

# **axos** *SERIES*

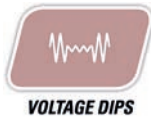
**EXPANDABLE TEST SYSTEM**



**SURGE**



**EFT / BURST**



**VOLTAGE DIPS**



**MAGNETIC FIELD**



**RING WAVE**



**TELECOM WAVE**



**SERVICES**

## **axos** *5*



## **axos** *8*



[www.haefely.com](http://www.haefely.com)

## **EMC IS ALL ABOUT STANDARDS.**

### **HAEFELY COVERS THEM IN JUST ONE SINGLE BOX.**

The standards - are you really familiar with all of them? Whether people talk about generic standards or product specific standards - stipulated by law or demanded from the manufacturer: HAEFELY has integrated all of them.

Take benefit from the most modern and easy to use conducted immunity test system ever built. Welcome to the [AXOS series](#).

#### **Indoor appliances**

| Domestic          | Industrial           | Medical    | IT        |
|-------------------|----------------------|------------|-----------|
| White goods       | Robotics             | Monitoring | Computers |
| Brown goods       | Welding machines     | Scanning   | Printers  |
| Household         | Packing machines     | Analysing  | Modems    |
| Lightning devices | Production lines     | Pumps      | Hubs      |
| Portable tools    | Laboratory equipment | Implants   | Phones    |
| Home automation   |                      |            | Servers   |

#### **Outdoor appliances**

| Renewable energy | Telecom                   | Transportation    | Defense           |
|------------------|---------------------------|-------------------|-------------------|
| Solar panels     | Outdoor lines             | Automotive        | Component testing |
| Windmills        | Repeater                  | Motorcycles       | Communications    |
| Turbines         | Switching stations        | Trucks            | Vehicles          |
| Inverters        | Data concentrators        | Electric vehicles | Aircrafts         |
| Infrastructure   | Telecommunication centers | Charging stations | Satellites        |

## THE STANDARDS



SURGE

### IEC/EN 61000-4-5 Surge Combination Wave 1.2/50 $\mu$ s...8/20 $\mu$ s

Surge events can be generated by lightning phenomena, switching transients or the activation of protection devices in the power distribution system. A surge itself is influenced by the propagation path taken so that impulses from the same event may have different forms depending upon where a measurement is taken. Combination Wave Generators (CWG) simulate a surge event in power lines close to or within buildings. Mostly the disturbances are tolerable because they are single events.



EFT / BURST

### IEC/EN 61000-4-4 Electric Fast Transients, EFT/Burst

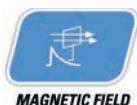
Industrial measurement and control equipment nearly always use conventional control units containing relays or other electro-mechanical switching devices. Fluorescent lamp ballast units, insufficiently suppressed motors (hair dryers, vacuum cleaners, drills, etc.) are found everywhere in the public power supply. All of these are primarily inductive loads which generate interference when switched on or off. EFT events, can cause microprocessor units to malfunction or reset, with corresponding disruption to normal operation.



VOLTAGE DIPS

### IEC/EN 61000-4-11 Voltage Dips and Interrupts

Voltage failures occur following switching operations, short-circuits, response of fuses and when running up heavy loads. The quality of the electrical power supply is increasingly becoming a central topic of discussion. The interference sources in the mains, caused by electronic power control with non-linear components e.g. thyristors are used more frequently in domestic appliances such as hotplates, heating units, washing machines, television sets, economy lamps, PCs and industrial systems with speed-controlled drives.



MAGNETIC FIELD

### IEC/EN 61000-4-9 Pulsed Magnetic Field

Under normal operating conditions, an AC current generates a steady magnetic field so that equipment, such as monitors, close to AC power lines could suffer interference. Under fault conditions, a sudden high current level can result in a short duration magnetic field. Lightning strokes or short circuit fault currents in the power network can generate high level short duration magnetic fields.

## THE STANDARDS



RING WAVE

### IEC/EN 61000-4-12 Ring Wave / IEEE C62.41

Ring waves are used to simulate lightning or switching effects in domestic single or three phase supplies within an adequately protected building. The waveform has similar characteristics in both open and short circuit conditions. The ring wave is characterised as a bipolar damped oscillating wave.



TELECOM WAVE

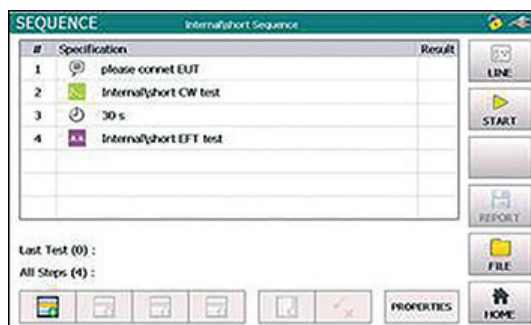
### IEC/EN 61000-4-5 Telecom Wave 10/700µs / ITU K.20, K.21, K.44, K.45

Telecommunication networks and lines are often disposed to lightning strikes and their associated effects. All telecommunication systems linked with lines installed outdoors therefore require a reliable protection which needs to be tested.

