
2	02  Ø 0,30 (.012)	N		
3	03  Ø 0,90 (.035)	A		
2	05  Ø 0,51 (.020)	N		

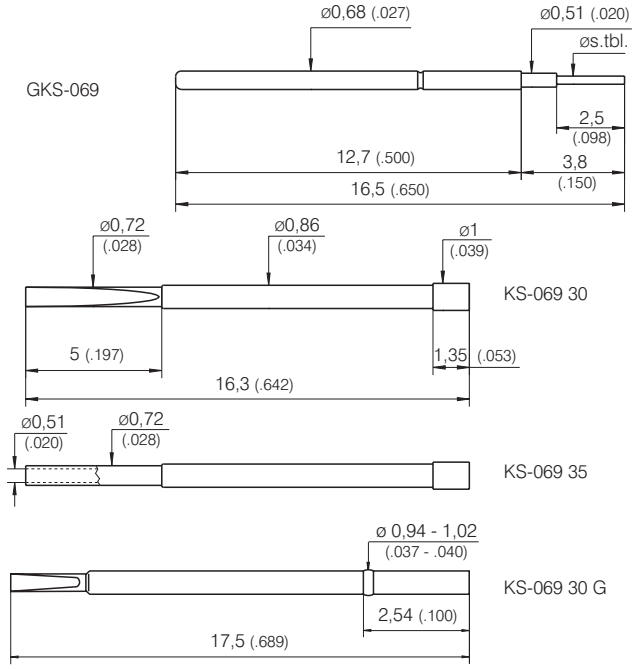
Note:
The usage of Series 069 is only possible with a Receptacle.

Test Probes of the Series GKS-069 are also available with bent Receptacle end (Special Designation "B").

The KS–069 35 is available pre-wired, with Wire AWG 26 (see Ordering Example).

Tools:
Insertion and Extraction Tools for GKS and KS > see Page 58.

Mounting and Functional Dimensions



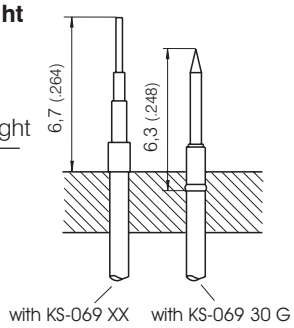
Mechanical Data

Working Stroke:	2,2 mm (.087)
Maximum Stroke:	2,8 mm (.110)
Spring Force at Working Stroke:	0,7 N (2.5 oz.)

Collar Height and Installation Height

The Installation Height of the Probe is determined by the Receptacle.

Designation	Installation Height
KS-069 30	6,7 mm (.264)
KS-069 35	6,7 mm (.264)
KS-069 30 G	variable



Electrical Data

Current Rating:	3 A
R_i typical:	20 mΩ

Mounting Hole Size

for KS-069 30 / 35:	Ø 0,85 - 0,86 mm (.033 - .034)
for KS-069 30 G:	Ø 0,86 - 0,92 mm (.034-.036)

Materials

Plunger:	BeCu or Steel, gold-plated or chemically nickel-plated
Barrel:	Nickel-Silver, gold-plated
Spring:	Steel, gold-plated
Receptacle:	Brass or Nickel-Silver, gold-plated

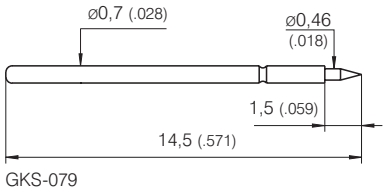
Ordering Example:

	Series	Tip Materials 2 = Steel 3 = BeCu	Tip Style	Tip Diameter ($^1/_{100}$ mm)	Plating A = Gold N = Nickel	Spring Force (dN)	Collar Height (mm)	Special Designation
Test Probe:	GKS	069	2	02	030	N	07	00
Receptacles:	KS–069 30		KS–069 35		KS–069 30 G			
Receptacle (pre-wired with AWG 26):	KS–069 35 V-26							

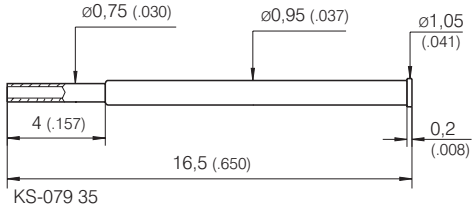
Available Tip Styles

Material	Tip Style	Standard Plating	Special Versions Ø (mm)	Special Versions Ø (inch)
3	01  Ø 0,50 (.020)	A		

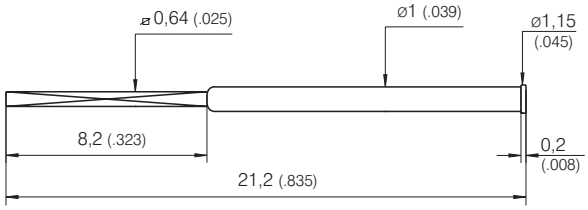
Mounting and Functional Dimensions



GKS-079



KS-079 35



KS-079 46

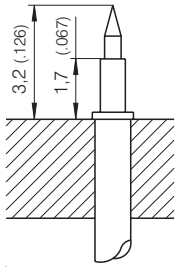
Note:
The KS-079 35 is available pre-wired, with Wire AWG 26 (see Ordering Example).

Mechanical Data

Working Stroke:	1,0 mm (.039)
Maximum Stroke:	1,2 mm (.047)
Spring Force at Working Stroke:	1,3 N (4.7 oz.)

Collar Height and Installation Height

The Install. Height with KS-079 is: 3,2 mm (.126)



Electrical Data

Current Rating:	3 A
R_i typical:	20 mΩ

Mounting Hole Size

KS-079 35	
in CEM 1 and FR 4:	Ø 0,94-0,95 mm (.037)
KS-079 46	
in CEM 1 and FR 4:	Ø 0,99-1,00 mm (.039)

Materials

Plunger:	BeCu, gold-plated
Barrel:	Bronze, gold-plated
Spring:	Steel, gold-plated

Ordering Example:

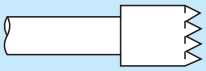
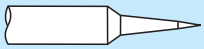
	Series	Tip Material 3 = BeCu	Tip Style	Tip Diameter (1/100 mm)	Plating A = Gold	Spring Force (dN)	Collar Height (mm)
Test Probe:	GKS	079	3	01	050	A	13	00
Receptacle:	KS-07935						
Receptacle with Wire-Wrap:	KS-07946						
Receptacle (pre-wired with Wire AWG 26):	KS-07935 V-26						

GKS 050

Grid:
≥ 1,27 mm
≥ 50 Mil

ICT/FCT Test Probe
Installation Height: 16,0 mm (.630)/var.
Recommended Stroke: 4,3 mm (.169)

Available Tip Styles

Material	Tip Style	Standard Plating	Special Versions Ø (mm)	Special Versions Ø (inch)
3	05  Ø 0,50 (.020)	A		
3	06  Ø 0,90 (.035)	A		
3	07  Ø 0,50 (.020)	A	0,90	(.035)
2	14  Ø 0,50 (.020)	A		
2	31  Ø 0,50 (.020)	A		
2	91  Ø 0,50 (.020)	A		
2	97  Ø 0,50 (.020)	A		

Special Version GKS-050...L

Available Tip Styles

Materials	Tip Style	Standard Plating	Special Versions Ø (mm)	Special Versions Ø (inch)
2	91  Ø 0,50 (.020)	A		

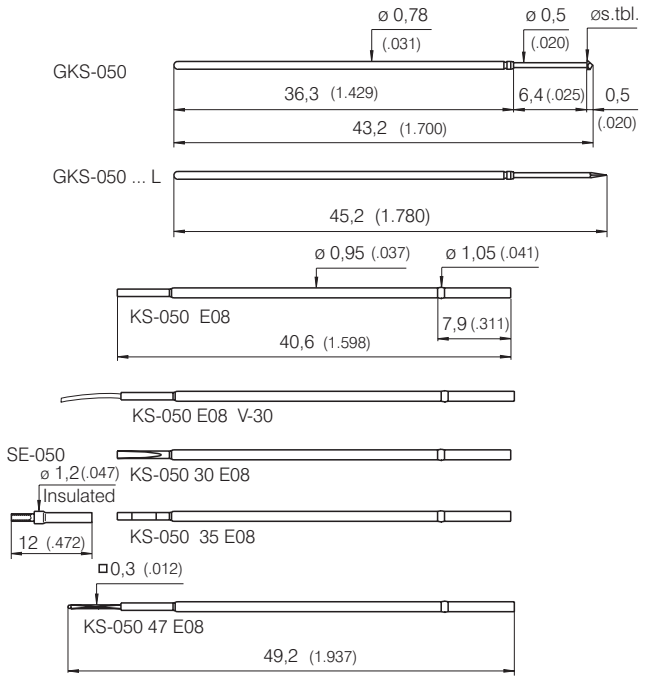
Total Length 45,2 mm (1.780), Special Designation "L"

Plug:
The Plugs SE-050 and SE-050 V-30 are to be used with the Receptacle KS-050 35 E08.

SE-050 V-30:
The Plug is pre-wired with Wire AWG 30 . The connection is soldered. A piece of insulating tubing prevents shorts.

Tools:
Insertion and Extraction Tools for GKS and KS > see Page 58.

Mounting and Functional Dimensions

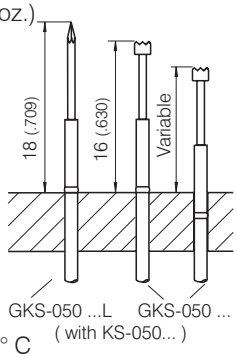


Mechanical Data

Working Stroke: 4,3 mm (.169)
Maximum Stroke: 6,35 mm (.250)
Spring Force at Work. Stroke: 1,5 N (5.4 oz.)
alternative: 1,0 N (3.6oz.); 2,0 N (7.2oz.)
Test Point Size: ≥ Ø 0,80 mm (.031)
with Guide Plate: ≥ Ø 0,60 mm (.024)

Collar Height and Installation Height

To adjust the Installation Height, Receptacles with a Press-ring are used. The Receptacles can up inserted up to the Press-ring (i.e. acting as a collar-stop) or with the Press-ring being pressed into the mounting hole.



Operating Temperature

Standard: -40° up to +80° C
with Special Designation "C": -100° up to +200° C (2,0 N)

Electrical Data

Current Rating: 2-3 A
R_i typical: < 20 mΩ

Mounting Hole Size

in CEM 1: Ø 0,96-0,98 mm (.038)
in FR 4: Ø 0,97-0,99 mm (.039)

Materials

Plunger: BeCu or Steel, gold-plated
Barrel: BeCu hardened, gold-plated
Spring: Steel, gold-plated
Receptacle: BeCu, gold-plated

Ordering Example:

Series	Tip Materials 2 = Steel 3 = BeCu	Tip Style	Tip Diameter ($^1/_{100}$ mm)	Plating A = Gold	Spring Force (dN)	Collar Height (mm)	Special Designation
GKS	050	291	050	A	10	00	
GKS	050	291	050	A	15	00	L

Test Probe with Total Length 43,2 mm (1.700): GKS 050 291 050 A 10 00
Test Probe with Total Length 45,2 mm (1.780): GKS 050 291 050 A 15 00 L

Plugs: SE-050 | SE-050 V-30

Receptacles: KS-050 E08 | KS-050 30E08 | KS-050 35E08 | KS-050 E08 V-30

Test Probe for Contacting in SMD Technology
Installation Height:10,5/13,0/16,0 mm (.413/.512/.630)
Recommended Stroke: 5,5 mm (.217)

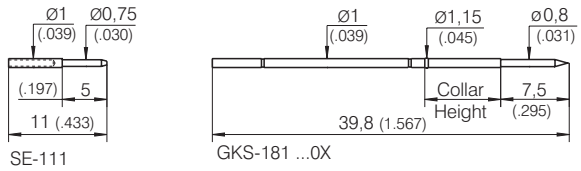
Grid:
≥ 1,27 mm
≥ 50 Mil

GKS 181

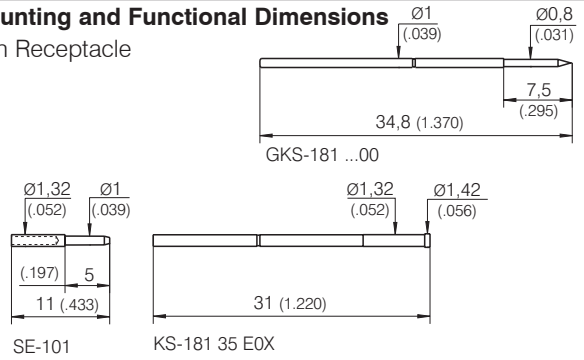
Available Tip Styles

Material	Tip Style	Standard Plating	Special Version Ø (mm)	Special Version Ø (inch)
3	05 Ø 0,80 (.031)	A		
3	51 Ø 0,80 (.031)	A		
3	54 Ø 0,80 (.031)	A		
2	91 Ø 0,80 (.031)	N		

Mounting and Functional Dimensions



Mounting and Functional Dimensions with Receptacle



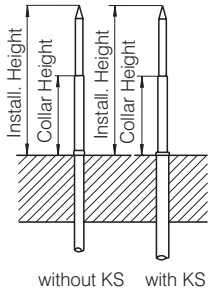
Mechanical Data

Working Stroke:	5,50 mm (.217)
Maximum Stroke:	7,50 mm (.295)
Spring Force at Work.Stroke:	1,5 N (5.4oz)
alternative:	0,8 N (2.9 oz)
Test Point Size:	≥ Ø 0,80 mm (.031)
with Guide Plate:	≥ Ø 0,60 mm (.024)

Collar Height and Installation Height

To adjust the Installation Height of the Test Probes, Receptacles are available with various collar heights.

Collar Height	Installation Height
03	10,5 mm (.413)
05	13,0 mm (.512)
08	16,0 mm (.630)



Electrical Data

Current Rating:	2-3 A
R_i typical:	< 20 mΩ

Mounting Hole Size

with Receptacle:	Ø 1,31-1,32 mm (.052)
without Receptacle:	Ø 1,00 mm (.039)

Materials

Plunger:	BeCu or Steel, gold-plated or chemically nickel-plated
Barrel:	Brass, gold-plated
Spring:	Steel, gold-plated
Receptacle:	Brass, gold-plated

Note:
The Receptacle can be used from Grid 1,91 (75 Mil) up.

Tools:
Insertion and Extraction Tools for GKS and KS > see Page 58.

Ordering Example:

	Series	Tip Materials 3 = BeCu 2 = Steel	Tip Style	Tip Diameter (1/100 mm)	Plating A = Gold N = Nickel	Spring Force (dN)	Collar Height mm
Test Probe for usage **without** Receptacle:	GKS	181	3	51	080	A	15	03
Test Probe for usage **with** Receptacle:	GKS	181	3	51	080	A	15	00
Receptacles:	KS – 181 35 E 03		KS – 181 35 E 05		KS – 181 35 E 08		
Plug for Direct Connection on to GKS:	SE – 111						
Plug for Receptacle:	SE – 101						

GKS 075

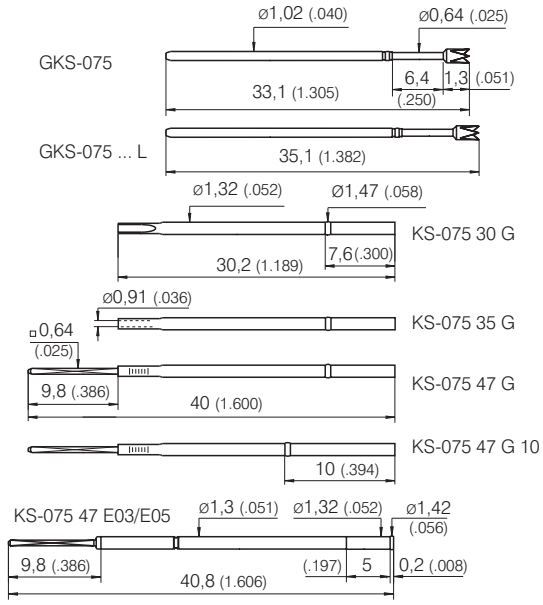
Grid:
≥ 1,91 mm
≥ 75 Mil

ICT/FCT Test Probe
Installation Height: 10,5 / 13 / 16 mm (.413 / .512 / .630)
Recommended Stroke: 4,3 mm (.169)

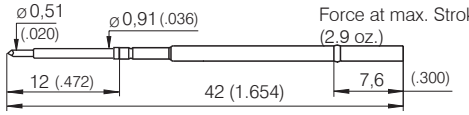
Available Tip Styles

Material (inch)	Tip Style		Standard Plating	Special Versions Ø mm	Special Versions (Ø)
2	01	Ø 0,64 (.025)	A		
3	03	Ø 1,20 (.047)	A		
3	05	Ø 0,64 (.025)	A		
3	06	Ø 1,00 (.039)	A	1,20	(.047)
2	07	Ø 0,64 (.025)	A	1,00 1,20	(.039) (.047)
2	09	Ø 0,64 (.025)	A		
2	14	Ø 0,50 (.020)	A		
2	14	Ø 0,64 (.025)	A	0.80 1,00	(.031) (.039)
2	17	Ø 1,20 (.047)	A		
2	24	Ø 1,30 (.051)	A		
2	25	Ø 1,20 (.047)	A	1,30	(.051)
2	31	Ø 0,64 (.025)	A		
2	77	Ø 0,64 (.025)	A		
2	88	Ø 1,20 (.047)	A		
2	89	Ø 0,50 (.020)	A		
2	91	Ø 0,64 (.025)	A		
2	97	Ø 0,64 (.025)	A	0,80	(.031)

Mounting and Functional Dimensions



Wireless Receptacle KS-075 WL



Tip Style: 07
Maximum Stroke: 2,5mm (.100)
Force at max. Stroke: 0,8N (2,9 oz.)

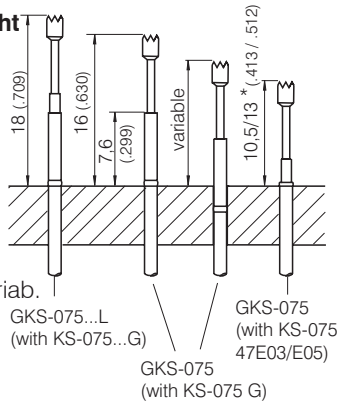
Mechanical Data

Working Stroke: 4,3 mm (.169)
Maximum Stroke: 6,4 mm (.250)
Spring Force at Working Stroke: 2,0 N (7.2 oz.)
alternative: 1,0 N (3.6oz); 1,5 N (5.4oz); 2,8 N (10.1oz)
Test Point Size: ≥ Ø 0,80 mm (.031)

Collar Height and Install. Height

To adjust the Installation Height Receptacles with a Press-ring (End Designation "G") or with a turned collar are used.

Designation	Installation H.
KS-075...E03*	10,5 mm (.413)
KS-075...E05*	13,0 mm (.512)
KS-075...G	16,0 mm (.630)/ variab.



Electrical Data

Current Rating: 3-4 A
R_i typical: < 20 mΩ

Operating Temperature

Standard: -40° up to +80°C
with Special Designation "C": -100° up to +200°C (2,0 N; 2,8 N)

Mounting Hole Size Size

by usage of Press-ring: Ø 1,36 - 1,40 mm (.054 - .055)
by usage up to Press-ring: Ø 1,30 - 1,31 mm (.051)
KS without Press-ring*: Ø 1,31 - 1,32 mm (.052)

Materials

Plunger: BeCu or Steel, gold-plated
Barrel: Nickel-Silver or Bronze, gold-plated
Spring: Steel, gold-plated
Receptacle: Nickel-Silver or Brass*, gold-plated

Tools:
Insertion and Extraction Tools for GKS and KS > see Page 58

Test Probe with Total Length 33,1 mm (1.305): GKS 075 2 91 064 A 10 00

Test Probe with Total Length 35,1 mm (1.382): GKS 075 2 91 064 A 10 00 L

Long-stroke Test Probe for Dual-Stage Fixtures
Install. Height: 14,2 / 16,7 / 19,7 mm / var. (.559 / .657 / .776)
Recommended Stroke: 8,0 mm (.315)

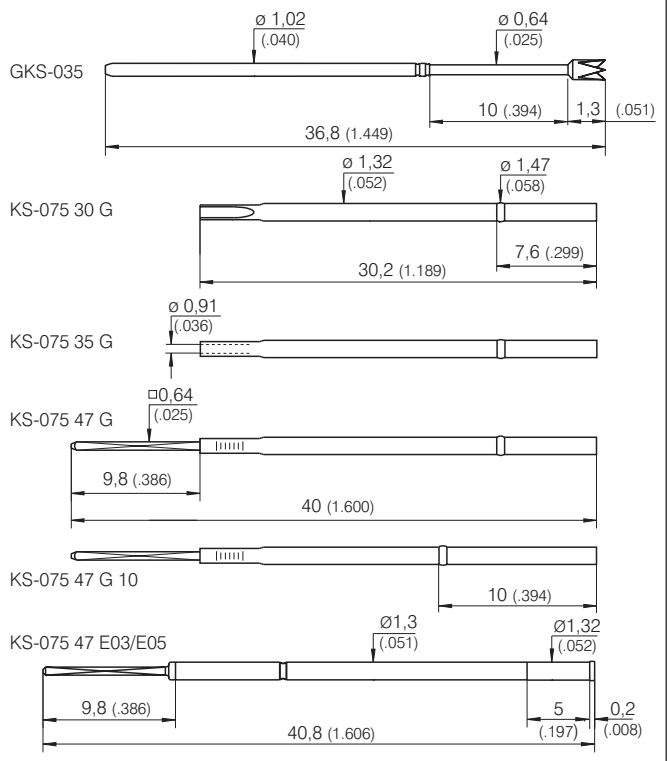
Grid:
≥ 1,91 mm
≥ 75 Mil

GKS 035

Available Tip Styles

Material	Tip Style		Standard Plating	Special Versions Ø mm	Special Versions (Ø inch)
3	06	Ø1,15 (.045)	A		
3	07	Ø 1,15 (.045)	A		
2	14	Ø 1,15 (.045)	A	0,64	(.025)
2	91	Ø 0,64 (.025)	A		

Mounting and Functional Dimensions

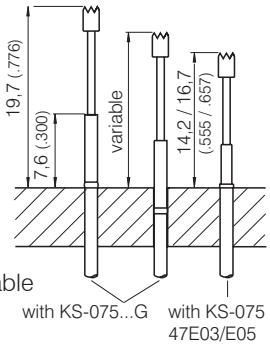


Mechanical Data

Working Stroke: 8,0 mm (.315)
Maximum Stroke: 10,0 mm (.394)
Spring Force at Work. Stroke: 1,2 N (4.3oz)

Collar Height and Installation Height

To adjust the Installation Height, Receptacles with either a Press-ring (End Designation "G") or with a turned collar are used.



Designation	Installation Height
KS-075...E03*	14,2 mm (.559)
KS-075...E05*	16,7 mm (.657)
KS-075...G	19,7 mm (.776) / variable

Electrical Data

Current Rating: 3-4 A
R_i typical: < 20 mΩ

Mounting Hole Size

see Probe series GKS-075

Materials

Plunger: BeCu or Steel, gold-plated
Barrel: Nickel-Silver or Bronze, gold-plated
Spring: Spring steel wire, gold-plated

Note:
For the Test Probe Series GKS-035, the Receptacles of the Series GKS-075 are used (see Page 18).

Ordering Example:

	Series	Tip Materials 2 = Steel 3 = BeCu	Tip Style	Tip Diameter (1/100 mm)	Plating A = Gold	Spring Force (dN)	Collar Height (mm)
Test Probe:	GKS	035	291	064	A	12	00
Receptacles with Pressring:	KS-075 30 G		KS-075 35 G			KS-075 47 G	
Receptacles with turned Collar:	KS-075 47 E03		KS-075 47 E05				

GKS 101

Grid:
≥ 1,91 mm
≥ 75 Mil

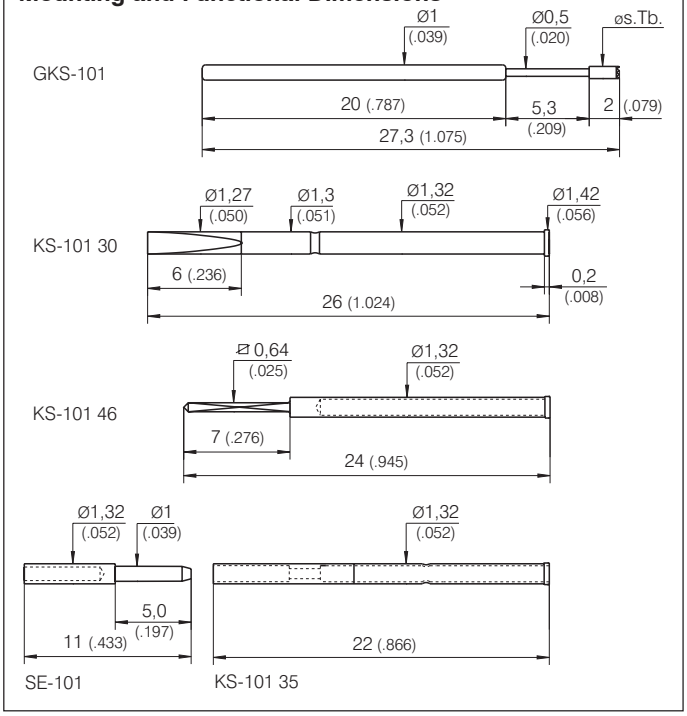
Installation Height:12,5 mm (.492)
Recomm. Stroke: 4,0 mm (.157)

Available Tip Styles

Material	Tip Style		Standard Plating	Special Versions Ø mm	Special Versions (Ø inch)
3	01	Ø 0,50 (.020)	A		
3	02	Ø 1,15 (.045)	A	0,50	(.020)
3	03	Ø 1,15 (.045)	A	1,50	(.059)
3	04	Ø 1,15 (.045)	A		
3	05	Ø 1,15 (.045)	A		
3	06	Ø 1,15 (.045)	A	1,50	(.059)
3	07	Ø 1,30 (.051)	A		
3	08	Ø 1,15 (.045)	A		
3	14	Ø 1,30 (.051)	A		
2	24	Ø 1,15 (.045)	A		
3	51 2mm (.079) shorter	Ø 0,50 (.020)	A		

Tools:
Insertion and Extraction Tools for GKS and KS > see Page 58

Mounting and Functional Dimensions



Mechanical Data

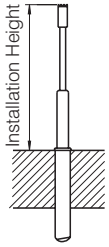
Working Stroke: 4,0 mm (.157)
Maximum Stroke: 5,3 mm (.209)
Spring Force at Work. Stroke: 0,8 N (2.9 oz.)
alternative: 0,5 N (1.8oz.); 1,5 N (5.4oz.)
Test Point Size: ≥ Ø 1,0 mm (.039)

Collar Height and Installation Height

The Installation Height of the Test Probe is determined by the Collar Height of the Receptacle.

Designation	Installation Height
KS-101 30 / 35 / 46	12,5 mm (.492)
KS-101 xx E13	14,0 mm (.551)

further Installation Heights on request



Electrical Data

Current Rating: 3-4 A
R_i typical: < 20 mΩ

Operating Temperature

Standard: -40° up to +80°C
with Special Designation "C": -100° up to +200°C (0,8 N)

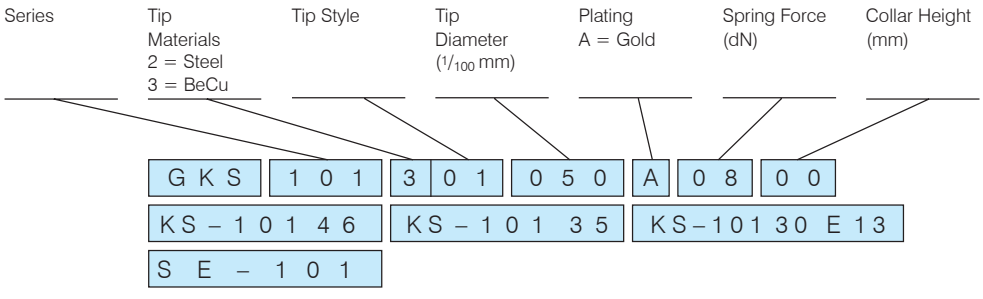
Mounting Hole Size

in CEM 1 and FR 4: Ø 1,31-1,32 mm (.052)

Materials

Plunger: BeCu or Steel, gold-plated
Barrel: Nickel-Silver, gold-plated
Spring: Steel, gold-plated
Receptacle: Brass, gold-plated

Ordering Example:



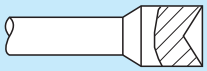
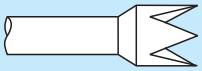
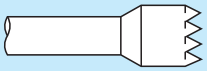
Installation Height: variable
Recommended Stroke: 2,7 mm (.106)

NEW

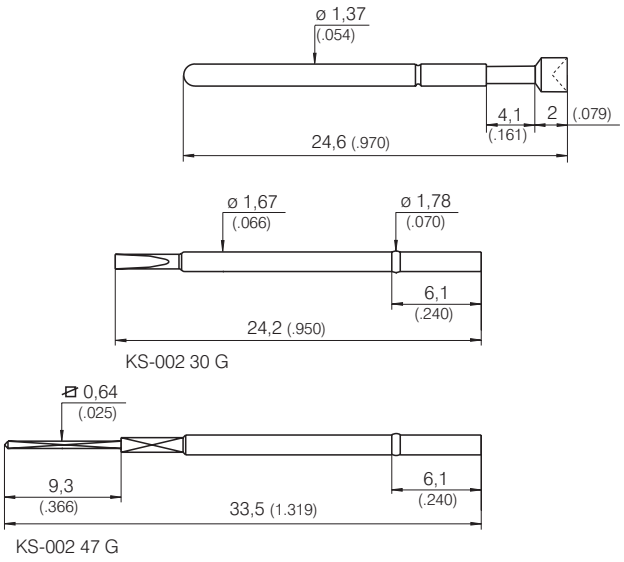
Grid:
≥ 2,54 mm
≥ 100 Mil

GKS 002

Available Tip Styles

Material	Tip Style	Standard Plating	Special Versions Ø	Special Versions (Ø inch)
2	01  Ø1,07 (.042)	A		
3	03  Ø 1,91 (.075)	A		
2	04  Ø 1,52 (.060)	A		
2 / 3	06  Ø 1,91 (.075)	A		

Mounting and Functional Dimensions

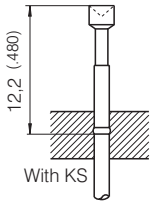


Mechanical Data

Working Stroke:	2,7 mm (.106)
Maximum Stroke:	4,1 mm (.161)
Spring Force at Working stroke:	1,0 N (3.6 oz.)
alternatives:	1,8 N (6.5 oz.)
	2,8 N (10.1 oz.)

Collar Height and Installation Height

To adjust the Installation Height of the Tip, Receptacles with Press-ring are used.



Electrical Data

Current Rating:	5-8 A
R_i typical:	< 20 mΩ

Mounting Hole Size

When pressing the Press-ring into the mounting hole in Material CEM1 and FR4: 1,70 - 1,75 mm (.067 - .069)

Materials

Plunger:	BeCu or Steel, gold-plated
Barrel:	Nickel-Silver, gold-plated
Spring:	Steel, gold-plated
Receptacle:	Nickel-Silver, gold-plated

Ordering Example:

Series	Tip Materials 2 = Steel 3 = BeCu	Tip Style	Tip Diameter ($^1/_{100}$ mm)	Plating A = Gold	Spring Force (dN)	Collar Height (mm)
Test Probe:	GKS	002	303	191	A	100
Receptacles with Press-ring:	KS – 002 30 G		KS – 002 47 G			

All specifications are subject to change without prior notification

GKS 100

Grid:
≥ 2,54 mm
≥ 100 Mil

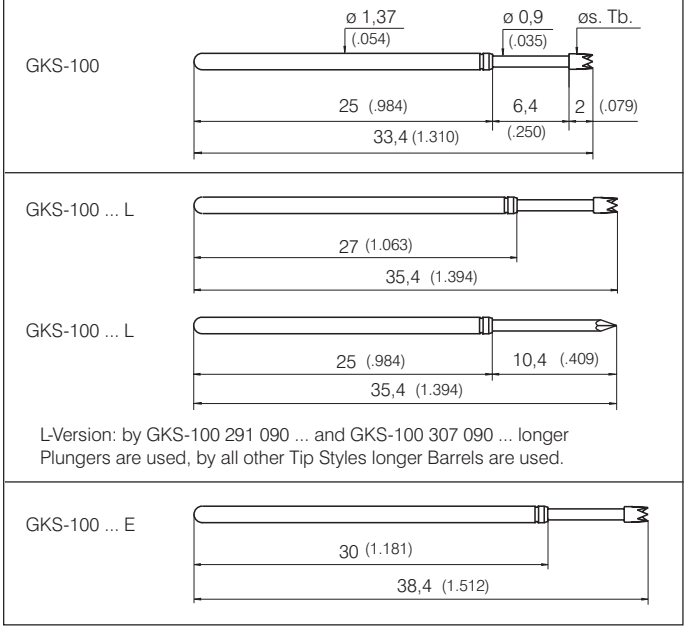
ICT/FCT Test Probe
Install. Height: 10,5-21,0 mm (.413-.827)
Recomm. Stroke: 4,3 mm (.169)

Available Tip Styles

Material	Tip Style	Standard Plating	Special Versions Ø mm	Special Versions (Ø inch)
0	06*	A		
2	01	A		
3	02	A		
3	03	A		
2	04	A		
2	04	A	1,50	(.059)
3	05	A	0,50 0,64 1,30	(.020) (.025) (.051)
3	06	A	1,50 2,00 2,50 3,00	(.059) (.079) (.098) (.118)
3	07	A		
3	07	A	1,70	(.067)
2	09	A		
3	13	A		
2	14	A	0,80	(.031)
2	14	A		
2/3	14	A	1,50	(.059)
2	17	A		
2	24	A	1,50	(.059)

*Tip Height: 2,9 mm (.114) - Total Length 0,9 mm (.035) longer than Standard

Mounting and Functional Dimensions



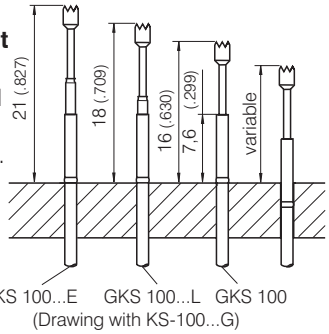
L-Version: by GKS-100 291 090 ... and GKS-100 307 090 ... longer Plungers are used, by all other Tip Styles longer Barrels are used.

