

Prüfadapter *Test Fixtures*

Kontaktstifte
Test Probes

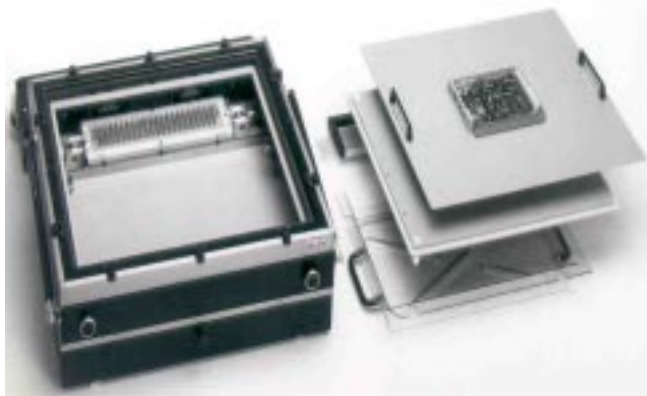
Prüfadapter
Test Fixtures

Testsysteme
Test Systems





Interchangeable Test Fixture VIN



VIN 423 with ATS 423

Operation:

The UUT is sealed by means of a PCB-specific seal which is assembled on the top plate. The registration of the PCB is via tooling pins which are also assembled in the top plate. The contact stroke results from evacuation of the air from the vacuum chamber. Subsequently the top plate supporting the UUT is sucked down onto the test probes. The vacuum frame unit is hinged to the base housing for easy access to the receptacles and wiring during vacuum actuation and PC board contacting.

When testing PC boards with open vias and other open areas, we recommend the use of either a Vacuum-free Zone sealing method (with a pressure-frame unit and push rods) or the use of a vacuum-sealed cover (with push-rods).

Recommended Contact Materials:

For INGUN Interface:

Upper half: Contact Terminals KT-254 W3 W03
 Lower half: Test Probes GKS-912 207 150 A 1502
 Receptacles KS-112 47

For GND: Probe GKS-414 202 500 A 1502 and
 Receptacle KS-113 23

Interchangeable Test Fixtures without Test System Interface

The vacuum frame encompasses the interchangeable kit and is hinged to the housing. The fixture has an internal INGUN-Interface consisting of two sections; the upper half being assembled in the back section of the interchangeable kit and the lower half being assembled in the back section of the base plate of the housing. See photo! The upper half of the INGUN Interface is loaded with contact terminals (KT's) and the lower half with spring-loaded test probes. The quantity of contact terminals and test probes depends on the resources available in the test system. The INGUN Interface is pre-drilled, and the maximum pin count of contact terminals and probes is 2280.

The INGUN Interface remains connected to the test system interface at all times.

Depending on the target test system, either an interface frame is assembled in the rear side of the housing or an interface panel is assembled in the base plate of the housing. The vacuum connection is positioned in accordance to the demands of the target test system. Anti-static discharge is achieved using a test probe and a GND screw.

The interchangeable kit (ATS) consists of a Probe Plate made of standard 10 mm hard-paper laminate (CEM-1) material, and the Top Plate made of 8 mm epoxy hard-paper laminate. Furthermore, a wiring protection cover made of acrylic glass is part of the kit. For storage purposes, the kit is supplied in plastic dust-proof box (ABB 423).

The interchangeable fixtures are also available in ICT/FCT (dual-stage) versions. The design of which is based on a shuttle-plate principle with electro-drive.

For Contacting of UUT:

Series GKS-100 ... with Receptacle KS-100 xx
 Series GKS-422 ... with receptacle KS-112 xx

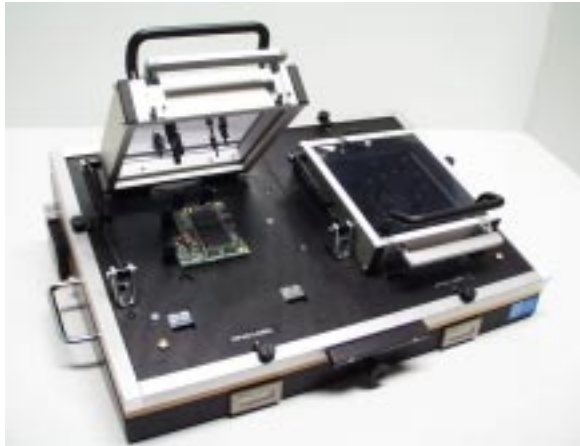
Part No.	Description	Usable Area (w x d, in mm)	Overall Dimensions (w x d x h, in mm)
4239 22376	VIN 423/D (Vacuum Port left) VIN 423-2/D		550 x 450 x 250 550 x 450 x 260
1385 18364	ATS 423 ATS 423-2	410 x 250 390 x 230	

Other Test Fixture versions on request.

Status:
20.01.04



Vacuum Test Fixtures



VA 2130/D/H Tandem Vacuum Test Fixtures
(with V-profile sealing)



VA 2040/F/H (with V-profile sealing)

Recommended Contact Materials:

For GND:

GKS-414 202 500 A 1502 / KS-113 23

For Contacting of UUT:

Series GKS-100 ... with Receptacle KS-100 xx

Series GKS-422 ... with receptacle KS-112 xx

The standard probe installation height for INGUN vacuum fixtures is 16mm.

Vacuum Test Fixtures without Test System Interface

The vacuum cassette (VK) is hinged to either a flat or desk-type housing. The rear side of the housing can be removed separately should connectors etc. need to be assembled.

INGUN vacuum fixtures are available in single or tandem vacuum cassette versions.

The vacuum cassette consists of a Probe Plate made of standard 10mm hard-paper laminate (CEM-1) material, and the Top Plate made of 8mm epoxy hard-paper laminate.

The cassette of the vacuum fixture series 2030, 2040, 2041 and 2140 consists of a strong plastic frame and the renowned INGUN wear-free V-profile seal. The height of the cassette is 30mm. The cassette of the vacuum fixture series 320, 420, 1320 and 1420 consists of an aluminium outer-frame and an INGUN pressure frame with two silicon cord sealing strips. The height of this cassette is 31mm.

The vacuum port connection is positioned in accordance to the demands of the target test system. Standard is on the left hand side. The diameter is 32mm.

Anti-static discharge is achieved using a test probe and a GND screw.

Operation:

The UUT is sealed by means of a PCB-specific seal which is assembled on the top plate. The registration of the PCB is via tooling pins which are also assembled in the top plate. The contact stroke results from evacuation of the air from the vacuum chamber. Subsequently the top plate supporting the UUT is sucked down onto the test probes.

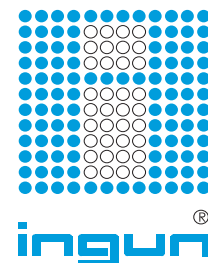
The vacuum frame unit is hinged to the base housing for easy access to the receptacles and wiring during vacuum actuation and PC board contacting.

When testing PC boards with open vias and other open areas, we recommend the use of either a Vacuum-free Zone sealing method (with a pressure-frame unit and push rods) or the use of a vacuum-sealed cover (with push-rods).

Tandem Test Fixture

INGUN's Tandem Test Fixtures allow the testing of two PCBs with a single test fixture. As ohne PCB is being removed another is being tested. The design is principally similar to standard vacuum test fixtures. Two separate vacuum chambers allow for tandem or single operation.

Status:
20.01.04



Vacuum Test Fixtures

Part No.	Description	Usable Area: (w x d, in mm)	Overall Dimensions (w x d x h, in mm)
	Vacuum Fixtures without Test system Interface with Flat Housing (F) or Desk-type housing (D)		
	Single Fixtures		
4753	VA 2030/F/H (Flat Housing)	340 x 220	460 x 330 x 90
4982	VA 2040/F/H (Flat Housing)	440 x 340	550 x 450 x 90
4979	VA 2030/D/H (Desk-type Housing)	340 x 220	460 x 330 x 150
4980	VA 2040/D/H (Desk-type Housing)	440 x 340	550 x 450 x 150
1093	VA 320/F/H (Flat Housing)	325 x 240	460 x 330 x 90
1098	VA 420/F/H (Flat Housing)	415 x 360	550 x 450 x 90
1106	VA 320/D/H (Desk-type Housing)	325 x 240	460 x 330 x 150
1119	VA 420/D/H (Desk-type Housing)	415 x 360	550 x 450 x 150
	Tandem Fixtures		
12699	VA 2130/D/H (Desk-type Housing)	137 x 265 (2x)	460 x 330 x 150
12700	VA 2140/D/H (Desk-type Housing)	182 x 385 (2x)	550 x 450 x 150
	Dual-stage Vacuum Test Fixtures with shuttle-plate without Test System Interface with Flat Housing (F) or Desk-type Housing		
22377	VA 2501-2/E/F/H	290 x 180	460 x 330 x 90
22378	VA 2601-2/E/F/H	390 x 300	550 x 450 x 90
22379	VA 2501-2/D/H	290 x 180	460 x 330 x 150
18399	VA 2601-2/D/H	390 x 300	550 x 450 x 150
	Tandem Fixtures		
22380	VA 2160-2/E/F/H	2 x 140 x 340	550 x 450 x 90
22381	VA 2160-2/E/D/H	2 x 140 x 340	550 x 450 x 150

Status:
20.01.04



Vacuum Test Fixtures with vacuum-free Zone



Vacuum Test Fixture with vacuum-free Zone



Push Rod 55,6 rigid, green Ø 2,5 and 6,0

Vacuum Test Fixtures with vacuum-free Zone

The vacuum-free Zone for single and dual-stage fixture customisation together with a UUT-specific Pressure Frame Unit is a proven alternative for testing UUT's under vacuum which cannot be sealed with conventional methods due to open vias or other open areas. The design also allows limited access to the UUT during testing.

Operation:

A special seal, based on the renowned INGUN wear-free V-profile silicone seal design, is let into the Probe Plate and secured with silicone glue. The one leg of the V-seal sits at a 45° angle against the Top Plate. This ensures good vacuum sealing on actuation. See sketch!

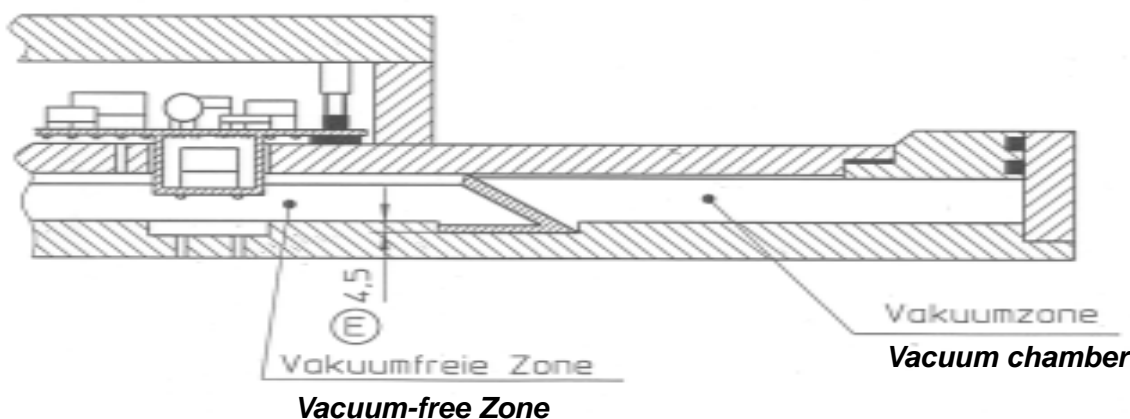
The contact stroke results from evacuation of the air in the remaining vacuum zone around the vacuum-free zone.

The V-seal frame-shape surrounds the UUT with a 35mm safety area.

The Pressure Frame Unit mounted over the vacuum-free zone and the UUT helps to compensate and counteract the force of the test probes working against the UUT from below during contacting. This ensures that the UUT is kept stable and avoids additional stress to the UUT during test.

On completion of the test process, the Pressure Frame Unit is unlatched and a gas-strut supports the opening, hinged movement. Subsequently the UUT can be removed.

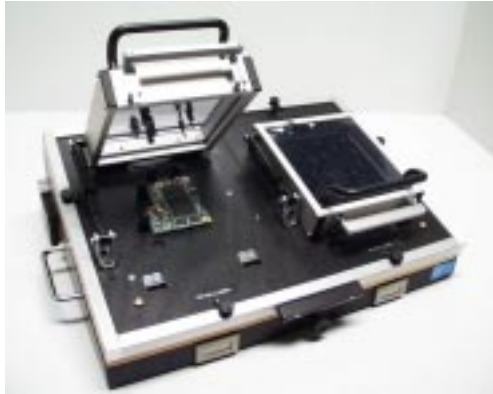
The vacuum-free zone can be supplied individually according to customer demands. Please confirm applicable dimensions.



