# Altech Corp.®



## **Test and Measurement**

Since 1984, Altech Corporation has grown to become a leading supplier of automation and industrial control components. Headquartered in Flemington, NJ, Altech a supplier of electronic components has an experienced staff of engineering, manufacturing and sales personnel to provide the highest quality products with superior service. This is the Altech Commitment!

Our well trained technical experts welcome the opportunity to answer your technical questions and provide solutions to your automation and control needs. Give us a call or visit www.altechcorp.com.



Commitment

Altech's control components meet diverse national and international standards such as UL, NEC, CSA, IEC, VDE and more. Altech provides superior customer service and delivery through Total Quality Management and Continuous Process Improvement. Altech is ISO 9001 approved. We perform these services with honesty and integrity and are committed to achieve these goals.



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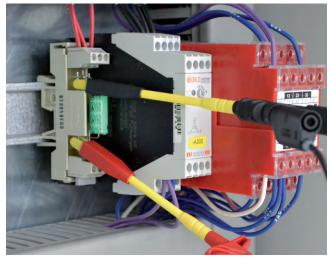




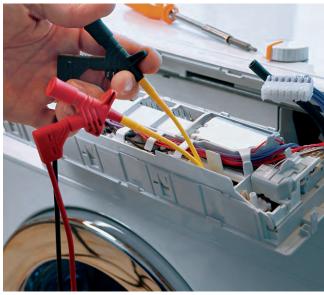
# **Plunger Style Test Clips**

Altech Plunger Style Test clips are easy to work with Test & Measurement Tools. They can handle high voltages, allow accessing difficult to reach areas and keep your hands free for other tasks. The grabber can access every measurement point even on the smallest Device or PCB Board circuit. The KLEPS 2700 is patented and its stainless steel piercing tip allows access to the wire without stripping.

- Measuring "difficult to access" testing points
- Various designs for different applications
- Handle with multiple connection points
- Patented KLEPS 2700 with special design steel tip for accessing connected wire







# **Plunger Style Test Clips** 0.64 mm System











**Type** 

#### **MICRO-KLEPS**

Mini plunger style test probe with rotating pincers, insulated shaft bendable up to 35°, suitable for very thin wires and densely packed contact points, fits MKL and MAL leads.

Clamping range 2 mm (0.079") **Rotating Pincers** Clamp type

PART NO. / Housing color 973972100 973972101

#### **KLEPS 3 ST**

Mini plunger style test probe with rotating pincers, suitable for very thin wires and densely packed contact points, fits MKL and MAL leads.

3.5 mm (0.138") **Rotating Pincers** 

973592100 973592101

#### **Technical Data**

2x pin Ø 0.64 mm Connection Type 30 VAC / 60 VDC Voltage Rating Measurement Category (IEC61010) CAT I

Current Rating\* 2 A Contact Resistance 10 mOhm

**Material Specifications** 

tin plated spring steel Pincers/ hook Connection pin/ socket nickel plated brass Contact Spring

**Environmental Conditions** 

Temperature Range

-25 °C to +100 °C (13°F to 212°F)

Flamability Rating

UL 94 HB Housing

pin Ø 0.64 mm

30 VAC / 60 VDC

CAT I 2 A 10 mOhm

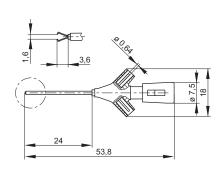
tin plated spring steel nickel plated brass

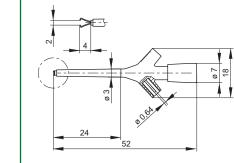
-25 °C to +100 °C (13°F to 212°F)

UL 94 HB

#### Drawing

Housing





<sup>\*</sup> Please consider derating graph on page 80.



# Plunger Style Test Clips 0.64 mm System



#### **KLEPS FP 2B**

For connecting to QFPIC's 0.5-0.8mm lead pitch. Slim design allows to test QFPIC's with several clips simultaneously, delivered in pairs of 2.



Type

PART NO. / Housing color

0.5 - 0.8 mm (0,020" - 0.031")

Micro grip jaws

974101188



#### KLEPS 064 PCH

Compact design allows usage with very small components up to 1mm, fits MKL and MAL leads.

1 mm (0.039") contact hook

974201100

974201101 974201102

974201103 974201104

974201106

974201107 (

#### **Technical Data**

Connection Type Voltage Rating

Measurement Category (IEC61010)

Current Rating\* Contact Resistance

#### **Material Specifications**

Pincers/ hook

Connection pin/ socket

Contact Spring

Housing

#### **Environmental Conditions**

Temperature Range Flamability Rating

Housing

pin Ø0.73mm 30 VAC / 60 VDC

CAT I

nickel plated spring steel

ABS

0°C to +60 °C (32°F to 140°F)

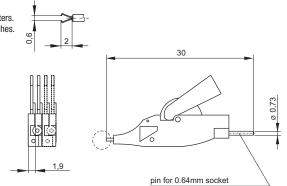
pin Ø0.64mm 30 VAC / 60 VDC CAT I

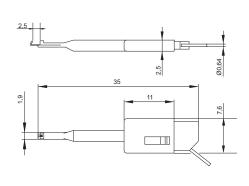
gold plated copper-beryllium

phosphor bronze

0°C to +70 °C (32°F to 158°F)

#### Drawing





<sup>\*</sup> Please consider derating graph on page 80.

# **Plunger Style Test Clips** 0.64 mm/4mm System





Type

#### KLEPS 2

Mini plunger style test probe with solder connection, gold plated phosphorus bronze contact hook for wires up to 2mm.

Clamping range 2 mm (0.079") contact hook Clamp type

PART NO. / Housing color 931467100

931467101



#### **KLEPS 2 BU**

Mini plunger style test probe with 2mm socket terminals, gold plated phosphorus bronze contact hook for wires up to 2mm, gold plated contact spring.

2 mm (0.079") contact hook

973501100 973501101

**Technical Data** 

Solder Terminal Connection Type 30 VAC / 60 VDC Voltage Rating

CAT I Measurement Category (IEC61010) Current Rating\* 6 A Contact Resistance 15 mOhm

**Material Specifications** 

gold plated phosphorous bronze Pincers/ hook

Connection pin/ socket Contact Spring

Housing Polyamide

**Environmental Conditions** 

-25 °C to +100 °C (13°F to 212°F) Temperature Range

Flamability Rating

UL 94 V-2 Housing

Spring-loaded socket Ø 2 mm

30 VAC / 60 VDC

CAT I 6 A 15 mOhm

gold plated phosphorous bronze

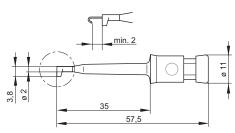
gold plated copper-beryllium

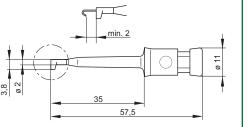
Polyamide

-25 °C to +100 °C (13°F to 212°F)

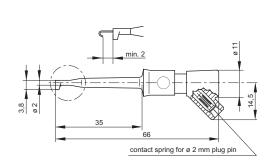
UL 94 V-2

#### Drawing





<sup>\*</sup> Please consider derating graph on page 80.





Type

# **Plunger Style Test Clips** 2 mm/4mm System



#### **KLEPS 1600**

Safety plunger style test probe with rotating pincers and flexible shaft. Special design of pincers allows clamping wires up to 4mm, 2mm gold plated brass socket terminal.

Clamping range 3 mm (0.118") Clamp type rotating pincers

PART NO. / Housing color

975106100 975106101



#### KLEPS 30

Plunger style test probe with rotating pincers and flexible shaft. Special design of pincers allows clamping wires up to 4mm, 4mm brass socket and screw

4 mm (0.157") rotating pincers

930113100 930113101



#### KLEPS 60

Plunger style test probe with rotating pincers and flexible shaft. Special design of pincers allows clamping wires up to 4mm, 4mm brass socket and screw terminals.

4 mm (0.157") rotating pincers

973053100 973053101

#### Technical Data

Socket Ø2 mm Connection Type AC/DC 1000V Voltage Rating Measurement Category (IEC61010) CAT III Current Rating\* 3 A Contact Resistance 50 mOhm **Material Specifications** 

nickel plated spring steel Pincers/ hook gold plated brass Connection pin/ socket

Contact Spring

Housing Polyamide

**Environmental Conditions** 

Temperature Range

-25 °C to +70 °C (13°F to 158°F)

Flamability Rating

UL 94 V-2 Housing

Socket Ø 4 mm, screw terminal

30 VAC / 60 VDC CAT I

4 A

50 mOhm

nickel plated spring steel

brass

-25 °C to +80 °C (13°F to 176°F)

UL 94 V-0

Socket Ø 4 mm, screw terminal

30 VAC / 60 VDC

CAT I 4 A

50 mOhm

nickel plated spring steel

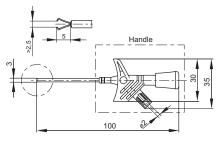
brass

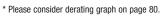
PP, PS

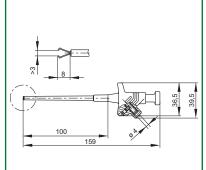
-25 °C to +60 °C (13°F to 140°F)

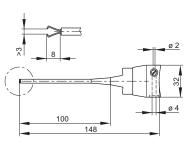
UL 94 HB

#### Drawing









# Plunger Style Test Clips 4mm System





#### Type

#### **KLEPS 250**

Touch proof plunger style test probe with rotating pincers and flexible shaft, allows to clamp wires up to 4mm, 4mm brass socket, fits MLN and MLB leads.

Clamping range Clamp type

PART NO. / Housing color

4 mm (0.157") rotating pincers

973528100

973528101



#### **KLEPS 2600**

Safety plunger style test probe with rotating pincers and flexible shaft, allows to clamp wires up to 4mm, 4mm brass socket.

4 mm (0.157") rotating pincers

972306100 **●** 972306101 **●** 

#### **Technical Data**

Connection Type
Voltage Rating

Measurement Category (IEC61010) Current Rating\* Contact Resistance

#### **Material Specifications**

Pincers/ hook Connection pin/ socket

Contact Spring Housing

#### **Environmental Conditions**

Temperature Range

Flamability Rating Housing

30 VAC / 60 VDC CAT I

socket Ø 4 mm

4 A

100 mOhm

nickel plated spring steel nickel plated brass

– PF

-25 °C to +80 °C (13°F to 176°F)

UL 94 V-0

socket Ø 4 mm AC/DC 1000 V CAT III 4 A 50 mOhm

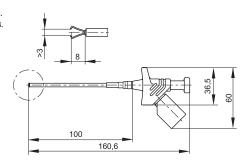
nickel plated spring steel nickel plated brass

-PBT

-25 °C to +80 °C (13°F to 176°F)

UL 94 HB

#### Drawing



Handle 450 4

<sup>\*</sup> Please consider derating graph on page 80.

# **Plunger Style Test Clips** 4 mm Safety System



Safety plunger style test probe with spring loaded stainless steel tip, for wires up to 3.5mm, no stripping necessary, 4mm brass socket.

Clamping range 3.5 mm (0.138") Clamp type spring-loaded stainless steel tip

PART NO. / Housing color

972307100 972307101



Safety plunger style test probe with wide opening alligator clip, for wires and areas with large cross sections, fits safety measurement leads.

10 mm (0.394") alligator clips

972308100 972308101



**KLEPS 2900** 

Safety plunger style test probe with stationary contact hook, fits safety measurement leads.

5.5 mm (0.217") contact hook

972309100 972309101

#### Technical Data

Type

socket Ø 4 mm Connection Type AC/DC 1000 V Voltage Rating Measurement Category (IEC61010) CAT III Current Rating\* 10 A Contact Resistance 100 mOhm

**Material Specifications** 

Pincers/ hook stainless steel nickel plated brass Connection pin/ socket

Contact Spring Housing

**Environmental Conditions** 

Temperature Range

Housing

-25 °C to +80 °C (13°F to 176°F)

Flamability Rating

**UL 94 HB** 

socket Ø 4 mm AC/DC 1000 V CAT III 20 A 100 mOhm

nickel plated spring steel nickel plated brass

-25 °C to +80 °C (13°F to 176°F)

UL 94 HB

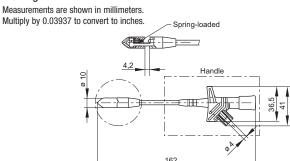
socket Ø 4 mm AC/DC 1000 V CAT III 20 A 50 mOhm

nickel plated brass nickel plated brass

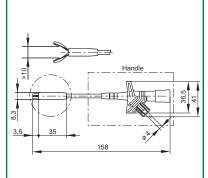
-25 °C to +80 °C (13°F to 176°F)

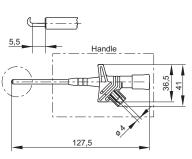
UL 94 HB

#### Drawing



\* Please consider derating graph on page 80.







# **Altech Digital Panel Meters**



#### **Digital Multi Function Meters**

MFM Series (Power, Energy, Voltage, Current, Frequency, Power Factor) VAF Series (Voltage, Current, Frequency) EM Series (Power, Energy)

#### **Digital Ampere Meters**

MA12 Series (LED Display) MA Series (LCD Display)

#### **Digital Voltage Meters**

MV15 Series (LED Series) MV Series (LCD Display)

#### **Digital Frequency Meter**

MF16 Series

#### **Digital Power Factor Meter**

MP14 Series

#### **Disconnect and Test Terminal Block**

For Meter Circuits

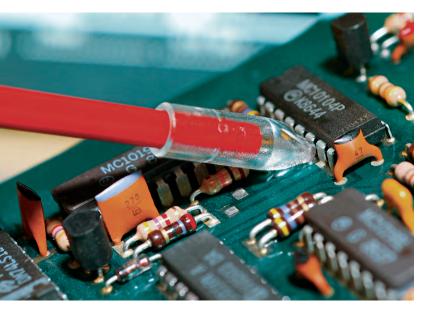


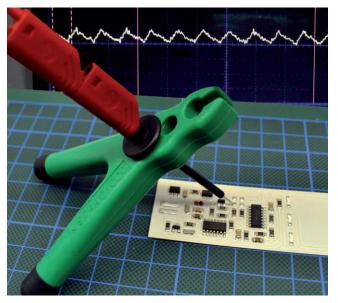
## **Test Probes**

Altech offers the proper test probe for every specific application. Due to small dimensions in electronic devices, test probes need to be very precise. The Test probes on the following pages meet these high standards.

- Slim and compact body for easy access
- Stainless steel tips
- Spring-loaded tips guarantee contact without damaging test object
- Suitable for testing through oxidation and insulation layers







# **Test Probes** 2 mm System







#### **Type**

#### MICRO-PRUEF MPS 2 0,64 FT

Miniature test probe with spring loaded stainless steel probe tip for sampling extremely small measuring points and SMD components. Because the probe tip is sprung, it cannot slip off and provides constant pressure. Connects with MKL 0.64/25-0.25 and MAL N 4-0.64/100-0.25

0.75 mm (0.029 in.) Tip diameter

PART NO. / Housing color

973995100

973995101

#### **PRUEF 1**

Miniature test probe for sampling extremely small measuring points. Shatter-proof grip, may be unscrewed. The stainless steel tip easily penetrates insulation and oxide layers. Solder connection up to 0.5 mm<sup>2</sup>.

1 mm (0.039 in.)

931376100 931376101

#### **Technical Data**

Connection Type Voltage Rating

Measurement Category (IEC61010)

Current Rating\* Contact Resistance

#### **Material Specifications**

Tip Connection pin/ socket

Contact Spring

**Environmental Conditions** 

Temperature range

Flamability Rating Housing

spring-loaded tip fixed pin Ø 0.64 mm 30 VAC / 60 VDC

CAT I 1 A

> stainless steel nickel plated brass

-25 °C to +80 °C (13°F to 176°F)

UL 94 HB

stationary tip

solder connection up to 0.5 mm<sup>2</sup>

30 VAC / 60 VDC

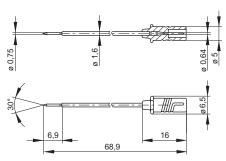
CAT I 1 A

> stainless steel nickel plated brass

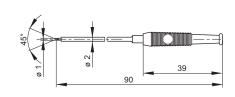
PVC-P

-25 °C to +60 °C (13°F to 140°F)

#### Drawing









# **Test Probes** 2 mm System





#### Type

#### MPS 1

Miniature test probe for sampling very small measuring points. The stainless steel tip easily penetrates insulation and oxide layers. Socket connection through a 2 mm diameter gold-plated socket with contact spring.

Tip diameter 1 mm (0.039 in.)

PART NO. / Housing color

973531100 973531101

#### PRUEF 1610 FT Au

Safety test probe with shatter-proof insulated sleeve, spring-loaded and slender stainless steel tip. 2 mm diameter gold-plated brass socket connection, stackable with 2 mm safety measuring lead MVL S WS. Insulation and oxide layers can be penetrated by this test probe.

975018701

0.75 mm (0.029 in.)

975017701

1.4 mm (0.055 in.)

PRUEF 1600 Au

Safety test probe with shatter-proof

insulated sleeve and slender stainless

steel tip. 2 mm diameter gold-plated

mm safety measuring lead MVL S WS.

Insulation and oxide layers can be

penetrated by this test probe.

brass socket connection, stackable with 2

975018700 975017700

#### Technical Data

Connection Type stationary tip

spring-loaded socket Ø 2 mm Voltage Rating

Measurement Category (IEC61010)30 VAC / 60 VDC

Current Rating\* CAT I Contact Resistance 1 A 100 mOhm **Material Specifications** 

Tip stainless steel gold plated copper-beryllium Connection pin/ socket

Contact Spring Housing

**Environmental Conditions** 

Temperature range -25 °C to +60 °C (13°F to 140°F)

Flamability Rating

Housing

spring-loaded tip fixed socket Ø 2mm

AC/DC 1000V

CAT II 10 A 20 mOhm

stainless steel gold plated copper-beryllium

-25°C to +70°C (13°F to 158°F)

UL 94 V-2

stationary tip

fixed socket Ø 2 mm

AC/DC 1000V

CAT III

10 A

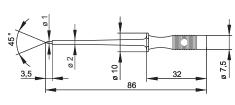
20 mOhm stainless steel

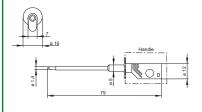
gold plated brass

-25°C to +70°C (13°F to 158°F)

UL 94 V-2

#### Drawing





<sup>\*</sup> Please consider derating graph on page 80.

# **Test Probes**4 mm System







#### Type MZS 1 - PRUEF

Needle-shaped, long stainless steel test probe with shatter-proof insulated sleeve and unsprung 4 mm connecting socket. During state of connection or operation of test leads, it is possible to measure with the test probe from the back side of the closed connector.

Tip diameter 1 mm (0.039 in.)

PART NO. / Housing color 973601100

973601100 973601101

#### PRUEF 2

Test probe with shatter-proof insulated sleeve. Insulation and oxide layers can be penetrated by the slender stainless steel tip. 4 mm diameter brass socket connection.

Accessory (optional): tip protector / IC tap SS 260

2 mm (0.079 in.)

973368100 **9**73368101 **•** 

#### **Technical Data**

Connection Type stationary tip

Voltage Rating fixed socket Ø 4 mm

Measurement Category (IEC61010) 30 VAC / 60 VDC

Current Rating\* CAT I

Contact Resistance 1 A

Material Specifications 10 mOhm

Tip stainless steel

Connection pin/ socket nickel plated brass

Contact Spring – Housing P

**Environmental Conditions** 

Temperature range -20°C to + 60°C (-4°F to 140°F)

Flamability Rating

Housing UL 94 HB

stationary tip

fixed socket Ø 4 mm 30 VAC / 60 VDC

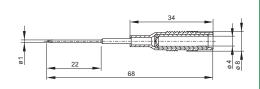
CAT I
1 A
50 mOhm
stainless steel
nickel plated brass

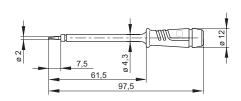
-PP

-25 °C to +80 °C (13°F to 176°F)

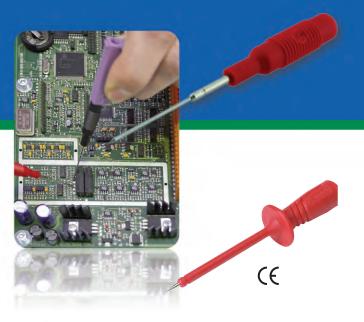
UL 94 HB

#### Drawing





<sup>\*</sup> Please consider derating graph on page 80.



# **Test Probes** 4 mm Safety System





#### Type

#### PRUEF 2600 C2

Test probe shatter - proof insulating sleeve and slender stainless steel tip. Tip for penetration of insulation and oxide layers. 4mm diameter brass socket connection. Connection with safety measuring leads. Accessory (optional): protector and IC - tap SS 260

2 mm (0.079 in.) Tip diameter

PART NO. / Housing color

972327100 972327101

#### SS 260

Tip protection and IC tap. Clipping onto the PRUEF 2, PRUEF 2 S and PRUEF 2600 C2 test probe covers the needle tip and provides protection against injury. Contact is made with ICs without short circuiting or slipping off.

973865001

#### PRUEF 2610 FT

Test probe with insulated sleeve and slender, sprung stainless steel tip. This allows a constant pressure to be applied without the tip slipping off the component, even in the smallest measuring points. 4 mm diameter brass socket connection.

0.75 mm (0.029 in.)

