ingun®
Partner for Future Technology

COMPATIBLE WITH EXISTING INGUN S-Line SOCKETLESS SYSTEMS

INGUN S-Line

Precise, durable test probes
for small grid sizes

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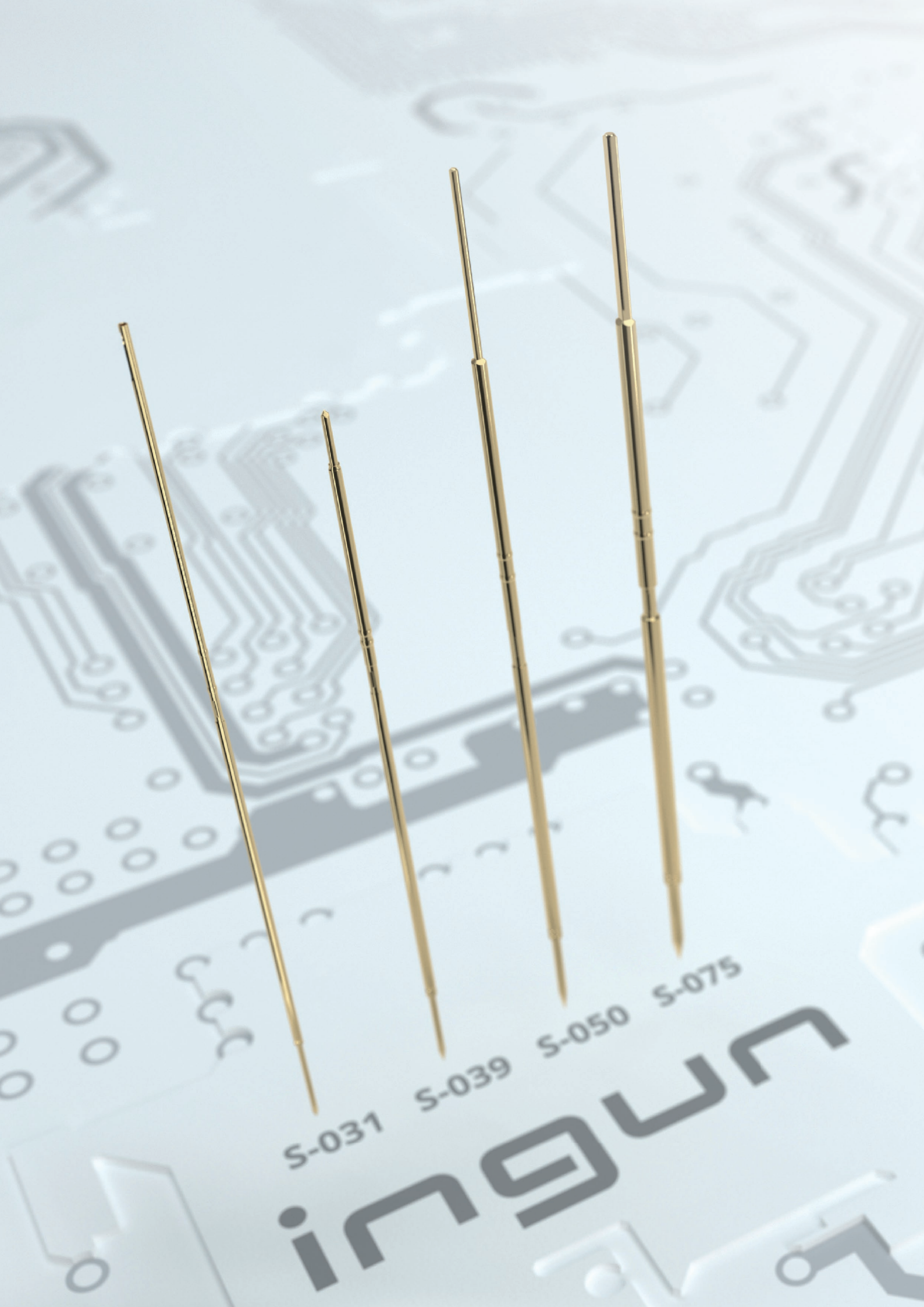

S-031
S-039
S-050
S-075
ingun

INGUN S-Line

Socketless Line

Easy, reliable testing
without receptacles

The new socketless series from INGUN (S-Line) with S-Line test probes and S-Line contact terminals enables testing without receptacles. Due to the omission of receptacles, our S-Line test probes fit in common grid sizes, despite being larger in diameter, and offer better mechanical durability. Thanks to the precise, robust S-Line test probes, you can test accurately using precise, replicable signals in a small grid.

All advantages at a glance

- ✓ **Use of larger test probes for increased contacting accuracy and longer service life**
- ✓ **Minimal grid dimensions due to omission of receptacles (socketless)**
- ✓ **Available for 031, 039, 050, and 075 Mil grids**
- ✓ **Standard and long stroke versions available for dual-stage contacting set-ups**
- ✓ **Large selection of tip styles and spring forces for optimal contact with the test point**
- ✓ **Variable installation height allows for optimal consideration of different test point levels**
- ✓ **Can be implemented in all test fixtures available on the market**
- ✓ **Compatible with all existing manufacturing and installation techniques**
- ✓ **Simple electrical connection thanks to standardised procedures**

INGUN is your one-stop shop

- ✓ **High-quality testing technology Made in Germany**
- ✓ **Ideally-suited contacting solutions for the best possible connection between test point and test system**
- ✓ **Order products quickly and easily online (EU)**
- ✓ **Personal, competent service**

INGUN offers the world's largest portfolio of test probes, test fixture kits, and customising accessories. In addition, we continuously offer you new, innovative test solutions. INGUN is your reliable Partner for Future Technology.

The new **INGUN S-Line** series is now also available in the **online shop.**

ingun.com/en/products
INGUN online shop

INGUN S-Line

Socketless Line

Smaller grid sizes
than when using conventional test probes

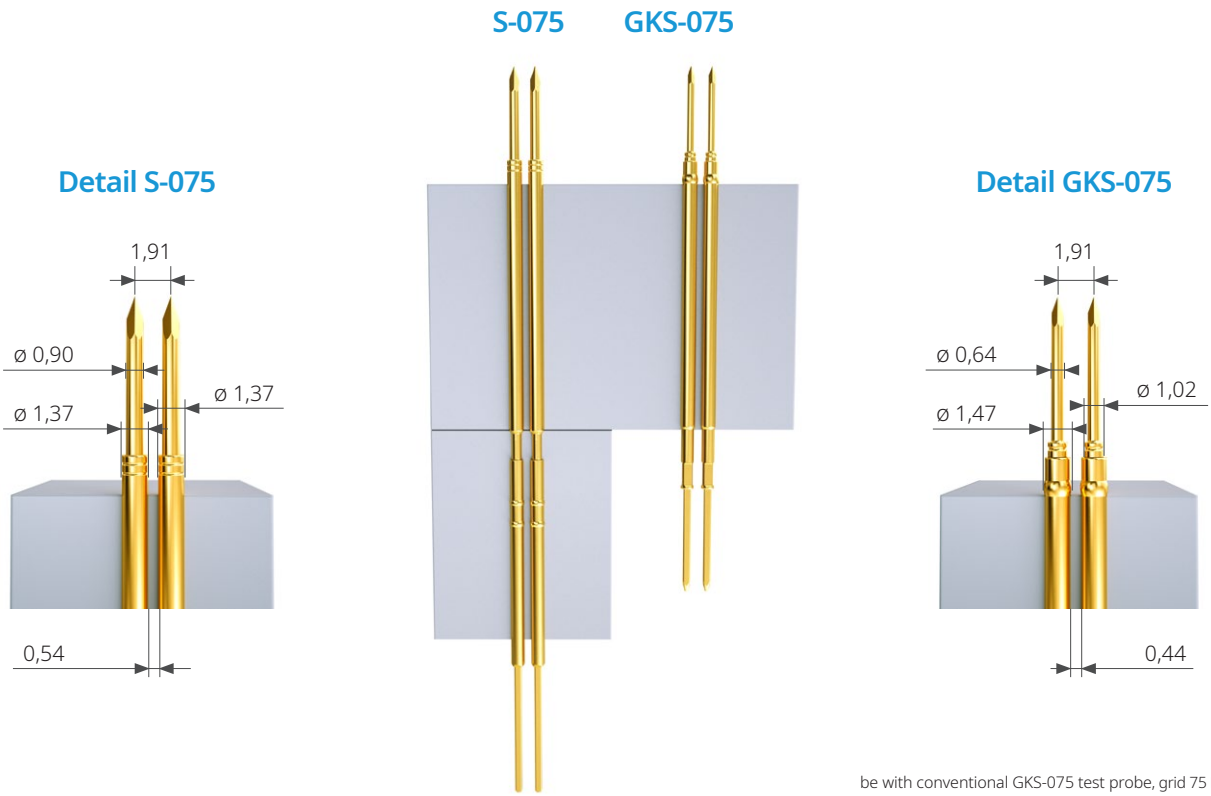
The new S-Line product series enables you to contact test points without the need for receptacles. Use larger test probes in common grid sizes in comparison to conventional test probes (GKS) with a receptacle. This gives ensures improved durability as the probes in socketless range have a longer service life, and achieves improved accuracy and precise, replicable signal

These advantages are achieved thanks to the concept using the S-Line test probe with a S-Line contact terminal (KT) mounted below. The S-Line contact terminal is pressed into the S-Line contact terminal plate (SKP). The test probe is then fitted onto the contact terminal, thus creating a durable, reliable electrical connection. The omission of a receptacle allows the S-Line test probes to be installed in close proximity to each other.