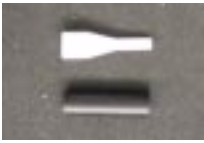
Status:
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Vacuum Test Fixtures



NDH 15

Part No.	Description	Usable Area: (w x d, in mm)	Overall Dimensions (w x d x h, in mm)
	Pressure-Frame Unit		
15670	Pressure-Frame Unit NDH 23 incl. anti-static (EGB) Pressure Frame Plate 10 mm	330 x 255 x 110	285 x 215 x 60
13655	Pressure-Frame Unit NDH 130 incl. anti-static (EGB) Pressure Frame Plate 10 mm	405 x 350 x 110	360 x 290 x 60
15669	Pressure -Frame Unit NDH 135 incl. anti-static (EGB) Pressure Frame Plate 10 mm	485 x 410 x 110	440 x 350 x 60
17324	Push-rods 55.6, rigid, green, Ø 2.5		
19419	Push-rods 55.6, rigid, green, Ø 6.0		
19578	Pressure-Frame Unit NDH 15 / vacuum-sealed	190 x 205 x 90	140 x 150 x 28
17340	Plastic Cap for Push-rods, Ø 2.5		
18742	Plastic Cap for Push-rods, Ø 6.0		
	Vacuum-free Zone		
000512	Vacuum-free Zone made of silicone (single stage) * Outer dimensions must be confirmed!	<p>The vacuum-free zone can be supplied individually according to customer demands. Please confirm applicable dimensions (exact dimensions on request).</p>	
000513	Vacuum-free Zone made of silicone for ICT/FCT (dual stage) * Outer dimensions must be confirmed!		

Status:
11.11.02

Vacuum-sealed Covers



Vacuum-sealed Covers

Vacuum-sealed Covers

The vacuum-sealed covers from INGUN are used for PC Boards which cannot be sealed reliably using a standard PC Board-specific, casted seal. This is the case when testing PC Boards with complex contours, open areas and a high quantity of open vias.

The sealing of the vacuum-sealed Cover is ensured by means of a cellular sealing ring which is assembled all around the base of the cover.

Note: when using vacuum-sealed covers, access to the PC Board is no longer possible.

Customised vacuum-sealed covers on request!



Push-Rod 55,6 rigid, green Ø 2.5 and 6.0

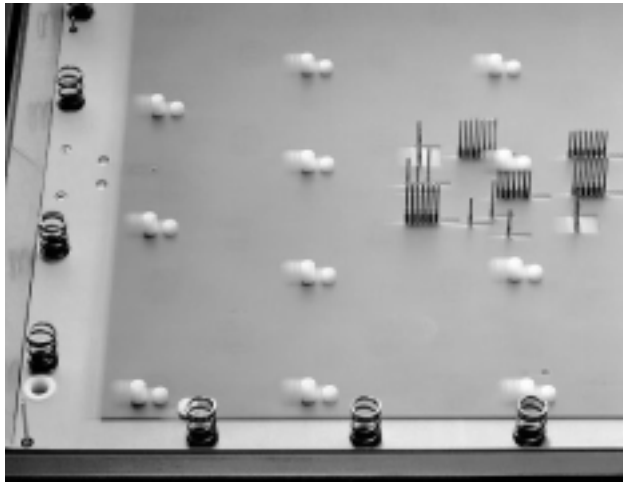
Part No.	Description	Usable Area: (w x d, in mm)	Overall Dimensions (w x d x h, in mm)
Customisation Accessories for Vacuum Fixtures			
15533	Vacuum Cover 1 (12mm wall-thickness)	300 x 215 x 72	276 x 191 x 60
15534	Vacuum Cover 2 (15mm wall-thickness)	390 x 360 x 75	360 x 330 x 60
15535	Vacuum Cover 3 (15mm wall-thickness)	370 x 220 x 75	340 x 190 x 60
17324	Push-Rods 55.6, rigid, green	55.6 mm length, Ø 2.5	
19419	Push-Rods 55.6, rigid, green	55.6 mm length, Ø 6.0	
5107	Cellular sealing ring	Ø 3mm	

Further cover sizes on request.

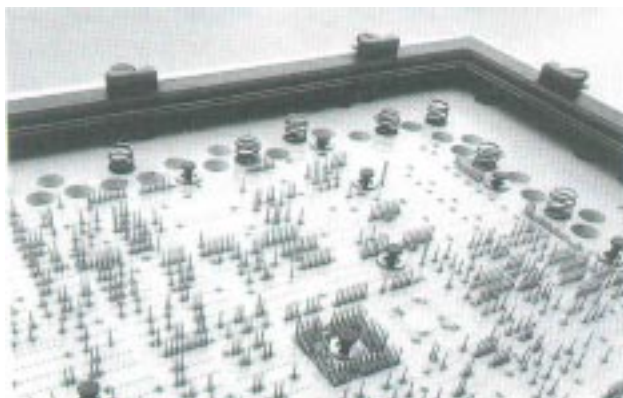
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Vacuum Test Fixtures (VA)



Dual-stage fixture with Shuttle Plate



Dual-stage fixture with pneumatic dead-stops

Dual-stage Vacuum Test Fixtures

INGUN vacuum test fixtures with two different designs of operation are available for combined In-Circuit and Functional Test:

- The shuttle-plate technology
- The pneumatic dead-stop technology

The Shuttle-Plate Technology

This principle is based on the renowned and practically maintenance-free VA 2030/2040 base fixture kits. The vacuum cassette (VK) is hinged to either a flat or desk-type housing.

A so-called shuttle plate is assembled on the Probe Plate and is movable. The movement of the Shuttle Plate is optionally either pneumatically or electrically.

Depending on the position of the shuttle plate, strategically placed supports with two different heights determine the contacting stroke of the Top Plate with PC Board. When moving the shuttle plate the vacuum actuation is turned off.

The pneumatic dead-stop technology

Pneumatic dead-stops in the vacuum fixture series VA 320 – VA 1420 and VIN 323d – 423d also enable a combined In-Circuit and Functional Test. The pneumatic dead-stops are operated with compressed air (6 bar) and thus present two pre-defined heights of contacting stroke of the Top Plate with PC Board.

Dual-stage Customisation

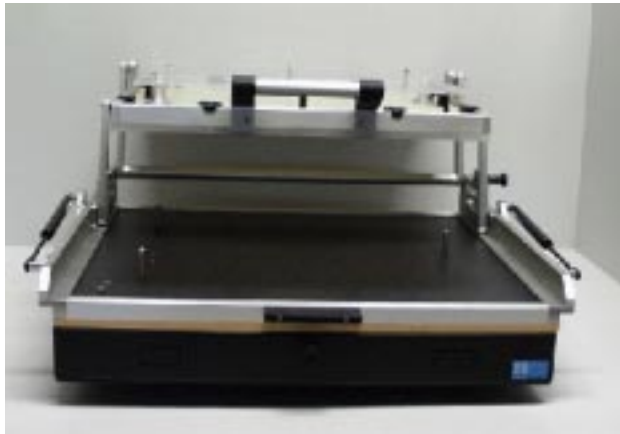
Both dual-stage versions require two different installation heights of the probes, i.e. only those probes with a higher installation height are contacting the PC Board when in Functional Test operation.

Two installed stroke sensors register the In-Circuit and Functional Test levels and help simplify test program control.

The anti-static discharge is via a test probe:
type GKS-414 202 500 A 1502 / KS-113 23



INGUN Vacuum Test Fixtures



VIN 423d with assembled ZSK 420

Vacuum Test Fixtures for double-sided contacting

Contacting from above is achieved with a hinged vacuum cassette unit, the movement of which is supported by side-assembled draw-springs. The mechanical design of the approach movement of the Test Probes ensure vertical contact onto the test points on the PC board. The two guide pins guarantee reliable contacting of test points from both sides with a target diameter of min. 0.8 mm.

The Additional Contacting Unit (ZSK) can easily be assembled onto standard fixture kits series VA 324/420 and VIN 323/423.

PC board specific milling of the Probe Plate (i.e. upper-side) of the Additional Contacting Unit is necessary when the components are higher than 10 mm, and on the under-side when the maximum component height is greater than 3 mm. This design of the Additional Contacting Unit does away with the necessity of PC board specific sealing.

Part No.	Description	Usable Area (w x d, in mm)	Overall Dimensions (w x d x h, in mm)	Remarks
4205	ZSK 420 VA/VIN		550 x 395 x 65	ZSK-Mechanics without customised parts
4206	ZSK 320 VA/VIN		370 x 265 x 65	ZSK-Mechanics without customised parts
1407	Replacement Kit (ATS-ZSK 423d)	315 x 240		for VIN with ZSK
1408	Replacement Kit (ATS-ZSK 323d)	250 x 175		for VIN with ZSK
10092	Customisation Kit (to ZSK 420 VA)	315 x 240		ZSK Probe Plate incl. Assembly Materials
10093	Customisation Kit (to ZSK 320 VA)	250 x 175		ZSK Probe Plate incl. Assembly Materials
12704	Assembly Set (to ZSK 420 VA)			Top Plate incl. Assembly Materials
12703	Assembly Set (to ZSK 320 VA)			Top Plate incl. Assembly Materials

The following components are required:

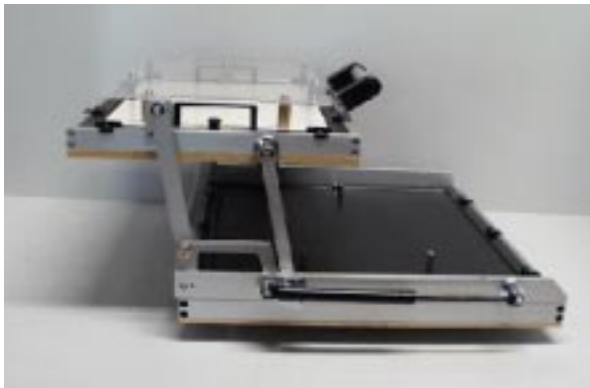
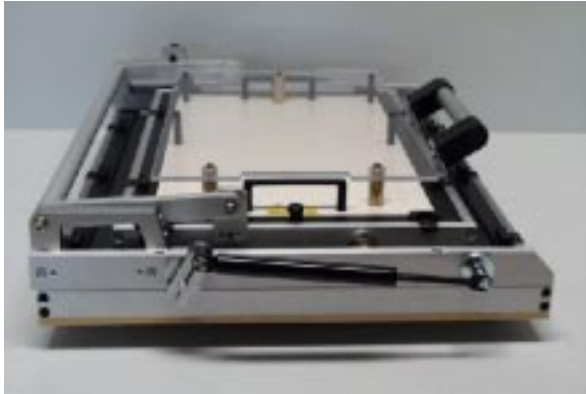
For VIN 423d: * 4205 Additional Contacting Unit ZSK 420 VA/VIN
* 1407 Replacement Kit ATS ZSK 423d

For VA 420: * 4205 Additional Contacting Unit ZSK 420 VA/VIN
* 10092 Customisation Kit to ZSK 420 VA
* 12704 Assembly Set to ZSK 420 VA

Status:
11.11.02



INGUN Additional Contacting Unit for Vacuum Fixtures



ZSK 420 assembled on vacuum cassette

The INGUN Additional Contacting Unit (ZSK) is lightweight and is easy to use due to its ergonomic design. This leads to a reduction of the handling time.

The sealing around the circumference of the cassette makes a separate PC-Board specific sealing superfluous.

The contacting accuracy of the unit is achieved by means of three ball-bearing bushes and the parallel guiding of the floating Probe Plate.

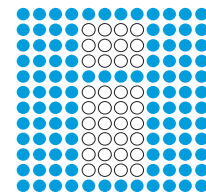
The wiring protection cover is made of anti-static material.

The transfer of the test point wiring is carried out by means of a transfer field with Receptacles series KS-112 47 and Test Probes series GKS-912 ... (assembly in the lower Probe Plate) and Contact Terminals series KT-254 W3 E03 (assembly in upper Probe Plate).

