

ESD3000 - MODULAR HANDHELD TESTER

# Electrostatic Discharge Testing




**4TECT**


ООО «4TECT»

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 Smart navigation through technical specifications. Click the green links.



#### Accredited Calibration

Quality at EMC PARTNER is based on an ISO 9001 management system. This is the foundation for an ISO 17025 accreditation verified by the Swiss Calibration Service (SCS). SCS No. 146 is the accreditation number of EMC PARTNER AG. Locally accredited but recognized worldwide through affiliation with the ILAC organisation



## THE ESD TESTING SOLUTION

# POWER AT YOUR FINGER TIPS

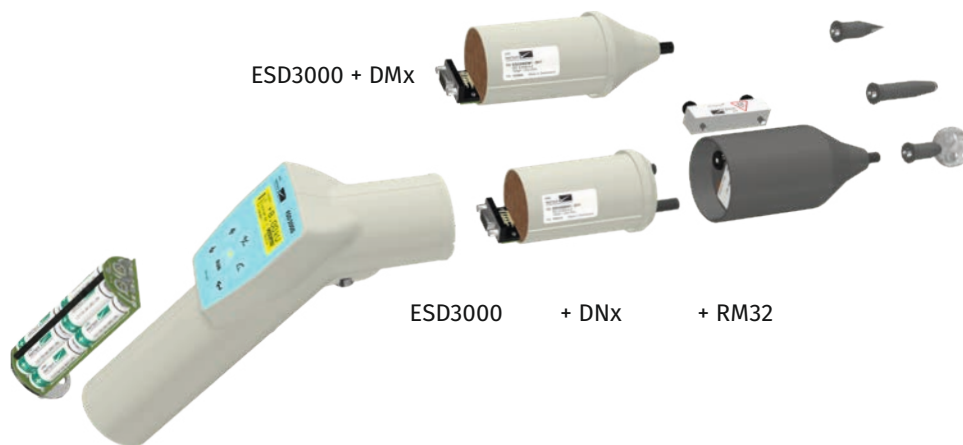
Electrostatic Discharge (ESD) is the most common test procedure applied to any electronic or electrical equipment. Used extensively to test:

- › Commercial products
- › Industrial systems
- › Military electronics
- › Automotive electronics
- › Fuses and detonators
- › Railway electronics
- › Avionic equipment qualification
- › Telecom equipment
- › Electronic components

The easily changeable and fully calibrated discharge networks, quickly adapt ESD3000 to the requirements of any new application.  
Light and easy to use.

# EASILY EXPANDABLE

ESD3000 is designed with the user in mind. The modular design allows configuration according to customer wishes, addition of more networks when adding applications and easy extension from 16kV to 30kV using the same generator. Automatic network recognition means ESD3000 is always ready.



## Discharge Modules (DMx)

up to 16kV Air / 10kV Contact Discharges

- ESD3000 required

### Available Extensions

- DM1 (150pF, 330 Ohm)
- DM4 (100pF / 1500 Ohm)
- DM6 (100pF / 1500 Ohm)

## Discharge Networks (DNx)

up to 30kV Air- and Contact Discharges

- ESD3000 & RM32 required

### Available Extensions

- DN1 (150pF / 330 Ohm)
- DN2 (330 pF, 2000 Ohm)
- DN3 (150 pF, 2000 Ohm)
- DN4 (500 pF, 5000 Ohm)
- DN5 (500 pF, 500 Ohm)
- DN6 (330 pF, 330 Ohm)

## Included

Rechargeable Long-life batteries  
Up to 3 test tips (Sharp, Round, Corona)  
Charger & Firmware update cable  
Handy, robust carrying case



# AVAILABLE MODULES

## Commercial & Industrial

### IEC 61000-4-2

ESD3000DM1 (150pF, 330 Ohm)



## Component Test

### IEC 61340-3-1 / JEDEC 22-A114 / MIL-STD-750D

ESD3000DM6 (100pF / 1500 Ohm)



## Automotive

### ISO 10605 / SAEJSSI-IS/FORD AB/AC /GMW 3097

ESD3000DN1(150pF / 330 Ohm)  
ESD3000DN2 (330pF / 2000 Ohm)  
ESD3000DN3 (150pF / 2000 Ohm)  
ESD3000DN6 (330pF / 330 Ohm)