## THE SEQUENCER

Linking test to form a sequence.

Individual tests stored on the PC or in the AXOS<sup>5</sup> / AXOS<sup>8</sup> itself can be combined to form a complex and fully automated test sequence. This feature enables Surge, EFT/Burst, Voltage Dips, Ring Wave and Telecom Wave tests to be linked and run in a continuous sequence. The already pre-installed IEC and generic standards make programming easier than ever before.



## ***THE MODULAR CONCEPT***

Welcome to the unique design and concept of modularity designed by HAEFELY.

HAEFELY is recognizing an increasing interest in testing departments to configure the required functions in compact immunity test systems more flexible than ever. For that reason HAEFELY designed a unique concept of modularity which eviscerates large additional investments for customers in the future.

Moreover, constantly reduced product development times call for powerful, easy-to-operate and ready-to-use conducted immunity test systems which can be expanded in a multitude of different test applications. Customer requirements, particularly in the telecommunications and industrial electronics sector, emphasize a test system's accuracy and modularity, thus clearly pointing to easy to expand T&M equipment that is favourably priced and suitable for most of industries.

The new AXOS series has been tailored to exactly meet these requirements, offering special cost advantages for T&M applications in the development, production and servicing of telecommunications, components as well as safety and industrial electronics.

All AXOS test systems come equipped with all the hardware needed for instant upgrades by only entering optional key codes into the licence code manager of the unit. After entering the key code(s) the additional test functionalities like Surge Combination Wave, Ring Wave, Telecom Wave, EFT/Burst or Voltage Dips and Interrupts become available immediately. No direct intervention has to be done by the user at all.

## ***THE SOFTWARE***

### **Remote Control Software**

The optionally available remote control software simply enables the user to remote control the AXOS<sup>5</sup> and AXOS<sup>8</sup> by using a remote device like a standard PC, Tablet or Smartphone. The connection can either be established by putting in a ethernet cable "point to point" or via wifi network (a separate access point will be required).

### **Reporting Software**

The reporting software creates automatically a test report. The main header can be adjusted with the individual company logo or any other text required. The data input can either be supplied directly via the remote control software or when saving the data on a USB drive. Furthermore, the data can be used from the sequence mode menu directly and the report gets generated. Detailed information will be provided with the reporting software tool itself. The reporting software is compatible with both Windows 7 and Windows 8 (32- and 64-bit).



## AXOS<sup>5</sup> EXPANDABLE TEST SYSTEM

# axos<sup>5</sup>

The new AXOS<sup>5</sup> expandable test system integrates all of the best features of several stand-alone test systems into one single economic solution.

It can be individually combined either with 5 kV Surge Combination Wave, 5 kV EFT/Burst, Dips & Interrupts, along with an integrated single-phase coupling / decoupling network. This allows quick and completely automated testing to the most common IEC, EN, ANSI, IEEE and UL standards.

The AXOS<sup>5</sup> can either be operated via front panel by large colour graphic interface or remotely from the PC. The easy to use menu together with the availability of predefined test routines for different standards makes testing easy and reliable, even for less frequently users.

Numerous additional functions such as external start/stop function allows easy integration of the test system also in customer specific test environments.

All the test parameters can be varied in a broad range wide above the requirements of the standards. Together with the ability of changing test parameters during test, AXOS<sup>5</sup> is not only the ideal product for compliance and pre-compliance testing, it is useful for monitoring & debugging function during design phase as well.

A wide range of cost-efficient and user friendly coupling / decoupling networks for power lines as well as for symmetrical and asymmetrical data- and signal lines are available as options.



AXOS<sup>5</sup> front view



AXOS<sup>5</sup> rear view



# OVERVIEW

## FEATURES & BENEFITS

- Easy to operate with manual and automated test modes, software assisted test preparation, pre-defined test routines and visual aided test setups
- Economic & Efficient  
Touch screen guarantees reduction of time and effort - Experience and know-how at a reasonable price
- Safe and reliable operation by using safety interlock, warning lamp and emergency stop functions
- Voltage and current monitoring of surge impulses and EUT power provides valuable feedback to the test engineer
- Automatic generation of test report, including test parameters, test setup and test result

## APPLICATIONS

- Compliance & pre-compliance testing of electrical products
- CE marking
- Product development and debugging
- Compliance testing of telecom and wireless devices

## STANDARDS

- IEC/EN 61000-4-4 EFT / Burst
- IEC/EN 61000-4-5 Surge Edition 2 & 3
- IEC/EN 61000-4-9 Imp Magnetic Field
- IEC/EN 61000-4-11  
AC Dips and Interrupts
- IEC/EN 61000-4-29  
DC Dips and Interrupts
- IEC/EN 61000-6-1 Generic Residential
- IEC/EN 61000-6-2 Generic Industrial
- IEC/EN 60335-1 Household
- IEC/EN 60601-1 Medical
- and many more