Technical Data:

Outside dimensions (w x d x h):	350 x 240 x 70 mm
Usable Area (w x d):	200 x 140 mm

Status:
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Accessories for Vacuum Fixtures



Vacuum switch-on valve



Vacuum hose



Vacuum quick-release coupling - straight



Stroke registration switch and actuation probe



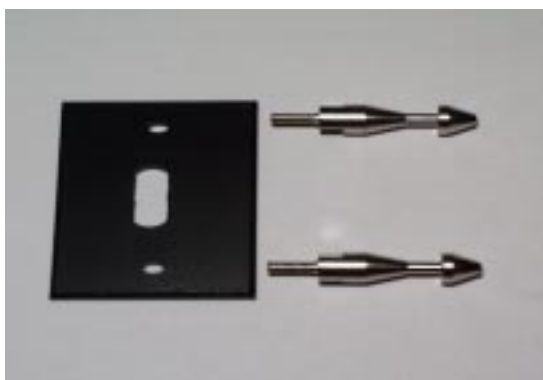
Vacuum quick-release coupling - angled



Counter-pressure spring



Anti-static PCB support, \varnothing 5.0, 2.8 mm high



Spacer Plate with 2 catch pins (for above)

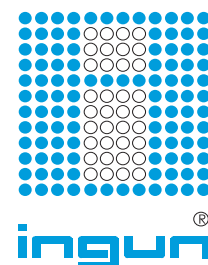


Stroke-limiting Disk, 1 mm high



Tooling Pin

Status:
11.11.02



Customisation Accessories for Vacuum Test Fixture

Part No.	Description	Remarks:
2579	Stroke Limiting Disk	1 mm high
3161	anti-static PCB support posts	Ø 5 mm, 2.8 mm high, with Ø 3 mm plug-section
2785	Counter-pressure Spring 10/80/15	For customised assembly in kits VA 320-420
	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> Example: 10 = Diameter in mm 80 = Spring Force in N 15 = Length in mm </div>	
1571	Counter-pressure Spring 10/80/15	For customised assembly in kits VA 320-420
1572	Counter-pressure Spring 14/80/22	For customised assembly in dual-stage Fixture
1569	Counter-pressure Spring 14/90/17,5	For assembly under Pressure Frame VA 320-420
3408	Stroke Sensor ICT	with micro-switch and probe (GKS-503 305 180 R 1502 / KS-103 23)
3409	Stroke Sensor FCT	with micro-switch and probe (GKS-504 205 180 R 3002 / KS-113 23)
xxxx	Tooling Pin, Installation Height 7mm	Ø in 0.1 mm steps, from 1.9 to 5.0 mm
xxxx	Stroke Counter: mechanical or electrical	on request!
5100	Instant adhesive glue	
5229	Silicone glue	
Accessories for Vacuum Port Connection		
1514	Vacuum switch-on valve 3/2 12 V-DC Electro-magnetic switch-on valve with 32mm connection Power drawn = 11 Watt	
1515	Vacuum switch-on valve 3/2 24 V-DC Electro-magnetic switch-on valve with 32mm connection Power drawn = 11 Watt	
1516	Vacuum switch-on valve 3/2 220 V-AC Electro-magnetic switch-on valve with 32mm connection Power drawn = 12 VA	
11301	Vacuum quick-release coupling – straight	for vacuum hose, ID = 32mm
11302	Vacuum quick-release coupling – angled	(without stop-bolts, incl. Seal)
2510	Stop-bolt	for vacuum quick-release coupling
2454	Spacer Plate with 2 Stop-bolts	plug-in connection for quick-release couplin
2722	Vacuum Hose LW 32	
2723	Vacuum Hose LW 25	

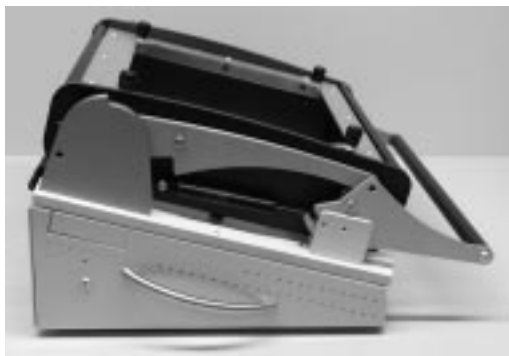
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Manual Test Fixture MA 2110



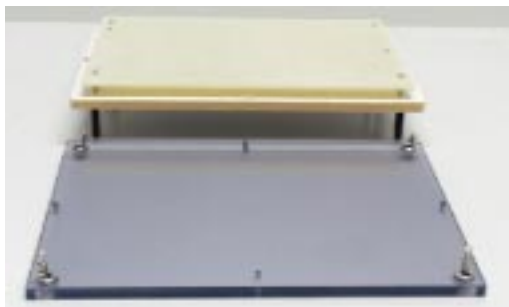
MA 2110



MA 2110



ATS 2110 with Interchangeable Pressure-Frame Plate (20969)



ATS 2110 with PC-Board Support Plate and Interchangeable Pressure-Frame Plate (19026)

The Manual Test Fixture **MA 2110** consists of the desk-housing with mounting for the probe-plate unit and the pressure-frame unit made of rigid aluminium-profiles and including the 3 slide-bars and 6 PC board push-rods. The actuation of the pressure-frame unit is by means of a front lever.

The fixture is designed for the maximum contact force of 300 N (i.e. 200 probes x 1,5 N spring force). The pressure-frame unit can be swivelled open completely and therefore ensures quick and simple placement and removal of the UUT (Unit-Under-Test). Furthermore, the design allows easy removal of the probe plate unit.

The 12° desk-type housing ensures the ideal ergonomic placement position.

The intermediate interface is achieved with either connectors or a customer-specific solution. Interface connections to specific test system types on request!

Functionality:

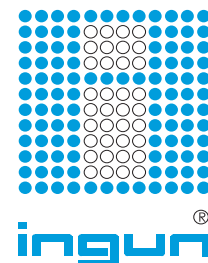
The UUT is guided by adjustable pre-registration pins and placed onto the support probes (PAS). Subsequently, the UUT is registered with tooling pins. The pressure-frame unit is closed, and, using the lever mounted on the front of the fixture (which is fitted with an eccentric curve) the pressure-frame unit is pulled down and the push-rods press the UUT against the probe field.

Simple debugging is ensured due to access to the underside of the probe plate while under contact. Furthermore, limited access to the top-side of the UUT through the slide-bars of the pressure frame is also possible.

Recommended Test Probes in 100mil (2,54mm) grid:

- Series GKS-912 xxx xxx x 1502 with receptacles KS-112 47
- Series GKS-100 xxx xxx x 1500 with receptacles KS-100 47 05

Status:
27.10.03



Manual Test Fixture MA 2110

Part No.	Description	Usable Area (w x d, in mm)	Overall Dimensions (w x d x h, in mm)
20907	MA 2110, incl. Pressure Frame Unit with Mounting for Interchangeable Kit (made of acrylic glass)		460 x 330 x 200
19026	Interchangeable Kit ATS 2110, Interchangeable Pressure-Frame Plate, Probe-Plate Unit, Wiring Protection Cover	270 x 190	320 x 230 x 65
	Accessories of 19026		
xxxxx	Tooling Pin, Installation height 16 mm (available in 1/10 mm steps up to 5.0 mm)		
xxxxx	UUT Support Probe GKS-102 250 400 P 3002		
2517	Excenter Pin M2, length = 38mm		
20969	Interchangeable Kit ATS 2110, with spring-loaded PC-Board Support Plate and Interchangeable Pressure-Frame Plate	280 x 190	320 x 230 x 50
	Accessories of 20969:		
19813	Push-rods for Pressure Frame Plate, L = 51 mm, Head = Ø 2.5 mm		
19815	Push-rods for Pressure Frame Plate, L = 51 mm, Head = Ø 6.0 mm		
xxxxx	Tooling Pin, Installation Height 7 mm - (available in 1/10 mm steps from Ø = 1.99 to 5.0 mm)		
3161	PC-Board Support, Ø = 5 mm x 3 mm high (anti-static)		
13781	Placement Guide Pins, made of Delrin (Nylon), 22 mm high		

Status:
11.11.02



Manual Test Fixture MA 2130

The new manual Test Fixture **MA 2130/NDH/D/H** represents the consequent enhancement of the manual driven test fixture series. The design consists of the desk-housing, the drive unit with mounting for the probe-plate unit, as well as the pressure-frame unit made of rigid aluminium-profiles and including 3 slide-bars and 6 push-rods.

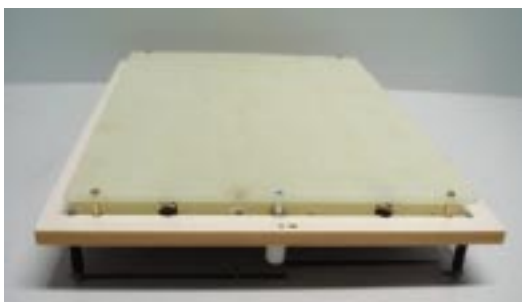
The fixture is designed for the maximum contact force of 600 N (i.e. 400 probes x 1,5N spring force). The guaranteed contactable target test-pad size is 0.5 mm – excluding PC board tolerances.

Special emphasis was put into the ergonomic design of the test fixture. The pressure-frame unit can be swivelled open completely and therefore ensures quick and simple placement and removal of the UUT (Unit-Under-Test). The 12° desk-type housing ensures the ideal ergonomic placement position. The design enables quick change of the probe-plate unit.

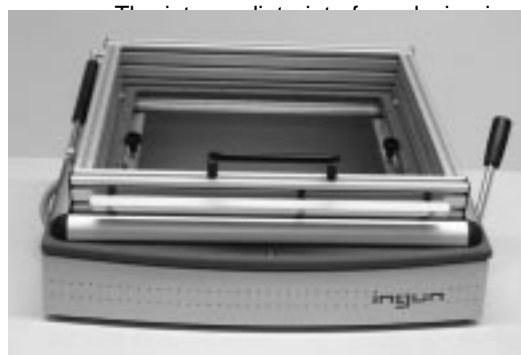
MA 2130/NDH/D/H with KTE 130



KTE 130/2130 and Connectors



KTE 130/2130 with spring-loaded PC-Board Support Plate



achieved with either solution. Interface types are available

or a special mounting precision tooling pins. and subsequently a lever drive unit is positioned. The drive unit is positioned against the UUT is then pressed

against the push-rods and contacted.

Simple debugging is ensured due to access to the underside of the probe plate while under contact. Furthermore, access to the top-side of the UUT is also possible.

Recommended Test Probes in 100mil (2,54 mm) grid:

Series KS/GKS-912

KS-112 xx (with wire-wrap or solder terminal)
GKS-912 291 130 N 1502 (for solder test-pads or vias)
GKS-912 204 130 A 1502 (for component leads)

Series KS/GKS-100

KS-100 xx (with wire-wrap or solder terminal)
GKS-100 291 090 A 1500 (for solder test-pads or vias)
GKS-100 204 130 A 1500 (for component leads)

Status:
27.10.03



Manual Test Fixture MA 2130

Part No.	Description	Usable Area (w x d in mm)	Overall Dimensions (w x d x h, in mm)
20611	MA 2130/NDH/D/H with slide-bars and push-rods		520 x 405 x 250
17494	Probe-Plate Unit KTE 130/2130 (connector mounting prepared for 96- or 64-way connector)	275 x 220	325 x 255 x 65
17495	Probe-Plate Unit KTE 130/2130 with spring-loaded PCB mounting plate (connector mounting prepared for 96- or 64-way connector)	240 x 220	325 x 255 x 65
20854	MA 2130/NDH/D/H with Mounting for Interchangeable Pressure Frame Plate		520 x 405 x 250
17639	Probe-Plate Unit KTE 130/2130 Interchangeable Pressure Frame Plate (connector mounting prepared for 96- or 64-way connector)	275 x 220	325 x 255 x 50
17640	Probe-Plate Unit KTE 130/2130 Interchangeable Pressure Frame Plate with spring-loaded PCB mounting plate (connector mounting prepared for 96- or 64-way connector)	240 x 220	325 x 255 x 65
Accessories:			
When using Pressure-Frame Unit with slide-bars and push-rods			
11070	Slide-bar for NDH 130/2130		
17338	Push-rods for slide-bar 130: length 45-50 mm, Ø of head 2,4mm		
When using Pressure-Frame Unit with mounting for pressure-frame plate (acrylic-glass)			
19813	Push-rods for Pressure Frame Plate, L = 51 mm, Head = Ø 2.5 mm		
19815	Push-rods for Pressure Frame Plate, L = 51 mm, Head = Ø 6.0 mm		
Customizing materials when using Probe-Plate Unit KTE 130/2130			
xxxxx	Tooling-pin ø xxx UUT-specific, installation height 14mm		
7766	Spring-loaded UUT mounting probe PAS 102 250 400 P 3002 W		
2517	Eccentric pin M2, length 38 mm, Ø 8 mm		
Customizing materials when using Probe-Plate Unit KTE 130/2130 with UUT support plate			
xxxxx	Tooling-pin ø xxx UUT-specific, installation height 7mm		
xxxxx	pre-registration, UUT-specific		
3161	anti-static PVC UUT-supports Ø 5 mm, height 3 mm, with press-in plug Ø 3 mm		
Interface Materials: (mounted under Probe Plate on spacers)			
4864	Connector: 64-way		
5195	Connector: 96-way		

Status:
21.01.03



Manual Test Fixture MA 2135

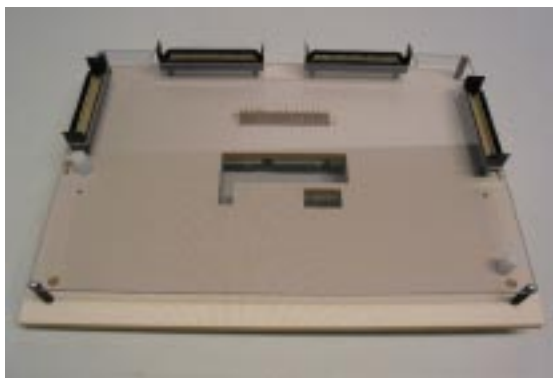
Manual Test Fixture MA 2135/NDH/D/H

The new manual Test Fixture MA 2135/NDH/D/H represents the consequent enhancement of the manual driven test fixture series. The design consists of the desk-housing, the drive unit with mounting for the probe-plate unit, as well as the pressure-frame unit made of rigid aluminium-profiles and including 3 slide-bars and 6 push-rods (alternativ: Interchangeable Pressure-Frame Plate made acrylic glass).