972318100 972318101

#### Technical Data

Connection Type stationary tip fixed socket Ø 4 mm Voltage Rating

Measurement Category (IEC61010) AC/DC 1000V

Current Rating\* CAT II Contact Resistance 1 A 50 mOhm **Material Specifications** Tip stainless steel

nickel plated brass Connection pin/ socket

Contact Spring Housing

**Environmental Conditions** 

-20°C to +60°C (-4°F to 140°F) Temperature range

Flamability Rating

UL 94 HB Housing

spring-loaded tip fixed socket Ø 4 mm

AC/DC 1000 V

CAT II 1 A

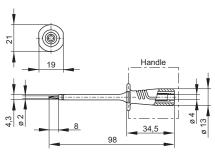
> 50 mOhm stainless steel nickel plated brass

-25 °C to +80 °C (13°F to 176°F)

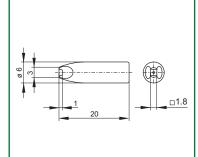
UL 94 HB

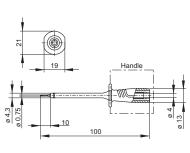
#### Drawing

Measurements are shown in millimeters. Multiply by 0.03937 to convert to inches.



\* Please consider derating graph on page 80.





# **Test Probes** 4 mm Safety System





#### **PRUEF 2700 Type**

Safety test probe with dual function. Tip for penetrating insulation and oxide layers and 4 mm diameter pin for insertion in sockets. 4 mm diameter brass socket connection. Connects with safety measuring leads.

4 mm (0.157 in.) Tip diameter

PART NO. / Housing color 972319100

972319101





#### **PRUEF 2600**

Test probe with elastic, shatter-proof insulated sleeve and slender stainless steel tip. Tip for penetration of insulation and oxide layers. 4 mm diameter brass socket connection. Connects with safety measuring leads. Accessory tip protector and IC tap SS 260.

2 mm (0.78 in.)

972317100 972317101



#### **Technical Data**

stationary tip Connection Type Voltage Rating fixed socket Ø 4 mm Measurement Category (IEC61010) AC/DC 1000 V Current Rating\* CAT II

Contact Resistance 32 A **Material Specifications** 2 mOhm Tip

nickel plated brass Connection pin/ socket nickel plated brass Contact Spring

**Environmental Conditions** 

-25 °C to +80 °C (13°F to 176°F) Temperature range

Flamability Rating

UL 94 HB Housing

stationary tip

fixed socket Ø 4 mm AC/DC 1000 V

CAT III 1 A

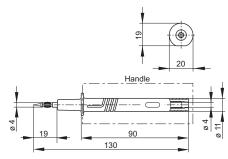
50 mOhm

stainless steel nickel plated brass

-25 °C to +80 °C (13°F to 176°F)

UL 94 HB

#### Drawing



Handle

<sup>\*</sup> Please consider derating graph on page 80.

# ddb TP9 31dwys 31dwys 31dwys 31dwys 31dwys 31dwys

# Oscilloscope Test Probes High Frequency Measurement



Altech High Frequency Test Probes are for direct connection to oscilloscopes. The line consists of a standard 5mm series with adjustable probe ratio and 2.5mm series with fixed 10:1 ratio.

- •10:1 probe ratio
- Exchangable spring tip
- Low Input Capacitence





Type

#### TKO 5 - PMS 221A

Passive High Impedance Miniature Test Probe with 150 MHz Bandwith and Probe Ratio 10:1 (Switchable, 20 MHz @ Probe Ratio 1:1). The probe is adjustable for low frequencies.

#### Features:

- Modular Probe
- Coaxial Design
- Coaxial Reed Switch
- New IC contact system for 0.003" to 0.004" grids
- Interchable Spring Contact Tip for reliable Contacting

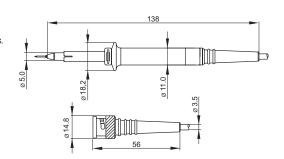
PART NO.

#### 974312000

Technical Data		
Probe Ratio	1:1	10:1
Input Ressitance	-	10 MΩ
Input Capacitence	78 pF inkl. Oszi.	13 pF
Oscilloscope Input	1 MΩ AC/DC	1 MΩ AC/DC
Probe bandwidth	20 MHz	150 MHz
Risetime	18 nsec	2,4 nsec
Compensation Range		15 40 pF
Measurement category	55 V eff. CAT II	300 V rms CAT II
Pollution degree	2	2
Safety standard	IEC 61010-031	
Cable length	1.2 m (3.94 ft.)	

#### Drawing

Measurements are shown in millimeters. Multiply by 0.03937 to convert to inches.



#### Contents



- Test Probe
- Manual
- Ground Lead 0.22m (0.72")
- Spring Tip 0.8mm (0.003")
  Solid Tip CuBe 0.8mm (0.003")
- Ground Blade 5.0mm (0.016")
- Isolation Cover 5.0mm (0.016")
- Protection Cover 5.0mm (0.016")
- IC covers 0.8 to 1.27mm (0.003-0.004")
- Spring Hook 5.0mm (0.016")
- Adjustment Tool T

# **Oscilloscope Test Probes**

## High Frequency Measurement





#### Type

#### TKO 2,5 - PML 711A

Passive High Impedance Miniature Test Probe with 500 MHz Bandwith and Probe Ratio 10:1. Designed for Oscilloscopes having 1MOhm Input resistance.

#### Features:

- Compact Size (0.008" probe tip) ideal for measuring SMD Components
- 0.002" gold plated spring loaded changeable Probe tip
- Innovative IC contact system for 0.002" to 0.004" grids
- With ReadOut (RO)



#### TKO 5 - PMT 221A

Passive High Impedance Miniature Test Probe with 250 MHz Bandwith and Probe Ratio 10:1 (Switchable, 30 MHz @ Probe Ratio 1:1). The probe is adjustable for low frequencies.

974311000

- Modular Probe
- Coaxial Design
- Coaxial Reed Switch
- Innovative IC contact system for 0.003" to 0.004" grids

10:1

10  $M\Omega$ 

13 pF

1 MO AC/DC

250 MHz

1,4 nsec

- Interchable Spring Contact Tip for reliable Contacting
- HF- Adjustment

#### PART NO.

#### 974301000

Technical	Data	

Probe Ratio 10:1 Input Impedence 10 M $\Omega$ Input Capacitence 9.5 pF Oscilloscope Input 1 M $\Omega$  AC/DC

Probe bandwidth (3dB) 500 MHz Risetime (10% - 90%) 700 psec Compensation Range 10 ... 25 pF 300 V CAT II Measurement category

Pollution degree IEC 61010-031 Safety standard Cable length 1.3 m (4.27 ft.)

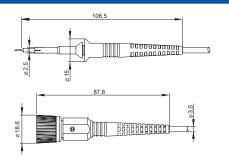
1:1 80 pF inkl. Oszi. 1 MΩ AC/DC 30 MHz

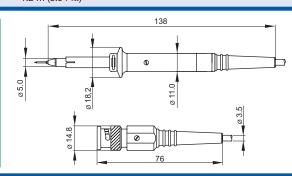
> 12 nsec 10...35 pF (\*\*) 55 V eff. CAT II 300 V rms CAT II

> > IEC 61010-031 1.2 m (3.94 ft.)

#### Drawing

Measurements are shown in millimeters. Multiply by 0.03937 to convert to inches.

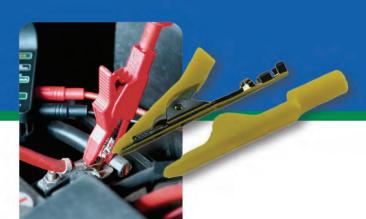




#### Contents



- Manual
- Spring Tip gold plated 0.5mm (0.002")
- Solid Tip CuBe 0.5mm (0.002")
- Coding Rings (3x4 colors)
- Ground Lead 0.11m (0.36")
- Ground Blade 2 5mm (0 008")
- 2 self adhesive Cu Pads
- Isolation Cover 2.5mm (0.008") Protection Cover 2 5mm (0.008")
- IC covers 0.5 to 1.27mm (0.002-0.004")
- Spring Hook 2.5mm (0.008")
- Ground Spring 2.5mm (0.008")
- PCB Adapter Kit 2.5mm (0.008") 2 Foot Positioner
- · Adjustment Tool T
- · Test Probe
- Manual
- Ground Lead 0.22m (0.72")
- Spring Tip 0.8mm (0.003") Solid Tip CuBe 0.8mm (0.003")
- Ground Blade 5.0mm (0.016")
- Isolation Cover 5.0mm (0.016")
- Protection Cover 5.0mm (0.016")
- IC covers 0.8 to 1.27mm (0.003-0.004")
- Spring Hook 5.0mm (0.016")
- BNC Adapter 5 0mm (0.016")
- 2 Foot Positioner
- · Adjustment Tool T



# **Alligator Clips**

Altech Alligator clips have the proper jaw opening and grabbing strength for every application. From a Micro SMD clip for measuring smallest surface-mount components up to a 30mm (1.18in) "big mouth" a wide range of alligator clips is available.

- Various clamping ranges
- Stainless steel versions for use in galvanic and acid environments
- Soldering connections for "do it yourself" connections







# Alligator Clips 0.64 and 2 mm System







Type

#### **MICRO-SMD CLIP 1**

Spring loaded 2 pole test clip designed for MSD components; gold plated, hardened tip; flat nose for testing individual components; insulated spring, 0.64mm connection pin terminal.

AGF 1

Mini alligator clip for small components, silver plated, solder/ crimp terminal max. 0.5mm<sup>2</sup>.

Clamping range

0 mm to 8 mm (0.31")

PART NO. / Housing color

972416100

1 mm (0.04")

930476001

**Technical Data** 

Contact Typealligator clipConnection Type2x pin 0.64 mmVoltage Rating30 VAC / 60 VDC

Measurment Category (IEC61010) CAT I

Current Rating\* 1 A

Contact Resistance 6 mOhm

**Material Specifications** 

Alligator Clip gold plated copper beryllium

Housing

**Environmental Conditions** 

Temperature Range

e -30 °C to +100 °C (22°F to 212°F)

Flamability Rating

Housing UL 94 HB

alligator clip

solder, crimp 0.5mm<sup>2</sup> 30 VAC / 60 VDC

CAT I 3 A 15 mOhm

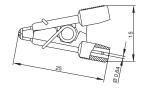
silver plated brass

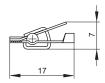
\_

-25°C to +100 °C (13°F to 212°F)

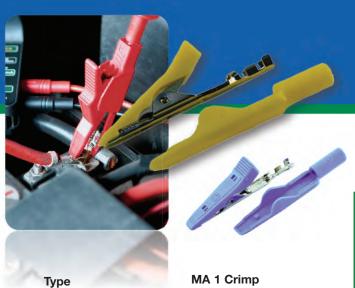
-

#### Drawing





<sup>\*</sup> Please consider derating graph on page 80.



# **Alligator Clips** 2 mm System



#### MA<sub>1</sub>

Mini Alligator Clip, high-strength insulation, nickel plated brass/ bronze jaws, 2mm system socket terminal.



#### **MA1S**

Mini Alligator Clip, high-strength insulation, stainless steel spring, nickel plated brass/ bronze jaws, 2mm system socket terminal.

Clamping range

PART NO. / Housing color

4 mm (0.16")

930318100 930318104 930318101

930318106 930318102 930318107 〇 930318103

-25°C to +100 °C (13°F to 212°F)

Mini Alligator Clip, high-strength

insulation, nickel plated brass/ bronze

jaws, crimp terminal 0.25mm 2-

0.5mm² for suitable crimp tool insert.

4 mm (0.16")

930317800 930317804 930317806 930317801 930317802 930317807 〇 4 mm (0.16")

973584100 973584104 973584101 973584106 973584102 973584107 🔾 973584103

#### **Technical Data**

Contact Type alligator clip

Connection Type crimp 0.25 mm<sup>2</sup> up to 0.5 mm<sup>2</sup>

30 VAC / 60 VDC Voltage Rating

Measurment Category (IEC61010) CAT I Current Rating\* 8 A Contact Resistance 5 mOhm

**Material Specifications** 

Alligator Clip nickel plated brass / bronze

Housing

**Environmental Conditions** 

Temperature Range

Flamability Rating

UL 94 HB Housing

alligator clip

930317803

spring-loaded socket Ø 2 mm

30 VAC / 60 VDC

CAT I 8 A 5 mOhm

nickel plated brass / bronze

-25°C to +100 °C (13°F to 212°F)

UL 94 HB

alligator clip

spring-loaded socket Ø 2 mm

30 VAC / 60 VDC

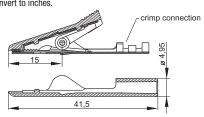
CAT I 8 A 5 mOhm

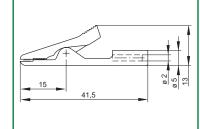
tin plated brass / bronze

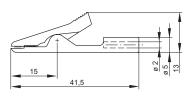
-25°C to +100 °C (13°F to 212°F)

**UL 94 HB** 

#### Drawing







<sup>\*</sup> Please consider derating graph on page 80.

# **Alligator Clips** 4 mm System







**Type** 

#### AGF 2

Extra small Alligator Clip, for extremely small dense contact points, jaws insulated on the outside, 2mm and 4mm system socket terminal.

AGF 20

Steel Alligator Clip, nickel plated, max, jaw opening 12mm, 4mm system socket and solder terminal.

**AGF 30** 

Stainless Steel Alligator Clip, max, jaw opening 10mm, 4mm system socket and solder terminal.

Clamping range

PART NO. / Housing color

4 mm (0.16")

931272101

931272100

12 mm (0.47")

930120000

10 mm (0.40")

930122000

**Technical Data** 

Contact Type

Connection Type Voltage Rating

Measurment Category (IEC61010)

Current Rating\* Contact Resistance

**Material Specifications** 

Alligator Clip PVC-P Housing

**Environmental Conditions** 

Temperature Range Flamability Rating

Housing

alligator clip

socket Ø 4mm and Ø 2mm

30 VAC / 60 VDC

CAT I 6 A

300 mOhm

stainless steel

-25°C to +80 °C (13°F to 176°F)

alligator clip

socket Ø 4 mm, solder terminal

30 VAC / 60 VDC

CAT I 4 A

15 mOhm

nickel plated steel

-25°C to +100 °C (13°F to 212°F)

alligator clip

socket Ø 4 mm, solder terminal

30 VAC / 60 VDC

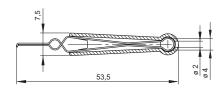
CAT I 4 A

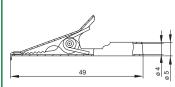
15 mOhm

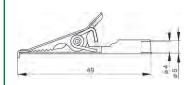
stainless steel

-25°C to +100 °C (13°F to 212°F)

#### Drawing







<sup>\*</sup> Please consider derating graph on page 80.



# **Alligator Clips** 4 mm System





**AGS 20** Type

> Steel Alligator Clip, nickel plated, max, jaw opening mm, 4mm system socket and solder/ screw terminal.

Insulated Alligator Clip, tin plated brass insert, suitable for very thin wires, 4mm system socket terminal.

**AK 2 S** 

High Strength Alligator Clip, insuslated, nickel plated brass, 4mm system socket and screw terminal max. 1.5mm<sup>2</sup>.

Clamping range 5 mm (0.20") PART NO. / Housing color

930126100 930126101 930126102 930126103 930126104

6 mm (0.24")

**AK 10** 

9.5 mm (0.37")

932146100 932146101

**Technical Data** 

Contact Type alligator clip

Connection Type socket Ø 4 mm, solder screw terminal

603006001

Voltage Rating 30 VAC / 60 VDC

Measurment Category (IEC61010) CAT I Current Rating\* 4 A Contact Resistance 10 mOhm

**Material Specifications** 

Alligator Clip nickel plated steel

Housing

**Environmental Conditions** 

-25°C to +100 °C (13°F to 212°F) Temperature Range

Flamability Rating

Housing

alligator clip socket Ø 4 mm 30 VAC / 60 VDC

CAT I 6 A 15 mOhm

tin plated brass

-25°C to +100 °C (13°F to 212°F)

UL 94 HB

alligator clip

socket Ø 4 mm, screw terminal

30 VAC / 60 VDC

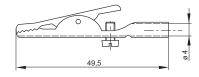
CAT I 25 A 10 mOhm

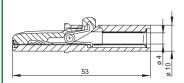
nickel plated brass

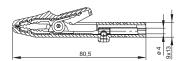
-25°C to +80 °C (13°F to 176°F)

UL 94 HB

#### Drawing







<sup>\*</sup> Please consider derating graph on page 80.

# **Alligator Clips** 4 mm System









**MA 260 SH** Type

> Touch proof mini Alligator Clip, nickel plated bronze, jaw opening 6mm, 4mm system socket and solder terminal.

AK 2B

High Strength Alligator Clip, touch proof, nickel plated brass, 9.5mm jaw opening, 4mm system socket terminal.

AK 2 B 2540 I

High Strength wide opening Alligator Clip, touch proof, nickel plated brass, 30mm jaw opening, 4mm system socket terminal.

6 mm (0.24") Clamping range

PART NO. / Housing color 973889100

973889101

9.5 mm (0.37")

932435100 932435101

30 mm (1.18")

972405100 972405101

972405102

972405103 972405104

972405188

**Technical Data** 

Contact Type alligator clip

Connection Type socket Ø 4 mm, solder terminal

Voltage Rating AC/DC 300 V Measurment Category (IEC61010) CAT II Current Rating\* 15 A 5 mOhm Contact Resistance

**Material Specifications** 

Alligator Clip nickel plated bronze

Housing

**Environmental Conditions** 

Temperature Range

-25°C to +80 °C (13°F to 176°F)

Flamability Rating

UL 94 HB Housing

alligator clip

socket Ø 4 mm AC/DC 300 V

CAT II 25 A

10 mOhm

nickel plated brass

-25°C to +80 °C (13°F to 176°F)

UL 94 HB

alligator clip socket Ø 4 mm

AC/DC 1000 V

CAT II 32 A

10 mOhm

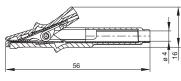
nickel plated brass

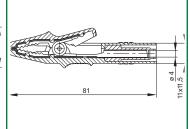
PP

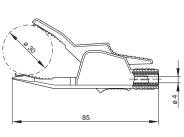
-30°C to +90 °C (22°F to 194°F)

UL 94 HB

#### Drawing







<sup>\*</sup> Please consider derating graph on page 80.

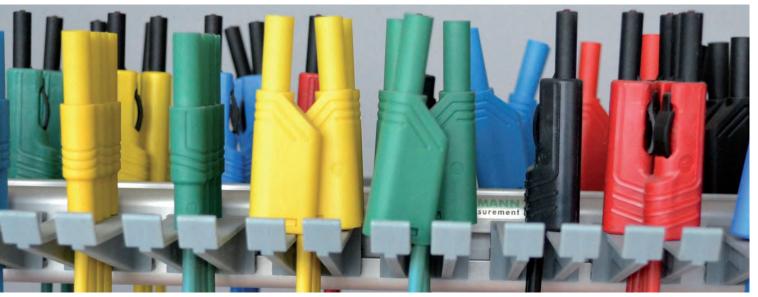


# **Measuring Leads**

Altech Test & Measurement Leads are often exposed to extensive wear and tear and other extreme conditions. They must be robust, flexible, carry heavy loads and long lasting. Therefore they are manufactured in a closely monitored process with high quality materials.

- Wide variety of colors, length and connections
- Double insulation
- Highly flexible also at low temperatures
- Silicone version for solder resistance
- Built-in white color indicator for damage identification
- Up to 1000V CAT III
- Wire size up to 2.5mm2 for 32A
- Safety Systems
- Nickel and Gold plating





# **Measuring Leads** 0.64 mm System









Type

#### **BNC AL 0,64**

BNC adapter lead with insulated sockets for 0.64 mm round and rectangular pin. Red inner lead, black shielding; cable type RG 58 A/U, 50 Ohm. For use with oscilloscopes, PC cards, etc.

1.2m (47.2") BNC + 0.1m (3.9") wires

Cable size Cable material Pin dimensions

RG 58 A/U Cable type PART NO. / Housing color 933844001

MAL N 4-0,64/100-0,25

Injection-moulded measuring lead with spring loaded 4 mm diameter plug and 4 mm diameter socket for further connection and insulated socket for 0.64 mm round and rectangular pin. Highly flexible 0.25 mm<sup>2</sup> stranded wire.

0.1m (39.4")

0.25 mm<sup>2</sup> (24 AWG)

4 mm (0.157")

934160100

934160101

MKL 0,64/25-0,25

Measuring lead with two insulated sockets for 0.64 mm round and rectangular pin. Highly flexible 0.25 mm<sup>2</sup> stranded wire with two 0.64 mm diameter sockets.

25 mm

0.25 mm2 (24 AWG)

4 mm (0.157")

LIY

973604100

973604101

**Technical Data** 

Cable length

BNC conenctor, 2x0.64 mm (0.025") Contact Type spring loaded square pin socket

30 VAC / 60 VDC

Voltage Rating

Measurement Category (IEC61010) CAT I Current Rating\* Contact Resistance

**Material Specifications** 

Contact Pin Contact Spring Housing

**Environmental Conditions** 

Temperature Range -15 °C to +70 °C (5°F to 158°F)

Flamability Rating

Housing

pin (spring-loaded), 0.64mm (0.025") spring loaded square pin socket

30 VAC / 60 VDC

CAT I 3 A 70 mOhm

nickel plated brass

nickel plated copper beryllium

PVC

-15°C to +70°C (5°F to 158°F)

square pin socket

30 VAC / 60 VDC

CAT I 3 A

20 mOhm

gold plated copper beryllium

2x0.64mm (0.025 in.) spring loaded

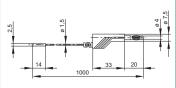
PPO

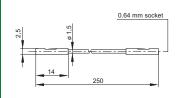
-40 °C to +60 °C (-40°F to 140°F)

UL 94 HB

#### Drawing







<sup>\*</sup> Please consider derating graph on page 80.





#### MVL 2/25; MVL 2/50; MVL 2/100

Injection-moulded measuring lead, at either end 2 mm diameter nickel-plated brass connector and 2 mm diameter socket with contact spring, for tower constructions. Highly flexible stranded lead, grip and lead shatter-proof.