Whereas the maximum diameter of the receptacle is decisive for the grid size when using standard test probes, in the S-Line range, the pitch distance is determined by the diameter of the test probe. Figure 1 shows the minimum grid size for S-075 test probes in comparison to conventional GKS-075 test probes.

Grid size	S-Line	Probe Ø	Standard-GKS	Probe Ø	Receptacle (KS) Ø
1.91 mm (75 Mil)	S-075	Ø 1.37 mm	GKS-075	Ø 1.02 mm	1.47 mm
1.27 mm (50 Mil)	S-050	Ø 1.01 mm	GKS-050	Ø 0.78 mm	1.05 mm
1.00 mm (39 Mil)	S-039	Ø 0.78 mm	GKS-040	Ø 0.61 mm	0.82 mm
0.80 mm (31 Mil)	S-031	Ø 0.62 mm	-	-	-

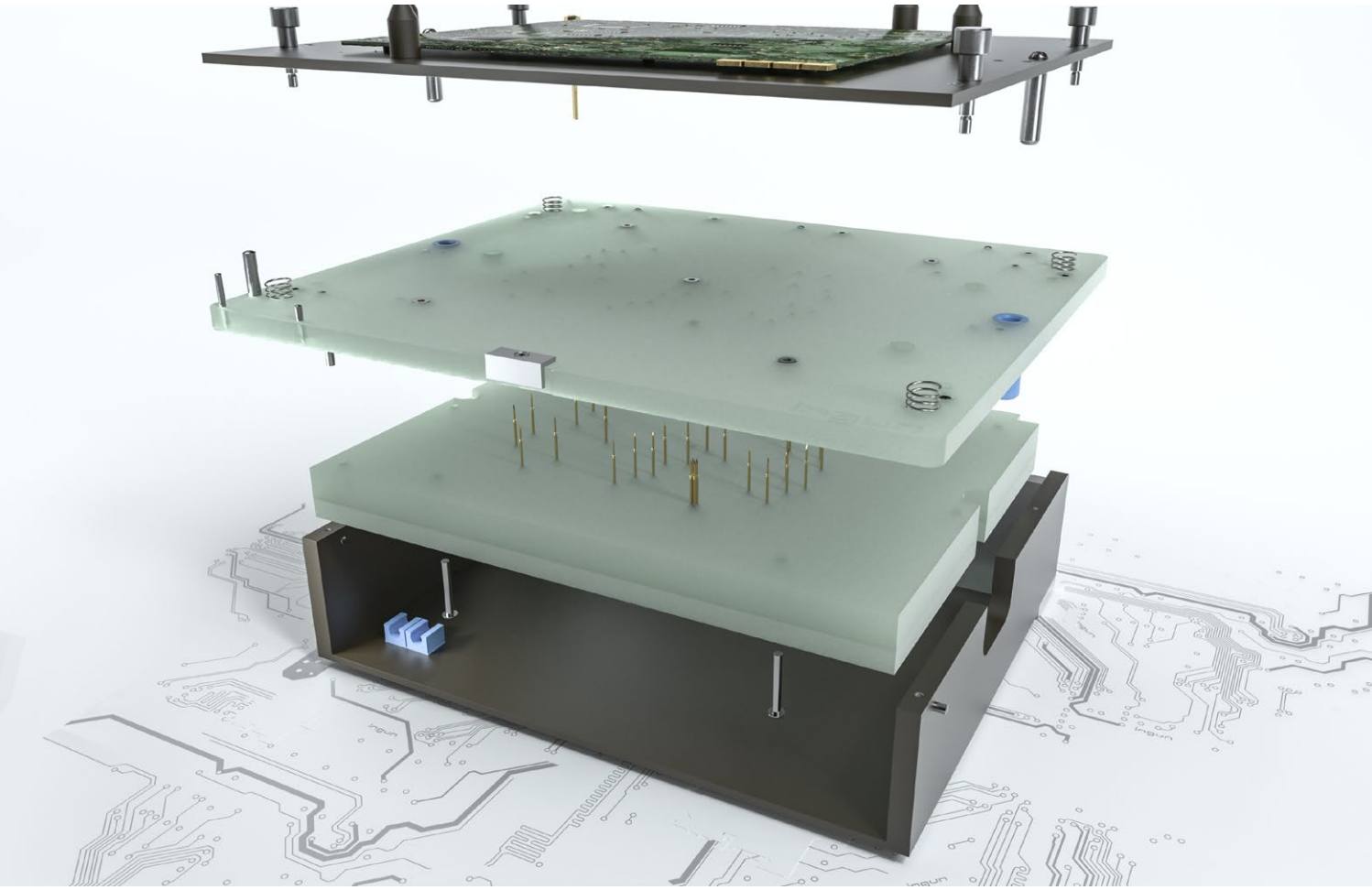
Tab. 1: Comparison of S-Line test probes and standard test probes (GKS)



be with conventional GKS-075 test probe, grid 75 Mil (1.91 mm)

INGUN S-Line

Socketless Line



Freely adjustable installation height

The installation height of the entire S-Line system (test probe and contact terminal) is adjusted by varying the insertion depth of the contact terminal in the plate. This is possible thanks to two press rings on the contact terminal, meaning that various test point levels (e.g., pad or pin) can be taken into account for an optimum test set-up.

Improved contacting accuracy for reliable contact

The accuracy of the S-Line test probes is improved by the guide plate and the contact terminal with the two press rings. The two press rings ensure centric alignment of the contact terminal in the mounting hole.

A wide range of tip styles and spring forces are available for optimum contact with the test point. The new S-Line series also includes test probes with increased spring pre-load (E version) to provide more force to penetrate any contamination present on the test point.

Easy integration and installation in common test fixtures

Socketless test probes are available with a standard stroke or a long stroke for dual-stage contacting applications. If maintenance is required, these probes can be exchanged as easily as conventional test probes. The test probes are simply removed from the contact terminal and new ones are installed. The wiring on the contact terminal remains intact.

The electrical connection is made via the contact terminal itself. Wire-wrap, wireless, or wire-grip versions of the contact terminals are available. In general, S-Line test probes can be easily installed in all INGUN test fixtures as well as into other common test fixtures, such as Keysight, Terradyne, Tornos, etc.

Well-known production equipment and installation procedures are used in the production of S-Line fixtures. This means that the S-Line fixture plates are manufactured using the same milling and drilling machines as plates used for conventional test probes.

INGUN S-Line

Socketless Line

Calculation of the correct installation height
of the contact terminal for optimum contact

When designing the test fixture and calculating the required insertion depth of the contact terminal (dimension C) in the probe plate, two dimensions are relevant:

Dimension A: Length of test probe at working stroke (total length of test probe minus working stroke)

Dimension B: Distance from the top side of the contact terminal plate (SKP) to the bottom side of the PC board (DUT) when the test fixture is closed (actuated at working stroke)

Dimension C: Insertion depth of contact terminal = Dimension B - Dimension A (Exemplary calculation for INGUN test fixtures)

The thicknesses of plates used in the test fixture should be dimensioned so that both press rings of the contact terminal sit at least 0.5 mm in the contact terminal plate (SKP) (measured from both the top and the bottom of the contact terminal plate).