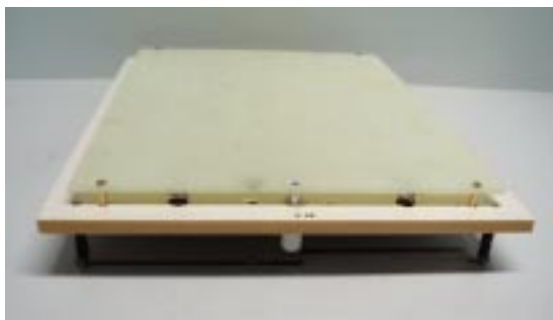
The fixture is designed for the maximum contact force of 600 N (i.e. 400 probes x 1,5N spring force). The guaranteed contactable target test-pad size is 0.5 mm – excluding PC board tolerances.

Special emphasis was put into the ergonomic design of the test fixture. The pressure-frame unit can be swivelled open completely and therefore ensures quick and simple placement and removal of the UUT (Unit-Under-Test). The 12° desk-type housing ensures the ideal ergonomic placement position. The design enables quick change of the probe-plate unit.

MA 2135/NDH/D/H

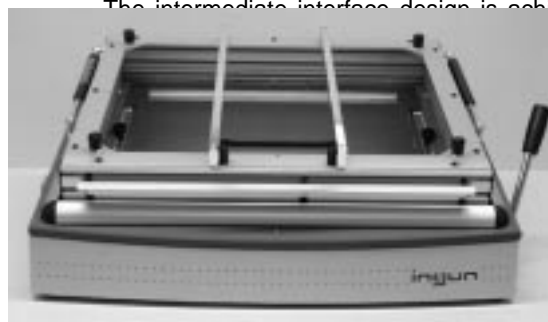


KTE 135/2135 and Connectors



KTE 135/2135 with spring-loaded PC-Board Support Plate

The intermediate interface design is achieved with either interface connectable on request!



A special mounting tooling pins. subsequently a drive unit is positioned under the probe plate unit. The UUT is then pressed against the push-rods and contacted.

Simple debugging is ensured due to access to the underside of the probe plate while under contact. Furthermore, access to the top-side of the UUT is also possible.

Recommended Test Probes in 100mil (2,54 mm) grid:

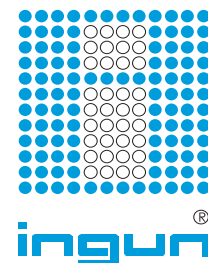
Series KS/GKS-912

KS-112 xx (with wire-wrap or solder terminal)
GKS-912 291 130 N 1502 (for solder test-pads or vias)
GKS-912 204 130 A 1502 (for component leads)

Series KS/GKS-100

KS-100 (with wire-wrap or solder terminal)
GKS-100 291 090 A 1500 (for solder test-pads or vias)
GKS-100 204 130 A 1500 (for component leads)

Status:
27.10.03



Manual Test Fixture MA 2135

Part No.	Description	Usable Area (w x d, in mm)	Overall Dimensions (w x d x h, in mm)
19789	MA 2135/NDH/D/H with slide-bars and push-rods		610 x 460 x 250
16706	Probe-Plate Unit KTE 135/2135 (connector mounting prepared for 96- or 64-way connector)	385 x 290	420 x 325 x 50
17289	Probe-Plate Unit KTE 135/2135 with spring loaded PCB-mounting plate (connector mounting prepared for 96- or 64-way connector)	370 x 290	420 x 325 x 65
19686	MA 2135/NDH/D/H with Mounting for Interchangeable Pressure Frame Plate		610 x 460 x 250
17637	Probe-Plate Unit KTE 135/2135 Interchangeable Pressure Frame Plate (connector mounting prepared for 96- or 64-way connector)	385 x 290	420 x 325 x 50
17638	Probe-Plate Unit KTE 135/2135 Interchangeable Pressure Frame Plate with spring-loaded PCB mounting plate (connector mounting prepared for 96- or 64-way connector)	370 x 290	420 x 325 x 65
	Accessories:		
	When using Pressure-Frame Unit with slide-bars and push-rods		
11071	Slide-bar for NDH 135/2135		
17338	Push-rods for slide-bar 135: length 45-50 mm, \varnothing of head 2,4mm		
	When using Pressure-Frame Unit with mounting for pressure-frame plate (acrylic-glass)		
19813	Push-rods for Pressure Frame Plate, L = 51 mm, Head = \varnothing 2.5 mm		
19815	Push-rods for Pressure Frame Plate, L = 51 mm, Head = \varnothing 6.0 mm		
	Customizing materials when using Probe-Plate Unit KTE 135/2135		
xxxxx	Tooling-pin \varnothing xxx UUT-specific, installation height 14mm		
7766	Spring-loaded UUT mounting probe PAS 102 250 400 P 3002 W		
2517	Eccentric pin M2, length 38 mm, \varnothing 8mm		
	Customizing materials when using Probe-Plate Unit KTE 135/2135 with UUT support plate		
xxxxx	Tooling-pin \varnothing xxx UUT-specific, installation height 7mm		
xxxxx	pre-registration, UUT-specific		
3161	anti-static PVC UUT-supports \varnothing 5 mm, height 3 mm, with press-in plug \varnothing 3mm		
	Interface Materials: (mounted under Probe Plate on spacers)		
4864	Connector: 64-way		
5195	Connector: 96-way		

Status:
11.11.02



Manual/Pneumatic Test Fixtures incl. Customizing



MA 2130-1/NDH/D/H with KTE 130-1

Manual/Pneumatic Test Fixtures

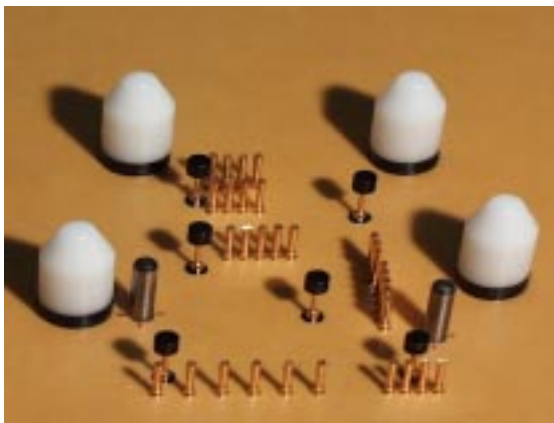
Manual or Pneumatic operated Test Fixtures with individually arranged connector bracket and UUT-specific interchangeable parts.

For a complete Test Fixture Unit the following is required:

- Basic Fixture (MA) with pressure frame (NDH)
- Probe Plate Unit (KTE)

Main Features:

- Up to 800N contact force
- 4-point drive
- economic, quick interchangeable component parts



Customized Probe Plate Unit (KTE) with Placement Guide Pins

Customisation of Probe Plate Unit (KTE) with:

- Spring-loaded PC Board support probes PAS 102 250 400 P 3002 W
- Excenter Pins EXS M2
- placement guide pins made of Delrin (Photo)
- Tooling Pins (Installation Height 14 mm)



Customized Probe Plate Unit (KTE) with Spring Loaded PCB Support Plate (PRA)

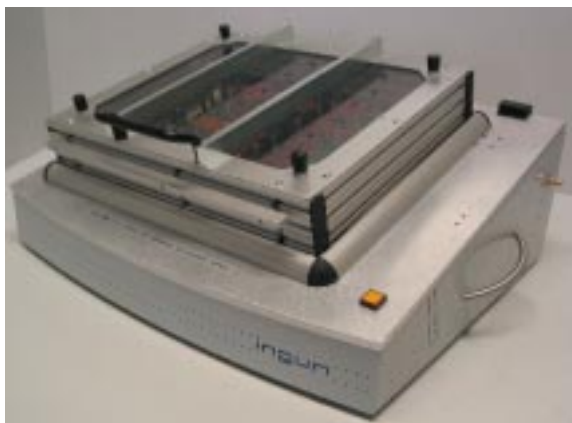
Customisation of Probe Plate Unit (KTE) with:

- Spring-loaded PC Board Support Plate (PRA) Customized with:
- Anti-static PC Board supports
- Tooling Pins (Installation Height 7 mm)

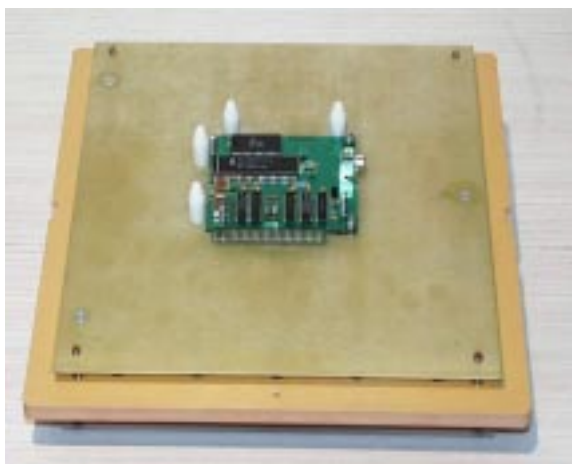
Status:
20.01.04



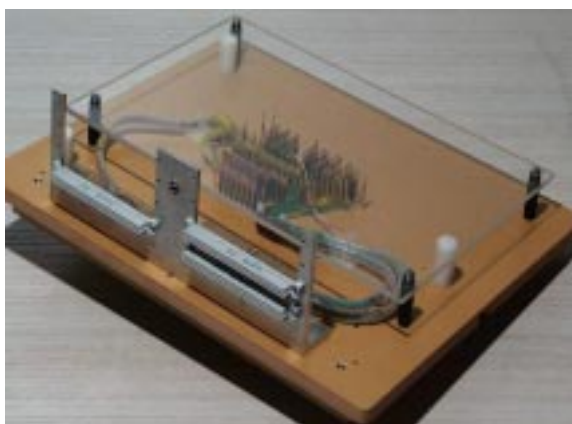
Pneumatic Test Fixtures



PA 2130/D/H incl. KTE 2130



KTE 2130 Probe Plate Unit



Interchangeable Kit for PA 2130

The pneumatic Test Fixture **PA 2130/D/H** consists of a desk-type Base Housing, the gear-wheel Drive Unit, the Probe Plate Mounting Unit and the Pressure Frame Unit which also includes three slides and six push-rods.

The PAZ 200 fixture is designed for a standard contact force of up to 1000 N (i.e. approx. 670 Probes x 1,5N spring force). The precise engineering guarantees reliable and accurate contact of test pads down to 0,5 mm diameter. Simple and quick change of the Probe Plate Unit (from the upper side) is ensured.

The ergonomic 12° desk-type housing and the complete slewability of the Pressure Frame System design ensures an efficient PC Board placement position and height.

The internal Interface is possible either via a plug-in connector set-up or in accordance to customer-specified demands.

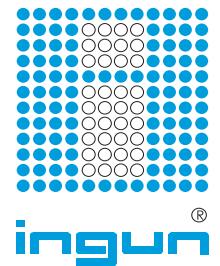
Test system integration option on request.

Access to the under-side of the Probe Plate during contacting allows simple debugging. Furthermore, the Pressure Frame Unit also allows limited access from above.