Mechanical Data

Working Stroke: 4,3 mm (.169)
Maximum Stroke: 6,35 mm (.250)
Spring Force at Working Stroke: 2,0 N (7.2 oz.)
alternatives: 0,6 N (2.2oz); 1,0 N (3.6oz); 1,5 N (5.4oz); 2,25 N (8.1oz); 3,0 N (10.8oz); 4,0 N (14.4oz)
Test Point Size: ≥ Ø 0,8 mm (.031)

Collar Height and Install. Height

To adjust the Installation Height, use Receptacles either with turned collar or with Press-ring (see Usage Examples > Page 23).



(Drawing with KS-100...G)

Electrical Data

Current Rating: 5-8 A
R_i typical: < 20 mΩ

Operating Temperature

Standard: -40° up to +80°C
with Special Designation "C": -100° up to +200°C (2,0 N; 3,0 N)

Mounting Hole Size

For KS-100...G when pressing the Press-ring into the Mounting Hole in Material CEM 1 and FR 4: Ø 1,70 - 1,75 mm (.067 - .069)

For KS-100 with turned Collar
Material CEM 1: Ø 1,68 - 1,69 mm (.066)
Material FR 4: Ø 1,69 - 1,70 mm (.067)

Materials

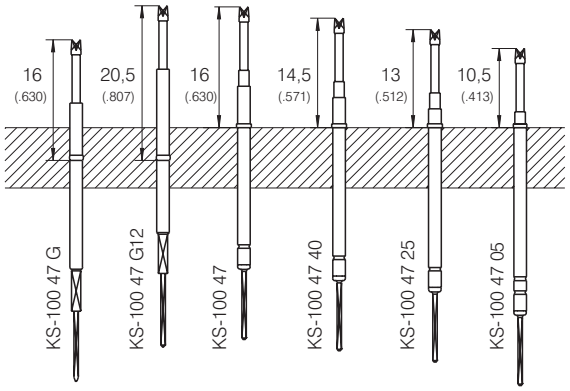
Plunger: BeCu or Steel, gold-plated
Barrel: Nickel-Silver or Bronze, gold-plated
Spring: Steel, gold-plated
Receptacle: Nickel-Silver or Brass, gold-plated

***Note:**
GKS-100 with Tip Style 93:
Installation Height with KS-100 30/47: 21,0 mm (.827)
Installation Height with KS-100 47 93: 16,0 mm (.630)
For easier usage of Test Probes with Tip Style "93", we recommend their usage in combination with Test Probes series "GKS-100...E".

Tools:
Insertion and Extraction Tools for GKS and KS > see Page 58.

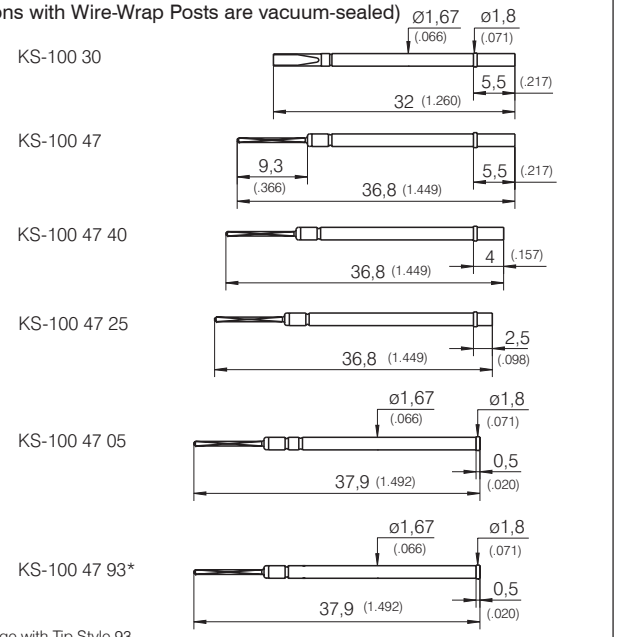
Available Tip Styles

Material	Tip Style		Standard Plating	Special Versions Ø mm	Special Versions (Ø inch)
2	25	Ø 1,30 (.051)	A	1,50	(.059)
2	31	Ø 0,90 (.035)	A		
2	33	Ø 1,06 (.042)	A		
2	77	Ø 0,90 (.035)	A		
2	88	Ø 1,50 (.059)	A		
2	89	Ø 0,50 (.020)	A		
2	91	Ø 0,90 (.035)	A		
2	91	Ø 1,30 (.051)	A		
2	93* *5mm longer as Standard	Ø 1,60 (.063)	A		
2	97	Ø 0,90 (.035)	A		



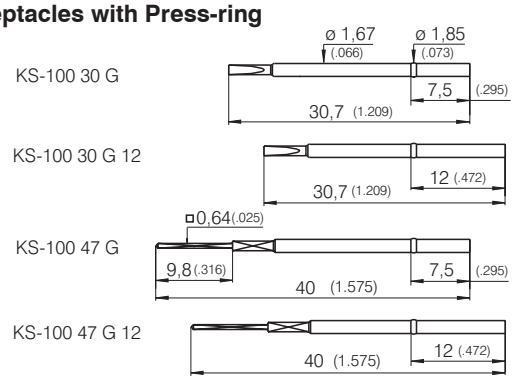
Receptacles with turned Collar

(Versions with Wire-Wrap Posts are vacuum-sealed)



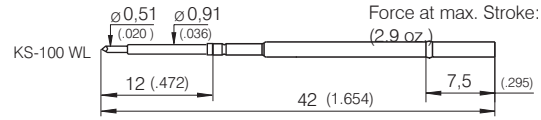
* for usage with Tip Style 93

Receptacles with Press-ring



Wireless Receptacle KS-100 WL

Tip Style: 07
Maximum Stroke: 2,5mm (.100)
Force at max. Stroke: 0,8N (2.9 oz.)



Note:

Receptacles with square-post length 13 mm (.512) and 18 mm (.709) are ordered with the Designation "–13" and "–18".

Example: KS – 100 47 G 12–13; KS – 100 47–13
KS – 100 47 G –18; KS – 100 47 –18

For checking the stroke of a Test Fixture, we recommend the usage of **Stroke Measurement Probes.** These are inserted into the Receptacle instead of a standard Probe. On activation of the Fixture, the Plunger is pressed down and remains in the compressed position. Note: Probes are reusable!

Ordering Example: HMS-100 305 090 A (for Pads)
HMS-100 306 150 A (for Component Pins)

Ordering Example:

Series	Tip Materials 2 = Steel 3 = BeCu	Tip Style	Tip Diameter ($^1/_{100}$ mm)	Plating A = Gold	Spring Force (dN)	Collar Height (mm)	Special-Designation
Test Probe with Total Length 33,4 mm (1.315):	GKS	100	307	150	A	30	00	
Test Probe with Total Length 35,4 mm (1.394):	GKS	100	291	090	A	20	00	L
Test Probe with Total Length 38,4 mm (1.512):	GKS	100	306	130	A	15	00	E
Receptacles:	KS – 100 30 G							
	KS – 100 47 G							

GKS 135

Grid:
≥ 2,54 mm
≥ 100 Mil

Long-stroke Test Probe for Dual-stage Fixture
Installation Height: 21,3 mm (.839)
Recommended Stroke: 9,3 mm (.366)

Available Tip Styles

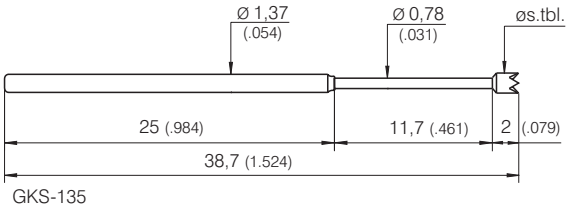
Material	Tip Style		Standard Plating	Special Versions Ø mm	Special Versions (Ø inch)
2	01	Ø 1,00 (.039)	A		
3	03	Ø 1,30 (.051)	A		
2	04	Ø 1,30 (.051)	A		
3	06	Ø 1,30 (.051)	A		
3	06	Ø 1,50 (.059)	A		
3	07	Ø 1,50 (.059)	A		
2	09*	Ø 0,50 (.020)	N		
2	14	Ø 0,50 (.020)	A		
2	14	Ø 1,30 (.051)	A	1,00	(.039)
2	14	Ø 1,50 (.059)	A		
2	25	Ø 1,30 (.051)	A		
2	91	Ø 1,00 (.039)	N		G

* Installation Height with KS-100 47: 23,3 mm (.917), Maximum Stroke: 11,0 mm (.433)

Note:
For the Test Probe series GKS-135 use Receptacles of the series KS-100 > see Page 22/23

Tools:
Insertion and Extraction Tools for GKS and KS > see Page 58

Mounting and Functional Dimensions



Mechanical Data

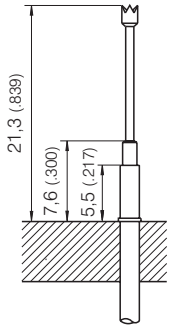
Working Stroke: 9,3 mm (.366)
Maximum Stroke: 11,5 mm(.453)
Spring Force at Working Stroke: 2,0 N (7.2 oz.)
alternative: 3,0 N (10.8 oz.)
Test Point Size: ≥ Ø 1,0 mm (.039)

Collar Height and Installation Height

The Installation Height of the Test Probe is determined by the collar height of the KS.

Designation	Installation Height
KS-100 47 05	15,8 mm (.622)
KS-100 47 25	18,3 mm (.720)
KS-100 47 40	19,8 mm(.780)
KS-100 47 (G)	21,3 mm (.839)/ variable

Dimensions and further Receptacles
> see series GKS-100 (Page 22/23)



Application example with KS - 100 47

Electrical Data

Current Rating: 5-8 A
R_i typical: < 30 mΩ

Mounting Hole Size

> see series GKS 100 (Page 22/23)

Materials

Plunger: Steel or BeCu, gold- or nickel- plated
Barrel: Nickel-Silver or Bronze, gold-plated
Spring: Steel, gold-plated

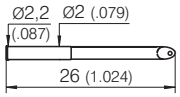
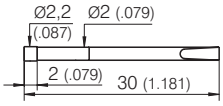
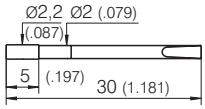
Ordering Example:

Series	Tip Materials 2 = Steel 3 = BeCu	Tip Style	Tip Diameter (1/100 mm)	Plating A = Gold N = Nickel	Spring Force (dN)	Collar Height (mm)
Test Probe: GKS	135	2	04	130	A	20	00
Receptacle: KS – 100 47						

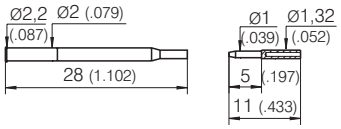
All specifications are subject to change without prior notification

Receptacles of the series KS-112 are available with different Collar Heights. Variable Installation Heights are possible.
* The number of variations can be increased when using Spacers. However, it is then possible that the holding force of the Test Probes in the Receptacle could be reduced. In such cases, Test Probes with bent ends (End Designation "B" = Banana) should be used.
The Receptacles KS-112 47 (with wire-wrap Post) are vacuum-sealed.

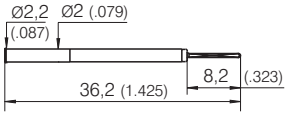
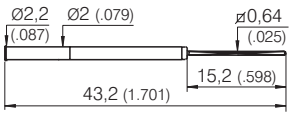
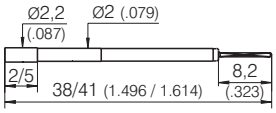
Receptacles with Solder Terminal

Order No.:	Receptacle Type	Collar Height in mm (inches)
KS–112 23		0,2 (.079)
KS–112 30		0,2 (.079)
KS–112 30 E2		2 (.079)
KS–112 30 E5		5 (.179)

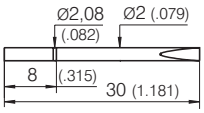
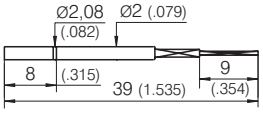
Receptacles with Plug Connection

KS-112 35 with SE-101		0,2 (.079)

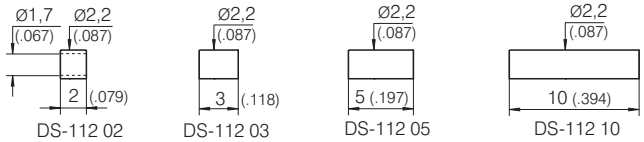
Vacuum-sealed Receptacles with wire-wrap Posts

KS–112 47		0,2 (.079)
KS–112 47 15		0,2 (.079)
KS–112 47 E2/E5		2 / 5 (.079/.179)

Receptacles with Press-ring

KS–112 30 G		8 (.315)
KS–112 47 G		8 (.315)

* Spacers to vary the Installation Height

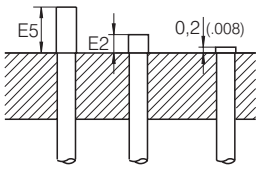


Mounting Hole Size for KS without Press-ring
in Material CEM 1: Ø 1,98–2,00 mm (.078)
and in FR 4: Ø 1,99–2,01 mm (.079)

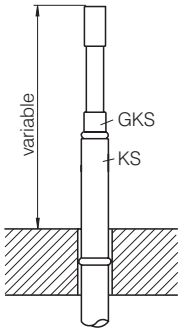
Mounting Hole Size for KS with Press-ring
in CEM 1 and FR 4: Ø 2,03–2,05 mm (.080 - .081)

Material
KS without Press-ring: Brass, gold-plated
KS with Press-ring: Bronze, gold-plated

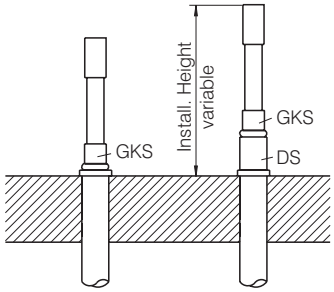
Tools:
Insertion Tools for Receptacles > see Page 58



Example of usage of KS-112 with different Collar Heights



Example of usage of KS-112...G (with Press-ring)



* Example of usage of a Receptacle with and without Spacer (restrictions see above)

GKS 912

Grid:
≥ 2,54 mm
≥ 100 Mil

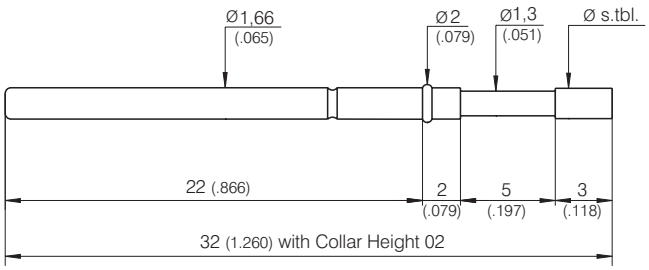
ICT/FCT Test Probe
Installation Height: 10,0 - 18,0 mm (.394-.709)
Recommended Stroke: 4,0 mm (.157)

Available Tip Styles

Material	Tip Style	Standard Plating	Special Versions Ø mm	Special Versions (Ø inch)
2	01 Ø 1,30 (.051)	A	0,60 R 0,80 R 1,00 R	(.024) (.031) (.039)
3	02 Ø 2,00 (.079)	A	2,50	(.098)
3	03 Ø 2,00 (.079)	A	1,80 2,50 3,50	(.071) (.098) (.138)
2	04 Ø 1,80 (.071)	A	1,30 2,00 R	(.051) (.079)
3	05 Ø 2,00 (.079)	A	0,70 1,40 1,50	(.028) (.055) (.059)
0	06* 0,8 ø1,8 Ø 2,30 (.091)	A		
3	06 Ø 2,00 (.079)	R	1,40 A 1,80 2,50 3,50	(.055) (.071) (.098) (.138)
2	07 Ø 2,00 (.079)	R	1,30 A 1,50 A 1,80 A 2,50 A	(.051) (.059) (.071) (.098)
2	09 ** Ø 0,70 (.028)	N	0,70 A 0,80 A	(.028) (.031)
2	14 Ø 1,80 (.071)	A	1,30 R	(.051)
2	15 ** Ø 1,80 (.071)	A	1,30	(.051)
2	17 Ø 1,75 (.069)	N	1,30 A	(.051)
2	24 Ø 2,00 (.079)	R	1,30 A	(.051)
2	31 Ø 1,80 (.071)	R		
2	33 Ø 1,30 (.051)	N		
2	91 Ø 1,30 (.051)	N	1,30 A 1,30 G	(.051) (.051)
2	93 Ø 1,60 (.063)	A		

* also available as Tip Style 002 and 003, ** pressed-in Steel Tip in Base Plunger made of Brass

Mounting and Functional Dimensions



Mechanical Data

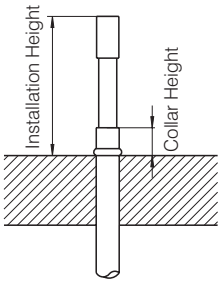
Working Stroke: 4,0 mm (.157)
Maximum Stroke: 5,0 mm (.197)
Spring Force at Working Stroke: 1,5 N (5.4 oz.)
alternative: 0,6 N (2.2 oz.); 0,8 N (2.9 oz.); 2,25 N (8.1 oz.); 3,0 N (10.8 oz.); 5,0 N (18.1 oz.)
Test Point Size: ≥ Ø 0,80 mm (.031)

Collar Height and Installation Height

To adjust the Installation Height of the Tip (Dimension without Receptacle) use Test Probes with alternative Collar Heights.

Collar Height	Installation Height (without KS)
02***	10,0 mm (.394)
03	11,0 mm (.433)
04***	12,0 mm (.472)
05***	13,0 mm (.512)
06	14,0 mm (.551)
07***	15,0 mm (.591)
10***	18,0 mm (.709)

(* Tip Styles 00x:
Installation Height is 0,8 mm (.031) higher)



Electrical Data

Current Rating: 5-8 A
R_i typical: 20 mΩ

Operating Temperature

Standard: -40° up to +80° C
with Special Designation "C": -100° up to +200° C (0,6 N; 1,5 N; 2,25 N; 3,0 N; 5,0 N)

Materials

Plunger: Steel or BeCu, gold-, rhodium or chemically nickel-plated
Barrel: Nickel-Silver*** or Brass, gold-plated
Spring: Steel, gold-plated

Note:
For Test Probes series 912, use Receptacles of series KS-112 > see Page 25.

Tools:
Insertion and Extraction Tools for GKS and KS > see Page 58

Ordering Example:
Test Probe:

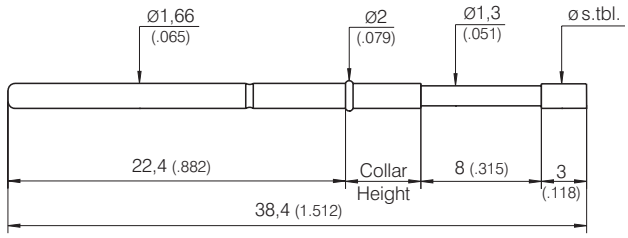
G K S	9 1 2	2	0 4	1 3 0	A	1 5	0 2

Available Tip Styles

Material	Tip Style	Standard Plating	Special Versions Ø mm	Special Versions (Ø inch)
2	01 Ø 1,30 (.051)	A	1,30 R	(.051)
3	02 Ø 2,00 (.079)	A		
2	04 Ø 1,30 (.051)	A		
3	05 Ø 1,30 (.051)	A	0,70	(.028)
0	06 * 0,8 ø1,8 Ø 2,30 (.091)	A		
3	06 Ø 2,00 (.079)	A	1,30 1,60	(.051) (.063)
3	07 Ø 1,30 (.051)	A		
2	09 ** Ø 0,80 (.031)	N	0,80 A/G 0,60 A	(.031) (.024)
2	14 Ø 1,30 (.051)	A	0,60 2,00	(.024) (.079)
2	17 Ø 1,80 (.071)	A		
2	24 Ø 1,80 (.071)	A		
2	33 Ø 1,30 (.051)	N		
2	91 Ø 1,30 (.051)	N	0,80 1,30 A/G	(.031) (.051)
2	93 Ø 1,60 (.063)	A		

* also available as Tip Style 002
** pressed-in Steel Tip in Base Plunger made of Brass

Mounting and Functional Dimensions

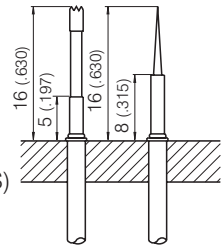


Mechanical Data

Working Stroke: 6,4 mm (.252)
Maximum Stroke: 8,0 mm (.315)
Spring Force at Working Stroke: 1,5 N (5.4 oz.)
alternative: 0,8 N (2.9 oz.); 2,25 N (8.1 oz.); 3,0 N (10.8 oz.); 5,0 N (18.1 oz.)
Test Point Size: ≥ Ø 0,80 mm (.031)

Collar Height and Installation Height

The Test Probes are always supplied with a Collar Height of 5 mm (.197).
The Test Probes with Tip Style 01 and 09 have a Collar Height of 8 mm (.315) - this to ensure greater stability of the plunger shaft.



Collar Height	Install. Height (without KS)
05	16,0 mm (.630)
08	16,0 mm (.630)

(*Tip Styles 00x: Install. Height 16,8 mm (.661))

Electrical Data

Current Rating: 5-8 A
R_i typical: 20 mΩ

Operating Temperature

Standard: -40° up to +80° C
with Special Designation "C": -100° up to +200° C (3,0 N)

Materials

Plunger: Steel or BeCu, gold-, rhodium- or chemically nickel-plated
Barrel: Nickel-Silver, gold-plated
Spring: Steel, gold-plated

Note:
For Test Probes of series 422, use Receptacles of series KS-112 > see Page 25.

Tools:
Insertion and Extraction Tools for GKS and KS > see Page 58

Ordering Example:

Series	Tip Materials 2 = Steel 3 = BeCu	Tip Style	Tip Diameter ($^1/_{100}$ mm)	Plating A = Gold G = Aurun R = Rhodium N = Nickel	Spring Force (dN)	Collar Height (mm)
Test Probe:	GKS	422	204	130	A	15	05
Receptacle:	KS – 112 47					

GKS 412

Grid:
≥ 2,54 mm
≥ 100 Mil

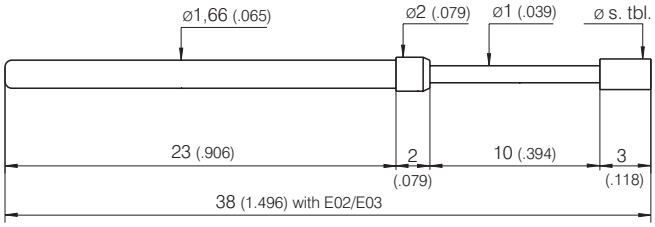
Long-stroke Test Probe for Dual-stage Fixture
Install. Height: 15/16/18/20/23 mm (.591/.630/.709/.787/.906)
Recommended Stroke: 8,0 mm (.315)

Available Tip Styles

Material	Tip Style	Standard Plating	Special Versions Ø mm	Special Versions (Ø inch)
2	01 Ø 1,00 (.039)	R		
3	03 Ø 1,80 (.071)	A	2,00	(.079)
0	03** 0,8 ø1,8 Ø 2,30 (.091)	A		
2	04 Ø 1,30 (.051)	R		
2	06 Ø 1,30 (.051)	R		
3	07 Ø 1,30 (.051)	R		
2	09 * Ø 0,70 (.028)	N		
2	14 Ø 1,30 (.051)	A		
2	17 Ø 2,00 (.079)	A		
2	24 Ø 2,00 (.079)	R		
2	25 Ø 1,50	R (.059)		

* pressed-in Steel Tip in Base Plunger made of Brass

Mounting and Functional Dimensions



Mechanical Data

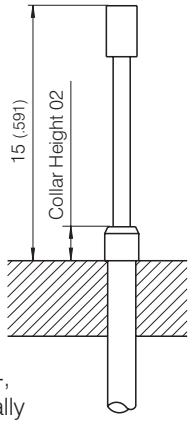
Working Stroke: 8,0 mm (.315)
Maximum Stroke: 10,0 mm (.394)
Spring Force at Working Stroke: 1,5 N (5.4 oz.)
alternative: 0,6 N (2.2 oz.); 3,0 N (10.8 oz.); 5,0 N (18.1 oz.)
Test Point Size: ≥ Ø 1,0 mm (.039)

Collar Height and Installation Height

To adjust the Installation Height of the Tip (Dimension without Receptacle), Test Probes with various Collar Heights are available.

Collar Height	Total Length	Install. Height (without KS)
02	38,0 mm (1.496)	15,0 mm (.591)
03	38,0 mm (1.496)	16,0 mm (.630)
05	40,4 mm (1.591)	18,0 mm (.709)
07	42,0 mm (1.654)	20,0 mm (.787)
10	45,0 mm (1.772)	23,0 mm (.906)

** Tip Style 0 03: Installation Height 0,8 mm (.315) higher



Electrical Data

Current Rating: 5-8 A
R_i typical: < 20 mΩ

Materials

Plunger: Steel or BeCu, gold-, rhodium-or chemically nickel-plated
Barrel: Brass, gold-plated
Spring: Steel, gold-plated

Note:
For Test Probes of series 412, use Receptacles of serie KS–112 (see Page 25).

Tools:
Insertion and Extraction Tools for GKS and KS > see Page 58

Ordering Example:

Series	Tip Materials 2 = Steel 3 = BeCu	Tip Style	Tip Diameter (1/100 mm)	Plating A = Gold R = Rhodium N = Nickel	Spring Force (dN)	Collar Height (mm)
Test Probe: GKS	412	2	04	130	R	15	02
Receptacle: KS – 112 47						

All specifications are subject to change without prior notification

Long-stroke Test Probe for Dual-stage Fixture
Installation Height: 16/18/23 mm (.630/.709/ .906)
Recommended Stroke: 8,0 mm (.315)

Grid:
≥ 2,54 mm
≥ 100 Mil

GKS 204 / M

Available Tip Styles

Material	Tip Style		Standard-Plating	Special Versions Ø mm	Special Versions (Ø inch)
2	01	Ø 1,30 (.051)	R		
3	02	Ø 1,80 (.071)	A		
3	03	Ø 1,80 (.071)	A		
2	04	Ø 1,30 (.051)	A		
3	05	Ø 1,30 (.051)	A		
2	06	Ø 1,80 (.071)	R		
2	07	Ø 1,30 (.051)	A		
2	09 *	Ø 0,70 (.028)	N	0,70 G	(.028)
2	14	Ø 1,30 (.051)	A		
2	15 *	Ø 1,80 (.071)	A		
2	24	Ø 2,00 (.079)	R		
2	91	Ø 1,30 (.051)	N	1,30 G	(.051)
2	93	Ø 1,60 (.063)	A		

* pressed-in Steel Tip in Base Plunger made of Brass

Tools:
Insertion and Extraction Tools for GKS and KS > see Page 58

GKS-204 ... M and KS-204 30 M:
GKS-204 ... M will be screwed into Receptacle KS-204 30 M using tool SW-ZW-GKS-112 M-B

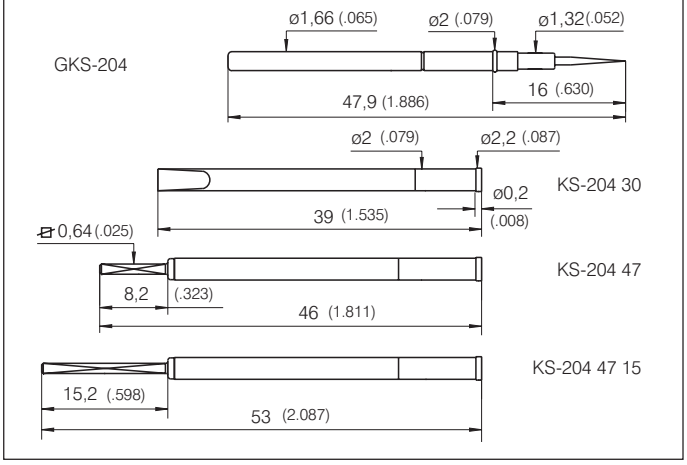
Ordering Example:

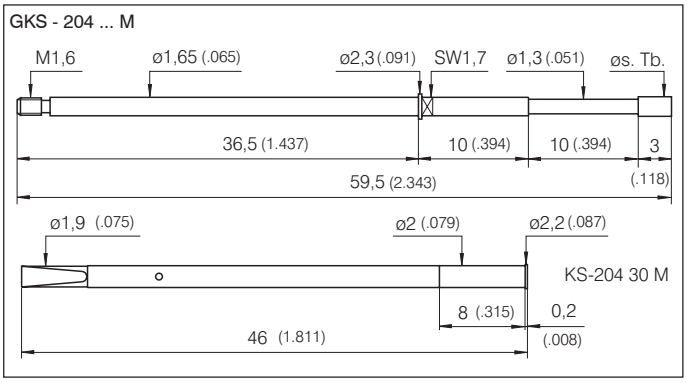
Series	Tip Materials 2 = Steel 3 = BeCu	Tip Style	Tip Diameter ($^1/_{100}$ mm)	Plating A = Gold N = Nickel R = Rhodium	Spring Force (dN)	Collar Height (mm)
GKS	204	204	130	A	15	03

Test Probe: GKS 204 204 130 A 15 03

Receptacles: KS-204 47 | KS-204 47 15 | KS-204 30

Mounting and Functional Dimensions

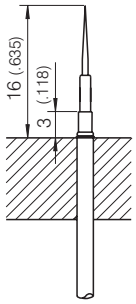




Mechanical Data
Working Stroke: 8,0 mm (.315)
Maximum Stroke: 10,0 mm (.394)
Spring Force at Working Stroke: 1,5 N (5.4 oz.)
alternative: 0,8 N (2.9 oz.); 3,0 N (10.8 oz.)
Test Point Size: ≥ Ø 0,80 mm (.031)

Collar Height and Installation Height
To adjust the Installation Height of the Tip (Dimension without Receptacle), use Test Probes with alternative Collar Heights.

Collar Height	Installation Height (without KS)
03	16,0 mm (.630)
05	18,0 mm (.709)
10	23,0 mm (.906)
10 M (with KS)	23,0 mm (.906)



Electrical Data
Current Rating: 5-8 A
R_i typical: < 20 mΩ

Mounting Hole Size
> see KS-112 on Page 25
for KS-204 30 M: Ø 1,99 mm (.079)

Materials
Plunger: Steel or BeCu, gold-, rhodium- or chemically nickel-plated
Barrel: Nickel-Silver, gold-plated
Spring: Steel, gold-plated
Receptacle: Brass, gold-plated

GKS 102

Grid:
≥ 2,54 mm
≥ 100 Mil

Universal Test Probe, for direct wiring
Install. Height: 12,5 resp.13,5 mm (.492/.531)
Recommended Stroke: 4,8 mm (.189)

Available Tip Styles

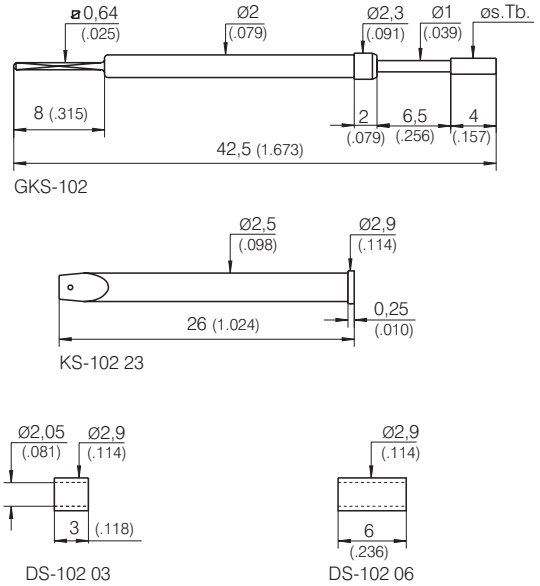
Material	Tip Style	Standard Plating	Special Versions Ø mm	Special Versions (Ø inch)
2	01 Ø 1,00 (.039)	A		
1	02 Ø 1,40 (.055)	A	2,30	(.091)
1	03 Ø 1,40 (.055)	A		
2	04 Ø 1,40 (.055)	A		
1	05 Ø 1,40 (.055)	A		
2	06 Ø 1,40 (.055)	A		
2	50* Ø 4,00 (.157)	P		

* PCB Support Probe: insulating Tip made of PVC, Tip Height 5 mm (.197)
Installation Height 13,5 mm (.531)

Note:
A Receptacle can be used from Grid 3,50 mm (140 Mil) up.

Tools:
Insertion and Extraction Tools for GKS and KS > see Page 58

Mounting and Functional Dimensions



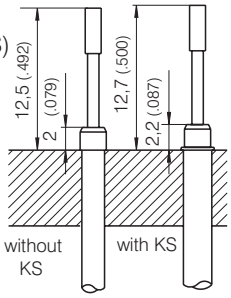
Mechanical Data

Working Stroke:	4,8 mm (.189)
Maximum Stroke:	6,5 mm (.256)
Spring Force at Working Stroke:	1,5 N (5.4 oz.)
alternative:	3,0 N (10.8 oz.); 5,0 N (18.1 oz.)
Test Point Size:	≥ Ø 1,2 mm (.047)

Collar Height and Installation Height

The Installation Height of the Tip (Dimension without Receptacle) is defined by the Collar Height.

