

ESD3000 - MODULAR HANDHELD TESTER

Electrostatic Discharge Testing





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

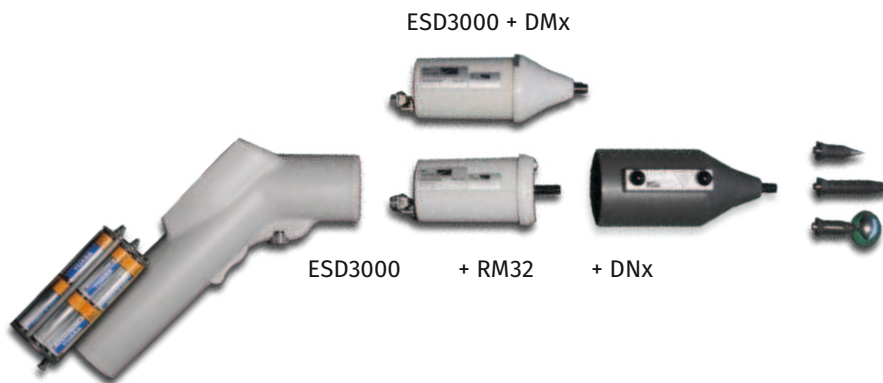
Electrostatic Discharge (ESD) is the most common test procedure applied to any electronic or electrical equipment. Used extensively to test:

- › 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)
- DM2 (330pF / 2000 Ohm)
- DM4 (100pF / 1500 Ohm)
- DM6 (100pF / 1500 Ohm)
- DM7 (200pF / 0 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 / ITU-T K.44

ESD3000DM1 (150pF, 330 Ohm)

ANSI / IEEE C63.16

ESD3000 DM16A-C63H (150pF / 330 Ohm)

ESD3000 DM16C-C63H (150pF / 330 Ohm)

UL 991

ESD3000DM32A-UL991 (100pF / 1000 Ohm)



Component Test

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

ESD3000DM6 (100pF / 1000 Ohm)

IEC 61340-3-2 / JEDEC 22-A115

ESD3000DM7 (200pF / 0 Ohm)



Automotive

PSA B21 7110

ESD3000DM2 (330pF / 2000 Ohm)

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

ESD3000DN1(150pF / 330 Ohm)

ESD3000DN2 (330pF / 2000 Ohm)

ESD3000DN3 (150pF / 2000 Ohm)

ISO 10605

ESD3000DN6 (330pF / 330 Ohm)

JASO D 001-94

ESD3000DN32-CAR1 (150pF / 500 Ohm)

Renault 32-10-001/D and 32-10-035/A

ESD3000DN32-CAR5 (330pF / 0 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-MIL2 (400pF / 150 Ohm)

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.

Technical Specifications

ESD3000 MODULES

ESD3000	Mainframe	DM1	DM2	DM4	DM6	DM7	RM32	DN1	DN2	DN3	DN4	DN5	DN6	CAR1	CAR5	IND1	MIL2	MIL3	A-C63H	C-63H	UL991
IEC 61000-4-2	✓	✓						✓													
ITU-T K20	✓	✓																			
PSA B32 7110	✓		✓																		
MIL-STD-883	✓			✓																	
GR78-CORE	✓			✓																	
IEC 61340-3-1	✓				✓																
JEDEC 22-A114	✓				✓																
MIL-STD-750D	✓				✓																
IEC 61340-3-2	✓					✓															
JEDEC22-A115	✓					✓	✓														
ISO 10605	✓						✓	✓	✓	✓			✓								
DO-160 S25	✓	✓					✓	✓													
MIL-STD-461G CS118	✓	✓					✓	✓													
GMW3100	✓						✓	✓	✓	✓			✓								
GMW3097	✓						✓		✓	✓											
STANAG4239	✓						✓				✓	✓									
ISO14304	✓						✓				✓										
MIL-STD-1512	✓						✓				✓	✓									
MIL-STD-330C	✓						✓				✓	✓									
JASO D 001-94	✓						✓							✓							
Renault 32-10-001/D	✓														✓						
ABD0100.1.2	✓						✓									✓					
Special MIL	✓						✓										✓				
MIL-STD-1576	✓						✓											✓			
ANSI C63.16	✓																		✓	✓	
UL991																					✓