Recommended Contact Materials for 100 mil grid (2,54 mm)

- Receptacle KS 100 47 (with WW-Connection) or
- Receptacle KS 100 30 (Solder Connection)
- Test Probe series GKS 100 291 090 A 1500 (for Testpads or Open Vias)
- Test Probe series GKS 100 204 130 A 1500 (for component pins)

Status:
11.11.02



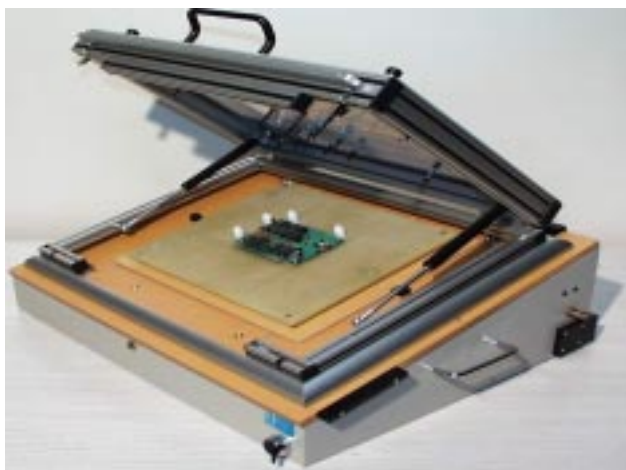
Pneumatic Test Fixtures

Part No.	Description	Usable Area: (w x d, in mm)	Overall Dimensions (w x d x h, in mm)
20598	PA 2130/D/H Base Unit incl. Pressure Frame base frame.		550 x 440 x 270
17640	KTE 2130 Probe Plate Unit with spring-loaded PC-Board Support Plate and Interchangeable Pressure-Frame Plate	240 x 220	325 x 255 x 50
	Customizing Materials		
xxxxx	Tooling Pin von Ø 1.9 – 5.0 mm Diameter in 0.1 mm steps	Install. Height 7 mm	
3161	Anti-static PCB Support Plugs Ø 5.0 mm, 3 mm high		
1584	Counter-pressure Spring D-090W01		
xxxxx	PC-Board specific Placement Guide Pins, made of Delrin (Nylon)		

Status:
11.11.02



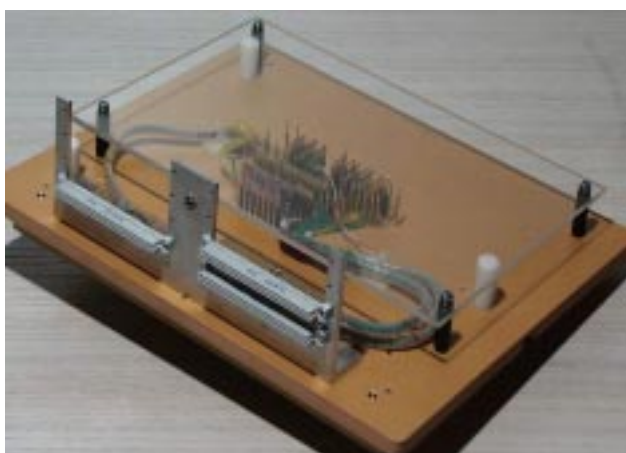
Pneumatic Test Fixtures



PAZ 200/D/H incl. KTE 200



Replacement Kit to PAZ 200 with spring-loaded PCB support plate



Replacement Kit to PAZ 200

Pneumatic Test Fixture with gear-wheel drive: PAZ 200/D/H

The pneumatic Test Fixture with gear-wheel drive PAZ 200/D/H consists of a desk-type Base Housing, the gear-wheel Drive Unit, the Probe Plate Mounting Unit and the Pressure Frame Unit which also includes three slides and six push-rods.

The PAZ 200 fixture is designed for a standard contact force of up to 1000 N (i.e. approx. 670 Probes x 1,5N spring force). The precise engineering guarantees reliable and accurate contact of test pads down to 0,5 mm diameter. Simple and quick change of the Probe Plate Unit (from the upper side) is ensured.

The ergonomic 12° desk-type housing and the complete slewability of the Pressure Frame System design ensures an efficient PC Board placement position and height.

The internal Interface is possible either via a plug-in connector set-up or in accordance to customer-specified demands.

Test system integration option on request.

Operation:

The PC Board is placed on the PCB Support Plate and registered with tooling pins. The Pressure Frame Unit is then closed. Subsequently, a play- and wear-free gear-wheel drive (which is assembled under the Probe Plate Mounting Unit) is activated by means of a pneumatic valve. The movement of the Pressure Frame Unit is guided by slide-bearings. Push-rods assembled in the Pressure Frame Unit ensure evenly divided counter-pressure against the PC Board, and also prohibits stress to the PC Board through possible bending when contacted.

Access to the under-side of the Probe Plate during contacting allows simple debugging. Furthermore, the Pressure Frame Unit also allows limited access from above.

Status:
20.01.04



Pneumatic Test Fixtures

Pneumatic Test Fixture with gear-wheel drive: PAZ 200/D/H

Part No.	Description	Usable Area: (w x d, in mm)	Overall Dimensions (w x d x h, in mm)
13694	PAZ 200/D/H Base Unit incl. Pressure Frame base frame.		550 x 440 x 270
13988	Replacement Kit ATS-PAZ 200 consisting of: Probe Plate Unit, spring-loaded PCB-Mounting Unit Connector Bracket for 6 x 96-way connectors Wiring Protection Cover, Inter- changeable Plate for upper Pressure Frame	250 x 230	
xxxxx	Customising Materials Tooling Pin von Ø 1,9 – 5,0 mm Diameter in 0,1 mm steps	Installation Height 7 mm	
3161	Anti-static PCB Support Plugs Ø 5,0 mm, 3 mm high		
1584	Counter-pressure Spring D-090W01		

Status:
20.01.04



Pneumatic Fixture PA 404 with front-draw loading



PA 404

The new pneumatic test fixture **PA 404** is a high-precision fixture with front-draw loading. It enables UUTs to be contacted from three different sides. The contacting accuracy is achieved through four precision engineered column guides (Accuracy of Basic Unit = 0.02 mm). The hitting target diameter is 0.5 mm (without taking the UUT-tolerances into consideration). A total contacting force of 1100 N is achieved on the upper and lower sides together.

Interchangeable kits for customized UUTs are inexpensive and can be exchanged quickly and easily. The signal cables to the test system are passed through an internal interface.

Functionality:

The manual/pneumatic drawer contains the UUT Mounting Plate (PRA) which is pulled into the fixture via a play-free and wear-resistant V-guide. The PRA is locked in automatically. At the same time, contacting in the horizontal position is carried out. After the signal „PRA locked in“ is given, contacting takes place from above and below. After on completion of the test, the contacting procedure is deactivated and the drawer with the UUT is automatically pushed open.

A visual „Pass/Fail“ Display gives actual information about the completed test. The controlling procedures for the test fixture are customized according to the customer's specifications and adapted to the test system used.

Performance Characteristics:

- ⇒ 730 Test Points using Test Probes with 1.5 N spring force (point quantity can be increased on request)
- ⇒ Overall Size: variable
- ⇒ Useable Area: optional
- ⇒ Controller: optional
- ⇒ Interchangeable Kits for PA 404:
 - * Probe plate unit (upper)
 - * Probe plate unit (lower)
 - * UUT Mounting (PRA)
- ⇒ Optional: Contacting Unit for multipoint connector
- ⇒ Activation via manual push-in

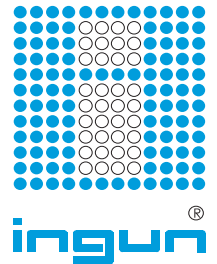
Part No.	Designation
22233	PA 404 Pneumatic Test Fixture without Control Unit (SPS-Control Unit customized)
22234	Interchangeable Kit for PA 404

Recommended Test Probe Series: KS/GKS-Series 100

Status:
12.01.04



INGUN Test Systems



Complete solutions from INGUN

When ever there is talk of testing, we have the right solution - from the standard Test Probe through to the complete Test System.

Our testing strategies:

MDA Test Systems

Production defects have no chance

Missing components, shorts, opens, badly or non-soldered components: the MDA Test System identifies defects quickly and reliably. Resistors, capacitors, inductors, diodes and transistors are measured in milliseconds. The main features of the MDA Test System from INGUN are the testing speed and high-level process capability. No programming knowledge is required for the operating of the Test System. Simple enhancement is possible due to the modular design.

Functional Test System

The right solution for each case

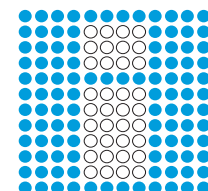
Universal usage and cost-effective: our Functional Test Systems have an open, modular hard and software structure, both of which are perfectly matched up to each other. All necessary components are put together in a fast and efficient way to create a reliable Test System. And due to the high level of flexibility, our solutions can be used in numerous fields of technology.

Combi Test System

With strategy to the ideal test coverage

The combinational test combines all the possibilities of the MDA and the FCT tests and therefore offers a much higher test coverage. The fast MDA test is used prior to the FCT test. Production defects are recognised quickly and precise, defect devices can be sorted out immediately. Should the system not have recognised a defect during the MDA test, then the PC-Boards undergo a thorough functional test. This mixed test strategy helps to save valuable testing time, because only those PC-Boards which have no production defects are tested functionally.

Status:
11.11.02



ingun[®]

INGUN Test Systems



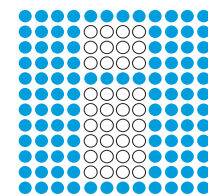
The vacuum Test Fixtures are assembled on a base housing, which is matched up to the INGUN Test System. The vacuum cassette is hinged to the housing. The INGUN interface of the Test Fixture is mounted on the rear-side of the base housing and can be adjusted in the height.

When testing PC boards with open vias and other open areas, we recommend the use of either a Vacuum-free Zone sealing method (with a pressure-frame unit and push rods) or the use of a vacuum-sealed cover (with push-rods).



Part No.	Description	Usable Area: (w x d, in mm)	Overall Dimensions (w x d x h, in mm)
20970	VA 2030/F/H/IN	340 x 220	480 x 370 x 90
20971	VA 2040/F/H/IN	440 x 340	550 x 490 x 90
20972	VA 2601-2/E/F/H/IN (ICT-/FCT Test Fixtures)	440 x 340	550 x 490 x 95
13515	Test Fixture Interface Materials Wiring-Block R&S 170 Contact Terminals with Mounting hole Ø 1 mm		

Status:
11.11.02



VA 2071/S/F/HP-NDH-Tandem



VA 2070/S/F/HP 3070-TESTJET

The vacuum operated Test Fixtures for the HP 3070 Test System family are based on the original HP Interface (Alignment) Plate design and enhanced with an INGUN vacuum cassette.

The Probe Plate is made of 14 mm epoxy fibre-glass laminate (G10) material with a double-sided grid print. The Top Plate is made of 8 mm epoxy hard-paper and coated both sides with an anti-static epoxy fibre-glass laminate layer.

The vacuum sealing is achieved using the renowned INGUN wear-free V-profile seal. Optionally, a stroke-counter can be built into the aluminium housing frame on the rear, left side.

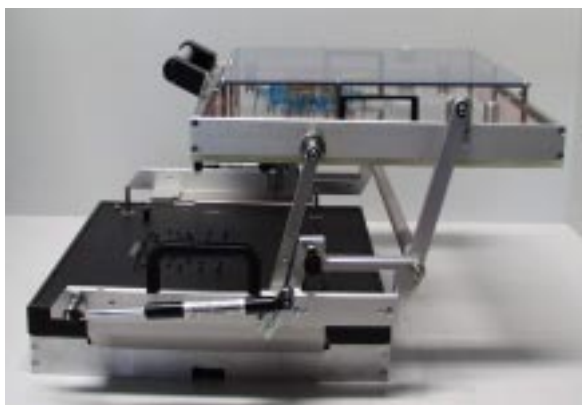
When testing PC boards with open vias, we recommend the use of either a Vacuum-free Zone sealing method (with a pressure-frame unit and push rods) or the use of a vacuum-sealed cover (with push-rods).

Furthermore, Pressure-Frame Units for TestJet-Assembly are available for all standard fixture sizes.

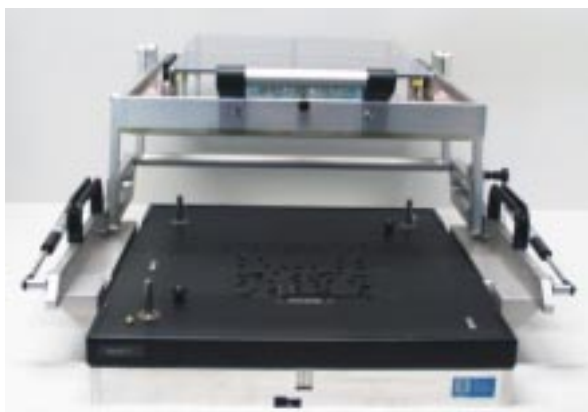
Part No.	Description	Usable Area (w x d, in mm)	Overall Dimension (w x d x h, in mm)	PCB Position	
				Rows	Columns
4998	VA 2041/S/F/HP3070	320 x 240	450 x 460 x 80	10/23	00/80
4844	VA 2070/S/F/HP3070	320 x 390	450 x 460 x 80	01/23	00/80
10319	VA 2171/S/F/HP3070 (Tandem Version)	2 x 120 x 390	450 x 460 x 80	01/23	00/25 + 55/80
8326	VA 2073/L/F/HP3070	680 x 390	815 x 460 x 80	01/23	00 left / 80 right
14251	VA 2070-2/E/S/F/HP 3070 (ICT-/FKT-Test Fixture)		450 x 460 x 85	01/23	00/80

Other Test Fixture versions on request.

Status:
11.11.02



VA 2070/S/F/HP 3070-ZSK



VA 2070/S/F/HP 3070-ZSK

Additional Contacting Unit (ZSK) for dual-sided contacting

The Additional Contacting Unit from above is assembled onto the HP 3070 Test Fixture and enables the possibility of double-sided contacting.