Collar Height	Install. Height (without KS)
02	12,5 mm (.492)
02 Tip Style 50*	13,5 mm (.531)



Electrical Data

Current Rating:	5-8 A
R_i typical:	20 mΩ

Mounting Hole Size

without Receptacle:	Ø 2,00 mm (.079)
with Receptacle:	Ø 2,48 - 2,49 mm (.098)

Materials

Plunger:	Brass or Steel, gold-plated
Barrel:	Brass, gold-plated
Spring:	Steel, gold-plated
Receptacle:	Brass, gold-plated

Ordering Example:

	Series	Tip Materials 1 = Brass 2 = Steel	Tip Style	Tip Diameter ($^1/_{100}$ mm)	Plating A = Gold P = PVC	Spring Force (dN)	Collar Height (mm)	Type
Test Probe:	GKS	1	02	102	A	15	02	W
Receptacle:	KS-10223							
Spacers:	DS-10203	DS-10206						

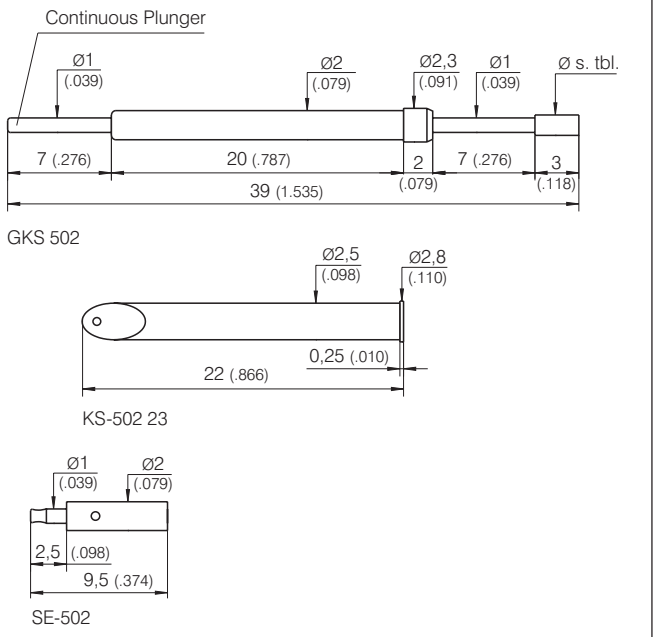
All specifications are subject to change without prior notification

Available Tip Styles

Material	Tip Style	Standard Plating	Special Versions Ø mm	Special Versions (Ø inch)
3	02 Ø 1,40 (.055)	A		
3	03 Ø 1,80 (.071)	A		
3	04 Ø 1,40 (.055)	A		
2	33** Ø 2,50 (.098)	R		
3	53* Ø 2,50 (.098)	A		
3	56* Ø 2,50 (.098)	A	2,50 R	(.098)

* Tip Length 4 mm (.157)
** Tip Length 4 mm (.157) > Special Designation "L"

Mounting and Functional Dimensions



Mechanical Data

Working Stroke: 5,6 mm (.220)
Maximum Stroke: 7,0 mm (.276)
Spring Force at Working Stroke: 1,5 N (5.4 oz.)
alternative: 0,8 N (2.9 oz.); 3,5 N (12.6 oz.); 5,0 N (18.1 oz.)
Test Point Size: ≥ Ø 1,2 mm (.047)

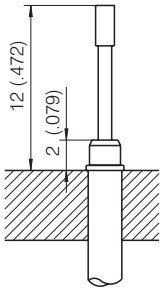
Materials

Plunger: BeCu or Steel, gold- or rhodium-plated
Barrel: Brass, gold-plated
Spring: Steel, gold-plated resp. stainless Steel
Receptacle: Brass, gold-plated

Collar Height and Installation Height

The Install. Height of the Tip (Dimension without KS) is defined by the Collar Height.

Collar Height	Tip Style	Installation Height (without KS)
02	04/03/02	12,0 mm (.472)
02	56/53/33	13,0 mm (.512)



Electrical Data

Current Rating: Connection to Plunger: **12-15 A**
Connection to KS: 5-8 A
R_i typical: Connection to Plunger: **< 10 mΩ**
Connection to KS: < 30 mΩ

Operating Temperature

Standard: -40° up to +80°C
with 5,0 N Spring: -100° up to +200°C

Mounting Hole Size

in Material CEM 1 and FR 4
with Receptacle: Ø 2,48-2,49 mm (.098)
without Receptacle: Ø 2,00 mm (.079)

Note:
A Receptacle can be used from Grid 3,50 mm (140 Mil) up.

Tools:
Insertion and Extraction Tools for GKS and KS > see Page 58

Ordering Example:

Series	Tip Materials 2 = Steel 3 = BeCu	Tip Style	Tip Diameter ($^1/_{100}$ mm)	Plating A = Gold R = Rhodium	Spring Force (dN)	Collar Height (mm)	Special-Designation
GKS	502	3	02	140	A	15	02	

Test Probe: GKS 502 302 140 A 15 02
Receptacle: KS-502 23
Plug (for plugging onto the end of the Plunger): SE-502

GKS 103 / M

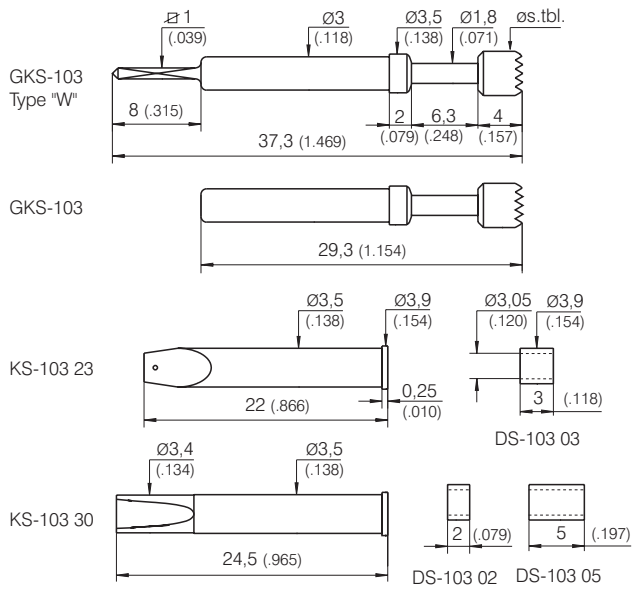
Grid:
≥ 4,00 mm
≥ 160 Mil

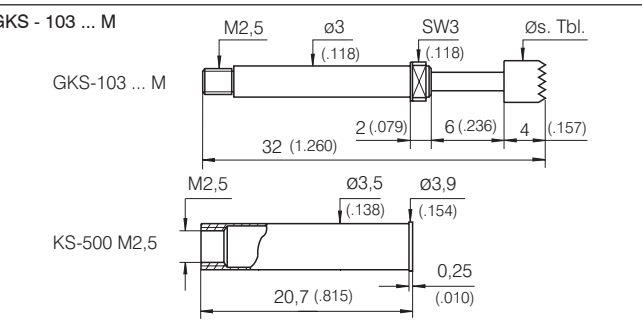
Universal Test Probe with high Stability
Installation Height: 12,0 mm (.472)
Recommended Stroke: 4,8 mm (.189)

Available Tip Styles

Material	Tip Style	Standard Plating	Special Versions Ø mm	Special Versions (Ø inch)
2	01 Ø 1,80 (.071)	A		
1	02 Ø 2,30 (.091)	A	4,00	(.157)
2	02 Ø 6,50 (.256)	A		
1	03 Ø 2,30 (.091)	A	4,00	(.157)
2	04 Ø 2,30 (.091)	A	4,00	(.157)
1	05 Ø 2,30 (.091)	A	4,00	(.157)
2	06 Ø 2,30 (.091)	A	4,00 6,50 9,00	(.157) (.256) (.360)

Mounting and Functional Dimensions





Notes:
A Receptacle can be used from Grid 4,50 mm (180 Mil) up
* Usage of Spacers is not possible with GKS-103 ... M
* Usage of the Test Probe with Spacer DS-103 03 and/or DS-103 05 is only possible with Receptacle KS-103 23 - 2 (i.e. Receptacle with stronger crimp in upper crimp position).

Tools:
Insertion and Extraction Tools for GKS and KS > see Page 58

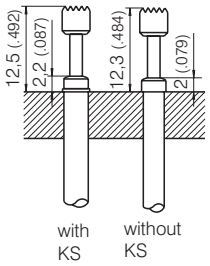
GKS-103 ... M and KS-500 M2.5:
GKS-103 ... M will be screwed into Receptacle KS-500 M2.5 using tool SW-ZW-GKS-503 M.
Test Probes with Tip Diameter > 4,0 mm (.158) cannot be assembled with the tool.

Operating Temperature
Standard: -40° up to +80°C
with Special Designation "C": -100° up to +200°C (1,5 N; 5,0 N)

Mechanical Data
Working Stroke: 4,8 mm (.189)
Maximum Stroke: 6,0 mm (.236)
Spring Force at Working Stroke: 1,5 N (5.4 oz.)
alternatives: 0,8 N (2.9 oz.); 3,0 N (10.8 oz.); 5,0 N (18.1 oz.)

Collar Height and Installation Height
The Installation Height of the Tip is determined by the Collar Height.

Collar Height	Install. Height (without KS)
02	12,3 mm (.484)



Electrical Data
Current Rating: 5-8 A
R_i typical: < 30 mΩ

Mounting Hole Size
with Receptacle: Ø 3,48-3,49 mm (.137)
without Receptacle: Ø 3,00 mm (.118)

Materials
Plunger: Steel or Brass, gold-plated
Barrel: Brass, gold-plated
Spring: Steel, gold-plated
Receptacle: Brass, gold-plated

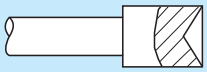
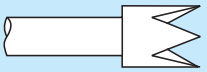
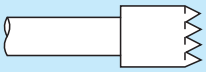
Ordering Example:

	Series	Tip Materials	Tip Style	Tip Diameter	Plating A = Gold ($^1/_{100}$ mm)	Spring Force (dN)	Collar Height (mm)	Type alternative
	"M","W"		1 = Brass 2 = Steel					
Test Probe:	GKS	103	201	180	A	15	02	
Receptacles:	KS – 103 23		KS – 103 30		KS – 500 M2.5			
Spacers *:	DS – 103 02		*DS – 103 03		*DS – 103 05			

All specifications are subject to change without prior notification

GKS 503 / M

Available Tip Styles

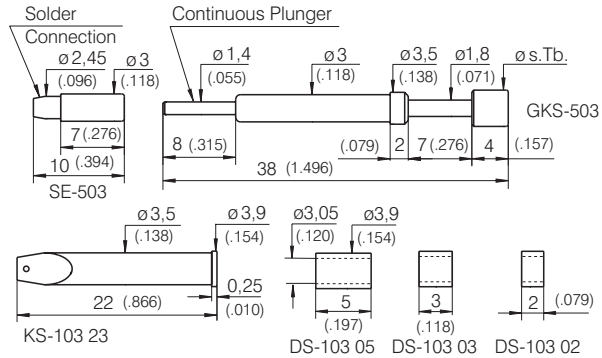
Material	Tip Style	Standard Plating	Special Versions Ø mm	Special Versions (Ø inch)
2	01  Ø 1,80 (.071)	R		
3	03  Ø 4,00 (.157)	A		
3	04  Ø 4,00 (.157)	R		
2	05  Ø 1,80 (.071)	R		
3	06  Ø 4,00 (.157)	R	1,80 3,00	(.071) (.118)

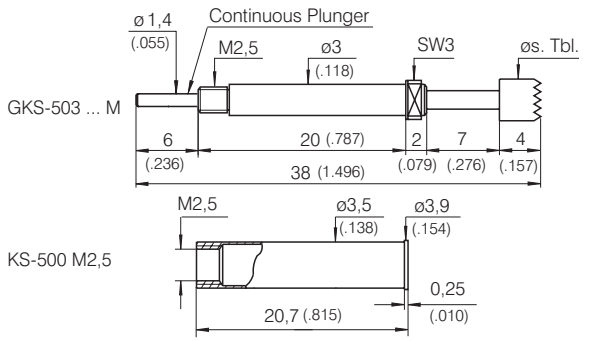
Notes:
A Receptacle can be used from Grid 4,50 mm (180 Mil) up
* Usage of Spacers is not possible with GKS-503 ... M
* Usage of the Test Probe with Spacer DS-103 03 and/or DS-103 05 is only possible with Receptacle KS-103 23 - 2 (i.e. Receptacle with stronger crimp in upper crimp position).

Tools:
Insertion and Extraction Tools for GKS and KS > see Page 58

GKS-503 ... M and KS-500 M2.5:
GKS-103 ... M will be screwed into Receptacle KS-500 M2.5 using tool SW-ZW-GKS-503 M.

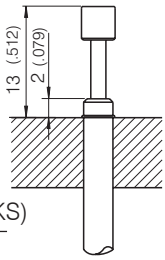
Mounting and Functional Dimensions





Mechanical Data

Working Stroke: 5,6 mm (.220)
Maximum Stroke: 7,0 mm (.276)
Spring Force at Working Stroke: 1,5 N (5.4 oz.)
alternative: 3,0 N (10.8 oz.);
5,0 N (18.1oz.)



Collar Height and Installation Height

The Installation Height of the Tip is determined by the Collar Height.

Collar Height	Installation Height (without KS)
02	13,0 mm (.512)

Electrical Data

Current Rating: Connection to Plunger: **12-15 A**
Connection to KS: 5-8 A
R_i typical: Connection to Plunger: **< 10 mΩ**
Connection to KS: < 30 mΩ

Operating Temperature

Standard: -40° up to +80°C
with 5,0 N Spring: -100° up to +200°C

Mounting Hole Size

with Receptacle: Ø 3,48 - 3,49 mm (.137)
without Receptacle: Ø 3,00 mm (.118)

Materials

Plunger: Steel or BeCu, gold- or rhodium-plated
Barrel: Brass, gold-plated
Spring: Steel, gold-plated
Receptacle: Brass, gold-plated

Ordering Example:

"M"	Series	Tip Materials	Tip Style 2 = Steel 3 = BeCu	Tip Diameter	Plating A = Gold ($^1/_{100}$ mm)	Spring Force (dN) R = Rhodium	Collar Height (mm)	Type alternative
Test Probe:	GKS	503	2	01	180	R	15	02	
Receptacle:	KS – 103 23			KS – 500 M 2.5				
Spacers *:	DS – 103 02			*DS – 103 03		*DS – 103 05		
Lamellar Plug: (for plugging onto the end of the Plunger)	SE – 503							

GKS 941

Grid: **Solderable Test Probes**
≥ 1,91 mm **Installation Height: 17,5 mm (.689)**
≥ 75 Mil **Recommended Stroke: 3,2 mm (.126)**

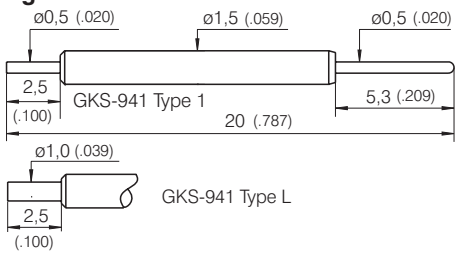
Available Tip Styles

Material	Tip Style	Standard Plating	Special Versions Ø mm	Special Versions (Ø inch)
3	01  Ø 0,50 (.020)	R		
3	05  Ø 0,50 (.020)	A		

Mechanical Data

Working Stroke:	3,2 mm (.126)
Maximum Stroke:	4,0 mm (.157)
Spring Force at Working Stroke:	0,8 N (2.9oz.)
alternatives:	1,7 N (6.1oz.); 3,5 N (12.6oz.)

Mounting and Functional Dimensions



Electrical Data

Current Rating:	5-8 A
R_i typical:	< 100 mΩ

Materials

Plunger:	BeCu, gold- or rhodium-plated
Barrel:	Brass, gold-plated
Spring:	Steel, gold-plated

GKS 064

NEW

Grid: **≥ 2,54 mm** **≥ 100 Mil** **Installation Height: 12,3 mm (.484)** **Recommended Stroke: 1,4 mm (.055)**

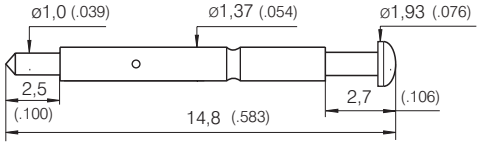
Available Tip Styles

Material	Tip Style	Standard Plating	Special Versions Ø mm	Special Versions (Ø inch)
3	05  Ø 1,93 (.076)	A		

Mechanical Data

Working Stroke:	1,4 mm (.055)
Maximum Stroke:	1,7 mm (.067)
Spring Force at Working Stroke:	0,4 N (1.4oz.)
alternatives:	0,2 N (0.7oz.); 0,6 N (2.2oz.)

Mounting and Functional Dimensions



Electrical Data

Current Rating:	5-8 A
R_i typical:	< 100 mΩ

Materials

see GKS-941 (above)

GKS 986

NEW

Grid: **≥ 2,54 mm** **≥ 100 Mil** **Installation Height: 19,0 mm (.748)** **Recommended Stroke: 3,0 mm (.118)**

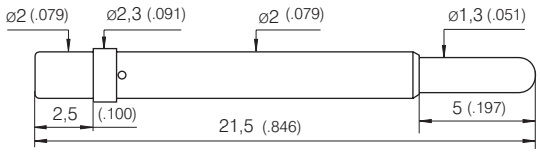
Available Tip Styles

Material	Tip Style	Standard Plating	Special Versions Ø mm	Special Versions (Ø inch)
1	05  Ø 1,30 (.051)	A		

Mechanical Data

Working Stroke:	3,0 mm (.118)
Maximum Stroke:	5,0 mm (.197)
Spring Force at Working Stroke:	1,0 N (3.6oz.)

Mounting and Functional Dimensions



Electrical Data

Current Rating:	5-8 A
R_i typical:	< 100 mΩ

Materials

Plunger:	Brass, gold-plated
Barrel:	Brass, gold-plated
Spring:	Steel, gold-plated

Other Solderable Test Probes:
see GKS-913 (page 38) and others on request

Ordering Example:

Series	Tip Materials 1 = Brass 3 = BeCu	Tip Style	Tip Diameter ($^1/_{100}$ mm)	Plating A = Gold R = Rhodium	Spring Force (dN)	Collar Height (mm)	Type 1 or L
Test Probe GKS-941 with Terminal Post Ø 0,5 or 1,0 mm:	GKS	941	3	01	050	R	08	00	1 or L
Test Probe GKS-064 with Terminal Post Ø 1,0 mm (.039):	GKS	064	3	05	193	A	04	00	L
Test Probe GKS-986:	GKS	986	1	05	130	A	10	01	
Test Probe GKS-967 (see Page 35):	GKS	967	3	04	130	A	20	01	
Receptacles KS-967 (see Page 35):	KS-967 25		KS-967 50		KS-967 70				

All specifications are subject to change without prior notification

Short Stroke and Charging Test Probes
Installation Height: 2,6 or 4,1 mm (.102 or .161)
Recommended Stroke: 1,0 mm (.039)

Grid:
≥ 3,00 mm
≥ 120 Mil

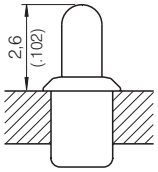
GKS 967

Available Tip Styles

Material	Tip Style		Standard Plating	Special Versions Ø mm	Special Versions (Ø inch)
3	02	Ø 1,30 (.051)	A		
3	03	Ø 1,30 (.051)	A		
3	04	Ø 1,30 (.051)	A		
3	05	Ø 1,30 (.051)	A		
3	06	Ø 1,30 (.051)	A		
2	15*	Ø 1,30 (.051)	A		

* pressed-in, hardened Steel tip. Base Plunger made of Brass; Installation Height 4,1 mm (.161)

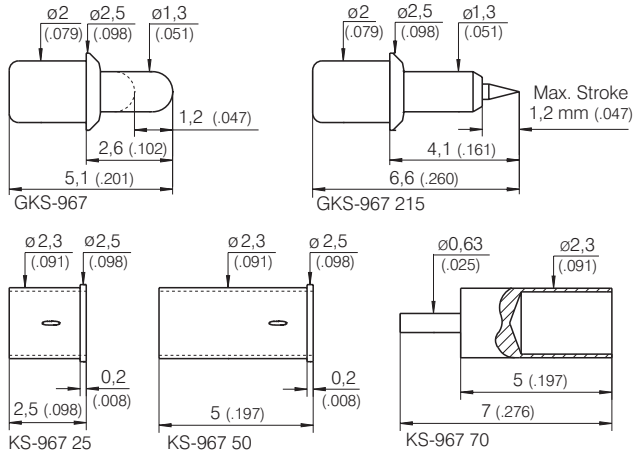
Materials
Plunger: BeCu or Steel, gold-plated
Barrel: Brass, gold-plated
Spring: Steel, gold-plated
Receptacle: Brass, gold-plated



Installation Height
Install. Height 2,6 mm (.102); (4,1mm (.161) for Tip Style 15)
(Note: Dimension without Receptacle)

Ordering Example: see page 34

Mounting and Functional Dimensions



Mechanical Data

Working Stroke:	1,0 mm (.039)
Maximum Stroke:	1,2 mm (.047)
Spring Force at Working Stroke:	2,0 N (7.2oz.)
alternative:	1,0 N (3.6oz.)

Electrical Data

Current Rating:	5-8 A
R_i typical:	< 10 mΩ

Mounting Hole Size
in Materials CEM 1 and FR 4

with Receptacle:	Ø 2,28-2,29 mm (.090)
without Receptacle:	Ø 2,00 mm (.079)

Tools:
Insertion and Extraction Tools for GKS and KS > see Page 58.

Installation Height: 2,6 or 4,9 mm (.102 or .193)
Recommended Stroke: 1,0 or 2,8 mm (.039 or .110)

NEW

Grid: ≥ 3,00 mm
≥ 120 Mil

GKS 970

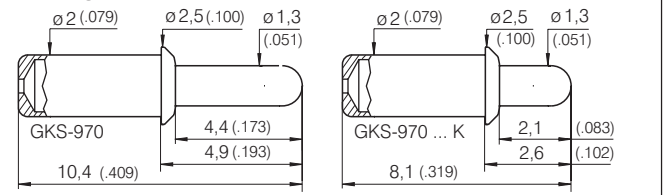
Available Tip Styles

Material	Tip Style		Standard Plating	Special Versions Ø mm	Special Versions (Ø inch)
3	05	Ø 1,30 (.051)	A		

Mechanical Data	GKS-970	GKS-970 ... K
Working Stroke:	2,8 mm (.110)	1,0 mm (.039)
Maximum Stroke:	3,5 mm (.138)	1,7 mm (.067)
Spring Force at Working Stroke:	2,0 N (7.2oz)	2,0 N (7.2oz.)

Receptacles
see GKS-967 (above): KS-967 25 and KS-967 50
Ordering Example: GKS-970 305 130 A 2001 (K)

Mounting and Functional Dimensions



Electrical Data

Current Rating:	5-8 A
R_i typical:	< 20 mΩ

Materials and Mounting Hole Size
see GKS-967 (above)

Installation Height: 2,8 mm (.110)
Recommended Stroke: 1,0 mm (.039)

NEW

Grid: ≥ 1,91 mm
≥ 75 Mil

GKS 961

Available Tip Styles

Material	Tip Style		Standard Plating	Special Versions Ø mm	Special Versions (Ø inch)
3	05	Ø 0,50 (.020)	R		

Mechanical Data

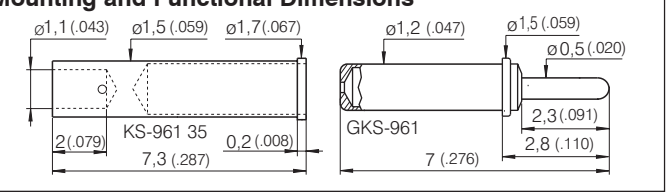
Working Stroke:	1,0 mm (.039)
Maximum Stroke:	1,3 mm (.051)
Spring Force at Working Stroke:	0,6 N (2.2oz.)

Mounting Hole Size

with Receptacle:	Ø 1,50-1,51 mm (.059)
without Receptacle:	Ø 1,2 mm (.047)

Ordering Example: GKS-961 305 050 R 0601

Mounting and Functional Dimensions



Electrical Data

Current Rating:	2 A
R_i typical:	< 100 mΩ

Materials
Spring: Stainless Steel, gold-plated
Rest see GKS-967 (above)

GKS 364

Grid:
≥ 6,50 mm
≥ 260 Mil

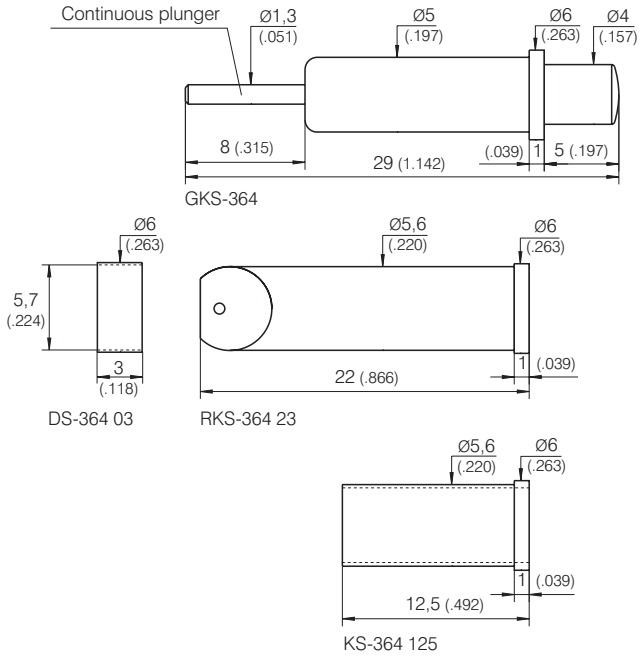
Test Probe with continuous Plunger
Installation Height: 6,0 mm (.236)
Recommended Stroke: 4,0 mm (.157)

Available Tip Styles

Material	Tip Style	Standard Plating	Special Versions Ø mm	Special Versions (Ø
nch)				
2	01*  Ø 4,00 (.157)	N		
2	04  Ø 4,00 (.157)	N		
2	05  Ø 4,00 (.157)	N		
2	06  Ø 4,00 (.157)	N		

* Angle of Tip 60°

Mounting and Functional Dimensions



Mechanical Data

Working Stroke: 4,0 mm (.157)
Maximum Stroke: 5,0 mm (.197)
Spring Force at Working Stroke: 1,5 N (5.4 oz.)
alternative: 0,6 N (2.2oz.); 3,0 N (10.8oz.); 8,0 N (28.9oz.)

Electrical Data

Current Rating: Connection to Plunger: 15-20 A
Connection to KS: 5-8 A
R_i typical: Connection to Plunger: < 10 mΩ
Connection to KS: < 30 mΩ

Operating Temperature

Standard: -40° up to +80°C
with 1.5N and 3.0N Spring: -100° up to +200°C

Mounting Hole Size

with Receptacle: Ø 5,59-5,60 mm (.220 - .221)
without Receptacle: Ø 5,00 mm (.197)

Materials

Plunger: Steel, nickel-plated
Barrel: Brass, gold-plated
Spring: Steel, gold-plated
Receptacles
RKS-364 23: Brass, not plated
KS-364 125: Brass, gold-plated

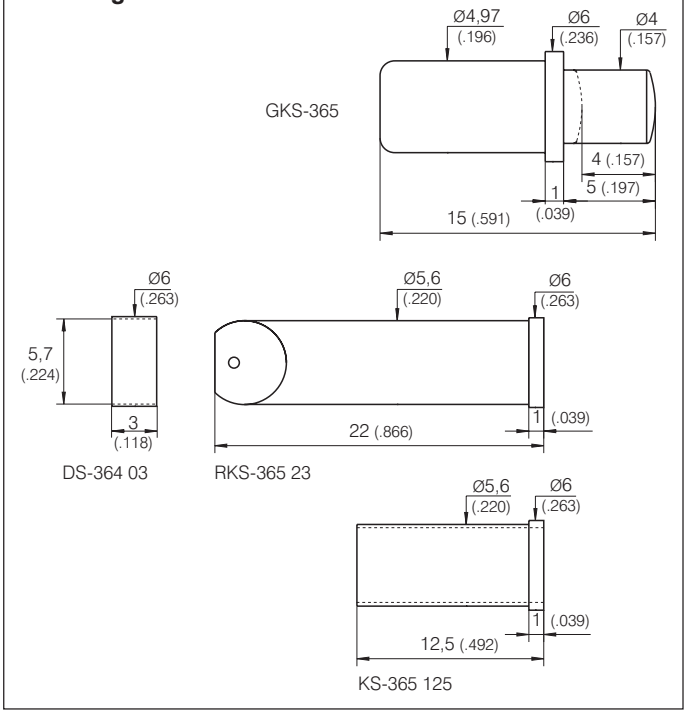
Ordering Example:

Series	Tip Material 2 = Steel	Tip Style	Tip Diameter (1/100 mm)	Plating N = Nickel	Spring Force (dN)	Collar Height (mm)
Test Probe:	GKS	364	204	400	N	150	01
Receptacles:	RKS-364 23	KS-364 125					
Spacer for Receptacle:	DS-364 03						
Lamellar Plug: (for plugging onto the end of the Plunger)	SE-503						

Available Tip Styles

Material	Tip Style	Standard Plating	Special Versions Ø mm	Special Versions (Øinch)
2	04  Ø 4,00 (.157)	N		
1	05  Ø 4,00 (.157)	A		
2	06  Ø 4,00 (.157)	A		

Mounting and Functional Dimensions



Mechanical Data

Working Stroke: 3,2 mm (.126)
Maximum Stroke: 4,0 mm (.157)
Spring Force at Working Stroke: 1,5 N (5.4 oz.)
alternative: 0,6 N (2.2 oz.); 3,0 N (10.8 oz.); 4,0 N (14.4 oz.); 8,0 N (28.9 oz.)

Electrical Data

Current Rating: 5-8 A
R_i typical: < 30 mΩ

Operating Temperature

Standard: -40° up to +80°C
with 8,0N Spring: -100° up to +200°C

Mounting Hole Size

with Receptacle: Ø 5,59-5,60 mm (.220 - .221)
without Receptacle: Ø 4,97 mm (.196)

Materials

Plunger: Brass or Steel, gold- or nickel-plated
Barrel: Brass, gold-plated
Spring: Steel, gold-plated
Receptacles
RKS-364 23: Brass, not plated
KS-364 125: Brass, gold-plated

Other comparable Versions on request:
GKS-366: Extension Height 11,0 mm, max. Stroke 10,0 mm, Operating Stroke 8,0 mm, Springs from 1,5 N to 8,0 N

Ordering Example:

Series	Tip Materials 1 = Brass 2 = Steel	Tip Style	Tip Diameter ($^1/_{100}$ mm)	Plating A = Gold N = Nickel	Spring Force (dN)	Collar Height (mm)
GKS	365	105	400	A	15	01

Test Probe: GKS 365 105 400 A 15 01
Receptacles: RKS-365 23 KS-365 125
Spacer for Receptacle: DS-36403

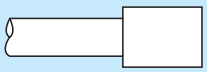
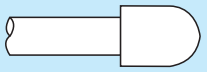
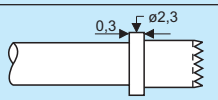
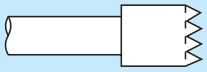
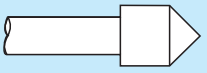
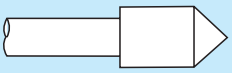
GKS 913 / M

NEW

Grid:
≥ 4,00 mm
≥ 160 Mil

Short Stroke Test Probe: can be soldered in
Installation Height: 7,2 / 8,7 mm (.283 / .348)
Recommended Stroke: 2,8 mm (.110)

Available Tip Styles

Material	Tip Style	Standard Plating	Special Versions Ø mm	Special Versions (Ø inch)
1	02  Ø 2,30 (.091)	A	3,50	(.138)
3	05  Ø 2,30 (.091)	A		
3	06*  Ø 1,80 (.071)	A		
3	06  Ø 2,30 (.091)	R	3,50	(.138)
3	08  Ø 2,30 (.091)	R		
3	58**  Ø 2,30 (.091) Tip Length: 3,4 mm (.134)	R		

Collar Height and Installation Height

The Installation Height of the Tip is defined by the Collar Height.

Collar H.	Tip Style	Install. Height (without KS)	Max. Stroke
02	02/05/06/08	7,2 mm (.283)	3,5 mm (.138)
02	06 180 *	7,2 mm (.283)	3,2 mm (.126)
02	58**	8,7 mm (.348)	3,3 mm (.126)

Tools:
Insertion and Extraction Tools for GKS and KS > see Page 58.
GKS-913 M will be screwed into KS-913 35 M using special tools (examples see below).

Note:

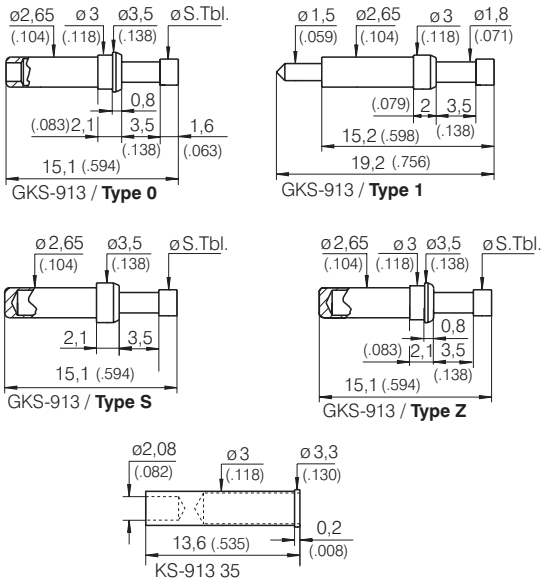
Type	Version
0	End of Probe Barrel open
1	End of Probe Barrel with solder terminal
M	End of Probe Barrel with thread M2 for KS-913 35 M
S	End of Probe Barrel closed; can be soldered into PCB
Z	End of Probe Barrel closed; can be soldered into PCB

The Receptacle KS-913 35 can only be combined with the Probe Types 0, S and Z.
The Receptacle KS-913 35 M can only be combined with the

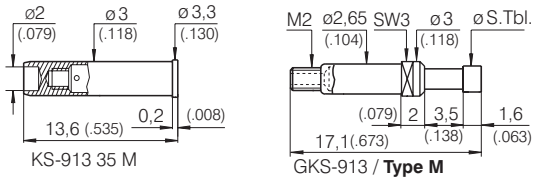
***** For applications up to 24 A:**
Ask for special High Current Probe HSS-520

Mounting and Functional Dimensions

GKS - 913



GKS - 913 ... M



Mechanical Data

Working Stroke:	2,8 mm (.110)
Maximum Stroke:	s. table on the left
Spring Force at Working Stroke:	1,5 N (5.4 oz.)
alternatives:	0,8 N (2.9 oz.); 2,5 N (9.0 oz.)

