

# VSURGE NX20

## 1.2/50 US SURGE GENERATOR FOR SOLAR PANEL TESTING



### FOR TESTS ACCORDING TO ...

- > EN 61730-1
- > EN 61730-2
- > IEC 60060
- > IEC 61730-1
- > IEC 61730-2
- > UL 1703

### PV PANEL TESTING - 1.2/50US SURGE GENERATOR AS PER IEC/EN 61730

The surge generator type vsurge NX20 is specifically designed to generate high voltage transients as required by IEC/EN 61730-2: Ed 2.0 (2016) for safety testing of photo voltaic panels.

The specified waveshape of 1.2/50us must be generated and maintained as specified across a broad range of capacitance the PV's do represent. Such generator needs to be based on different pulse shaping networks to cope with the variable capacitive load of the panels depending on their size and design.

### HIGHLIGHTS

- > **Surge voltage up to 20 kV**
- > **11 different capacitance ranges selectable from 20 nF to 170 nF**
- > **Compliant to IEC/EN 61730-1/2**
- > **Peak voltage and peak current measurement**
- > **Automatic detection of selected load range and polarity**
- > **Interlock and Warning lamp control**

### APPLICATION AREAS

-  INDUSTRY
-  COMPONENTS
-  RESIDENTIAL
-  RENEWABLE ENERGY

**TECHNICAL DETAILS**

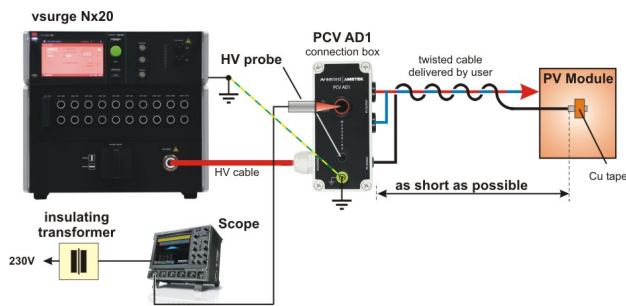
**BENEFITS**

**VSURGE NX20 - PULSE VOLTAGE GENERATOR FOR PHOTOVOLTAIC PANELS**

As per IEC/EN 61730-1/2 requirements for surge testing of photovoltaic panels these shall be wrapped with copper foil. This leads to comparatively high capacitance values of several tenth of nanofarad (typically values between approx. 20 nF and 170 nF are seen). This capacitance is switched in parallel to the output of the generator. The required waveform of 1.2/50us needs to be maintained within the specified tolerance for the entire load range. To cope with these requirements a dedicated impulse voltage generator is required.

The EM TEST vsurge NX20 has been designed to cover the full range of capacitive load photovoltaic panels may represent offering 11 different load ranges. Each load range is based on a separate pulseforming network to comply with the tolerances given in the standard.

Same as all EM TEST equipment the vsurge NX20 offers manual operation as well as remote control operation via software. The generator detects automatically the manual selected PV-panel capacity range as well as the polarity for all tests. Opto Link with USB at the computer and ethernet interfaces are implemented for software control.



**OPERATION**

**EASY TO OPERATE**

Front panel menu and function keys enable the user to program his test routines quickly and accurately. The touch screen allows fast control of all test parameters of the programmed routine, thus test procedures are simplified and confidence is generated that every step is carried out correctly.

**SOFTWARE**

**IEC.CONTROL SOFTWARE FOR CONTROL AND DOCUMENTATION**

Outstanding user convenience, clearly structured windows and operation features and the EM TEST standards library along with the flexibility to generate user specific test sequences very easily are the main features of iec,control software. The software is automatically configured according to the connected EM TEST generators. Extensive reporting capabilities help the user to create test reports that meet international requirements.

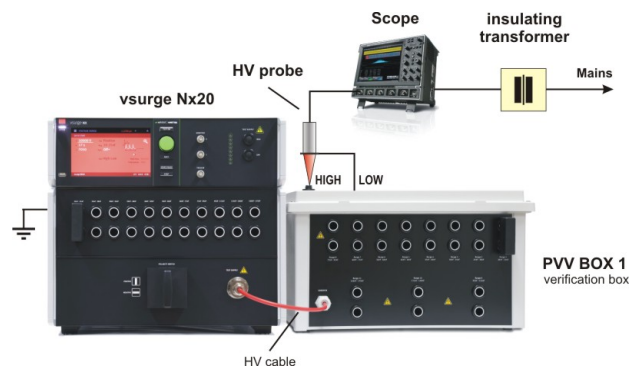
iec.control is supported by Windows 7, Windows 8 (64 Bit) and Windows 10. Remote control is achieved either via Ethernet or opto link with USB at the computer. The iec.control supports various interfaces for control external measuring instruments.