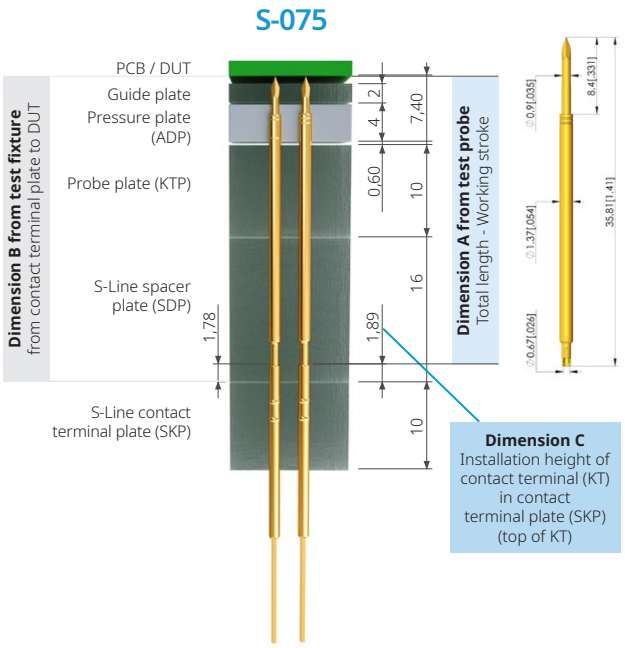


Figure 2: S-Line concept with required plates and dimensions. Example using wire-wrap probes

S-Line series	Total length of test probe	Working stroke	Dimension A probe length at working stroke	Dimension B from test fixture (example)	Dimension C insertion depth of contact terminal (KT) in plate (SKP)
S-031 S	38.35 mm	4.3 mm	34.05 mm	33.4 mm	-0.65 mm
S-031 L	42.16 mm	8.0 mm	34.16 mm	33.4 mm	-0.76 mm
S-039 S	36.83 mm	4.3 mm	32.53 mm	33.4 mm	0.87 mm
S-039 L	41.02 mm	8.0 mm	33.02 mm	33.4 mm	0.38 mm
S-050 S	35.81 mm	4.3 mm	31.51 mm	33.4 mm	1.89 mm
S-050 L	39.62 mm	8.0 mm	31.62 mm	33.4 mm	1.78 mm
S-075 S	35.81 mm	4.3 mm	31.51 mm	33.4 mm	1.89 mm
S-075 L	39.62 mm	8.0 mm	31.62 mm	33.4 mm	1.78 mm

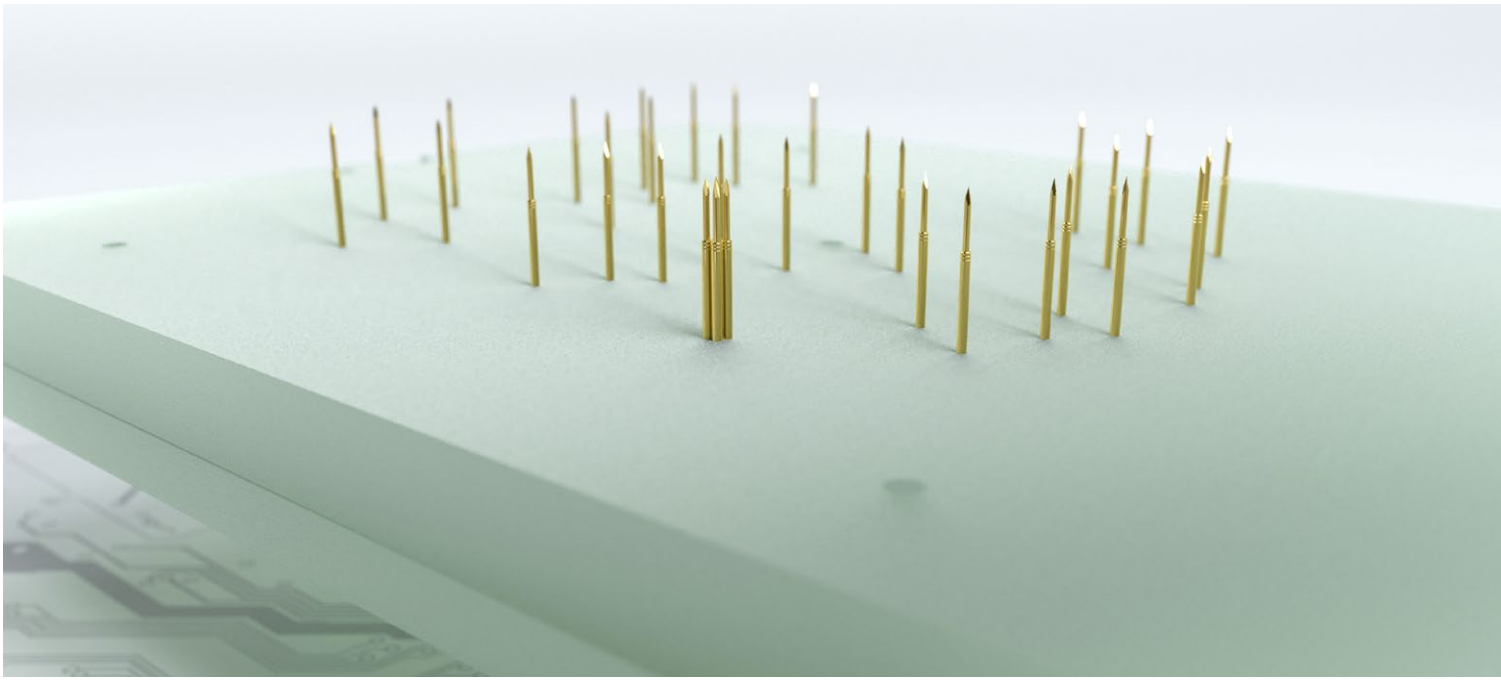
Tab. 2: Installation height calculation for contact terminals (example for MA-xx)

Customisation for wireless version

To create a wireless connection verison, the thickness of the underlying guide plate (SFP) must also be calculated. To do so, the height of the wireless contact terminal that protrudes from the probe plate (KTP) must be taken into account. In addition, the working stroke of the spring-loaded plunger of the wireless contact terminal should be approx. 60 - 80% of the maximum working stroke in the actuated state.
For more detailed information about and further support with the wireless version, please contact our customer service team at any time.

Drilling the respective S-Line fixture plates

Various fixture plates are required for the S-Line concept, see figure 2. It should be noted that in the S-Line probe plate (KTP), a press fit is created using the contact terminal. All other fixture plates must be drilled so ensure a clearance fit. The required drilling diameters can be found on the of the S-Line test probes product pages. When drilling, ensure that the respective plates are aligned flush with each other using a reference bore.



Installing the fixture plates and the test probes.

First, the required contact terminals are pressed into the mounting holes in the contact terminal plate (SKP). The previously calculated insertion depth must be observed. Next, the spacer plate (SDP) and guide plate (SFP) are installed in the guide bores using the alignment pins. Then the test probes are inserted and pressed onto the pin of the contact terminals. Finally, the probe plate (KTP) and any additional guide plates are installed.
The wiring of the contact terminals is done either before or after installing theses plates.

Tools for installing contact terminals and test probes

Precise, replicable measurements can only be achieved using test probes that have been mounted in the best possible way. INGUN offers you a variety of suitable tools for the optimum installation of S-Line test probes and contact terminals. You will find a complete overview of the tools at the end of this flyer.