Electrical Data

Current Rating:	5–8 A***
R_i typical:	< 20 mΩ

Operating Temperature

Standard: -40° up to +80° C
with Special Designation "C": -100° up to +200° C (1,5 N)

Mounting Hole Size

in Materials CEM 1 and FR 4

with Receptacle:	Ø 2,98-2,99 mm (.117 - .118)
without Receptacle:	Ø 2,65 mm (.104)

Materials

Plunger:	Brass or BeCu, gold- or rhodium-plated
Barrel:	Brass, gold-plated
Spring:	Steel, gold-plated
Receptacle:	Brass, gold-plated

Ordering Example:

Series	Tip Materials 1 = Brass 3 = BeCu	Tip Style	Tip Diameter (1/100 mm)	Plating A = Gold R = Rhodium	Spring Force (dN)	Collar Height (mm)	Type
GKS	913	3	08	230	R	15	02	1

Test Probe: GKS 913 3 08 230 R 15 02 1

Receptacles: KS-913 35 | KS-913 35 M

Tool for GKS-913 ... M with Tip ≤ 3 mm: SW ZW GKS - 113 M-B

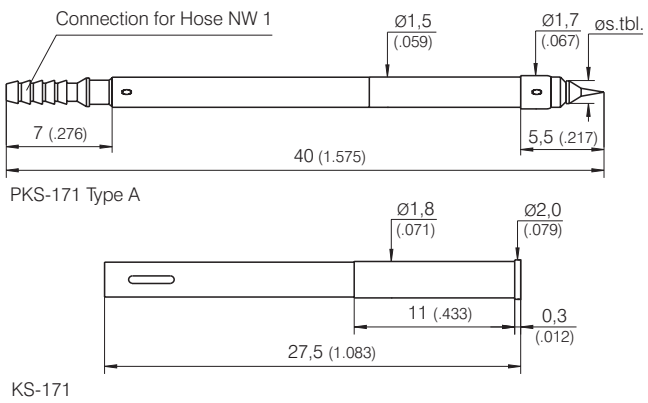
Tool for GKS-913 ... M with Tip > 3 mm: SW ZW GKS - 113 M

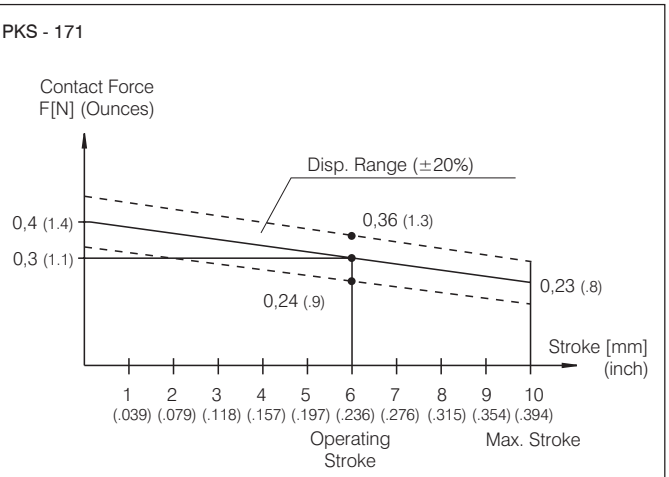
Available Tip Styles

Material	Tip Style		Standard Plating	Special Versions Ø mm (Ø inch)
2	04 *	Ø 1,00 (.039)	A	
2	14 *	Ø 0,50 (.020)	A	
2	91 *	Ø 1,00 (.039)	A	

* Diameter of Collar: 1,3 mm

Mounting and Functional Dimensions





Note:
The assembly in Grid 1,91 mm (75 mil) is only possible up to a double row, and then only without use of Receptacles.
The Receptacle can be used from Grid 2,54 mm (100 mil) up.

Pneumatic Accessories and general Instructions > see P. 46/47.

Mechanical Data

Working Stroke:	6,0 mm (.236)
Maximum Stroke:	10,0 mm (.394)
Contact Force at Working Stroke:	0,3 N (1.1 oz.)
Operating Medium:	Compressed Air (filtered, oil-free)
Operating Pressure:	6 bar

Electrical Data

Current Rating:	1-2 A
R_i typical:	< 30 mΩ

Mounting Hole Size

with Receptacle:	Ø 1,79 - 1,80 mm (.070 - .071)
without Receptacle:	Ø 1,49 mm (.059)

Materials

Plunger:	Steel, gold-plated
Barrel:	Brass, gold-plated
Restoring Spring:	Steel, gold-plated
Receptacle:	Brass, gold-plated
O-Rings:	Perbunan

Ordering Example:

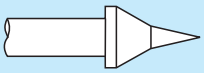
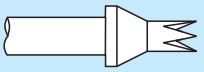
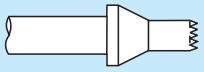
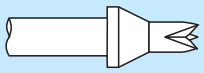
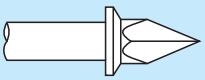
Series	Tip Material 2 = Steel	Tip Style	Tip Diameter ($^1/_{100}$ mm)	Plating A = Gold	Contact Force (dN)	Collar Height (mm)	Type
Test Probe:	P K S	1 7 1	2	0 4	1 0 0	A	0 3	0 2	A
Receptacle:	K S – 1 7 1								

PKS 200

Grid:
≥ 2,54 mm
≥ 100 Mil

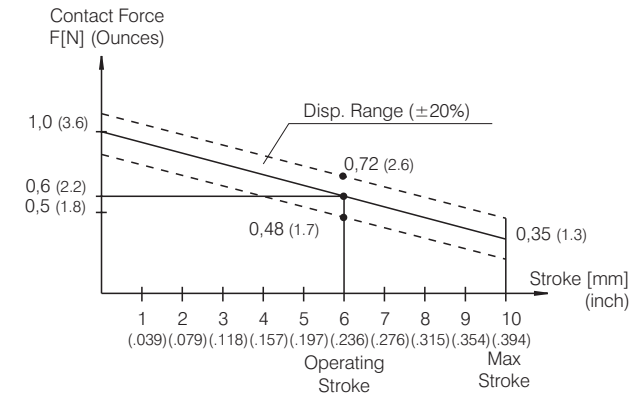
Pneumatic Test Probe
Installation Height: 5,5 mm (.217)
Recommended Stroke: 6,0 mm (.236)

Available Tip Styles

Material	Tip Style	Standard Plating	Special Versions Ø	Special Versions mm (Ø
2	01 ***  Ø 1,50 (.059)	R		
2	04 ****  Ø 1,30 (.051)	R		
2	06 **  Ø 1,00 (.039)	A		
2	33 ****  Ø 1,30 (.051)	A		
2	91 *  Ø 1,00 (.039)	A		

Collar Diameter: *=1,20 mm (.047), **=1,30 mm (.051), ***=1,50 mm (.059), ****=1,80 mm (.071)

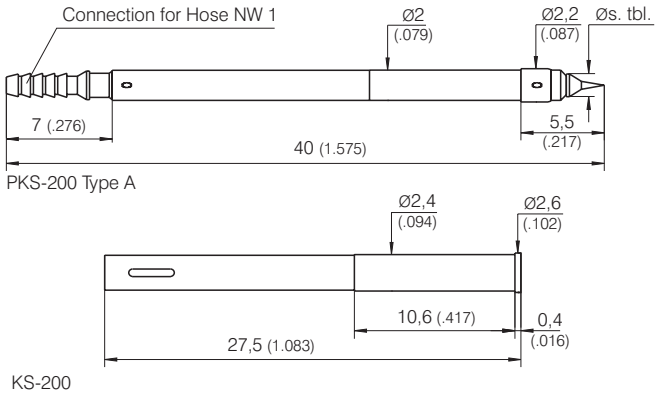
PKS - 200

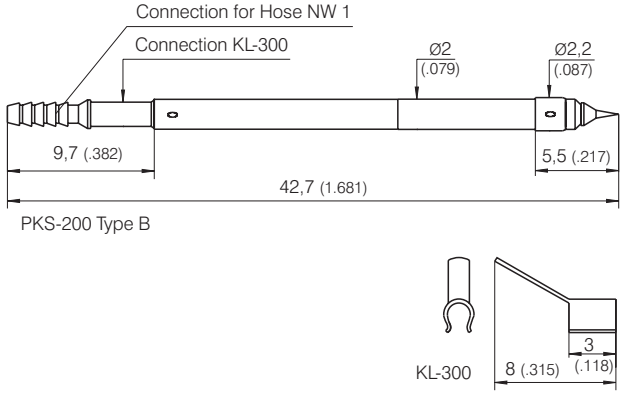


Note:
The assembly in Grid 2,54 mm (100 mil) is only possible up to a double row, and then only without use of Receptacles. Then, pre-wired PKS-200...V (with flexible Wire AWG 34, Length 500 mm (20.000)) must be used.
The Receptacle can be used from Grid 3,0 mm (120 Mil) up.

Pneumatic Accessories and general Instructions > see P. 46/ 47.

Mounting and Functional Dimensions





Mechanical Data

Working Stroke:	6,0 mm (.236)
Maximum Stroke:	10,0 mm (.394)
Contact Force at Working Stroke:	0,6 N (2.2 oz.)
Operating Medium:	Compressed Air (filtered, oil-free)
Operating Pressure:	6 bar

Electrical Data

Current Rating:	1-2 A
R_i typical:	< 30 mΩ

Mounting Hole Size

with Receptacle:	Ø 2,38-2,39 mm (.094)
without Receptacle:	Ø 2,00 mm (.079)

Materials

Plunger:	Steel, rhodium or gold-plated
Barrel:	Brass, gold-plated
Restoring Spring:	Steel, gold-plated
Receptacle:	Brass, gold-plated
O-Rings:	Perbunan

Ordering Example:

Series	Tip Material 2 = Steel	Tip Style	Tip Diameter ($^1/_{100}$ mm)	Plating A = Gold R = Rhodium	Contact Force (dN)	Collar Height (mm)	Type (alternative B or V)
PKS	200	201	150	R	06	02	A

Test Probe: PKS 200 201 150 R 06 02 A

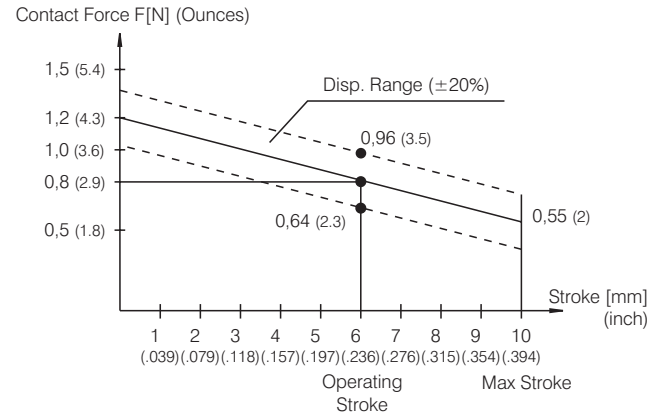
Receptacle with Solder Terminal for series 200: KS – 200

Clip connection with Solder Terminal for series 200: KL – 300

Available Tip Styles

Material (Ø inch)	Tip Style		Standard Plating	Special Versions Ø	Special Versions mm
2	01 **	Ø 1,50 (.059)	R		
3	03	Ø 2,00 (.079)	R		
2	04 *	Ø 1,30 (.051)	R		
2	05 ***	Ø 1,00 (.039)	A		
2	06	Ø 2,50 (.098)	A	2,00 R	(.079)
2	07	Ø 2,00 (.079)	R		
2	91 ****	Ø 1,00 (.039)	N		

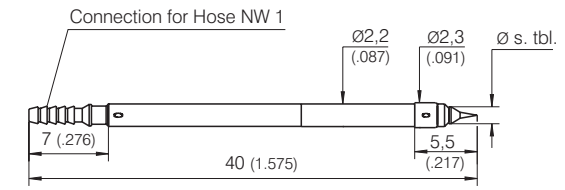
Collar Dia.: *= 2,00 mm (.079), **=1,50 mm (.059),
=1,30 mm (.051), *=1,20 mm (.047)



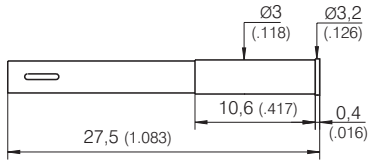
Note:
The assembly in Grid 2,54 mm (100 mil) is only possible up to a double row, and then only without use of Receptacles.
The Receptacle can be used from Grid 3,5 mm (140 Mil) up.

Pneumatic Accessories and general Instructions > see P. 46/47.

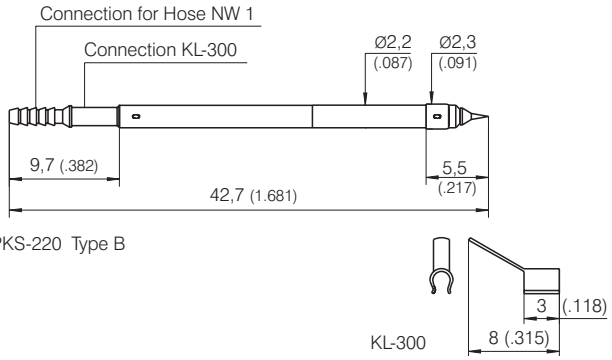
Mounting and Functional Dimensions



PKS-220 Type A



KS-220



PKS-220 Type B

KL-300

Mechanical Data

Working Stroke:	6,0 mm (.236)
Maximum Stroke:	10,0 mm (.394)
Contact Force at Working Stroke:	0,8 N (2.9 oz.)
Operating Medium:	Compressed Air (filtered, oil-free)
Operating Pressure:	6 bar

Electrical Data

Current Rating:	2-3 A
R_i typical:	30 mΩ

Mounting Hole Size

with Receptacle:	Ø 2,98-2,99 mm (.117 . -118)
without Receptacle:	Ø 2,20 mm (.087)

Materials

Plunger:	Steel or BeCu, rhodium, gold or nickel-plated
Barrel:	Brass, gold-plated
Restoring Spring:	Steel, gold-plated
Receptacle:	Brass, gold-plated
O-Rings:	Perbunan

Ordering Example:

Series	Tip Materials 2 = Steel 3 = BeCu	Tip Style	Tip Diameter ($^1/_{100}$ mm)	Plating A = Gold R = Rhodium N = Nickel	Contact Force (dN)	Collar Height (mm)	Type (alternative B)
PKS	220	201	150	R	08	02	A

Test Probe: PKS 220 201 150 R 08 02 A

Receptacle with Solder Terminal for Series 220: KS – 220

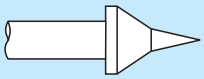
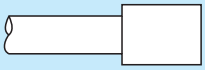
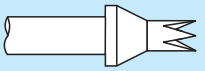
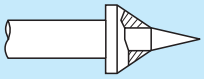
Clip Connection with Solder Terminal for Series 220: KL – 300

PKS 299

Grid:
≥ 3,50 mm
≥ 140 Mil

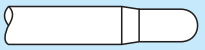
Pneumatic Test Probe
Installation Height: 5,5 mm (.217)
Recommended Stroke: 12,0 mm (.472)

Available Tip Styles

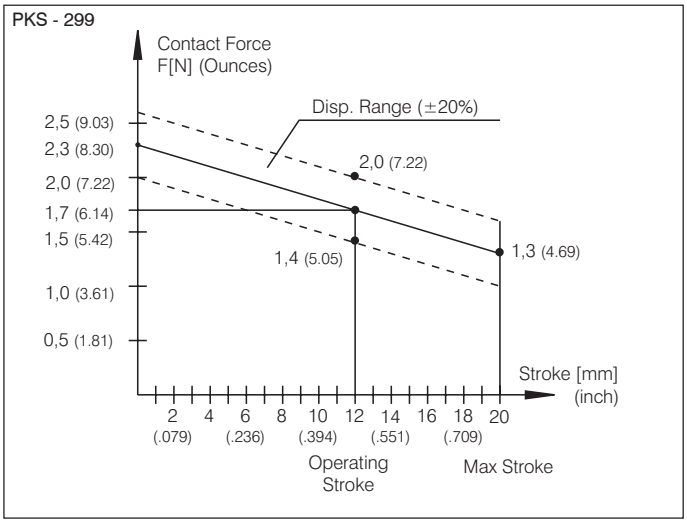
Material	Tip Style	Standard Plating	Special Versions Ø	Special Versions mm (Ø inch)
2	01 ** 	Ø 2,00 (.079) R		
3	02 	Ø 2,50 (.098) A		
2	04 ** 	Ø 1,30 (.051) R	2,00	(.079)
2	15* ** 	Ø 2,00 (.079) A		

* pressed-in HM-Tip, Installation Height 6,5 mm (.256)
** Collar Dia. : 2,0 mm (.079)

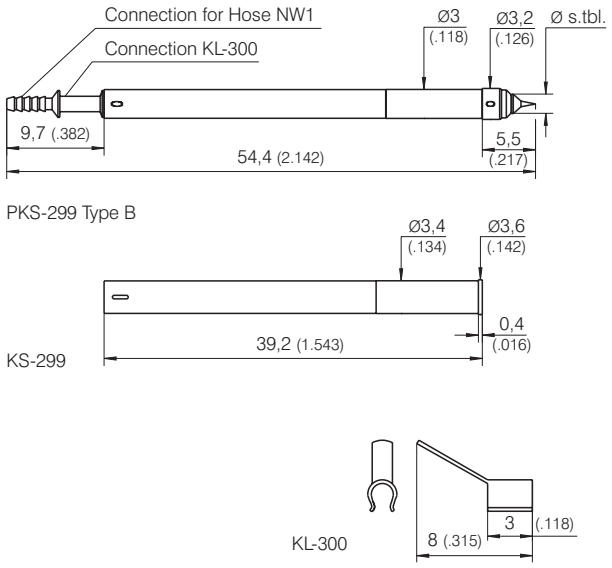
Special Versions without Collar

Material	Tip Style	Standard Plating	Special Versions Ø mm	Special Versions (Ø inch)
2	01 *** 	Ø 1,50 (.059) R		
2	04 *** 	Ø 1,50 (.059) R		
3	05 *** 	Ø 1,30 (.051) A		

*** Shaft Diameter: 1,5 mm (.059)



Mounting and Functional Dimensions



Mechanical Data

Working Stroke:	12,0 mm (.472)
Maximum Stroke:	20,0 mm (.787)
Contact Force at Working Stroke:	1,7 N (6.1 oz.)
Operating Medium:	Compressed Air (filtered, oil-free)
Operating Pressure:	6 bar

Electrical Data

Current Rating:	2-3 A (up to 10 A > see Note below)
R_i typical:	30 mΩ

Mounting Hole Size

with Receptacle:	Ø 3,38-3,39 mm (.133 - .134)
without Receptacle:	Ø 3,00 mm (.118)

Materials

Plunger:	Steel or BeCu, rhodium or gold-plated
Barrel:	Brass, gold-plated
Restoring Spring:	Steel, gold-plated
Receptacle:	Brass, gold-plated
O-Rings:	Perbunan

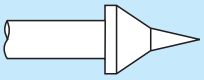
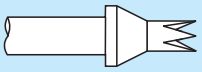
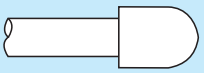
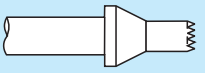
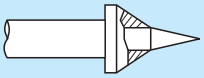
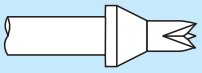
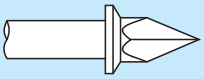
Note:
for High-Current Applications up to 10 A, order with Special Designation "BH" (Terminal "B").
The Receptacle can be used from Grid 4,0 mm (160 Mil) up.

Pneumatic Accessories and general Instructions > see P. 46 / 47.

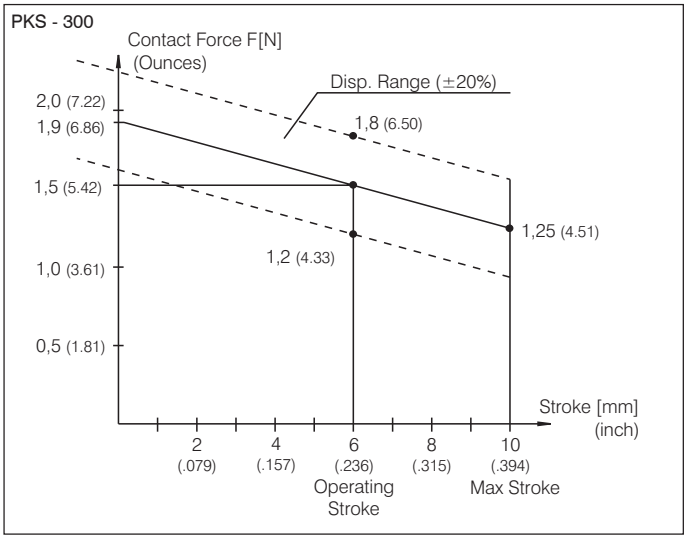
Ordering Example:

Series	Tip Materials 2 = Steel 3 = BeCu	Tip Style	Tip Diameter ($^1/_{100}$ mm)	Plating A = Gold R = Rhodium	Contact Force (dN)	Collar Height (mm)	Type
Test Probe:	P K S	2 9 9	2	0 1	2 0 0	R	1 7	0 2	B
Receptacle:	K S – 2 9 9								
Clip Connection with Solder Terminal:	K L – 3 0 0								

Available Tip Styles

Material	Tip Style	Standard Plating	Special Versions Ø mm	Special Versions (Ø inch)
2	01 **  Ø 2,00 (.079)	R		
2	04 **  Ø 1,30 (.051)	R	2,00	(.079)
2	05  Ø 2,50 (.098)	R	1,30 **	(.051)
2	06 **  Ø 1,30 (.051)	A	2,50 3,50	(.098) (.138)
2	15* **  Ø 2,00 (.079)	A		
2	33 **  Ø 1,30 (.051)	A		
2	91 **  Ø 1,30 (.051)	A		

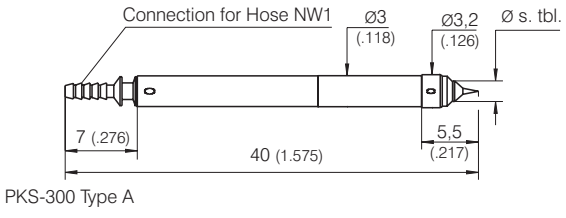
* pressed-in HM-Tip; Installation Height 6,5 mm (.256)
** Collar Diameter: 2,0 mm (.079)



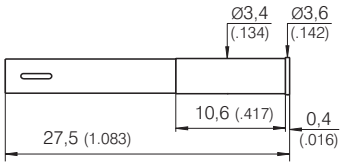
Note:
For High-Current Applications up to 10 A, order with Special Designation "AH" (Terminal "A") resp. "BH" (Terminal "B").
The Receptacle can be used from Grid 4,0 mm (160 Mil) up.

Pneumatic Accessories and general Instructions > see P. 46 / 47.

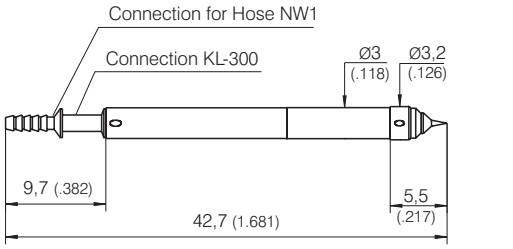
Mounting and Functional Dimensions



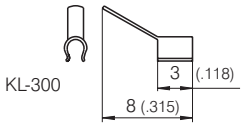
PKS-300 Type A



KS-300



PKS-300 Type B



KL-300

Mechanical Data

Working Stroke:	6,0 mm (.236)
Maximum Stroke:	10,0 mm (.394)
Contact Force at Working Stroke:	1,1 N (4.0 oz.) or 1,5 N (5.4oz.)***
Operating Medium:	Compressed Air (filtered, oil-free)
Operating Pressure:	6 bar

Electrical Data

Current Rating:	2-3 A (up to 10 A > see Note below)
R_i typical:	30 mΩ

Mounting Hole Size

with Receptacle:	Ø 3,38-3,39 mm (.133 -.134)
without Receptacle:	Ø 3,00 mm (.118)

Materials

Plunger:	Steel, rhodium or gold-plated
Barrel:	Brass, gold-plated
Restoring Spring:	Steel, gold-plated
Receptacle:	Brass, gold-plated
O-Rings:	Perbunan

***** Note:**

Tip 15, 01, 91	F = 1,1 N (4.0 oz.)
Tip 04, 05, 06, 33	F = 1,5 N (5.4 oz.)

Ordering Example:

Series	Tip Material 2 = Steel	Tip Style	Tip diameter ($^1/_{100}$ mm)	Plating A = Gold R = Rhodium	Contact Force (dN) ***	Collar Height (mm)	Type (alternative B)
PKS	300	2 01	200	R	11	02	A

Test Probe: PKS 300 2 01 200 R 11 02 A

Receptacle with Solder Terminal for Serie 300: KS – 300

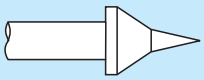
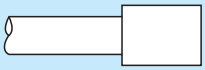
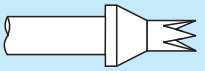
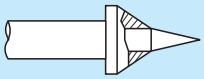
Clip Connection with Solder Terminal for Serie 300: KL – 300

PKS 399

Grid:
≥ 4,50 mm
≥ 180 Mil

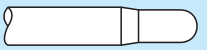
Pneumatic Test Probes
Installation Height: 5,5 mm (.217)
Recommended Stroke: 12,0 mm (.472)

Available Tip Styles

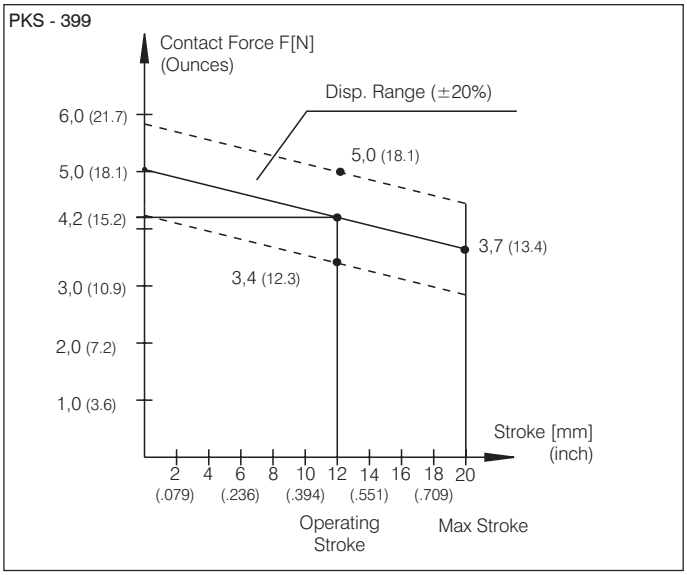
Material	Tip Style	Standard Plating	Special Versions Ø mm	Special Versions (Ø inch)
2	01 **  Ø 2,00 (.079)	R		
3	02  Ø 2,50 (.098)	A		
2	04 **  Ø 1,30 (.051)	R	2,00	(.079)
2	15* **  Ø 2,00 (.079)	A		

* pressed-in HM-Tip; Installation Height 6,5 mm (.256)
** Collar Diameter: 2,0 mm (.079)

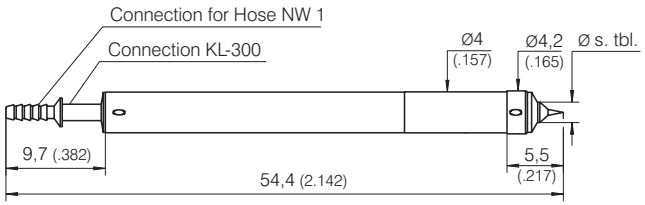
Special Versions without Collar

Material	Tip Style	Standard Plating	Special Versions Ø mm	Special Versions (Ø inch)
2	01 ***  Ø 1,50 (.059)	R		
2	04 ***  Ø 1,50 (.059)	R		
3	05 ***  Ø 1,30 (.051)	A		

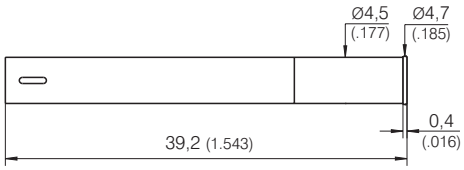
*** Shaft Diameter: 1,5 mm (.059)



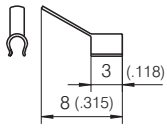
Mounting and Functional Dimensions



PKS-399 Type 1
PKS-399 Type 2: with Connection for Hose NW2



KS-399



KL-300

Mechanical Data

Working Stroke:	12,0 mm (.427)
Maximum Stroke:	20,0 mm (.787)
Contact Force at Work. Str.:	3,7 N (13.4oz.) or 4,2 N (15.2 oz.)****
Operating Medium:	Compressed Air (filtered, oil-free)
Operating Pressure:	6 bar

Electrical Data

Current Rating:	2-3 A
R_i typical:	30 mΩ

Mounting Hole Size

with Receptacle:	Ø 4,48-4,49 mm (.176 - .177)
without Receptacle:	Ø 4,00 mm (.157)

Materials

Plunger:	Steel or BeCu, rhodium- or gold-plated
Barrel:	Brass, gold-plated
Restoring Spring:	Steel, gold-plated
Receptacle:	Brass, gold-plated
O-Rings:	Perbunan

****** Note:**

Tip 01, 15	F=3,7 N (13.4 oz.)
Tip 02, 04, 05	F=4,2 N (15.2 oz.)

Note:
The Receptacle can be used from Grid 5,08 mm (200 Mil) up.

Pneumatic Accessories and general Instructions > see P. 46/47.

Ordering Example:

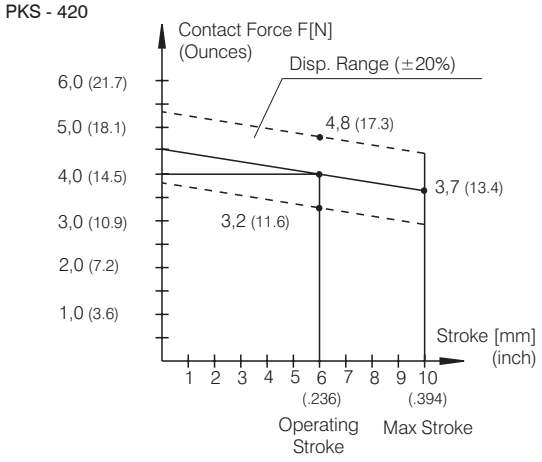
Series	Tip Materials 2 = Steel 3 = BeCu	Tip Style	Tip diameter ($^1/_{100}$ mm)	Plating A = Gold R = Rhodium	Contact Force (dN)****	Collar Height (mm)	Type (alternative 2)
Test Probe:	PKS	399	2	01	200	R	37	02	1
Receptacle:	KS – 399								
Clip Connection for Solder Terminal for Type 1:	KL – 300								

All specifications are subject to change without prior notification

Available Tip Styles

Material	Tip Style		Standard Plating	Special-Versions Ø mm	Special-Versions (Ø inch)
2	01 **	Ø 2,00 (.079)	R		
2	04 **	Ø 1,30 (.051)	R	2,00	(.079)
2	05	Ø 2,50 (.098)	R	1,30 **	(.051)
2	06 **	Ø 1,30 (.051)	A	2,50 3,50	(.098) (.138)
2	15* **	Ø 2,00 (.079)	A		
2	33 **	Ø 1,30 (.051)	A		
2	91 **	Ø 1,30 (.051)	A		

* Pressed-in HM-Tip, Installation Height: 6,5 mm (.256)
** Collar Diameter: 2,0 mm (.079)

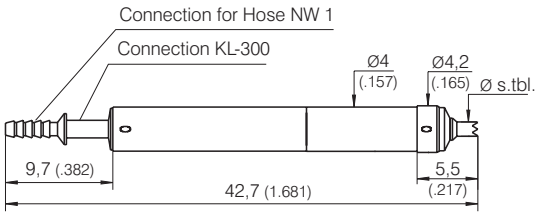


***** Note:**
Tip 15, 01, 91 F= 3,7 N (.13.4 oz.)
Tip 04, 05, 06, 33 F= 4,2 N (.15.2 oz.)

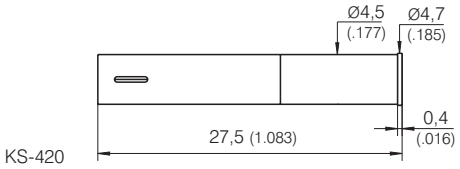
Note:
The Receptacle can be used from Grid 5,08 mm (200 Mil) up.

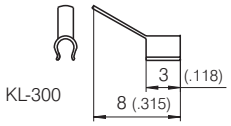
Pneumatic Accessories and general Instructions > see P. 46/47.

Mounting and Functional Dimensions



PKS-420 Type 1
PKS-420 Type 2: with Connection for Hose NW2





Mechanical Data

Working Stroke: 6,0 mm (.236)
Maximum Stroke: 10,0 mm (.394)
Contact Force at Work. Stroke: 3,7 N (13.4 oz.) or 4,2 N (15.2 oz.)***
Operating Medium: Compressed Air (filtered, oil-free)
Operating Pressure: 6 bar

Electrical Data

Current Rating: 2-3 A
R_i typical: 30 mΩ

Mounting Hole Size

with Receptacle: Ø 4,48-4,49 mm (.176 - .177)
without Receptacle: Ø 4,00 mm (.157)

Materials

Plunger: Steel, rhodium- or gold-plated
Barrel: Brass, gold-plated
Restoring Spring: Steel, gold-plated
Receptacle: Brass, gold-plated
O-Rings: Perbunan

Ordering Example:

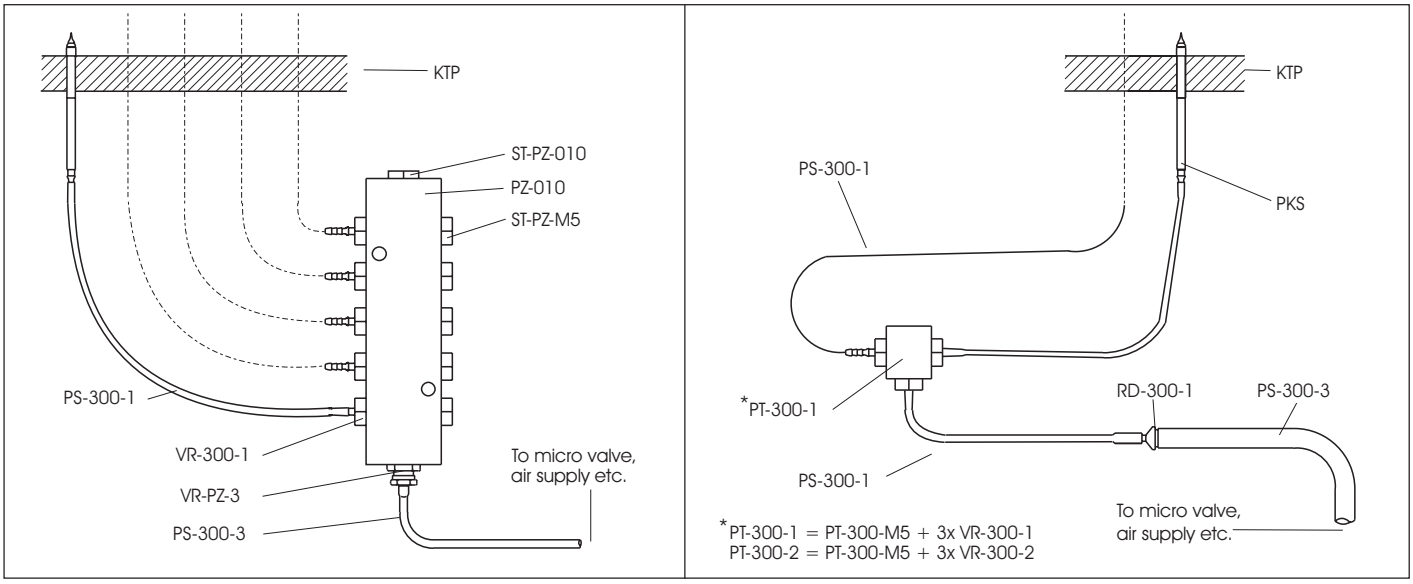
Series	Tip Material 2 = Steel	Tip Style	Tip diameter ($^1/_{100}$ mm)	Plating A = Gold R = Rhodium	Contact Force (dN)	Collar Height (mm)	Type (alternative 2)
PKS	420	206	130	A	42	02	1

Test Probe: PKS 420 206 130 A 42 02 1
Receptacle: KS-420
Clip Connection with Solder Terminal for Type 1: KL-300

PKS Accessories

Pneumatic Test Probes can be actuated and controlled individually or in groups.