Cable length 0.25m (9.8"), 0.5m (19.7"), 1.0m (39.4")

Cable size 0.5 mm<sup>2</sup> (20AWG)

Cable material PVC

Type

Pin dimensions 2 mm (0.078")

Cable type LF-Y

**PART NO.** / Housing color 0.25 m **973594100 973594101** 

0.5 m **973595100 973595101** 

1.0 m **973596100 973596101** 



#### MAL S WS 2-4 100/1

Safety measuring lead according to IEC 61010, one end with 2 mm safety plug and other end with 4 mm safety plug, as well as 2 mm and 4 mm socket for onward connection capability. Gold-plated / nickel-plated copper-beryllium contact spring. Highly flexible, double insulated stranded lead and shatter-proof grip sleeves. Built in colour indicator for easy identification of insulation damages.

100 m (39.4")

1 mm<sup>2</sup> (18 AWG)

PVC

2 mm (0.078") / 4 mm (0.157")

LEH-XY

975163100
975163105

975163101
975163106

975163102975163107975163103975163109

975163104

### Technical Data

Contact Type stationary pin

Voltage Rating 30 VAC / 60 VDC

Material Specifications

Contact Pin nickel plated brass
Contact Spring copper beryllium
Housing Polypropylene

**Environmental Conditions** 

Temperature Range  $-40 \, ^{\circ}\text{C}$  to  $+60 \, ^{\circ}\text{C}$  (-40  $^{\circ}\text{F}$  to 140  $^{\circ}\text{F}$ )

Flamability Rating

Housing UL 94 HB

spring-loaded pin

AC/DC 1000V CAT II

10 A

21 mOhm

nickel plated brass

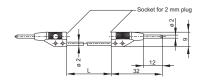
gold plated copper beryllium

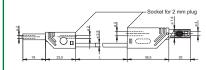
Polyamide

-15 °C to +70 °C (5°F to 158°F)

UL 94 V-2

#### Drawing





<sup>\*</sup> Please consider derating graph on page 80.

# Measuring Leads 2 mm System





Type MVL S WS 25/1 Au MVL S WS 50/1 Au MVL S WS 100/1 Au MVL S WS 200/1 Au

Safety measuring lead according to IEC 61010, with 2 mm safety plugs on both sides and 2 mm sockets for onward connection capability. Gold-plated copper-beryllium contact spring. Highly flexible, double insulated stranded lead and shatter-proof grip sleeves. Built in colour indicator for easy identification of insulation damages.

Cable length	0.25m (9.8")	0.5m (19.7")	1.0m (39.4")	2.0m (78.7")
Cable size	1 mm² (18 AWG)	1 mm <sup>2</sup> (18 AWG)	1 mm <sup>2</sup> (18 AWG)	1 mm² (18 AWG)
Cable material	PVC	PVC	PVC	PVC
Pin dimensions	2 mm (0.078")	2 mm (0.078")	2 mm (0.078")	2 mm (0.078")
Cable type	LEH-XY	LEH-XY	LEH-XY	LEH-XY
PART NO. / Housing color	975694700	975695700	975696700	● 975698700
	975694701	975695701	975696701	975698701
	975694702	975695702	975696702	975698702
	975694703	975695703	975696703	975698703
	975694704	975695704	975696704	975698704
	975694705	975695705	975696705	975698705
	<b>975694706</b>	975695706	<b>975696706</b>	975698706
	O 975694707	O 975695707	O 975696707	<b>975698707</b>
	975694709	975695709	975696709	975698709

Tec	hnica	ıl Data

Contact Type 2x spring-loaded pin 2x spring-loaded pin 2x spring-loaded pin 2x spring-loaded pin 2x spring-loaded pin

Voltage Rating AC/DC 1000V AC/DC 1000V AC/DC 1000V AC/DC 1000V Measurement Category (IEC61010) CAT III CAT III CAT III CAT III Current Rating\* 10A 10A 10A Contact Resistance 10 mOhm 15 mOhm 24 mOhm 44 mOhm

Material Specifications

Contact Pin

Contact Spring
Housing
Environmental Conditions
Temperature Range

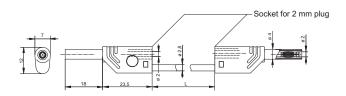
Flamability Rating
Housing

gold plated brass gold plated copper-berylium Polyamide

-15 °C to +70 °C (5°F to 158°F)

UL 94 V-2

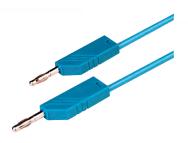
#### Drawing



<sup>\*</sup> Please consider derating graph on page 80.



# **Measuring Leads** 4 mm Solder Resistant System



**MLN SIL 25/1 MLN SIL 50/1** MLN SIL 100/1 MLN SIL 200/1 MLN SIL 150/1

Measuring lead, at either end 4mm diameter plug with caged spring and 4mm diameter socket for tower construction. Nickel-plated copper beryllium contact spring. Highly flexible, double insulated stranded lead, grip and lead shatterproof. Built in colour indicator for easy identification of insulation damages.

Cable length
Cable size
Cable material
Pin dimensions
Cable type

PART NO. / Housing color

0.25m (9.8")	0.5m (19.7")	1.0m (39.4")	1.5m (59.1")	2.0m (78.7")
1 mm² (18 AWG)	1 mm² (18 AWG)	1 mm² (18 AWG)	1 mm <sup>2</sup> (18 AWG)	1 mm² (18 AWG)
Silicone	Silicone	Silicone	Silicone	Silicone
4 mm (0.157")	4 mm (0.157")	4 mm (0.157")	4 mm (0.157")	4 mm (0.157")
LEH-XY	LEH-XY	LEH-XY	LEH-XY	LEH-XY
934090100	934091100	<ul><li>934092100</li></ul>	<ul><li>934093100</li></ul>	<ul><li>934094100</li></ul>
934090101	934091101	934092101	934093101	934094101
934090102	934091102	934092102	934093102	934094102
934090103	934091103	934092103	934093103	934094103
934090104	934091104	934092104	934093104	934094104

#### **Technical Data**

Contact Type

Voltage Rating Measurement Category (IEC61010)

Current Rating\*

Contact Resistance

#### **Material Specifications**

Contact Pin Contact Spring

Housing **Environmental Conditions** 

Temperature Range

Flamability Rating

Housing

2x spring-loaded pin

30 VAC / 60 VDC CAT I

16A 8.5 mOhm 2x spring-loaded pin

30 VAC / 60 VDC CAT I

16A 13 mOhm 2x spring-loaded pin

30 VAC / 60 VDC CAT I

16A 22 mOhm 2x spring-loaded pin

30 VAC / 60 VDC CAT I 16A 34 mOhm

30 VAC / 60 VDC

2x spring-loaded pin

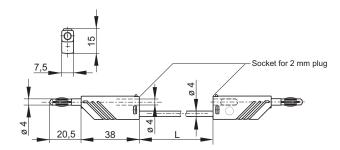
CAT I 16A 40 mOhm

nickel plated brass nickel plated copper-berylium Polyamide

-15 °C to +70 °C (5°F to 158°F)

UL 94 V-2

#### Drawing



<sup>\*</sup> Please consider derating graph on page 80.

# Measuring Leads 4 mm Retractable Sleeve System





Type MLB 25/1 V MLB 50/1 V MLB 100/1 V MLB 200/1 V

Contact-protected measuring lead, at either end: 4 mm diameter plug, insulated by latching and sprung insulated sleeve which is only released by pressure on the side mounted locking spring. 4 mm diameter nickel-plated. Highly flexible, double insulated stranded conductor. Color indicator for the recognition of damage to the insulation. 4 mm diameter socket for tower construction.

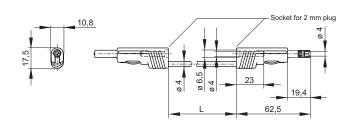
	Sockerior	tower construct	1011.					
Cable length	0.25m	(9.8")		0.5m (19.7")		1.0m (39.4")		2.0m (78.7")
Cable size	1 mm²	(18 AWG)		1 mm² (18 AWG)		1 mm² (18 AWG)		1 mm <sup>2</sup> (18 AWG)
Cable material	PVC			PVC		PVC		PVC
Pin dimensions	4 mm (	(0.157")		4 mm (0.157")		4 mm (0.157")		4 mm (0.157")
Cable type	LEH-X	Y		LEH-XY		LEH-XY		LEH-XY
PART NO. / Housing color	973644	100	•	973645100	•	973646100	•	973647100
	973644	101		973645101		973646101		973647101
	973644	102		973645102		973646102		973647102
	973644	103		973645103	0	973646103		973647103
	973644	104		973645104		973646104		973647104
						973646188		

Technical Data								
Contact Type	spring-loaded pin	spring-loaded pin	spring-loaded pin	spring-loaded pin				
Voltage Rating	30 VAC / 60 VDC	30 VAC / 60 VDC	30 VAC / 60 VDC	30 VAC / 60 VDC				
Measurement Category (IEC61010)	CAT I	CAT I	CAT I	CAT I				
Current Rating*	16 A	16 A	16 A	16 A				
Contact Resistance	8.5 mOhm	13 mOhm	22 mOhm	40 mOhm				
Material Specifications								
Contact Pin		nickel plated brass						
Contact Spring	Contact Spring copper-berylium							
Housing Polyamide								
Environmental Conditions								
Temperature Range		-15 °C to +70 °C (5°F to	158°F)					

#### Drawing

Flamability Rating Housing

Measurements are shown in millimeters. Multiply by 0.03937 to convert to inches.



UL 94 V-2

<sup>\*</sup> Please consider derating graph on page 80.



# **Measuring Leads** 4 mm System



MLN 25/1 MLN 50/1 MLN 100/1 MLN 150/1 MLN 200/1

Measuring lead, at either end 4mm diameter plug with caged spring and 4mm diameter socket for tower construction. Nickel-plated copper beryllium contact spring. Highly flexible, double insulated stranded lead, grip and lead shatterproof. Built in colour indicator for easy identification of insulation damages.

Cable length Cable size Cable material Pin dimensions Cable type

PART NO. / Housing color

0.25m (9.8")	0.5m (19.7")	1.0m (39.4")	1.5m (59.1")	2.0m (78.7")
1 mm <sup>2</sup> (17 AWG)	1 mm <sup>2</sup> (17 AWG)	1 mm² (17 AWG)	1 mm² (17 AWG)	1 mm² (17 AWG)
PVC	PVC	PVC	PVC	PVC
4 mm (0.157")	4 mm (0.157")	4 mm (0.157")	4 mm (0.157")	4 mm (0.157")
LEH-XY	LEH-XY	LEH-XY	LEH-XY	LEH-XY
934058100	<ul><li>934060100</li></ul>	934062100	<ul><li>934064100</li></ul>	<ul><li>934065100</li></ul>
934058101	934060101	934062101	934064101	934065101
934058102	934060102	934062102	934064102	934065102
934058103	934060103	934062103	934064103	934065103
934058104	934060104	934062104	934064104	934065104

Technical Data	
Contact Type	
Voltage Rating	
Measurement Category (IEC61010)	
Commant Pating*	

Current Rating

Contact Resistance

#### **Material Specifications**

Contact Pin Contact Spring Housing

#### **Environmental Conditions**

Temperature Range

#### Flamability Rating

Housing

spring-loaded pin

30 VAC / 60 VDC

8.5 mOhm

spring-loaded pin

30 VAC / 60 VDC

13 mOhm

spring-loaded pin

30 VAC / 60 VDC

22 mOhm

spring-loaded pin

30 VAC / 60 VDC

34 mOhm

16A 40 mOhm

spring-loaded pin

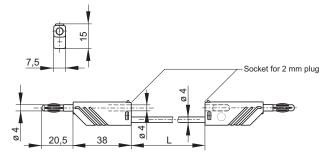
30 VAC / 60 VDC

nickel plated brass nickel plated copper-beryllium Polyamide

-15 °C to +70 °C

UL 94 V-2

#### **Drawing**



<sup>\*</sup> Please consider derating graph on page 80.

# Measuring Leads 4 mm System



2.5 mm² (14 AWG) Nickel plated contacts					
Туре	MLN 25/2.5	MLN 50/2.5	MLN 100/2.5	MLN 150/2.5	MLN 200/2.5
PART NO. / Housing color	<ul><li>934059100</li></ul>	934061100	<ul><li>934063100</li></ul>	934507100	934066100
	934059101	934061101	934063101	934507101	934066101
	934059102	934061102	934063102	934507102	934066102
	934059103	934061103	934063103	934507103	934066103
	934059104	934061104	934063104	934507104	934066104
	934059105	934061105	934063105	934507105	934066105
	934059106	934061106	934063106	934507106	934066106
	<b>934059107</b>	<b>934061107</b>	<b>934063107</b>	<b>934507107</b>	934066107
	934059109	934061109	934063109	934507109	934066109
	934059188	934061188	934063188	934507188	934066188
2.5 mm² (14 AWG) Gold plated contacts					
Туре	MLN 25/2.5 Au	MLN 50/2.5 Au	MLN 100/2.5 Au	MLN 150/2.5 Au	MLN 200/2.5 Au
PART NO. / Housing color	<ul><li>934059700</li></ul>	934061700	934063700	934507700	934066700
	934059701	934061701	934063701	934507701	934066701
	934059702	934061702	934063702	934507702	934066702
	934059703	934061703	934063703	934507703	934066703
	934059704	934061704	934063704	934507704	934066704
	934059705	934061705	934063705	934507705	934066705
	934059706	934061706	934063706	934507706	934066706
	934059707	934061707	934063707	934507707	934066707
	934059709	934061709	934063709	934507709	934066709
	934059788	934061788	934063788	934507788	934066788
			• • • • • • • • • • • • • • • • • • • •	300.000.000	<b>J</b> 65 1650166
Technical Data	spring-loaded pin	spring-loaded pin	spring-loaded pin	spring-loaded pin	spring-loaded pin
Contact Type Voltage Rating	30 VAC / 60 VDC	30 VAC / 60 VDC	30 VAC / 60 VDC	30 VAC / 60 VDC	30 VAC / 60 VDC
Voltage Rating					
Measurement Category (IEC61010)	CAT I	CAT I	CAT I	CAT I	CAT I
Current Rating*	32A	32A	32A	32A	32A
Contact Resistance	6 mOhm	8 mOhm	12 mOhm	16 mOhm	20 mOhm
Material Specifications					
Contact Pin	nickel /gold plated brass				
Contact Spring	nickel/gold plated copper-beryllium				
Housing			Polyamide		
Environmental Conditions					
Temperature Range			-15 °C to +70 °C		
Flamability Rating Housing					
			UL 94 V-2		

<sup>\*</sup> Please consider derating graph on page 80.

# Type

# **Measuring Leads** 4.0 mm Safety Plug System



 $\epsilon$ 

MLS GG 25/1 MLS GG 25/2,5

MLS GG 50/1 MLS GG 50/2,5

MLS GG 100/2,5

MLS GG 200/1 MLS GG 200/2,5

Safety measuring lead, at either end 4 mm diameter safety connector with straight outlet. Nickel-plated copper beryllium contact spring. Highly flexible, double insulated stranded lead, shatter-proof grip sleeve and lead. Built in colour indicator for easy identification of insulation damages.

1 mm<sup>2</sup> (18 AWG) PART NO. / Housing color

2.5 mm<sup>2</sup> (14 AWG) PART NO. / Housing color

	,	0		
	0.25m (9.8") 1 mm² (18 AWG) PVC 4 mm (0.157") LEH-XY	0.5m (19.7") 1 mm² (18 AWG) PVC 4 mm (0.157") LEH-XY	1.0m (39.4") 1 mm² (18 AWG) PVC 4 mm (0.157") LEH-XY	2.0m (78.7") 1 mm² (18 AWG) PVC 4 mm (0.157") LEH-XY
•	934070100	934072100	934074100	934076100
ŏ	934070101	934072101	934074101	934076101
ŏ	934070102	934072102	934074102	934076102
ŏ	934070103	934072103	934074103	934076103
	934070104	934072104	934074104	934076104
•	934071100	934073100	934075100	934077100
Ŏ	934071101	934073101	934075101	934077101
	934071102	934073102	934075102	934077102
	934071103	934073103	934075103	934077103
	934071104	934073104	934075104	934077104
	934071105	934073105	934075105	934077105
	934071106	934073106	934075106	934077106
$\bigcirc$	934071107	934073107	934075107	934077107
	934071109	934073109	934075109	934077109

#### **Technical Data**

Contact Type Voltage Rating

Measurement Category (IEC61010)

Current Rating\*

Contact Resistance

#### **Material Specifications**

Contact Pin Contact Spring Housing

#### **Environmental Conditions**

Temperature Range Flamability Rating Housing

spring-loaded pin AC/DC 1000V

CAT III 16 A

934071188

32 A 8.5 mOhm 6 mOhm

spring-loaded pin AC/DC 1000V CAT III 16 A 32 A

13 mOhm

8 mOhm

934073188

spring-loaded pin AC/DC 1000V CAT III 16 A 32 A 22 mOhm 12 mOhm

934075188

spring-loaded pin AC/DC 1000V CAT III 16 A 32 A 40 mOhm 20 mOhm

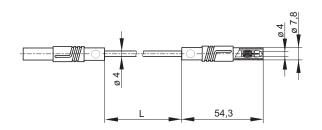
934077188

nickel plated brass copper-berylium

Polyamide

-15 °C to +70 °C (5°F to 158°F)

UL 94 V-2



<sup>\*</sup> Please consider derating graph on page 80.

# **Measuring Leads** 4.0 mm Safety Plug System



Test & Measurement



((

MLS WG 25/1 MLS WG 50/1 MLS WG 100/1 MLS WG 200/1 Type MLS WG 25/2.5 MLS WG 50/2.5 MLS WG 100/2.5 MLS WG 200/2.5

Safety measuring lead, at either end 4mm diameter safety connector with straight and angled outlet. Nickel-plated copper beryllium contact spring. Highly flexible, double insulated stranded lead, shatter-proof grip sleeve and lead. Built in colour indicator for easy identification of insulation damages.

Cable length	0.25m (9.8")	0.5m (19.7")	1.0m (39.4")	2.0m (78.7")
Cable size	1 mm² (18 AWG) 2.5 mm² (14 AWG)			
Cable material	PVC	PVC	PVC	PVC
Pin dimensions	4 mm (0.157")	4 mm (0.157")	4 mm (0.157")	4 mm (0.157")
Cable type	LEH-XY	LEH-XY	LEH-XY	LEH-XY
1 mm <sup>2</sup>				
PART NO. / Housing color	934078100	934080100	934082100	934084100
	934078101	934080101	934082101	934084101
	934078102	934080102	934082102	934084102
	934078103	934080103	934082103	934084103
	934078104	934080104	934082104	934084104
2.5 mm <sup>2</sup>	934079100	934081100	934083100	934085100
PART NO. / Housing color	934079101	934081101	934083101	934085101
	934079102	934081102	934083102	934085102
	934079103	934081103	934083103	934085103
	934079104	934081104	934083104	934085104
	934079188	934081188	934083188	934085188

Contact Type Voltage Rating Measurement Category (IEC61010)

Current Rating\*

Contact Resistance

**Material Specifications** 

Contact Pin Contact Spring

Housing

**Environmental Conditions** 

Temperature Range Flamability Rating Housing

spring-loaded pin AC/DC 1000V

CAT III

16 A 32 A 8 mOhm 6 mOhm spring-loaded pin AC/DC 1000V

CAT III 16 A 32 A 13 mOhm 8 mOhm

spring-loaded pin AC/DC 1000V CAT III 32 A 22 mOhm

12 mOhm nickel plated brass copper-berylium

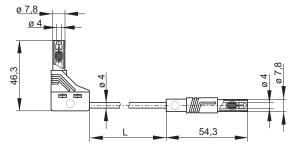
Polyamide

-15 °C to +70 °C (5°F to 158°F)

UL 94 V-2

#### Drawing

Measurements are shown in millimeters. Multiply by 0.03937 to convert to inches.



spring-loaded pin

AC/DC 1000V

CAT III

16 A

32 A

40 mOhm

20 mOhm

<sup>\*</sup> Please consider derating graph on page 80.



# Measuring Leads 4 mm - Safety Plug System



((

Туре

MLS WS 25/1 MLS WS 25/2,5 MLS WS 50/1 MLS WS 50/2,5 MLS WS 100/1 MLS WS 100/2,5 MLS WS 200/1 MLS WS 200/2,5

Safety measuring lead, at either end 4 mm diameter safety connector with onward connection capability (4mm socket). Nickel-plated copper beryllium contact spring. Highly flexible, double insulated stranded lead, shatter-proof grip sleeve and lead. Built in colour indicator for easy identification of insulation damages.

Cable length
Cable size

Cable material
Pin dimensions
Cable type
1 mm<sup>2</sup>

2.5 mm<sup>2</sup>
PART NO. / Housing color

PART NO. / Housing color

0.25m (9.8")

1 mm² (18 AWG)

2.5 mm² (14 AWG)

PVC

4 mm (0.157")

LEH-XY

934067100

934067101

934067102

934068100 934068101 934068103 934067103 934067104 934068104 934086100 934087100 934086101 934087101 934086102 934087102 934086103 934087103 934086104 934087104 934086105 934087105 934086106 934087106 934086107 934087107 934086109 934087109 934086188 934087188

for easy identification of insulation damages.

