

# ZPA-AC-100-0050-OGW

Two-Part-Testsystem

100 000 V AC / 50 mA

Product Information Sheet



## Short summary - overview

|                       |   |
|-----------------------|---|
| Item number           | 206418  |
| Test voltage          | 1 000 – 100 000 V AC,<br>PI – regulated             |
| Test current, limit   | 0,5 - 50 mA   |
| Power                 | > 5 000 VA  |
| Short circuit current | > 50 mA   |
| Testing time          | 1 s - 99 min, endless                               |
| Grounded on one side  | for applications with fixed<br>high voltage cabling |



## Functions and range of application

- Over limit trip and peak detection
- Voltage ramp, key panel interlock, minimum current monitoring
- Remote-controllable (DLL, ASCII, LabVIEW, C#, DataView, Digital-IO)
- 15 programmable sets of parameters
- Signalling: Acoustic, optical and via interface
- Safety circuit including two interlock safety relays

### Universal usage

- Individual test device
- In semi-automatic test stations

### Remote-controllable

- Control interface (RS232) for remote control by PC (DLL, ASCII, LabVIEW, C# or GUI software Dataview)
- Digital interface for remote control by PLC (Start, Stopp, In Operation, Failed, Passed)

### Usage

- Testing with fixed cables
- As system component within a test field
- Test of railway vehicles
- Test of materials (e.g. cables, electric motors, insulating foils, isolation materials, ...)

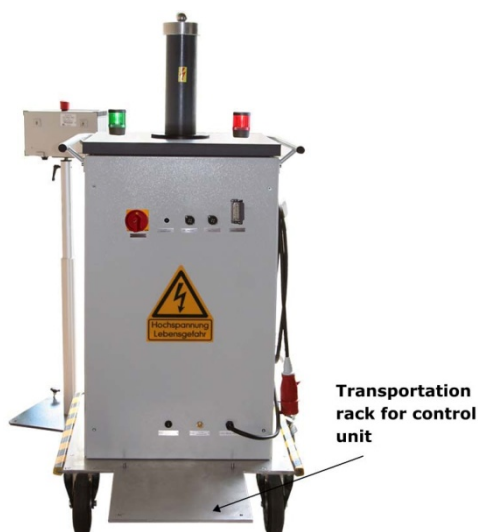
## Device views

### Front side



- LED – display elements
- Display of preset and actual values: Voltage, current, testing time
- Pushbuttons for setting-up test parameters
- Function selection buttons
- Signalling: danger, test running, test fail, type of fault

### Back side



### Interfaces and connections

- Control interface / Digital IO
- RS232 Interface
- ETL CAN bus for controlling peripheral equipment (Relay matrix, etc... )
- Safety circuit, signal lights
- Fuses
- Mains voltage

## Description of the construction

- The test unit exists out of power unit and of a separate control unit.
- The power unit is located in a mobile separate test trolley.
- The power unit is containing all necessary components for generating and measuring the high voltage. The integrated processing unit will submit all relevant data to the control unit.
- The wiring between processing unit and control unit, for electrical connection and for processing, has a length of 10 m (other lengths available on request), to guarantee a well dimensioned and secure distance to the high voltage supply unit.
- The control unit allows data management and the programming of test sequences. This unit also contains a security circuit and a function that allows sequence starts only on following a specified switching procedure.

- The high voltage will be provided by an oil-immersed transformer. The high voltage output terminal is located on top of the transformer unit.
- The high voltage will rise regarding a ramp-function, from zero up to the desired testing voltage. This will be done by a motor driven adjustable transformer.
- The unit also includes warning lamps regarding EN 50191, to visualize the state of danger.
- Highly stressed parts are corresponding to classic machinery engineering, to ensure a high lifetime of the device.
- The equipment is secure and easy to use.

## Detailed functional description

### Shut-down over limit detection and peak detection

Insulation fault of the test object can be detected by several criteria. Insulation fault alarm will be triggered by a current over limit exceedance or by a special peak detection in order to detect even low-energy spikes.

### Voltage ramp and detection of disruptive discharge voltage

The voltage ramp can be switched on in addition. Parameters like rise time and fall time are freely selectable. The voltage ramp enables safe testing and it is absolutely necessary for testing to norms which require special voltage curves. The voltage at which an isolation fault is detected, will be permanently displayed as a flashing value.

### Key panel interlock

The key panel interlock prevents incorrect setting of parameters. It can be set up individually. For example all pushbuttons may be locked. Also desired functions can be left unlocked.

### Test device for operating "Stand-Alone" or remotely controlled via interface

The test device can be controlled by a Windows software (user interface software DataView), by a self created custom software application (LabView, DLL, C#), simple command parameters (ASCII) or digitally with a PLC (Digital-IO).

