

Developed according to international standards and the way you test

DEFINITION

THE SAFETY TESTER IS THE GENERIC TERM TO COVER THE 3 OR 4 TESTS OF THE ELECTRICAL SAFETY STANDARDS, FROM THE INTERNATIONAL STANDARDS.



- ground bond test (also called bonding test, ground continuity test)
- insulation test (also called high resistance test, megger test)
- hipot test to make a high voltage test (also called dielectric strength test, hipot test, hi-pot test, breakdown test or flash test)
- leakage current measurement (also called line leakage test)

The final purpose of those tests is to validate that the product under test is safe for the end user, and complies with the quality requirements from the Low Voltage Directive (LVD), applicable to the corresponding standards (IEC335, IEC950, IEC601, IEC1010, IEC598, IEC990, IEC204...)

APPLICATION

MANUFACTURER, LABORATORY, HIGH SPEED PRODUCTION, MAINTENANCE, IN ORDER TO COMPLY WITH THE LOW VOLTAGE DIRECTIVE.

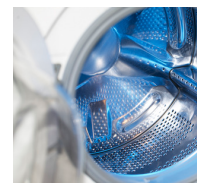
- IEC 335 household manufacturer (washing machines, coffee machines, fridges, heaters, boilers, ...)
- IEC 204 industrial equipment (compressor, electrical tools, ...)
- IEC 598 lighting industry (street lights, professional lighting, medical lighting, bulbs, ...)
- IEC 601 medical industry (scanners, surgery equipments, X-ray, electrical beds, ...)
- IEC 950 information technology industry (modems, satellite receivers, servers, printers, cash dispensers, ...)
- IEC 1010 measurement, control and laboratories industry (electrical meters, test & measurement equipment, ...)

- IEC 990 technical report on leakage current measurement (many standards will refer to this report for leakage current measurement)
- IEC 61730-2, IEC 61215, IEC 61646, UL1703 (solar panels, inverters, converters, solar cables, solar connectors)

SPECIFICATION OVERVIEW

FROM LABORATORY TO PRODUCTION TESTING, OUR RANGE COVERS THE FOLLOWING SPECIFICATIONS.

- ground bond test from 5 A AC up to 40 A AC with resistance measurement from 1 m Ω up to 1.5 Ω
- insulation test up to 2 T Ω with DC Voltage from 10 V up to 1000 V DC (1V steps)
- hipot test with our "delta I" exclusive detection type for non destructive testing, up to 5 kV AC, 6 kV DC
- possible destructive hipot test (for investigation and laboratory use) but also hipot test at operating temperature
- leakage current measurement in single or three phases, according to all current international standards
- power measurement and cos ϕ measurement
- GPIB, RS232, Ethernet, 0-10 V, PLC available
- SXS Pro software for quality purposes, traceability



Technical specifications

Selector guide

From the below board select the right product according to your application

Safelec Electrical Safety Tester range	Ground continuity test (Ground bond test)	AC/DC Dielectric strength test (Hipot test)	Insulation test (High resistance test)	Leakage current (Line leakage test)	Power measurement P, U, I cosφ	Interface	Software
SXS50	5 - 32 A AC 40 A option 1 mΩ - 1.5 Ω	0 - 5 kV AC - 10 mA	500 V DC 1000 V in option 50 kΩ - 200 GΩ 2 TΩ option	FXS501	FXS501	RS232 included, GPIB, PLC, 0-10 V, Ethernet in option	Yes in option
SXS56	5 - 32 A AC 40 A option 1 mΩ - 1.5 Ω	0 - 5 kV AC - 10 mA 0 - 6 kV DC - 4 mA	500 V DC 1000 V in option 50 kΩ - 200 GΩ 2 TΩ option	FXS501	FXS501	RS232 included, GPIB, PLC, 0-10 V, Ethernet in option	Yes in option
SXS500	5 - 32 A AC 40 A option 1 mΩ - 1.5 Ω	0 - 5 kV AC - 110 mA	500 V DC 1000 V in option 50 kΩ - 200 GΩ 2 TΩ option	FXS501	FXS501	RS232 included, GPIB, PLC, 0-10 V, Ethernet in option	Yes in option
SXS506	5 - 32 A AC 40 A option 1 mΩ - 1.5 Ω	0 - 5 kV AC - 110 mA 0 - 6 kV DC - 50 mA DC	500 V DC 1000 V in option 50 kΩ - 200 GΩ 2 TΩ option	FXS501	FXS501	RS232 included, GPIB, PLC, 0-10 V, Ethernet in option	Yes in option
SXS16	5 - 32 A AC 40 A option 1 mΩ - 1.5 Ω	100 V DC - 10 kV DC 1000 μA	500 V DC to 1500 V DC 1000 kΩ - 20 GΩ	-	-	RS232 included, GPIB, PLC, 0-10 V, Ethernet in option	Yes in option
PREMIER 2804	3 - 30 A AC up to 650 mΩ	0-5 kV AC - 40 mA 0-6 kV DC - 10 mA	1000 V DC up to 9.5 GΩ	-	-	RS232, USB, signal I/O included	No
MEMI2094 (portative)	100 mA, 200 mA, 10 A, 25 A 10 mΩ - 1 Ω	0 - 5 kV AC 100 mA	1000 V DC 0 - 1 GΩ	IEC335, IEC950, IEC598, IEC1010, IEC990	Until 16A single phase	RS232	No
FXS501 (slave)	XS Series	XS Series	XS Series	IEC335, IEC950, IEC598, IEC601, IEC1010, IEC990	Up to 63 A single phase or three phases	XS Series	Yes in option
FMG500 (master)	-	-	-	IEC335, IEC950, IEC598, IEC601, IEC1010, IEC990	Up to 63 A single phase or three phases	RS232 included, GPIB, PLC in option	Yes in option