0.5m (19.7")

1 mm² (18 AWG)

2.5 mm² (14 AWG)

PVC

4 mm (0.157")

LEH-XY

934068100

934095100

934095102

934095103

2.0m (78.7")
1 mm² (18 AWG)
2.5 mm² (14 AWG)
PVC
4 mm (0.157")
LEH-XY

934069100
934069101

934069102

934069103

934089109

934089188

#### **Technical Data**

Contact Type
Voltage Rating
Measurement Category (IEC61010)
Current Rating\*
Contact Resistance

#### **Material Specifications**

Contact Pin
Contact Spring
Housing
Environmental Conditions

Temperature Range
Flamability Rating
Housing

spring-loaded pin AC/DC 1000V\*\* CAT II\*\* 16 A 32 A 8 mOhm 6 mOhm spring-loaded pin AC/DC 1000V\*\* CAT II\*\* 16 A 32 A 13 mOhm 8 mOhm spring-loaded pin AC/DC 1000V\*\* CAT II\*\* 16 A 32 A 22 mOhm 12 mOhm spring-loaded pin AC/DC 1000V\*\* CAT II\*\* 16 A 32 A 40 mOhm 20 mOhm

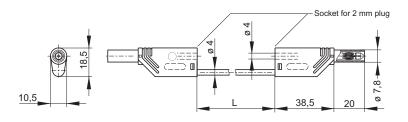
Polyamide -15 °C to +70 °C (5°F to 158°F)

nickel plated brass

copper-berylium

UL 94 V-2

#### **Drawing**



<sup>\*</sup> Please consider derating graph on page 80.

<sup>\*\* 600</sup>VV AC/DC CAT III

# Measuring Leads 4 mm - Safety Plug System





Type PL 2600 S

Safety measuring lead with dual function safety test probe. Tip for penetration of insulation and oxide layers and 4 mm diameter pin for insertion into sockets. 4 mm diameter safety connector with straight outlet. Incl. Tip protection

Cable length 1.0m (39.4")

Conductor size 1 mm² (18 AWG)

Cable material PVC

Pin dimensions 4 mm (0.157")
Clamp type LEH-XY

PART NO. / Housing color 934159100

934159101934159102

20 mOhm



#### PL 2600 S W

Safety measuring lead with dual function safety test probe. Tip for penetration of insulation and oxide layers and 4 mm diameter pin for insertion into sockets.

4 mm diameter safety connector with right-angled outlet. Incl. Tip protection

1.0m (39.4")

1 mm<sup>2</sup> (18 AWG)

**PVC** 

4 mm (0.157") LEH-XY

934158100

934158101

### **Technical Data**

Contact Type spring-loaded pin, stationary tip

Voltage Rating AC/DC 1000 V
Measurement Category (IEC61010) CAT II
Current Rating\* 16 A

Material Specifications

Contact Resistance

Contact Pin nickel plated brass

Contact Spring nickel plated copper-beryllium

Housing PA, PP

**Environmental Conditions** 

Temperature Range  $-15^{\circ}\text{C to } +70^{\circ}\text{C } (5^{\circ}\text{F to } 158^{\circ}\text{F})$ 

Flamability Rating

Housing UL 94 HB

spring-loaded pin, stationary tip

AC/DC 1000 V

CAT II

16 A

20 mOhm

nickel plated brass

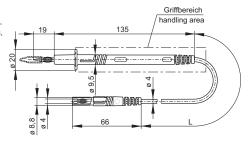
nickel plated copper-beryllium

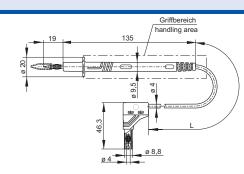
PA, PP

-15°C to +70°C (5°F to 158°F)

UL 94 HB

#### Drawing





<sup>\*</sup> Please consider derating graph on page 80.

# Measuring Leads 4 mm Safety System





#### **LMLH 50**

Laboratory test lead holder with plastic brackets. Measuring leads can be laid neatly on walls, cabinets, etc. Consists: one aluminium profile rail, 30 plastic brackets, fastening kit.

Cable length Conductor size Cable material Pin dimensions Clamp type -

PART NO. / Housing color 973919001



#### **TW 120 BAN**

SMD Test Tweezer for 2 wire measurements with multimeters. The gold-plating ensures lowest transition resistance. Available with BNC Connectors or Banana Plugs. Contacts gold-plated. Other cable lengths on request.

1.2m (47.2")

\_

RG 174

974330000

lechnical Data	
Contact Type	-
Voltage Rating	-
Measurement Category (IEC61010)	-
Current Rating*	-
Contact Resistance	-
Material Specifications	
Contact Pin	-
Contact Spring	-
Housing	-
Environmental Conditions	
Temperature Range	-
Flamability Rating Housing	_

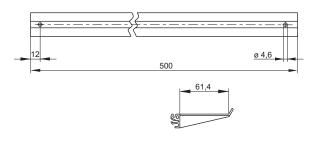
2 gold-plated 4 mm banana plugs to gold-plated tweezer tips 30 VAC / 60 VDC  $\,$ 

CAT I

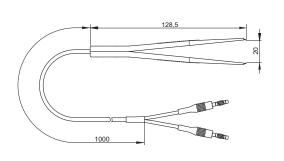
-

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## Drawing



<sup>\*</sup> Please consider derating graph on page 80.



# **Measuring Leads** 4 mm Safety System





TKL 065 BAN Type

> High quality Kelvin Measuring Leads for 4 wire measurements with LCR measuring bridges and multimeters. The gold-plating ensures lowest transition resistance. Available with BNC Connectors or Banana Plugs. Contacts goldplated. Other cable lengths on request.

0.65m (25.6") Cable length

Conductor size

Cable material

4 mm (0.157") Pin dimensions RG 174 Clamp type

PART NO. / Housing color 974340000



#### SML 100/1

Silicone measuring lead, 4 mm plug with caged spring on both sides. Nickel-plated copper beryllium contact spring. Highly flexible, double insulated stranded lead, resistant against soldering iron, grip and lead shatter-proof. Built in colour indicator for easy identification of insulation damages.

1m (39.37")

1 mm<sup>2</sup> (18 AWG)

4 mm (0.157")

LEH-XY

973388100

973388101

973388102 973388103

973388104

**Technical Data** 

spring-loaded pin, stationary tip Contact Type

Voltage Rating 30 VAC / 60 VDC

Measurement Category (IEC61010) CAT I Current Rating\* Contact Resistance

**Material Specifications** 

Contact Pin Contact Spring Housing

**Environmental Conditions** Temperature Range

Flamability Rating Housing

spring-loaded pin 30 VAC / 60 VDC

CAT I

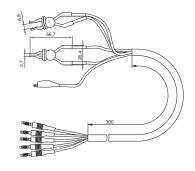
20 mOhm

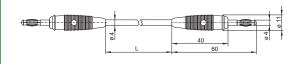
nickel plated copper-beryllium

PA, PP

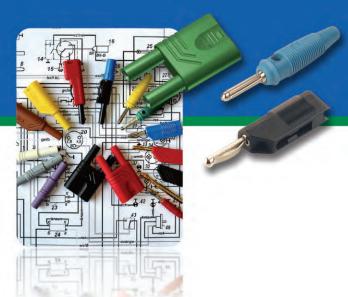
-15°C to +70°C (5°F to 158°F)

#### Drawing





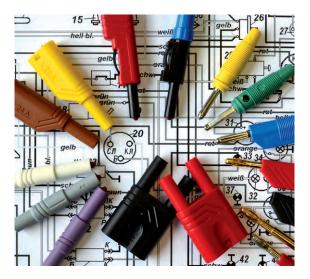
<sup>\*</sup> Please consider derating graph on page 80.



# **Test Plugs**

Test Plugs from the inventor of the Banana Plug. Altech and SKS Hirschmann offers endless possibilities and solutions for different contact and connection systems. Various Plugs are also available for "Do it yourself" measurement leads.

- Large color spectrum
- Various connection types
- Different cross sections
- Safety plugs according to IEC61010











MST 201 Type

> 2mm mini connector pin for PCB boards, fits MKU1 and MBU2 (for stacking PCB boards),

pin spacing 5mm and up.

2 mm (0.078") Pin diameter PART NO. / Housing color 931338001

MST 3

2mm mini connector, nickel plated brass pin with solder connection, flexible and shatter proof insulated sleeve, connecting leads up to 1.9mm.

2 mm (0.078")

973509100

973509101

973509102

973509103

973509104 973509106

**Technical Data** 

Contact Type pin

Connection Type solder terminal 30 VAC / 60 VDC Voltage Rating

Measurement Category (IEC61010) CAT I 6A Current Rating\* Contact Resistance 6 mOhm

**Material Specifications** 

Plug nickel plated brass

Contact Spring Housing

**Environmental Conditions** 

-20 °C to +60 °C (-4 to 140°F) Temperature range

Flamability Rating

Housing

spring loaded pin solder terminal 30 VAC / 60 VDC

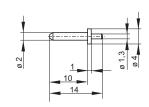
CAT I 6A 6 mOhm

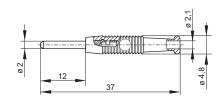
nickel plated brass

PVC-P

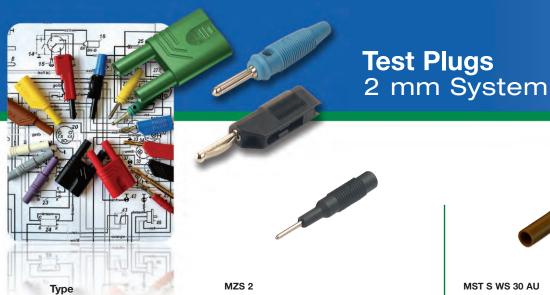
-20 °C to +60 °C (-4 to 140°F)

#### Drawing





<sup>\*</sup> Please consider derating graph on page 80.



Shrouded Adapter 2mm plug to 4mm jack.

2 mm (0.078") Pin diameter

PART NO. / Housing color 973600100

973600101



#### MST S WS 30 AU

2mm safety plug, spring loaded pin, gold plated, solder terminal 0.5mm2-1.0mm2, 1000V system.

2 mm (0.078")

- 975090700
- 975090701
- 975090702
- 975090703
- 975090704
- 975090705
- 975090706 975090707
- 975090709

## **Technical Data**

Contact Type stationary Connection Type jack Ø4mm 30 VAC / 60 VDC Voltage Rating

Measurement Category (IEC61010) CAT I Current Rating\* 6A Contact Resistance 6 mOhm

**Material Specifications** 

Plug nickel plated brass

Contact Spring Housing PP

**Environmental Conditions** 

-20 °C to +60 °C (-4 to 140°F) Temperature range

Flamability Rating

Housing UL94 HB spring loaded pin solder terminal AC/DC 1000V CAT III

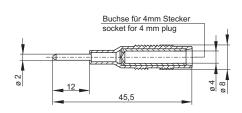
10A 2 mOhm

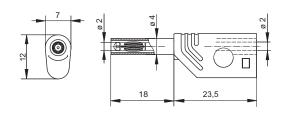
gold plated copper-beryllium

gold plated brass Polyamide

-15°C to +70°C (-5 to 158°F)

#### Drawing





<sup>\*</sup> Please consider derating graph on page 80.





Type VST 100

4mm spring loaded connector pin, nickel plated brass, screw terminal up to 1.5mm².

Pin diameter 4 mm (0.157")

PART NO. / Housing color 930581000



**VST 20** 

4mm spring loaded connector pin, nickel plated brass, M4 thread/ screw terminal up to 2mm<sup>2</sup>.

4 mm (0.157")

930050000

#### **Technical Data**

Contact Type spring loaded pin

Connection Type screw terminal max. 1.5mm<sup>2</sup>

Voltage Rating 30 VAC / 60 VDC

Measurement Category (IEC61010) CAT I
Current Rating\* 16A
Contact Resistance 3 mOhm

**Material Specifications** 

Plug nickel plated brass

Contact Spring –
Housing –

**Environmental Conditions** 

Temperature range -25 °C to +100°C (-13 to 212°F)

Flamability Rating

Housing -

spring loaded pin

M4 thread / soldering max. 2mm²

30 VAC / 60 VDC

CAT I 16A 3 mOhm

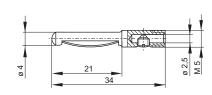
nickel plated brass

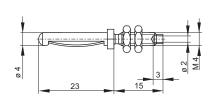
\_

-25 °C to +100°C (-13 to 212°F)

\_

#### Drawing





<sup>\*</sup> Please consider derating graph on page 80.



Shrouded Adapter 4mm plug to 2mm jack.

KB 2

Fork type cable lug, nickel plated brass, flexible insulation sleeve, screw terminal up to 2.5mm<sup>2</sup>.

Pin diameter

4 mm (0.157")

PART NO. / Housing color

- 973599100
- 973599101

Fork

- 930584100
- 930584101

**Technical Data** 

Contact Type spring loaded pin

Connection Type spring-loaded jack (Ø 2 mm)

30 VAC / 60 VDC Voltage Rating

Measurement Category (IEC61010) CAT I Current Rating\* 6A Contact Resistance 6 mOhm

**Material Specifications** 

Plug nickel plated brass

nickel plated copper-beryllium Contact Spring

Housing

**Environmental Conditions** 

-20 °C to +60 °C (-4 to 140°F) Temperature range

Flamability Rating

Housing

fork cable lug

screw terminal max. 2.5mm<sup>2</sup>

30 VAC / 60 VDC

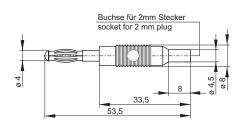
CAT I 30A 1 mOhm

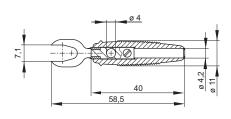
nickel plated brass

PVC-P

-25 °C to +70 °C (-13 to 158°F)

#### Drawing





<sup>\*</sup> Please consider derating graph on page 80.





Type LAS 30 / LAS 30 Au

4mm spring loaded plug, nickel/ gold plated contact spring, solder terminal up 1.5mm<sup>2</sup>.



**BUELA 20 K** 

4mm multi spring plug, flexible, insulated sleeve with 4mm cross hole, nickel plated brass, screw terminal max. 1.5mm².

Pin diameter 4 mm (0.157")

Nickel Plated 972518100

Gold Plated 972518700

972518701972518702

972518102972518103

972518104

972518703 972518704 4 mm (0.157")

930726100

930726101

930726102

930726103

930726104930726107

**Technical Data** 

Contact Type spring loaded pin

Connection Type solder terminal max. 1.5mm<sup>2</sup>

Voltage Rating 30 VAC / 60 VDC

Measurement Category (IEC61010) CAT I
Current Rating\* 32A
Contact Resistance 3 mOhm

**Material Specifications** 

Plug nickel plated brass; gold plated brass

Contact Spring nickel pl. copper-beryllium; gold pl. copper-beryllium

Housing PVC-P

**Environmental Conditions** 

Temperature range -25 °C to +70°C (-13 to 158°F)

Flamability Rating

Housing –

spring loaded pin

screw terminal max. 1.5mm<sup>2</sup>

30 VAC / 60 VDC

CAT I 16A 3 mOhm

nickel plated brass

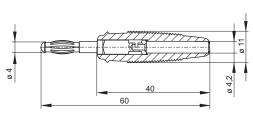
\_\_\_\_\_

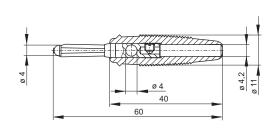
PVC-P

-25 °C to +70°C (-13 to 158°F)

\_

### Drawing





<sup>\*</sup> Please consider derating graph on page 80.





4mm multi spring plug, flexible, insulated sleeve with 4mm cross hole, nickel plated brass, solder terminal max. 2.5mm<sup>2</sup>.



#### **BUELA 300 K**

4mm multi spring plug, flexible, insulated sleeve with 4mm cross hole, nickel plated brass, solder terminal max. 2.5mm².

Pin diameter 4 mm (0.157")

PART NO. / Housing color

- 930727100
- 930727101
- 930727102
- 930727103
- 930727104
- **930727107**

4 mm (0.157")

- 931667100
- 931667101
- 931667102
- 931667103
- 931667104

**Technical Data** 

Type

Contact Type spring loaded pin

Connection Type solder terminal max. 2.5mm<sup>2</sup>

Voltage Rating 30 VAC / 60 VDC

Measurement Category (IEC61010) CAT I
Current Rating\* 30A
Contact Resistance 3 mOhm

**Material Specifications** 

Plug nickel plated brass

Contact Spring –

Housing PVC-P

**Environmental Conditions** 

Temperature range -25 °C to +70°C (-13 to 158°F)

Flamability Rating

Housing -

fork cable lug

solder terminal max. 2.5mm<sup>2</sup>

30 VAC / 60 VDC

CAT I 30A 3 mOhm

nickel plated brass

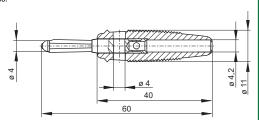
\_\_\_\_\_

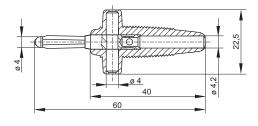
PVC-P

-25 °C to +70°C (-13 to 158°F)

-

## Drawing





<sup>\*</sup> Please consider derating graph on page 80.





#### LAS N WS / LAS N WS Au

4mm stackable plug, nickel/ gold plated contact spring, screw terminal 0.5-1.5mm².



## BSB 20 K

4mm multi spring plug with cable gland, nickel plated brass, screw terminal max. 2.5mm<sup>2</sup>.

930729100

4 mm (0.157")

- 930729101
- 930729102
- 930729103
- 930729104

Pin diameter

PART NO. / Housing color

Type

4 mm (0.157")

**Nickel Plated** 

- 934100100
  - 934100100
    - - 934100701
- 934100102 934100103
- 934100702934100703

**Gold Plated** 

934100700

- 934100104
- 934100703
- 934100105
- 934100704
- 934100106
- 934100706934100707
- 934100107 934100109
- 934100709

**Technical Data** 

Contact Type spring loaded pin

Connection Type screw terminal max. 1.5mm<sup>2</sup>

Voltage Rating 30 VAC / 60 VDC

Measurement Category (IEC61010) CAT I
Current Rating\* 24A

Contact Resistance

Material Specifications

Plug nickel plated brass; gold plated brass

Contact Spring nickel pl. copper-beryllium; gold pl. copper-beryllium

3 mOhm

Housing Polyamide

**Environmental Conditions** 

Temperature range -15 °C to +70°C (5 to 158°F)

Flamability Rating

Housing UL 94 V-2

spring loaded pin

screw terminal max. 2.5mm<sup>2</sup>

30 VAC / 60 VDC

CAT I 30A

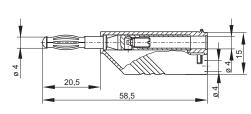
3 mOhm

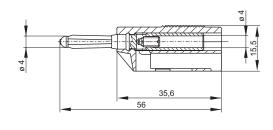
nickel PP

-25 °C to +100°C (-13 to 212°F)

UL 94 HB

#### Drawing





<sup>\*</sup> Please consider derating graph on page 80.





4mm multi spring wire plug with parallel adapter for shorting proof connection, nickel plated brass, solder terminal max. 1.5mm<sup>2</sup>.

Pin diameter 4 mm (0.157")

PART NO. / Housing color

Type

- 931294100
- 931294101
- 931294102
- 931294103
- 931294104



#### VSB 20

4mm spring loaded plug with cable gland, stackable (4mm jack), screw terminal max.  $2.5 \, \mathrm{mm}^2$ .

4 mm (0.157")

- 930435100
- 930435101
- 930435102
- 930435103
- 930435104

## **Technical Data**

Contact Type spring loaded pin

Connection Type solder terminal max. 1.5mm<sup>2</sup>

Voltage Rating 30 VAC / 60 VDC

Measurement Category (IEC61010) CAT I
Current Rating\* 16A
Contact Resistance 3 mOhm

**Material Specifications** 

Plug nickel plated brass

Contact Spring –
Housing PP

**Environmental Conditions** 

Temperature range -25 °C to +100°C (-13 to 212°F)

Flamability Rating

Housing UL 94 HB

spring loaded pin

screw terminal max. 2.5mm<sup>2</sup>

30 VAC / 60 VDC

CAT I 30A 3 mOhm

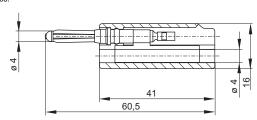
nickel plated brass

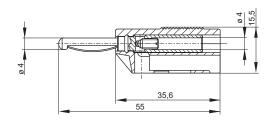
PP

-25 °C to +70 °C (-13 to 158°F)

UL 94 HB

#### Drawing





<sup>\*</sup> Please consider derating graph on page 80.





Type VON 20

4mm spring loaded plug, flexible insulation sleeve, nickel plated brass, screw terminal max. 1.5mm<sup>2</sup>.

 Pin diameter
 4 mm (0.157")

 PART NO. / Housing color
 ● 930046100

930046101930046102

930046103930046104

**VON 30** 

4mm spring loaded plug, flexible insulation sleeve, nickel plated brass, solder terminal max. 2.5mm<sup>2</sup>.

4 mm (0.157")

930047100

930047101

930047102930047103

930047104

**Technical Data** 

Contact Type spring loaded pin

Connection Type screw terminal max. 1.5mm<sup>2</sup>

Voltage Rating 30 VAC / 60 VDC

Measurement Category (IEC61010) CAT I
Current Rating\* 16A
Contact Resistance 3 mOhm

**Material Specifications** 

Plug nickel plated brass

Contact Spring –
Housing PVC-P

**Environmental Conditions** 

Temperature range -25°C to +70°C (-13 to 158°F)

Flamability Rating

Housing -

spring loaded pin

screw terminal max. 2.5mm<sup>2</sup>

30 VAC / 60 VDC

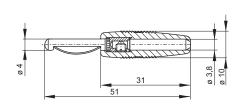
CAT I 30A 3 mOhm

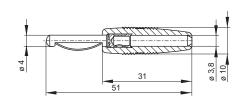
nickel plated brass

PVC-P

-25°C to +70°C (-13 to 158°F)

#### **Drawing**





<sup>\*</sup> Please consider derating graph on page 80.



4mm spring loaded plug with 4mm cross hole, flexible insulation sleeve, nickel plated brass, screw terminal max. 1.5mm<sup>2</sup>.

#### VQ 30

4mm spring loaded plug with 4mm cross hole, flexible insulation sleeve, nickel plated brass, solder terminal max. 2.5mm<sup>2</sup>.