Possible set-up and layout:



General Notes:

To connect up Pneumatic Probes, a compressed-air hose with a normal width of 1mm (NW1) or 2 mm (NW2) is necessary.
A range of adapters (see table below) are offered to establish air feed lines from commercially available compressed-air hose NW3 or from compressed-air distributors with threaded terminals M5.

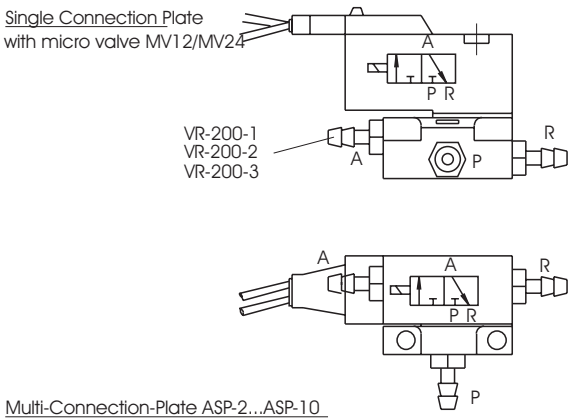
Item	Techn. Designation	Order No.
Reducer piece	NW 3 / NW 1	RD-300-1
Reducer piece	NW 1 / NW 2	RD-300-1-2
Reducer piece	NW 3 / NW 2	RD-300-2
Threaded Terminal	M 5 / NW 1	VR-300-1
Threaded Terminal	M 5 / NW 2	VR-300-2
Threaded Terminal	M 5 / NW 3	VR-300-3
Threaded Terminal	M 3 / NW 2	VR-200-2
Threaded Terminal	M 3 / NW 3	VR-200-3
T-Piece (without Threaded Terminal)	3 x M 5	PT-300-M 5
T-Piece (incl. 3 x VR-300-1)	3 x NW 1	PT-300-1
T-Piece (incl. 3 x VR-300-2)	3 x NW 2	PT-300-2
Ten-fold Distributor	10 x M 5	PZ-010
Compressed-air Hose	NW 1	PS-300-1
Compressed-air Hose	NW 2	PS-300-2
Compressed-air Hose	NW 3	PS-300-3
Special Cutting Tool		SS-010
Dummy Plug for Distributor	B1/8	ST-PZ-010
Dummy Plug for Distributor	M 5	ST-PZ-M 5
Plug for Distributor	M 5-1/8a	ST-PZ-VR
Terminal for Hose NW 3	NM 5-PK 3	VR-PZ-3
Terminal for Hose NW 4	NM 5-PK 4	VR-PZ-4
3/2 Micro-Valve, 12 V (0,95 W)		MV-12
3/2 Micro-Valve, 24 V (0,95 W)		MV-24
Single-connection Plate	for 1 Valve	ASP-1
Multi-connection Plate	for 2–10 Valves	ASP-X

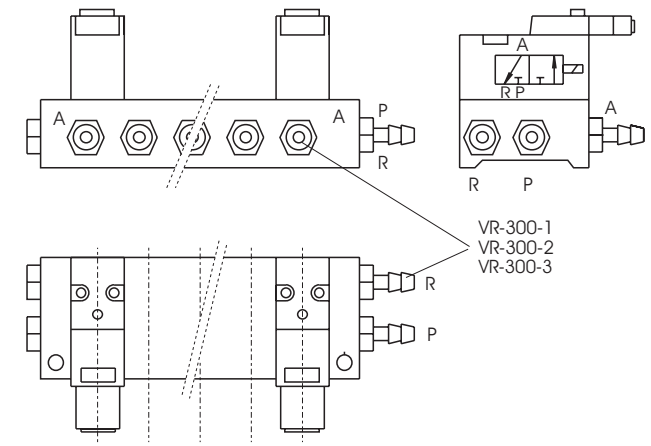
Ordering Example: Simultaneous Controlling of 5 PKS-300

5	PKS-300 xxx xxx x xx 02 x	
x m	PS-300-1	Hose NW 1
1	PZ-010	Ten-fold Distributor
1	ST-PZ-010	Dummy Plug
1	VR-PZ-3	Terminal for Hose NW 3
5	VR-300-1	Terminal for Hose NW 1
x m	PS-300-3	Hose NW 3
1	MV-24	Micro-Valve, 24 V (incl. Plug)
1	ASP-1	Single-connection Plate for MV
2	VR-200-3	Threaded Terminal for Hose NW 3

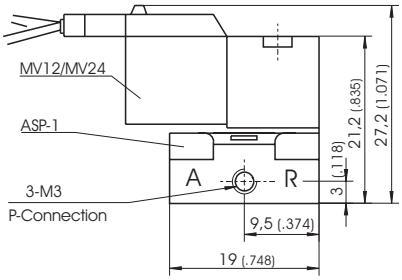
The hose NW1 should only be used for short distances. The larger diameter of 3 mm guarantees good Operating Pressure. The electrical connection is established by first soldering the wire to the Clip KL-300, and then fixing the Clip onto the end of the Pneumatic Probe. (Refer to marked positions in the drawings on the previous data sheets).

To avoid damage to the ends of the hose, only use special cutter tool.

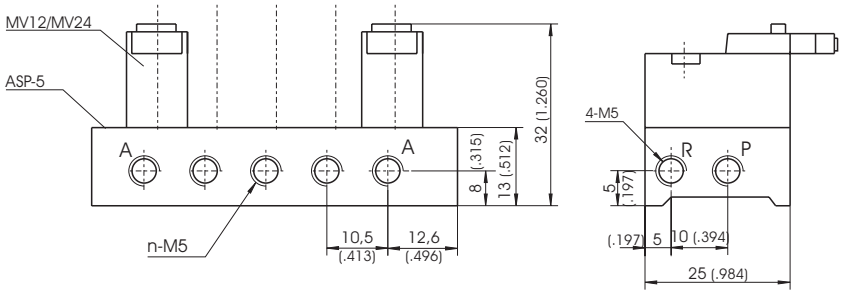


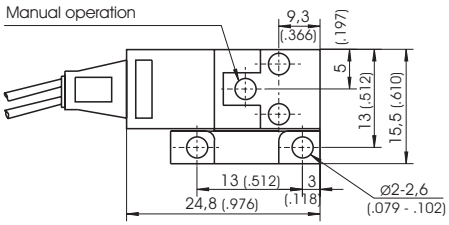


Single Connection Plate (ASP-1)



Multi Connection Plate (ASP-2...-10)





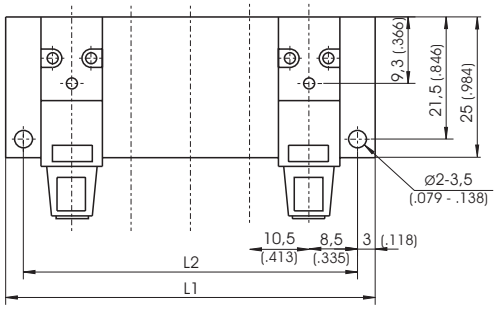
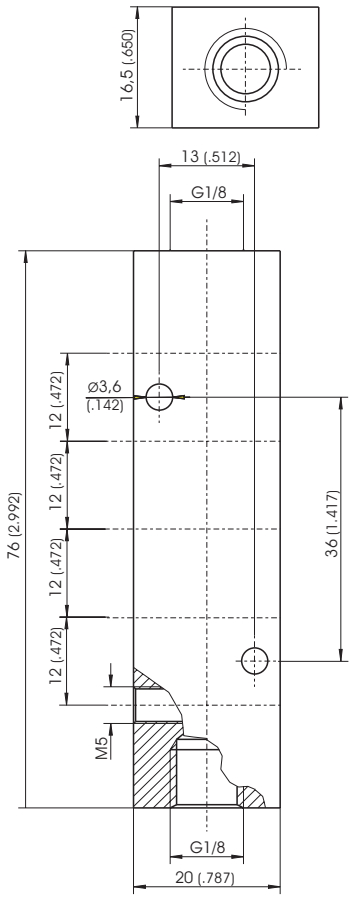


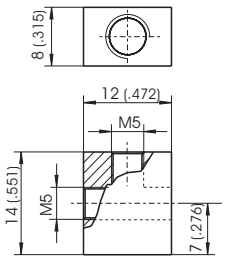
Table of Dimensions for Multi Connection Plate

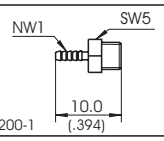
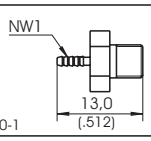
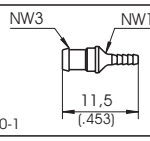
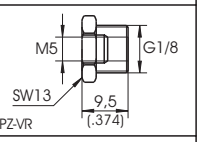
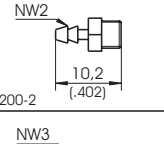
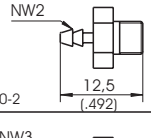
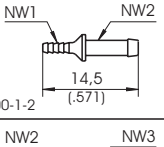
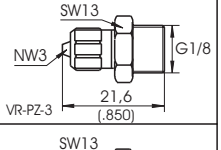
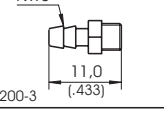
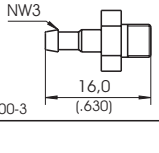
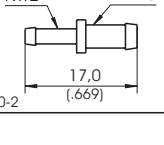
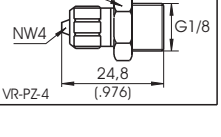
Number Valves	L1	L2
2	33,5 (1.319)	27,5 (1.083)
3	44,0 (1.732)	38,0 (1.496)
4	54,5 (2.146)	48,5 (1.909)
5	65,0 (2.559)	59,0 (2.323)
6	75,5 (2.972)	69,5 (2.736)
7	86,0 (3.386)	80,0 (3.150)
8	96,0 (3.780)	90,5 (3.563)
9	107,0 (4.213)	101,0 (3.976)
10	117,5 (4.626)	111,5 (4.390

Tenfold distributors (PZ-010)



T-piece (PT-300-M5)



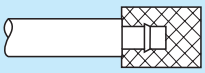
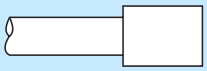
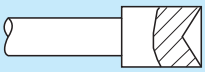
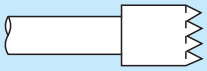
Threaded Terminal M3	Threaded Terminal M5	Reducers	Plugs for Distributors PZ-010
			
			
			

SKS 215

Grid:
≥ 2,54 mm
≥ 100 Mil

Switching Probe
Install. Height: 10,0 mm (.394)
Switching Path: 1,5 mm (.059)

Available Tip Styles

Material	Tip Style	Standard Plating	Special Versions Ø mm	Special Versions (Ø inch)
0	02  Ø 1,80 (.071)	A		
3	02  Ø 1,80 (.071)	A	1,00	(.039)
3	03  Ø 1,80 (.071)	A		
3	05  Ø 1,00 (.039)	A		
3	06  Ø 1,80 (.071)	N		

Electrical Data
Current Rating: 3 A

Mounting Hole Size
with Receptacle: > see KS-112 (Page 25)
without Receptacle: Ø 1,65 mm (.065)

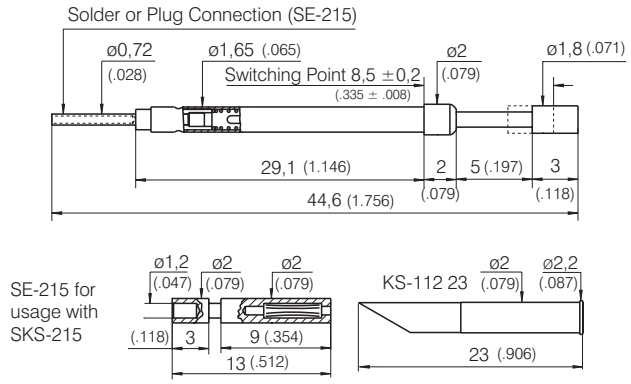
Materials
Plunger: BeCu, gold- or nickel-plated (or gold-plated with Insulator Cap)
Barrel: Brass, gold-plated
Spring: Steel, gold-plated
Contact Terminal: Brass, gold-plated
Receptacle: Brass, gold-plated

Application Areas:
- Combined component test with presence check
- active switching element

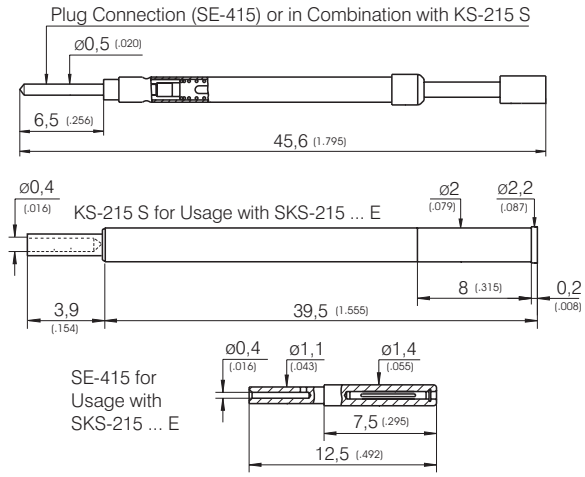
Note:
Receptacles of the series KS-112 23 are used for the Switching Probes SKS-215 (> see Page 25).
The special tool "SW/ZW GKS - 112" must be used to install the Test Probe (see Page 58).
The Receptacle KS-215 S enables easy changing of the Test Probe without removing the wiring connection. This Receptacle can only be used with "SKS-215 ... E"

Screw-in Version > see SKS-215 M on Page 72.

Mounting and Functional Dimensions
SKS - 215



SKS - 215 ... E

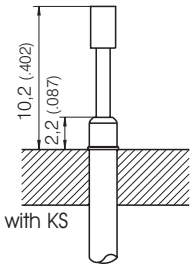


Mechanical Data
Switching Path: 1,5 mm (.059) ± 0,2 (.008)
Maximum Stroke: 5,0 mm (.197)

Spring Force (dN)	Spring Force at Switching Point	Spring Force at 80 % Stroke
08	0,23 N (0.8 oz.)	0,8 N (2.9 oz.)
15	0,45 N (1.6 oz.)	1,5 N (5.4 oz.)
30	0,90 N (3.2 oz.)	3,0 N (10.8 oz.)

Collar Height and Installation Height
The Installation Height of the Tip (Dimension without KS) is determined by the Collar Height.

Collar Height	Install. Height (without KS)
02	10,0 mm (.394)

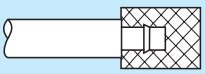
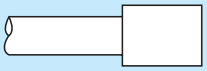
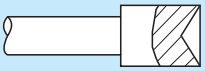
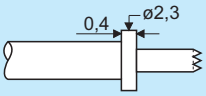
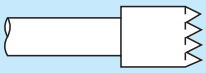
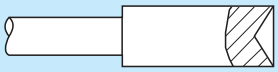
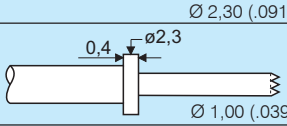
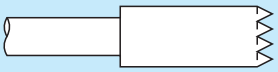


Ordering Example:

Series	Tip Materials 0 = Delrin 3 = BeCu	Tip Style	Tip diameter ($^1/_{100}$ mm)	Plating A = Gold N = Nickel	Spring Force (dN)	Collar Height (mm)	Type (alternative E)
Test Probe:	SKS	215	302	180	A	30	02	
Receptacles:	KS – 112 23		KS – 215 S				
Lamellar Plug:	SE – 215						

All specifications are subject to change without prior notification

Available Tip Styles

Material	Tip Style	Standard Plating	Special Versions Ø mm	Special Versions (Ø inch)
0	02  Ø 3,00 (.118)	A	5,00 2,30	(.197) (.091)
3	02  Ø 3,00 (.118)	A		
3	03  Ø 2,30 (.091)	A		
3	06  Ø 1,00 (.039)	A		
3	06  Ø 2,30 (.091)	A	4,00	(.157)
3	53*  Ø 2,30 (.091)	A		
3	56*  Ø 1,00 (.039)	A		
3	56*  Ø 2,30 (.091)	A		

* Tip Length 9,5 mm (.374)

Electrical Data
Current Rating: 5 A

Mounting Hole Size
with Receptacle: Ø 2,98 - 2,99 mm (.117 - .118)
without Receptacle: Ø 2,65 mm (.104)

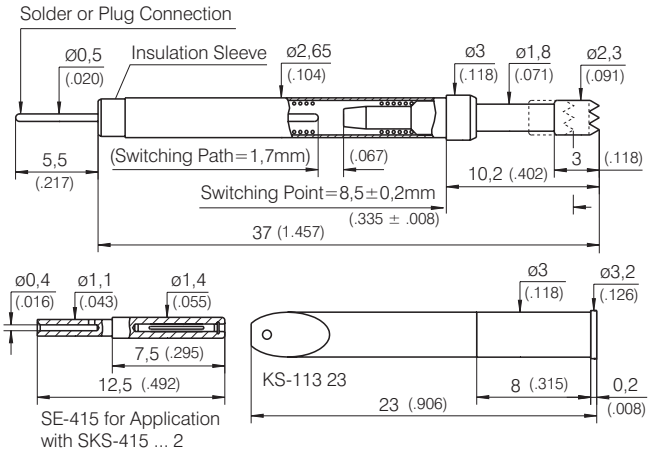
Materials
Plunger: BeCu, gold-plating (or gold-plating with Insulator Cap)
Barrel: Brass, gold-plating
Spring: Steel, gold-plating
Receptacle: Brass, gold-plating

Note:
- The Receptacle can be used from Grid 4,5 mm (180 Mil) up.
- Screw-in Version > see SKS-465 M on Page 73.
- The Receptacle KS-415 S enables easy changing of the Probe
  SKS-415 ... 02 E without removing the wiring connection.

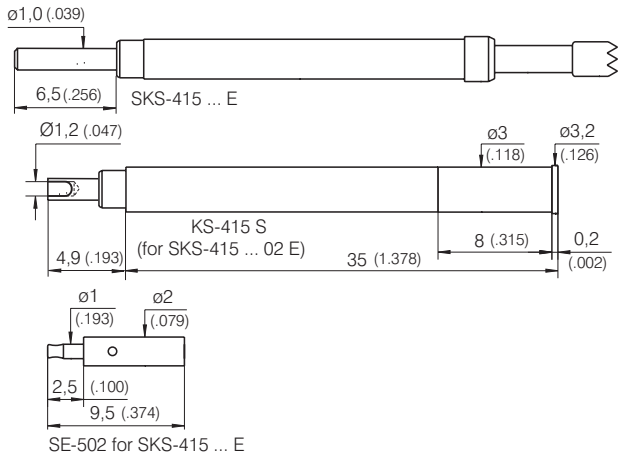
Tools:
Insertion and Extraction Tools for SKS and KS > see Page 58.

Mounting and Functional Dimensions

SKS - 415 ... 2

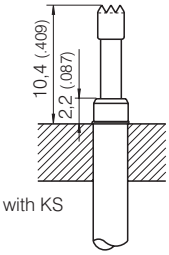


SKS - 415 ... E



Mechanical Data
Switching Path: 1,7 mm (.067) ± 0,2 (.008)
Maximum Stroke: 5,2 mm (.205)
Spring Force at Switching Point: 0,7 N (2.5 oz.)
Spring Force 80 % Stroke: 2,3 N (8.3 oz.)

Collar Height and Installation Height
To adjust the Installation Height (Dimension without KS) Test Probes with different Collar Heights are available.



Collar Height	Install. Height (without KS) with Tip Style 02/03/06	Install. Height (without KS) with Tip Style 53/56
02	10,2 mm (.402)	16,7 mm (.657)
05	13,2 mm (.520)	19,7 mm (.776)
10	18,2 mm (.716)	24,7 mm (.972)

Ordering Example:

Series	Tip Materials 0 = Delrin 3 = BeCu	Tip Style	Tip diameter (1/100 mm)	Plating A = Gold	Spring Force (dN)	Collar Height (mm)	Type (alternative E)
Test Probe:	S K S	4 1 5	3	0 6	2 3 0	A	2 3	0 2	2
Receptacles:	K S – 1 1 3	2 3	K S – 4 1 5 S						
Lamellar Plugs:	S E – 4 1 5	S E – 5 0 2							

SKS 425

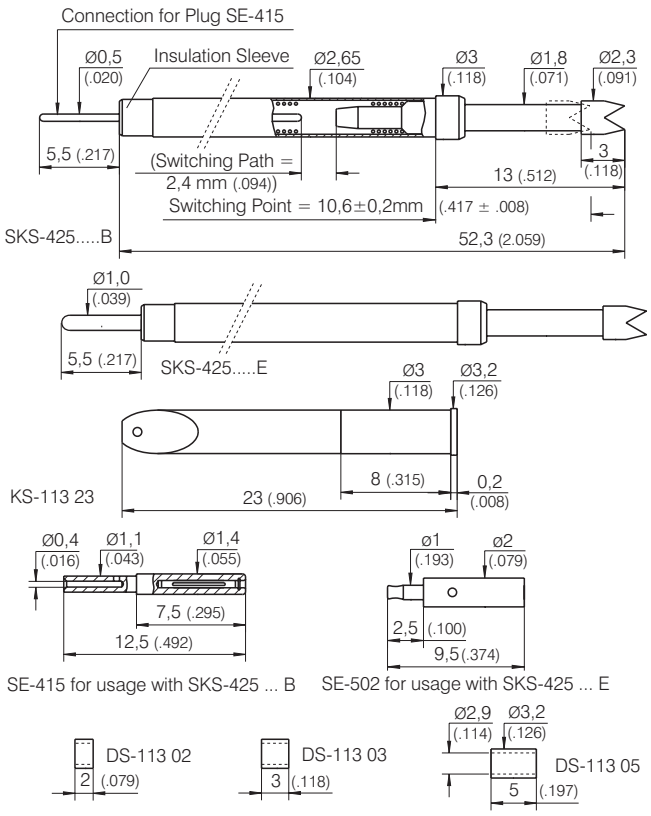
Grid:
≥ 3,50 mm
≥ 140 Mil

Switching Probe with long Stroke
Installation Height: 13,0 mm (.512)
Switching Path: 2,4 mm (.094)

Available Tip Styles

Material	Tip Style		Standard Plating	Special Versions Ø mm	Special Versions (Ø inch)
0	02	Ø 3,00 (.118)	A	5,00	(.197)
3	04	Ø 2,30 (.091)	A		
(3	06	Ø 2,30 (.091)	A	4,00 R	(.157)

Mounting and Functional Dimensions



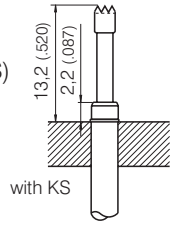
Mechanical Data

Switching Path: 2,4 mm (.094) ± 0,2 (.008)
Maximum Stroke: 8,0 mm (.315)
Spring Force at Switching Point: 0,9 N (3.2 oz.)
Spring Force 80 % Stroke: 2,5 N (9.0 oz.)

Collar Height and Installation Height

The Installation Height of the Tip (Dimension without KS) is determined by the Collar Height.

Collar Height	Installation Height (without KS)
02	13,0 mm (.512)



Electrical Data

Switching Current: 5 A

Mounting Hole Size

with Receptacle: Ø 2,98-2,99 mm (.117 - .118)
without Receptacle: Ø 2,65 mm (.104)

Materials

Plunger: BeCu, gold-plated (or gold-plated with Insulator Cap)
Barrel: Brass, gold-plated
Spring: Steel, gold-plated
Receptacle: Brass, gold-plated

Note:
The Receptacle can be used from Grid 4,5 mm (180 Mil) up.

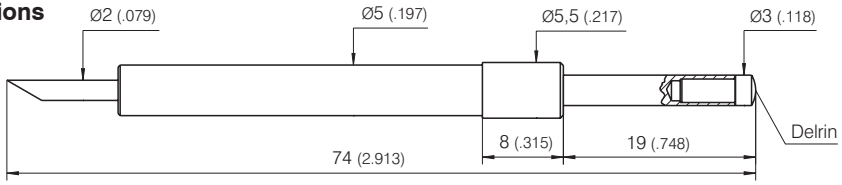
Tools:
Insertion and Extraction Tools for SKS and KS > see Page 58.

Ordering Example:

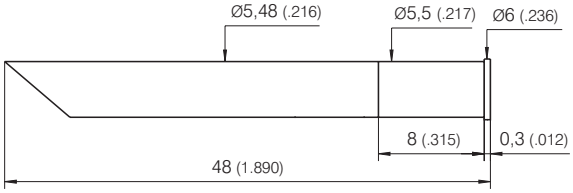
	Series	Tip Materials 0 = Delrin 3 = BeCu	Tip Style	Tip diameter (1/100 mm)	Plating A = Gold	Spring Force (dN)	Collar Height (mm)	Type (alternative E)
Test Probe:	SKS	425	304	230	A	25	02	B
Receptacle:	KS–113 23							
Spacers:	DS–113 02	DS–113 03	DS–113 05					
Lamellar Plug:	SE–415	SE–502						

Mounting and Functional Dimensions

SKS-419

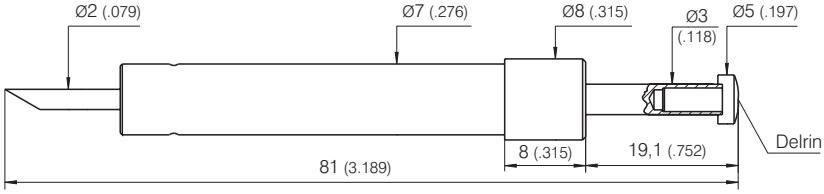


KS-419 23

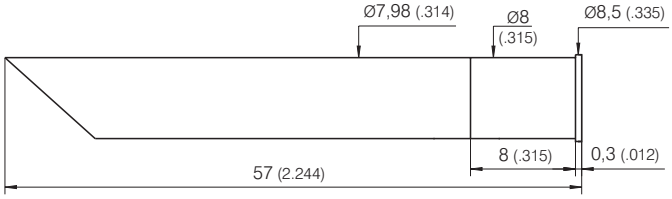


Mounting and Functional Dimensions

SKS-429



KS-429 23



SKS 419

Mechanical Data

Switching Path:	2,0 mm (.079) ± 0,2 (.008)
Maximum Stroke:	14,0 mm (.551)
Spring Force at Switching Point:	2,6 N (9.4 oz.)
Spring Force 80 % Stroke:	5,2 N (18.8 oz.)

Electrical Data

Switching Current:	5 A

Mounting Hole Size

with Receptacle:	Ø 5,49 mm (.216)
without Receptacle:	Ø 5,00 mm (.197)

Materials

Plunger:	BeCu, gold-plated with Insulator Cap (Delrin)
Barrel:	Brass, gold-plated
Spring:	Steel, gold-plated
Receptacle:	Brass, gold-plated

SKS 429

Mechanical Data

Switching Path:	2,0 mm (.079) ± 0,2 (.008)
Maximum Stroke:	16,0 mm (.630)
Spring Force at Switching Point:	2,9 N (10.5 oz.)
Spring Force 80 % Stroke:	6,4 N (23.2 oz.)

Electrical Data

Switching Current:	5 A

Mounting Hole Size

with Receptacle:	Ø 7,99 mm (.315)
without Receptacle:	Ø 7,00 mm (.276)

Materials

Plunger:	BeCu, gold-plated with Insulator Cap (Delrin)
Barrel:	Brass, gold-plated
Spring:	Steel, gold-plated
Receptacle:	Brass, gold-plated

Ordering Example:

	Series	Tip Material 0 = Delrin	Tip Style	Tip diameter (1/100 mm)	Plating A = Gold	Spring Force (dN)	Collar Height (mm)
Test Probe:	SKS 419	0	05	300	A	65	08
	SKS 429	0	05	500	A	80	08
Receptacles:	KS-4192 3						
	KS-4292 3						

HFS 010

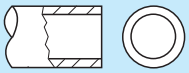
Grid:
≥ 2,54 mm
≥ 100 Mil

Coaxial Dipole Probe/HF-Test Probe
Installation Height: 9,5 mm (.374)
Recommended Stroke: 5,5 mm (.217)

Available Tip Styles Inner Conductor

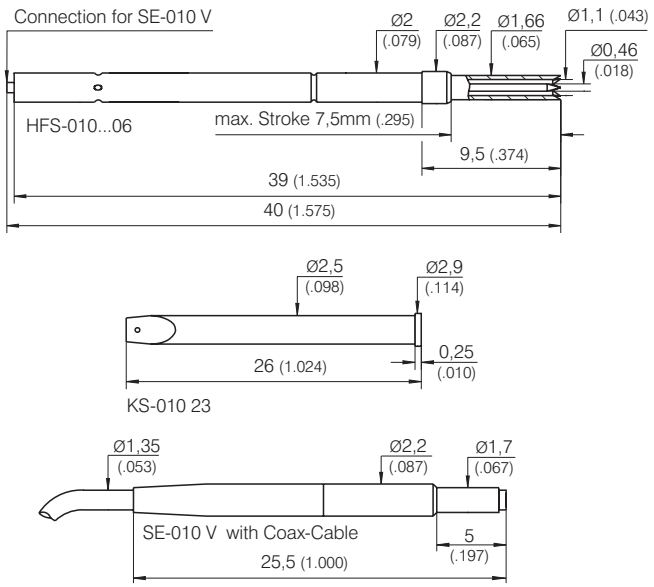
Material	Tip Style	Standard Plating	Special Versions Ø mm	Special Versions (Ø inch)
3	51  Ø 0,50 (.020)	A		
3	54  Ø 0,50 (.020)	A		

Available Tip Styles Outer Plunger

02	
06	

Note:
The spring-loaded Outer Plunger of the HFS-010 is available with a shorter assembly-length on request.