## INDUSTRIES

- Industrial
- Residential
- Components
- Medical
- Renewable energy
- Telecom



## TECHNICAL DATA - AXOS<sup>5</sup>

| GENERAL DATA                      |  |  |   |
|-----------------------------------|--|--|---|
| <b>Control power</b>              | 85 V - 264 V<br>50/60 Hz                   | <b>Dimensions<br/>(W x H x D)</b>      | 19" / 4U<br>(45 x 18 x 49 cm)                                 |
| <b>User test storage</b>          | unlimited                                  | <b>Weight</b>                          | 25 kg   |
| <b>Remote interface</b>           | Ethernet, RJ45                             | <b>USB</b>                             | for USB memory stick  |
| <b>Display</b>                    | 7" / 800x480 / 24 bit<br>with touch-screen | <b>AUX. interface</b>                  | D-sub 37p for external<br>CDN, external trans-<br>former etc. |
| <b>External trigger<br/>input</b> | 5 VTTL                                     | <b>Synch input</b>                     | BNC, 10 V – 264 V AC  |
| <b>Trigger output</b>             | 5 VTTL                                     | <b>External start / stop<br/>input</b> | 5 VTTL, starts / stops<br>predefined test se-<br>quence       |
| <b>EUT failed input</b>           | 5 VTTL                                     | <b>Analog output</b>                   | 0 – 10 V, for use with<br>external options                    |
| <b>Warning lamp<br/>output</b>    | 2 x 24 V / 1 A DC                          | <b>Safety circuit</b>                  | stops the test when<br>unlocked                               |

| IEC / EN 61000-4-4 EDITION 2 & 3 EFT / BURST |  |  |  |
|--|--|--|--|
| <b>Output voltage</b>                        | 0.2 – 5.0 kV $\pm 10\%$<br>at coaxial output                       | <b>Spike frequency</b>   | 1 Hz – 1 MHz                                 |
| <b>Polarity</b>                              | pos / neg / alternate  | <b>Burst duration</b>  | 10 $\mu$ s – 1 s                             |
| <b>Output impedance</b>                      | 50 Ohm   | <b>Burst period</b>  | 1 ms – 10 s                                  |
| <b>Rise time</b>                             | 5 ns $\pm 30\%$  | <b>Test time</b>   | 1 s– 1'000 minutes                           |
| <b>Impulse duration</b>                      | 50 ns $\pm 30\%$ at<br>50 Ohm<br>50 ns –15 +100 ns at<br>1'000 Ohm | <b>Trigger</b>   | automatic, manual,<br>external trigger input |
| <b>Burst mode</b>                            | normal, continuous,<br>real, random                                | <b>Integrated single<br/>phase coupling /<br/>decoupling network</b> | 264 V AC / 16 A<br>220 V DC / 10 A           |



| IEC / EN 61000-4-5 EDITION 2 & UPCOMING EDITION 3 SURGE COMBINATION WAVE |   |                                    |   |
|--|---|------------------------------------|---|
| <b>Output voltage</b>  | 0.2 – 5.0 kV ±10%                           | <b>Output current</b>              | 0.1 – 2.5 kA ±10%   |
| <b>Voltage rise time</b>   | 1.2 µs ±30%                                 | <b>Current rise time</b>           | 8 µs ±20%   |
| <b>Voltage duration</b>  | 50 µs ±20%                                  | <b>Current duration</b>            | 20 µs ±20%  |
| <b>Polarity</b>  | positive / negative / alternate             | <b>Integrated single phase CDN</b> | 264 V AC / 16 A<br>220 V DC / 10 A                          |
| <b>Output impedance</b>  | 2 Ohm                                       |                                    |   |
| <b>Phase sync</b>  | 0 – 359° with 1° steps or asynchronous mode | <b>Impulse trigger</b>             | automatic 2 s – 100 min<br>manual<br>external trigger input |
| <b>Counter preselect</b>   | 1 – 1'000 / infinite                        |                                    |   |
| <b>Counter</b>   | 100'000                                     |                                    |   |
| <b>Peak voltage monitor</b>  | BNC output: 1000:1<br>display: 3 digits     | <b>Peak current monitor</b>        | BNC output: 1 kA/V<br>display: 3 digits                     |