INGUN S-Line

Socketless Line

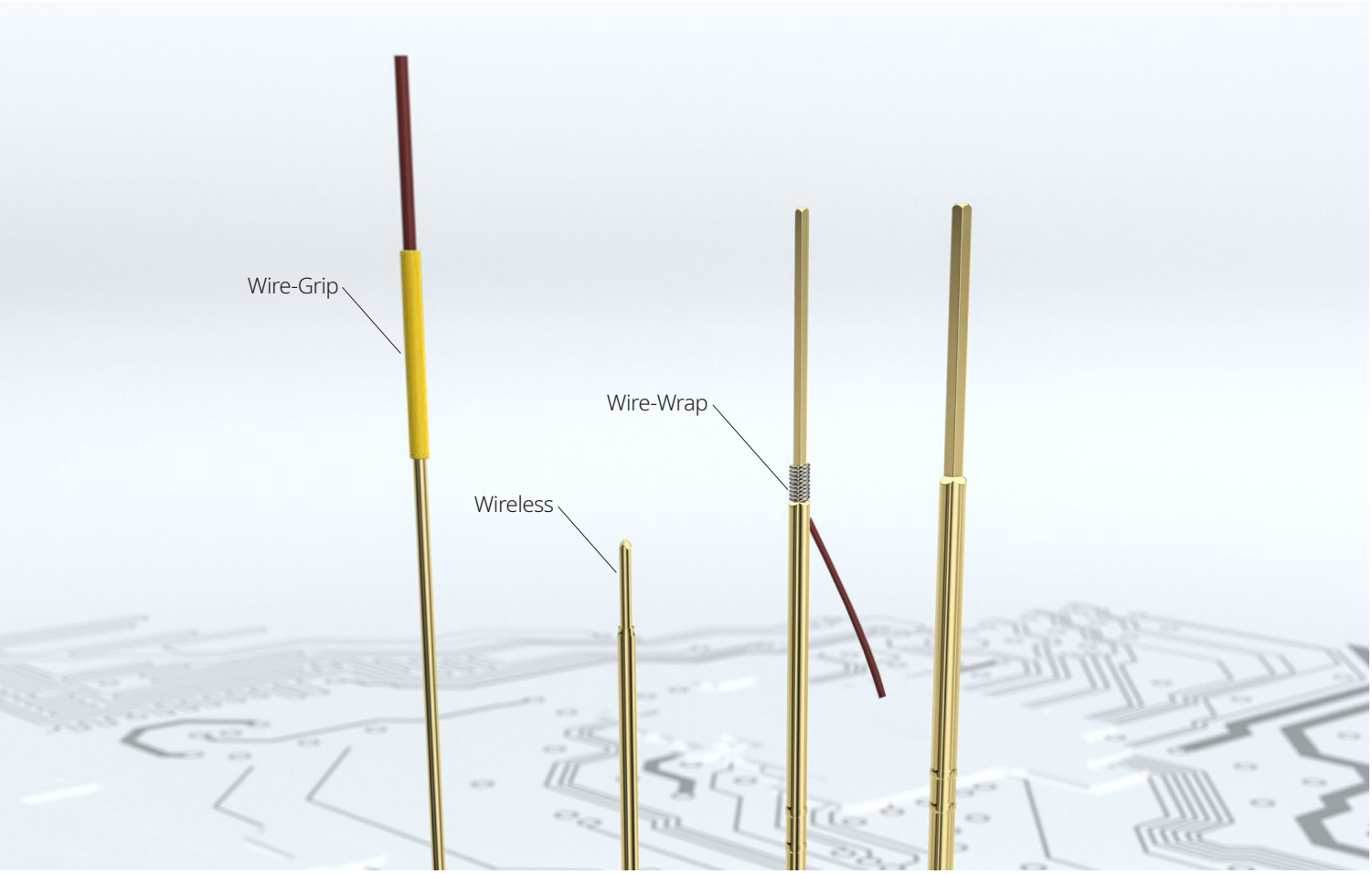
Connection techniques
for a reliable connection

Three different versions are available to ensure the reliable electrical connection of a cable to the contact terminal:

Wire-wrap
In wire-wrap wiring technology, a wire is wrapped around a square post at the base of the contact terminal. The wire is wound either manually or automatically using a specialised tool. This creates a permanent and reliable electrical connection

Wireless
Reliable signal transmission via contact terminals in small grids is often created by contacting spring-loaded plunger onto a printed circuit board (translator board) from above. In INGUN's socketless concept, the spring-loaded plunger is located at the bottom of the contact terminals.

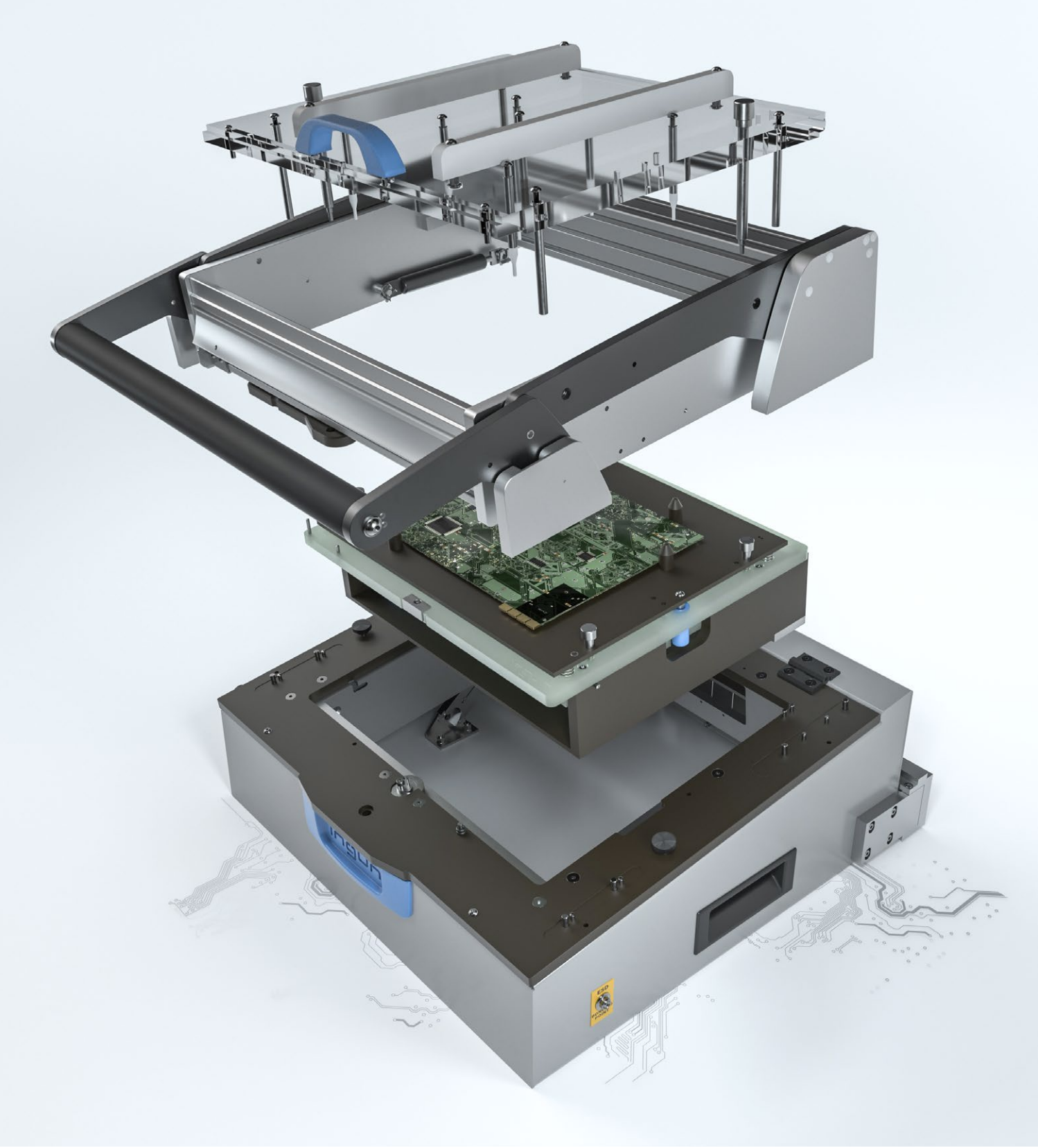
Wire-grip
Another possibility for wiring the contact terminal is the wire-grip method. Here the wire is inserted into the slot at the lower end of the contact terminal and securely connected with the help of a polyamide tube. This tube additionally protects contact terminals in close proximity to one another from unintentional electrical short circuits. INGUN also offers the appropriate tool for applying the polyamide tube.



INGUN S-Line

Socketless Line

Easy installation of the S-Line assembly kits
in INGUN exchangeable kits and test fixtures



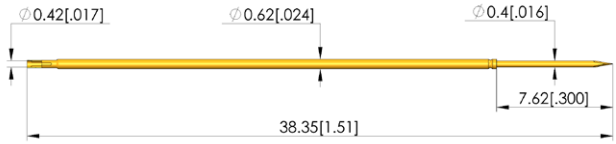
S-031 S

S-Line standard stroke

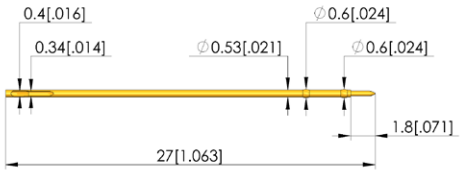
Grid:
≥ 0.80 mm
≥ 31 Mil
Adjustable installation height
Recommended stroke: 4.3 mm

Installation and functional dimensions

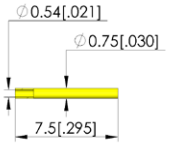
S-031 S



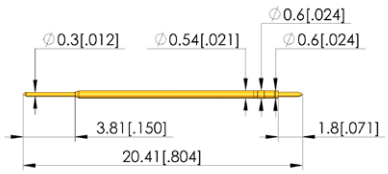
KT-S-031 57 27 wire-grip



PAS-S-031 GE-075 wire-grip tube



KT-031 67 20 wireless



Available tip styles

Version: S-031 S						
Material	Tip style		Diameter (mm)	Plating	Additional versions	
					ø	Plating
3	05		0.40	A		
3	07		0.40	A		
2	14		0.40	A		
2	38		0.40	A		
2	77		0.40	A		
2	91		0.40	A		
2	97		0.40	A		