## Military

### MIL-STD-883 / GR78-CORE

ESD3000DM4 (100pF / 1500 Ohm)

### STANAG 4239 / ISO 14304 / MIL-STD-1512

ESD3000DN4 (500pF / 5000 Ohm)

### MIL-STD-331C / MIL-DTL-23659D / STANAG 4239

ESD3000DN5 (500pF / 500 Ohm)

### MIL-STD-1576

ESD3000DN32-MIL3 (500pF / 0 Ohm)





## UNIQUE FEATURES

The original 30kV battery powered generator with a unique system of changeable modules. Flexibility and power combined.

### AA battery powered



Long life standard battery. Up to 8 hours on full battery charge. Readily available in any store.

### Electronic polarity change



Single key press switches polarity before and during the test.

### Extend testing capability



Add calibrated modules to maintain the system value. Unique modules and accessories for special applications.

### Compact solution



Ergonomic hand held tester without additional base unit. Program directly on generator.



# Tradition meets Technology

Over 25 years devoted to combining  
latest technologies into the best products.

 **100% Swiss made products**



# Technical Specifications



## ESD3000 MODULES

ESD3000	Mainframe	DM1 (16 kV)	DM4	DM6	RM32	DN1 (30 kV)	DN2	DN3	DN4	DN5	DN6	MIL3
IEC 61000-4-2	✓	✓				alt*						
MIL-STD-883	✓		✓									
GR78-CORE	✓		✓									
IEC 61340-3-1	✓			✓								
JEDEC 22-A114	✓			✓								
JS-001	✓			✓								
MIL-STD-750	✓		✓									
ISO 10605	✓				✓	✓	✓	✓			✓	
DO-160 S25	✓	✓			✓	✓						
MIL-STD-461G CS118	✓	✓			✓	✓						
GMW3097	✓				✓		✓	✓			✓	
STANAG4239	✓				✓				✓	✓		
MIL-STD-331	✓				✓				✓	✓		
MIL-STD-1576	✓				✓							✓

\* DN1 as alternative to DM1. Standard requires only 15 kV.

# ACCESSORIES FOR DIFFERENT MODULES

ESD3000	Mainframe	DM1	DM4	DM6	RM32	DN1	DN2	DN3	DN4	DN5	DN6	MIL3
EARTH CABLE	✓	IEC				IEC						
ESD-VCP50	✓	IEC				IEC						
ESD-TARGET2	✓	IEC										
ESD-TARGET2 DN	✓					ISO	ISO	ISO			ISO	
ESD-VERI-V	✓	✓	0		0	✓	0	0	✓	✓	0	✓
ESD-STAND ED2	✓	0	0	0	0	0	0	0	0	0	0	0
ESD-HCP-AUTO	✓					ISO					ISO	
DM-EXT	✓								MIL	MIL		
SAFETY-S	✓								MIL	MIL		
TC-ST ED	✓								MIL	MIL		
WARNING LAMP	✓								MIL	MIL		
EMERGENCY STOP	✓								MIL	MIL		
ESD3000 CNH12	✓					0	0	0	0	0	0	
OPTOLINK	✓	0	0	0	0	0	0	0	0	0	0	0
TEMA	✓	0	0	0	0	0	0	0	0	0	0	0

0 = Optional Accessories, see product details

ESD3000	EARTH CABLE	ESD-VCP50	ESD-TARGET2	ESD-TARGET2 DN	ESD-VERI-V	ESD-STAND ED2	ESD-HCP-AUTO	DM-EXT	ESD-SAFETY-S	TC-ST ED	WARNING LAMP	EMERGENCY STOP	ESD3000 CNH12	ESD-OPTOLINK	TEMA SOFTW.
IEC61000-4-2	✓	✓	opt		opt	opt								opt	opt
MIL-STD-883														opt	opt
GR78-CORE														opt	opt
IEC61340-3-1														opt	opt
JEDEC 22-A114														opt	opt
JS-001															
MIL-STD-750														opt	opt
ISO10605	✓			opt	opt	opt	opt							opt	opt
DO-160 S25					✓									opt	opt
MIL-461G CS118	✓		✓		✓									opt	opt
GMW3097														opt	opt
STANAG4239								✓	✓	✓	✓	✓		opt	opt
MIL-STD-331								✓	✓	✓	✓	✓		opt	opt
MIL-STD-1576														opt	opt

