

ZPA-AC-60-0150-OGW

Two-Part-Testsystem

60 000 V AC / 150 mA

Product Information Sheet





Short summary - overview

Item number	207868
Test voltage	1 000 – 60 000 V AC, PI – regulated
Test current, limit	0,5 - 150 mA
Power	> 9 000 VA
Short circuit current	> 200 mA, EN 61180
Testing time	1 s - 99 min, endless
Grounded on one side	for applications with fixed 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, Stop, 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 adaptions 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 – 60 000 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	> 9 000 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 - 150 mA
Resolution / Digit	0,1 mA
Measurement inaccuracy, precision	1 % of Reading +/- 3 Digits
Short-circuit current	> 200 mA / > ca. 10 000 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 32 A, 5p
Tolerance mains voltage	+/- 10%
Current consumption	max. 22,5 A
Fuse	B 32 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) 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)	1 150 mm
Height test trolley incl. castor (caster) and tube	1 600 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. 380 kg
Casing	Test trolley: steel sheet 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 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.