Mechanical data

Working stroke:	4.3 mm
Maximum stroke:	6.35 mm
Spring force at working stroke:	1.5 N
Alternative spring forces:	0.8 N | 1.0 N | 2.2 N
Wireless contact terminal	
Maximum stroke:	3.8 mm

Electrical data

Current rating:	2 A
Typical resistance:	< 30 mΩ

Operating temperature range

Standard:	- 40° to + 80° C

Mounting hole (in CEM1 and FR4)

Probe plate (KTP)	ø 0.64 - 0.66 mm
S-Line spacer plate (SDP)	min ø 0.68 mm
S-Line contact terminal plate (SKP)	ø 0.55 - 0.57 mm
S-Line guide plate (SFP, Wireless)	ø 0.55 - 0.57 mm

Materials

Plunger:	steel or CuBe, gold-plated
Barrel:	bronze, gold-plated
Spring:	steel, gold-plated
Wire-grip contact terminal	CuBe, gold-plated
Wireless contact terminal	
Barrel:	bronze, gold-plated
Plunger and pin:	CuBe, gold-plated

Ordering example	Series	Tip material 2 = steel, 3 = CuBe	Tip style	Tip diameter (1/100 mm)	Plating A = Gold	Spring force (dN)	Collar-height (mm)	Special designation S - standard stroke
Test probe	S-031	2	91	040	A	15	00	S
Contact terminal	KT - S - 031	57	27					

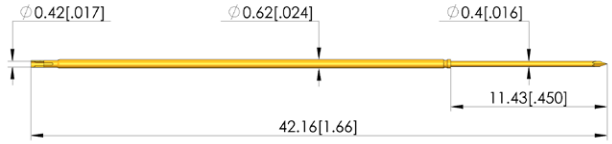
Grid:
≥ 0.80 mm
≥ 31 Mil
Adjustable installation height
Recommended stroke: 8.0 mm

S-031 L

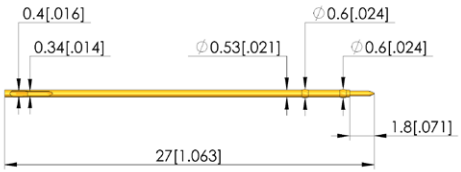
S-Line long stroke

Installation and functional dimensions

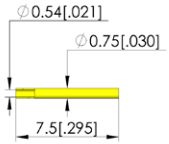
S-031 L



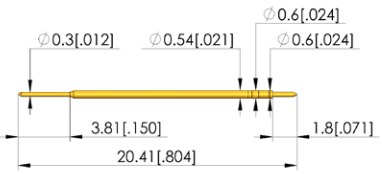
KT-S-031 57 27 wire-grip



PAS-S-031 GE-075 wire-grip tube



KT-031 67 20 wireless



Available tip styles

Version: S-031 L

Material	Tip style	Diameter (mm)	Plating	Additional versions: ø	Additional versions: Plating
2	38	0.40	A		
2	97	0.40	A		

Mechanical data

Working stroke:	8.0 mm
Maximum stroke:	10 mm
Spring force at working stroke:	0.8 N
Alternative spring forces:	1.5 N
Wireless contact terminal	
Maximum stroke:	3.8 mm

Electrical data

Current rating:	2 A
Typical resistance:	< 30 mΩ

Operating temperature range

Standard:	- 40° to + 80° C

Mounting hole (in CEM1 and FR4)

Probe plate (KTP)	ø 0.64 - 0.66 mm
S-Line spacer plate (SDP)	min ø 0.68 mm
S-Line contact terminal plate (SKP)	ø 0.55 - 0.57 mm
S-Line guide plate (SFP, Wireless)	ø 0.55 - 0.57 mm

Materials

Plunger:	steel or CuBe, gold-plated
Barrel:	bronze, gold-plated
Spring:	steel, gold-plated
Wire-grip contact terminal	CuBe, gold-plated
Wireless contact terminal	
Barrel:	bronze, gold-plated
Plunger and pin:	CuBe, gold-plated

Ordering example

	Series	Tip material (2 = steel, 3 = CuBe)	Tip style	Tip diameter (1/100 mm)	Plating (A = Gold)	Spring force (dN)	Collar-height (mm)	Special designation (L - long stroke)
Test probe	S-031	2	97	040	A	15	00	L
Contact terminal	KT - S - 031	57	27					

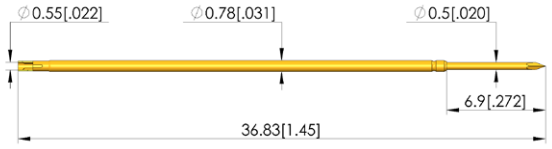
S-039 S and S-039 ES

S-Line standard stroke

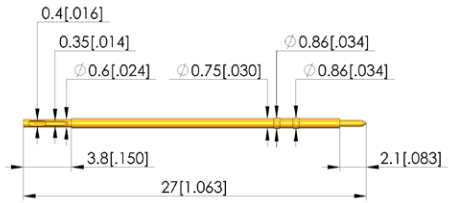
Grid:
≥ 1.00 mm
≥ 39 Mil
Adjustable installation height
Recommended stroke: 4.3 mm

Installation and functional dimensions

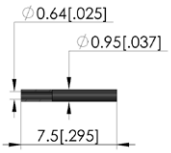
S-039 S



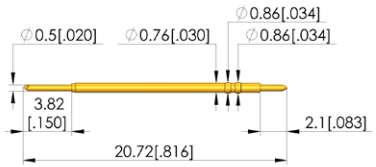
KT-S-039 57 27 wire-grip



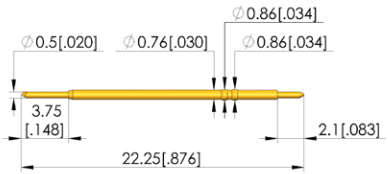
PAS-S-039 SCH-075 wire-grip tube



KT-S-039 67 21 wireless



KT-S-039 67 22 wireless



Available tip styles

Version: S-039 S / S-039 ES						
Material	Tip style		Diameter (mm)	Plating	Additional versions	
					ø	Plating
2	01*		0.50	A		
3	05		0.50	A		
3	07		0.50	A		
2	14*		0.28	A	0.50	A
2	38*		0.50	A		
2	77*		0.50	A		
2	91*		0.50	A		
2	97*		0.50	A		

Mechanical data

Working stroke:	4.3 mm
Maximum stroke:	6.35 mm
Spring force at working stroke:	1.5 N
Alternative spring forces:	0.8 N | 1.2 N |1.5 N | 2.0 N | 2.2 N*
Wireless contact terminal	
Maximum stroke:	3.8 mm

Electrical data

Current rating:	2-3 A
Typical resistance:	< 30 mΩ

Operating temperature range

Standard:	- 40° to + 80° C

Mounting hole (in CEM1 and FR4)

Probe plate (KTP)	ø 0.80 - 0.82 mm
S-Line spacer plate (SDP)	min ø 0.86 mm
S-Line contact terminal plate (SKP)	ø 0.80 - 0.82 mm
S-Line guide plate (SFP, Wireless)	ø 0.80 - 0.82 mm

Materials

Plunger:	steel or CuBe, gold-plated
Barrel:	bronze, gold-plated
Spring:	steel, gold-plated
Wire-grip contact terminal	CuBe, gold-plated
Wireless contact terminal	
Barrel:	bronze, gold-plated
Plunger and pin:	CuBe, gold-plated

*2.2 N also available as E-Type spring (special designation ES)

Ordering example	Series	Tip material 2 = steel, 3 = CuBe	Tip style	Tip diameter (1/100 mm)	Plating A = Gold	Spring force (dN)	Collar height (mm)	Special designation S - standard stroke ES - standard stroke with E-Type Spring
Test probe	S-039	2	91	050	A	15	00	S
	S-039	2	91	050	A	22	00	ES
Contact terminal	KT - S - 039 57 27							

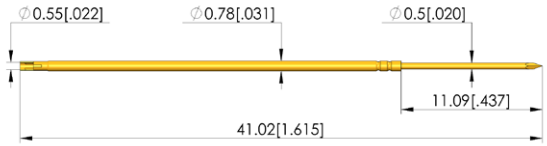
Grid:
≥ 1.00 mm
≥ 39 Mil
Adjustable installation height
Recommended stroke: 8.0 mm