| IEC / EN 61000-4-11 EDITION 2 AND IEC / EN 61000-4-29 DIPS & INTERRUPTS |   |                            |  |
|---|---|----------------------------|--|
| <b>Max. voltage</b>   | 264 V AC/DC   | <b>Interrupt time</b>      | 0.5 period – 800 periods<br>100 µs – 1000 minutes                  |
| <b>Max. current</b>   | 16 A AC/DC continuous<br>20 A for 5 s<br>23 A for 3 s<br>40 A for 3 s<br>> 500 A inrush current | <b>Interval time</b>       | 1 period – 800 periods<br>synch<br>100 µs – 1000 minutes<br>asynch |
| <b>Trigger</b>  | automatic<br>manual<br>external trigger input   | <b>Test time</b>           | 1 s – 1000 minutes<br>infinite                                     |
| <b>Interrupt dip level</b>  | 0%<br>0% – 99% with external voltage source   | <b>Phase sync</b>          | 0 – 359° 16 / 40 / 50 / 60 Hz<br>asynchronous mode                 |
| <b>RMS voltage monitor</b>  | BNC output: 100:1<br>display: 4 digits  | <b>RMS current monitor</b> | BNC output: 10 A/V<br>display: 4 digits                            |

## OVERVIEW OF AXOS<sup>5</sup> SERIES



**AXOS<sup>5</sup>**  
Compact Test System  
Article no. 2490400

Surge 1.2/50 $\mu$ s...8/20 $\mu$ s  
IEC/EN 61000-4-5

EFT/Burst  
IEC/EN 61000-4-4

Voltage Dips  
IEC/EN 61000-4-11\*

Magnetic Field  
IEC/EN 61000-4-9\*\*



**AXOS<sup>5</sup>**  
Surge Test System  
Article no. 2490401

Surge 1.2/50 $\mu$ s...8/20 $\mu$ s  
IEC/EN 61000-4-5

EFT/Burst  
IEC/EN 61000-4-4

Voltage Dips  
IEC/EN 61000-4-11\*

Magnetic Field  
IEC/EN 61000-4-9\*\*



**AXOS<sup>5</sup>**  
EFT/Burst Test System  
Article no. 2490402

Surge 1.2/50 $\mu$ s...8/20 $\mu$ s  
IEC/EN 61000-4-5

EFT/Burst  
IEC/EN 61000-4-4

Voltage Dips  
IEC/EN 61000-4-11\*

Magnetic Field  
IEC/EN 61000-4-9\*\*



**AXOS<sup>5</sup>**  
Dips Test System  
Article no. 2490403

Surge 1.2/50 $\mu$ s...8/20 $\mu$ s  
IEC/EN 61000-4-5

EFT/Burst  
IEC/EN 61000-4-4

Voltage Dips  
IEC/EN 61000-4-11\*

Magnetic Field  
IEC/EN 61000-4-9\*\*

- Activated by default
- Optionally available by activation via key code

\*external voltage dips transformer "DIP 116" required

\*\*additional antenna coil "MSURGE-A" required

## **SCOPE OF SUPPLY - OPTIONS & ACCESSORIES**

### **SCOPE OF SUPPLY**

|  |         |
|--|---------|
| AXOS <sup>5</sup> Compact Immunity Test System | 2490400 |
| AXOS <sup>5</sup> Surge Test System            | 2490401 |
| AXOS <sup>5</sup> EFT/Burst Test System        | 2490402 |
| AXOS <sup>5</sup> Voltage Dips Test System     | 2490403 |

|        |  |
|--------|--|
| Qty. 1 | Immunity Test System AXOS <sup>5</sup> |
| Qty. 1 | Mains Cable                            |
| Qty. 1 | User Manual                            |
| Qty. 1 | Certificate of Calibration             |

### **OPTIONS AND ACCESSORIES**

|                    |   |         |
|--------------------|---|---------|
| FP-EFT 32M         | 3-Phase CDN EFT/Burst 32 A / 690 V                    | 2490170 |
| FP-EFT 100M2       | 3-Phase CDN EFT/Burst 100 A / 690 V                   | 2495860 |
| IP4A               | Capacitive Coupling Clamp for EFT/Burst               | 2491300 |
| FP-SURGE 32A       | Automatic 3-Phase CDN Surge 32 A / 690 V              | 2490700 |
| FP-SURGE 100M2     | 3-Phase CDN Surge 100A / 690 V                        | 2490180 |
| PCD 121            | Symmetrical Data & Control Line Coupler               | 2498010 |
| PCD 126A           | Asymmetrical Data & Control Line Coupler              | 2498030 |
| DEC 5              | Symmetrical Data & Control Line Decoupler             | 2490141 |
| DEC 6              | Symmetrical Data & Control Line Decoupler             | 2490151 |
| DEC 7              | Asymmetrical Data & Control Line Decoupler            | 2490161 |
| DIP 116            | Automatic Dips Transformer 16 A 40/70/80%             | 2490410 |
| MSURGE-A           | Magnetic Field Test IEC / EN 61000-4-9                | 2490441 |
| VTM 15000          | Isolation Test 1.2/50 us up to 10 kV                  | 2499960 |
| VTM 15000/05       | Isolation Test 1.2/50 us up to 10 kV / 0.5J           | 2499692 |
| PDP 8000           | HV Differential Probe 1000:1 for Surge                | 2499911 |
| CP 101             | Current Probe Model for Surge                         | 2499931 |
| ES                 | External Emergency Stop Switch P12                    | 4700751 |
| WL                 | External Warning Lamp P12                             | 4700750 |
| Calibration        | Accredited ISO 17025 Calibration AXOS <sup>5</sup>    | 2490420 |
| Surge Key Code     | Key Code for Surge extension AXOS <sup>5</sup>        | 4700814 |
| EFT/Burst Key Code | Key Code for EFT/Burst extension AXOS <sup>5</sup>    | 4700815 |
| Dips Key Code      | Key Code for Voltage Dips extension AXOS <sup>5</sup> | 4700816 |
| Remote Control     | Remote Control Software for AXOS <sup>5</sup>         | 2490440 |
| Report Software    | Reporting Software for AXOS <sup>5</sup>              | 4700975 |