For product datasheet, options and accessory details, or for more technical information, go to our website www.sefelec.com

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M1501 series, the most famous solution for cable manufacturers

DEFINITION

A MEGOHMMETER IS A HIGH RESISTANCE METER DEDICATED TO MEASURE AN OHMIC VALUE UNDER A DIRECT VOLTAGE OF GREAT STABILITY.



• to measure a high value resistance, techniques for measuring a low value current are used. A constant voltage source (DC Voltage) is applied to the resistance to be measured and the resulting current is read on a highly sensitive ammeter circuit that can display the resistance value (in M Ω , G Ω , T Ω)

A megohmmeter is also called a high resistance tester, a teraohmmeter, a megger, a high insulation tester

APPLICATION

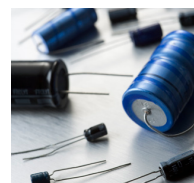
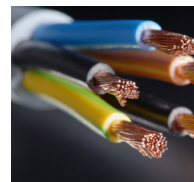
MANUFACTURER, LABORATORY, HIGH SPEED PRODUCTION, MAINTENANCE.

- cable manufacturer (measurement made on reel, on 1m cable samples, ... shielding against wires)
- transformers, coils, electrical motors
- components (capacitors, resistors, ...)
- aeronautic, aerospace sub assemblies (satellites panels, ...)
- connectors, switches
- test laboratories (insulated materials such as paper, ceramic, plastics, ...)
- car industry (splices, cable samples in salty water, ...)
- printed circuit boards

SPECIFICATION OVERVIEW

FROM PORTATIVE TO DESKTOP SOLUTIONS, FROM HAND USE TO REMOTE CONTROLLED USE, OUR RANGE COVER THEM ALL.

- resistance measurement up to 2000 T Ω
- DC Voltage from 1 V up to 1500 V DC (1 V steps), in option up to 70 kV DC
- picoammeter function from 0.1 pA
- GPIB, RS232, 0-10 V, PLC available
- high accuracy down to 0.2 %
- surface and resistance measurement according to DIN53482, VDE0303, IEC93 with our SRE24 probe



Technical specifications

Selector guide

From the below board select the right product according to your application

Safelec Megohmmeter range	Resistance range	DC voltage	Resistance Accuracy	Pico-ammeter	Interface	Software	Portative
M1501P	100 Ω - 2000TΩ	1 - 1500 (1V steps) option up to 70 kV DC	0.2 %	0.01 pA-20 mA	GPIB included, PLC, 0-10 V in option	yes in option	No
M1501M	100 Ω -2000TΩ	1-1500 (1 V steps) option up to 70 kV DC	0.2 %	0.01 pA-20 mA	RS232, PLC, 0-10 V in option	yes in option	No
M1501U	5 kΩ - 20TΩ	10 - 1500 (10V steps)	0.2 %	50 pA-20 mA	No	No	No
MXS1000	50 kΩ - 200 GΩ 2TΩ in option	20-1000 (1 V steps)	±(1.5 % + 1u)	No	RS232 included, GPIB, PLC, Ethernet in option	yes in option	No
MXS500	50 kΩ - 200 GΩ 2TΩ in option	10-500 (1 V steps)	±(1.5 % + 1u)	No	RS232 included GPIB, PLC, Ethernet in option	yes in option	No
CA6547	30 kΩ - 10TΩ	500, 1000, 2500, 5000	5 %	No	RS232	No	Yes
CA6545	30 kΩ - 10TΩ	500, 1000, 2500, 5000	5 %	No	No	No	Yes
CA6543	2 kΩ - 2TΩ	50, 100, 250, 500, 1000	5 %	No	RS232	No	Yes
CA6541	2 kΩ - 2TΩ	50, 100, 250, 500, 1000	5 %	No	No	No	Yes

REMA Series

we also manufacture a wide range of high value standard resistors from 1 MΩ to 100TΩ

For product datasheet, options and accessory details, or for more technical information, go to our website www.sefelec.com

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Since 50 years, we manufacture devices for production and laboratory testing

DEFINITION

A DIELECTRIMETER IS A COMBINATION OF 2 EQUIPMENTS DEDICATED FOR 2 FUNCTIONS.