Mounting and Functional Dimensions



Mechanical Data

Working Stroke:	5,5 mm (.217)
Max. Working Stroke:	7,5 mm (.295)
Spring Force at Working Stroke	
- Outer Conductor:	1,2 N (4.3 oz.)
- Inner Conductor:	0,8 N (2.9 oz.)
Operating Temperature	–40 up to +80 °C

Electrical Data

Frequency Range:	**up to 200 MHz**
Current Rating:	3 A
R_i typical:	20 mΩ
Impedance - Test Probe:	25–30 Ω/200 MHz
Impedance - Cable:	50 Ω/200 MHz
	90 pF/m

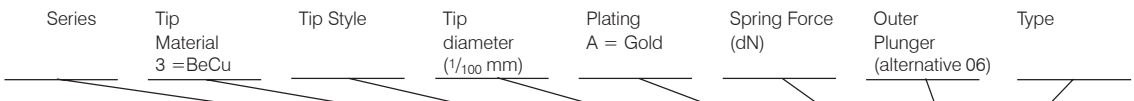
Mounting Hole Size

with Receptacle:	Ø 2,48-2,49 mm (.098)
without Receptacle:	Ø 2,00 mm (.079)

Materials

Plunger:	BeCu, gold-plated
Barrel:	Brass, gold-plated
Spring:	Steel, gold-plated
Insulation:	Delrin
Receptacle:	Brass

Ordering Example:



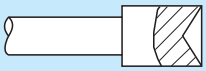
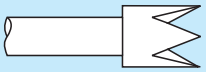
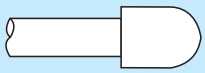
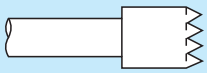
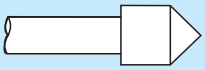
Test Probe: H F S 0 1 0 3 5 1 0 5 0 A 2 0 0 2 A
Plug with HF Coaxial Cable pre-wired
Length 0,75 m (29.50) - Special Lengths on request: S E – 0 1 0 V
Receptacle: K S – 0 1 0 2 3

Coaxial Dipole Probe/HF-Test Probe
Installation Height: 9,5 mm (.374)
Recommended Stroke: 4,0 mm (.157)

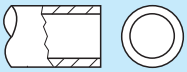
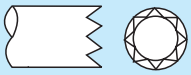
Grid:
≥ 4,50 mm
≥ 180 Mil

HFS 110

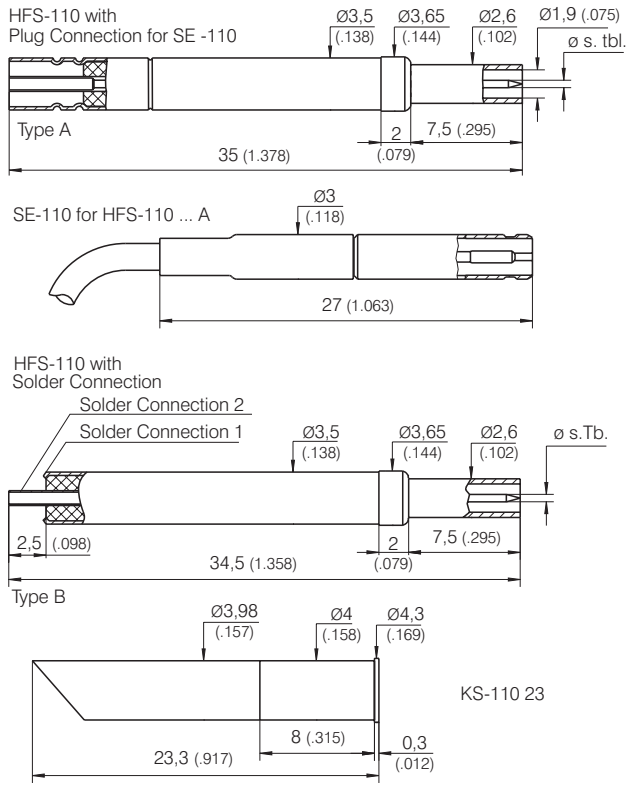
Available Tip Styles Inner Conductor

Material	Tip Style	Standard Plating	Special Versions Ø mm	Special Versions (Ø inch)
3	01  Ø 0,50 (.020)	A		
3	02  Ø 0,50 (.020)	A		
3	03  Ø 1,15 (.045)	A		
3	04  Ø 1,15 (.045)	A		
3	05  Ø 1,15 (.045)	A		
3	06  Ø 1,15 (.045)	A		
3	08  Ø 1,15 (.045)	A		

Available Tip Styles Outer Plunger

02	
06	

Mounting and Functional Dimensions



Mechanical Data

Working Stroke:	4,0 mm (.157)
Max. Working Stroke:	5,0 mm (.197)
Spring Force at Working Stroke	
- Outer Conductor:	3,0 N (10.8 oz.)
- Inner Conductor:	1,5 N (5.4 oz.)
Operating Temperature:	–40 up to +80 °C

Electrical Data

Frequency Range:	**up to 700 MHz**
Current Rating:	2-3 A
R_i typical:	20 mΩ
Impedance Test Probe:	50–60 Ω/700 MHz
Impedance Cable:	50 Ω/200 MHz
	96 pF/m

Mounting Hole Size

with Receptacle:	Ø 3,98-3,99 mm (.157)
without Receptacle:	Ø 3,5 mm (.138)

Materials

Plunger:	BeCu, gold-plated
Barrel:	Brass, gold-plated
Spring:	Steel, gold-plated
Insulation:	Teflon
Receptacle:	Brass

Ordering Example:

Series	Tip Material 3= BeCu	Tip Style	Tip diameter ($^1/_{100}$ mm)	Plating A = Gold	Spring Force (dN) Outer Conductor	Outer Plunger (alternative 06)	Type (alternative B)
HFS	110	3	04	115	A	30	02	A

Test Probe: SE-110 V
Plug with HF-Coax Cable RG 178 B/U pre-wired
Length 0,75 m (29.50) - Special Lengths on request:
Receptacle: KS-110 23

HFS 810

Grid:
≥ 5,08 mm
≥ 200 Mil

Coaxial HF Test Probe, 50 Ω, 4 GHz
Installation Height: 11,5 mm (.453)
Recommended Stroke: 4,0 mm (.157)

Available Tip Styles
for replaceable Inner Conductor

Material	Tip Style	Standard Plating	Special Versions Ø mm	Special Versions (Ø inch)
2	01 Ø 0,51 (.020)	A		
3	05 Ø 0,51 (.020)	A		
3	08 Ø 0,80 (.031)	A		

Inner Conductor replaceable; Ordering Example: GKS-051 201 051 A 1300

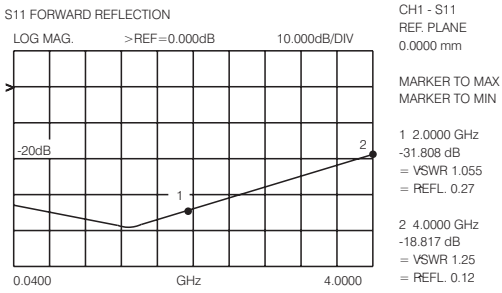
Available Tip Styles: Outer Plunger
Outer Plunger secured against rotation

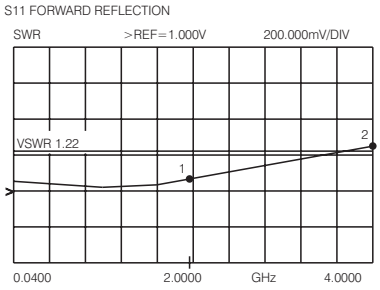
02

02 S

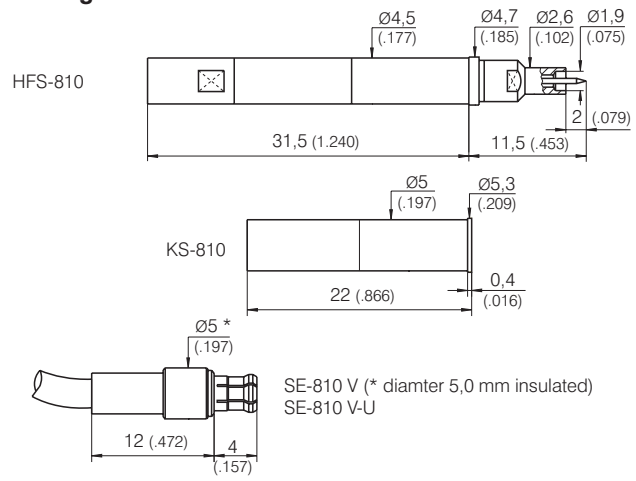
06

06 S





Mounting and Functional Dimensions



Mechanical Data

Working Stroke:	4,0 mm (.157)
Max. Working Stroke:	5,0 mm(.197)
Spring Force at Working Stroke:	Outer Conductor: 4,0 N (14.4 oz.)
	Inner Conductor: 1,3 N (4.7 oz.)
Operating Temperature:	–40 up to +80 °C

Electrical Data

Frequency Range:	**up to 4 GHz**
Current Rating	
Outer Conductor:	8-10 A
Inner Conductor:	2-3 A
R_i typical: Inner Conductor:	≤ 10 mΩ
Impedance Test - Probe:	50 Ω
Impedance - Cable:	50 Ω

Mounting Hole Size

with Receptacle:	Ø 4,98-4,99 mm (.196 - .197)
without Receptacle:	Ø 4,5 mm (.177)

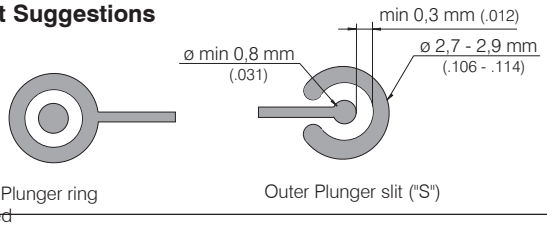
Materials: Inner Conductor

Plunger:	BeCu or Steel, gold-plated
Barrel:	Bronze, gold-plated
Spring:	Steel, gold-plated

Materials: Outer Conductor

Plunger:	BeCu or Brass, gold-plated
Barrel:	Brass, gold-plated
Spring:	Stainless Steel
Insulation:	Teflon
Receptacle:	Brass

Layout Suggestions



Ordering Example:

Series	Tip Materials 2 = Steel 3 = BeCu	Tip Style	Tip diameter (1/100 mm)	Plating A = Gold	Spring Force (dN)	Outer Plunger	Outer Plunger slit (S)
HFS	810	201	051	A	53	02	

Test Probe with flat Outer Plunger: HFS 810 201 051 A 53 02

Test Probe with serrated Outer Plunger: HFS 810 201 051 A 53 06

MCX-Plug pre-wired (Cable RG 316/U), Length 0,7 m: SE–810V-U (Grid>5,08mm (200mil)) SE–810V (Grid =5,08mm (200mil))

Receptacle: KS–810

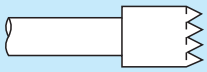
All specifications are subject to change without prior notification

Coaxial Dipole Probe/HF-Test Probe, 75 Ω, 1,5 GHz
Installation Height: 16,0 mm (.630)
Recommended Stroke: 4,0 mm (.157)

Grid:
≥ 30,0 mm
≥ 1200 Mil

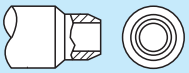
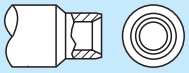
HFS 409

Available Tip Styles Inner Conductor

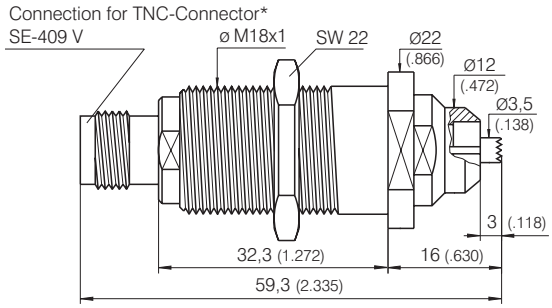
Material	Tip Style	Standard Plating
3	06  Ø 3,50 (.138)	A

*Inner Conductor replaceable; Ordering Example: HSS-118 306 350 A 3005 B

Available Tip Styles Outer Plunger

42	
43	

Mounting and Functional Dimensions



*HF-Plug SE–409 V (TNC), pre-wired with Cable RG 59 B/U

Mechanical Data

Working Stroke:	4,0 mm (.157)
Max. Working Stroke:	5,0 mm (.197)
Spring Force at Working Stroke	
- Outer Conductor:	6,0 N (21.7 oz.)
- Inner Conductor:	3,0 N (10.8 oz.)
Operating Temperature:	–40 up to +80 °C

Electrical Data

Frequency Range:	**up to 1,5 GHz**
Current Rating	
- Outer Conductor:	10 A
- Inner Conductor:	16 A
R_i typical: Inner Conductor:	≤ 10 mΩ
Impedance - Test Probe:	75 Ω
Impedance - Cable:	75 Ω

Mounting Hole Size

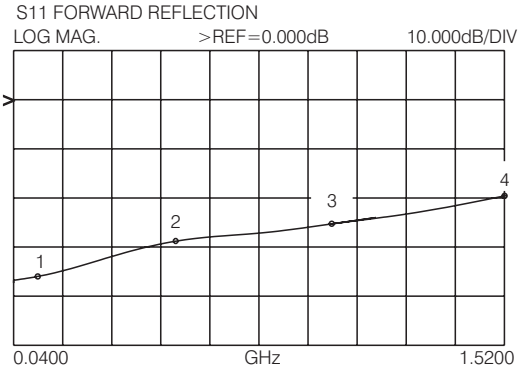
in CEM 1 and FR 4:	Ø 18,5 mm (.728)

Materials: Inner Conductor

Plunger:	BeCu, gold-plated
Barrel:	Brass, gold-plated
Spring:	Steel, gold-plated or Stainless Steel

Materials: Outer Conductor

Plunger:	Brass, nickel-plated
Barrel:	Brass, nickel-plated
Spring:	Stainless Steel
Insulation:	Teflon



CH1 - S11
REF. PLANE
0.0000 mm

MARKER TO MAX
MARKER TO MIN

1 0.1200 GHz
-35.792 dB

2 0.5200 GHz
-29.196 dB

3 1.0000 GHz
-25.648 dB

4 1.5200 GHz
-19.364 dB

Ordering Example:

Series	Tip Material 3 = BeCu	Tip Style	Tip diameter (1/100 mm)	Plating A = Gold	Spring Force (dN)	Outer Plunger

Test Probe for contacting Socket:	HFS	409	3	06	350	A	83	42
Test Probe for contacting Plug:	HFS	409	3	06	350	A	83	43
TNC-Plug (without Cable):	SE – 409							
TNC-Plug (with 0,7 m Cable RG 59 B/U):	SE – 409 V							

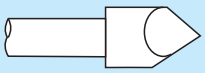
Interface Probes

Interface Test Probes for GenRad, R&S, Teradyne, Factron and Agilent/HP 3070 Test Systems

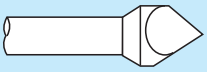
GKS-945 / 946
for GenRad / Augat-Pylon / Rhode & Schwarz Interfaces

Material	Tip Style	Plating
3	01  Ø 1,06 (.042)	A
3	57  Ø 1,06 (.042)	A

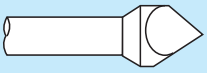
GKS-938

Material	Tip Style	Plating
3	07  Ø 1,80 (.071)	A

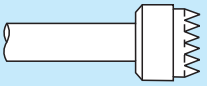
GKS-100
for Factron 300 / 700 Interface

Material	Tip Style	Plating
3	57  Ø 1,50 (0.59)	A

GKS-100
for Teradyne 800 / 1800 Interface

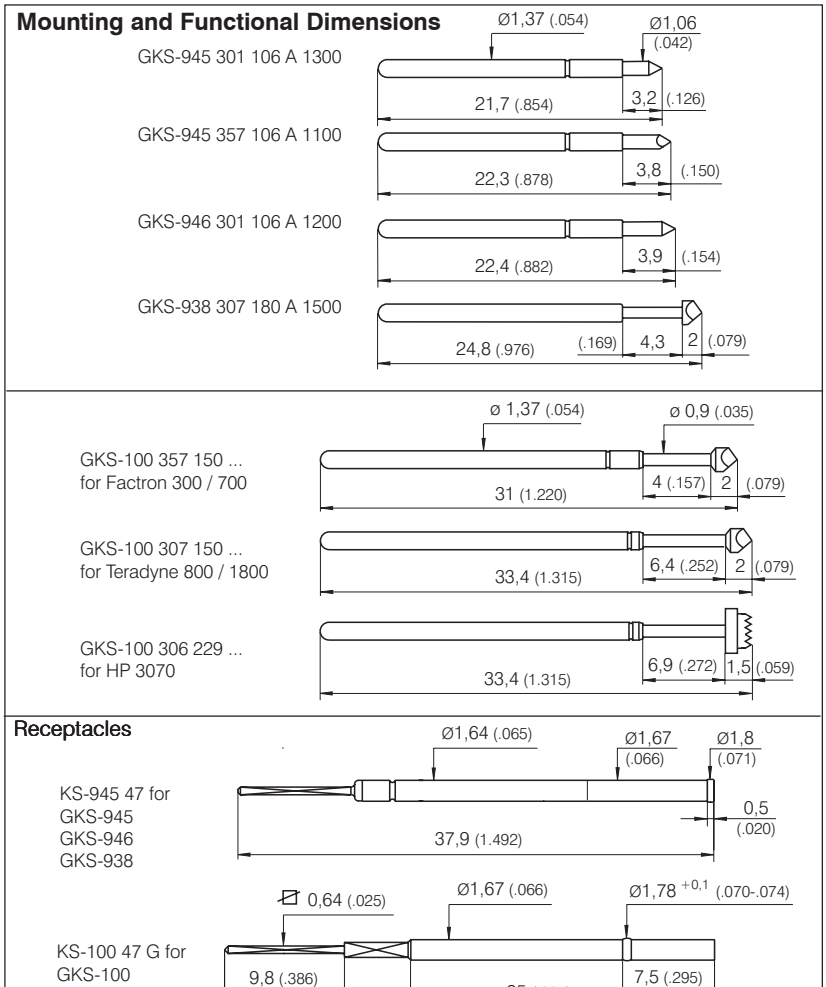
Material	Tip Style	Plating
3	07  Ø 1,50 (0.59)	A

GKS-100
for HP 3070 Interface

Material	Tip Style	Plating
3	06  Ø 2,29 (.090)	A

Note:
To order Test Probes with bent barrel end , use Special Designation "B" (=Banana)
Contacting Terminals for various Interfaces on request.

Mounting and Functional Dimensions



Mechanical Data

Type	Working Stroke	Max. Stroke	Spring Force at Working Stroke	Installation Height
945 301	2,1 (.083)	3,2 (.126)	1,3 N (4.7 oz.)	3,7 (.146)*
945 357	2,6 (.102)	3,2 (.126)	1,1 N (4.0 oz.)	4,3 (.169)*
946 301	3,2 (.126)	3,9 (.154)	1,2 N (4.3 oz.)	4,4 (.173)*
938 307	3,6 (.142)	4,3 (.169)	1,5 N (5.4 oz.)	6,8 (.268)*
100 357	3,0 (.118)	4,0 (.158)	1,2 N (4.3 oz.)>Order Term=10	13,6 (.535) / var. **
100 ...	4,3 (.169)	6,4 (.250)	1,0 N (3.6 oz) / 2,0 N (7.2 oz)	16,0 (.630) / var. **
			2,25 N (8.1 oz) / 3,0 N (10.8 oz)	

* with KS-945 47 ** with KS-100 47 G

Collar Height and Installation Height
The Installation Height is variable, depending on how deep the Press-ring is set

Electrical Data
Current Rating: 4-5 A
R_i typical: 20 mΩ

Mounting Hole Size
for KS-945 47: Ø 1,68 - 1,69 (.066 - .067) > in CEM1, using collar
for KS-100 47 G: Ø 1,70-1,75 mm (.067 - .069) > Press-ring inserted

Materials
Plunger: BeCu, gold-plated
Barrel: Nickel-Silver, gold-plated
Spring: Steel, gold-plated

Ordering Example:

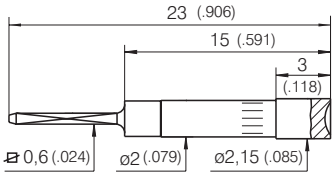
Series	Tip Material 3 = BeCu	Tip Style	Tip Diameter (1/100 mm)	Plating A = Gold	Spring Force (dN)	Collar Height (mm)	Special Designation (see Note)
Test Probe:	GKS	945	3	01	106	A	13	00	
Receptacles for GKS-945 / 946 / 938:	KS– 945 47							
Receptacles for GKS-100:	KS– 100 47G							

All specifications are subject to change without prior notification

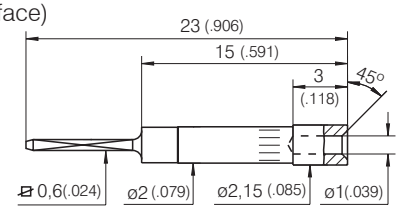
Contact Terminals

Contact Terminals with Collar Height: 3 mm (.118)

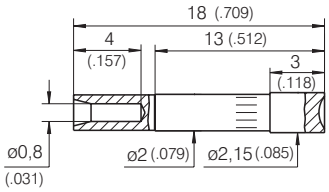
KT-254 W-E03 (wire-wrap)



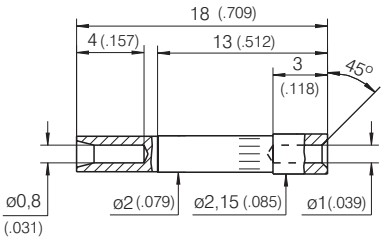
KT-254 W3 E03 (wire-wrap)
(For assembly in INGUN VIN/ATS Interface)



KT-254 L-E03 (Solder)

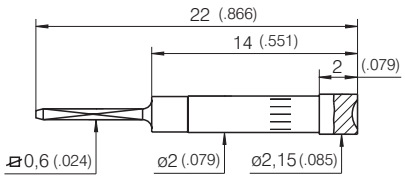


KT-254 L3 E03 (Solder)

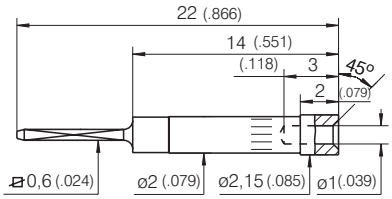


Contact Terminals with Collar Height: 2 mm (.079)

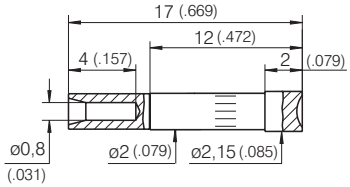
KT-254 W-E02 (wire-wrap)



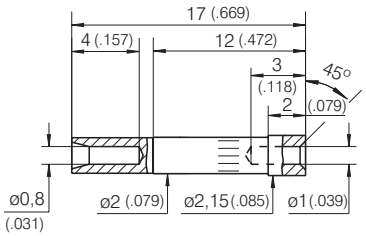
KT-254 W3 E02 (wire-wrap)



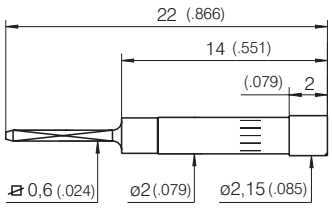
KT-254 L-E02 (Solder)



KT-254 L3 E02 (Solder)

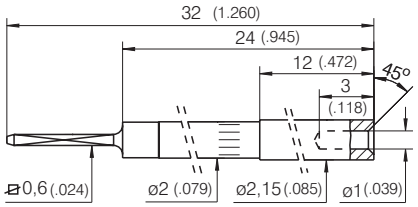


KT-254 W-PL (wire-wrap)

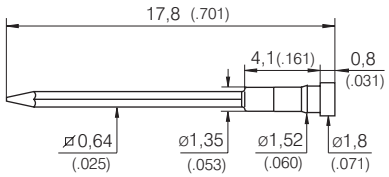


Other Contact Terminals

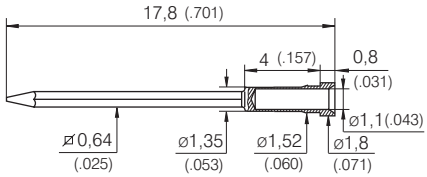
KT-254 W3 E12
For assembly in Ingun-ZSK-Transfer Field (ZSK=Top-side Contacting Unit)



KT-158 02
Contact Terminal for GenRad Interface

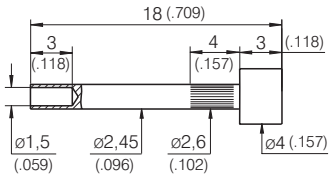


KT-158
Contact Terminals for Zehntel Interface

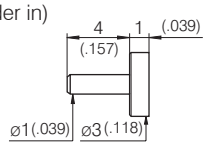


Contact Terminals for general usage

KT-586 102 400 R



KT-279 102 300
(to solder in)



Electrical Data
R_i typical: < 5 mΩ

Materials
Contact Terminals: Brass, gold-plated
KT-586: Brass, rhodium-plated

Note:
We recommend that all Ingun VIN/ATS-Interfaces use the Contact Terminal type KT-254 W3 E03 and the Test Probes series GKS-912 207 150 A 1502.

Collar Height and Installation Height for KT-254
The Installation height of the Contact Terminals is determined by the Collar Height.

Collar Height	Installation Height
02	2,0 mm (.079)
03	3,0 mm (.118)
12	12,0 mm (.427)

Mounting Hole Size for KT-254
in CEM 1: Ø 1,98 - 2,00 mm (.078-.079)
in FR 4: Ø 1,98 - 1,99 mm

Mounting Hole Size for KT-158
in CEM1/FR4: Ø 1,40 mm (.055)

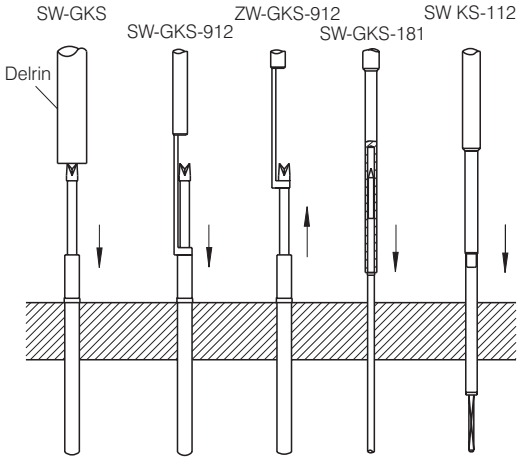
Mounting Hole Size for KT-586
in CEM1/FR4: Ø 2,55 - 2,57 mm (.100-.101)

Ordering Example: KT-254 W-3 E03

Insertion and Extraction Tools

Insertion and Extraction Tools enable Test Probes and Receptacles to be inserted and extracted safely, easily and damage-free. The Insertion Tools are generally eqipped with a Handle (SW-H) and an interchangeable Bit. The Bit being in accordance to the specific probe series (e.g. : E-SW KS - 112 >see Fig. 1).
Tools which can be adjusted in a variable manner are available for Receptacles with a Press-ring for the series GKS-050, GKS-075 and GKS-100 (see Fig. 2). When inserting the Receptacle, the Press-ring is pressed into the mounting hole; the Installation Height of the Test Probes can then be adjusted to meet the applicable application.

Tools for Screw-in Probes are shown on the pages of the applicable Probe series.



Series	Insertion Tool GKS (SW ...)	for Tip∅ > Shaft-∅: Extraction Tools GKS (ZW...) and Insertion and Extraction Tool GKS (SW-ZW)	Insertion Tool for Receptacles
E- / GKS-050	SW-GKS-081 (1)		SW-KS-050 G (5)
GKS-069	SW-GKS-187 B		SW-KS-080
E- / GKS-075 F		SW-ZW-GKS-075	SW-KS-075 G (5) SW-KS-075 T (4)
GKS-080		SW-ZW-GKS-080	SW-KS-080
GKS-081	SW-GKS-081 (1)		SW-KS-080
E- / GKS-100	SW-GKS-100 B (1)	SW-ZW-GKS-100	SW-KS-100 SW-KS-100 G (5)
GKS-101		SW-ZW-GKS-101	SW-KS-101
GKS-102		SW-ZW-GKS-112	SW-KS-102
GKS-103		SW-ZW-GKS-103	SW-KS-103
GKS-112		SW-ZW-GKS-112	SW-KS-112
GKS-113		SW-ZW-GKS-103	SW-KS-113
GKS-135	SW-GKS-100 B (1)	SW-ZW-GKS-075	SW-KS-100 SW-KS-100 G (5)
GKS-204	SW-GKS-912 A (2) SW-GKS-912 B (3)	ZW-GKS-912	SW-KS-112
GKS-181	SW-GKS-181 (1)		SW-KS-181
GKS-412		SW-ZW-GKS-112	SW-KS-112
GKS-422	SW-GKS-912 A (2) SW-GKS-912 B (3)	ZW-GKS-912	SW-KS-112
GKS-502		SW-ZW-GKS-112	SW-KS-102
GKS-503		SW-ZW-GKS-103	SW-KS-103
GKS-710		ZW-GKS-912	SW-KS-112
GKS-714			SW-KS-113
GKS-912	SW-GKS-912 A (2) SW-GKS-912 B (3)	ZW-GKS-912	SW-KS-112
GKS-913		SW-ZW-GKS-103	SW-KS-113
GKS-967			SW-KS-102
HSS-118		SW-ZW-GKS-112	SW-KS-112
HSS-120		SW-ZW-GKS-103	SW-KS-113
PKS-200 / 220			SW-KS-102
PKS-300 / 299			SW-KS-103
SKS-215		SW-ZW-GKS-112	SW-KS-112
SKS-415 / 425		SW-ZW-GKS-103	SW-KS-113

SW-GKS (universal insertion tool for GKS)

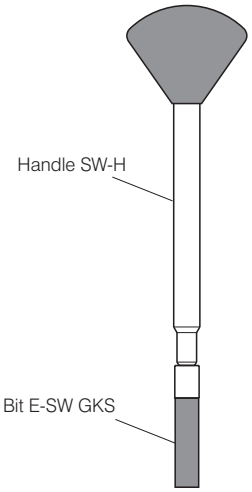


Fig. 1

SWKS-xxx G (5) (variable adjustable Insertion Tool for KS with Press-ring)

Fig. 2

① Insertion Tool for Plunger with continuous Shaft ② universal usage
③ for Tip Style “09” ④ for KS- ... E02 / E03 / E05 ⑤ continuously adjustable

Ordering Example:

Insertion and Extraction Tool for GKS 112: SW-ZW-GKS-112

Insertion Tools for GKS 912: SW-GKS-912A or SW-GKS-912 B

Bits for Insertion Tools GKS 912: E-SW-GKS-912A or E-SW-GKS-912B

The following listed Test Probes are mainly used for testing Cable Harnesses and Connectors. Especially the screw-in Probes (with the index "M") and the Probes for special applications (Part Nos. VF xx) offer the ideal prevention against the Probe creeping up out of the Receptacle. Note that there are also screw-in types within certain standard series (see following overview matrix). Further special versions are available on request.

Grid in mm (Mil)	Max. Stroke in mm	Current Rating in A	ICT / FCT	Combined ICT / FCT-Test	Cable Harness Probes	Solderable Probes	Battery Probes	Micro-Contacting	RF-Applications	High-Current Applications	High Temperature Range	Component Presence Check	Individually controllable	Interface Probes	Low Installation Height	High Installation Height	Short-stroke Probes	Long-stroke Probes	Through (continuous) Plunger	Non Rotating Probes	High Spring Forces	Stroke-measurement Probes	Series	Page	
Screw-in Test Probes																									
1,27 (50)	6,4	3			x																		GKS-050 M	60	NEW
2,54 (100)	5,3/8	5-8			x						x	x				x					x		GKS-112 / M	61	
2,54 (100)	10	5-8			x						x												GKS-204 / M	29	
5,08 (200)	3,5	5-8			x						x												GKS-913 / M	38	
5,08 (200)	5,3	5-8			x						x					x					x		GKS-113 / M	62	
4,5 (180)	6	5-8			x						x										x		GKS-103 / M	32	
4,5 (180)	7	5-15			x														x		x		GKS-500 M	63	NEW
4,8 (189)	7	5-15			x						x								x		x		GKS-503 / M	33	
Probes for special Applications																									
2,54 (100)	6	5			x											x			x	x	x		VF 25	64	
4 (157)	7	8			x											x			x	x	x		VF 4	65	
5 (200)	12	10			x											x		x	x	x	x		VF 5	66	
General Applications																									
3,18 (125)	6,4	6			x										x								GKS-003	67	
4,8 (189)	6,4	7			x																		GKS-004	67	
4,8 (189)	6,4	8			x																x		GKS-005	67	
Screw-in High Current Probes																									
2,54 (100)	5,3	16			x					x	x												HSS-118 / M	68	
5,08 (200)	5,3	24			x					x	x												HSS-120 / M	69	
5,08 (200)	5,5	50			x					x	x										x		HSS-150 / M	70	
>12 (470)	>9	>50			x					x											x		HSS-2259-2532	71	
Screw-in Switching Probes																									
2,54 (100)	5	3			x							x											SKS-215 M	72	
3,5 (140)	5,2	3			x							x											SKS-465 M / S	73	NEW
Non Rotating Probes																									
2,54 (100)	5	5-8			x															x	x		GKS-710	74	
5,08 (200)	5	8-10			x															x	x		GKS-714	75	
Fax-sheet for Special Inquiries																								76	

GKS 050 M

NEW

Grid: ≥ 1,27 mm ≥ 50 Mil
Screw-in Test Probe
Install. Height: 10,5 / 12,5 mm (.413-.492)
Recomm. Str.: 4,3 mm (.169)

Available Tip Styles

Material	Tip Style	Standard Plating	Special Versions Ø mm	Special Versions (Ø inch)
3	03 Ø 0,50 (.020)	A	0,90	(.035)
3	05 Ø 0,50 (.020)	A		
3	06 Ø 0,90 (.035)	A		
3	07 Ø 0,50 (.020)	A	0,90	(.035)
2	14 Ø 0,50 (.020)	A		
2	31 Ø 0,50 (.020)	A		
2	91 Ø 0,50 (.020)	A		
2	97 Ø 0,50 (.020)	A		

Special Version GKS-050...ML

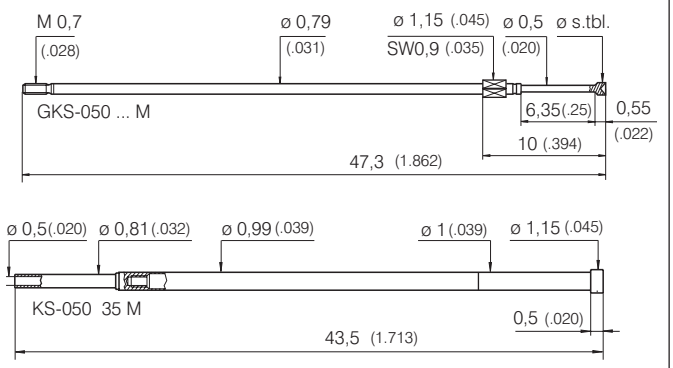
Available Tip Styles

Material	Tip Style	Standard Plating	Special Versions Ø (mm)	Special Versions Ø (inch)
2	91 Ø 0,50 (.020)	A		

"ML"Total Length 49,3 mm (1.941), Special Designation "ML"

Note:
The Receptacle KS-050 ... M is available pre-wired, with Wire AWG 30 (see Ordering Example).

Mounting and Functional Dimensions



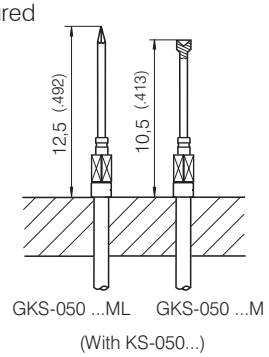
Mechanical Data

Working Stroke:	4,3 mm (.169)
Maximum Stroke:	6,35 mm (.250)
Spring Force at Work. Stroke:	1,5 N (5.4 oz.)
alternatives:	1,0 N (3.6oz.); 2,0 N (7.2oz.)
Test Point Size:	≥ Ø 0,80 mm (.031)
when using Guide Plate:	≥ Ø 0,60 mm (.024)

Collar Height and Installation Height

The Installation Height of the Tip (measured with the Receptacle) is determined by the Collar Height of the Receptacle.