**VERIFICATION**

**WAVESHAVE VERIFICATION**

The specified waveshape of 1.2/50us must be verified with external load references that simulates the capacitive load of a PV-module. With the PVV BOX 1 it is possible to verify all different pulse shaping networks with the variable capacitive load up to full voltage range of 20 kV impulse voltage. The PVV BOX 1 offers a high voltage output for direct application of the high voltage probe for measuring and verify the waveshape and the peak voltage.



## TECHNICAL DETAILS

## VSURGE NX20 - 1.2/50 US SURGE GENERATOR

VOLTAGE PULSE	
Voltage (open circuit)	800 V to 20,000 V +/-10 %
Front time	1.2 $\mu$ s +/-30 %
Time to half value	50 $\mu$ s +/-20 %
Pulse shaping networks	Depending on load capacitance
Capacitance ranges	20 nF to 170 nF in 11 ranges, manual selectable, 20 nF to 25 nF, 25 nF to 30 nF, 30 nF to 35 nF, 35 nF to 40 nF, 40 nF to 50 nF, 50 nF to 60 nF, 60 nF to 75 nF, 75 nF to 95 nF, 95 nF to 115 nF, 115 nF to 140 nF, 140 nF to 170 nF
Wave Shape	As per IEC 60060-1
Polarity	Positive/negative, manual
Event counter	1 to 99,999, selectable

TRIGGER	
Automatic	Automatic pulse release
Manual	Single pulse release
External	External pulse release
CRO trigger	5V trigger signal for oscilloscope
Pulse repetition rate	2 s to 9,999 s depending on the voltage min. 29 s @ 20 kV

OUTPUT	
Direct	Via coaxial HV connector
	Direct connection to the EUT or via external testbox PCV AD1

## VSURGE NX20 - 1.2/50 US SURGE GENERATOR

MEASUREMENTS	
CRO $\hat{U}$ -monitor	10 Vp at 20,000 V
CRO $\hat{I}$ -monitor	10 Vp at 5,000 A
Peak voltage	20,000 V, in the touch display
Peak current	5,000 A, in the touch display
Overcurrent protection	Breaks the Surge test when the surge current is over the limit, Range, 0 - 4950 A
Undervoltage protection	Breaks the Surge test when the surge impulse voltage is lower than the limit, Range, 0 - 20,000 V
Charging	Bar display LED 0 - 100 % of settet voltage

TEST ROUTINES	
Quick Start	Immediate start; easy to use and fast
Standard Test Routines	IEC 61730-2 range 20 nF to 170 nF
Extended Test Routines	Change polarity Change voltage

## TECHNICAL DETAILS

## GENERAL DATA

INTERFACE	
Serial interface	2 x USB A for memory stick, 1 x USB B for service only, Opto - Link to USB for remote
Lan	Ethernet for remote
Sys.link	26 pin high density connector to control an external coupling network
Fail inputs	EUT monitoring via input (one each) EUT Monitor 1 EUT Monitor 2

SAFETY	
Safety standard	IEC/EN 61010
Security circuit	Control input (24 VDC)
Warning lamp	Floating contact (max. 60 V/2 A)

GENERAL DATA	
Dimensions, weight	19"/9 HU, 448 x 442 x 550 mm, approx. 25 kg
Supply voltage	85 V - 264 VAC
Fuses	115 V: 2 x 4 A slow blow, 230 V: 2 x 2 A slow blow
Power	max. 95 W, 0.42 A, avg. 35 W, 0.15 A

ENVIRONMENT	
Temperature	10 °C to 35 °C
Humidity	30 % to 75 %, non condensing
Atmospheric pressure	86 kPa (860 mbar) to 106 kPa (1,060 mbar)