# 1. ESD3000 MAINFRAME AND MODULES

## 1.1. TECHNICAL SPECIFICATIONS

### ESD3000 Mainframe

<b>To be used with modules</b>	all modules from this document are compatible
<b>Construction</b>	fully portable, no additional basic unit
<b>Control</b>	LCD and 6 menu buttons, 1 trigger button
<b>Maximum voltage</b>	16 kV or 30 kV, depending on modules chosen
<b>Voltage steps</b>	100 V - test
<b>Discharge polarity</b>	positive, negative, alternating
<b>Discharge modes</b>	contact discharge (CD) and air discharge (AD)
<b>Discharge frequency CD</b>	max. 20 Hz, (pulse every 0.05, 0.1, 0.2 ... 60 s)
<b>Discharge frequency AD</b>	≥ 30 Hz or more, for ex. with DM1, DN1, other
<b>Counter</b>	pre-selectable, 1 to 29999
<b>Discharge detection</b>	selectable, count pulses or count discharges
<b>Holding time</b>	≥ 5 s
<b>Trigger</b>	manual, automatic, remote
<b>Ramps</b>	voltage, polarity
<b>Reporting with TEMA</b>	automatic report sequence, amplitude, polarity
<b>Dimensions</b>	for ex. with DM1 and tip 340 x 130 x 70 mm
<b>Weight mainframe</b>	730 g, w/o battery pack and module
<b>Weight equipped</b>	1050 g, with battery pack, DM1 and AD tip
<b>Power supply</b>	10 x AA rechargeable batteries or mains
<b>Included</b>	10 batteries, mains adapter, ground cable 2 m, 3 test tips (AD, AD2, CD), carrying case, RS232 cable, E3Loader for remote control
<b>Requires</b>	at least a DM module, or a DN module + RM32



### ESD3000DM1

<b>Standards</b>	IEC 61000-4-2 (latest)
<b>Other standards</b>	MIL-STD-461G CS118, DO-160 Section 25
<b>Storage capacitor</b>	150 pF according to IEC61000-4-2
<b>Discharge resistor</b>	330 $\Omega$ according to IEC61000-4-2
<b>Circuit inductance</b>	< 5 $\mu$ H
<b>Voltage range AD</b>	0.2 – 16 kV $\pm$ 5 %
<b>Voltage range CD</b>	0.2 – 10 kV $\pm$ 5 %
<b>Current rise time into 2 <math>\Omega</math></b>	0.8 $\pm$ 25 %
<b>First I peak into 2 <math>\Omega</math> CD</b>	7.5 A @ 2 kV – 37.5 A @ 10 kV ( $\pm$ 15 %)
<b>Current at 30 ns</b>	4 A @ 2 kV – 20 A @ 10 kV ( $\pm$ 30 %)
<b>Current at 60 ns</b>	2 A @ 2 kV – 10 A @ 10 kV ( $\pm$ 30 %)
<b>Optional</b>	<a href="#">ESD-TARGET2</a>



### ESD3000DM4

<b>Standards</b>	MIL-STD-883, GR78-CORE, MIL-STD-750
<b>Storage capacitor</b>	100 pF $\pm$ 10 %
<b>Discharge resistor</b>	1500 $\Omega$ $\pm$ 10 %
<b>Voltage range AD</b>	0.2 – 16 kV $\pm$ 5 %
<b>Voltage range CD</b>	0.2 – 10 kV $\pm$ 5 %
<b>Current rise time into 2 <math>\Omega</math></b>	< 10 ns @ 0.2 – 8 kV
<b>I peak into 2 <math>\Omega</math> (CD)</b>	2.66 A @ 4 kV, 3.33 A @ 5 kV
<b>RC time constant</b>	150 $\pm$ 20 ns



### ESD3000DM6

<b>Standards</b>	IEC 61340-3-1, JS-001
<b>Storage capacitor</b>	100 pF according to IEC61000-4-2
<b>Discharge resistor</b>	1500 $\Omega$ according to IEC61000-4-2
<b>Voltage range CD</b>	0.25 – 8 kV $\pm$ 10 %
<b>Current rise time into 2 <math>\Omega</math></b>	2 – 10 ns @ 0.25 – 8 kV
<b>RC time constant</b>	150 $\pm$ 20 ns



