



4 channel PD tester for semiconductor test

**TPP**

## 4 CHANNEL PD TESTER FOR SEMICONDUCTOR TEST

**New! Up to 18.3kV peak (13kV rms), ask for higher voltages!**

Multi channel Partial discharge test system for check up the safety electric isolation of electronic components (e.g. opto couplers, core-less transformers) by routine tests with an automatic handler system and control computer.

It is as 10kV peak, 14kV peak and 18.3kV peak system available.

The test can be done according VDE 0884-10, IEC 60747, UL 1577 . . .

The PD test system TTS is very flexible and all test parameters can be changed easily. It also has an integrated self check function.

The voltage, current and Partial discharge is measured continuously



### The test set consists of:

- Control and measuring unit, built in a 19"- cabinet with following components:
- Partial discharge test system TTS for Partial Discharge, voltage and current measurement
- Integrated control unit for voltage control with status LEDs, electronic power amplifier for fast voltage settings and special safety relays
- Control panel with emergency stop, main switch, control key switch and the push buttons Ready / Enable
- High Voltage module with
  - HV- test transformer, integrated current limiting network (RC circuit)
  - Coupling capacitor and resistive divider for voltage measurement
  - automatic ground switch
  - integrated high voltage Partial Discharge calibrator for self check
- Short testing period starting from approx. 1.5 second
- 1- channel, 2- channel or 4- channel systems available
- All test parameter and test results are available by interface
- Interfaces RS232 and USB (IEEE 488 and Ethernet on request)
- Control software MSPS-20 included. It has many options, e.g. graphical display of PD



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## Technical data for the Partial Discharge Test System:

### Voltage ranges and voltage setting

Different high voltages modules available, 7, 10 or 13 kVrms (max 18.3kVpeak)

System automatically switches between 50% or 100% of the voltage range for higher resolution of the voltage setting at small test voltages

Frequency of the test voltage 50 Hz (60 Hz on request)

Voltage setting by electronic power amplifier, independent of mains supply, resolution 1023steps

Voltage can be set in 0.05% (< 50% of max. voltage) or 0.1% steps up to 100% of max. test voltage

Variable setting of the speed for the voltage ramp

High voltage parts are free of PD min. up to 10 kVpeak (<1 pC)

Maximum output voltage at 0kV setting : 0.025kV if high voltage is not switched off after the test

Voltage duration can be set between 0.4 and 999.9 sec in 0.1 sec steps for every voltage step

Integrated current limiting network (RC circuit)

### Voltage measurement, according IEC60060

Accuracy +/- 1.0%, +/- 0.5% of voltage range, typical <1% between 10% and 100% of voltage range

Voltage measurement on the high voltage side, resolution 0.1%

Internal check if the test voltage is within the limits

### Partial Discharge measurement, according IEC60270

Measuring ranges 2.5 - 5 - 10 .... 25000 pC, auto range or fixed ranges, resolution up to 0.01pC

Narrow band filter 0.10 to 2.50 MHz, adjustable in 0.01 MHz steps, bandwidth 15 kHz

Wide band filters 40 - 250 kHz, 40 - 400 kHz, 80 - 250kHz, 80 - 400kHz

Correction factor 1.00 to 9.99 adjustable

Accuracy +/- 3 %, +/- 2% of PD range, typical <5 % between 25% and 100% of PD range

Noise level of the PD system itself < 1pC, typical around 0.3pC

PD limit setting in 0.1 pC steps, maximum 999.9 pC

Programmable waiting time before PD measurement in 0.1 sec steps

Integrated PD calibrator with 5pC and 10 pC, high voltage resistant

### Current measurement

Measurement between 0 to 100µA, resolution 0.1% (switching 100uA / 1000µA on request)

Accuracy +/- 1.5%, +/- 0.5% of current range, typical <1% between 15% and 100% of current range

Threshold for maximum current adjustable between 0 and 100µA in 0.1µA steps

Threshold for minimum capacitance in 0.1pF steps (contact test), Accuracy +/- 2%, typical +/- 0.1pF, resolution 0.01pF

Subtraction of an offset capacitance can be set to get the current / capacitance of the test object

### Safety system

Special safety relays with two loop magnetic safety contact for highest safety level

Warning lamps Green / Red and integrated automatic grounding device

### LED indicators

Power, amplifier power, status of safety loop, self test, high voltage ON, ERROR (i.e. voltage error)

PASS, FAIL, Breakdown (flash over / over current), PD Fail, ILeak Fail

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### Minimum test time

For voltage and current measurement: 0.3 sec

For PD measurement: 0.5 sec

### Handler interface (single channel system)

Galvanic insulated TTL signals (0 / 5V)

START, triggers a measurement

EOM, end of measurement, EOT, end of test (test is complete including evaluation), binning is valid

BIN outputs (8) for PASS, PD Fail, BREAKDOWN, CURRENT Fail, MIN CAPACITANCE Fail ...