## AXOS<sup>8</sup> EXPANDABLE TEST SYSTEM

# axos<sup>8</sup>

The new AXOS<sup>8</sup> expandable test system integrates all of the best features of several stand alone test systems into one single economic solution.

It can be individually combined either with 7 kV Surge Combination Wave, 7 kV Ring Wave, 7 kV Telecom Wave\*, 5 kV EFT/Burst or Dips & Interrupts, along with an integrated single-phase coupling / decoupling network. This allows quick and completely automated testing to the most common IEC, EN, ANSI, ITU, IEEE and UL standards.

The AXOS<sup>8</sup> can either be operated via front panel by large colour graphic interface or remotely from the PC. The easy to use menu together with the availability of predefined test routines for different standards makes testing easy and reliable, even for less frequently users. Numerous additional functions such as external start/stop function allows easy integration of the test system also in customer specific test environments.

All the test parameters can be varied in a broad range wide above the requirements of the standards. Together with the ability of changing test parameters during test, AXOS<sup>8</sup> is not only the ideal product for compliance and pre-compliance testing, it is useful for monitoring & debugging function during design phase as well.

A wide range of cost-efficient and user friendly coupling / decoupling networks for power lines as well as for symmetrical and asymmetrical data- and signal lines are available as options.



AXOS<sup>8</sup> front view



AXOS<sup>8</sup> rear view

\*external Telecom Wave Modul "TW8" required

# OVERVIEW

## FEATURES & BENEFITS

- Easy to operate with manual and automated test modes, software assisted test preparation, pre-defined test routines and visual aided test setups
- Economic & Efficient  
Touch screen guarantees reduction of time and effort - Experience and know-how at a reasonable price
- Safe and reliable operation by using safety interlock, warning lamp and emergency stop functions
- Voltage and current monitoring of surge impulses and EUT power provides valuable feedback to the test engineer
- Automatic generation of test report, including test parameters, test setup and test result

## APPLICATIONS

- Compliance & pre-compliance testing of electrical products
- CE marking
- Product development and debugging
- Compliance testing of telecom and wireless devices
- Overtesting

## STANDARDS

- IEC/EN 61000-4-4 EFT / Burst
- IEC/EN 61000-4-5 Surge Edition 2 & 3 (1.2/50µs...8/20µs)
- IEC/EN 61000-4-5 Surge (10/700µs)\*
- IEC/EN 61000-4-9 Magnetic Field\*\*
- IEC/EN 61000-4-11  
AC Dips and Interrupts\*\*\*
- IEC/EN 61000-4-12 Ring Wave
- IEC/EN 61000-4-29  
DC Dips and Interrupts
- IEC/EN 61000-6-1 Generic Residential
- IEC/EN 61000-6-2 Generic Industrial
- IEC/EN 60335-1 Household
- IEC/EN 60601-1 Medical
- IEC/EN 60950
- EN 55024
- IEEE C62.41
- ITU K.20, K.21, K.44, K.45

\* in combination with external Telecom Wave Modul "TW8"

\*\* additional antenna coil "MSURGE-A" required

\*\*\* external voltage dips transformer "DIP 116" required

## TECHNICAL DATA - AXOS<sup>8</sup>

| GENERAL DATA                      |  |  |   |
|-----------------------------------|--|--|---|
| <b>Control power</b>              | 85 V - 264 V<br>50/60 Hz                   | <b>Dimensions<br/>(W x H x D)</b>      | 22" / 6U<br>(45 x 27 x 50 cm)                                 |
| <b>User test storage</b>          | unlimited                                  | <b>Weight</b>                          | 30 kg   |
| <b>Remote interface</b>           | Ethernet, RJ45                             | <b>USB</b>                             | for USB memory stick  |
| <b>Display</b>                    | 7" / 800x480 / 24 bit<br>with touch-screen | <b>AUX. interface</b>                  | D-sub 37p for external<br>CDN, external trans-<br>former etc. |
| <b>External trigger<br/>input</b> | 5 VTTL                                     | <b>Synch input</b>                     | BNC, 10 V – 264 V AC  |
| <b>Trigger output</b>             | 5 VTTL                                     | <b>External start / stop<br/>input</b> | 5 VTTL, starts / stops<br>predefined test se-<br>quence       |
| <b>EUT failed input</b>           | 5 VTTL                                     | <b>Analog output</b>                   | 0 – 10 V, for use with<br>external options                    |
| <b>Warning lamp<br/>output</b>    | 2 x 24 V / 1 A DC                          | <b>Safety circuit</b>                  | stops the test when<br>unlocked                               |