- a megohmmeter, made to measure insulation resistance, high resistances
- a hipot tester to make a high voltage test (also called dielectric strength test, hipot test, hi-pot test, breakdown test or flash test)
- the dielectrimer can do automatically and successively those 2 above tests, as hipot then megohm, megohm then hipot, or megohm then hipot then megohm again. This last test is the ideal one, which ensures that the high voltage test has not been damaging anything on the device under test.

APPLICATION

MANUFACTURER, LABORATORY, HIGH SPEED PRODUCTION, MAINTENANCE, IN ORDER TO COMPLY WITH THE LOW VOLTAGE DIRECTIVE.

- cable manufacturer (measurement made on reel, on cable samples, ... > shielding against wires)
- transformers
- components (capacitors, resistors, sensors,...)
- aeronautic, aerospace sub assemblies (satelites panels,...)
- connectors, switches, activators, ...
- test laboratories
- car industry (splices, electric engines, pumps, ...)
- satellite receivers, decoders, television receivers, ...
- solar panels (test in between current output and the frame)
- wind turbines

SPECIFICATION OVERVIEW

FROM LABORATORY TO PRODUCTION TESTING, OUR RANGE COVERS THE FOLLOWING SPECIFICATIONS.

- resistance measurement up to 2 TΩ
- insulation test with DC Voltage from 10 V up to 1000 V DC (1 V steps)
- hipot test with our "delta I" exclusive detection type for non destructive testing, up to 5 kV AC, 6 kV DC
- 1 single output connexion for 2 tests done in automatic testing
- possible destructive hipot testing (for investigation and laboratory use) and hipot at operating temperature

- GPIB, RS232, Ethernet, 0-10 V, PLC available
- SXS Pro software for quality purposes, traceability and professional reporting



Technical specifications

Selector guide

From the below board select the right product according to your application

Sefelec Dielectrimeter range	AC Dielectric strength tester (hipot test)	DC Dielectric strength test (hipot test)	AC/DC Dielectric strength test current (hipot test)	Megohmmeter Resistance	Megohmmeter Voltage	Interface	Software
DXS50	100 V to 5 kV	No	10 mA AC	50 k Ω -200 G Ω 2 T Ω in option	10...500 V DC (1 V steps) 1000 V DC in option	RS232 included GPIB, PLC, Ethernet in option	SXS Pro
DXS56	100 V to 5 kV	100 V to 6 kV	10 mA AC 4 mA DC	50 k Ω -200 G Ω 2 T Ω in option	10...500 V DC (1 V steps) 1000 V DC in option	RS232 included GPIB, PLC, Ethernet in option	SXS Pro
DXS500	100 V to 5 kV	No	110 mA AC	50 k Ω -200 G Ω 2 T Ω in option	10...500 V DC (1 V steps) 1000 V DC in option	RS232 included GPIB, PLC, Ethernet in option	SXS Pro
DXS506	100 V to 5 kV	100 V to 6 kV	110 mA AC 50 mA DC	50 k Ω -200 G Ω 2 T Ω in option	10...500 V DC (1 V steps) 1000 V DC in option	RS232 included GPIB, PLC, Ethernet in option	SXS Pro
PREMIER 2803	100 V to 5 kV	100 V to 6 kV	40 mA AC 10 mA DC	up to 9.5 G Ω	1000 V DC	RS232, USB, signal I/O included	No

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High voltage is hazardous, our solutions protect the user

DEFINITION

A DIELECTRIC STRENGTH TESTER PROVIDES A HIGH VOLTAGE TEST IN ORDER TO CHECK THE QUALITY OR SOME CURRENT LIMITS DEFINED IN THE INTERNATIONAL STANDARDS.



- this high voltage test (also called dielectric strength test, hipot test, hi-pot test, breakdown test or flash test) is made to stress the device under test with an AC or DC high voltage and check that there is no breakdown nor perforation happening. It also checks that insulation distances and distances in the air are respected

APPLICATION

MANUFACTURER, LABORATORY, HIGH SPEED PRODUCTION, MAINTENANCE, IN ORDER TO COMPLY WITH QUALITY STANDARDS.

- cable manufacturer, switchgear industry, bus bar, batteries, ...
- electronic component (capacitor, transistor, electronic boards, IGBT, relays, ...)
- household manufacturer (washing machines, coffee machines, fridges, heaters, boilers, ovens, ...)
- industrial equipment (compressor, electrical tools, ...)
- lighting industry (street lights, professional lighting, medical lighting, bulbs, ...)
- information technology industry (modems, satellite receivers, servers, printers, cash dispensers, ...)