#### Pin diameter

PART NO. / Housing color

- 4 mm (0.157")
- 930058100
- 930058101
- 930058102
- 930058103
- 930058104
- 930058107

- 4 mm (0.157")
- 930061100
- 930061101
- 930061102
- 930061103
- 930061104
- 930061107

#### **Technical Data**

Contact Type spring loaded pin

Connection Type screw terminal max. 1.5mm<sup>2</sup>

30 VAC / 60 VDC Voltage Rating

Measurement Category (IEC61010) CAT I 16A Current Rating\* Contact Resistance 3 mOhm

**Material Specifications** 

Plug nickel plated brass

Contact Spring

Housing PVC-P

**Environmental Conditions** 

-25°C to +70°C (-13 to 158°F) Temperature range

Flamability Rating

Housing

spring loaded pin

solder terminal max. 2.5mm<sup>2</sup>

30 VAC / 60 VDC

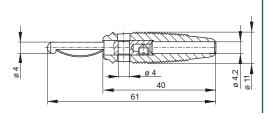
CAT I 30A 3 mOhm

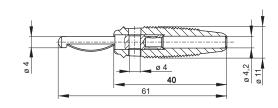
nickel plated brass

PP

-25°C to +70 °C (-13 to 158°F)

#### Drawing





<sup>\*</sup> Please consider derating graph on page 80.

# Test Plugs 4 mm Retractable Plug System



4mm touch proof banana plug, sliding sleeve system, screw



Type SLS 10 B

4mm touch proof banana plug, sliding sleeve system, solder terminal max. 2.5mm² leads.

system, solder terminal max. 2.5mm² leads. terminal max. 1.5mm² leads.

Pin diameter 4 mm (0.157") **PART NO** / Housing color ■ **931824100** 

PART NO. / Housing color 931824100 931824101

931824101

931824103

931824104

931824107

4 mm (0.157")

931825100

**SLS 20 B** 

931825101

931825102

931825103

931825104

931825107

**Technical Data** 

Contact Type spring loaded plug
Connection Type solder terminal max. 2.5mm<sup>2</sup>

Voltage Rating 30 VAC / 60 VDC

Measurement Category (IEC61010) CAT I

Current Rating\* 30A

Contact Resistance 5 mOhm

**Material Specifications** 

Plug nickel plated brass

Contact Spring nickel plated copper-beryllium

Housing POM

**Environmental Conditions** 

Temperature range -25°C to +70°C (-13 to 158°F)

Flamability Rating

Housing UL 94 HB

spring loaded plug

screw terminal max. 1.5mm<sup>2</sup>

30 VAC / 60 VDC1

CAT I 16A 5 mOhm

nickel plated brass

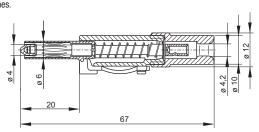
nickel plated copper-beryllium

POM

-25°C to +70°C (-13 to 158°F)

UL 94 HB

#### Drawing



<sup>20 67</sup> 

<sup>\*</sup> Please consider derating graph on page 80.

<sup>&</sup>lt;sup>1</sup>For this two types up to DC 150 V, CAT II according IEC/EN 61010-31 item 6.4., comment 4 allowed for devices with not yet protected sockets.







4mm touch proof banana plug, stackable, sliding sleeve system, screw terminal max. 2.5mm<sup>2</sup> leads.

Pin diameter

PART NO. / Housing color

4 mm (0.157")

- 932153100
- 932153101
- 932153102
- 932153103
- 932153104

#### LAS S W

4mm safety banana plug, angled, 1000V system, screw terminal 0.5-1.5mm<sup>2</sup> leads.

4 mm (0.157")

- 934098100
- 934098101
- 934098102
- 934098103
- 934098104

#### **Technical Data**

Contact Type spring loaded plug

Connection Type screw terminal max. 2.5mm<sup>2</sup>

30 VAC / 60 VDC<sup>1</sup> Voltage Rating

Measurement Category (IEC61010) CAT I 30A Current Rating\* Contact Resistance 5 mOhm

**Material Specifications** 

nickel plated brass Plug

Contact Spring nickel plated copper-beryllium

Housing

**Environmental Conditions** 

-25°C to +70°C (-13 to 158°F) Temperature range

Flamability Rating

Housing UL 94 HB spring loaded plug

screw terminal 0.5-1.5mm<sup>2</sup>

AC/DC 1000V

CAT III

24A

nickel plated brass

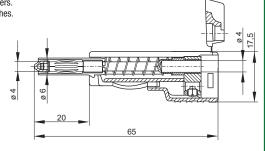
nickel plated copper-beryllium

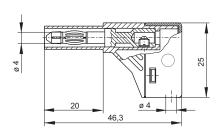
Polyamide

-25°C to +70°C (-13 to 158°F)

UL 94 V-2

### Drawing





<sup>\*</sup> Please consider derating graph on page 80.

<sup>1</sup>For this two types up to DC 150 V, CAT II according IEC/EN 61010-31 item 6.4., comment 4 allowed for devices with not yet protected sockets.





## LAS S WS

4mm safety banana plug, stackable, 1000V system, screw terminal 0.5-1.5mm<sup>2</sup> leads.



## LAS S G

4mm safety banana plug, stackable, 1000V system, screw terminal 0.5-1.5mm<sup>2</sup>



#### KST S WS

4mm dual safety plug, stackable, 1000V system, nickel plated, 4mm jack.

### Pin diameter

Type

PART NO. / Housing color

- 4 mm (0.157")
- 934099100
- 934099101
- 934099102
- 934099103
- 934099104
- 934099105
- 934099106934099107
- 934099109

- 4 mm (0.157")
- 934097100
- 934097101
- 934097102
- 934097103
- 934097104
- 934097105934097106
- 934097107
- 934097109

- 4 mm (0.157")
- 932200100
- 932200101
- 932200102
- 932200103932200104

#### **Technical Data**

Contact Type
Connection Type

Voltage Rating

Measurement Category (IEC61010)

Current Rating\*
Contact Resistance

### **Material Specifications**

Plug

Contact Spring

Housing

Environmental Conditions
Temperature range

Flamability Rating

Housing

spring loaded plug

screw terminal 0.5-1.5mm<sup>2</sup>

AC/DC 1000 V

CAT II

24A

nickel plated brass

nickel plated copper-beryllium

Polyamide

UL 94 V-2

-15°C to +70°C (5 to 158°F)

spring loaded plug

screw terminal 0.5-1.5mm<sup>2</sup>

AC/DC 1000 V

CAT III

24A

nickel plated brass

nickel plated copper-beryllium

Polyamide

-15°C to +70°C (5 to 158°F)

UL 94 V-2

2x spring loaded plug

jack Ø 4 mm

AC/DC 1000 V

CAT II

8 mOhm

nickel plated copper-beryllium

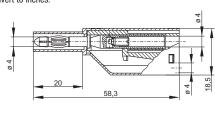
nickel plated brass

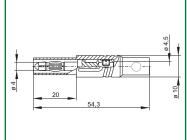
Polyamide

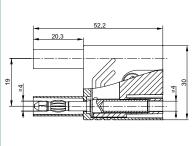
-15°C to +70°C (5 to 158°F)

UL 94 V-2

#### Drawing







<sup>\*</sup> Please consider derating graph on page 80.

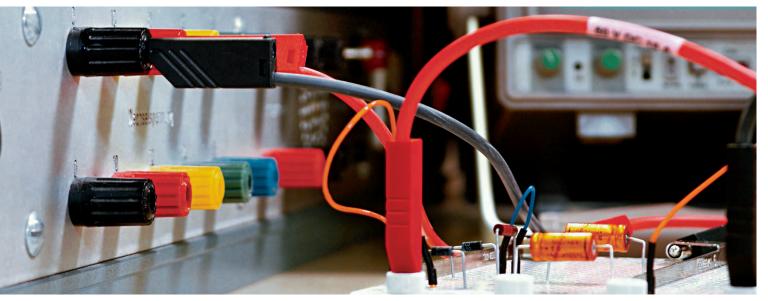


## **Test Jacks**

Quick mounting and durability are 2 attributes that characterize Altech test jacks and sockets. They can be used as connecting sockets in power supplies, connecting points in service devices or test jacks in test & measurement applications and devices.

- Large variety in colors
- Tin/ nickel/ gold plating
- Screw-in and press-in versions
- Regular and spring loaded jacks/ sockets
- Up to 1000V CAT III voltage rating









MKU 1 Type

> 2mm mini Adapter, tin plated Copper-Beryllium contact spring with solder terminal. Flexible, shatter-proof insulation sleeve, max. connecting lead diameter 2mm.

2 mm Pin Diameter

930320100 PART NO. / Housing color

930320101 930320102 930320103 930320104 930320107

MBI 1 / MBI 1 Au

2mm panel mount mini test jack, tin/ gold plated Copper-Beryllium contact spring with solder terminal. Installation in equipment chassis and switch panels, max. wall thickness

2 mm

**Nickel Plated** 930308100

930308101 930308102

930308103 930308104 930308106

**Gold Plated** 

930308700 930308701

930308702 930308703

930308704 930308706

**Technical Data** 

Contact Type Connection Type solder terminal max Ø 2 mm

Voltage Rating

Measurement Category (IEC61010) CAT I Current Rating\* 6 A Contact Resistance 6 mOhm Mounting Type

**Material Specifications** 

Jack Body

Contact Spring tin plated copper-beryllium Housing

**Environmental Conditions** 

Temperature Range

Flamability Rating

Housing

spring-loaded jack Ø 2 mm

30 VAC / 60 VDC

PVC-P

-20°C to +60 °C (-4 to 140°F)

spring-loaded jack Ø 2 mm

solder terminal 30 VAC / 60 VDC

CATI 6 A

6 mOhm

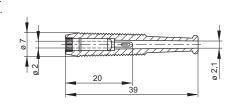
screw thread M5

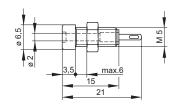
tin plated copper-beryllium | gold plated copper-beryllium Polyamide

-20°C to +60 °C (-4 to 140°F)

UL 94 HB

#### **Drawing**





<sup>\*</sup> Please consider derating graph on page 80.





#### MBU 1

2mm panel mount mini test jack, nickel plated brass, spring loaded with solder terminal. max. installation wall thickness 8mm.

2 mm Pin Diameter

930312000 PART NO. / Housing color



#### MBU 2

2mm mini metal test jack, tin plated brass, spring loaded with PCB soldering terminal. Fits MST3, MVL 2 and MST201.

2 mm

931337000

#### **Technical Data**

Type

Contact Type

Connection Type solder terminal 30 VAC / 60 VDC Voltage Rating

Measurement Category (IEC61010) CAT I Current Rating\* 6 A Contact Resistance 6 mOhm screw thread M5 Mounting Type

**Material Specifications** 

Jack Body Contact Spring

Housing

**Environmental Conditions** 

-20°C to +60 °C (-4 to 140°F) Temperature Range

Flamability Rating

spring-loaded jack Ø 2 mm

nickel plated brass

tin plated copper-beryllium

spring-loaded jack Ø 2 mm

solder terminal 30 VAC / 60 VDC CAT I

6 A 6 mOhm screw

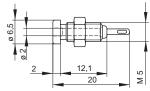
tin plated brass

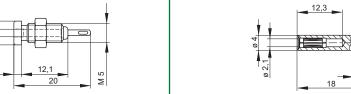
gold plated copper-beryllium

-20°C to +60 °C (-4 to 140°F)

#### **Drawing**

Housing





<sup>\*</sup> Please consider derating graph on page 80.





MPB 1 Type

2mm mini test jack, dimensions according to DIN41649. Suitable for testing PCB boards during operation.

2 mm Pin Diameter

930224100 PART NO. / Housing color 930224101

#### MPK 1

2mm insulated panel mount binding post with cross hole, gold plated Copper-Beryllium contact spring, tin plated brass thread bold with solder terminal. max. panel thickness 8mm

2 mm

930268100

930268101

**Technical Data** 

spring-loaded jack Ø 2 mm Contact Type

Connection Type solder terminal 30 VAC / 60 VDC Voltage Rating

CAT I Measurement Category (IEC61010) 6 A Current Rating\* Contact Resistance 6 mOhm PCB Mounting Type

**Material Specifications** 

Jack Body

tin plated bronze Contact Spring

Housing PC

**Environmental Conditions** 

-20°C to +60 °C (-4 to 140°F) Temperature Range

Flamability Rating

UL 94 HB Housing

spring-loaded jack Ø 2 mm, cross hole Ø 2 mm

solder terminal 30 VAC / 60 VDC

CAT I 6 A 6 mOhm screw thread M3

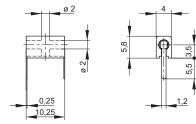
gold plated copper-beryllium

Polyamide

-20°C to +60 °C (-4 to 140°F)

UL 94 V-2

#### Drawing



<sup>\*</sup> Please consider derating graph on page 80.





#### MSEB 2600 G M3 Au

2mm panel mount safety test jack, gold plated brass with M3 thread and solder terminal. max. installation wall thickness 8mm.

Pin Diameter PART NO. / Housing color

Type

2 mm

- 975454700
- 975454701
- 975454702
- 975454703
- 975454704
- 975454705
- 975454706
- 975454707
- 975454709



#### MSEB 2610 F2.8 Au

2mm panel mount safety test jack, gold plated brass with flat 2.8x0.8mm DIN46244 terminal. max. installation wall thickness 8mm.

2 mm

- 975455700
- 975455701
- 975455702
- 975455703
- 975455704
- 975455705
- 975455706
- 975455707
- 975455709





#### MSEB 2630 S1.9 Au

2mm panel mount safety test jack, gold plated brass with 1.9mm solder pin terminal. max. installation wall thickness 8mm.

2 mm

- 975459700
- 975459701
- 975459702
- 975459703
- 975459704
- 975459705
- 975459706
- 975459707
- 975459709

#### **Technical Data**

Contact Type

Connection Type Voltage Rating

Measurement Category (IEC61010)

Current Rating\* Contact Resistance Mounting Type

**Material Specifications** 

Jack Body Contact Spring Housing

**Environmental Conditions** 

Temperature Range

Flamability Rating Housing

jack Ø 2 mm

M3 thread, solder terminal

AC/DC 1000V

CAT III 10 A

5 mOhm

screw thread M8

gold plated brass

Polyamide

-15°C to +70°C (5 to 158°F)

UL 94 V-2

jack Ø 2 mm

flat 2.8x0.8 mm push in tab

AC/DC 1000V CAT III

10 A

5 mOhm

screw thread M8

gold plated brass

Polyamide

-15°C to +70°C (5 to 158°F)

UL 94 V-2

jack Ø 2 mm

solder terminal AC/DC 1000V

CAT III

10 A

5 mOhm

screw thread M8

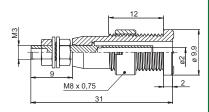
gold plated brass

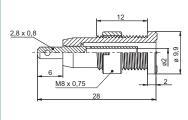
Polyamide

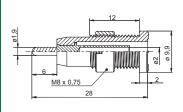
-15°C to +70°C (5 to 158°F)

UL 94 V-2

#### Drawing







<sup>\*</sup> Please consider derating graph on page 80.





Type

#### KUN 30 / KUN 30 Au

4mm Adapter, nickel/ gold plated brass with solder terminal max 2.5mm2. Flexible, shatterproof insulation sleeve

PB 4

4mm test jack, dimensions according to DIN41649. Suitable for testing PCB boards during operation.

Pin Diameter

PART NO. / Housing color

4 mm

Nickel Plated 931804100

**Gold Plated** 931804700

931804101

931804701

931804102

931804702

931804103 931804104 931804703 931804704

931804107 nickel

931804707 gold

4 mm

973582100

973582101

**Technical Data** 

jack Ø 4 mm Contact Type

Connection Type solder terminal (max. 2.5mm²)

30 VAC / 60 VDC Voltage Rating

CAT I Measurement Category (IEC61010) 16 A Current Rating\* Contact Resistance 3 mOhm Mounting Type

**Material Specifications** 

nickel plated brass | gold plated brass Jack Body

Contact Spring

Housing PVC-P

**Environmental Conditions** 

-25°C to +70 °C (-13 to 158°F) Temperature Range

Flamability Rating

Housing

jack Ø 4 mm

solder

30 VAC / 60 VDC

CATI 16 A 5 mOhm PCB

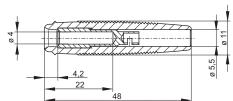
tin plated brass

PC

-25°C to +70 °C (-13 to 158°F)

UL 94 HB

#### Drawing



<sup>\*</sup> Please consider derating graph on page 80.





#### KD 10

4mm Insulated Adapter, nickel plated brass, for two 4mm plugs



## **KUN 10**

4mm Insulated Adapter, tin plated brass jack and screw terminal max 1.5mm2

Pin Diameter

Type

4 mm

PART NO. / Housing color

930109100

930109101

4 mm

930189100

930189101

Technical Data

jack Ø 4 mm Contact Type Connection Type jack (Ø 4 mm)

30 VAC / 60 VDC Voltage Rating

Measurement Category (IEC61010) CAT I Current Rating\* 10 A Contact Resistance 5 mOhm

Mounting Type **Material Specifications** 

nickel plated brass Jack Body

Contact Spring PS Housing

**Environmental Conditions** 

Temperature Range -25°C to +70 °C (-13 to 158°F)

Flamability Rating

**UL 94 HB** Housing

jack Ø 4 mm

screw terminal max. 1.5mm<sup>2</sup>

30 VAC / 60 VDC

CAT I 16 A 3 mOhm

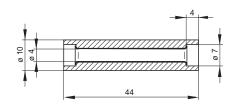
tin plated brass

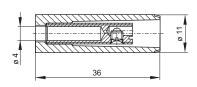
PS

-25°C to +70 °C (-13 to 158°F)

UL 94 HB

#### Drawing





<sup>\*</sup> Please consider derating graph on page 80.





Type BO 10

4mm panel mount test jack, nickel plated brass, M6 thread screw terminal. panel thickness 1.5-

8mm

Pin Diameter 4 mm

PART NO. / Housing color 930160000

BU 10 / BU 10 Au

4mm panel mount test jack, nickel/gold plated brass, M6 thread screw/ solder terminal. max. panel thickness 11mm

4 mm

930147000

(Nickel plated)

930147700

(Gold plated)

Technical Data

Contact Type jack Ø 4 mm

Connection Type M6 thread

Voltage Rating 30 VAC / 60 VDC

Measurement Category (IEC61010)

CAT I

Current Rating\*

16 A

Contact Resistance

Mounting Type

screw thread M6

**Material Specifications** 

Jack Body nickel plated brass

Contact Spring –
Housing –

**Environmental Conditions** 

Temperature Range  $-25^{\circ}\text{C to } +70 \,^{\circ}\text{C (-13 to } 158^{\circ}\text{F)}$ 

Flamability Rating

Housing

jack Ø 4 mm

M6 thread, solder terminal

30 VAC / 60 VDC

CAT I 16 A 5 mOhm

screw thread M6

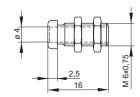
nickel / gold plated brass

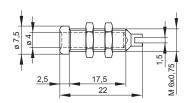
\_

-25°C to +70 °C (-13 to 158°F)

\_

## Drawing





<sup>\*</sup> Please consider derating graph on page 80.





#### BU 20

4mm panel mount test jack, nickel plated brass, M6 thread screw/ solder terminal. max. panel thickness 13.5mm

4 mm Pin Diameter

930177000 PART NO. / Housing color



#### BIL 20 / BIL 20 Au

4mm panel mount test jack, tin/ gold plated brass, M6 thread screw/ solder terminal, max. panel thickness 2mm

4 mm

Nickel Plated

**Gold Plated** 930176700

930176100 930176101

930176701

930176102 930176103 930176702

930176104

930176703 930176704

930176105 930176106

930176705 930176706

930176107 930176109 930176707 930176709

## **Technical Data**

Contact Type

Connection Type

Voltage Rating

Measurement Category (IEC61010)

Current Rating\* Contact Resistance Mounting Type

**Material Specifications** 

Jack Body Contact Spring

Housing

**Environmental Conditions** 

Temperature Range Flamability Rating

Housing

jack Ø 4 mm

M6 thread, solder terminal

30 VAC / 60 VDC

CAT I 16 A

5 mOhm

screw thread M6

nickel plated brass

nickel

-25°C to +70 °C (-13 to 158°F)

jack Ø 4 mm

M6 thread, solder terminal

30 VAC / 60 VDC

CAT I

32 A

5 mOhm

screw thread M6

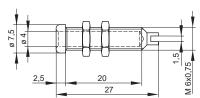
tin / gold plated brass

Polyamide

-25°C to +70 °C (-13 to 158°F)

UL 94 V-2

#### **Drawing**





<sup>\*</sup> Please consider derating graph on page 80.





Type BIL 30 / BIL 30 Au

4mm panel mount test jack, tin/ gold plated brass, M6 thread screw/ solder terminal, max. panel thickness 4mm

930166709

Pin Diameter 4 mm

PART NO. / Housing color

**Nickel Plated** Gold Plated 930166700 930166100 930166101 930166701 930166102 930166702 930166103 930166703 930166704 930166104 930166105 930166705 930166106 930166706 930166107 930166707

O THE PROPERTY

BUG 10 / BUG 10 Au

4mm panel mount test jack, tin/ gold plated brass, M6 thread screw/ solder terminal, max. panel thickness 8mm

4 mm

Nickel Plated

930175100

930175101

930175102930175103

930175104

**930175107** 

Gold Plated

● 930175700

930175701

930175702930175703

930175704

930175707

**Technical Data** 

Contact Type

Connection Type

Voltage Rating

Measurement Category (IEC61010)

Current Rating\*
Contact Resistance

Mounting Type

**Material Specifications** 

Jack Body Contact Spring

Housing

**Environmental Conditions** 

Temperature Range

Flamability Rating Housing

jack Ø 4 mm

930166109

M6 thread, solder terminal

30 VAC / 60 VDC

CAT I 32 A

5 mOhm

screw thread M6

tin / gold plated brass

Polyamide

1 Olyannae

-25°C to +85 °C (-13 to 185°F)

UL 94 V-2

jack Ø 4 mm

M6 thread, solder terminal

30 VAC / 60 VDC

CAT I

16 A

5 mOhm

screw thread M6

tin / gold plated brass

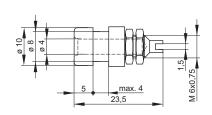
-

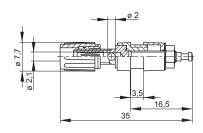
Polyamide

-25°C to +85 °C (-13 to 185°F)

UL 94 V-2

#### **Drawing**





<sup>\*</sup> Please consider derating graph on page 80.