The handler interface can be done by the PC control software (Option)

### Others

Integrated self test function

Integrated power line filters

Over current protection primary, secondary and test object (no ARC detection needed)

### Power supply

208V / 230V / 241V AC selector switch, max 1.2 A, 50/60Hz, 115V AC on request

### Operation parameters

15 to 35 degree centigrade, 30 to 80% relative humidity, non-condensing

### Dimensions

1 PD system TTS: 500 x 400 x 180 mm, weight approx. 15kg

1 HV module: 250 x 250 x 270 mm, weight approx. 7.5kg

Control unit with 4 PD test systems TTS: 600 x 900 x 1650mm, weight approx. 110kg

HV- housing with 4 HV- modules: 570 x 570 x 280mm, weight approx. 52kg

### Options

Variable setting of the frequency for the test voltage between 50 and 60Hz in 1Hz steps

Remote control by IEEE488 and Ethernet on request. The system can be fully controlled and all measurements and test results can be read out

Manual test adapter

Adapter (test head) for different handlers

### Control software

PC controlled software MSPS-20 to create test sequences, save the test results and get test reports

The test can also be started by the handler, manually or software

This option is recommended for advanced quality monitoring and product improvement. Provided information per tested device is e.g. measured PD value, applied test voltage, maximum current during test cycle and so on.

Extensions to export the test results as STDF file is available

Please ask for detailed description of the software MSPS-20

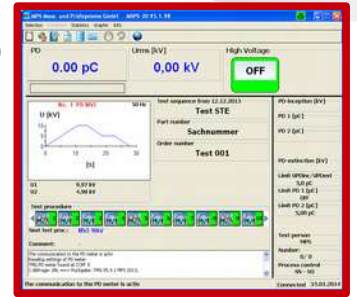


# MEASURING AND ANALYSING SOFTWARE **MSPS-20**



A complete remote control of the partial discharge test set TPP is possible with software MSPS-20. It is designed on a data base and offers following possibilities especially for high volume tests and in the quality control.

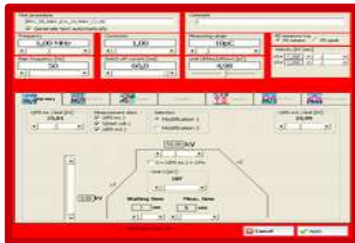
- Automated control of the PD - test and recording of measured values with the indication PASS - FAIL - Break Down ...
- Simple operation, only pressing the start button or start by handler signal
- Easy editing of the test parameters for the test sequences
- Several successive test sequences are possible in one test plan
- Combination of dielectric and partial discharge test in one test cycle
- Additional test sequences for DC-test, current and capacitance measurement (option)
- Password entrance check of protected parts of MSPS, 4 levels
- Test report with all measured values and setting parameters
- Export of the measured data as STDF file (option)
- Statistical evaluation with graphical display of test results as a Gaussian curve
- Log - files for failure diagnostics
- Multi user access of one data base in connection with several PD - test sets (option)
- Administration of calibration and measuring instrument data and process data recording of the PD-test set (option)
- Connection to a SQL- Server to save the test results (option)



## Display for generating test procedures (more test procedures are available)

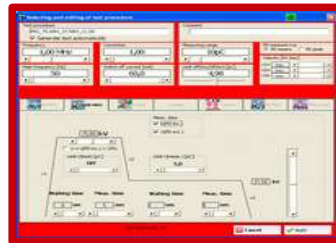
### Measuring sequence 1:

For isolation tests with PD-inception and PD-extinction detection

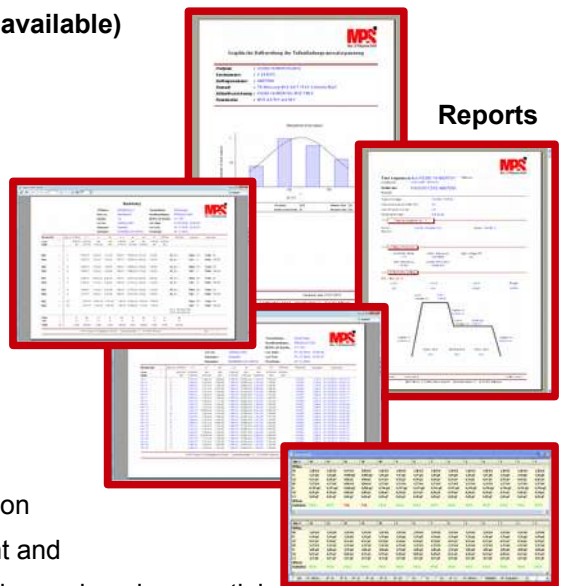


### Measuring sequence 2:

For hipot tests and PD- tests for quality test



## Reports

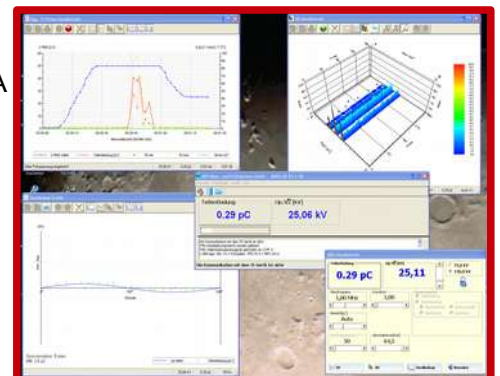


## Partial discharge analysing (option)

Knowing the level and number of PD-pulses in relation to the phase position is important to find out the cause of failures, especially during development and testing of complex components. The software option allows to detect, display and analyse partial discharges, which will be displayed with number, level and phase position. Following graphical displays are available

- Coloured PD-pattern as fingerprint
- Three - dimensional coloured PD – pattern
- Partial discharge and voltage curves: presents the voltage and PD graph along the time

Besides simple operation you have the advantage of adjusting any angle of view of the three - dimensional chart. It is possible to load, save and export graphics. A module for presentation the voltage and PD-graph along the time is available too.



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Changing without notice (Oct 2016)