- test houses, certification laboratories (electrical meters, components, insulated materials, such as plastic, ceramic, textile, ...)
- railway industry (train power line, electrical cabinets, cabling, ...)
- transformers, coils, electric engines, ...)
- possible destructive hipot testing (for investigation and laboratory use), but also hipot test at operating temperature
- GPIB, RS232, Ethernet, 0-10 V, PLC available
- SXS PRO software for quality purposes, traceability and professional reporting

SPECIFICATION OVERVIEW

FROM LABORATORY TO PRODUCTION TESTING, OUR RANGE COVERS THE FOLLOWING SPECIFICATIONS.

- hipot test up to 400 kV AC and DC
- wide range of safety cages and accessories
- hipot test with our "delta I" exclusive detection type for non destructive testing



Technical specifications

Selector guide

From the below board select the right product according to your application

Sefelec Hipot tester range	AC Dielectric strength tester (hipot test)	DC Dielectric strength test (hipot test)	Current	Detection type	Interface	Software
RXS50	100 V to 5 kV	No	10 mA AC	Delta I+Imax	RS232 included GPIB, PLC, Ethernet in option	Yes in option
RXS56	100 V to 5 kV	100 V to 6 kV	10 mA AC 4 mA DC	Delta I+Imax	RS232 included GPIB, PLC, Ethernet in option	Yes in option
RXS500	100 V to 5 kV	No	110 mA AC	Delta I+Imax	RS232 included GPIB, PLC, Ethernet in option	Yes in option
RXS506	100 V to 5 kV	100 V to 6 kV	110 mA AC 50 mA DC	Delta I+Imax	RS232 included GPIB, PLC, Ethernet in option	Yes in option
RMG15AC	100 V to 15 kV	No	35 mA AC	Delta I+Imax	RS232,GPIB, PLC, 0-10 V in option	Yes in option
RMG12DC	No	100 V to 12 kV	10 mA DC	Delta I+Imax	RS232,GPIB, PLC, 0-10 V in option	Yes in option
RMG12AC-DC	100 V to 12 kV	100 V to 12 kV	35 mA AC 10 mA DC	Delta I+Imax	RS232,GPIB, PLC, 0-10 V in option	Yes in option
PREMIER 2801	100 V to 5 kV	No	40 mA AC	Delta I+Imax	RS232, USB, signal I/O included	No
PREMIER 2802	100 V to 5 kV	100 V to 6 kV	40 mA AC 10 mA DC	Delta I+Imax	RS232, USB, signal I/O included	No
DTMG Series	5 kV to 50 kV	option	up to 500 VA	delta I + Imax	RS232, GPIB, PLC in option	DTPG Pro
DTPG Series	5 kV to 50 kV	option	up to 5000 VA	delta I + Imax	RS232, GPIB, PLC in option	DTPG Pro
Digital DT tester	5 kV to 400 kV	5 kV to 400 kV	up to 400 kVA	Imax	No	No
Programmable DT tester	5 kV to 400 kV	5 kV to 400 kV	up to 400 kVA	Imax	RS232, 0-10 V, PLC in option	Yes in option

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Metallization for aero applications, Sefelec, a worldwide reference

DEFINITION

MICROHMMETER AND MILLIOHMMETER ARE LOW RESISTANCE METERS DEDICATED TO MEASURE AN OHMIC VALUE UNDER A DEDICATED CURRENT



- they are based on two main circuits : an extremely stable current source + a high impedance and very accurate voltage measurement system for real 4 wire measurement method (also called Kelvin method)

APPLICATION

MANUFACTURER, HIGH SPEED PRODUCTION, MAINTENANCE, LABORATORY, BUT ALSO AERONAUTICAL INDUSTRY

- cable manufacturer (measurement on 1 meter cable sample, ...) with MGR10
- electric motors, generators (test of the winding resistance for the determination of heat rise) with MGR10

- resistors, fuses, transformer windings, transducers, coils, printed circuit boards ... with MGR10

- automotive component manufacturer (test of air bag and seat belt detonator resistance, of the ABS braking system coils, ...) with MGR10C

- dielectric/electronic component manufacturer, relays, connectors (measurement of the switch contact resistance, relay contact resistance, ...) with MGR10B

- rockets, launch vehicles, tanks, planes, helicopter bondings (also called bonding test or metallization) for production and maintenance with RCP2A

- household, industrial equipment, medical industry, information technology industry, measurement, control and laboratories industry in order to validate that all the touch accessible parts are properly connected to the protective earth

connection, according to the quality standards from the Low Voltage Directive (LVD), applicable to the corresponding standards (IEC335, IEC950, IEC601, IEC1010, IEC598, IEC990, IEC204...) with CXS40

- wind turbines

SPECIFICATION OVERVIEW

FROM LABORATORY TO PRODUCTION TESTING AND MAINTENANCE, OUR RANGE IS MADE OF 3 FAMILIES

- very low measurement resistance measurement from 0.1 $\mu\Omega$ with MGR10 (10 A max.)