#### PK 110

4mm insulated panel mount binding post with 2mm cross hole, nickel plated brass M4 thread terminal.

Pin Diameter

PART NO. / Housing color

Type

4 mm

931713100931713101



#### PKI 110

4mm insulated panel mount binding post with 2mm cross hole, nickel plated brass, M4 thread terminal, max. panel thickness 3.5mm.

4 mm

- 931714100
- 931714101
- 931714102
- 931714103
- 931714104
- 931714188

#### **Technical Data**

Contact Type

Connection Type

Voltage Rating

Measurement Category (IEC61010)

Current Rating\*
Contact Resistance

Mounting Type

### **Material Specifications**

Jack Body Contact Spring

Housing

#### **Environmental Conditions**

Temperature Range

### Flamability Rating

Housing

jack Ø 4 mm, cross hole Ø 2 mm

M4 thread terminal

30 VAC / 60 VDC

CAT I

35 A

2 mOhm

screw thread M4

nickel plated brass

-

Polyamide

-25°C to +100 °C (-13 to 212°F)

UL 94 V-2

jack Ø 4 mm, cross hole Ø 2 mm

M4 thread terminal

30 VAC / 60 VDC

CAT I

35 A

2 mOhm

screw thread M4

nickel plated brass

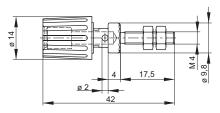
-

Polyamide

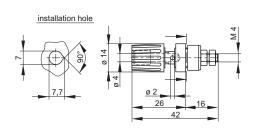
-25°C to +100 °C (-13 to 212°F)

UL 94 V-2

#### **Drawing**



<sup>\*</sup> Please consider derating graph on page 80.







Туре

PKI 100

4mm insulated panel mount binding post with 2mm cross hole, nickel plated brass, M4 thread terminal, max. panel thickness 3.5mm.

PKI 10 A / PKI 10 A Au

4mm insulated panel mount binding post with 2mm cross hole, nickel/ gold plated brass, M4 thread terminal, max. panel thickness 2mm

Pin Diameter

4 mm

PART NO. / Housing color

- 930757100
- 930757101
- 930757102
- 930757103
- 930757104
- 930757188

4 mm

Nickel Plated 930103100

- Gold Plated

  930103700
- 930103101
- 930103701
- 930103102
- 930103701
- 930103103
- 930103703
- 930103104
- 930103704

930103188

930103788

Technical Data

Contact Type

Connection Type

Voltage Rating

Measurement Category (IEC61010)

Current Rating\*
Contact Resistance

Mounting Type

**Material Specifications** 

Jack Body Contact Spring

Housing

**Environmental Conditions** 

Temperature Range

Flamability Rating Housing

jack Ø 4 mm, cross hole Ø 2 mm

M4 thread terminal

30 VAC / 60 VDC

CAT I

32 A

2 mOhm

screw thread M4

nickel plated brass

-

Polyamide

-25°C to +100 °C (-13 to 212°F)

UL 94 V-2

jack Ø 4 mm, cross hole Ø 2 mm

M 4 thread terminal

30 VAC / 60 VDC

CAT I

35 A

2 mOhm

screw thread M4

nickel plated brass | gold plated brass

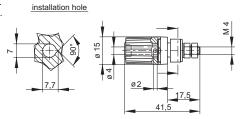
PF

-25°C to +100 °C (-13 to 212°F)

\_

## Drawing

Measurements are shown in millimeters. Multiply by 0.03937 to convert to inches.



<sup>\*</sup> Please consider derating graph on page 80.





#### PK 10 A

4mm insulated panel mount binding post with 2mm cross hole, nickel plated brass, M4 thread terminal



#### **PKN 10 B**

4mm insulated panel mount binding post with 2.6mm cross hole, nickel plated brass, M6 thread terminal

Pin Diameter

**Type** 

4 mm

PART NO. / Housing color

- 930099100
- 930099101
- 930099102
- 930099103
- 930099104
- 930099188

4 mm

930117100

930117101

## Technical Data

Contact Type

Connection Type

Voltage Rating

Measurement Category (IEC61010)

Current Rating\* Contact Resistance Mounting Type

#### **Material Specifications**

Jack Body Contact Spring Housing

## **Environmental Conditions**

Temperature Range

## Flamability Rating

Housing

jack Ø 4 mm, cross hole Ø 2 mm

M 4 thread terminal 30 VAC / 60 VDC

CAT I 16 A

2 mOhm

screw thread M4

nickel plated brass

nickel PF

-25°C to +100 °C (-13 to 212°F)

jack Ø 4 mm, cross hole Ø 2,6 mm

M6 thread, solder terminal

30 VAC / 60 VDC

CAT I

63 A

2 mOhm

screw thread M6

brass

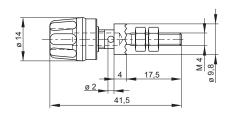
nickel plated nickel

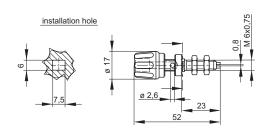
PF

-25°C to +100 °C (-13 to 212°F)

UL 94 HB

#### Drawing





<sup>\*</sup> Please consider derating graph on page 80.





Type PKNI 10 B

4mm insulated panel mount binding post with 2.6mm cross hole, nickel plated brass, M6 thread/ solder terminal, max. panel thickness 3.5mm

Pin Diameter 4 mm

930136100930136101



#### PKNI 20 B

4mm insulated panel mount binding post with 2.6mm cross hole, nickel plated brass, M6 thread/ solder terminal, max. panel thickness 3.5mm

4 mm

930144100930144101

**Technical Data** 

PART NO. / Housing color

Contact Type jack Ø 4 mm, cross hole Ø 2.6 mm

Connection Type M6 thread, solder terminal Voltage Rating 30 VAC / 60 VDC

Measurement Category (IEC61010)

Current Rating\*

Contact Resistance

Mounting Type

CAT I

C

Material Specifications

Jack Body nickel plated brass
Contact Spring –
Housing PF

Housing
Environmental Conditions

Temperature Range Flamability Rating

Housing UL 94 HB

jack Ø 4 mm, cross hole Ø 2.6 mm

M6 thread, solder terminal 30 VAC / 60 VDC

CAT I 63 A 2 mOhm

screw thread M6

nickel plated brass

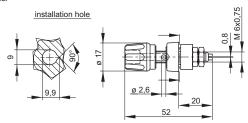
PF

-25°C to +100 °C (-13 to 212°F)

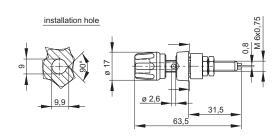
UL 94 HB

## Drawing

Measurements are shown in millimeters. Multiply by 0.03937 to convert to inches.



-25°C to +100 °C (-13 to 212°F)



<sup>\*</sup> Please consider derating graph on page 80.





## SEB 2600 G M4

4mm panel mount safety Jack, touch proof, gold plated brass with M4 thread/ solder terminal, max. panel thickness

(E 61010

KUN S

4mm Safety adapter, nickel plated brass with screw terminal 0.5-1.5mm2, IEC61010 1000V system

Pin Diameter

**Type** 

PART NO. / Housing color

- 4 mm
- 934096100
- 934096101
- 934096102
- 934096103
- 934096104

- 4 mm
- 972354100
- 972354101
- 972354102
- 972354103
- 972354104
- 972354105
- 972354106 972354107
- 972354109 972354188

**Technical Data** 

Contact Type

Connection Type

Voltage Rating

Measurement Category (IEC61010)

Current Rating\*

Contact Resistance

Mounting Type

Material Specifications

Jack Body

Contact Spring Housing

**Environmental Conditions** 

Temperature Range

Flamability Rating Housing

jack Ø 4 mm

screw terminal max. 1.5mm<sup>2</sup>

AC/DC 1000 V

CAT III

24 A

nickel plated brass

Polyamide

-15°C to +70°C (5 to 158°F)

UL 94 V-2

jack Ø 4 mm

M4 thread, solder terminal

AC/DC 1000 V

CAT III

32 A

5 mOhm

screw thread M12

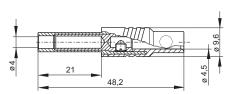
gold plated brass

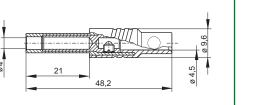
Polymide

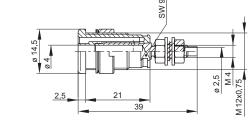
-40°C to +80°C (-40 to 176°F)

UL 94 V-2

#### **Drawing**







<sup>\*</sup> Please consider derating graph on page 80.











Type

#### SEB 2610 F4,8

4mm panel mount safety Jack, touch proof, gold plated brass with flat 4.8x0.8mm DIN46244 terminal, max. panel thickness 6mm

#### SEB 2620 F6,3

4mm panel mount safety Jack, touch proof, gold plated brass with flat 6.3x0.8mm DIN46244 terminal, max. panel thickness 6mm

Pin Diameter

PART NO. / Housing color

- 4 mm
- 972355100
- 972355101
- 972355102
- 972355103
- 972355104
- 972355105
- 972355106
- 972355107
- 972355109
- 972355188

- 4 mm
- 972356100
- 972356101
- 972356102
- 972356103 972356104
- 972356105
- 972356106
- 972356107
- 972356109 972356188

Technical Data

Contact Type

Connection Type

Voltage Rating

Measurement Category (IEC61010)

Current Rating\*

Contact Resistance

Mounting Type

Material Specifications

Jack Body

Contact Spring

Housing

**Environmental Conditions** 

Temperature Range Flamability Rating

Housing

jack Ø 4 mm

flat 4.8 x 0.8 mm tab

AC/DC 1000 V

CAT III

25 A

5 mOhm

screw thread M12

gold plated brass

\_

Polyamide

-40°C to +80°C (-40 to 176°F)

UL 94 V-2

jack Ø 4 mm

flat 6.3 x 0.8 mm tab

AC/DC 1000 V

CAT III

32 A

5 mOhm

screw thread M12

gold plated brass

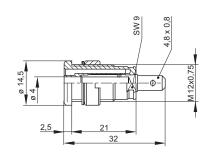
-

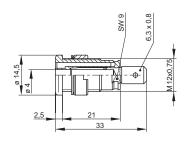
Polyamide

-40°C to +80°C (-40 to 176°F)

UL 94 V-2

## Drawing





<sup>\*</sup> Please consider derating graph on page 80.





#### SEB 2630 S1,9

4mm panel mount safety Jack, touch proof, gold plated brass with soldering pin 1.9mm, max. panel thickness 6mm



#### MW SEB

Installation tool for 4mm panel mount safety jacks.

Pin Diameter

PART NO. / Housing color

4 mm

972359100

972359101

972359102

972359103

972359104

972359105

972359106

972359107

972359109

972359188

4 mm

973929000

# **Technical Data**Contact Type

Connection Type

V II D II

Voltage Rating

Measurement Category (IEC61010)

Current Rating\*
Contact Resistance

Mounting Type

**Material Specifications** 

Jack Body Contact Spring

Housing

**Environmental Conditions** 

Temperature Range Flamability Rating

Housing

jack Ø 4 mm

solder pin 1.9mm

AC/DC 1000 V

CAT III

24 A

5 mOhm screw thread M12

gold plated brass

Polyamide

-40°C to +80°C (-40 to 176°F)

UL 94 V-2

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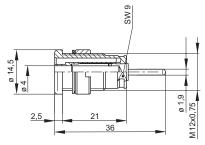
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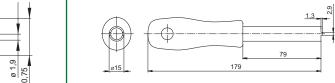
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### Drawing





<sup>\*</sup> Please consider derating graph on page 80.





## Type

Safety press-in socket, 4 mm diameter, contact-protected, with 4.8 x 0.8 tab connector complying with DIN 46 244, gold-plated brass. For rapid installation into switch panels with wall thicknesses between 1-10 mm. Installation hole: 12.2 +/- 0.1 mm diameter. Entry chamfer: 0.5 x

Pin Diameter

PART NO. / Housing color

45 degree.

SEP 2610 F4,8

2 mm 972361100

972361101

972361102

972361103 972361104

972361188



#### SEP 2620 F6,3

Safety press-in socket, 4 mm diameter, contact-protected, with 6.3 x 0.8 tab connector complying with DIN 46244, gold-plated brass. For rapid installation into switch panels with wall thicknesses between 1-10 mm. Installation hole: 12.2 +/- 0.1 mm diameter. Entry chamfer: 0.5 x 45 degree.

2 mm

972362100

972362101

972362102

972362103

972362104 972362188

SEP 2630 S1,9

contact-protected, with 1.9 mm soldering spike. For installation into switch panels with wall thicknesses between 1 mm and 10 mm. Installation hole: 12.2 +/- 0.1 mm diameter. Entry chamfer: 0.5 x 45 degree.

Gold-plated brass safety press-

in socket, 4 mm diameter,

2 mm

972363100

972363101

972363102

972363103

972363104 972363188

**Technical Data** 

Contact Type

Connection Type

Voltage Rating

Measurement Category (IEC61010)

Current Rating\* Contact Resistance

Mounting Type

**Material Specifications** 

Jack Body Contact Spring

Housing

**Environmental Conditions** 

Temperature Range Flamability Rating

Housing

jack Ø 4 mm

flat 4.8 x 0.8 mm tab

AC/DC 1000 V

CAT III

24 A

5 mOhm

press in

gold plated brass

PA

-40°C to +80°C (-40 to 176°F)

UL 94 V-2

jack Ø 4 mm

flat 6.3 x 0.8 mm tab AC/DC 1000 V

CAT III

32 A

5 mOhm

press in

gold plated brass

-40°C to +80°C (-40 to 176°F)

UL 94 V-2

jack Ø 4 mm

solder pin 1.9mm AC/DC 1000V

CAT III

24 A 5 mOhm

press in

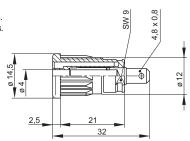
gold plated brass

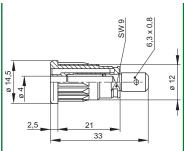
PA

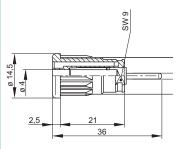
-40°C to +80°C (-40 to 176°F)

UL 94 V-2

#### Drawing







<sup>\*</sup> Please consider derating graph on page 80.



# **Test & Measurement Sets**

Altech offers a variety of Test & Measurement Sets consisting of suitable components for certain System Types and specific applications. Comprehensive Service cases include extensive line of products for in-field installation, testing and service.

- 0.64 System
- 2mm System
- 4mm System
- 4mm Retracable Sleeve System
- 4mm Safety System
- Automobile Test Kit
- Service cases for Electronic or Electrical applications











#### PMS 0.64 932959001

Micro Test Equipment Set for SMD Components and 0.64mm systems.

- 1 x Plunger Style Test Probe MICRO-KLEPS black 973972100
- 1 x Plunger Style Test Probe MICRO-KLEPS red 973972101
- 1 x Test Probe MICRO-PRUEF MPS 2/0,64 FT black 973995100
- 1 x Test Probe MICRO-PRUEF MPS 2/0,64 FT red 973995101
- 1 x Alligator Clip AGF 1 930476001
- 1 x Measuring Lead MAL N 4-0,64/100-0,25 black 934160100
- 1 x Measuring Lead MAL N 4-0,64/100-0,25 red 934160101



#### PMS 2 932961001

Test Equipment Set for 2mm systems.

- 1 x Plunger Style Test Probe KLEPS 2 BU black 973501100
- 1 x Plunger Style Test Probe KLEPS 2 BU red 973501101
- 1 x Test Probe MPS 1 black 973531100
- 1 x Test Probe MPS 1 red 973531101
- 1 x Alligator Clip MA 1 black 930317800
- 1 x Alligator Clip MA 1 red 930317801
- 1 x Measuring Lead MVL 2/100 black 973596100
- 1 x Measuring Lead MVL 2/100 red 973596101



# PMS 2 S LMLH 975604001

Laboratory Test Holder with 10 measuring leads in various colors for 2mm safety system.



- 1 x Test Lead Holder LMLH 973919001
- 2 x Test Lead MVL S WS 100/1 AU black 975696700
- 2 x Test Lead MVL S WS 100/1 AU red 975696701
- 2 x Test Lead MVL S WS 100/1 AU blue 975696702
- 2 x Test Lead MVL S WS 100/1 AU yellow 975696703
- 2 x Test Lead MVL S WS 100/1 AU green 975696704



Type
PART No.
Description

#### PMS 4 932793001

Test Equipment Set for 4mm systems.



- 1 x Plunger Style Test Probe KLEPS 30 black 930113100
- 1 x Plunger Style Test Probe KLEPS 30 red 930113101
- 1 x Test Probe PRUEF 2 black 973368100
- 1 x Test Probe PRUEF 2 red 973368101
- 1 x Alligator Clip AK 2 S black 932146100
- 1 x Alligator Clip AK 2 S red 932146101
- 1 x Measuring Lead MLN 100/1 black 934062100
- 1 x Measuring Lead MLN 100/1 red 934062101



#### PMS 4 KFZ 933003001

Test Equipment Set for Automobiles, Service and repair shops.

- 1 x Safety Plunger Style Test Probe KLEPS 2700 black 972307100
- 1 x Safety Plunger Style Test Probe KLEPS 2700 red 972307101
- 1 x Test Probe PRUEF 2610 FT black 972318100
- 1 x Test Probe PRUEF 2610 FT red 972318101
- 1 x Safety Alligator Clip AK 2 B 2540 I black 972405100
- 1 x Safety Alligator Clip AK 2 B 2540 I red 972405101
- 1 x Silicone Test Lead MLN SIL 150/1 black 934093100
- 1 x Silicone Test Lead MLN SIL 150/1 red 934093101

Type
PART No.
Description

#### PMS 4 SKS 932794001

Test Equipment Set for 4mm systems.

- 1 x Measuring Lead MLN 50/1 black 934060100
- 1 x Measuring Lead MLN 50/1 red 934060101
- 2 x Measuring Lead MLN 100/1 black 934062100
- 2 x Measuring Lead MLN 100/1 red 934062101
- 1 x Measuring Lead MLN 200/1 black 934065100
- 1 x Measuring Lead MLN 200/1 red 934065101
- 1 x Plunger Style Test Probe KLEPS 30 black 930113100
- 1 x Plunger Style Test Probe KLEPS 30 red 930113101
- 1 x Alligator Clip AK 2 S black 932146100
- 1 x Alligator Clip AK 2 S red 932146101
- 1 x Test Probe PRUEF 2 black 973368100
- 1 x Test Probe PRUEF 2 red 973368101



#### PMS 4 LMLH 972604001

Laboratory Test Holder with 10 measuring leads in various colors for 4mm safety system.

- 1 x Test Lead Holder LMLH 973919001
- 2 x Test Lead MLN 100/1 black 934062100
- 2 x Test Lead MLN 100/1 red 934062101
- 2 x Test Lead MLN 100/1 blue 934062102
- 2 x Test Lead MLN 100/1 yellow 934062103
- 2 x Test Lead MLN 100/1 green 934062104



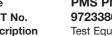
#### PMS 250 932827001

Sliding Sleeve Test Equipment Set for 4mm systems.

- 1 x Plunger Style Test Probe KLEPS 250 black 973528100
- 1 x Plunger Style Test Probe KLEPS 250 red 973528101
- 1 x Test Probe PRUEF 2 S black 973659100
- 1 x Test Probe PRUEF 2 S red 973659101
- 1 x Alligator Clip AK 2 B black 932435100
- 1 x Alligator Clip AK 2 B red 932435101
- 1 x Measuring Lead MLB 100/1 V black 973646100
- 1 x Measuring Lead MLB 100/1 V red 973646101







**PMS PMS 2600** 972338001

Test Equipment Set Safety Applications for 4mm system (Accessory for measuring instruments)



- 1 x Plunger Style Test Probe KLEPS 2600 red 972306101
- 1 x Test Probe PRUEF 2600 black 972317100
- 1 x Test Probe PRUEF 2600 red 972317101
- 1 x Alligator Clip AK 2 B black 932435100
- 1 x Alligator Clip AK 2 B red 932435101
- 1 x Measuring Lead MLS GG 100/1 black 934074100
- 1 x Measuring Lead MLS GG 100/1 red 934074101





#### PL 2600 S Set 972337002

Test Probe Set for measuring devices with straight connectors.

- 1 x Measuring Lead PL 2600 S black 934159100
- 1 x Measuring Lead PL 2600 S red 934159101





#### PL 2600 S W Set 972425002

Test Probe Set for measuring devices with angled connectors.

- 1 x Measuring Lead PL 2600 S W black 934158100
- 1 x Measuring Lead PL 2600 S W red 934158101



#### **MMS 2010** 972339001

Test Equipment Set for Safety Applications - Plunger Test Clips KLEPS 2800, Test probes, Measuring Leads.