S-039 L

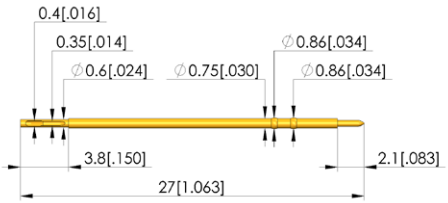
S-Line long stroke

Installation and functional dimensions

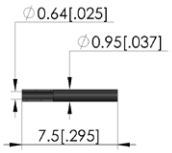
S-039 L



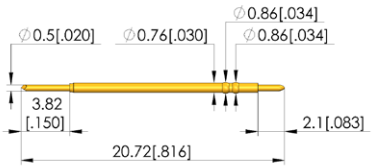
KT-S-039 57 27 wire-grip



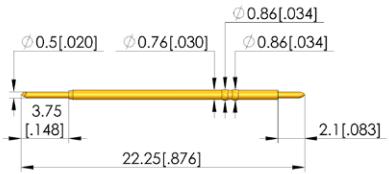
PAS-S-039 SCH-075 wire-grip tube



KT-S-039 67 21 wireless



KT-S-039 67 22 wireless



Available tip styles

Version: S-039 L						
Material	Tip style		Diameter (mm)	Plating	Additional versions	
					ø	Plating
3	07		0.50	A		
2	38		0.50	A		
2	77		0.50	A		
2	91		0.50	A		
2	97		0.50	A		

Mechanical data

Working stroke:	8.0 mm
Maximum stroke:	10.15 mm
Spring force at working stroke:	1.3 N
Alternative spring forces:	2.0 N
Wireless contact terminal	
Maximum stroke:	3.8 mm

Electrical data

Current rating:	2-3 A
Typical resistance:	< 30 mΩ

Operating temperature range

Standard:	- 40° to + 80° C

Mounting hole (in CEM1 and FR4)

Probe plate (KTP)	ø 0.80 - 0.82 mm
S-Line spacer plate (SDP)	min ø 0.86 mm
S-Line contact terminal plate (SKP)	ø 0.80 - 0.82 mm
S-Line guide plate (SFP, Wireless)	ø 0.55 - 0.57 mm

Materials

Plunger:	steel or CuBe, gold-plated
Barrel:	bronze, gold-plated
Spring:	steel, gold-plated
Wire-grip contact terminal	CuBe, gold-plated
Wireless contact terminal	
Barrel:	bronze, gold-plated
Plunger and pin:	CuBe, gold-plated

Ordering example

	Series	Tip material 2 = steel | 3 = CuBe	Tip style	Tip diameter (1/100 mm)	Plating A = Gold	Spring force (dN)	Collar-height (mm)	Special designation L - long stroke
Test probe	S-039	2	91	050	A	13	00	L
Contact terminal	KT - S - 031	57	27					

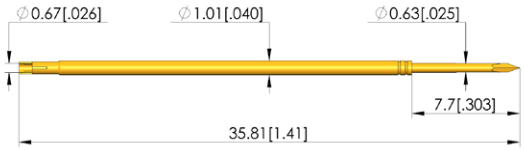
S-050 S and S-050 ES

S-Line standard stroke

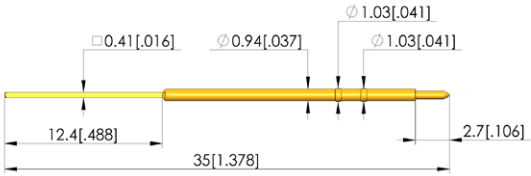
Grid:
≥ 1.27 mm
≥ 50 Mil
Adjustable installation height
Recommended stroke: 4.3 mm

Installation and functional dimensions

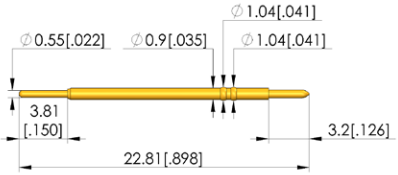
S-050 S



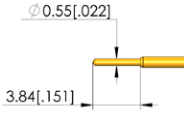
KT-S-050 47 35 wire-wrap



KT-S-050 67 23 wireless



... **23** wireless



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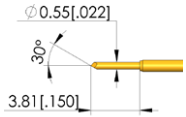

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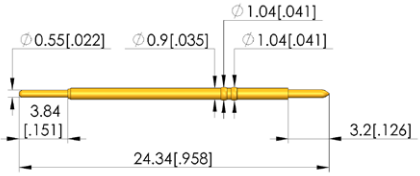

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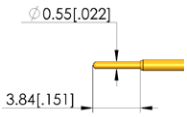
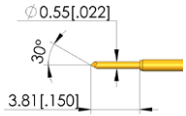


... **24-07** wireless



Available tip styles

Version: S-050 S / S-050 ES

Material	Tip style		Diameter (mm)	Plating	Additional versions	
					Ø	Plating
2	01*		0.64	A		
3	03		1.20	A		
3	05		0.64	A		
3	06		1.00	A	1.20	A
2	07*		0.64	A		
2	07*		1.00	A	1.20	A
2	14*		0.50	A		
2	14*		1.00	A		
2	38*		0.64	A		
2	77*		0.64	A		
2	89		0.50	A		
2	91*		0.64	A		
2	97*		0.64	A		

Mechanical data

Working stroke:	4.3 mm
Maximum stroke:	6.35 mm
Spring force at working stroke:	1.5 N
Alternative spring forces:	0.8 N | 2.0 N | 2.2 N* | 2.8 N*
Wireless contact terminal	
Maximum stroke:	3.8 mm

Electrical data

Current rating:	3-4 A
Typical resistance:	< 20 mΩ

Operating temperature range

Standard:	- 40° to + 80° C

Mounting hole (in CEM1 and FR4)

Probe plate (KTP)	ø 1.07 - 1.09 mm
S-Line spacer plate (SDP)	min ø 1.14 mm
S-Line contact terminal plate (SKP)	ø 0.97 - 0.99 mm
S-Line guide plate (SFP, wireless)	ø 0.97 - 0.99 mm

Materials

Plunger:	steel or CuBe, gold-plated
Barrel:	bronze, gold-plated
Spring:	steel, gold-plated
Wire-grip contact terminal	CuBe, gold-plated
Wireless contact terminal	
Barrel:	bronze, gold-plated
Plunger and pin:	CuBe, gold-plated

*2.2 N and 2.8 N also available as E-Type spring (special designation ES)

Ordering example	Series	Tip material 2 = steel, 3 = CuBe	Tip style	Tip diameter (1/100 mm)	Plating A = Gold	Spring force (dN)	Collar height (mm)	Special designation S - standard stroke ES - standard stroke with E-Type Spring
Test probe	S-050	2	91	064	A	15	00	S
	S-050	2	91	064	A	22	00	ES
Contact terminal	KT - S - 050	47	35					

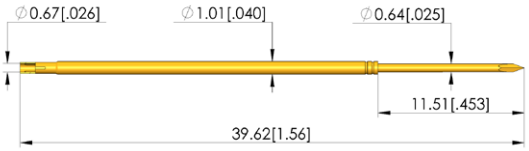
Grid:
≥ 1.27 mm
≥ 50 Mil
Adjustable installation height
Recommended stroke: 8.0 mm

S-050 L

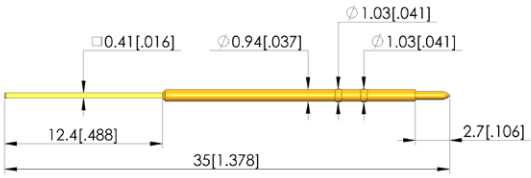
S-Line long stroke

Installation and functional dimensions

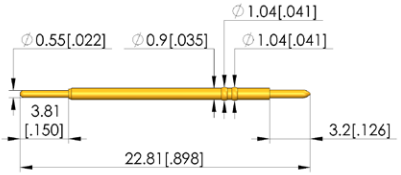
S-050 L



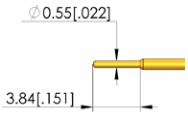
KT-S-050 47 35 wire-wrap



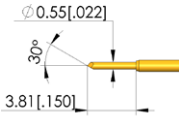
KT-S-050 67 23 wireless



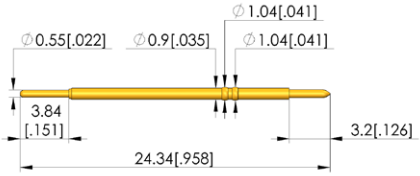
... **23** wireless



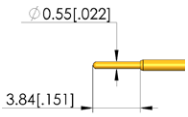
... **23-07** wireless



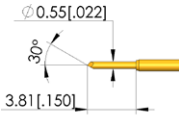
KT-S-050 67 24 wireless



... **24** wireless



... **24-07** wireless



Available tip styles

Version: S-050 L

Material	Tip style		Diameter (mm)	Plating	Additional versions Ø	Additional versions Plating
3	06		1.15	A		
2	07		1.15	A		
2	14		1.15	A		
2	38		0.64	A		
2	91		0.64	A		
2	97		0.64	A		