- temperature compensation for copper and aluminium (but also any additional materials) with MGR10

- 10 A pulsed current with a 600 m Ω range for measurement on dissimilar materials (also called composite) with RCP2A

- ground bond test up to 50 A AC (typical resistance limits 100 m Ω , 200 m Ω or 500 m Ω) with CXS40

- GPIB, RS232, 0-10 V, PLC available

- SXS Pro, RCP2A Pro & MGR10 Pro software for quality purposes, traceability and professional reporting



Technical specifications

Selector guide

From the below board select the right product according to your application

Sefelec Microhmmeter / Milliohmmeter range	Resistance range	AC or DC current	Resistance / Accuracy	Temperature Compensation	Interface	Software	Portative
MGR10	0.1 $\mu\Omega$ - 30 k Ω	10 μ A - 10 A DC	0.03 %	Yes	RS232, GPIB, PLC in option	Yes in option	MGR10A on battery
MGR10A (on battery)	0.1 $\mu\Omega$ - 30 k Ω	10 μ A - 10 A DC	0.03 %	Yes	RS232, GPIB, PLC in option	Yes in option	Yes
MGR10B (for contact resistance)	10 $\mu\Omega$ - 30 k Ω	10 μ A - 100 mA DC	0.03 %	Yes	RS232, GPIB, PLC in option	Yes in option	No
MGR10C (pyrotechnic version)	100 $\mu\Omega$ - 30 k Ω	10 μ A - 10 mA DC	0.03 %	Yes	RS232, GPIB, PLC in option	Yes in option	No
RCP2A (metalisation)	1 $\mu\Omega$ - 6 Ω	100 mA - 10 A DC	0.1 %	No	RS232 included	Yes in option	Yes
CXS40 (ground bond tester)	1 m Ω - 1.5 Ω	5 - 40 A AC 50 A AC option	2.5 %	No	RS232, GPIB, PLC, Ethernet in option	Yes in option	No
MO1	10 $\mu\Omega$ - 4 k Ω	0.1 mA DC - 100 mA DC	0.05 %	No	No	No	Yes
DO7	600 $\mu\Omega$ - 60 Ω	up to 10 A DC	0.15 %	No	RS232	No	Yes
DO4000	10 $\mu\Omega$ - 4 k Ω	100 μ A - 100 mA	0.05 %	No	No	No	Yes
MK Series (clamping device)	1 meter linear measurement guides to measure cable section : from 0.1 mm ² to 2500 mm ²						
KW Series (standard resistors)	standard resistors from 100 $\mu\Omega$ to 1 m Ω						

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Since 50 years, we manufacture systems for production and maintenance

DEFINITION

SYNOR CABLE TESTER RANGE IS AN ATE (AUTOMATIC TEST EQUIPMENT) DEDICATED FOR TESTING ELECTRICAL WIRING HARNESSES, BACKPLANES OR CABLES.



APPLICATION

SEFELEC INVESTS A LOT IN R&D, BUT ALSO LISTENS TO HIS CUSTOMERS IN ORDER TO ALWAYS PROVIDE BETTER AND MORE ADAPTED SOLUTIONS FOR THE SYNOR CABLE TESTER USERS. OUR AUTOMATIC HIGH VOLTAGE CABLE TESTERS HAVE BEEN SOLD AROUND THE WORLD, IN MORE THAN 26 COUNTRIES, MOSTLY IN THE BELOW INDUSTRIES.

- aerospace (satellites, launch vehicules, sub-assemblies, sliprings, ...)

- aeronautic (planes, helicopters, optronics, unmanned air vehicles, sub-assemblies, ...)
- railways (trains, metro, tramways, ...)
- army (radars, rockets, ucav, submarines, sliprings, tanks, ...)
- connector manufacturers, telecommunication, electrical cabinets, medical equipments
- global harness manufacturers

SPECIFICATION OVERVIEW > HARDWARE

FROM 8 TEST POINTS TO 100 000 TEST POINTS, OUR CABLE TESTER RANGE INTEGRATES THE FOLLOWING FEATURES.

- continuity test in 2 and 4 wires mode up to 2 A (10 A with external equipment)
- insulation test up to 2121 V DC
- hipot test up to 5000 V AC and 6000 V DC
- component test (capacitor, resistance, diode, zener diode, inductance, GMOV, transorbs), shielding test, twisted pairs, coaxial cable measurement ...