### Freely programmable sets of parameters

15 freely programmable sets of parameters are available for recalling test parameters.

### Signalling: Acoustic, optical and communication interface

Faulty test objects can be reliably identified. Indication lights will also flash additionally.

### Safety circuit including two forcibly guided safety relays

The safety technology is designed according to EN 50191.

### Measuring of current and voltage directly on the high voltage section

Direct measurement guarantees absolute accurate test results.

### Regulated test voltage

Continuously PI-controlled (power integral) test voltage is stabilized regardless of fluctuations in the mains voltage.

### High voltage

The test voltage is grounded on one side. Only for applications with fixed high voltage cabling (2. HV-pole, grounded).

### Individual setup

Start options, language, behaviour of digital IO interface, voltage ramp options, options for connection and cable break monitoring, etc.

### Updatable via interface

For customer specific adaptations and updates.

## Interfaces

### Control interface / Digital-IO

Digital interface for connection to a PLC, footswitch or a remote panel including signalling of start, stop, good result, bad result, faulty test object and in operation.

### RS232 / PC-interface

For Computer connection. All parameters are selectable in a major control program. The defined test values will be automatically adjusted by the test device. The RS232 interface also allows permanent data logging and controlling of status information.

PC-software options are: The data management software DataView or drivers (DLL, ASCII, LabVIEW, C#) for your own application.

### RS232 / ASCII printout

Direct connection for a terminal program or to a protocol printer. Results are sent by the device in ASCII format and can be read from the interface alternatively to the other software options. The output language is adjustable.

### CAN-Interface

Expansion of the test system by add-on features and by further extensions. Any number of ETL test devices and CAN-components may be attached to this interface in a row and can be remotely controlled.

### Safety circuit

For integrating an adequate custom safety circuit regarding EN 50191. Three different circuit arrangements are available for standardized testing with test pistols, test cages or transfer lines.

### Signal light connector

For connecting a signal light combination consisting of red and green allround lights. According to EN 50191.

## Specifications, device characteristics

### Test voltage

|                                   |   |
|-----------------------------------|---|
| Setup range                       | 1 000 – 100 000 V AC                                    |
| Resolution, Digit                 | 10 V  |
| Measurement inaccuracy, precision | 1 % of measured value +/- 2 Digits                      |
| Frequency of voltage              | 50 Hz / 60 Hz, depending on mains frequency             |
| Curve shape                       | sine-shaped according to EN 61180, depending on mains   |
| Voltage stability                 | regulated output voltage, PI-regulated                  |
| Power                             | > 5 000 VA  |
| Zero-voltage switching            | test voltage on- off- switching occurs on zero crossing |
| Voltage ramp                      | freely programmable                                     |
| Display for actual value          | LED-Display 13 mm, red                                  |
| Display for desired value         | LED-Display 10 mm, red                                  |

### Test current

|                                      |  |
|--------------------------------------|--|
| Setting range, threshold value       | 0,5 - 50 mA  |
| Resolution / Digit                   | 0,1 mA   |
| Measurement inaccuracy, precision    | 1 % of Reading +/- 3 Digits                        |
| Short-circuit current                | > 50 mA / > ca. 17 000 V                           |
| Burn function (optionally available) | burning the faulty area (max. burning time is 1 s) |
| Display for actual value             | LED-Display 13 mm, red                             |
| Display for desired value            | LED-Display 10 mm, red                             |

## Testing time

|                                   |  |
|-----------------------------------|--|
| Setting range, testing time       | 1 s - 99 min, continuous   |
| Setting range, ramp time          | 0,5 s - 99 s   |
| Resolution up to 10 s             | 0,1 s (Digit)  |
| Resolution display > 10 s         | 1 s  |
| Measurement inaccuracy, precision | +/- 1 Digit  |
| Start testing time                | The test time does not start before the desired test voltage has been reached. |
| Minimum testing time              | 1 s  |
| Display for actual value          | LED-Display 13 mm, red   |
| Display for desired value         | LED-Display 10 mm, red   |