Mechanical data

Working stroke:	8.0 mm
Maximum stroke:	10.15 mm
Spring force at working stroke:	1.2 N
Alternative spring forces:	2.0 N
Wireless contact terminal	
Maximum stroke:	3.8 mm

Electrical data

Current rating:	3-4 A
Typical resistance:	< 20 mΩ

Operating temperature range

Standard:	- 40° to + 80° C

Mounting hole (in CEM1 and FR4)

Probe plate (KTP)	ø 1.07 - 1.09 mm
S-Line spacer plate (SDP)	min ø 1.14 mm
S-Line contact terminal plate (SKP)	ø 0.97 - 0.99 mm
S-Line guide plate (SFP, Wireless)	ø 0.97 - 0.99 mm

Materials

Plunger:	steel or CuBe, gold-plated
Barrel:	bronze, gold-plated
Spring:	steel, gold-plated
Wire-grip contact terminal	CuBe, gold-plated
Wireless contact terminal	
Barrel:	bronze, gold-plated
Plunger and pin:	CuBe, gold-plated

Ordering example

	Series	Tip material 2 = steel, 3 = CuBe	Tip style	Tip diameter (1/100 mm)	Plating A = Gold	Spring force (dN)	Collar-height (mm)	Special designation L - long stroke
Test probe	S-050	2	91	064	A	12	00	L
Contact terminal	KT - S - 050	47	35					

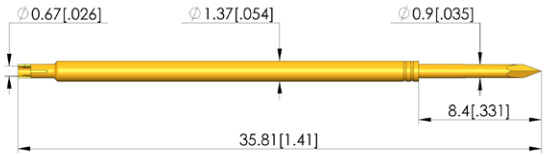
S-075 S and S-075 ES

S-Line standard stroke

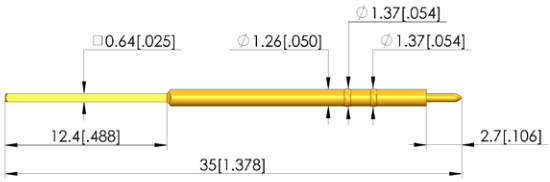
Grid:
≥ 1.91 mm
≥ 75 Mil
Adjustable installation height
Recommended stroke: 4.3 mm

Installation and functional dimensions

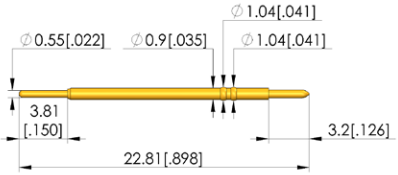
S-075 S



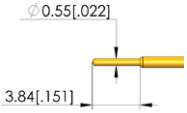
KT-S-075 47 35 wire-wrap **



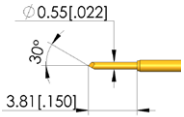
KT-S-050 67 23 wireless



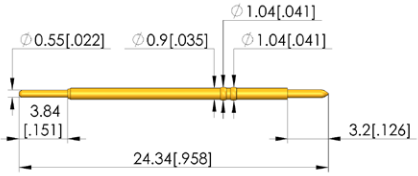
... **23** wireless



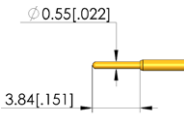
... **23-07** wireless



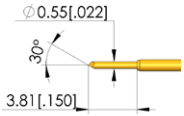
KT-S-050 67 24 wireless



... **24** wireless



... **24-07** wireless



Mechanical data

Working stroke:	4.3 mm
Maximum stroke:	6.35 mm
Spring force at working stroke:	1.5 N
Alternative spring forces: 1.0 N | 2.0 N | 2.2 N* | 3.0 N* | 4.8 N	
Wireless contact terminal	
Maximum stroke:	3.8 mm

Electrical data

Current rating:	5-8 A
Typical resistance:	< 30 mΩ

Operating temperature range

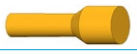
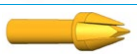
Standard:	- 40° to + 80° C

Mounting hole (in CEM1 and FR4)

See S-075 L

Available tip styles

Version: S-075 S / S-075 ES

Material	Tip style		Diameter (mm)	Plating	Additional versions Ø	Additional versions Plating
2	01*		0.90	A		
3	02		1.50	A		
3	03		1.50	A		
2	04		0.90	A		
2	04		1.50	A		
3	05		0.90	A		
3	06		1.30	A	1.50 2.00	A A
3	07*		0.90	A		
3	07*		1.50	A	1.70*	A
2	09*		0.60	A		
2	14*		0.50	A	0.80	A
2	14*		1.30	A	1.50*	A
3	14*		1.30	A		
2	17		1.70	A		
3	19		1.80	A		
2	25		1.30	A		
2	38*		0.90	A		
3	60		0.90	A		
2	77*		0.90	A		
3	79		0.90	A		
2	88		1.50	A		
2	89		0.50	A		
2	91*		0.90	A		
2	97*		0.90	A		

Materials

See S-075 L

*2.2 N and 3.0 N also available as E-Type spring (special designation ES)

Ordering example	Series	Tip material 2 = steel, 3 = CuBe	Tip style	Tip diameter (1/100 mm)	Plating A = Gold	Spring force (dN)	Collar height (mm)	Special designation S - standard stroke ES - standard stroke with E-Type Spring
Test probe	S-075	2	91	090	A	15	00	S
	S-075	2	91	090	A	22	00	ES
Contact terminal	KT - S - 075 47 35							

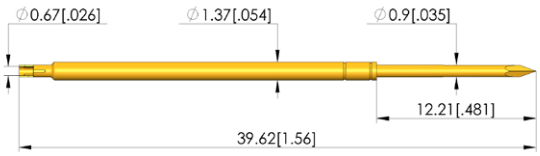
Grid:
≥ 1.91 mm
≥ 75 Mil
Adjustable installation height
Recommended stroke: 8.0 mm

S-075 L

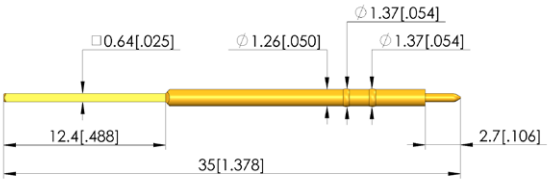
S-Line long stroke

Installation and functional dimensions

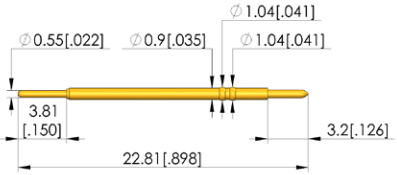
S-075 L



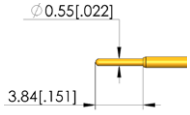
KT-S-075 47 35 wire-wrap **



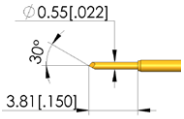
KT-S-050 67 23 wireless



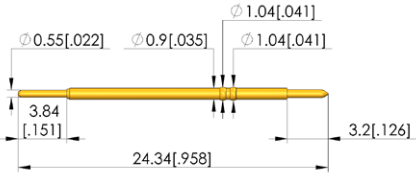
... **23** wireless



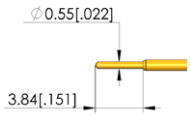
... **23-07** wireless



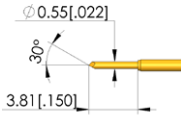
KT-S-050 67 24 wireless



... **24** wireless



... **24-07** wireless



Available tip styles

Version: S-075 L

Material	Tip style		Diameter (mm)	Plating	Additional versions Ø	Additional versions Plating
3	03		1.50	A		
3	06		1.30	A	1.50	A
3	07		1.30	A	1.50	A
2	14		1.30	A		
2	38		0.90	A		
2	77		0.90	A		
2	91		0.90	A		
2	97		0.90	A		

Mechanical data

Working stroke:	8.0 mm
Maximum stroke:	10.15 mm
Spring force at working stroke:	1.5 N
Alternative spring forces:	0.8 N | 2.0 N | 2.2 N
Wireless contact terminal	
Maximum stroke:	3.8 mm

Electrical data

Current rating:	5-8 A
Typical resistance:	< 30 mΩ

Operating temperature range

Standard:	- 40° to + 80° C

Mounting hole (in CEM1 and FR4)

Probe plate (KTP)	ø 1.39 - 1,41 mm
S-Line spacer plate (SDP)	min ø 1.58 mm
S-Line contact terminal plate (SKP)	** ø 1.31 - 1.33 mm
S-Line contact terminal plate (SKP)	***ø 0.97 - 0.99 mm
S-Line guide plate (SFP)	***ø 0.97 - 0.99 mm

Materials

Plunger:	steel or CuBe, gold-plated
Barrel:	bronze, gold-plated
Spring:	steel, gold-plated
Wire-grip contact terminal	CuBe, gold-plated
Wireless contact terminal	
Barrel:	bronze, gold-plated
Plunger and pin:	CuBe, gold-plated

Ordering example

	Series	Tip material 2 = steel, 3 = CuBe	Tip style	Tip diameter (1/100 mm)	Plating A = Gold	Spring force (dN)	Collar-height (mm)	Special designation L - long stroke
Test probe	S-075	2	91	090	A	15	00	L
Contact terminal	KT - S - 075	47	35					

Kits
Test fixture kits

Kits
for INGUN test fixture kits

Using the new S-Line kits (SBU), the INGUN test fixture kits can be easily upgraded to perform precise, reliable contacting.