- 1 x Safety Plunger Style Test Probe KLEPS 2800 black 972308100
- 1 x Safety Plunger Style Test Probe KLEPS 2800 red 972308101
- 1 x Safety Test Probe PRUEF 2700 black 972319100
- 1 x Safety Test Probe PRUEF 2700 red 972319101
- 1 x Safety Test Lead MLS WG 100/1 black 934082100
- 1 x Safety Test Lead MLS WG 100/1 red 934082101





Type

#### MMS 2020 972340001

Test Equipment Set for Safety Applications - Alligator Clips, Test probes, Measuring Leads.

- 1 x Safety Alligator Clip AK 2 B 2540 I black 972405100
- 1 x Safety Alligator Clip AK 2 B 2540 I red 972405101
- 1 x Safety Test Probe PRUEF 2700 black 972319100
- 1 x Safety Test Probe PRUEF 2700 red 972319101
- 1 x Safety Test Lead MLS WG 100/1 black 934082100
- 1 x Safety Test Lead MLS WG 100/1 red 934082101

# Type PART No. Description

# **Test & Measurement Sets**

# MMS 2030 972341001

Test Equipment Set for Safety Applications – Plunger Test Clips KLEPS 2600, Test probes, Measuring Leads.

- 1 x Safety Test Probe PRUEF 2700 black 972319100
- 1 x Safety Test Probe PRUEF 2700 red 972319101
- 1 x Plunger Style Test Probe KLEPS 2600 black 972306100
- 1 x Plunger Style Test Probe KLEPS 2600 red 972306101
- 1 x Safety Test Lead MLS WG 100/1 black 934082100
- 1 x Safety Test Lead MLS WG 100/1 red 934082101



# MMS 2040 972342100

Test Equipment Set for Safety Applications – Plunger Test Clips KLEPS 2600, Alligator Clips, Measuring Leads.

- 1 x Plunger Style Test Probe KLEPS 2600 black 972306100
- 1 x Plunger Style Test Probe KLEPS 2600 red 972306101
- 1 x Alligator Clip AK 2 B black 932435100
- 1 x Alligator Clip AK 2 B red 932435101
- 1 x Measuring Lead PL 2600 S black 934159100
- 1 x Measuring Lead PL 2600 S red 934159101
- 1 x Safety Test Lead MLS WG 100/1 black 934082100
- 1 x Safety Test Lead MLS WG 100/1 red 934082101

# Type PART No. Description

# PMS SKS Safety 932795001

Safety Test Equipment Set – Plunger Test Clips KLEPS 2600, Alligator Clips, Test Leads.

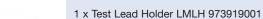


- 1 x Plunger Style Test Probe KLEPS 2600 black 972306100
- 1 x Plunger Style Test Probe KLEPS 2600 red 972306101
- 1 x Test Probe PRUEF 2600 black 972317100
- 1 x Test Probe PRUEF 2600 red 972317101
- 1 x Alligator Clip AK 2 B black 932435100
- 1 x Alligator Clip AK 2 B red 932435101
- 1 x Test Lead MLS WS 50/1 black 934068100
- 1 x Test Lead MLS WS 50/1 red 934068101
- 2 x Test Lead MLS WS 100/1 black 934095100 2 x Test Lead MLS WS 100/1 red 934095101
- 1 x Test Lead MLS WS 100/1 red 934095101
- 1 x Test Lead MLS WS 200/1 red 934069101



#### PMS 4 S LMLH 972605001

Laboratory Test Holder with 10 measuring leads in various colors for 4mm safety system.



- 2 x Test Lead MLS WS 100/1 black 934095100
- 2 x Test Lead MLS WS 100/1 red 934095101
- 2 x Test Lead MLS WS 100/1 blue 934095102
- 2 x Test Lead MLS WS 100/1 yellow 934095103
- 2 x Test Lead MLS WS 100/1 green 934095104







Type PART No. Description

#### PMS SKS Elektronik 932791001

Service Case Electronic

- 1 x Safety Test Probe PRUEF 2610 FT black 972318100
- 1 x Safety Test Probe PRUEF 2610 FT red 972318101
- 1 x Test Probe MICRO-PRUEF MPS 2/0,64 FT black 973995100
- 1 x Test Probe MICRO-PRUEF MPS 2/0,64 FT red 973995101
- 1 x Plunger Style Test Probe MICRO-KLEPS black 973972100
- 1 x Plunger Style Test Probe MICRO-KLEPS red 973972101
- 1 x Mini Alligator Clip KLEPS 064 PCH black 974201100
- 1 x Mini Alligator Clip KLEPS 064 PCH red 974201101
- 1 x Mini Alligator Clip KLEPS 064 PCH blue 974201102 1 x Mini Alligator Clip KLEPS 064 PCH yellow 974201103
- 1 x Mini Alligator Clip KLEPS 064 PCH green 974201104
- 1 x Mini Alligator Clip KLEPS 064 PCH gray 974201106
- 1 x Mini Alligator Clip KLEPS 064 PCH white 974201107
- 1 x Adapter MZS 4 black 973599100
- 1 x Adapter MZS 4 red 973599101
- 1 x 2 pole Test Clip MICRO-SMD CLIP 1 972416100
- 1 x Mini Alligator Clip MA 260 SH black 973889100
- 1 x Mini Alligator Clip MA 260 SH red 973889101
- 1 x Alligator Clip AK 2 B 2540 I yellow-green 972405188
- 1 x Test Lead MLS WS 50/2,5 black 934087100
- 1 x Test Lead MLS WS 50/2,5 red 934087101
- 1 x Test Lead MLS WS 50/2,5 yellow-green 934087188
- 1 x Measuring Lead MAL N 4-0,64/100-0,25 black 934160100
- 1 x Measuring Lead MAL N 4-0,64/100-0,25 red 934160101
- 1 x Test Lead MKL 0,64/25-0,25 black 973604100
- 1 x Test Lead MKL 0,64/25-0,25 red 973604101
- 1 x Adapter BNC AL 0,64 black 933844001
- 1 x Passive Divider Probe TKO 5 PMS 221 A 974312000
- 1 x 2 foot positioner for oscilloscope test probes 974401000





Type PART No. Description

#### **PMS SKS Electrical** 932791001

Service Case Electric (Industrial, Utility Management, Training, etc...)

- 1 x Plunger Style Test Probe KLEPS 2 BU black 973501100
- 1 x Plunger Style Test Probe KLEPS 2 BU red 973501101
- 1 x Test Probe PRUEF 2600 black 972317100
- 1 x Test Probe PRUEF 2600 red 972317101
- 1 x Safety Test Probe PRUEF 2700 black 972319100 1 x Safety Test Probe PRUEF 2700 red 972319101
- 1 x Safety Plunger Style Test Probe KLEPS 2800 black 972308100
- 1 x Safety Plunger Style Test Probe KLEPS 2800 red 972308101
- 1 x Adapter MZS 4 black 973599100
- 1 x Adapter MZS 4 red 973599101
- 1 x Test Lead MLS WS 25/2,5 black 934086100
- 1 x Test Lead MLS WS 25/2,5 red 934086101
- 1 x Test Lead MLS WS 200/2,5 black 934089100
- 1 x Test Lead MLS WS 200/2,5 red 934089101
- 1 x Test Lead MLS WS 520/2,5 black 934089188
- 1 x Alligator Clip AK 2 B 2540 I yellow-green 972405188
- 1 x Test Lead MVL 2/50 black 973595100
- 1 x Test Lead MVL 2/50 red 973595101
- 1 x Adapter MZS 2 black 973600100
- 1 x Adapter MZS 2 red 973600101



# **Test & Measurement Glossary**

#### **Clearance Distance**

Clearance Distance is the directly measured distance between two conducting parts, acts as an insulator and should be dimensioned according to IEC 61010.

#### **Contact Material**

Contact Material is the base Material of the part.

#### **Contact Resistance**

Contact Resistance is the resistance measured between the connections of connected contact parts. It consists of resistivity and contact-circuit resistance. Given values are according to DIN EN 60512.

#### **Contact Surface Material**

Contact Surface Material is the material on the surface of the electrical contact. For Test & Measurement purposes special nickel or gold plating is used for ideal electrical and mechanical conditions.

#### **Creepage Distance**

Creepage Distance is the shortest path between two conductive parts (or between a conductive part and the bounding surface of the equipment) measured along the surface of the insulation. It is defined in IEC 61010.

#### **Pollution Degree Rating**

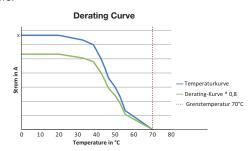
The pollution degree is the numerical index of the degree of pollution that can exist in the environment. IEC/EN 61010-031 defines 3 Pollution Degrees:

- Pollution Degree 1: No pollution or only dry, non-conductive pollution occurs. The pollution has no influence.

  Example: Inside closed pieces of equipment.
- Pollution Degree 2: Normally only non-conductive pollution occurs. Occasionally, however, a temporary conductivity caused by condensation is to be expected. Examples: Laboratory, light industry.
- Pollution Degree 3: Conductive pollution occurs, or dry non-conductive pollution, which becomes conductive due to condensation, is to be expected. Examples: Heavy industry, short service outdoors.

#### **Derating Curve**

According to the derating Curve (load reduction curve acc. to DIN EN 60512-5-2), the operating current at higher ambient temperatures is reduced. The current loading capacity of measurement accessories is limited by the thermal load-bearing capacity of the contact material or insulating parts and by the upper temperature limit of measurement accessories acc. to IEC 61010. Therefore, the derating graph applies as a function of environmental temperature to currents that may continuously pass through each contact element without exceed the upper temperature limit.



The derating graph describes the relation between currents, thereby caused increase of temperature (power loss on contact resistance) and environmental temperature of the measurement accessory. The Graph ends with the upper temperature limit of the measurement accessory. Upper temperature limits for measurement accessories are according to IEC 61010:

Non-metallic Material 70C (158F), Metallic Material 55C (131F)

GRAPH from Hirschmann Catalog

#### Handle Area

The Handle Area is the area in which the user can touch a measuring device during operation without being exposed to electrical currents.

#### IEC 61010-31

Title of the IEC/EN 61010:

"Safety requirements for electrical equipment for measurement, control and laboratory use"

#### Part 031:

"Safety requirements for hand-held probe assemblies for electrical measurement and test"

All products of the Hirschmann Test & Measurement Range are designed and approved according to this standard.

## **Test & Measurement Glossary**



#### Insulation

Basic insulation - is the insulation applied to live parts to provide basic protection against electric shock, eg. the failure of the basic insulation could cause the risk of electric shock.

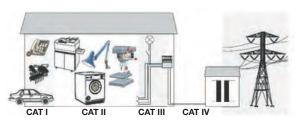
Double insulation - Insulation comprising both basic insulation and supplementary insulation.

Reinforced insulation - Insulation which provides protection against electric shock not less than that provided by double insulation.

#### Measurement Categories acc. to IEC 61010-031

To facilitate the assignment of test accessories to the appropriate applications, standard IEC 61010-031 has established a number of categories which define where they can be used in the power supply network and to lay down appropriate requirements for each category.

In standard EN 61010-031 there are four different test categories, abbreviated "CAT". The category CAT followed by a number from I to IV is stated in our catalog with the rated voltage. As a general rule, the higher the CAT rating, the higher the safety requirement that applies to the product.



#### CAT I

Applies to test objects that are not connected to the mains. E.g. electronic devices, batteries, etc. in which only minor over voltages occur.

CAT I will also include all test objects that cannot be assigned to CAT II to CAT IV.

Applies to measurements on equipment that is connected to the mains or supplied from the mains without constituting a part of the mains installation. Electrical equipment between appliance and power socket, or inside electrical equipment such as domestic appliances.

#### **CAT III**

Applies to measurements inside the house or building installation. Installations in buildings, contactors, protective devices, switches, power sockets (Electricians).

#### CAT IV

Applies to measurements at the supply source of the installation (input side). Secondary side of medium-voltage transformers, electricity meters, cable networks, connection to overhead lines (employees of power distribution companies).

#### **Current Rating**

The rated current is the current which the test & measurement devices can carry continuously without the temperature exceeding the upper limit.

#### **Voltage Rating**

Voltage Rating is the voltage at which the product can be used safely, if used properly. The specified rated voltage always relates to Pollution Degree 2. Each Voltage also refers to the appropriate Measuring Category.

#### **Safety Color Indicator**

All the measuring leads of the 2 mm & 4 mm safety system have a safety colour indicator. The cable insulation consists of two separated insulation layers. The first layer is directly installed on the conductor and it is white in all measuring leads (except of white ones >red colour indicator). In a subsequent manufacturing stage, a second insulation layer is applied in the respective cable colour. If the insulation is damaged while using the measuring lead, the first insulating layer becomes visible. For safety reasons, the lead should be immediately replaced with a new SKS measuring lead.

#### Sliding Sleeve System

The Sliding Sleeve System has a retraceable protective insulation to avoid short circuits and electric shocks while not connected. It is not allowed to use this system for dangerous voltages during use. Adapter test leads for the connection to equipment that (still) cannot take fully insulated plugs are an exception. For this reason the Sliding Sleeve System is classified according to IEC 61010, CAT I up to 60V.

#### Temperature range (environmental conditions)

The temperature range is the allowed range in which the products may be used without damaging the materials.

#### Voltage details

The voltage details for the products mentioned in the catalog indicate the voltage range for which they can be used. SKS has designed the entire 2 mm & 4 mm safety system, unless otherwise specified, for 1,000V, Measurement Category III (CAT III) with Pollution Degree 2. The largest range of measuring tasks in the higher voltage range is safely covered.

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S 2900	9723091xx	10	MLN SIL 50/1	9340911xx
60	9730531xx	8	MLN SIL 100/1	9340921xx
3 ST	9735921xx	5	MLN SIL 150/1	9340931xx
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SO AU			MLS GG 100/1 MLS GG 100/2,5	
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	9725181xx	45	MLS GG 200/1	9340761xx
0 Au	9725187xx	45	MLS GG 200/2,5	9340771xx
WS	9341001xx	47	MLS WG 25/1	9340781xx
WS Au	9341007xx	47	MLS WG 25/2,5	9340791xx
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Example Part No. 9340621 <u>xx</u>					
00 = ● black	05 = ● brown				
01 = • red	06 = ○ grey				
02 = • blue	07 = ○ white				
03 = 🕠 yellow	09 = ● violet				
04 = • green	88 = ● yellow/green				