## General data

|  |  |
|--|--|
| Mains supply                                       | 400 V, 50 Hz / 60 Hz   |
| Mains connection                                   | CEE 16 A, 5p   |
| Tolerance mains voltage                            | +/- 10%  |
| Current consumption                                | max. 12,5 A  |
| Fuse   | B 16 A   |
| Displays   | LED, permanently shown actual and desired values   |
| Setting of test parameters                         | manually or all-automatic via interface (ASCII, DLL, LabVIEW, C#, DataView)  |
| Programming  | 15 sets of parameters, freely programmable   |
| Signalling   | acoustic, optical and over interface   |
| Outputs back panel                                 | 1 x high voltage output via tube (1-poled socket)<br>1 x ground connection by earth connector (2. HV-pole, grounded)                             |
| Dimensions:  |  |
| Width test trolley/body (corpus)                   | 610 mm   |
| Width test trolley incl. handle                    | 770 mm   |
| Width test trolley incl. handle and wire holder    | 830 mm   |
| Height test trolley incl. castor (caster)          | 1 250 mm   |
| Height test trolley incl. castor (caster) and tube | 1 700 mm   |
| Depth test trolley/body (corpus)                   | 650 mm   |
| Depth test trolley incl. handle                    | 750 mm   |
| Depth test trolley incl. handle and storage place  | 1 240 mm   |
| Weight   | appr. 420 kg   |
| Casing   | Test trolley: steel sheet<br>Control unit: Upon a tripod, diecast aluminium, RAL 7035  |
| Basic equipment                                    | manual, mains cable, safety circuit plug   |
| Calibration  | incl. certificate of factory-calibration traceable to national standards, DAKKS-calibration according to DIN EN ISO/IEC 17025 optional available |

## Environmental conditions

|                              |  |
|------------------------------|--|
| Casing                       | IP20                                       |
| Humidity                     | max. 80 %, non condensing                  |
| Allowed range of temperature | + 5 to + 40 °C                             |
| Max. height above sea level  | 2 000 m                                    |
| Cooling                      | passive, active cooling optional available |

## Interfaces

|                          |   |
|--------------------------|---|
| Control- / Digital-IO    | start, stop, GOOD / BAD result, test running  |
| RS232 for remote control | computer connection for terminal programming and controlling by customer specific software applications, optional usage of a protocol printer |
| CAN Interface            | for expanding the test system by additional devices   |

## Additional functions

|                            |  |
|----------------------------|--|
| Voltage ramp               | The voltage ramp time is freely programmable. The test voltage will ramp up to the desired value. Testing then start when this value has been reached. |
| Fault detection            | switch off on threshold value and by peak detection  |
| Minimum-current monitoring | permanent monitoring during the whole testing process  |

## Expanded device-Setup

|  |  |
|--|--|
| Ramp function                                    | individual setup   |
| Ramp options                                     | individual setup for ramp-up time and ramp-down options                  |
| Locking of pushbuttons                           | individual setup   |
| Signal-configurator                              | individual setup for digital result outputs                              |
| Buzzer-options                                   | individual setup of acoustic signals                                     |
| LED-display                                      | individual LED brightness  |
| Start options                                    | individual setup of start modes  |
| Language and mode selection for external printer | printout at pass, fail, continuous or switch off<br>Formats: List or CSV |

## Start options for testing

|                            |  |
|----------------------------|--|
| Start via safety circuit   | The test can be started with the closing of the safety circuit |
| Start button on the device | front panel button for test-start                              |
| Start by serial interface  | triggered by a PLC or a PC                                     |
| Start by digital interface | Digital I/O for example by a footswitch, PLC or a push button  |
| Start options              | individual setup of start modes                                |

## Outputs – DUT, security components

|                        |  |
|------------------------|--|
| High-Voltage outputs   | 1 x high voltage output via tube                                       |
| Earth connection       | 1 x ground connection by earth connector                               |
| Safety circuit         | allows the connection of a safety circuit according to EN 50191        |
| Signal-light connector | for connecting a combined green/red signal light according to EN 50191 |

## Electrical safety and norms

|                           |  |
|---------------------------|--|
| EN 61010-1                | safety regulations for electrical measurement, control- and lab- equipment |
| EN 61326-1                | electrical measurement, control- and lab- equipment – EMC-requirements     |
| EN 61000-3-3/EN 61000-3-2 | Electromagnetic compatibility (EMC)  |
| EN 50191                  | erection and operation of electrical test equipment                        |
| EN 60598-1                | luminaire / Part 1: General requirements and tests                         |
| Contamination level       | 2  |
| Protection class          | 1  |

## Contacting by a telescope mast (optional), especially for railway vehicles



The telescope mast will be integrated into the power unit of the test system.

The telescope mast will be mounted next to the high voltage tube in a special isolated fixture (appr. 1,7 m high). It can be turned. The mast and the test device has a height in sum of 2,7 m in not extended mode. The max. height is approx. 5,5 m in extended mode. The mast can be extended by pumping a pneumatic cylinder.

- incl. cable thighter
- incl. contact clamp for contacting the test object
- incl. hand pump for extending the telescope mast

The connection can be done also without telescope mast by using a separate optional high voltage cable.