Collar Height	Install. Height
03 M	10,5 mm (.413)
03 ML	12,5 mm (.492)



Electrical Data

Current Rating:	2-3 A
R_i typical:	< 20 mΩ

Operating Temperature

Standard: -40° up to +80° C
with Spec. Designation "MC": -100° up to +200° C (2,0 N)

Mounting Hole Size

in CEM 1:	Ø 1,01-1,03 mm (.040 - .041)
in FR 4:	Ø 1,02-1,04 mm (.040 - 0,41)

Materials

Plunger:	BeCu or Steel, gold-plated
Barrel:	Brass, gold-plated
Spring:	Steel, gold-plated
Receptacle:	Brass, gold-plated

Ordering Example:

Series	Tip Materials 2 = Steel 3 = BeCu	Tip Style	Tip Diameter (1/100 mm)	Plating A = Gold	Spring Force (dN)	Collar Height (mm)	Special Designation
GKS	050	291	050	A	15	03	M

Test Probe with Total Length 47,3 mm (1.862): GKS 050 291 050 A 15 03 M

Tool for Screw-in Probe: SW - ZW - GKS - 050 M

Receptacles: KS – 050 35 M | KS – 050 35 M-V-30

Test Probe
Installation Height: 10,3 - 18,3 mm (.406 - .702)
Recommended Stroke: 4,0 resp. 6,4 mm (.157 resp. .252)

Raster:
≥ 2,54 mm
≥ 100 Mil

GKS 112 / M

Available Tip Styles

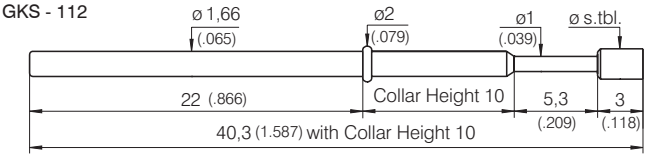
Material	Tip Styles	Standard plating	Special Versions Ø mm	Special Versions (Ø inch)
2	01 Ø 1,00 (.039)	R	0,80	(.031)
3	02 Ø 2,00 (.079)	A	1,00 1,50	(.039) (.059)
3	03 Ø 2,00 (.079)	A	1,80	(.071)
2	04 Ø 2,00 (.079)	R	1,30	(.051)
3	05 Ø 2,00 (.079)	A	0,64 0,80 1,00 1,40 2,30	(.025) (.031) (.039) (.055) (.091)
3	05 Ø 0,63 ** (.025)	A		
0	06* Ø 2,30 (.091) 0,8 ø1,8	A		
3	06 Ø 2,00 (.079)	A	1,30 1,50 1,80 2,50	(.051) (.059) (.071) (.098)
2	07 Ø 2,00 (.079)	R	1,30	(.051)
2	09 *** Ø 0,60 (.024)	N		
2	14 Ø 1,30 (.051)	R		
2	17 Ø 1,75 (.069)	N		

* also available as Tip Style 002 and 003, Install. H. plus 0,8 mm (.031)
** Plunger with defined wobble, Special Designation: ... MT
*** pressed-in Steel point in Base Plunger made of Brass

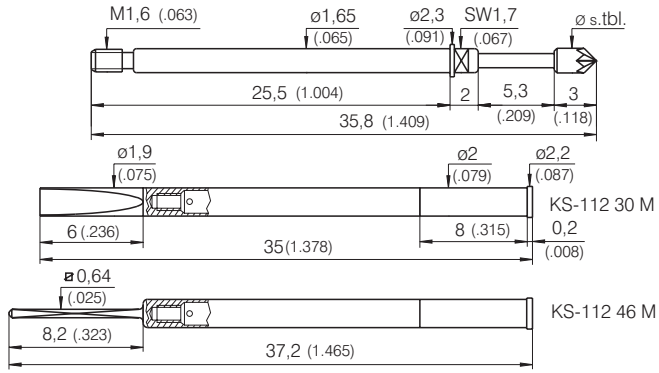
Note to GKS - 112 and KS - 112: For Test Probes series GKS-112 (without Designation "M") Receptacles of the series KS-112 are used > see Page 25.
Insertion and Extraction Tools for GKS and KS > see Page 58.
Note to GKS - 112 . . . M und KS - 112 xx M
For Test Probes GKS-112 ... M Receptacles KS-112 xxx M are used. Special Tools > see below.

Mounting and Functional Dimensions

GKS - 112



GKS - 112 ... M



Mechanical Data

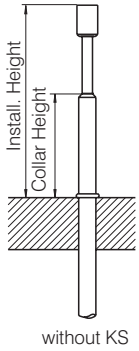
Working Stroke: 4,0 mm (.157)
Maximum Stroke: 5,3 mm (.209)
Spring Force at Working Stroke: 1,5 (5.4 oz.)
alternative: 0,6 N (2.2 oz.); 0,8 N (2.9 oz.);
2,25 N (8.1 oz.); 3,0 N (10.8 oz.); 5,0 N (18.1 oz.)

By Test Probes with Tip Dia. ≤ 1,0 mm (.039), the Spring Force is reached at the recommended Working Stroke of 6,4 mm (.252) (maximum Stroke: 8,0 mm (.315)). Exception: 5,0 N (18.1oz) Spring > max. Stroke is always 5,3 mm (.209).

Collar Height and Installation Height

To adjust the Installation Height of the Probe Tip (Dimension without KS), Test Probes with alternative Collar Heights are available.

Collar Height	Installation Height (without KS)
02 M	10,5 mm (.413) (with KS)
02***	10,3 mm (.406)
03	11,3 mm (.445)
04***	12,3 mm (.484)
05***	13,3 mm (.524)
06	14,3 mm (.563)
07***	15,3 mm (.602)
08	16,3 mm (.642)
09	17,3 mm (.681)
10***	18,3 mm (.720)



Electrical Data

Current Rating: 5-8 A
R_i typical: < 20 mΩ

Operating Temperature

Standard: -40° upto +80° C
with Spec. Designation "C": -100° up to +200° C (0,8; 1,5; 2,25; 3,0 N)

Mounting Hole Size for KS - 112 xx M

in CEM 1 and FR 4: Ø 1,99 mm (.078)

Materials

Plunger: Steel or BeCu, gold-plated, rhodium- or chemically nickel-plated
Barrel: Nickel-Silver *** oder Brass, gold-plated
Spring: Steel, gold-plated
Receptacles: Brass, gold-plated

Ordering Example:

Series	Tip Materials 2 = Steel 3 = BeCu	Tip Style	Tip Diameter ($^1/_{100}$ mm)	Plating A = Gold N = Nickel R = Rhodium	Spring Force (dN)	Collar Height (mm)	Special Designation alternative "M"
GKS	112	2	04	130	R	15	02	

Test Probe: GKS 112 2 04 130 R 15 02
Receptacles for GKS-112 (without "M"): KS – 112 30 / KS – 112 47
Receptacles for GKS-112 ... M: KS – 112 30M / KS – 112 46M
Tool for Screw-in Probe for Tip >2,0/≤ 3,5 mm: SW-ZW-GKS – 112 M
Tool for Screw-in Probe for Tip ≤ 2,0 mm: SW-ZW-GKS – 112 M – B

GKS 113 / M

Grid:
≥ 4,00 mm
≥ 160 Mil

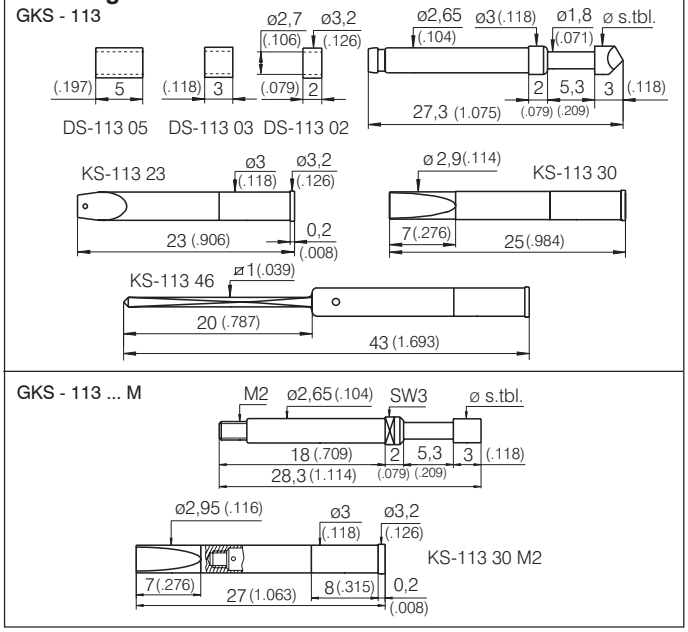
Spring Loaded Test Probe
Install. Height: 10,5 - 18,5 mm (.413 - .728)
Recomm. Stroke: 4,0 mm (.157)

Available Tip Styles

Material	Tip Style	Standard Plating	Special Versions Ø mm	Special Versions (Ø inch)
2	01 Ø 1,80 (.071)	R		
3	02 Ø 1,40 (.055) Ø 2,30 (.091)	A	0,80 1,00 1,80 3,00 4,00	(.031) (.039) (.071) (.118) (.157)
3	03 Ø 2,30 (.091)	A	3,00 * 4,00 R	(.118) (.157)
2	04 Ø 2,30 (.091)	R	1,80 A 3,00	(.071) (.118)
3	05 Ø 2,30 (.091)	A	0,80 1,40 3,00 R	(.031) (.055) (.118)
3	55 Tip Length 4 mm (.157) Ø 3,00 (.118)	R		
3	06 Ø 2,30 (.091)	R	3,00 A 3,50 4,00 A 6,00 8,00	(.118) (.138) (.157) (.236) (.315)
2	07 Ø 3,00 (.118)	A	4,20 R	(.165)
3	12 Ø 1,80 (.071)	A		
3	13 Ø 1,80 (.071)	R		
2	14 Ø 1,40 (.055)	R		
2	15* Ø 1,00 (.039) 2,5 mm (.098) longer	A		
2	17 Ø 2,30 (.091)	R	1,80 3,00 A	(.071) (.118)
3	72 Ø 1,80 (.071)	A		
2	87 Ø 2,60 (.102)	N	4,00	(.157)

* pressed-in Steel Tip in Base Plunger made of Brass

Mounting and Functional Dimensions



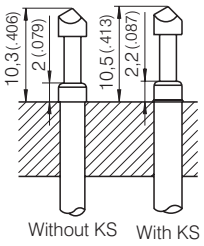
Mechanical Data

Working Stroke: 4,0 mm (.157)
Maximum Stroke: 5,3 mm (.209)
Spring Force at Work. Stroke: 1,5 N (5.4 oz.)
alternative: 0,3 N (1.1 oz.); 0,6 N (2.2 oz.); 1,0 N (3.6 oz.); 2,25 N (8.1 oz.); 3,0 N (10.8 oz.); 5,0 N (18.1 oz.)

Collar Height and Installation Height

To adjust the Installation Height of the Tip, use Test Probes with alternative Collar Heights.

Collar Height	Install. Height (with KS)
02 / 02 M	10,5 mm (.413)
05	13,3 mm (.524)
10	18,3 mm (.720)



Electrical Data

Current Rating: 5-8 A
R_i typical: < 30 mΩ

Operating Temperature

Standard: -40° up to +80° C
with Spec. Designation "C": -100° up to +200° C (1,5 N; 2,25 N; 3,0 N)

Mounting Hole Size for KS - 113 30 M2

in CEM 1 und FR 4: Ø 2,99 mm (.118)

Mounting Hole Size for GKS - 113 and KS - 113

with Receptacle: Ø 2,98 - 2,99 mm (.117 - .118)
without Receptacle: Ø 2,65 mm (.104)

Materials

Plunger: Steel or BeCu; gold-, rhodium- or chemically nickel-plated
Barrel: Brass, gold-plated
Spring: Steel, gold-plated or stainless steel
Receptacle: Brass, gold-plated

Note to GKS - 113 and KS - 113: For Test Probes series GKS-113 (without Designation "M") Receptacles KS-113 are used. Insertion and Extraction Tools for GKS and KS > see Page 58.

Note to GKS - 113 . . . M and KS - 113 xx M: For Test Probes GKS-113 ... M Receptacles KS-113 ... M are used. See Tools below.

Ordering Example:

Series	Tip Material 2 = Steel	Tip Style	Tip Diameter ($^1/_{100}$ mm)	Plating A = Gold N = Nickel	Spring Force (dN)	Collar Height (mm)	Special Designation (alternative
"M")		3 = BeCu			R = Rhodium		
Test Probe:	G K S	1 1 3	3	0 6	2 3 0	R	1 5	0 2	

Tool for Screw-in Probe for Tip ≤ 3 mm: SW-ZW-GKS – 113 M-B

Tool for Screw-in Probe for Tip > 3 mm / < 4,2 mm: SW-ZW-GKS – 113 M

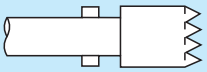
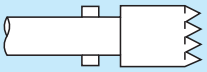
Screw-in Test Probe with continuous Plunger
Installation Height: 13,0 mm (.511)
Recommended Stroke: 5,6 mm (.220)

NEW

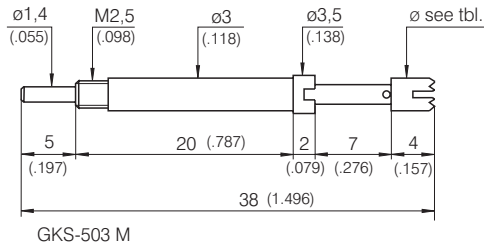
Grid:
≥ 4,50 mm
≥ 177 Mil

GKS 500 M

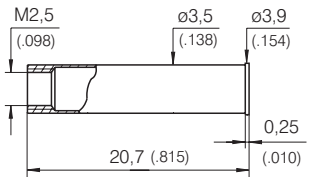
Available Tip Styles

Material	Tip Style	Standard Plating	Special Versions Ø	Special Versions (Ø inch)
3	06  Ø 3,00 (.118)	A		
3	06  Ø 4,00 (.157)	A		

Mounting and Functional Dimensions



GKS-503 M



KS-500 M2,5

Mechanical Data

Working Stroke:	5,6 mm (.220)
Maximum Stroke:	7,0 mm (.276)
Spring Force at Working stroke:	1,5 N (5.4 oz.)
alternatives:	3,0 N (10.8 oz.)
	5,0 N (18.1 oz.)

Collar Height and Installation Height

The Installation Height of the Tip is determined by the Collar Height.

Collar Height	Installation Height
02	13,0 mm (.511)

Electrical Data

Current Rating:	Connection to Plunger:	**12-15 A**
	Connection to Recep:	5-8 A
R_i typical:	Connection to Plunger:	**< 10 mΩ**
	Connection to Recep:	< 30 mΩ

Mounting Hole Size

in CEM1 and FR4:	Ø 3,49 mm (.137)
without Receptacle:	Ø 3,00 mm (.118)

Materials

Plunger:	BeCu, gold-plated
Barrel:	Brass, gold-plated
Spring:	Steel, gold-plated
Receptacle:	Brass, gold-plated

Ordering Example:

Series	Tip Materials 2 = Steel 3 = BeCu	Tip Style	Tip Diameter ($^1/_{100}$ mm)	Plating A = Gold R = Rhodium	Spring Force (dN)	Collar Height (mm)	Type

Test Probe:	G	K	S	5	0	0	3	0	6	3	0	0	A	1	5	0	2	M
Receptacle:	K	S	–	5	0	0	M	2,5										
Tool for Screw-in Probe:	normal screwdriver																	

VF 25

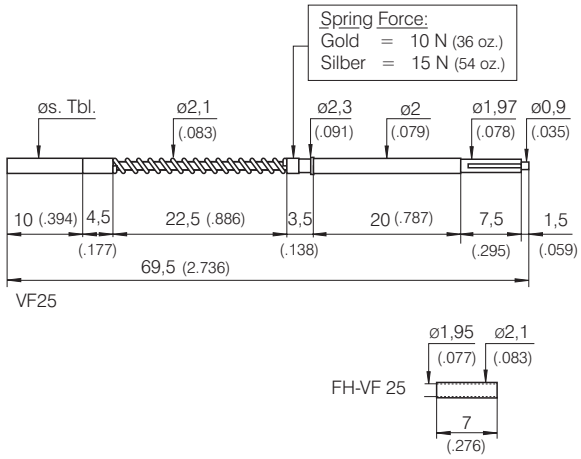
Grid:
≥ 2,54 mm
≥ 100 Mil

Test Probe for Special Applications
Installation Height: 40,5 mm (1.595)
Recommended Stroke: 5,0 mm (.197)

Available Tip Styles

Material	Tip Style	Standard Plating	Special Versions Ø	Special Versions (Ø inch)
2	03 Ø 2,20 (.087)	A		
2	29 2,5 / 0,8 258	A		
2	29 1,9 / 0,3 193	A		

Mounting and Functional Dimensions



Assembly Notice:
The patented design allows the test probe (consisting of plunger and spring) to be easily exchanged according to the following procedure:

- press the plunger into the receptacle until it reaches it's limit
- turn the plunger 90°
- release the plunger

In order to stabilize the test probe and to avoid damage to the receptacle during mounting and dismounting, we recommend that either an additional guide plate be inserted underneath, or that the guide bush FH-VF 25 be attached to the end of the receptacle after mounting, and subsequently soldered to secure it.

Mechanical Data

Working Stroke:	5,0 mm (.197)
Maximum Stroke:	6,0 mm (.236)
Spring Force at Working stroke:	10 N (36 oz.)
	15 N (54 oz.)
Interchangeable stroke:	> 6,0 mm (.236)

Installation Height

Installation Height:	40,5 mm (.1595)

Electrical Data

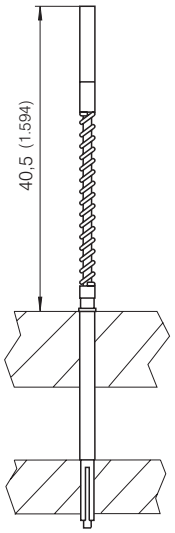
Current Rating:	5 A
R_i (typical):	< 50 mΩ

Mounting Hole Size

in CEM 1 and FR4:	2,0 mm (.079)

Materials

Receptacle:	Bronze, gold-plated
Spring:	Steel, gold-plated
Plunger:	Steel, gold-plated



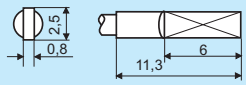
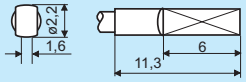
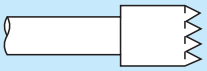
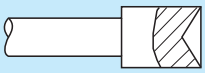
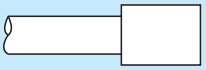
Ordering Example:

Series	Tip Material 2 = Steel	Tip Style	Tip Diameter ($^1/_{100}$ mm)	Plating A = Gold	Spring Force (dN)

Test Probe:	V F 25	2	2 9	1 9 3	A	1 5 0
Receptacle:	K S – V F 2 5					
Receptacle (pre-wired):	K S – V F 2 5 V					
Guide Bush:	F H – V F 2 5					

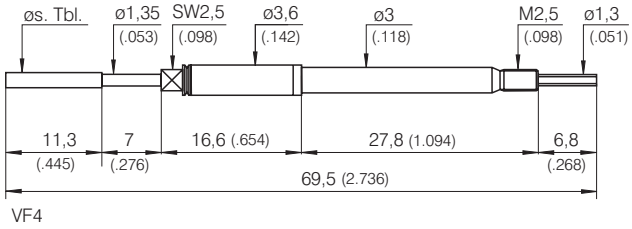
All specifications are subject to change without prior notification

Available Tip Styles

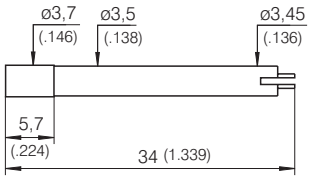
Material	Tip Style	Standard Plating	Special Versions Ø	Special Versions (Ø inch)
2	21*  0.80 (.031)	A		
2	23*  1.60 (.063)	A		
2	06  Ø 3.00 (.118)	A	4.00	(.157)
2	03  Ø 3.00 (.118)	A	4.00	(.157)
2	02  Ø 2.30 (.090)	A		
2	02  Ø 1.80 (.071)	A		

*Note:
The flat surface on the plunger tip is in the same alignment as the flat surface on the rear end of the plunger.

Mounting and Functional Dimensions



VF4



KS-VF4

Mechanical Data

Working Stroke:	5,0 mm (.197)
Maximum Stroke:	7,0 mm (.275)
Spring Force at Working stroke:	15 N (54 oz.)
alternative:	20 N (72 oz.)

Installation Height

Installation Height with KS:	40,5 mm (1.594)

Electrical Data

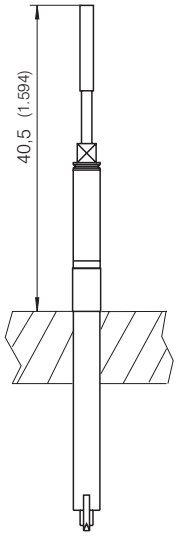
Current Rating:	8 A
R_i (typical):	< 30 mΩ

Mounting Hole Size

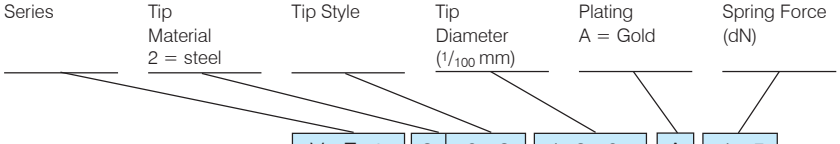
in CEM 1 and FR4:	3,5 mm (.138)

Materials

Barrel:	Brass, gold-plated
Spring:	Steel, gold-plated
Plunger:	Steel, gold-plated
Receptacle:	Brass, gold-plated



Ordering Example:



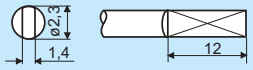
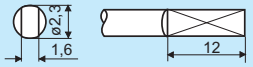
Test Probe:	VF4 | 2 | 02 | 180 | A | 15
Receptacle:	KS – VF4
Tool for Screw-in Probe:	SW ZW SKS – 465 M

VF 5

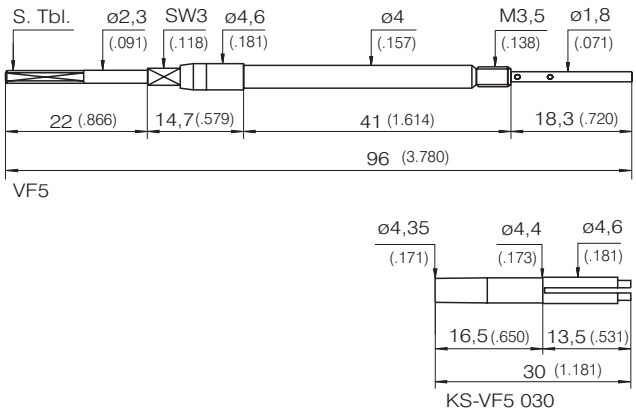
Grid:
≥ 5,00 mm
≥ 200 Mil

Test Probe for Special Applications
Installation Height: 36,5 mm (.1437)
Recommended Stroke: 5,0 (.197) / 9,5 mm (.374)

Available Tip Styles

Material	Tip Style	Standard Plating	Special Versions Ø	Special Versions (Ø inch)
3	20  1,40 (.055)	A		
3	20*  1,50* (.059)	A		
3	20  1,60 (.063)	A		
3	20  1,80 (.071)	A		

Mounting and Functional Dimensions

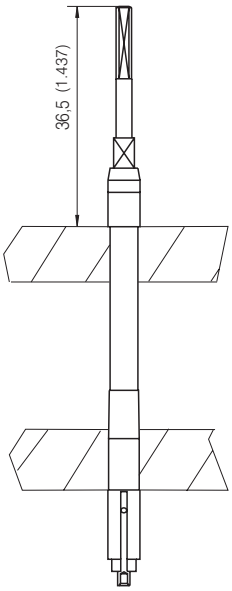


Mechanical Data

Spring Force at Working Stroke	Pre-load	Working Stroke	Maximum Stroke
15 N (54oz.)	2,7 N (10oz.)	9,5 mm (.374)	12 mm* (.472)
20 N (72oz.)	3,6 N (13oz.)	9,5 mm (.374)	12 mm* (.472)
34 N (122oz.)	10,0 N (36oz.)	5,0 mm (.197)	6,5 mm (.256)

Installation Height
Installation Height: 36,5 mm (1.437)

Mounting Hole Size:
in CEM 1 and FR 4: 4,0 mm resp. 4,4 mm (.157) resp. (.173)



Electrical Data
Current Rating: 10 A
R_i (typical): < 30 mΩ

Materials
Barrel: Brass, gold-plated
Spring: Steel, gold-plated
Plunger: BeCu, gold-plated
Receptacle: Brass, gold-plated

* Maximum Stroke of VF5 - 320 150 A 096 15 and 20: 10,0 mm (.394)

Note:
To secure the spring force, the flat areas for the spanner are marked with notches: 1 notch 1 5 N (54oz.)
2 notches 20 N (72oz.)
3 notches 34 N (123oz)

Ordering Example:

Series	Tip Material 3 = BeCu	Tip Style	Tip Diameter (1/100 mm)	Plating A = Gold	Total Length (mm)	Spring Force (N)
VF5	3	20	150	A	096	20

Test Probe: VF5 320 150 A 096 20
Receptacle: KS-VF5 030
Tool for Screw-in Probe: SW ZW GKS – 113 M

GKS 003 / 004 / 005

Available Tip Styles for GKS-003

Material	Tip Style	Standard Plating	Special Versions Ø	Special Versions (Ø inch)
2	01 Ø1,27 (.050)	A		
3	03 Ø 2,54 (.100)	A		
3	05 Ø 1,27 (.050)	A		
2 / 3	06 Ø 2,54 (.100)	A		

Available Tip Styles for GKS-004

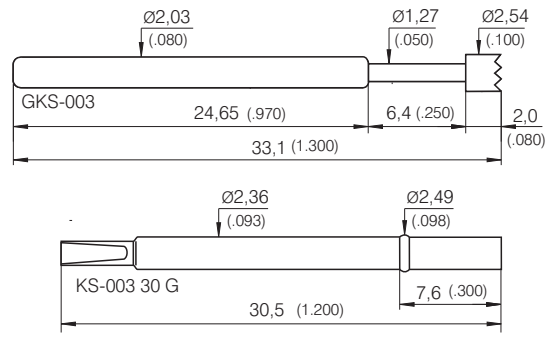
Material	Tip Style	Standard Plating	Special Versions Ø	Special Versions (Ø inch)
2	01 Ø1,52 (.060)	A		
2	03 Ø 3,96 (.156)	A		
2	06 Ø 3,96 (.156)	A		

Available Tip Styles for GKS-005

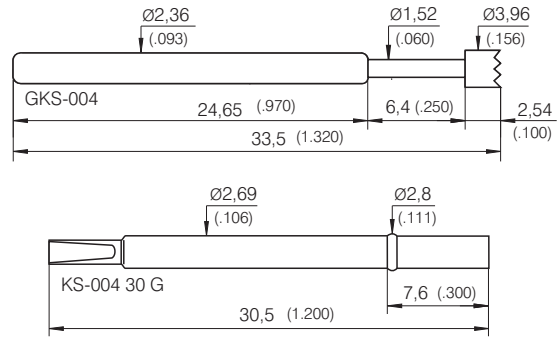
Material	Tip Style	Standard Plating	Special Versions Ø	Special Versions (Ø inch)
2	01 Ø2,03 (.080)	A		
2	03 Ø 3,96 (.156)	A		
2	06 Ø 3,96 (.156)	A		

Mounting and Functional Dimensions

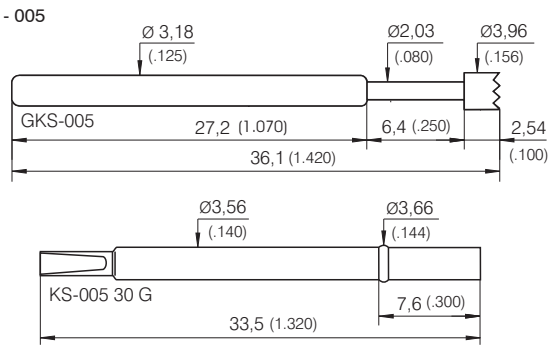
GKS - 003



GKS - 004



GKS - 005



Mechanical Data

Type	Work. Str. mm (inch)	Max. Stroke (mm)	Spring Force at Work. Str. N (oz.)	Current Rating (A)
003	4,4 (.173)	6,4 (.025)	1,2 (4.3) / 2,0 (7.2)	5 - 6
004	4,4 (.173)	6,4 (.025)	1,5 (5.4) / 2,0 (7.2)	6 - 7
005	4,4 (.173)	6,4 (.025)	2,0 / 3,0 / 5,0 (7.2 / 10.8 / 18.1)	7 - 8

Collar Height and Installation Height

To adjust the Installation Height, Receptacles with a Press-ring (End-Designation "G") are used.

Electrical Data

Current Rating: see table
R_i typical: < 20 mΩ

Mounting Hole Size

for KS - 003 30 G: Ø 2,39 - 2,44 mm
for KS - 004 30 G: Ø 2,72 - 2,77 mm
for KS - 005 30 G: Ø 3,58 - 3,63 mm

Materials

Plunger: BeCu or Steel, gold-plated
Barrel: Nickel-Silver or Bronze, gold-plated
Spring: Steel, gold-plated
Receptacle: Nickel-Silver, gold-plated

Ordering Example:

Series	Tip Materials 2 = Steel 3 = BeCu	Tip Style	Tip Diameter ($^1/_{100}$ mm)	Plating A = Gold	Spring Force (dN)	Collar Height (mm)
Test Probe:	GKS	003	2	01	127	A	20	00
Receptacle with Press-ring:	KS – 003 30 G							

HSS 118 / M

Grid:
≥ 2,54 mm
≥ 100 Mil

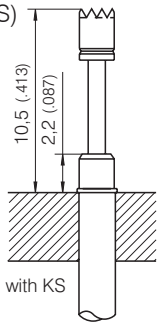
High-Current Probe up to 16 A
Install. height 10,3 mm - 18,5 mm (.406 - .728)
Recomm. Stroke: 4,0 resp. 6,4 mm (.157 resp. .252)

Available Tip Styles

Material	Tip Style		Standard Plating	Special Versions Ø mm	Special Versions Ø inch
3	02	Ø 1,00 (.039)	A		
3	03	Ø 2,00 (.079)	A		
3	05	Ø 1,00 (.039)	A		
3	06	Ø 2,00 (.079)	A	1,30 1,60 2,50 3,50	(.051) (.063) (.098) (.138)
2	14	Ø 1,30 (.051)	A		
3	17	Ø 1,75 (.069)	A	2,00	(.079)

Collar Height and Installation Height
The Installation Height of the Tip (Dimension without Receptacle) is determined by the Collar Height. Exception HSS - 118 ... M: can only be used with Receptacle.

Collar Height	Installation Height
02 M	10,5 mm (.413) (with KS)
02	10,3 mm (.406)
03	11,3 mm (.445)
04	12,3 mm (.484)
05	13,3 mm (.524)
06	14,3 mm (.563)
07	15,3 mm (.602)
08	16,3 mm (.642)
09	17,3 mm (.681)
10	18,3 mm (.720)

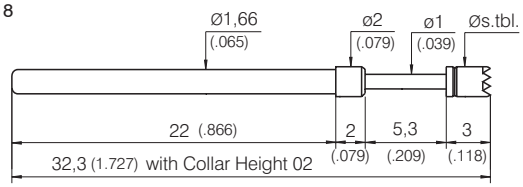


Note to HSS - 118 and KS - 112: Test Probes HSS-118 (without End- Designation "M") are used with Receptacles of Series KS-112 (s. Page 25).
Insertion and Extraction Tools for HSS and KS > see Page 58.
Note to HSS - 118 . . . M and KS - 112 xx M
Test Probes HSS-118 M are used with KS-112 xxx M. The Probes will be screwed in with special Tools (see below).

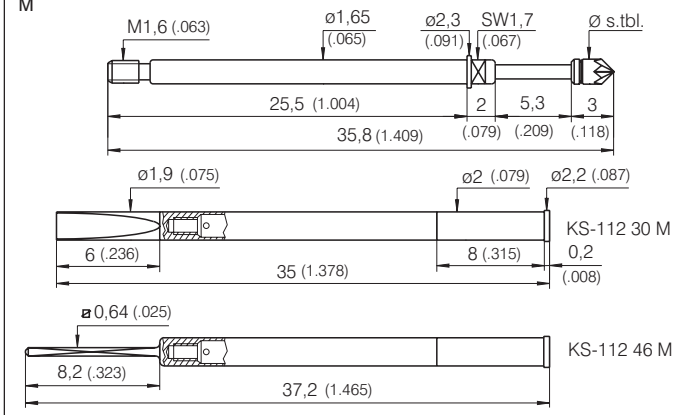
Applications:
see HSS - 150 on Page 70

Mounting and Functional Dimensions

HSS - 118



HSS - 118 . . . M



Mechanical Data
Working Stroke: 4,0 mm (. 157)
Maximum Stroke: 5,3 mm (. 209)
Tip Diameter ≤ 1 mm (.039)
Working Stroke: 6,4 mm (.252)
Maximum Stroke: 8,0 mm (.315)
Spring Force at Working Stroke: 1,5 N (5.4 oz.)
alternative: 0,8 N (2.9 oz.); 2,25 N (8.1 oz.)
Test Point Size: ≥ Ø 1,1 mm (.043)

Electrical Data
Current Rating: **max. 16 A**
R_i typical: **≤ 10 mΩ**

Operating Temperature
Standard: -40° up to +80° C
with 1,5 N and 2,25 N-Spring: -100° up to +120° C

Mounting Hole Size for KS - 112 xx M
in CEM 1 and FR 4: Ø 1,99 mm (.078)

Mounting Hole Size for HSS - 118 and KS - 112 xx
with Receptacle: see KS-112 on Page 25
without Receptacle: Ø 1,65 mm (.065)

Materials
Plunger: Steel or BeCu, gold-plated
Barrel: Brass, gold-plated
Spring: Steel, gold-plated or stainless Steel
Receptacle: Brass, gold-plated

Ordering Example:

Series	Tip Material 2 = Steel 3 = BeCu	Tip Style	Tip diameter ($^1/_{100}$ mm)	Plating A = Gold	Spring Force (dN)	Collar Height (mm)	Special Designation alternative "M"
HSS	118	3	17	175	A	15	02	

Test Probe: HSS 118 3 17 175 A 15 02
Receptacles for HSS-118 (without "M"): KS – 112 30 / KS – 112 47
Receptacles for HSS-118 ... M: KS – 112 30M / KS – 112 46M
Tool for Screw-in Probe HSS - 118 ... M: SW-ZW-GKS–112 M (for Tip Diameter > 2,0 mm)
Tool for Screw-in Probe HSS - 118 ... M: SW-ZW-GKS – 112 M–B (for Tip Diameter ≤ 2,0 mm)

HSS 120 / M

Available Tip Styles

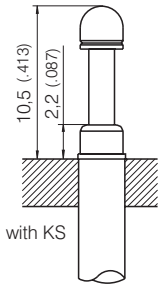
Material	Tip Style		Standard Plating	Special Versions Ø mm	Special Versions (Ø
nch)					
3	02	Ø 2,30 (.091)	A	4,00	(.157)
3	03	Ø 3,00 (.118)	A		
3	05	Ø 2,30 (.091)	A	3,00	(.118)
3	06	Ø 2,30 (.091)	A	3,00 4,00	(.118) (.157)
3	17	Ø 3,00 (.118)	A		
2	51*	Ø 2,30 (.091)	A		
3	55*	Ø 3,00 (.118)	A		

* Tip length 5 mm (.197) - Installation Height with Collar Height 02: 12,5 mm (.492)

Collar Height and Installation Height

The Installation Height of the Tip (Dimension without Receptacle) is determined by the Collar Height. Exception HSS - 120... M: can only be used with Receptacle.