The manual movement of the hinged Unit is supported by gas-springs.

The mechanical design of the movement of the Unit ensures vertical approach of the Test Probes to the test points on the PC board.

The three guide pins guarantee high-precision registration of the Unit. The minimum possible test point target diameter from the upper-side is 0.5mm and from the lower-side 0.4mm.

PC board-specific milling of the Probe Plate (i.e. upper-side) of the Additional Contacting Unit is necessary when the maximum component is higher than 10 mm, and on the under-side when the maximum component height is higher than 3 mm.

This design of the Additional Contacting Unit does away with the necessity of PC board specific sealing.

The fixtures are also available in ICT/FCT (dual-stage) versions. The design of which is based on a shuttle-plate principle with electro-drive.

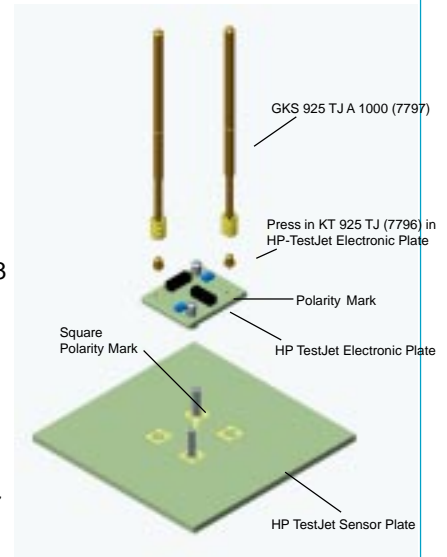
Part No.	Description	Usable Area (w x d, in mm)	Overall Dimension (w x d x h, in mm)	PCB Position	
				Rows	Columns
18084	VA 2070/S/F/HP3070 incl. ZSK 2070	280 x 310	520 x 550 x 200	04,4/21	02/77
7530	KT-254 W3 E12 with WW post Contacting Terminals, for use in upper Probe Plate (ZSK) KS-100 47 with WW post Receptacles, for use in lower Probe Plate (Main Fixture Vac. Cassette) GKS-100 307 150 A 1500 Test Probes, for use in receptacles				

Other Test Fixture versions on request.

Status:
11.11.02



Part No.	Description	Overall Dimensions	Inner-Dimension (w x d x h, in mm)
7015	Fixture Interface Panel Pin Original HP Personality Pin 44275P		
	Test System Interface Probe GKS-100 306 229 A 1000		
15266 15241	Pressure Frame for TestJet Euro Format double-euro	160 x 138 230 x 138	
12517 11427 15972	Pressure-Frame Unit Pressure-Frame 2041/TestJet Pressure-Frame 2070/TestJet Pressure-Frame 2071/TestJet left/right (2 pcs. needed)	385 x 280 x 70 385 x 390 x 70 185 x 390 x 70	345 x 240 x 60 345 x 340 x 60 145 x 340 x 60
17324 19419	Pressure-Frame Push-rods 55.6 rigid, green Ø 2.5 Pressure-Frame Push-rods 55.6 rigid, green Ø 6.0	55.6 mm length 55.6 mm length	
000512 000513	Vacuum-free Zone (single stage) Vacuum-free Zone – silicone (dual stage) for ICT/FCT	variable, see PC-Board specific customizing variable, see PC-Board specific customizing	
9681 14038 12570	TestJet Assembly Materials Original HP Signal Conditioner Board (MUX) Original HP Signal Conditioner Board (MUX & REF) Original HP TestJet Sensor Plate 1.2-(complete) (see drawing)	32 x 32	
12571 12572 12573	Original HP TestJet Sensor Plate 2.5-(complete) Original HP TestJet Sensor Plate SO20-(complete) Original HP TestJet Sensor Plate SO14-(complete)	65 x 65 14.6 x 10.8 11.6 x 9.6	
12318 12319	Polarity-Check Assembly Materials Original HP Polarity Check, B-C Size – (complete) Original HP Polarity Check, D Size – (complete)	6.4 x 3.8 7.7 x 5.0	
12574	Connector-Check Assembly Materials Original HP Connector Check – (complete)	31.5 x 12.7	



Status:
11.11.02



VA 2040/F/H/TD 88xx-M

S = Small for 1280 Test Points
M = Medium for 2560 Test Points
L = Large for 5120 Test Points

The vacuum operated Test Fixtures for the **TD 88xx Spectrum Test System** consist of a base housing and an INGUN vacuum cassette. The cassette is hinged for easy access to the receptacles and wiring during vacuum actuation and PC board contacting. The base housing is designed to prevent injury through pinching of the fingers when the fixture is locked onto the Spectrum System Interface. The mounting of the Interface Panel on the fixture base housing is designed so that the panel is "floating". This ensures that the fixture does not weigh heavily onto the System Interface.

The Probe Plate is made of standard 10 mm hard-paper laminate (CEM-1) material. The Top Plate is made of 8 mm epoxy hard-paper laminate and coated both sides with an anti-static coating. The vacuum sealing within the cassette of the VA 2040 fixture version is achieved using the renowned INGUN wear-free V-profile seal.

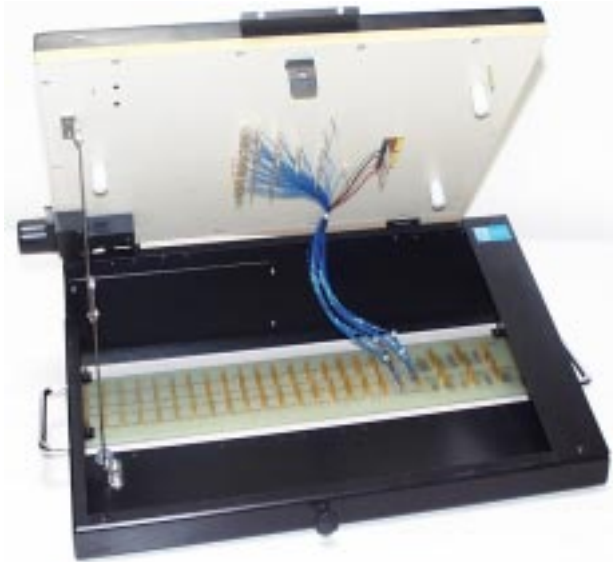
When testing PC boards with open vias, we recommend the use of either a Vacuum-free Zone sealing method (with a pressure-frame unit and push rods) or the use of a vacuum-sealed cover (with push-rods).

Furthermore, Pressure-Frame Units for Frame-Scan Assembly are available for all standard fixture sizes.

Part No.	Description	Usable Area (w x d, in mm)	Overall Dimensions (w x d x h, in mm)
19219	VA 2030/F/H/TD 88xx-S	340 x 220	550 x 400 x 140
15267	VA 2040/F/H/TD 88xx-S	440 x 360	550 x 520 x 140
14420	VA 2040/F/H/TD 88xx-M	440 x 360	550 x 520 x 140
13881	VA 420/F/H/TD 88xx-M	415 x 340	550 x 520 x 140
13898	VA 2601-2/E/F/H/TD 88xx-M (ICT-/FKT-Test Fixture)	390 x 300	550 x 520 x 145
	Vacuum "Interchangeable" Fixture (maximum test points: 2280 terminals)		
16498	VIN 423/F/H/TD 88xx-S		550 x 520 x 210
14875	VIN 423/F/H/TD 88xx-M		550 x 520 x 210
	Replacement Kit (ATS) for Vacuum "Interchangeable" Fixture VIN 423		
1385	ATS 423d	410 x 250	

Other Test Fixture versions on request.

Status:
11.11.02



VA 2030/D/H/Z1800-M

- Z1800-M = medium for 640 Test Points
- Z1800-L = large for 1024 Test Points
- Z1800-L2 = 2 x Large-Interface for 2048 Test Points

The vacuum operated Test Fixtures for the **TD Z1800 Test System** consist of a base housing and an INGUN vacuum cassette. The cassette is hinged for easy access to the receptacles and wiring during vacuum actuation and PC board contacting. The vacuum port is mounted on the left-hand side. Assembly on the right-hand side on request!

The Probe Plate is made of standard 10 mm hard-paper laminate (CEM-1) material. The Top Plate is made of 8 mm epoxy hard-paper laminate and coated both sides with an anti-static coating. The vacuum sealing within the cassette is achieved using the renowned INGUN wear-free V-profile seal.

When testing PC boards with open vias, we recommend the use of either a Vacuum-free Zone sealing method (with a pressure-frame unit and push rods) or the use of a vacuum-sealed cover (with push-rods).

Furthermore, Pressure-Frame Units for Frame-Scan Assembly are available for all standard fixture sizes.

The fixtures are also available in ICT/FCT (dual-stage) versions. The design of which is based on a shuttle-plate principle with electro-drive.

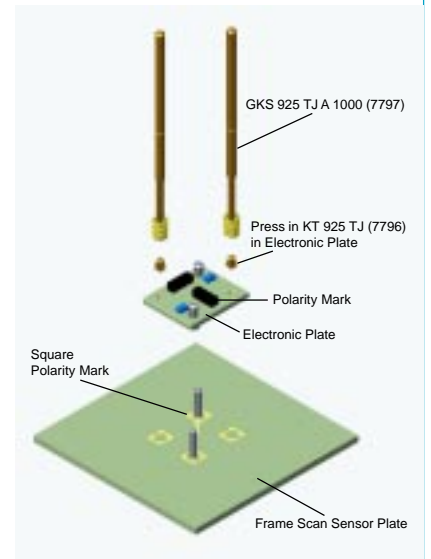
Part No.	Description	Usable Area (w x d, in mm)	Overall Dimensions (w x d x h, in mm)
13516	VA 2030/D/H/Z1800-M	340 x 220	520 x 330 x 150
13517	VA 2040/D/H/Z1800-M	440 x 360	550 x 450 x 150
13520	VA 2040/D/H/Z1800-L	440 x 360	760 x 450 x 150
12888	VA 2040/D/H/Z1800-L2	440 x 360	760 x 450 x 150
	Tandem Vacuum Fixture		
14877	VA 2140/D/H/Z1800-M	137 x 265 (pro chamber)	550 x 450 x 150

Other Test Fixture versions on request.

Status:
11.11.02



Part No.	Description	Overall Dimensions (w x d x h in mm)	Inside Dimension (w x d x h in mm)
15266 15241	Pressure-Frame for Frame Scan Europe Format Double-Europe Format	160 x 138 230 x 138	
13655	Pressure-Frame Unit Pressure-Frame 130	385 x 280 x 70	345 x 240 x 60
17324 19419	Push rods 55.6 rigid, green, Ø 2.5 Push rods 55.6 rigid, green, Ø 6.0	55.6 mm long 55.6 mm long	
000512 000513	Vacuum-free Zone (single stage) Vacuum-free Zone of Silicon for ICT/FCT (dual-stage)	variable, see PC-Board specific customizing	
20246 17240 17241 17242 17238 17239	Frame Scan assembly material Frame Scan Selector Board Frame Scan Plus PCA 1.25 x 1.25" Frame Scan Plus PCA 2.56 x 2.56" Frame Scan Plus PCA 0.375 x 0.475 Frame Scan Plus PCA 0.425 x 0.575 Frame Scan Plus PCA 0.500 x 6.25		
19643 19644	Cap Scan assembly material Cap Scan, B-C Size, complete Cap Scan, D-Size, complete	6.4 x 3.8 7.7 x 5.0	



Status:
11.11.02



VA 2040/F/H/GR 228x-15/07

The vacuum operated Test Fixtures for the **GR 2272 and GR 228x Test Systems** are mounted on the base housing and enhanced with an INGUN vacuum cassette. The cassette is hinged for easy access to the receptacles and wiring during vacuum actuation and PC board contacting.

The size and number of loaded slots of the applicable GenRad Interface Panel is dependant on the number of system resources, i.e. GR 228x-15/7 = 15 slot version, 7 slots assembled. The Interface Panel is mounted on the base plate of the housing.

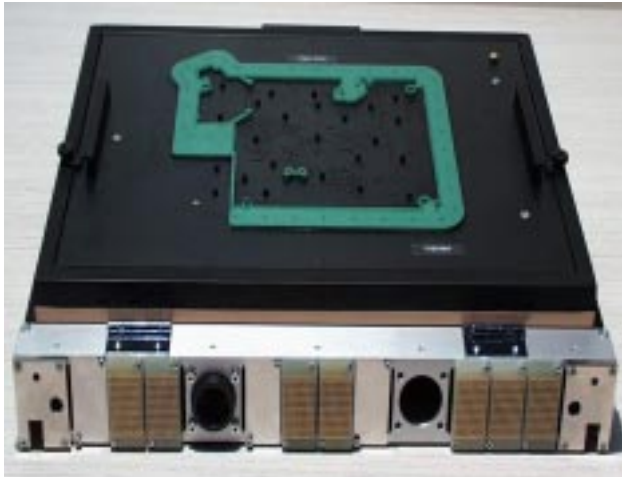
The Probe Plate is made of standard 10 mm hard-paper laminate (CEM-1) material. The Top Plate is made of 8 mm epoxy hard-paper laminate and coated both sides with an anti-static coating. The vacuum sealing within the cassette is achieved using the renowned INGUN wear-free V-profile seal.