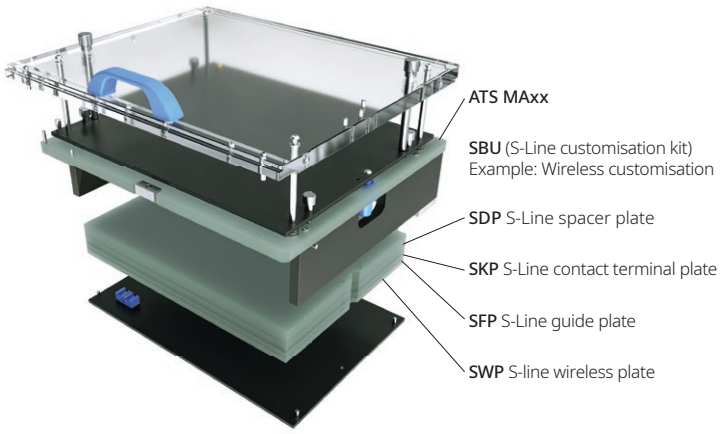
The S-Line kits consist of a set of plates with fittings. These are compatible with the standard exchangeable kits ATS MAxx used with the manual test fixtures in the MA xxxx series as well as for the vacuum test fixtures VA 2070S/i3070 for Keysight offline test systems. Depending on the version, the kits consist of between two and four plates, which are easily and quickly installed underneath the probe plate.

Customisation of test fixture kits
The S-Line spacer plate (SDP) and the S-Line contact terminal plate (SKP) are available as a set for standard customisation. For the wireless customisation, INGUN offers a set consisting of: S-Line spacer plate (SDP), S-Line contact terminal plate (SKP), S-Line guide plate (SFP), and S-Line wireless plate (SWP). The latter is used to stabilise the wireless translation board.

The plate sets require assembly, and fittings for installation - cylindrical pins, screws and tightening nuts - are provided. The wireless translation board for the wireless customisation is not included in delivery and must be provided by the customer.

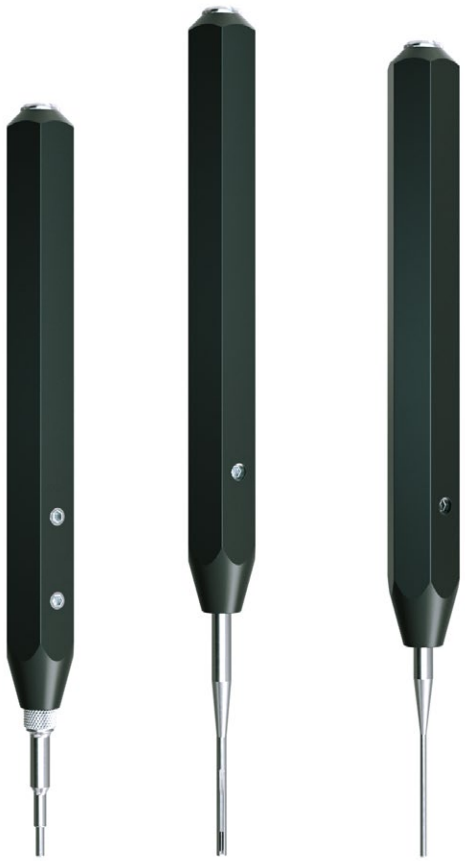
Information about the professional installation of and the DUT-specific customisation of the plate sets can be found in our detailed customisation guidelines document INFO 4586. Here, in addition to the installation of the S-Line kit, the drilling parameters of the new S-Line test probes are also provided. Please note that the standard useable area of the INGUN test fixture kits is minimally reduced when using the S-Line kits.

Features
- Precise, reliable contacting in small grids
- Quick, easy installation
- Extensive, detailed customisation guidelines
- Plate material is deflection-resistant FR4



Part number	Designation	Version:	Outer dimension (WxDxH)	Useable area (WxD)
S-Line kits (SBU) for standard customisation, consisting of SDP, SKP, and fittings				
113305	SBU-145-160-ATSMA09	Compatible with ATS MA09(/S-5)	158 x 160 x 26 mm	145 x 160 mm
113312	SBU-145-230-ATSMA11	Compatible with ATS MA11(/S-5)	158 x 230 x 26 mm	145 x 230 mm
113150	SBU-285-230-ATSMA12	Compatible with ATS MA12(/S-7)	298 x 230 x 26 mm	285 x 230 mm
113322	SBU-440-300-ATSMA13	Compatible with ATS MA13(/S-10)	454 x 300 x 26 mm	440 x 300 mm
113329	SBU-540-300-ATSMA14	Compatible with ATS MA14(/S-10)	546 x 300 x 26 mm	532 x 300 mm
113338	SBU-305-380-VA2070S/i3070-5	Compatible with VA 2070S/i3070-5	358 x 412 x 16 mm	305 x 380 mm
S-Line kits (SBU) for wireless customisation, consisting of SDP, SKP, SFP, SWP, and fittings (without wireless translation board)				
113306	SBU-145-160-WL-ATSMA09	Compatible with ATS MA09(/S-5)	158 x 160 x 40 mm	145 x 160 mm
113313	SBU-145-230-WL-ATSMA11	Compatible with ATS MA11(/S-5)	158 x 230 x 40 mm	145 x 230 mm
113151	SBU-285-230-WL-ATSMA12	Compatible with ATS MA12(/S-7)	298 x 230 x 40 mm	285 x 230 mm
113323	SBU-440-300-WL-ATSMA13	Compatible with ATS MA13(/S-10)	454 x 300 x 40 mm	440 x 300 mm
113330	SBU-540-300-WL-ATSMA14	Compatible with ATS MA14(/S-10)	546 x 300 x 40 mm	532 x 300 mm
113339	SBU-305-380-WL-VA2070S/i3070-5	Compatible with VA 2070S/i3070-5	358 x 412 x 30 mm	305 x 380 mm

Tools for installing
contact terminals and test probes



Series	S-Line contact terminals		
	Insertion tool to press in contact terminals into the S-Line probe plate (+/- 4 mm)	**Wiring tool** to apply the polyamide tube on the contact terminal **(wire-grip)**	**Extraction tool** to remove damaged contact terminal
KT-031	SW-S-031 KT-G	VW-S-031 KT	ZW-S-031 KT
KT-039	SW-S-039 KT-G	VW-S-039 KT	ZW-S-039 KT
KT-050	SW-S-050 KT-G	-	ZW-S-050 KT
KT-075	SW-S-075 KT-G	-	ZW-S-050 KT
Replacement parts for tools - example: grid 039 Mil			
Handle	G-S-039 SW-KT-G	G-S-039 VW-KT-G	G-S-039 ZW-KT-G
Barrel	H-S-039 SW-KT	-	-
Mandrel	D-S-039 SW-KT	D-S-039 VW-KT	D-S-039 ZW-KT

Series	S-Line test probes	
	Insertion tool to press in test probes (tip-Ø ≤ shaft-Ø)	**Insertion/extraction tool** to press in and remove test probes (tip-Ø > shaft-Ø)
S-031	SW-GKS-040	-
S-039	SW-GKS-081	-
S-050	SW-GKS-075	SW-ZW-GKS-075
S-075	SW-GKS-100 B	SW-ZW-GKS-100
Replacement parts for tools - example: grid 039 Mil		
Insert bit	E-SW-GKS-081	E-SW-ZW-GKS-050

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