## 30 KV

These extensions need the module ESD3000RM32

### ESD3000DN1

<b>Standards</b>	IEC 61000-4-2, ISO 10605
<b>Other standards</b>	MIL-STD-461G CS118, DO-160 Section 25
<b>Storage capacitor</b>	150 pF according to IEC61000-4-2
<b>Discharge resistor</b>	330 $\Omega$ according to IEC61000-4-2
<b>Circuit inductance</b>	< 5 $\mu$ H
<b>Voltage range AD</b>	1 – 30 kV
<b>Voltage range CD</b>	1 – 30 kV
<b>Current rise time into 2 <math>\Omega</math></b>	0.8 $\pm$ 25 %
<b>First I peak into 2 <math>\Omega</math> CD</b>	7.5 A @ 2 kV – 112.5 A @ 30 kV
<b>Current at 30 ns</b>	4 A @ 2 kV – 60 A @ 30 kV
<b>Current at 60 ns</b>	2 A @ 2 kV – 30 A @ 30 kV
<b>Requires</b>	<a href="#">ESD3000RM32</a>
<b>Included in ESD3000RM32</b>	detachable module for faster tr (<700ps)
<b>Optional</b>	<a href="#">ESD-TARGET2 DN</a> , <a href="#">ESD-HCP-AUTO</a>

### ESD3000DN2

<b>Standards</b>	ISO 10605, GMW3097
<b>Storage capacitor</b>	330 pF according to IEC61000-4-2
<b>Discharge resistor</b>	2000 $\Omega$ according to IEC61000-4-2
<b>Voltage range AD</b>	2 – 30 kV $\pm$ 5 %
<b>Voltage range CD</b>	2 – 30 kV $\pm$ 5 %
<b>Current rise time into 2 <math>\Omega</math></b>	0.7 – 1 ns
<b>First I peak into 2 <math>\Omega</math> CD</b>	7.5 A @ 2 kV – 112.5 A @ 30 kV (- 0 / + 30 %)
<b>RC time constant</b>	600 $\pm$ 130 ns
<b>Requires</b>	<a href="#">ESD3000RM32</a>
<b>Optional</b>	<a href="#">ESD-TARGET2 DN</a>

### ESD3000DN3

<b>Standards</b>	ISO 10605, GMW3097
<b>Storage capacitor</b>	150 pF according to IEC61000-4-2
<b>Discharge resistor</b>	2000 $\Omega$ according to IEC61000-4-2
<b>Voltage range AD</b>	2 – 30 kV $\pm$ 5 %
<b>Voltage range CD</b>	2 – 30 kV $\pm$ 5 %
<b>Current rise time into 2 <math>\Omega</math></b>	0.7 – 1 ns
<b>First I peak into 2 <math>\Omega</math> CD</b>	7.5 A @ 2 kV – 112.5 A @ 30 kV (- 0 / + 30 %)
<b>RC time constant</b>	300 $\pm$ 60 ns
<b>Requires</b>	<a href="#">ESD3000RM32</a>
<b>Optional</b>	<a href="#">ESD-TARGET2 DN</a>



### ESD3000DN4

<b>Standards</b>	STANAG4239, ISO14304, MIL-STD-1512, MIL-STD-331
<b>Storage capacitor</b>	500 pF ± 10 %
<b>Discharge resistor</b>	5000 Ω ± 10 %
<b>Voltage range CD</b>	2 – 30 kV ± 5 %
<b>I rise time into 2 Ω CD</b>	0.7 – 1 ns
<b>Requires</b>	<a href="#">ESD3000RM32</a>
<b>Optional</b>	<a href="#">ESD3000 SAFETY-S, DM-EXT, TC-ST ED,</a> <a href="#">WARNING-LAMP, EMERGENCY-STOP</a>