- stimuli and functional test for relay, light, speaker, engine activation, energisation ...
- tester configuration: mobile, compact, or distributed modules
- integration of external devices (SXS, DXS, MGR10 microhmmeter, M1501 teraohmmeter, ...) for higher specs availability

SPECIFICATION OVERVIEW > SOFTWARE

WINDOWS® ORIENTED, WINPASS, OUR MULTI LANGUAGES SOFTWARE IS EASY TO LEARN, TO PROGRAM, TO USE, AND CAN ALSO BE CUSTOMIZED BY THE CUSTOMER FOR HIS OWN APPLICATION.

- automatic testing, connector library, equivalence tables, dialogues boxes , self learning, self testing, graphical results, self calibration
- production oriented - its fastness is an advantage, and data traceability (EXCEL®, ACCESS®, WORD® reports) is today essential
- high-technology oriented – some external SEFELEC equipment such as microhmmeter, teraohmmeter, hipot testers with very high specs can be easily controlled through the same ease and data traceability
- WINPASS lets you convert various file formats (from internal sources, other cable tester manufacturers, ...) or CAD files (ACCESS®, CATIA®, See One from XAO®, MENTOR®, ELSA®) into Sefelec format files
- bar code reader management for test automation



Technical specifications

Selector guide

From the below board select the right product according to your application

Our range of Cable Testers can be organized in 2 different presentations:

- test points can be gathered into 1 rack / cabinet
- test points can be dispatched in small racks / satellites, all around the device under test (daisy chain presentation)

The first presentation is dedicated to customers who do not need long distance of interface cables to connect to the D.U.T.

The second presentation has been especially designed for large D.U.T., for instance in avionics, aerospace & transportation industry, where big length of interface cables are required ; our solution then drastically reduces cost and cable interface length.

Sefelec Electrical Safety Tester range	Number of tests points	AC/DC Dielectric strength test (Hipot test)	DC insulation test / resistance range	2/4 wires continuity test	Presentation
SYNOR 5000P	8 - 384 2 relays per point	Up to 5000 V AC 6000 V DC	20 - 2121 V DC 50 k Ω - 5 G Ω	1 Ω - 2 k Ω 1 m Ω - 2 k Ω	19 inches portative unit 3U height
SYNOR 5000H	8 - 100 000 2 relays per point	Up to 5000 V AC 6000 V DC	20 - 2121 V DC 50 k Ω - 5 G Ω	1 Ω - 2 k Ω 1 m Ω - 2 k Ω	19 inches rack with housing 7U height
SYNOR 5000R	8 - 100 000 2 relays per point	Up to 5000 V AC 6000 V DC	20 - 2121 V DC 50 k Ω - 5 G Ω	1 Ω - 2 k Ω 1 m Ω - 2 k Ω	19 inches rack 6U height
SYNOR 5000C	8 - 100 000 2 relays per point	Up to 5000 V AC 6000 V DC	20 - 2121 V DC 50 k Ω - 5 G Ω	1 Ω - 2 k Ω 1 m Ω - 2 k Ω	19 inches cabinet up to 36U height
SYNOR 5000D	8 - 100 000 2 relays per point	Up to 5000 V AC 6000 V DC	20 - 2121 V DC 50 k Ω - 5 G Ω	1 Ω - 2 k Ω 1 m Ω - 2 k Ω	distributed modules (satellites) 6U height
SYNOR 4200 Series	64 - 100 000 2 relays per point/multi contact relays	Up to 1500 V AC 2 000 V DC	20 - 2000 V DC 50 k Ω - 1 G Ω	1 Ω - 250 Ω 1 m Ω - 250 Ω	various presentations

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Automate your process for traceability, time and money savings

DEFINITION

A SWITCHING MATRIX IS A SCANNER (RELAYS) DEDICATED TO AUTOMATE A TEST PROCESS. IT ALLOWS YOU TO AUTOMATICALLY TEST SEVERAL PRODUCTS AT THE SAMETIME, OR SEVERAL POINTS OF A DEVICE UNDER TEST. OUR MATRIXES ARE ORGANIZED INTO MODULES (MODULO 4) IN ORDER TO GIVE YOU A GREAT FLEXIBILITY. EITHER YOU CAN DRIVE OUR SYSTEM OR OUR SOFTWARE SOLUTION CAN.



APPLICATION

WHEN SEVERAL HIGH VOLTAGE OR GROUND BOND TEST POINTS ARE NEEDED, IT BECOMES INTERESTING TO AUTOMATE THE TEST PROCESS FOR SAVING TIME AND MONEY, SECURING THE TESTING, AND TRACE ALL RESULTS. OUR MATRIXES ARE DEDICATED FOR THAT JOB.

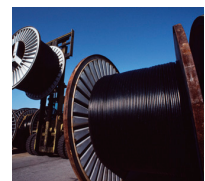
- power supplies, inverters (input tested against output)
- cables (when switching power is a must)
- motors, harnesses, cable assemblies (groups of cables tested against other groups)
- IEC 335 household manufacturer (washing machines, coffee machines, fridges, heaters, boilers, ...)