Collar Height	Installation Height
02 M	10,5 mm (.413) (with KS)
02	10,3 mm (.406)
05	13,3 mm (.524)
10	18,3 mm (.720)

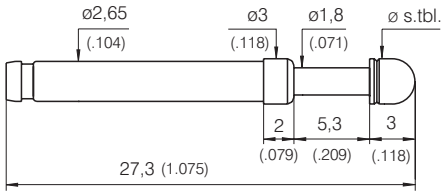


Note to HSS - 120 and KS - 113: Test Probes HSS-120 (without End- Designation "M") are used with Receptacles of Series GKS-113 (s. Page 62).
Insertion and Extraction Tools for HSS and KS > see Page 58.

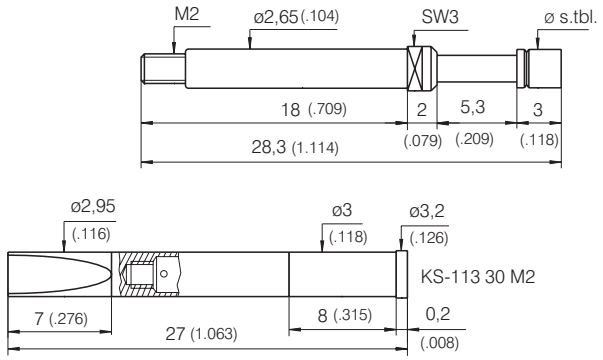
Note to HSS - 120 . . . M and KS - 113 xx M
Test Probes HSS-120 M are used with KS-113 30 M. The Probes will be screwed in with special Tools (see below).

Mounting and Functional Dimensions

HSS - 120



HSS - 120 ... M



Mechanical Data

Working Stroke: 4,0 mm (.157)
Maximum Stroke: 5,3 mm (.209)
Spring Force at Working Stroke: 1,5 N (5.4 oz.)
alternative: 0,3 N (1.1 oz.); 0,6 N (2.2 oz.); 1,0 N (3.6 oz.); 2,25 N (8.1 oz.)

Electrical Data

Current Rating: **max. 24 A**
R_i typical: **< 10 mΩ**

Operating Temperature

Standard: -40° up to +80° C
with 1,5 N and 2,25 N-Spring: -100° up to +120° C

Mounting Hole Size for KS - 113 30 M2

in CEM 1 and FR 4: Ø 2,99 mm (.118)

Mounting Hole Size for HSS - 120 and KS - 113

with Receptacle: see GKS-113 (Page 62)
without Receptacle: Ø 2,65 mm (.104)

Materials

Plunger: Steel or BeCu, gold-plated
Barrel: Brass, gold-plated
Spring: Steel, gold-plated or stainless Steel
Receptacle: Brass, gold-plated

Applications:
see series HSS - 150 on Page 70

Ordering Example:

Series	Tip Material 2 = Stahl 3 = CuBe	Tip Style	Tip diameter ($^1/_{100}$ mm)	Plating A = Gold	Spring Force (dN)	Collar Height (mm)	Special Designation alternative "M"
HSS	120	306	300	A	15	02	

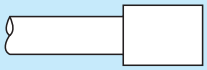
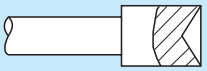
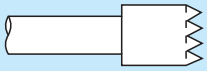
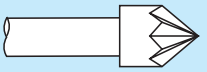
Test Probe: HSS 120 306 300 A 15 02
Receptacles for HSS-120 (without "M"): KS – 113 30 | KS – 113 23 | KS – 113 46
Receptacles for HSS-120 ... M: KS – 113 30 M2
Tool for Screw-in Probe HSS - 120 ... M: SW-ZW-GKS – 113 M (for Tip Diameter > 3,0 mm)
Tool for Screw-in Probe HSS - 120 ... M: SW-ZW-GKS – 113 M-B (for Tip Diameter ≤ 3,0 mm)

HSS 150 / M

Grid:
≥ 5,08 mm
≥ 200 Mil

High-Current Probe up to 50 A
Install. Height: 10,8 mm (.425)
Recomm. Stroke: 4,4 mm (.173)

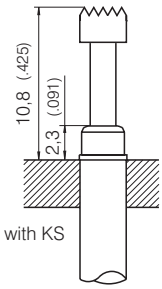
Available Tip Styles

Material	Tip Style	Standard Plating	Special Versions Ø	Special Versions mm (Ø
nch)				
3	02  Ø 4,00 (.157)	A		
3	03  Ø 4,00 (.157)	A		
3	06  Ø 4,00 (.157)	A	3,00	(.118)
3	17  Ø 3,00 (.118)	A		

Collar Height and Installation Height

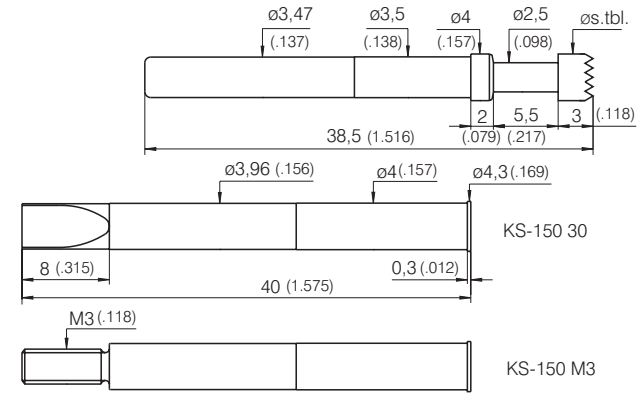
The Installation Height of the Tip (Dimension with Receptacle) is determined by the Collar Height.

Collar Height	Installation Height (with KS)
02 / 02 M	10,8 mm (.425)

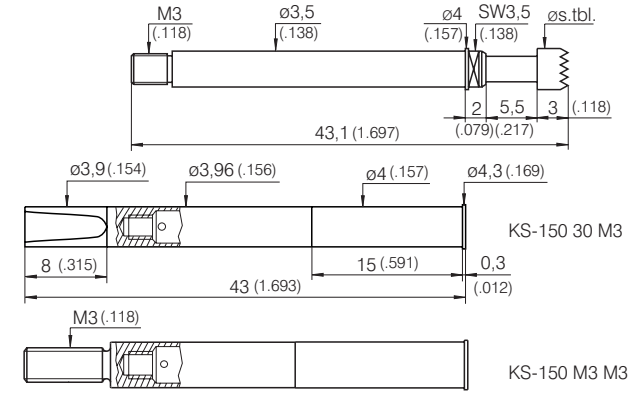


Mounting and Functional Dimensions

HSS - 150



HSS - 150 ... M



Mechanical Data

Working Stroke: 4,4 mm (.173)
Maximum Stroke: 5,5 mm (.217)
Spring Force at Working Stroke: 3,0 N (10.8 oz.)
alternative: 5,0 N (18.1 oz.)

Electrical Data

Current Rating: **50 A**
R_i typical: **≤ 10 mΩ**

Operating Temperature

Standard: -100° up to +120° C

Mounting Hole Size for KS-150 30 M3 and KS-150 M3 M3

in CEM 1 and FR 4: Ø 3,99 mm (.157)

Mounting Hole Size for HSS-150 and KS-150

with Receptacle: Ø 3,98 - 3,99 mm (.157)
without Receptacle: Ø 3,50 mm (.138)

Materials

Plunger: BeCu, gold-plated
Barrel: Brass, gold-plated
Spring: stainless Steel
Receptacle: Brass, gold-plated

Applications

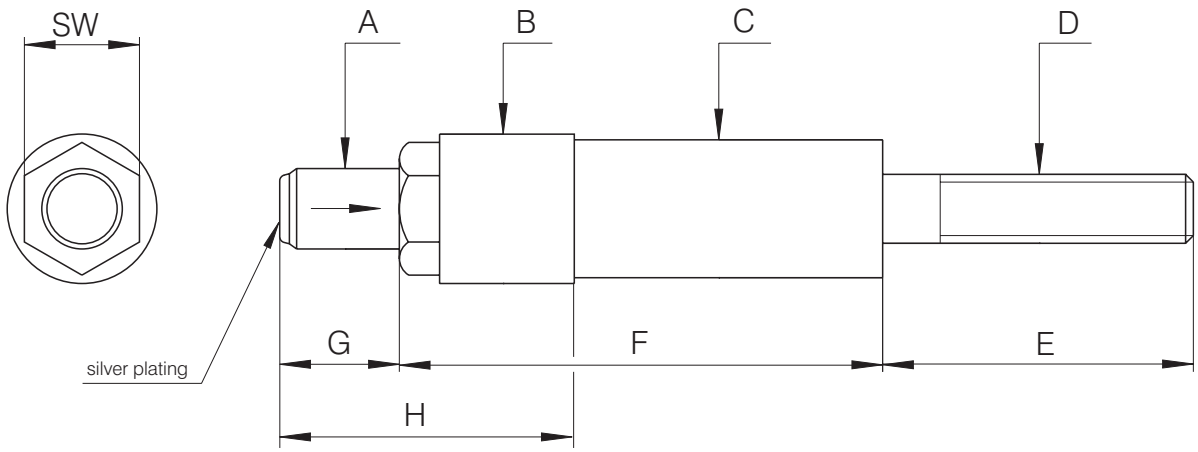
– High-current transfer during Functional Test
– Power-Supply Test
– Burn-In Test
– Contacting element in permanent use
– Usage with AC and DC

Ordering Example:

Series	Tip Material 3 = CuBe	Tip Style	Tip diameter ($^1/_{100}$ mm)	Plating A = Gold	Spring Force (dN)	Collar Height	Special Designation alternative "M"
Test Probe:	H S S	1 5 0	3	0 6	4 0 0	A	3 0	0 2	
Receptacles for HSS-150 (without "M"):	K S – 1 5 0 3 0			K S – 1 5 0 M 3					
Receptacles for HSS-150 ... M:	K S – 1 5 0 3 0 M 3			K S – 1 5 0 M 3 M 3					
Tool for Screw-in Probe HSS - 150 ... M:	S W - Z W - H S S – 1 5 0 M								

HSS 2259–2532

High Current Test Probe



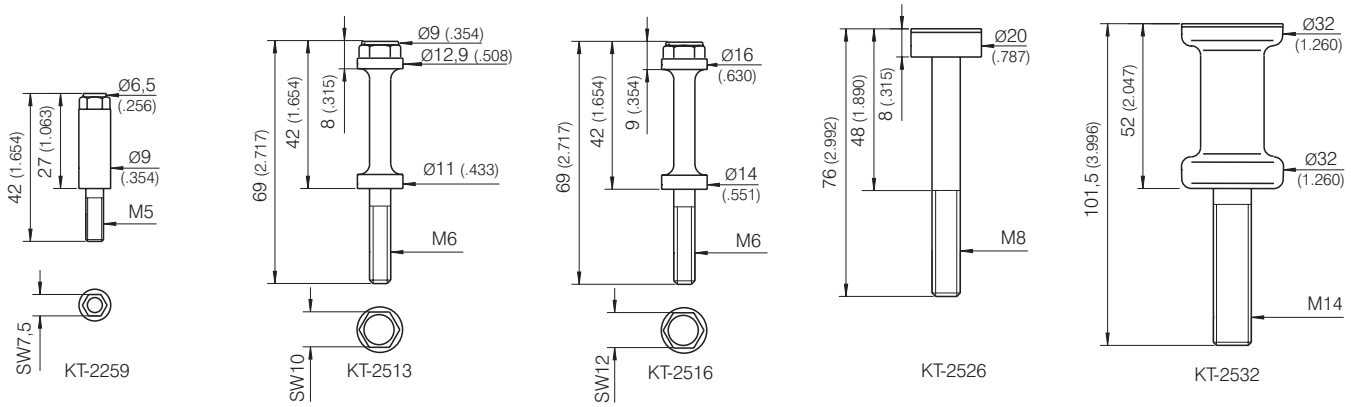
Order No.	**Maximum Current A**	Transition Resistance mΩ	Spring Force Pre-Load N (oz.)	Spring Force Work. Stroke N (oz.)	Ø A mm	Ø B mm	Ø C mm	D Thread	E mm	F mm	G mm	H mm	SW Spanner Size	Silver Plating mm
2259	**25**	1,0	5 (18.1)	10 (36.0)	4,9 (.193)	9 (.354)	9 (.354)	M 5	20 (.787)	28 (1.102)	9,5 (.374)	37,5 (1.476)	SW 7	1 (.039)
2513	**35**	0,7	6 (21.7)	12 (43.2)	7 (.276)	13 (.512)	12 (.472)	M 6	27 (1.063)	42 (1.654)	10,5 (.413)	25,7 (1.012)	SW 10	1 (.039)
2516	**100**	0,5	7 (25.2)	17 (61.2)	9 (.354)	16 (.630)	15 (.591)	M 6	27 (1.063)	42,2 (1.661)	12 (.472)	27 (1.063)	SW 12	1 (.039)
2526	**200**	0,3	38 (136.8)	58 (208,8)	16 (.630)	26 (1.024)	25 (.984)	M 8	27 (1.063)	52 (2.047)	11 (.433)	40 (1.575)	SW 20	3 x Ø6 (.236)
2532	**400**	0,1	70 (252.0)	116 (417.6)	25,9 (1.020)	32 (1.260)	32 (1.260)	M 14	51 (2.01)	52 (2.008)	11 (.433)	63 (2.480)	–	3 x Ø8 (.315)

Mechanical Data
Working Stroke: 7,0 mm (.276)
Max. Working Stroke: see Table above - column "G"

Electrical Data see Table above

Materials
Plunger: Brass, silver-plated
Silver-plating on the Contact Surface
Barrel: Brass, silver-plated
Spring: Stainless Steel

Contacting Terminals for High Current Test Probes (with silver plating)



Materials
Contact Terminals: Brass, silver-plated
Silver-plating on the Contact Surface

Ordering Example:

High-Current Test Probe: H S S 2 2 5 9
Contact Terminal: K T 2 2 5 9

SKS 215 M

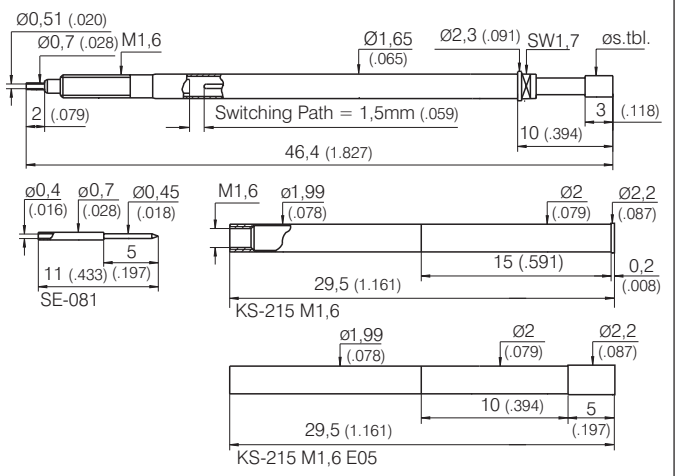
Grid:
≥ 2,54 mm
≥ 100 Mil

Screw-in Switching Probe
Install. Height: 10,5 - 20,0 mm (.413 - .787)
Switching path: 1,5 mm (.059)

Available Tip Styles

Material	Tip Style	Standard Plating	Special Versions Ø mm	Special Versions (Ø
inch)				
0	02 Ø 1,80 (.071)	A		
3	02 Ø 1,80 (.071)	A	1,00	(.039)
3	03 Ø 1,80 (.071)	A		
3	05 Ø 1,00 (.039)	A		
3	06 Ø 1,80 (.071)	N		

Mounting and Functional Dimensions

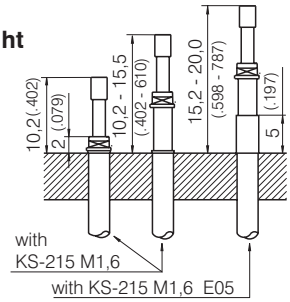


Mechanical Data

Switching path:	1,5mm (.059) ± 0,2 mm (.008)
Maximum Stroke:	5,0 mm (.197)
Spring Force at Switching Point:	0,9N (3.2oz.)
Spring Force at 80% Stroke:	3,0 N (10.8oz.)
alternative:	0,8N (2.9oz.); 1,5N (5.4oz.)

Collar Height and Installation Height

Crimps in the Receptacle prevent the Test Probe from rotating. Different Installation Heights can be variably achieved with two different Receptacles:



Designation	Installation Height
KS-215 M1,6	10,5 - 15,5 mm (.413 - .610)
KS-215 M1,6 E05	15,2 - 20,0 mm (.598 - .787)

Electrical Data

Current Rating: 3 A

Mounting Hole Size

in CEM 1 and FR 4: Ø 1,99 mm (.078)

Materials

Plunger:	BeCu, gold- or nickel-plated (or gold-plated with Insulator Cap)
Barrel:	Brass, gold-plated
Spring:	Steel, gold-plated
Receptacle:	Brass, gold-plated

Ordering Example:

Series	Tip Materials 0 = Delrin 3 = BeCu	Tip Style	Tip Diameter ($^1/_{100}$ mm)	Plating N = Nickel A = Gold	Spring Force (dN)	Collar Height (mm)	Type

Test Probe:	S K S	2 1 5	3	0 2	1 8 0	A	3 0	0 2	M
Receptacles:	K S – 2 1 5 M 1,6		K S – 2 1 5 M 1,6 E 0 5					
Plug:	S E – 0 8 1							
Tool for Screw-in Probe:	S W Z W GKS - 112 M - B							

Screw-in Switching Probe
Installation Height: 10,5 - 26,5 mm (.413 - 1.043)
Switching path: 1,7 mm (.067)

NEW

Grid:
≥ 3,50 mm
≥ 140 Mil

SKS 465 M / S

Available Tip Styles
for SKS-465 ... M

Material	Tip Style	Standard Plating	Special Versions Ø mm	Special Versions (Ø inch)
0	02 Ø 3,00	A	5,00 2,30	A A
3	02 Ø 3,00	A		
3	03 Ø 2,30	A		
3	06 0,4 ø2,3 Ø 1,00	A		
3	06 Ø 2,30	A	4,00	A
3	53* Ø 2,30	A		
3	56* 0,4 ø2,3 Ø 1,00	A		
3	56* Ø 2,30	A		

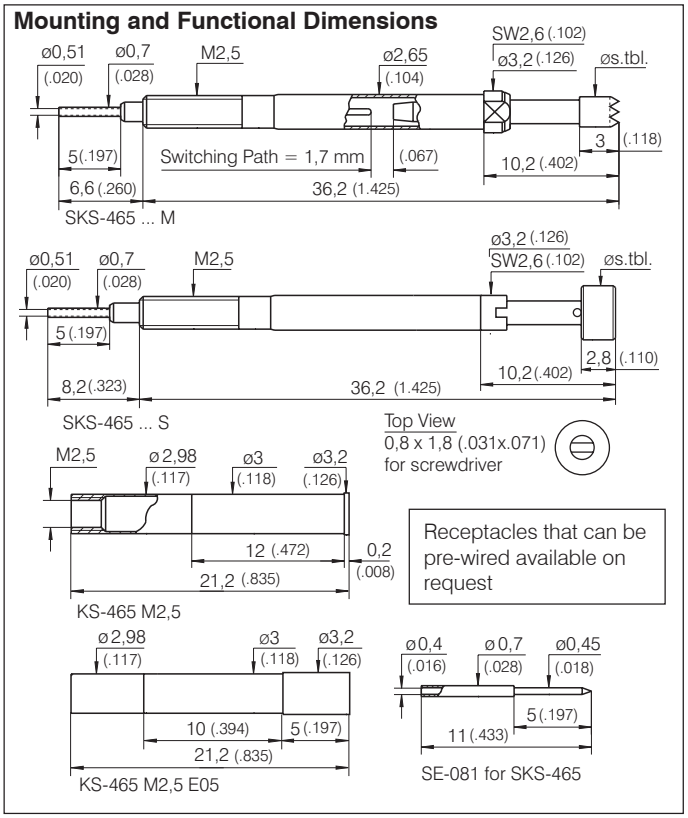
for SKS-465 ... S

Material	Tip Style	Standard Plating	Special Versions Ø mm	Special Versions (Ø inch)
3	02 Ø 3,00 (.118)	A	3,50 4,00	(.138) (.157)
3	02 Ø 4,50 (.177)	A	5,00 5,50 5,90	(.197) (.217) (.232)
3	52* Ø 3,00 (.118)	A	3,50	(.138)

* Tip Length 9,5 mm (.374)

Note: Test Probes with Tip Diameter > 3,0 mm cannot be assembled with the available Screw-in Tools.
Test Probes with SKS-465 ... S are assembled with a normal screwdriver.

Mounting and Functional Dimensions



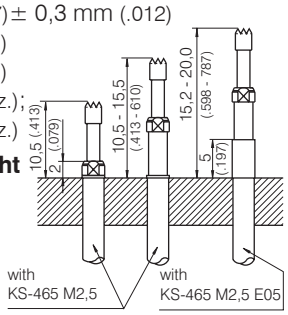
Receptacles that can be pre-wired available on request

Mechanical Data

Maximum Stroke:	5,2 mm (.205), (4,5 mm (.177) at Typ "S")
Switching Path:	1,7 mm (.067)± 0,3 mm (.012)
Force at Switching Point:	0,7 N (2.5 oz.)
Force at 80 % Stroke:	2,0 N (7.2 oz.)
alternatives:	3,5 N (12.7 oz.); 9,0 N (32.5 oz.)

Collar Height and Installation Height

Crimps in the Receptacle prevent the Test Probe from rotating.
Different Installation Heights can be variably achieved with two different Receptacles:



Designation	Install. Heights with Tips 02/03/06	Install. Heights with Tips 52/53/56
KS-465 M 2,5	10,5-15,5 mm (.413-.610)	17,0-22,0 mm (.413-.610)
KS-465 M 2,5 E05	15,2-20,0 mm (.598-.787)	21,7-26,5 mm (.413-.610)

Electrical Data

Current Rating: 3 A

Mounting Hole Size

in CEM 1 and FR 4: Ø 2,98 - 2,99 mm (.117 - .118)

Materials

Plunger:	BeCu, gold-plated, with or without Insulator Cap
Barrel:	Brass, gold-plated
Spring:	Steel, gold-plated resp. stainless Steel
Receptacle:	Brass, gold-plated
Insulation:	Teflon

Ordering Example:

Series	Tip Materials 0 = Delrin 3 = CuBe	Tip Style	Tip diameter ($^1/_{100}$ mm)	Plating A = Gold	Spring Force (dN)	Collar Height (mm)	Type alternative "S"
SKS	465	3 06	230	A	20	02	M

Test Probe: SKS 465 3 06 230 A 20 02 M

Receptacles: KS-465 M2,5 | KS-465 M2,5 E05

Tool for Screw-in Probe SKS-465 ... M: SW ZW SKS - 465 M — for Tip-Ø > 2,3 (> .091) and ≤ 3,0 (≤ .118)

Tool for Screw-in Probe SKS-465 ... M: SW ZW SKS - 465 M-B — for Tip-Ø ≤ 2,3 mm (≤ .091)

Plug: SE-081

All specifications are subject to change without prior notification

GKS 710

Grid:
≥ 2,54 mm
≥ 100 Mil

Non-Rotating Test Probe
Installation Height: see below
Recommended Stroke: 4,0 mm (.157)

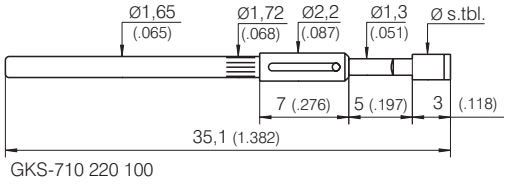
Available Tip Styles

Material	Tip Style	Standard Plating	Install. Height (without KS)	Special Version Ø / Plating
2	20 — 1,00 (.039)	A	15 (.591)	
2	20 — 0,50 (.020)	R	18 (.709)	0,40/R (.016)
2	21 — 0,50 (.020)	A	15 (.591)	1,30/A (.051)
2	22 — Ø 2,00 (.079)	A	15 (.591)	
2	23 — Ø 1,30 (.051)	R	13 (.512)	
2	26 — 2,00 (.079)	A	15 (.591)	

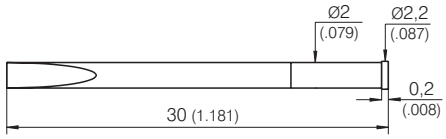
Note:
The knurl on the barrel of the Test probe guarantees sure fitting in the Receptacle or directly into the Probe Plate.
Please specify Special Designation "S" when using Receptacle KS-712 30.

Tools:
Insertion and Extraction Tools for GKS and KS > see Page 58.

Mounting and Functional Dimensions



GKS-710 220 100



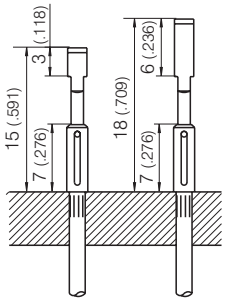
KS-712 30

Mechanical Data

Working Stroke:	4,0 mm (.157)
Maximum Stroke:	5,0 mm (.197)
Force at Work. Stroke:	1,5 N (5.4 oz.)
alternative:	3,0 N (10.8 oz.); 5,0 N (18.1 oz.)

Collar Height and Installation Height

The Installation Height of the Tip (Dimension without KS) is determined by the Collar Height and the Tip Length
(> see Table "Available Tip Styles").



without KS

Electrical Data

Current Rating:	5-8 A
R_i typical:	30 mΩ

Mounting Hole Size

in Material CEM 1	
with Receptacle:	Ø 1,98 - 2,00 mm (.078)
in Material FR 4	
with Receptacle:	Ø 1,99 - 2,01 mm(.079)
without Receptacle:	Ø 1,66 mm (.065)

Materials

Plunger:	Steel, gold- or rhodium-plated
Barrel:	Brass, gold-plated
Spring:	Steel, gold-plated
Receptacle:	Brass, gold-plated

Ordering Example:

Series	Tip Material 2 = Steel	Tip Style	Tip Diameter ($^1/_{100}$ mm)	Plating A = Gold R = Rhodium	Spring Force (dN)	Collar Height (mm)	Special Designation alternative "S"
Test Probe:	G K S	7 1 0	2	2 0	1 0 0	R	1 5	0 7	
Receptacle:	K S – 7 1 2 30								

Non-Rotating Test Probe
Installation Height: see below
Recommended Stroke: 4,0 mm re. 6,0 mm (.157-.236)

Grid:
≥ 5,08 mm
≥ 200 Mil

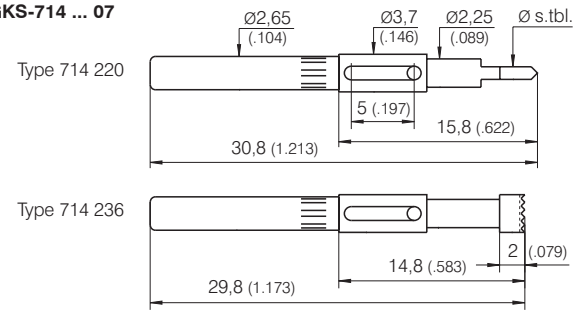
GKS 714

Available Tip Styles

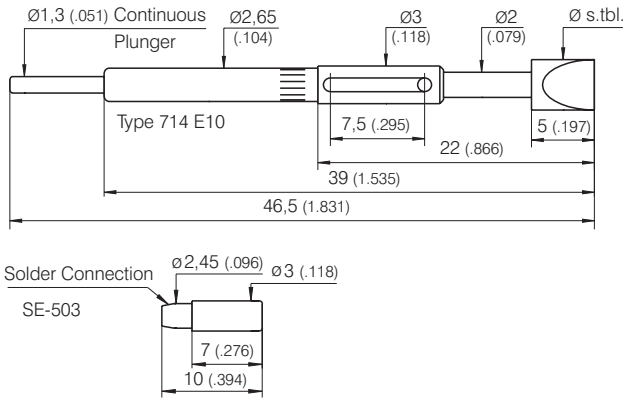
Material	Tip Style		Standard Plating	Install. and Functional Dimen.	
				Collar Height	Inst. Height
2	20	504	R	E 07	18,8 (.740)
2	20	510	R	E 07	15,8 (.622)
2	22	Ø 4,00 (.157)	A	E 10	22,0 (.866)
2	23	Ø 2,00 (.079)	A	E 10	22,0 (.866)
2	23	Ø 4,00 (.157)	A	E 10	22,0 (.866)
2	36	630	R	E 07	14,8 (.583)

Mounting and Functional Dimensions

GKS-714 ... 07



GKS-714 ... 10



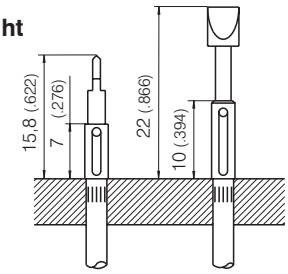
Mechanical Data

	Collar Height 07	Collar Height 10
Working Stroke:	4,0 mm (.157)	6,0 mm (.236)
Maximum Stroke:	5,0 mm (.197)	7,0 mm (.276)

Spring Force at Working Stroke: 1,5 N (5.4 oz.)
alternative: 3,0 N (10.8 oz.); 5,0 N (18.1 oz.)

Collar Height and Installation Height

The Installation Height of the Tip (Dimension without KS) is determined by the Collar Height and the Tip Length
(> see Table "Available Tip Styles").



Electrical Data

Current Rating: 8-10 A
R_i typical: 30 mΩ

Mounting Hole Size

with Receptacle: Ø 2,98 - 2,99 mm (.117 - .118))
without Receptacle: Ø 2,66 mm (.105)

Materials

Plunger: Steel, gold- or rhodium-plated
Barrel: Brass, gold-plated
Spring: Steel, gold-plated
Receptacle: Brass, gold-plated

Note:
For the Test Probe series 714 , use Receptacle KS-113 23
> see Page 62.

The knurl on the barrel of the Test Probe guarantees sure fitting in the Receptacle or directly into the Probe Plate

Tools:
Insertion and Extraction Tools for GKS and KS > see Page 58.

Ordering Example:

Series	Tip Material 2 = Steel	Tip Style	Tip Diameter (1/100 mm)	Plating A = Gold R = Rhodium	Spring Force (dN)	Collar Height (mm)
GKS	714	2	20	504	R	15	07

Test Probe: GKS 714 220 504 R 15 07
Receptacle: KS-113 23
Lamellar Plug for Type 714 E10: SE-503

Please copy this form and forward it to Fax No.: +49 7531 8105-65

To:

INGUN Prüfmittelbau GmbH

Probe Design Dept.

Max-Stromeyer-Str. 162

D-78467 Konstanz

Germany

From:

Company: _____

Dept.: _____

Name: _____

Street: _____

Post/Zip Code: _____

City: _____

Country: _____

Fax: _____

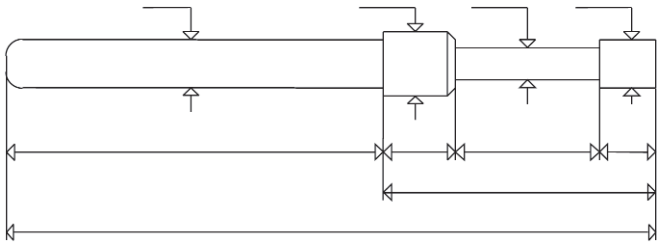
Tel.: _____

E-mail: _____

Your Requirement–Our Solution

Features:

Short description / Operation Example:



Tip:

Tip-Style: _____

Material: _____

Plating: _____

Electrical data

Imax: _____ A

Umax: _____ V

Rmax: _____ Ω

Grid:	**Stroke mm (inch)**	**Force (N)**
Pre-Load		
Working Stroke		
Max. Stroke		
Required life-expectancy:		

Environmental Conditions and Application Range:

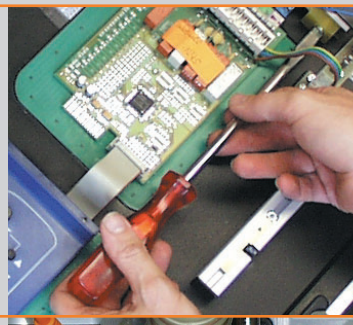
Temperature range from: _____ °C to: _____ °C

Rough Operation/Usage ❑ Radial Force ❑ Vibration ❑ Snap Effect ❑

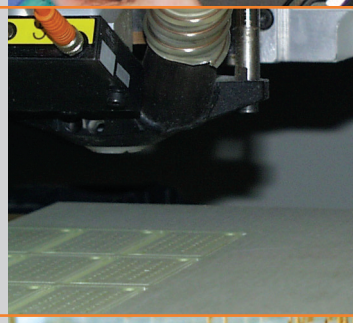
High Humidity ❑ Contamination ❑ Other ❑

The Best Service leads to Success

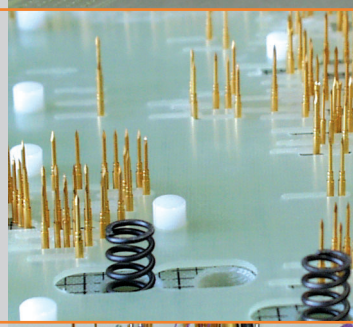
Customising of Test Fixtures



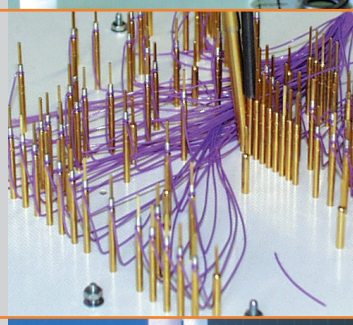
Drilling/Milling



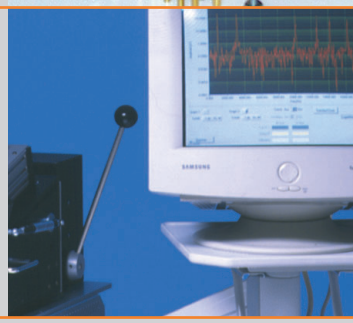
Customised Probe Plate



Wiring according to wiring data



Test Systems for individual Testing Requirements



What belongs to the best Testing Concept is especially...
...Know-how and Service. Our customers and users benefit from over 30 years of experience of designing and manufacturing Test Equipment. This guarantees an ideal Testing Concept and ensures a problem-free Production Process.

„Quality through Precision-worldwide“

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Japan
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Mexico
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Singapore
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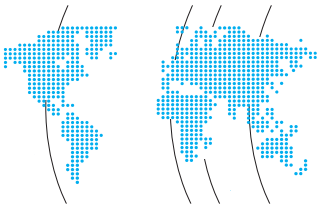
Thailand
USA

Representative



INGUN
Prüfmittelbau GmbH
Max-Stromeyer-Straße 162
D-78467 Konstanz
Germany
Tel. +49(0)7531/8105-0
Fax +49(0)7531/8105-65
info@ingun.com
www.ingun.com