### ESD3000DN5

<b>Standards</b>	STANAG4239, MIL-STD-1512, MIL-STD-331
<b>Storage capacitor</b>	500 pF ± 10 %
<b>Discharge resistor</b>	500 Ω ± 10 %
<b>Voltage range CD</b>	2 – 30 kV ± 5 %
<b>I rise time into 2 Ω CD</b>	0.7 – 1 ns
<b>Requires</b>	<a href="#">ESD3000RM32</a>
<b>Optional</b>	<a href="#">ESD3000 SAFETY-S, DM-EXT, TC-ST ED,</a> <a href="#">WARNING-LAMP, EMERGENCY-STOP</a>



### ESD3000DN6

<b>Standards</b>	ISO 10605, GMW3097
<b>Storage capacitor</b>	330 pF according to IEC61000-4-2
<b>Discharge resistor</b>	330 Ω according to IEC61000-4-2
<b>Voltage range AD</b>	2 – 30 kV ± 5 %
<b>Voltage range CD</b>	2 – 30 kV ± 5 %
<b>Current rise time into 2 Ω</b>	0.7 – 1 ns
<b>RC time constant</b>	300 ± 130
<b>Requires</b>	<a href="#">ESD3000RM32</a>
<b>Optional</b>	<a href="#">ESD-TARGET2 DN, ESD-HCP-AUTO</a>



### ESD3000DN32-MIL3

<b>Standard</b>	MIL-STD-1576
<b>Storage capacitor</b>	500 pF
<b>Discharge resistor</b>	0 Ω
<b>Voltage range CD</b>	2 – 30 kV ± 5 %
<b>Requires</b>	<a href="#">ESD3000RM32</a>





## 1.2. POWER, CLIMATIC CONDITIONS, SHIPPING WEIGHT, DIMENSIONS

### ESD3000 mainframe

<b>Mains adapter</b>	95 – 250 V (50/60 Hz)
<b>Power consumption</b>	ON < 20 VA, standby < 5 VA
<b>Temperature range</b>	15 – 35 °C
<b>Humidity</b>	30 – 60 % non-condensing
<b>Air pressure</b>	86 – 106 kPa
<b>Shipping weight</b>	2.4 kg plus selected modules
<b>Carrying case dimensions</b>	46 x 41 x 17 cm
<b>Included in delivery</b>	
<b>User manual</b>	with conformity declaration
<b>Calibration certificate</b>	factory calibration for selected modules

## 2. ACCESSORIES FOR ESD3000

### 2.1. TECHNICAL SPECIFICATIONS

#### EARTH CABLE

<b>Application</b>	connection of HCP or VCP to ground plane
<b>Impedance</b>	2 x 470 k $\Omega$ $\pm$ 1 %
<b>Length</b>	2 m
<b>Connectors</b>	2 x banana plugs

#### ESD-VCP50

<b>Application</b>	indirect ESD application as per IEC 61000-4-2
<b>Spacer in between</b>	10 cm wooden spacer
<b>Coupling plane</b>	50 x 50 cm
<b>Application points</b>	one on each side
<b>Dimensions</b>	50 x 50 x 10 cm
<b>Weight</b>	8 kg
<b>Included</b>	2 m earth cable (with 2 x 470 k $\Omega$ )



#### ESD-TARGET2

<b>Standard</b>	IEC 61000-4-2 latest
<b>Application</b>	current target for calibration of ESD generator
<b>Input impedance</b>	2 $\Omega$
<b>Input voltage</b>	max. 10 kV CD
<b>Frequency range</b>	$\pm$ 0.5 dB up to 1 GHz, $\pm$ 1.2 dB up to 4 GHz
<b>Current range</b>	0 – 50 A standard, could be extended
<b>Transfer function</b>	0.2 V / 1 A with 20 dB
<b>Diameter</b>	70 mm
<b>Thickness</b>	40 mm
<b>Weight</b>	398 g including attenuator
<b>Fixing</b>	8 x M3 screws, included in delivery
<b>Included</b>	20 dB att., 50 $\Omega$ coax. cable (1 m) with SMA out



#### ESD-TARGET2 DN

<b>Standard</b>	IEC 61000-4-2 latest
<b>Application</b>	current target for calibration of ESD generator
<b>Input impedance</b>	2 $\Omega$
<b>Input voltage</b>	max. 30 kV CD
<b>Frequency range</b>	$\pm$ 0.5 dB up to 1 GHz, $\pm$ 1.2 dB up to 4 GHz
<b>Current range</b>	0 – 120 A standard, could be extended
<b>Transfer function</b>	0.2 V / 1 A with 20 dB, 0.02 V / 1 A with 40 dB
<b>Diameter</b>	70 mm
<b>Thickness</b>	40 mm
<b>Weight</b>	398 g including attenuator
<b>Fixing</b>	8 x M3 screws, included in delivery
<b>Included</b>	40 dB att., 50 $\Omega$ coax. cable (1 m) with SMA out