- IEC 204 industrial equipment (compressor, electrical tools, ...)
- IEC 598 lighting industry (street lights, professional lighting, medical lighting, bulbs, ...)
- IEC 601 medical industry (scanners, surgery equipments, X-ray, electrical beds, ...)
- IEC 950 information technology industry (modems, satellite receivers, servers, printers, cash dispensers, ...)
- IEC 61730-2, IEC 61215, IEC 61646, UL1703 (solar panels, inverters, converters, solar cables, solar connectors)

SPECIFICATION OVERVIEW

FROM 4 TEST POINTS TO MUCH MORE, OUR SWITCHING MATRIXES COVER A WIDE RANGE OF POWERS

- continuity test in 2 and 4 wires mode up to 40 A
- insulation test up to 2121 V DC
- hipot test up to 100 KV AC and 100 KV DC / 100 A
- for MX series, discharge systems are available



Technical specifications

Selector guide

From the below board select the right product according to your application

Sefelec Switching Matrix range	Number of test points	Switching Matrix (scanner) type	Ground continuity (Ground bond test) / 2/4 wires continuity test	AC/DC Dielectric strength test (Hipot test) / Flowing current	DC Insulation test / resistance test	Interface	Software
EXS3200-HV	4-128	High voltage	-	5 kV AC / 2 A max 7 kV DC / 2 A max	1 kV DC 5 TΩ max	RS232, dry contacts	SXS Pro-EXS
EXS3200-HC	4-128	High current	40 A AC/DC max	-	-	RS232, dry contacts	SXS Pro-EXS
EXS3200-HV-HC	4-128	High voltage High current	40 A AC/DC max	5 kV AC / 2 A max 7 kV DC / 2 A max	1 kV DC 5 TΩ max	RS232, dry contacts	SXS Pro-EXS
SYNOR 5000 Series	8-100000	High voltage Medium current	10 A DC max	5 kV AC / 2 A max 6 kV DC / 2 A max	20-2121 V DC 50 kΩ - 5 GΩ max	Ethernet	Winpass
DT Series	2-512	Very high voltage Very high current	2 A typical	100 kV AC / 100 A max 100 kV DC / 100 A max	1.5 kV DC 200 GΩ max	RS232, 0-10V, PLC in option	Test Lab

For product datasheet, options and accessory details, or for more technical information, go to our website www.sefelec.com

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Qualify your test & measurement devices to produce with the highest level of quality

DEFINITION

A STANDARD RESISTOR IS A VERY LOW VALUE REFERENCE (FEW MICRO-OHMS) OR VERY HIGH VALUE REFERENCE (SOME TERA-OHMS), WITH THE HIGHEST LEVELS OF ACCURACY. IT CAN BE USED AS A STANDARD FOR CONTROLLING AND ADJUSTING DEVICES SUCH AS MILLIOHMMETER / MICROHMMETER OR MEGOHMMETER / TERAHMMETER.



APPLICATION

SEFELEC SUPPLIES THE WIDEST RANGE OF RESISTANCE STANDARD VALUES AVAILABLE – INCLUDING THE ABILITY TO PROVIDE PRECISION UNITS FOR SPECIAL APPLICATIONS AND WITH SPECIAL RESISTANCE VALUES FOR CUSTOMER SPECIFIC REQUIREMENTS.

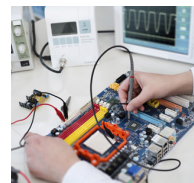
- These high quality standards are produced under strict manufacturing and quality control conditions to ensure long term stability and permanence of calibration for a wide range of applications.

- The range of resistance decade boxes includes 5, 6 and 8 decade boxes which are designed to provide highly accurate and variable standard values of resistance and current for calibration, comparison and test applications in electrical and electronic workshops, test laboratories and educational environments

- Gold plated brass contacts on the switches ensure low contact resistance and negligible thermal EMF are among a number of design features incorporated in the decade boxes to ensure precise measurement accuracy and stable loads.