When testing PC boards with open vias, we recommend the use of either a Vacuum-free Zone sealing method (with a pressure-frame unit and push rods) or the use of a vacuum-sealed cover (with push-rods). Furthermore, Pressure-Frame Units for Opens-Express Assembly are available for all standard fixture sizes.

Part No.	Description	Usable Area (w x d, in mm)	Overall Dimension (w x d x h, in mm)
8459	VA 2040/F/H/GR 2272 33/11 Slots	440 x 360	800 x 500 x 120
8852	VA 2040/F/H/GR 228x 15/07 Slots	440 x 360	550 x 450 x 110
12833	VA 2040/F/H/GR 228x 15/15 Slots	440 x 360	550 x 450 x 110
19533	VA 2040/F/H/GR 228x 18/07 Slots	440 x 360	550 x 450 x 110
15980	VA 2040/F/H/GR 228x 18/18 Slots	440 x 360	550 x 450 x 110
17013	VA 2601-2/E/F/H/GR 228x 15/15 Slots (ICT-/FCT-Test Fixture)	390 x 300	550 x 450 x 115
	Contact Terminals for assembly in the Interface Panels		
17513	Contact Terminal for Signal Field		
17739	Contact Terminal for Power Field		
	Accessories: Opens-Xpress components on request		

Other Test Fixture versions on request.

Status:
11.11.02



VA 2040/F/H/GR 2270/71

The vacuum operated Test Fixtures for the **GR 2270/71 Test Systems** are mounted on the base housing and enhanced with an INGUN vacuum cassette. The cassette is hinged for easy access to the receptacles and wiring during vacuum actuation and PC board contacting.

The applicable GenRad Interface is mounted on the rear side of the base housing. The position height of the Interface can be varied. The approach plate is designed to accommodate guide pins with a diameter of 10.3 mm. (Optionally 9.6 mm, on request).

The Probe Plate is made of standard 10 mm hard-paper laminate (CEM-1) material. The Top Plate is made of 8 mm epoxy hard-paper laminate and coated both sides with an anti-static coating. The vacuum sealing within the cassette is achieved using the renowned INGUN wear-free V-profile seal.

When testing PC boards with open vias, we recommend the use of either a Vacuum-free Zone sealing method (with a pressure-frame unit and push rods) or the use of a vacuum-sealed cover (with push-rods). Furthermore, Pressure-Frame Units for Opens-Express Assembly are available for all standard fixture sizes.

Part No.	Description	Usable Area (w x d, in mm)	Overall Dimension (w x d x h, in mm)
3802	VA 2030/F/H/GR 2270/71	340 x 220	480 x 370 x 90
3812	VA 2040/F/H/GR 2270/71	440 x 340	550 x 490 x 90
4672	VA 2130/F/H/GR 2270/71 (Tandem Version)	2 x 130 x 220	480 x 370 x 90
4673	VA 2140/F/H/GR 2270/71 (Tandem Version)	2 x 180 x 340	550 x 490 x 90
13963	VA 2601-2/E/F/H/GR 2270/71 (ICT-/FCT-Test Fixture)	390 x 300	550 x 450 x 95
	Fixture Interface Materials		
13515	Wiring-Block PWB 170		
	Test System Interface Probe		
	GKS 938 307 180 A 1500		
	Accessories:		
	Opens-Xpress components on request		

Other Test Fixture versions on request.

Status:
11.11.02



VA 2040/D/H/MTS 100



VA 2040/D/H/MTS 200

The vacuum operated Test Fixtures for the **Digitaltest MTS 100/200/300 Test Systems** consist of a base housing and an INGUN vacuum cassette. The cassette is hinged to enable easy access to the receptacles and wiring during vacuum actuation and PC board contacting.

The Interface Frame for the MTS100 test system is mounted in the rear section of the housing, and the Interface Panel for the MTS 200 test system in the base plate of the housing. See photos!

The Probe Plate is made of standard 10 mm hard-paper laminate (CEM-1) material. The Top Plate is made of 8 mm epoxy hard-paper laminate and coated both sides with an anti-static coating. The vacuum sealing within the cassette is achieved using the renowned INGUN wear-free V-profile seal.

When contacting PC boards with open vias and other open areas, we recommend the use of either a Vacuum-free Zone sealing method (with a pressure-frame unit and push rods) or the use of a vacuum-sealed cover (with push-rods).

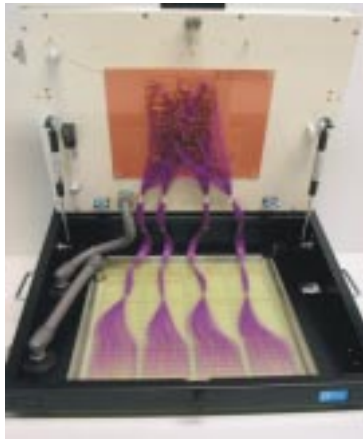
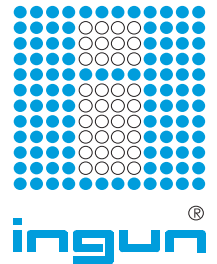
Furthermore, Pressure-Frame Units for the Assembly of *Opens Detection and Vectorless Testing Components* are available for all standard fixture sizes.

Part No.	Description	Usable Area: (w x d, in mm)	Overall Dimensions (w x d x h, in mm)
10932	VA 2040/D/H/MTS 100	440 x 340	550 x 450 x 150
8234	VA 2030/D/H/MTS 200	340 x 220	460 x 330 x 150
4758	VA 2040/D/H/MTS 200	440 x 340	550 x 450 x 150
16509	VA 2601-2/E/D/H/MTS 200 (ICT-/FCT-Test Fixture)	390 x 300	550 x 450 x 155
13001	Contact Terminals Male Connector 32pol. a/c for MTS 100		
3650	KT-158 (for assembly in the MTS 200 Interface Panel)		

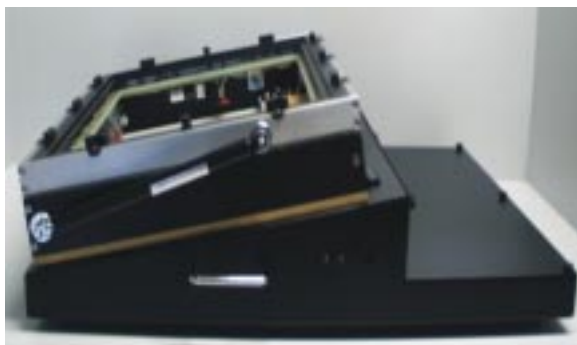
Status:
11.11.02



digital test



VA 2601-2/E/D/H/MTS 300



VIN 423-2/E/D/H/MTS 300

The vacuum Test Fixtures are assembled on a base housing, which is matched up to the Digitaltest Test System. The vacuum cassette is hinged to the housing. The Digitaltest interface of the Test Fixture is mounted to the base housing.

Due to the position of the Test Fixture being placed towards the front, the VIN 423 is especially user-friendly.

When contacting PC-Boards with open vias we recommend the customizing of the vacuum cassette with either a vacuum-free zone and pressure-frame unit or with a vacuum-sealed cover and push-rods.

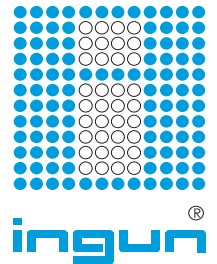
Pressure-Frame Units for customizing with vacuum-free Zones are available for all standard fixture sizes.

Part No.	Description	Usable Area: (w x d, in mm)	Overall Dimensions (w x d x h, in mm)
18000	VA 2040/D/H/MTS 300	440 x 340	575 x 510 x 170
18060	VIN 423/D/H/MTS 300		575 x 760 x 250
1385	ATS 423	410 x 250	
18510	VA 2601-2/E/D/H/MTS 300	390 x 300	575 x 510 x 175
18512	VIN 423-2/E/D/H/MTS 300		575 x 760 x 250
18364	ATS 423-2	365 x 285	
18137	Placement support for MTS 300		
3650	Contact Terminal KT 158		

Status:
11.11.02



ROHDE & SCHWARZ



VA 2140/F/H/R&S



VA 2040/F/H/R&S

The vacuum operated Test Fixtures for the **Rohde & Schwarz Test Systems** consist of a base housing and an INGUN vacuum cassette. The cassette is hinged for easy access to the receptacles and wiring during vacuum actuation and PC board contacting.

The Interface Frame for the R&D test system is mounted in the rear section of the housing. See photos!

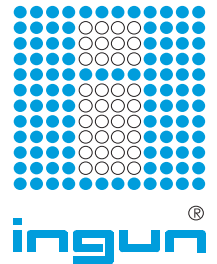
The Probe Plate is made of standard 10 mm hard-paper laminate (CEM-1) material. The Top Plate is made of 8 mm epoxy hard-paper laminate and coated both sides with an anti-static coating. The vacuum sealing within the cassette is achieved using the renowned INGUN wear-free V-profile seal. (See also section 9 of this catalog for more information on vacuum fixture designs).

When testing PC boards with open vias and other open areas, we recommend the use of either a Vacuum-free Zone sealing method (with a pressure-frame unit and push rods) or the use of a vacuum-sealed cover (with push-rods).

Part No.	Description	Usable Area (w x d, in mm)	Overall Dimension (w x d x h, in mm)
4116	VA 2030/F/H/R&S	340 x 220	480 x 370 x 90
1226	VA 2040/F/H/R&S	440 x 340	550 x 490 x 90
16124	VA 2040/F/H/R&S-19" (for 19" Housing)	440 x 340	550 x 535 x 90
16001	VA 2601-2/E/F/F/R&S (ICT-/FCT-Test Fixture)	440 x 340	550 x 490 x 95
16198	VA 2601-2/E/F/F/R&S-19" (ICT-/FCT-Test Fixture)	440 x 340	550 x 535 x 95
13515	Fixture Interface Materials Wiring Block R&S 170 Contact Materials with Mounting Hole Ø 1 mm Test probes for assembly in Test System Interface GKS-945 357 106 A 1100		

Other Test Fixture versions on request.

Status:
11.11.02



VA 2040/F/H/MC 4200/4210

The vacuum operated Test Fixtures for the **IFR Test Systems** consist of a base housing and an **INGUN** vacuum cassette. The cassette is hinged for easy access to the receptacles and wiring during vacuum actuation and PC board contacting.

The Interface Panel for the MC 4200/4210 test system is mounted in the base plate of the housing. See photo!

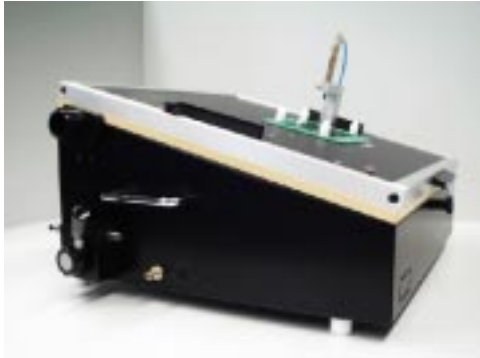
The Probe Plate is made of standard 10 mm hard-paper laminate (CEM-1) material. The Top Plate is made of 8 mm epoxy hard-paper laminate and coated both sides with an anti-static coating. The vacuum sealing within the cassette of the VA 2040 fixture version is achieved using the renowned **INGUN** wear-free V-profile seal. (See also section 9 of this catalog for more information on vacuum fixture designs).

When testing PC boards with open vias and other open areas, we recommend the use of either a Vacuum-free Zone sealing method (with a pressure-frame unit and push rods) or the use of a vacuum-sealed cover (with push-rods).

Part No.	Description	Usable Area (w x d, in mm)	Overall Dimension (w x d x h, in mm)
9904	VA 2040/F/H/MC 4200/4210	440 x 340	550 x 515 x 110
12736	VA 2140/F/H/MC 4200/4210	240 x 325	550 x 515 x 110
18210	VA 2601-2/E/F/H/MC 4200/4210	390 x 300	550 x 515 x 115
	Fixture Interface Materials		
9408	KT-158 02-PL (for MC 4200/4210 Interface)		

Other Test Fixture versions on request.

Status:
11.11.02



VA 2035/D/H/Reinhardt



VIN 423/D/H/Reinhardt

The mechanical and vacuum operated Test Fixtures for the **Reinhardt Test Systems** consist of a base housing and either a Pressure Frame and Probe Plate Unit (by the mechanical fixture) or a vacuum cassette. Both the Pressure Frame and Probe Plate Unit as well as the Cassette are hinged for easy access to the receptacles and wiring during fixture operation and PC board contacting.

The Interface Frame for both fixture versions is mounted in the rear section of the housing. See photos!