### ESD-VERI-V

<b>Application</b>	adapter for ESD DC voltage measurement
<b>Input impedance</b>	20 GΩ    3 pF
<b>Input voltage range</b>	0 – 32 kV
<b>Output voltage range</b>	0 – 1.6 V in 10MΩ or 1MΩ
<b>Output connector</b>	BNC
<b>Dimensions</b>	17 cm height, 5.5 cm diameter
<b>Weight</b>	433 g
<b>Included</b>	earth conductor, BCN adapter, BNC termination



### ESD-STAND Ed2

<b>Application</b>	stand for supporting ESD gun, fixed point test
<b>Height</b>	50 – 180 cm, adjustable
<b>Position</b>	360° adjustable
<b>Dimensions</b>	64 x 17 x 12 cm (packed)
<b>Weight</b>	4 kg
<b>Included</b>	cable holder for calibration

### ESD-HCP-AUTO

<b>Application</b>	coupling plane as per ISO 10605 annex F
<b>Length</b>	1500 mm
<b>Insulation distance</b>	50 mm
<b>Test level</b>	8 – 20 kV, as per standard
<b>Dimensions</b>	180 x 120 x 5 cm
<b>Weight</b>	2.2 kg
<b>Included</b>	EARTH CABLE



### ESD3000DM-EXT

<b>Application</b>	1 m extension cable for ESD3000 modules
<b>Compatibility</b>	DM and DN modules
<b>Cable length</b>	1 ± 0.05 m
<b>Weight</b>	0.5 kg including accessories
<b>Can be used with</b>	DN modules



### ESD3000 SAFETY-S

<b>Standard</b>	MIL-STD-1512
<b>Application</b>	safety switch for testing explosive devices
<b>Voltage</b>	max. 30 kV CD
<b>Dimensions</b>	20 x 16 x 12 cm
<b>Weight</b>	2 kg including accessories
<b>Included</b>	mains adapter
<b>To be used with</b>	ESD3000DM-EXT, TC-MIG24 ED



### TC-ST ED for testing explosive devices

Application	test cabinet
Voltage insulation	max. 36 kV
EUT dimensions	max. 20 x 30 x 20 cm
EUT weight	max. 5 kg
Safety circuit	door interlock
Signal lamps	red and green lamps built-in
External warning lamps	requires <a href="#">WARNING-LAMP</a> , <a href="#">EMERGENCY-STOP</a>
Dimensions	47 x 43.5 x 25.4 cm
Weight	8.5 kg
Included	connection cable 25pol to <a href="#">ESD3000 SAFETY-S</a>



### WARNING-LAMP

Cable length	5 m
Dimensions	diameter 7x cm x 25 cm
Weight	0.5 kg



### EMERGENCY-STOP

Cable length	5 m
Dimensions	8 cm x 8 cm x 10cm
Weight	0.3 kg



### ESD3000 CNH12

Application	Magnetic field loop for ESD3000 test system
Loop diameter	12 cm
Loop current allowed	> 100 A
Discharge mode selection	contact discharge (CD)
Current at 15 kV setting	50 A, with RM32 and DN1
Current at 30 kV setting	108 A, with RM32 and DN1
Dimensions	33 x 13 x 1 cm
Weight	0.2 kg including accessories
Requires	<a href="#">ESD3000RM32</a> , <a href="#">ESD3000DN1</a> or other DN



### ESD3000-OPTOLINK

Application	(insulating) optical cable ESD3000 - computer
Length	10 m
Interface	RS232, requires USB adapter
Baud rate	9600 bps
Weight	0.2 kg
Included	transceiver with mains adapter



### TEMA

Application	control software for ESD3000 system
License	1 license for 1 generator
Capabilities with ESD3000	Sequences, reporting, remote control
Compatibility	Windows XP, 7, 8, 10
Requires	<a href="#">ESD3000-OPTOLINK</a>

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