ACCESSORIES FOR DIFFERENT MODULES

ESD3000	Mainframe	DM1	DM2	DM4	DM6	DM7	RM32	DN1	DN2	DN3	DN4	DN5	DN6	CAR1	CAR5	IND1	MIL2	MIL3	A-C63H	C-63H
EARTH CABLE	✓	IEC						IEC												
ESD-VCP50	✓	IEC						IEC												
ESD-TARGET2	✓	IEC																		
ESD-TARGET2 DN	✓							ISO	ISO	ISO			ISO							
ESD-VERI-V	✓	✓	○	○			○	✓	○	○	✓	✓	○	○	○	✓	✓	✓	✓	
ESD-STAND ED2	✓	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
ESD-HCP-AUTO	✓							ISO					ISO							
DM-EXT	✓										MIL	MIL								
SAFETY-S	✓										MIL	MIL								
TC-MIG24 ED	✓										MIL	MIL								
ESD3000 CNH12	✓							○	○	○	○	○	○							
OPTOLINK	✓	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
TEMA	✓	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

○ = Optional Accessories, see product details

1. ESD3000 MAINFRAME AND MODULES

1.1. TECHNICAL SPECIFICATIONS

ESD3000 Mainframe

To be used with modules	all modules from this document are compatible
Construction	fully portable, no additional basic unit
Control	LCD and 6 menu buttons, 1 trigger button
Maximum voltage	16 kV or 30 kV, depending on modules chosen
Voltage steps	100 V - test
Discharge polarity	positive, negative, alternating
Discharge modes	contact discharge (CD) and air discharge (AD)
Discharge frequency CD	max. 20 Hz, (pulse every 0.05, 0.1, 0.2 ... 99 s)
Discharge frequency AD	≥ 30 Hz or more, for ex. with DM1, DN1, other
Counter	pre-selectable, 1 to 29999
Discharge detection	selectable, count pulses or count discharges
Holding time	≥ 5 s
Trigger	manual, automatic, remote
Ramps	voltage, polarity
Reporting with TEMA	automatic report sequence, amplitude, polarity
Dimensions	for ex. with DM1 and tip 340 x 130 x 70 mm
Weight mainframe	730 g, w/o battery pack and module
Weight equipped	1050 g, with battery pack, DM1 and AD tip
Power supply	10 x AA rechargeable batteries or mains
Included	10 batteries, mains adapter, ground cable 2 m, 3 test tips (AD, AD2, CD), carrying case, RS232 cable, E3Loader for remote control
Requires	at least a DM module, or a DN module + RM32



ESD3000DM1

Standards	IEC 61000-4-2 (latest), ITU-T K.20,
Other standards	MIL-STD-461G CS118, DO-160 Section 25
Storage capacitor	150 pF ± 10 %
Discharge resistor	330 Ω ± 10 %
Voltage range AD	0.2 – 16 kV ± 5 %
Voltage range CD	0.2 – 10 kV ± 5 %
Current rise time into 2 Ω	0.8 ± 25 %
First I peak into 2 Ω CD	7.5 A @ 2 kV – 37.5 A @ 10 kV (± 15 %)
Current at 30 ns	4 A @ 2 kV – 20 A @ 10 kV (± 30 %)
Current at 60 ns	2 A @ 2 kV – 10 A @ 10 kV (± 30 %)
Optional	ESD-TARGET2



ESD3000DM2

Standards	PSA B32 7110 up to 16 kV / 10 kV
Storage capacitor	330 pF ± 10 %
Discharge resistor	2000 Ω ± 10 %
Voltage range AD	0.2 – 16 kV ± 5 %
Voltage range CD	0.2 – 10 kV ± 5 %
Current rise time into 2 Ω	0.7 – 1 ns
First I peak into 2 Ω CD	7.5 – 30 A ± 10 %
RC time constant	600 ± 130 ns