Both fixture versions use a Probe Plate made of standard 10mm hard-paper laminate (CEM-1) material and a Top Plate made of 8 mm epoxy hard-paper laminate. The Top Plate is coated both sides with an anti-static coating. The vacuum sealing within the cassette is achieved using the renowned INGUN wear-free V-profile seal.

When testing PC boards with open vias and other open areas with the vacuum fixture design, we recommend the use of either a Vacuum-free Zone sealing method (with a pressure-frame unit and push rods) or the use of a vacuum-sealed cover (with push-rods). Pressure Frame Units are made of high-quality alu-profile bars.

The fixtures are available in ICT/FCT (dual-stage) versions. The design of which is based on a shuttle-plate principle with electro-drive.

Part No.	Description	Usable Area (w x d, in mm)	Overall Dimension (w x d x h, in mm)
17293	VA 2035/D/H/Reinhardt	350 x 308	420 x 400 x 230
12421	VA 2040/D/H/Reinhardt	440 x 340	550 x 515 x 110
20892	VIN 423/D/H/Reinhardt		550 x 515 x 170
1385	ATS 423	410 x 250	
Fixture Interface Materials			
8256	Female Connector STV-c-64-F-a/c (Replaceable part)		
11438	Male Connector STV-c-64-M-a/c (Interface)		

Status:
11.11.02



MA 2135/D/H/Reinhardt



KTE 135

The manual Interchangeable Test Fixture **MA 2135 for Reinhardt Test Systems** offers the possibility to use the original Reinhardt Interchangeable Kits.

The manual Interchangeable Test Fixture has been designed for up to 800 N contact force.

The Probe Plate Unit (KTE) and the Pressure-Frame Plate are lightweight and easy to change. The contacting of the PC-Board is carried out by means of the downward movement of the Pressure-Frame. This ensures no movement of the wiring.

The integrated intermediate interface is achieved by using 64-pole connectors.

Part No.	Description	Usable Area (w x d, in mm)	Overall Dimension (w x d x h, in mm)
19794	MA 2135/D/H/Reinhardt		650 x 460 x 270
19800	KTE 135 Probe Plate Unit (KTE) with spring-loaded PC-Board Support Plate and Interchangeable Pressure-Frame Plate	370 x 290	420 x 295 x 80

Status:
11.11.02



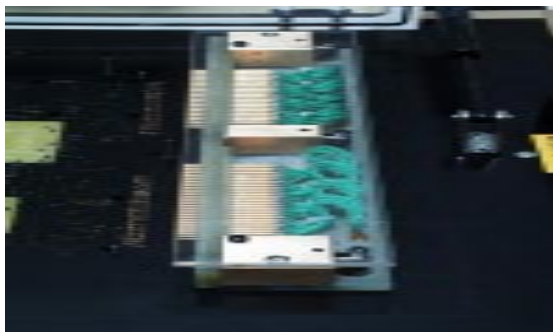
Accessories



SAM-E incl. 96pol. Connector



SAM-DE incl.96pol. Connector



VA-SAM with test probes – drive with vacuum

The **Connector Approach Mechanic (SAM)** enables the enhancement of functional test of the PC Board via connectors.

Main characteristics:

- Quick assembly using 2 knurled screw-knobs
- Compact, modular design
- ergonomic handle/lever
- Precise guiding
- Rigid design ensures long life
- High contact forces possible
- Stroke registration signal using micro switch
- Available with single (E = Euro Format) or double (DE = Double Euro Format) connectors

Contact Carriers:

The contact carrier plate can accommodate either standard connectors or rows of standard test probes. In the case of use of test probes, a contact carrier plate made of epoxy fibre-glass (G10) material is assembled.

Standard INGUN test probes (series GKS-912) are assembled in the contact carrier plate.

The signal transfer is accomplished by means of flexible ribbon-cables and a transfer field (see photo left).

Connector Approach Mechanic (SAM) with vacuum or pneumatic drive: These particular designs have a stroke of 9 mm.

* Note: the vacuum driven SAM can only be used in conjunction with a vacuum fixture.

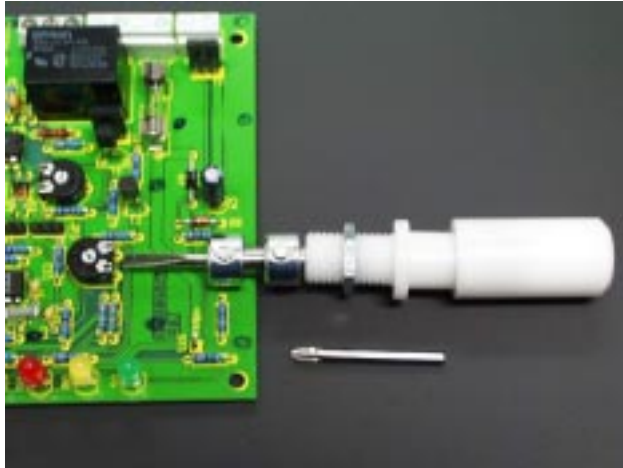
E = Euro Format
DE = Double Euro Format

Part No.	Description	Overall Dimensions (w x d x h, in mm)	Remarks
1495	SAM-E Stroke 9mm	200 x 32 x 70	Standard
12306	SAM-E Stroke 14mm	200 x 32 x 70	
10421	SAM-E / 96 pole	200 x 32 x 70	incl. 96-pole Standard Connector
1506	SAM-DE Stroke 9mm	270 x 32 x 70	Standard
12559	SAM-DE Stroke 14mm	270 x 32 x 70	
1504	SAM-Pneum. E	130 x 60 x 90	Stroke 9 mm
9894	SAM-TE	420 x 55 x 95	Stroke 10 mm
10142	SAM-Vacuum-E	166 x 88 x 28	* Stroke of Vacuum Fixture 8 mm
10371	SAM-Vacuum-DE	306 x 88 x 28	* Stroke of Vacuum Fixture 8 mm

Further Connector Approach Mechanic designs on request!

Status:
11.11.02

Accessories



Manuel Screwing Tool für Potentiometer Adjustment

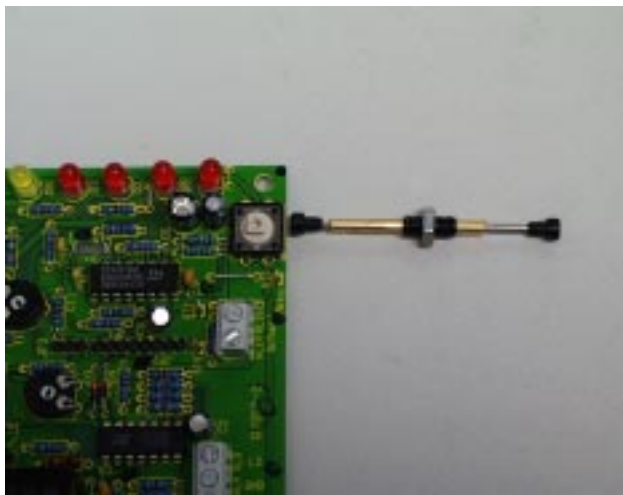
These manual screwing units enable adjustment of potentiometers. The screwing tool is spring-loaded and must be pushed down against the potentiometer during adjustment. The modular design of the screwing tool allows universal usage in a grid of 20 mm.

The chuck of the tool (which accepts the bits) is spring-loaded. The bits are easily exchanged.

The tool is supplied with two bits (1 x cross-head screw-driver tip, 1 x flat screw-driver tip). The length of the bit must be machined to suit the potentiometer mounted on the PC-Board.

Technical Data

Total length without bit:	92 mm
Largest Diameter :	18 mm
Assembly Hole Size:	12 mm
Adjustable installation size:	15 mm
Part No.:	17049



Manual Button Activator Tool

Using this tool, buttons and spring-loaded switches can be activated, and this during the testing of the PC-Board. The modular design of this tool allows universal usage in a grid of 10 mm.

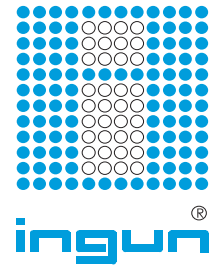
The manual button activation consists of an easy-to-change Test Probe (series GKS-504 305 180 A 3004), a threaded pin (M5 x 20 mm), a counter-nut (m5) and two anti-static supports. The button activation can be adjusted freely.

Technical Data

Total length:	59 mm
Largest Diameter:	9 mm
Assembly Hole Size:	M5
Part No.:	19637

Status:
11.11.02

Accessories



Ingun Marking Unit

The Ingun Marking Unit enables the marking of "good" PC-Board. Due to its compact design, it can easily be integrated inside the test fixture. Assembly is possible both above the PC-Board as well as below it.

After successful testing of the PC-Board, the marking unit is activated with a 2V impulse signal (msec) being applied.

The spring-loaded bit is pressed onto the PC-Board during testing. On activation of the unit, the bit scratches a circle ($\varnothing = 2.5$ mm) into the surface of the PC-Board.

Technical Data

Current Rating:	= 2 V
Connection Resistor:	8.5 Ohm
Speed of Bit:	4.9 sec. -1
Torque of Bit:	45 m Nm
Size of Marked Circle:	2.5 mm \varnothing
Material of Bit:	Hard Metal
Outside Dimensions (w x d x h):	15 x 36.5 x 60 mm
Part No.:	19504

Status:
11.11.02



Contacting Unit for Western-Mini-Plugs



Test Plug for Mini-Western-Connector

Photo:
Pneumatic Contacting Unit
incl. Western-Mini-Test Plug



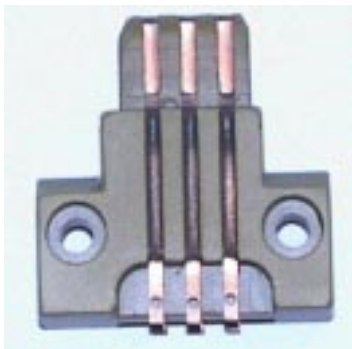
The Western-Mini-Test Plugs are available in four different versions:

- 17824 Western-Mini-Test Plug (4-channel plug)
- 18197 Mounting Shoe for Western-Mini-Test Plug (4 channel)
- 17825 Western-Mini-Test Plug (6-channel plug)
- 18198 Mounting Shoe for Western-Mini-Test Plug (6 channel)
- 17826 Western-Mini-Test Plug (8-channel plug)
- 17827 Western-Mini-Test Plug (10-channel plug)
- 18199 Mounting Shoe for Western-Mini-Test Plug (8 + 10 channel)



USB-Test Plugs

- 17829 USB-Test Plug (4-channel plug)
- 17830 Mounting Shoe for USB-Test Plug (4-channel plug)



TAE-Test Plugs

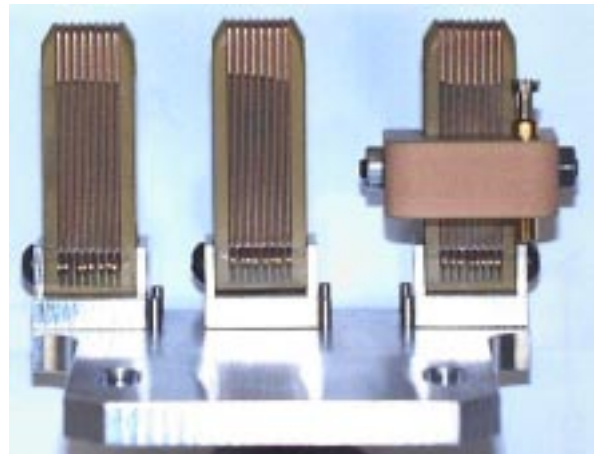
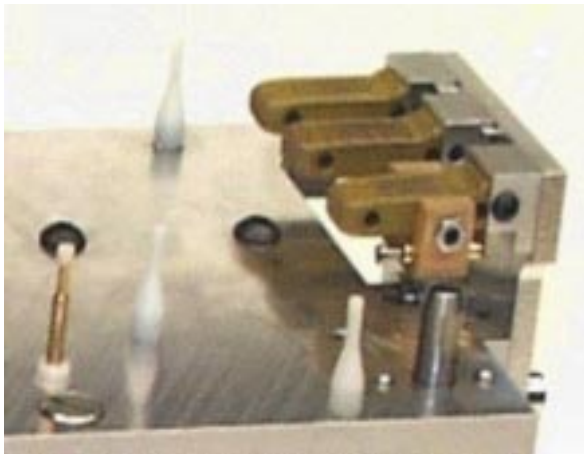
- 17831 TAE-Test Plug (6-channel plug)
- 18198 Mounting Shoe for TAE-Test Plug (6-channel plug)

Status:
11.11.02



Contacting Unit for Western-Mini-Plugs

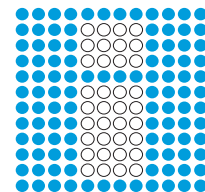
Example: Three Western-Mini-Test Plugs assembled floating on an Assembly Plate



Status:
11.11.02

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