- Metrology & certification laboratories

- Production & maintenance



Technical specifications

Selector guide

From the below board select the right product according to your application

Sefelec Standards resistance range	Range	Current / voltage	Accuracy	Dimensions (WxHxD)	Mass
KW	100 $\mu\Omega$ to 10 k Ω	10 mA to 60 A	$\pm 0.02\%$ to $\pm 0.1\%$	100mm x 400mm x 40mm	0.2 kg
RS3	0.1 m Ω to 1 M Ω	0.2 mA to 100 A	$\pm 0.003\%$ to $\pm 0.02\%$	160mm (high) x 90mm (\varnothing)	0.9 kg
REMA	1 M Ω to 100T Ω	Up to 1000 V DC	$\pm 1\%$ to $\pm 10\%$	110mm x 36mm x 36mm	0.1 kg
RBB 5 or 6 decades	1 Ω to 11.1111 M Ω	0.3 mA to 2 A	$\pm 0.05\%$ to $\pm 2\%$	350mm x 100mm x 80mm	0.6 kg
RBC 4, 5 or 6 decades	1.111 Ω to 111.111 Ω	22 mA to 7 A	$\pm 5\%$ or $\pm 10\%$	450mm x 105mm x 130mm	3.5 kg
00 series 5,6,8 or 10 decades	1 m Ω à 11 M Ω	from 0.3 mA to 1.4 A	$\pm 0.01\%$ to 2%	350mm x 100mm x 80mm	0.8 kg
RH9A decades	1 k Ω to 1T Ω	30 V to 5000 V	$\pm 0.1\%$ to $\pm 2\%$	460mm x 380mm x 160mm	8.8 kg
RM6 6 decades	10 Ω to 10 M Ω	0.5 mA to 100 mA	$\pm 1\%$	287mm x 65mm x 65mm	0.48 kg
RM6N decades	10 Ω to 10 M Ω	0.18 mA to 250 mA	$\pm 1\%$	190mm x 140mm x 70mm	0.49 kg
RM8 8 decades	0.01 Ω to 1 M Ω	3 mA to 1 A	$\pm 1\%$	254mm x 145mm x 80mm	0.95 kg
MTS True 4 terminals standards	1 m Ω to 100 k Ω 400 $\mu\Omega$ to 400 k Ω	1 mA to 10 A 0.45 mA to 10 A	$\pm 0.01\%$ or $\pm 0.05\%$ $\pm 0.01\%$ or $\pm 0.1\%$	215mm x 88mm x 250mm	2.8 kg
CM5-N 5 decades Capacitance box	100 pF to 11.111 μ F	Up to 250 V DC	$\pm 5\%$	330mm x 240mm x 200mm	6.5 kg

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Test safely and protect the user

DEFINITION

A SAFETY CAGE IS NECESSARY WHEN YOU WANT TO REALIZE DIELECTRIC STRENGTH TEST ON SMALL SUB-ASSEMBLIES WITH THE HIGHEST LEVEL OF SAFETY.



APPLICATION

ASSOCIATE OUR SAFETY CAGES WITH OUR DIELECTRIC STRENGTH TESTER, DIELECTRIMETER OR MEGOHMMETER IN ORDER TO REALIZE YOUR TEST AND PREVENT THE USER FROM HIGH VOLTAGE DANGERS.

- cable manufacturer (measurement on a cable sample of 1 meter)
- electrical motor, small assemblies
- electrical equipment for LVD test

SPECIFIC OVERVIEW

FROM TEST LABORATORY TO PRODUCTION LINE, OUR RANGE OF SAFETY CAGES COVER THE FOLLOWING SPECIFICATIONS

- for maximum voltage up to 35 kV
- robust safety cages and easy to carry
- in compliance with IEC1010 standard (general safety requirement)
- specific safety cage on demand

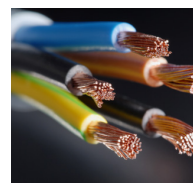
DIMENSIONS AND VOLUME

- CA001-00-00:
380 x 220 x 320 (WxHxD) mm
29 dm³
- CA002-00-00:
575 x 380 x 765 (WxHxD) mm
126 dm³
- CA003-00-00:
969 x 410 x 765 (WxHxD) mm
209 dm³

ADAPTATION

SEFELEC adapts each safety cage with the test equipment connected to it. Three connection terminals are provided inside the cage (4 mm female banana plugs):

- a red terminal for access to the high voltage
- a black terminal for the return signal
- a grey terminal for the guard



Technical specifications

Selector guide

From the below board select the right product according to your application

Sefelec Safety Cage range	Voltage	Volume	Internal dimensions (WxHxD) mm	External dimensions (WxHxD) mm
CA001-00-00	15 kV AC 21 kV DC	29 dm ³	390x212x424	430x356x465
CA002-00-00	15 kV AC 21 kV DC	126 dm ³	378x373x746	620x565x800
CA003-00-00	15 kV AC 21 kV DC	209 dm ³	958x373x746	1000x565x800
CSB-13U	35 kV AC 49 kV DC	125 dm ³	440x580x490*	600x800x600
CSB-18U	35 kV AC 49 kV DC	125 dm ³	440x580x490*	600x950x600
CSB-22U	35 kV AC 49 kV DC	125 dm ³	440x580x490*	600x1130x600
CSB-36U	35 kV AC 49 kV DC	125 dm ³	440x580x490*	600x1750x600
CSI – Inox Safety Cage	300 kV AC/DC	on demand	on demand	on demand
CSP – Shaped Safety Cage	300 kV AC/DC	on demand	on demand	on demand

* Internal dimensions and volume is identical for each CSB - External dimension varies depending on the additional equipment you need to integrate.

For product datasheet, options and accessory details, or for more technical information, go to our website www.sefelec.com

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