| IEC / EN 61000-4-4 EDITION 2 & 3 EFT / BURST |   |  |  |
|--|---|--|--|
| <b>Output voltage</b>                        | 0.2 – 5.0 kV $\pm 10\%$ at<br>coaxial output                        | <b>Spike frequency</b>   | 1 Hz – 1 MHz                                 |
| <b>Polarity</b>                              | pos / neg / alternate   | <b>Burst duration</b>  | 10 $\mu$ s – 1 s                             |
| <b>Output impedance</b>                      | 50 Ohms   | <b>Burst period</b>  | 1 ms – 10 s                                  |
| <b>Rise time</b>                             | 5 ns $\pm 30\%$   | <b>Test time</b>   | 1 s – 1000 minutes                           |
| <b>Impulse duration</b>                      | 50 ns $\pm 30\%$ at 50<br>Ohm<br>50 ns – 15 + 100 ns at<br>1000 Ohm | <b>Trigger</b>   | automatic, manual,<br>external trigger input |
| <b>Burst mode</b>                            | normal, continuous,<br>real, random                                 | <b>Integrated single<br/>phase coupling /<br/>decoupling network</b> | 264 V AC / 16 A<br>220 V DC / 10 A           |

| IEC / EN 61000-4-5 EDITION 2 & UPCOMING EDITION 3 SURGE COMBINATION WAVE |   |  |   |
|--|---|--|---|
| <b>Output voltage</b>  | 0.2 – 7.0 kV $\pm 10\%$                           | <b>Output current</b>                  | 0.1 – 3.5 kA $\pm 10\%$                                     |
| <b>Voltage rise time</b>   | 1.2 $\mu$ s $\pm 30\%$                            | <b>Current rise time</b>               | 8 $\mu$ s $\pm 20\%$  |
| <b>Voltage duration</b>  | 50 $\mu$ s $\pm 20\%$                             | <b>Current duration</b>                | 20 $\mu$ s $\pm 20\%$                                       |
| <b>Polarity</b>  | pos / neg / alternate                             | <b>Integrated single<br/>phase CDN</b> | 264 V AC / 16 A<br>220 V DC / 10 A                          |
| <b>Output impedance</b>  | 2 Ohms  | <b>Impulse trigger</b>                 | automatic 2 s – 100 min<br>manual<br>external trigger input |
| <b>Phase sync</b>  | 0 – 359° with 1° steps<br>or asynchronous<br>mode |  |   |
| <b>Counter preselect</b>   | 1 – 1000 / infinite                               |  |   |
| <b>Counter</b>   | 100000  |  |   |
| <b>Peak voltage<br/>monitor</b>  | BNC output: 1000:1<br>display: 3 digits           | <b>Peak current<br/>monitor</b>        | BNC output: 1 kA/V<br>display: 3 digits                     |



| IEC / EN 61000-4-5 Telecom Wave / ITU K.20, K.21, K.44, K.45 (external TW 8 module) |                        |                                    |  |
|---|------------------------|------------------------------------|--|
| <b>Output voltage</b>   | 0.2 - 7.0 kV $\pm$ 10% | <b>Source impedance / coupling</b> | 15 Ohm x 1<br>40 Ohm x 4<br>40 Ohm gas arresters x 4 |
| <b>Front time OCV</b>   | 10 $\mu$ s $\pm$ 30%   | <b>Front time SCC</b>              | 5 $\mu$ s $\pm$ 20%                                  |
| <b>Decay time OCV</b>   | 700 $\mu$ s $\pm$ 20%  | <b>Front time SCC</b>              | 5 $\mu$ s $\pm$ 20%                                  |
| <b>Polarity</b>   | Pos., neg., alt.       | <b>Weight</b>                      | 10 kg  |
| <b>Outputs</b>  | 4 mm banana socket     | <b>Dimensions</b>                  | 19" / 4U, (45 x 18 x 49 cm)                          |