ESD3000DM4

Standards	MIL-STD-883, GR78-CORE
Storage capacitor	100 pF ± 10 %
Discharge resistor	1500 Ω ± 10 %
Voltage range AD	0.2 – 16 kV ± 5 %
Voltage range CD	0.2 – 10 kV ± 5 %
Current rise time into 2 Ω	< 10 ns @ 0.2 – 8 kV
I peak into 2 Ω (CD)	2.66 A @ 4 kV, 3.33 A @ 5 kV



ESD3000DM6

Standards	IEC 61340-3-1, JEDEC 22-A114, MIL-STD-750D
Storage capacitor	100 pF ± 10 %
Discharge resistor	1500 Ω ± 10 %
Voltage range CD	0.25 – 8 kV ± 10 %
Current rise time into 2 Ω	2 – 10 ns @ 0.25 – 8 kV
RC time constant	150 ± 20 ns



ESD3000DM7

Standards	IEC 61340-3-2, JEDEC 22-A115
Storage capacitor	200 pF ± 10 %
Discharge resistor	0 Ω ± 10 %
Voltage range CD	0.1 – 2 kV ± 5 %
Current into short circuit	1.7 A – 35 A ± 15 % into short circuit (< 1 Ω)
Current waveform	as per IEC 61340-3-2 into SC (< 1 Ω)
Current ringing frequency	11 – 16 MHz @ 0.1 – 2 kV into SC (< 1 Ω)



ESD3000DM32A-UL991

Standard	UL991, paragraph 15.2.2
Storage capacitor	100 pF ± 10 %
Discharge resistor	1500 Ω ± 5 %
Discharge mode	AD only, consists of DM+ and DM- modules
Voltage range AD	4 – 30 kV ± 5 %
Rise time at 4 kV, 20 kV	< 5 ns
RC const. at 4 kV, 20 kV	150 ns ± 20 %



30 KV

These Extensions need the Module ESD3000RM32



ESD3000DN1

Standards	IEC 61000-4-2, ISO 10605
Other standards	MIL-STD-461G CS118, DO-160 Section 25
Storage capacitor	150 pF \pm 10 %
Discharge resistor	330 Ω \pm 10 %
Voltage range AD	1 – 32 kV \pm 5 %
Voltage range CD	1 – 30 kV \pm 5 %
Current rise time into 2 Ω	0.8 \pm 25 %
First I peak into 2 Ω CD	7.5 A @ 2 kV – 112.5 A @ 30 kV (\pm 15 %)
Current at 30 ns	4 A @ 2 kV – 60 A @ 30 kV (\pm 30 %)
Current at 60 ns	2 A @ 2 kV – 30 A @ 30 kV (\pm 30 %)
Requires	ESD3000RM32
Included in ESD3000RM32	Detachable module for faster tr (<700ps)
Optional	ESD-TARGET2 DN , ESD-HCP-AUTO



ESD3000DN2

Standards	ISO 10605, GMW3100, GMW3097
Storage capacitor	330 pF \pm 10 %
Discharge resistor	2000 Ω \pm 10 %
Voltage range AD	2 – 30 kV \pm 5 %
Voltage range CD	2 – 30 kV \pm 5 %
Current rise time into 2 Ω	0.7 – 1 ns
First I peak into 2 Ω CD	7.5 A @ 2 kV – 112.5 A @ 30 kV (- 0 / + 30 %)
RC time constant	600 \pm 130 ns
Requires	ESD3000RM32
Optional	ESD-TARGET2 DN



ESD3000DN3

Standards	ISO 10605, GMW3100, GMW3097
Storage capacitor	150 pF \pm 10 %
Discharge resistor	2000 Ω \pm 10 %
Voltage range AD	2 – 30 kV \pm 5 %
Voltage range CD	2 – 30 kV \pm 5 %
Current rise time into 2 Ω	0.7 – 1 ns
First I peak into 2 Ω CD	7.5 A @ 2 kV – 112.5 A @ 30 kV (- 0 / + 30 %)
RC time constant	300 \pm 60 ns
Requires	ESD3000RM32
Optional	ESD-TARGET2 DN