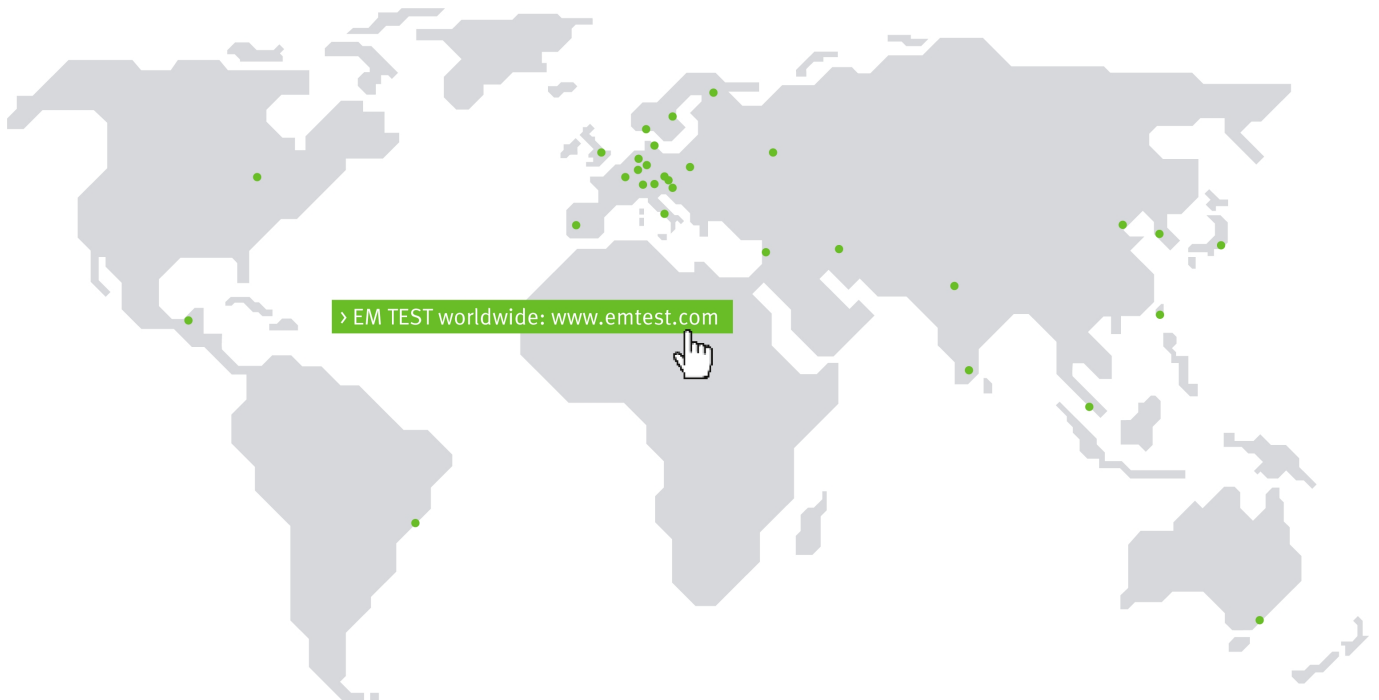
## ACCESSORIES AND OPTIONS

ACCESSORIES	
Scope of delivery	vsurge NX20 generator, Safety circuit und warning lamp adapter, Mains supply cable (depends on country), Operation manual
PCV KIT 1	Set of test accessories including - Carrying case, - Connection box: PCV AD 1, - 2*1m HV leads, one end open, - Earth cable 2 m - Copper tape, self-adhesive, - Set of banana connectors

OPTIONS	
iec.control 1	Remote control and documentation software, including standard test routines and reporting capabilities.
UOC	USB-Optolink Converter, Optical Fibre cable, 5 m
SWL	Warning Lamp, red - green, 0.85 kg

PULSE VERIFICATION	
PVV BOX 1	Calibration box for vsurge NX20 including different capacitor values
Capacitor values	22.5 nF, 27.5 nF, 32.5 nF, 37.5 nF, 45 nF, 55 nF, 67.5 nF, 85 nF, 105 nF, 127.5 nF, 155 nF
Voltage	20 kV
Dimension	505 x 280 x 445 mm, (LxHxD)
Weight	18.85 kg

# COMPETENCE WHEREVER YOU ARE



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Information about scope of delivery, visual design and technical data correspond with the state of development at time of release. Subject to change without further notice.