| IEC / EN 61000-4-11 EDITION 2 AND IEC / EN 61000-4-29 DIPS & INTERRUPTS |   |                            |   |
|---|---|----------------------------|---|
| <b>Max. voltage</b>   | 264 V AC/DC   | <b>Interrupt time</b>      | 0.5 period – 800 periods<br>100 $\mu$ s – 1000 minutes                  |
| <b>Max. current</b>   | 16 A AC/DC continuous<br>20 A for 5 s<br>23 A for 3 s<br>40 A for 3 s<br>> 500 A inrush current | <b>Interval time</b>       | 1 period – 800 periods<br>synch<br>100 $\mu$ s – 1000 minutes<br>asynch |
| <b>Trigger</b>  | automatic<br>manual<br>external trigger input   | <b>Test time</b>           | 1 s – 1000 minutes<br>infinite  |
| <b>Interrupt dip level</b>  | 0%<br>0% – 99% with external voltage source   | <b>Phase sync</b>          | 0 – 359° 16 / 40 / 50 / 60 Hz<br>asynchronous mode                      |
| <b>RMS voltage monitor</b>  | BNC output: 100:1<br>display: 4 digits  | <b>RMS current monitor</b> | BNC output: 10 A/V<br>display: 4 digits                                 |

| IEC / EN 61000-4-12 EDITION 2 AND ANSI / IEEE C62.41 Ring Wave |   |                             |   |
|--|---|-----------------------------|---|
| <b>Max. voltage</b>  | 0.2 - 7.0 kV $\pm$ 10%                  | <b>Repetition rate</b>      | Up to 30 pulses / min   |
| <b>Frequency</b>   | 100 kHz                                 | <b>Polarity</b>             | Positive / negative / alternate   |
| <b>Rise time OC</b>  | 5 $\mu$ s                               | <b>Floating output</b>      | Max. 460 V / AC   |
| <b>Rise time SC</b>  | 1 $\mu$ s                               | <b>Phase sync accuracy</b>  | $\pm$ 1°  |
| <b>Impedance</b>   | 12 Ohm, 30 Ohm                          | <b>Damping rate</b>         | 0.4 < peak1/peak2 < 1.1<br>0.4 < peak3/peak2 < 1.1<br>0.4 < peak4/peak3 < 1.1 |
| <b>Peak voltage monitor</b>                                    | BNC output: 1000:1<br>Display: 3 digits | <b>Peak current monitor</b> | BNC output: 1kA / V<br>Display: 3 digits                                      |

## OVERVIEW OF AXOS<sup>8</sup> SERIES



**AXOS<sup>8</sup>**  
Compact Test System  
Article no. 2490800

Surge 1.2/50 $\mu$ s...8/20 $\mu$ s  
IEC/EN 61000-4-5

Telecom Wave 10/700 $\mu$ s\*  
IEC/EN 61000-4-5 & ITU

Ring Wave  
IEEE C62.41

EFT/Burst  
IEC/EN 61000-4-4

Voltage Dips  
IEC/EN 61000-4-11\*

Magnetic Field  
IEC/EN 61000-4-9\*\*



**AXOS<sup>8</sup>**  
Surge Test System  
Article no. 2490810

Surge 1.2/50 $\mu$ s...8/20 $\mu$ s  
IEC/EN 61000-4-5

Telecom Wave 10/700 $\mu$ s\*  
IEC/EN 61000-4-5 & ITU

Ring Wave  
IEEE C62.41

EFT/Burst  
IEC/EN 61000-4-4

Voltage Dips  
IEC/EN 61000-4-11\*

Magnetic Field  
IEC/EN 61000-4-9\*\*



**AXOS<sup>8</sup>**  
Dips Test System  
Article no. 2490840

Surge 1.2/50 $\mu$ s...8/20 $\mu$ s  
IEC/EN 61000-4-5

Telecom Wave 10/700 $\mu$ s\*  
IEC/EN 61000-4-5 & ITU

Ring Wave  
IEEE C62.41

EFT/Burst  
IEC/EN 61000-4-4

Voltage Dips  
IEC/EN 61000-4-11\*

Magnetic Field  
IEC/EN 61000-4-9\*\*



**AXOS<sup>8</sup>**  
EFT/Burst Test System  
Article no. 2490830

Surge 1.2/50 $\mu$ s...8/20 $\mu$ s  
IEC/EN 61000-4-5

Telecom Wave 10/700 $\mu$ s\*  
IEC/EN 61000-4-5 & ITU

Ring Wave  
IEEE C62.41

EFT/Burst  
IEC/EN 61000-4-4

Voltage Dips  
IEC/EN 61000-4-11\*

Magnetic Field  
IEC/EN 61000-4-9\*\*

\* in combination with external Telecom Wave Modul "TW8"  
\*\* external voltage dips transformer "DIP 116" required  
\*\*\* additional antenna coil "MSURGE-A" required