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ESD3000DN4

Standards	STANAG4239, ISO14304 MIL-STD-1512, MIL-STD-330
Storage capacitor	500 pF ± 10 %
Discharge resistor	5000 Ω ± 10 %
Voltage range CD	2 – 30 kV ± 5 %
I rise time into 2 Ω CD	0.7 – 1 ns
Requires	ESD3000RM32
Optional	ESD3000 SAFETY-S , DM-EXT , TC-MIG24ED



ESD3000DN5

Standards	STANAG4239, MIL-STD-1512, MIL-STD-330
Storage capacitor	500 pF ± 10 %
Discharge resistor	500 Ω ± 10 %
Voltage range CD	2 – 30 kV ± 5 %
I rise time into 2 Ω CD	0.7 – 1 ns
Requires	ESD3000RM32
Optional	ESD3000 SAFETY-S , DM-EXT , TC-MIG24ED



ESD3000DN6

Standards	ISO 10605, GMW3100
Storage capacitor	330 pF ± 10 %
Discharge resistor	330 Ω ± 10 %
Voltage range AD	2 – 30 kV ± 5 %
Voltage range CD	2 – 30 kV ± 5 %
Current rise time into 2 Ω	0.7 – 1 ns
RC time constant	300 ± 130
Requires	ESD3000RM32
Optional	ESD-TARGET2 DN , ESD-HCP-AUTO



SPECIAL

ESD3000DN32-CAR1

Standard	JASO D 001-94
Storage capacitor	150 pF ± 10 %
Discharge resistor	500 Ω ± 10 %
Voltage range AD	2 – 30 kV ± 10 %
Voltage range CD	2 – 30 kV ± 10 %
I rise time into 2 Ω CD	0.8 ± 25 %
First I peak into 2 Ω AD	< 5 ns
RC time constant	300 ± 60 ns
Requires	ESD3000RM32
Optional	ESD-TARGET2 DN



ESD3000DN32-CAR5

Standard	Renault 32-10-001/D
Application	testing airbag initiators
Storage capacitor	330 pF ± 10 %
Discharge resistor	0 Ω ± 10 %
Source impedance Rt	< 30 Ω
Voltage range AD	2 – 16 kV ± 5 %
Voltage range CD	2 – 16 kV ± 5 %
Requires	the module is already integrated in RM32



ESD3000DN32-IND1

Standard	ABD0100.1.2, IEC801-2
Storage capacitor	150 pF ± 10 %
Discharge resistor	150 Ω ± 10 %
Voltage range AD	2 – 30 kV ± 5 %
Voltage range CD	2 – 30 kV ± 5 %
I rise time into 2 Ω CD	0.7 – 1 ns
RC time constant	30 ns ± 30 %
Requires	ESD3000RM32



ESD3000DN32-MIL2

Standards	special military requirement
Storage capacitor	400 pF ± 10 %
Discharge resistor	150 Ω ± 10 %
Voltage range AD	2 – 30 kV ± 5 %
Voltage range CD	2 – 30 kV ± 5 %
I rise time into 2 Ω CD	0.8 ± 25 %
Requires	ESD3000RM32



ESD3000DN32-MIL3

Standard	MIL-STD-1576
Storage capacitor	500 pF ± 10 %
Discharge resistor	0 Ω ± 10 %
Voltage range CD	2 – 30 kV ± 5 %
Requires	ESD3000RM32



ESD3000DM16A-C63H

Standard	ANSI C63.16 (AD requirement)
Storage capacitor	150 pF ± 10 %
Discharge resistor	330 Ω ± 10 %
Voltage range AD	2 – 16 kV ± 5 %
Requires	-



ESD3000DM16C-C63H

Standard	ANSI C63.16 (CD requirement)
Storage capacitor	150 pF ± 10 %
Discharge resistor	330 Ω ± 10 %
Voltage range CD	2 – 16 kV ± 5 %
Requires	-