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9345071xx MLN 150/2,5 33 9345077xx MLN 150/2,5 Au 33 9723061xx KLEPS 2600 9 9723071xx KLEPS 2700 10 9723081xx KLEPS 2800 10 9723091xx KLEPS 2900 10 9723171xx PRUEF 2600 17 9723181xx PRUEF 2600 17 9723181xx PRUEF 2610 FT 16 9723191xx PRUEF 2600 C2 16 972337002 PL 2600 S Set 75 972338001 PMS 2600 75 972339001 MMS 2010 75 972340001 MMS 2020 75 972341001 MMS 2030 76 972342001 MMS 2040 76 9723541xx SEB 2600 G M4 68 9723551xx SEB 2600 F4,8 69 9723561xx SEB 2630 S1,9 70 9723611xx SEP 2630 S1,9 71 9724051xx SEP 2630 S1,9 71 972425002 PL 2600 S W Set 75 9725181xx LAS 30 45 9725187xx LAS 30 44 972605001 PMS 4 S LMLH 74 972605001 PMS 4 S LMLH 76 9733581xx SRUEF 2 BU 7 9735091xx SRUEF 2 BU 7 9735091xx SLUEPS 2 BU 7 9735091xx SLUEPS 2 BU 7	9341601xx	MAL N 4-0,64/100-0,25	27
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9723181xx         PRUEF 2610 FT         16           9723191xx         PRUEF 2700         17           9723271xx         PRUEF 2600 C2         16           972337002         PL 2600 S Set         75           972338001         PMS 2600         75           972339001         MMS 2010         75           972340001         MMS 2030         76           972342001         MMS 2040         76           9723541xx         SEB 2600 G M4         68           9723551xx         SEB 2610 F4,8         69           9723561xx         SEB 2630 S1,9         70           9723611xx         SEP 2610 F4,8         71           9723621xx         SEP 2630 S1,9         71           9723631xx         SEP 2630 S1,9         71           9724051xx         AK 2 B 2540 I         25           972416100         MICRO-SMD CLIP         21           972425002         PL 2600 S W Set         75           9725187xx         LAS 30         45           9725187xx         LAS 30         45           97250001         PMS 4 LMLH         74           972604001         PMS 4 S LMLH         76           973381xx <td< td=""><td>9723091xx</td><td>KLEPS 2900</td><td>10</td></td<>	9723091xx	KLEPS 2900	10
9723191xx         PRUEF 2700         17           9723271xx         PRUEF 2600 C2         16           972337002         PL 2600 S Set         75           972338001         PMS 2600         75           972339001         MMS 2010         75           972340001         MMS 2020         75           972342001         MMS 2040         76           9723541xx         SEB 2600 G M4         68           9723551xx         SEB 2610 F4,8         69           9723561xx         SEB 2630 S1,9         70           9723611xx         SEP 2610 F4,8         71           9723621xx         SEP 2630 S1,9         71           9723631xx         SEP 2630 S1,9         71           9724051xx         AK 2 B 2540 I         25           972416100         MICRO-SMD CLIP         21           972425002         PL 2600 S W Set         75           9725187xx         LAS 30         45           9725187xx         LAS 30         45           972604001         PMS 4 LMLH         74           97360501         PMS 4 S LMLH         76           9733881xx         SML 100/1         39           9735091xx         MS	9723171xx		17
9723271xx         PRUEF 2600 C2         16           972337002         PL 2600 S Set         75           972338001         PMS 2600         75           972339001         MMS 2010         75           972340001         MMS 2030         76           972342001         MMS 2040         76           9723541xx         SEB 2600 G M4         68           9723551xx         SEB 2610 F4,8         69           9723561xx         SEB 2630 S1,9         70           9723611xx         SEP 2610 F4,8         71           9723621xx         SEP 2620 F6,3         71           9723631xx         SEP 2630 S1,9         71           9724051xx         AK 2 B 2540 I         25           972416100         MICRO-SMD CLIP         21           972425002         PL 2600 S W Set         75           9725187xx         LAS 30         45           9725187xx         LAS 30 Au         45           972604001         PMS 4 LMLH         74           9730531xx         KLEPS 60         8           9733881xx         SML 100/1         39           9735091xx         MST 3         41           9735281xx         KLEPS 25	9723181xx	PRUEF 2610 FT	16
9723271xx         PRUEF 2600 C2         16           972337002         PL 2600 S Set         75           972338001         PMS 2600         75           972339001         MMS 2010         75           972340001         MMS 2030         76           972342001         MMS 2040         76           9723541xx         SEB 2600 G M4         68           9723551xx         SEB 2610 F4,8         69           9723561xx         SEB 2630 S1,9         70           9723611xx         SEP 2610 F4,8         71           9723621xx         SEP 2620 F6,3         71           9723631xx         SEP 2630 S1,9         71           9724051xx         AK 2 B 2540 I         25           972416100         MICRO-SMD CLIP         21           972425002         PL 2600 S W Set         75           9725187xx         LAS 30         45           9725187xx         LAS 30 Au         45           972604001         PMS 4 LMLH         74           9730531xx         KLEPS 60         8           9733881xx         SML 100/1         39           9735091xx         MST 3         41           9735281xx         KLEPS 25	9723191xx	PRUEF 2700	17
972338001 PMS 2600 75 972339001 MMS 2010 75 972340001 MMS 2020 75 972341001 MMS 2030 76 972342001 MMS 2040 76 9723541xx SEB 2600 G M4 68 9723551xx SEB 2610 F4,8 69 9723561xx SEB 2620 F6,3 69 9723591xx SEB 2630 S1,9 70 9723611xx SEP 2610 F4,8 71 9723621xx SEP 2620 F6,3 71 9723631xx SEP 2630 S1,9 70 9723631xx SEP 2630 S1,9 71 9724051xx AK 2 B 2540 I 25 972416100 MICRO-SMD CLIP 21 972425002 PL 2600 S W Set 75 9725181xx LAS 30 45 9725187xx LAS 30 Au 45 972604001 PMS 4 LMLH 74 972605001 PMS 4 S LMLH 76 9730531xx SPUEF 2 15 9733881xx SML 100/1 39 9735011xx KLEPS 2 BU 7 9735091xx MST 3 41 9735281xx MST 3	9723271xx		16
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972340001         MMS 2020         75           972341001         MMS 2030         76           972342001         MMS 2040         76           9723541xx         SEB 2600 G M4         68           9723551xx         SEB 2610 F4,8         69           9723561xx         SEB 2620 F6,3         69           9723591xx         SEB 2630 S1,9         70           9723611xx         SEP 2610 F4,8         71           9723621xx         SEP 2620 F6,3         71           9723631xx         SEP 2630 S1,9         71           9724051xx         AK 2 B 2540 I         25           972416100         MICRO-SMD CLIP         21           972425002         PL 2600 S W Set         75           9725181xx         LAS 30         45           9725187xx         LAS 30 Au         45           972604001         PMS 4 LMLH         74           972605001         PMS 4 S LMLH         76           9733681xx         PRUEF 2         15           9733881xx         SML 100/1         39           9735011xx         KLEPS 2 BU         7           9735091xx         MST 3         41           9735281xx         KLEPS 25	972338001	PMS 2600	75
972341001         MMS 2030         76           972342001         MMS 2040         76           9723541xx         SEB 2600 G M4         68           9723551xx         SEB 2610 F4,8         69           9723561xx         SEB 2620 F6,3         69           9723591xx         SEB 2630 S1,9         70           9723611xx         SEP 2610 F4,8         71           9723621xx         SEP 2620 F6,3         71           9723631xx         SEP 2630 S1,9         71           9724051xx         AK 2 B 2540 I         25           972416100         MICRO-SMD CLIP         21           972425002         PL 2600 S W Set         75           9725181xx         LAS 30         45           9725187xx         LAS 30 Au         45           972604001         PMS 4 LMLH         74           972605001         PMS 4 S LMLH         76           9733681xx         PRUEF 2         15           9733881xx         SML 100/1         39           9735011xx         KLEPS 2 BU         7           9735091xx         MST 3         41           9735281xx         KLEPS 250         9	972339001	MMS 2010	75
972342001         MMS 2040         76           9723541xx         SEB 2600 G M4         68           9723551xx         SEB 2610 F4,8         69           9723561xx         SEB 2620 F6,3         69           9723591xx         SEB 2630 S1,9         70           9723611xx         SEP 2610 F4,8         71           9723621xx         SEP 2620 F6,3         71           9723631xx         SEP 2630 S1,9         71           9724051xx         AK 2 B 2540 I         25           972416100         MICRO-SMD CLIP         21           972425002         PL 2600 S W Set         75           9725181xx         LAS 30         45           9725187xx         LAS 30 Au         45           972604001         PMS 4 LMLH         74           972605001         PMS 4 S LMLH         76           9733681xx         PRUEF 2         15           9733881xx         SML 100/1         39           9735011xx         KLEPS 2 BU         7           9735091xx         MST 3         41           9735281xx         KLEPS 250         9	972340001	MMS 2020	75
9723541xx         SEB 2600 G M4         68           9723551xx         SEB 2610 F4,8         69           9723561xx         SEB 2620 F6,3         69           9723591xx         SEB 2630 S1,9         70           9723611xx         SEP 2610 F4,8         71           9723621xx         SEP 2620 F6,3         71           9723631xx         SEP 2630 S1,9         71           9724051xx         AK 2 B 2540 I         25           972416100         MICRO-SMD CLIP         21           972425002         PL 2600 S W Set         75           9725181xx         LAS 30         45           9725187xx         LAS 30 Au         45           972604001         PMS 4 LMLH         74           972605001         PMS 4 S LMLH         76           9733681xx         PRUEF 2         15           9733881xx         SML 100/1         39           9735011xx         KLEPS 2 BU         7           9735091xx         MST 3         41           9735281xx         KLEPS 250         9	972341001	MMS 2030	76
9723551xx         SEB 2610 F4,8         69           9723561xx         SEB 2620 F6,3         69           9723591xx         SEB 2630 S1,9         70           9723611xx         SEP 2610 F4,8         71           9723621xx         SEP 2620 F6,3         71           9723631xx         SEP 2630 S1,9         71           9724051xx         AK 2 B 2540 I         25           972416100         MICRO-SMD CLIP         21           972425002         PL 2600 S W Set         75           9725181xx         LAS 30         45           9725187xx         LAS 30 Au         45           972604001         PMS 4 LMLH         74           972605001         PMS 4 S LMLH         76           9733681xx         PRUEF 2         15           9733881xx         SML 100/1         39           9735011xx         KLEPS 2 BU         7           9735091xx         MST 3         41           9735281xx         KLEPS 250         9	972342001	MMS 2040	76
9723561xx         SEB 2620 F6,3         69           9723591xx         SEB 2630 S1,9         70           9723611xx         SEP 2610 F4,8         71           9723621xx         SEP 2620 F6,3         71           9723631xx         SEP 2630 S1,9         71           9724051xx         AK 2 B 2540 I         25           972416100         MICRO-SMD CLIP         21           972425002         PL 2600 S W Set         75           9725181xx         LAS 30         45           9725187xx         LAS 30 Au         45           972604001         PMS 4 LMLH         74           972605001         PMS 4 S LMLH         76           9733681xx         PRUEF 2         15           9733881xx         SML 100/1         39           9735011xx         KLEPS 2 BU         7           9735091xx         MST 3         41           9735281xx         KLEPS 250         9	9723541xx	SEB 2600 G M4	68
9723591xx         SEB 2630 S1,9         70           9723611xx         SEP 2610 F4,8         71           9723621xx         SEP 2620 F6,3         71           9723631xx         SEP 2630 S1,9         71           9724051xx         AK 2 B 2540 I         25           972416100         MICRO-SMD CLIP         21           972425002         PL 2600 S W Set         75           9725181xx         LAS 30         45           9725187xx         LAS 30 Au         45           972604001         PMS 4 LMLH         74           9730531xx         KLEPS 60         8           9733681xx         PRUEF 2         15           9733881xx         SML 100/1         39           9735011xx         KLEPS 2 BU         7           9735091xx         MST 3         41           9735281xx         KLEPS 250         9	9723551xx	SEB 2610 F4,8	69
9723611xx         SEP 2610 F4,8         71           9723621xx         SEP 2620 F6,3         71           9723631xx         SEP 2630 S1,9         71           9724051xx         AK 2 B 2540 I         25           972416100         MICRO-SMD CLIP         21           972425002         PL 2600 S W Set         75           9725181xx         LAS 30         45           9725187xx         LAS 30 Au         45           972604001         PMS 4 LMLH         74           9730531xx         KLEPS 60         8           9733681xx         PRUEF 2         15           9733881xx         SML 100/1         39           9735011xx         KLEPS 2 BU         7           9735281xx         KLEPS 250         9	9723561xx	SEB 2620 F6,3	69
9723621xx         SEP 2620 F6,3         71           9723631xx         SEP 2630 S1,9         71           9724051xx         AK 2 B 2540 I         25           972416100         MICRO-SMD CLIP         21           972425002         PL 2600 S W Set         75           9725181xx         LAS 30         45           9725187xx         LAS 30 Au         45           972604001         PMS 4 LMLH         74           972605001         PMS 4 S LMLH         76           9730531xx         KLEPS 60         8           9733881xx         PRUEF 2         15           9735011xx         KLEPS 2 BU         7           9735091xx         MST 3         41           9735281xx         KLEPS 250         9	9723591xx	SEB 2630 S1,9	70
9723631xx         SEP 2630 S1,9         71           9724051xx         AK 2 B 2540 I         25           972416100         MICRO-SMD CLIP         21           972425002         PL 2600 S W Set         75           9725181xx         LAS 30         45           9725187xx         LAS 30 Au         45           972604001         PMS 4 LMLH         74           972605001         PMS 4 S LMLH         76           9730531xx         KLEPS 60         8           9733681xx         PRUEF 2         15           9733881xx         SML 100/1         39           9735011xx         KLEPS 2 BU         7           9735091xx         MST 3         41           9735281xx         KLEPS 250         9	9723611xx	SEP 2610 F4,8	71
9724051xx         AK 2 B 2540 I         25           972416100         MICRO-SMD CLIP         21           972425002         PL 2600 S W Set         75           9725181xx         LAS 30         45           9725187xx         LAS 30 Au         45           972604001         PMS 4 LMLH         74           972605001         PMS 4 S LMLH         76           9730531xx         KLEPS 60         8           9733681xx         PRUEF 2         15           9733881xx         SML 100/1         39           9735011xx         KLEPS 2 BU         7           9735091xx         MST 3         41           9735281xx         KLEPS 250         9	9723621xx	SEP 2620 F6,3	71
972416100         MICRO-SMD CLIP         21           972425002         PL 2600 S W Set         75           9725181xx         LAS 30         45           9725187xx         LAS 30 Au         45           972604001         PMS 4 LMLH         74           972605001         PMS 4 S LMLH         76           9730531xx         KLEPS 60         8           9733681xx         PRUEF 2         15           9733881xx         SML 100/1         39           9735011xx         KLEPS 2 BU         7           9735091xx         MST 3         41           9735281xx         KLEPS 250         9	9723631xx	SEP 2630 S1,9	71
972425002       PL 2600 S W Set       75         9725181xx       LAS 30       45         9725187xx       LAS 30 Au       45         972604001       PMS 4 LMLH       74         972605001       PMS 4 S LMLH       76         9730531xx       KLEPS 60       8         9733681xx       PRUEF 2       15         9733881xx       SML 100/1       39         9735011xx       KLEPS 2 BU       7         9735091xx       MST 3       41         9735281xx       KLEPS 250       9	9724051xx	AK 2 B 2540 I	25
9725181xx         LAS 30         45           9725187xx         LAS 30 Au         45           972604001         PMS 4 LMLH         74           972605001         PMS 4 S LMLH         76           9730531xx         KLEPS 60         8           9733681xx         PRUEF 2         15           9733881xx         SML 100/1         39           9735011xx         KLEPS 2 BU         7           9735091xx         MST 3         41           9735281xx         KLEPS 250         9	972416100	MICRO-SMD CLIP	21
9725187xx       LAS 30 Au       45         972604001       PMS 4 LMLH       74         972605001       PMS 4 S LMLH       76         9730531xx       KLEPS 60       8         9733681xx       PRUEF 2       15         9733881xx       SML 100/1       39         9735011xx       KLEPS 2 BU       7         9735091xx       MST 3       41         9735281xx       KLEPS 250       9	972425002	PL 2600 S W Set	75
972604001       PMS 4 LMLH       74         972605001       PMS 4 S LMLH       76         9730531xx       KLEPS 60       8         9733681xx       PRUEF 2       15         9733881xx       SML 100/1       39         9735011xx       KLEPS 2 BU       7         9735091xx       MST 3       41         9735281xx       KLEPS 250       9	9725181xx	LAS 30	45
972605001       PMS 4 S LMLH       76         9730531xx       KLEPS 60       8         9733681xx       PRUEF 2       15         9733881xx       SML 100/1       39         9735011xx       KLEPS 2 BU       7         9735091xx       MST 3       41         9735281xx       KLEPS 250       9	9725187xx	LAS 30 Au	45
9730531xx         KLEPS 60         8           9733681xx         PRUEF 2         15           9733881xx         SML 100/1         39           9735011xx         KLEPS 2 BU         7           9735091xx         MST 3         41           9735281xx         KLEPS 250         9	972604001	PMS 4 LMLH	74
9733681xx       PRUEF 2       15         9733881xx       SML 100/1       39         9735011xx       KLEPS 2 BU       7         9735091xx       MST 3       41         9735281xx       KLEPS 250       9	972605001	PMS 4 S LMLH	76
9733881xx       SML 100/1       39         9735011xx       KLEPS 2 BU       7         9735091xx       MST 3       41         9735281xx       KLEPS 250       9	9730531xx		8
9735011xx       KLEPS 2 BU       7         9735091xx       MST 3       41         9735281xx       KLEPS 250       9	9733681xx		15
9735091xx MST 3 41 9735281xx KLEPS 250 9	9733881xx	SML 100/1	39
9735281xx KLEPS 250 9	9735011xx	KLEPS 2 BU	7
	9735091xx	MST 3	41
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#### Instructions for Index and Part No.

Example Part No. 9340621 <u>xx</u>					
00 = ● black	05 = ● brown				
01 = • red	06 = ⊚ grey				
02 = 🔵 blue	07 = 🔾 white				
03 = 🕠 yellow	09 = 🌘 violet				
04 = • green	88 = ●● yellow/green				

## **Terms & Conditions**

TITLE - Title to the products of ALTECH shall remain with ALTECH until payment is made in full by Customer. Such reservation of title is for the purpose of securing the purchase price and shall not relieve Customer of the duty to inspect the products upon receipt, to notify ALTECH of any deficiencies or defects, and to exercise due care in the use, installation, operation, and maintenance of the products when on the premise of the Customer or under the control of the Customer. Notwithstanding any reservation of title by ALTECH, risk of loss shall pass to customer at any time of shipment.

SHIPMENT AND DELIVERY - All orders for destination in the mainland United States (less Hawaii, Alaska and non-continental United States possessions) will be shipped F.O.B. Flemington, N.J. All destination, shipping and other charges shall be paid by the Customer in accordance with ALTECH's then current shipping and billing practices.

Delivery dates given in the acceptance of any order are approximate. ALTECH shall not be liable for delays in delivery or in performance due to causes beyond its reasonable control including acts of God, acts of Customer, acts of civil or military authority, fires, strikes or other labor disturbances, war, riot or delays in transportation. In the event of such delay, the date of delivery or performance shall be extended for a period equal to the time lost by reason of the delay.

**PRICE** - PRICES in any ALTECH publication are subject to change without prior notification. Catalog prices are based on prices published in the current price list. All written quotations are valid for thirty (30) days from the date of quotation. Customer shall pay all sales, use, excise or similar taxes whenever ALTECH must itself pay and/or collect such tax from Customer arising out of the sale.

**PAYMENT** - Customer agrees to make payment within thirty (30) days of date of the invoice from ALTECH. Customer agrees to pay a late payment charge of one and one-half percent (1.5% per month, or the maximum late payment charge permitted by applicable law, whichever is less, on any unpaid amount for each calendar month (or fraction thereof) that such payment is in default. Orders amounting to less than \$100.00 will be billed at \$100.00 plus freight. Full carton purchases are required. In the event of referral to an attorney for collection, reasonable attorney's fees for collection of the overdue amount shall be paid by Customer. In the event payment is not received within 30 days from the date of invoice, any discount shall be cancelled and the full list price will be due.

**LIMITED WARRANTY** - ALTECH warrants to Customer that the equipment purchases shall be free from defects in material and workmanship under normal use and service for a period of one year from shipment.

Written notice as an explanation of the circumstances of any claim that the equipment has proved defective in material or workmanship shall be given promptly by the Customer to ALTECH.

ALTECH will not be liable for any misuse, improper operations, improper installation, improper maintenance, alteration, modification, accident or unusual degradation of the equipment or parts due to an unsuitable installation environment.

No representation of other affirmation of facts, including but not limited to statements regarding capacity, suitability for use or performance of the equipment, shall be or be deemed to be a warranty or representation by ALTECH for any purpose, nor give rise to any liability or obligation of ALTECH whatsoever.

Customer's sole and exclusive remedy in the event of breach of warranty, as set forth herein, is expressly limited to (1) the correction of the defect by adjustment, repair, modification, or replacement, or (2) issuance of a credit or refund of the purchase price for the defective equipment at ALTECH's election and sole expense.

EXCEPT AS SPECIFICALLY PROVIDED IN THIS AGREEMENT, THERE ARE NO OTHER WARRANTIES EXPRESSED OR IMPLIED INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

THIS WARRANTY EXTENDS ONLY TO THE CUSTOMER FROM ALTECH OR ITS AUTHORIZED DISTRIBUTOR.

**LIMITATION OF LIABILITY** - IN NO EVENT, SHALL ALTECH BE LIABLE FOR LOSS OF PROFITS, INDIRECT, SPECIAL, CONSEQUENTIAL OR OTHER SIMILAR DAMAGES ARISING OUT OF ANY BREACH OF THIS AGREEMENT OR OBLIGATIONS UNDER THE AGREEMENT.

ALTECH SHALL NOT BE LIABLE FOR ANY DAMAGES CAUSED BY DELAY IN SHIPMENT, INSTALLATION OR FURNISHING OF EQUIPMENT OR SERVICES UNDER THIS AGREEMENT.

No action arising out of any claimed breach of this Agreement may be brought by either party more than two (2) years after the cause of action has accrued.

PATENT INDEMNITY - ALTECH shall defend or settle any suit or proceeding brought against Customer based on a claim that any equipment made to ALTECH design and furnished hereunder constitutes an infringement of any existing United States patent, provided (ALTECH) is notified promptly in writing and is given complete authorization and information required for the defense, and ALTECH shall pay all damages and costs awarded against Customer, but shall not be responsible for any costs, expense or compromise incurred or made by Customer without ALTECH's prior written consent. If any equipment is in ALTECH's opinion likely to or does become the subject of a claim for patent infringement, ALTECH may at its option and expense procure for Customer the right to continue using the device, modify it to become non-infringing, but in the event ALTECH is not reasonably able to modify, substitute, or otherwise procure for Customer the right to continue using it, ALTECH will remove such equipment and refund to Customer the amount paid in excess of a reasonable rental for past use.

ALTECH shall not be liable for any infringement or claim based upon use of the equipment in combination with other equipment not supplied by ALTECH or with modifications made by Customer.

The foregoing states the entire liability of ALTECH to Customer arising from patent infringement.

SELLER'S REMEDIES - Should Customer fail to make any payment within ten (10) days of its due date, or fail to perform any other of the Customer's obligation hereunder upon thirty (30) days written notice, or should Customer be or become insolvent or be a party to any bankruptcy receivership proceeding prior to full payment of all amounts payable hereunder, ALTECH may: (a) with or without demand or notice to customer declare the entire amount unpaid immediately due and payable; (b) enter upon the premises where the equipment may be found and remove it (Customer shall assemble the equipment and make it available to ALTECH at a place reasonably convenient to both parties and shall permit and assist ALTECH in effecting the retaking and removal of the equipment); and (c) sell any or all the equipment as permitted under applicable law, applying the proceeds of the sale to payment of the expenses of retaking, repairing and selling the equipment, reasonable attorney fees and to the satisfaction of all indebtedness then due and unpaid under this Agreement. Any surplus shall be paid to Customer and any deficiency shall be paid to ALTECH by Customer.

The remedies provided herein shall be cumulative and in addition to all other remedies provided by law or equity or under the Uniform Commercial Code.

**GOVERNING LAW** - This agreement will be governed by the Laws of the State of New Jersey.

**GENERAL** - This Agreement shall only become effective and binding when either (a) it has been accepted and executed by an authorized representative of ALTECH, or (b) the equipment has been shipped to Customer, with or without acceptance in writing hereon. Notice of acceptance is hereby waived by Customer. Customer hereby acknowledges receipt of a true and complete copy beared.

No addition to or modification of any of the Terms and Conditions of Sale as they appear herein shall be binding upon ALTECH unless signed in writing by duly authorized representative of ALTECH in Flemington, N.J.

Typographical and clerical errors in quotations, orders and acknowledgments are subject to correction.

This Agreement is not assignable without the prior written consent of ALTECH. Any attempt to assign any of the rights, duties or obligations of this Agreement without such consent is void.

If any provision or provisions of this Agreement shall be held to be invalid, illegal or unenforceable, the validity, legality and enforceability, of the remaining provisions shall not in any way be affected or impaired thereby.

ALTECH is not responsible for failure to fulfill its obligation under this Agreement due to causes beyond its control, or except as agreed herein.

THE CUSTOMER ACKNOWLEDGES THAT HE HAS READ THE AGREEMENT, UNDERSTANDS IT, AND AGREES TO BE BOUND BY ITS TERMS AND CONDITIONS. FURTHERMORE, THE CUSTOMER AGREES THAT IT IS THE COMPLETE AND EXCLUSIVE STATEMENT OF THE AGREEMENT BETWEEN THE PARTIES, WHICH SUPERSEDES ALL PROPOSALS OR PRIOR AGREEMENTS, ORAL OR WRITTEN, EXPRESSED OR IMPLIED, AND ALL OTHER COMMUNICATIONS BETWEEN THE PARTIES RELATING TO THE SUBJECT MATTER OF THIS AGREEMENT.

## **Some Other Altech Products**



#### Circuit Protection Devices



Altech the market leader in UL508 Manual Motor Controllers/ Miniature Circuit Breakers now introduces UL489 Miniature Circuit Breakers and UL1077 Supplementary Protectors. The UL489 versions are DIN rail mounted, 17.5mm wide, thermal magnetic, 240V, 480Y/277V AC, 50/60Hz, 125 and 250 VDC models, with short circuit interrupt capacity of 10kA, a positive trip indicator, and are line/load reversible. The UL1077 versions are DIN rail mounted, 17.5mm wide, thermal magnetic, 480Y/277V AC, 50/60Hz, a short circuit withstand capacity 10kA, have a positive trip indicator.

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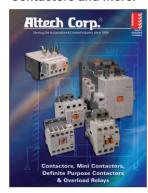
#### Interface Modules and Industrial Relays



Altech offers a wide range of DIN Rail or panel mount cable interface modules, relay interface modules, power supplies, carrier modules, and custom designed modules. Cable to connector models include: D-Sub connectors, ribbon cable connectors, and Dip socket connectors to terminals. Standard relay modules from 1 to 16 channels, and safety relay modules from 1 to 16 channels and up to 10 poles are included. The catalog also contains a large selection of industrial relays, and custom designed interface modules.

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#### Contactors and More!



Altech's now carries contactors, mini contactors, definite purpose contactors & overload relays. The contactors come in 3 and 4 pole configurations at 9A to 800A. Available in Single Phase (115 -230V) and Three Phase (200 - 575V) AC and DC models. A large variety of coil voltages are supported and the accessories are auxiliary contacts and overload relays. The mini contactors come in screw clamp, fast-on, cage clamp and solder pin types.

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#### Terminal Blocks



Altech offers a NEW Terminal Block catalog with the most competitively priced blocks in the industry. We feature screw and spring clamp models for DIN rail and panel mount applications. This advanced line of wire termination products will increase your design options and help to get the job done more efficiently. Our line of blocks include feed-through (single, double or triple level), distribution, ground, fuse, disconnect, thermocouple, surge suppressor and indicator. A wide variety of accessories, tools and ferrules are available.

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#### **Motor Disconnect Switches**



Altech's line of Motor Disconnect Switches are UL 508 listed as Manual Motor Controllers for AC Motor Starting Across-the-line and AC General use. This new 16 page catalog includes the 3 different handle designs, which are all available in gray/black or yellow/red housings. Electrical ratings are 25-150A / 600V. The switches are non-fused DIN Rail mountable. Neat features include: snap-on auxiliary switches, door mounting kit and a retrofit 30A fuse holder. Also featured are Enclosed Motor Disconnect Switches & Fused Enclosed Motor Disconnect Switche (30A) in plastic or stainless housings.

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#### Liquid Tight Strain Reliefs



This 64-page catalog introduces Altech's full line Liquid Tight Strain Reliefs (Cord Grips) which are used to seal cable entries, keep contaminant's from entering enclosures, provide strain relief and thus reduce stress on components and termination points inside enclosures. Available in standard highperformance, and economy versions, functions include Straight-Through, Increased Strain Relief, Bend Protection, Pull/Bend Protection, Multi-conductor, Flat Cable and EMI/RFI. They can be used with almost any type of cable, cord or conductor solid, stranded, flat, shielded, high temperature, etc.

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