AXOS<sup>8</sup>  
 Ring Wave Test System  
 Article no. 2490820

Surge 1.2/50µs...8/20µs  
 IEC/EN 61000-4-5

Telecom Wave 10/700µs\*  
 IEC/EN 61000-4-5 & ITU

Ring Wave  
 IEEE C62.41

EFT/Burst  
 IEC/EN 61000-4-4

Voltage Dips  
 IEC/EN 61000-4-11\*

Magnetic Field  
 IEC/EN 61000-4-9\*\*



AXOS<sup>8</sup>  
 Telecom Wave System  
 Article no. 2490850

Surge 1.2/50µs...8/20µs  
 IEC/EN 61000-4-5

Telecom Wave 10/700µs\*  
 IEC/EN 61000-4-5 & ITU

Ring Wave  
 IEEE C62.41

EFT/Burst  
 IEC/EN 61000-4-4

Voltage Dips  
 IEC/EN 61000-4-11\*

Magnetic Field  
 IEC/EN 61000-4-9\*\*

- Activated by default
- Optionally available by activation via key code

\* in combination with external Telecom Wave Modul "TW8" (included in 2490850)  
 \*\* external voltage dips transformer "DIP 116" required  
 \*\*\* additional antenna coil "MSURGE-A" required



## SCOPE OF SUPPLY - OPTIONS & ACCESSORIES

### SCOPE OF SUPPLY

|  |         |
|--|---------|
| AXOS <sup>8</sup> Compact Immunity Test System | 2490800 |
| AXOS <sup>8</sup> Surge Test System            | 2490810 |
| AXOS <sup>8</sup> EFT/Burst Test System        | 2490830 |
| AXOS <sup>8</sup> Voltage Dips Test System     | 2490840 |
| AXOS <sup>8</sup> Ring Wave Test System        | 2490820 |
| AXOS <sup>8</sup> Telecom Wave Test System     | 2490850 |

|        |   |
|--------|---|
| Qty. 1 | Immunity Test System AXOS <sup>8</sup>    |
| Qty. 1 | Telecom Wave Modul "TS 8" 10/700 $\mu$ s* |
| Qty. 1 | Mains Cable                               |
| Qty. 1 | User Manual                               |
| Qty. 1 | Certificate of Calibration                |

### OPTIONS AND ACCESSORIES

|                |  |         |
|----------------|--|---------|
| FP-EFT 32M     | 3-Phase CDN EFT/Burst 32 A / 690 V                                     | 2490170 |
| FP-EFT 100M2   | 3-Phase CDN EFT/Burst 100 A / 690 V                                    | 2495860 |
| IP4A           | Capacitive Coupling Clamp for EFT/Burst                                | 2491300 |
| FP-SURGE 32A   | Automatic 3-Phase CDN Surge 32 A / 690 V                               | 2490700 |
| FP-SURGE 100M2 | 3-Phase CDN Surge 100A / 690 V   | 2490180 |
| TW 8           | Telecom Wave Modul 10/700 $\mu$ s                                      | 4700915 |
| PCD 121        | Symmetrical Data & Control Line Coupler                                | 2498010 |
| PCD 126A       | Asymmetrical Data & Control Line Coupler                               | 2498030 |
| DEC 5          | Symmetrical Data & Control Line Decoupler                              | 2490141 |
| DEC 6          | Symmetrical Data & Control Line Decoupler                              | 2490151 |
| DEC 7          | Asymmetrical Data & Control Line Decoupler                             | 2490161 |
| DIP 116        | Automatic Dips Transformer 16 A 40/70/80%                              | 2490410 |
| MSURGE-A       | Magnetic Field Test IEC / EN 61000-4-9                                 | 2490441 |
| VTM 15000      | Isolation Test 1.2/50 us up to 10 kV                                   | 2499960 |
| VTM 15000/05   | Isolation Test 1.2/50 us up to 10 kV / 0.5J                            | 2499692 |
| PDP 8000       | HV Differential Probe 1000:1 for Surge                                 | 2499911 |
| CP 101         | Current Probe Model for Surge  | 2499931 |
| ES             | External Emergency Stop Switch P12                                     | 4700751 |
| WL             | External Warning Lamp P12  | 4700750 |
| Calibration    | Accredited Calibration AXOS <sup>8</sup><br>according to ISO/IEC 17025 | 2490900 |

\* only with AXOS<sup>8</sup> Telecom Wave Test System (2490850)

## OPTIONS AND ACCESSORIES

|                    |   |         |
|--------------------|---|---------|
| Surge Key Code     | Key Code for Surge extension AXOS <sup>®</sup>        | 4700911 |
| EFT/Burst Key Code | Key Code for EFT/Burst extension AXOS <sup>®</sup>    | 4700912 |
| Ring Wave Key Code | Key Code for Ring Wave extension AXOS <sup>®</sup>    | 4700913 |
| Dips Key Code      | Key Code for Voltage Dips extension AXOS <sup>®</sup> | 4700914 |
| Remote Control     | Remote Control Software for AXOS <sup>®</sup>         | 2490440 |
| Report Software    | Reporting Software for AXOS <sup>®</sup>              | 4700975 |

## VALUE ADDED SERVICES

- Pre- & After Sales Support
- Application Support
- Commissioning
- Warranty Extension
- Calibration (accredited & factory)
- Training and Seminars
- Rental units







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