1.2. POWER, CLIMATIC CONDITIONS, SHIPPING WEIGHT, DIMENSIONS

ESD3000 mainframe

Mains adapter	95 – 250 V (50/60 Hz)
Power consumption	ON < 20 VA, standby < 5 VA

Temperature range	15 – 35 °C
Humidity	30 – 60 % non-condensing
Air pressure	86 – 106 kPa

Shipping weight	2.4 kg plus selected modules
Carrying case dimensions	46 x 41 x 17 cm

Included in delivery	
User manual	with conformity declaration
Calibration certificate	factory calibration for selected modules

2. ACCESSORIES FOR ESD3000

2.1. TECHNICAL SPECIFICATIONS

EARTH CABLE

Application	connection of HCP or VCP to ground plane
Impedance	2 x 470 kΩ
Length	2 m
Connectors	2 x banana plugs

ESD-VCP50

Application	indirect ESD application as per standard
Spacer in between	10 cm wooden spacer
Coupling plane	50 x 50 cm
Application points	one on each side
Dimensions	50 x 50 x 10 cm
Weight	8 kg
Included	2 m earth cable (with 2 x 470 k Ω)



ESD-TARGET2

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



ESD-TARGET2 DN

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



ESD-VERI-V

Application	target for ESD DC voltage measurement
Input impedance	20 G Ω 3 pF
Input voltage range	0 – 32 kV
Output voltage range	0 – 1.6 V
Output connector	BNC
Dimensions	17 cm height, 5.5 cm diameter
Weight	433 g
Included	earth conductor



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ESD-STAND Ed2

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



ESD-HCP-AUTO

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



ESD3000DM-EXT

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



ESD3000 SAFETY-S

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



TC-MIG24 ED for testing explosive devices

Application	test cabinet
Voltage insulation	max. 36 kV
EUT dimensions	max. 30 x 30 x 20 cm
EUT weight	max. 5 kg
Safety circuit	door interlock
Signal lamps	red and green lamps built-in
Control of signal lamps	for example with ESD3000 SAFETY-S
Dimensions	47 x 43.5 x 25.4 cm
Weight	8 kg
Included	connection cable 25pol/ ESD3000 SAFETY-S



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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	ESD3000RM32 , ESD3000DN1 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
Requires	USB-RS 232 ADAPTER



USB-RS232 ADAPTER

Application	adapter between RS232 and USB interfaces
Adapter type	Passive, no power supply
Input	RS232 male
Output	USB
Cable length	0.35 m
Weight	0.2 kg




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	ESD3000-OPTOLINK , USB-RS 232 ADAPTER

Specific EMC test requirements ?

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Select one or more checkboxes and press the search button to show the products.

<input type="checkbox"/> ABD0100.1.2	<input type="checkbox"/> IEC 60255-5	<input type="checkbox"/> IEC 61000-4-34	<input type="checkbox"/> IEC 62052-11	<input type="checkbox"/> MIL-STD-461 / CS117
<input type="checkbox"/> ABD0100.1.8.1	<input type="checkbox"/> IEC 60335-1	<input type="checkbox"/> IEC 61000-4-4	<input type="checkbox"/> ISO 10605	<input type="checkbox"/> MIL-STD-461 / CS118
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<input type="checkbox"/> FAA AC 20-136	<input type="checkbox"/> IEC 61000-4-16	<input type="checkbox"/> IEC 61340-3-1	<input type="checkbox"/> MIL-STD-1512	<input type="checkbox"/> STANAG 4239
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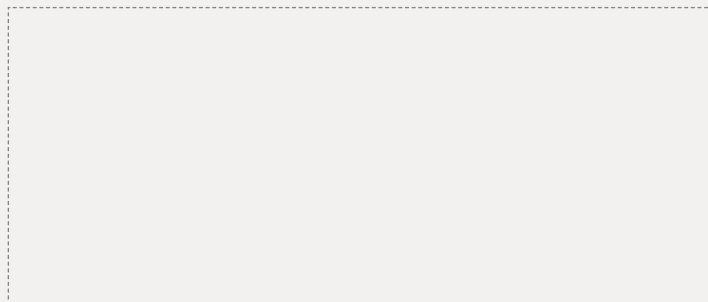


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