NSG 4060
LOW FREQUENCY IMMUNITY TEST SYSTEM

NSG 4060 and NSG 4060-1 Extension Unit

The NSG 4060 is an EMC immunity test system for the frequency range 15 Hz to 150 kHz. It consists of a sine wave generator, power amplifier, EUT monitoring interfaces and different coupling units depending on the application, i. e. NSG 4060-1 for testing IEC/EN 61000-4-16 including short duration disturbance tests for DC, AC from $16^2/_3$ Hz to 200 Hz and test levels up to 300 V. Voltage testing according IEC/EN 61000-4-19 requires the combination with CDND M316-2. It includes the differential mode coupling and decoupling and the required 10 Ω impedance of the disturbance source. Current testing according IEC/EN 61000-4-19, e.g. testing electricity meters, requires the combination with CT 419-5.
The powerful and easy to use firmware makes the NSG 4060 independent from an external PC and control software, however it can also be remote controlled for system operation. Part of NSG 4060's delivery is an USB-to-serial/optical converter which offers potential free remote control.

- **Signal generator and integrated power amplifier 15 Hz to 150 kHz**
- **Meets IEC/EN 61000-4-16 in combination with NSG 4060-1**
- **Meets IEC/EN 61000-4-19 in combination with CDND M316-2 for voltage and CT 419-5 for current testing**
- **Meets IEC/EN 60255-26 Annex A in combination with CN 60255-26**
- **Prepared test configurations for IEC/EN 61000-4-16 and IEC/EN 61000-4-19**
- **5.7" color display**
- **Multiple EUT monitoring options**

- Optional generator output (standard equipped on the back)
- Sensor input
- 5.7" color display, easy to use firmware
- Hard keys for important functions

- User port for 4 TTL inputs and 4 TTL outputs and supply voltages for individual monitoring and control applications
- Generator output, system and coupling network control, phase synchronisation input
- Remote control via optical RS232, RS232, LAN or USB
- 2x USB, analog, digital and optical EUT monitoring inputs, external modulation input

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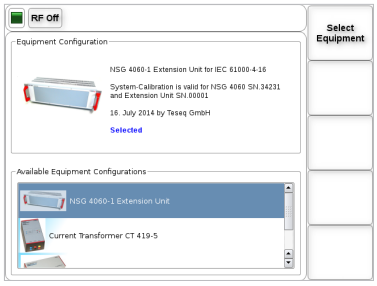
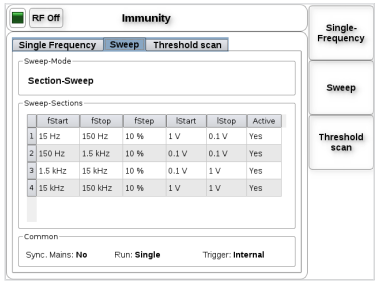


Firmware: Select equipment menu



Firmware: Sweep menu

Firmware: During sweep testing

Technical specifications NSG 4060 in combination with NSG 4060-1

IEC / EN 61000-4-16	
Application:	IEC 61000-4-16 edition 2.0, EN 61000-4-16:1998 / FprA3:2015
Frequency range	
Short duration test 1 s:	DC, $16^2/_3$ Hz to 200 Hz
Sweep and continuous test:	13 Hz to 150 kHz
Frequency resolution:	0.01 Hz
Output voltage	
Short duration test 1 s:	0.1 V_{rms} to ≥300 V_{rms} (max. 2 A), 1 V DC to 100 V DC
Sweep and continuous test:	0.1 V_{rms} to ≥30 V_{rms}
Resolution:	0.01 V
Phase synchronisation:	0°
Harmonic distortion	
Short duration test:	<10%
Sweep and continuous test:	<1%
Rise and fall time of the DC output voltage at on / off switching:	between 1 to 5 µs
Output impedance:	50 Ω ±10%

Technical specifications NSG 4060 in combination with CDND M316-2

IEC / EN 61000-4-19 voltage testing	
Application:	IEC 61000-4-19 edition 1.0, EN 61000-4-19:2015
Frequency range:	2 kHz to 150 kHz
Frequency resolution:	0.01 Hz
Output voltage:	0.1 V_{rms} to ≥20 V_{rms}
Resolution:	0.01 V
Harmonic distortion:	<5%
Pulse modulation	
Modulation frequency range:	3 Hz to 10 kHz
Frequency resolution:	0.01 Hz
Duty cycle:	50%
Rise / fall time (10% / 90%):	< 10 µs
Output impedance:	10 Ω ±30%

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Technical specifications NSG 4060 in combination with CT 419-5

IEC/EN 61000-4-19 current testing	
Application:	IEC 61000-4-19 edition 1.0, EN 61000-4-19:2015 TR 50579:2012
Frequency range:	2 kHz to 150 kHz
Frequency resolution:	0.01 Hz
Output current:	
2 kHz to 30 kHz	0.1 A to ≥4 A
30 kHz to 150 kHz	0.1 A to ≥2 A
Resolution:	0.01 A
Harmonic distortion:	<5%
Pulse modulation	
Modulation frequency range:	3 Hz to 10 kHz
Frequency resolution:	0.01 Hz
Duty cycle:	50%
Rise/fall time (10%/90%):	< 10 µs
Output impedance:	1 Ω ±30%

Technical specifications NSG 4060 in combination with NSG 4060-1 hardware version 1A and connected CN 60255-26

IEC/EN 60255-26	
Application:	Annex A of IEC 60255-26:2013, EN 60255-26:2013 + AC:2013 + Corrigendum 1 and 2
Frequency	
Single frequency test:	$16^{2}/_{3}$ Hz to 60 Hz
Frequency resolution:	0.01 Hz
Output voltage:	0.1 V_{rms} to ≥300 V_{rms}
Resolution:	0.01 V
Dwell time:	0.3 s to >10 s
Phase synchronisation:	0° ±10%
Harmonic distortion:	<10%
Generator output impedance:	50 Ω ±10%
Remote connection:	via User port with D-Sub 15 pole 1:1 connection to CN 60255-26

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General specifications NSG 4060

Display:	640 x 480, 5.7" color
Output connector:	4 mm safety banana
User port:	D-Sub 15 pole with 4 TTL inputs and 4 TTL outputs +12 V / 100 mA, -12 V / 100 mA, +5 V / 100 mA power supply
Monitoring input analog:	BNC socket, 0-24 V Ri=>15 kΩ, 6 mV resolution
Monitoring digital input:	BNC socket, 0 to 24 V via optical coupler Ri=1.5 kΩ, switching threshold approx. 2 to 3 V
Monitoring optical input:	optical fiber, HP versatile link HFBR0501 series 40 kBd, (avoid scattered light on the front panel)
Sensor input:	ODU socket, 0 to 4.2 V Ri≥4 kΩ, 6 mV resolution
External modulation input:	BNC socket (prepared only)
RS232:	D-Sub 9 pole, up to 115200 Bd
RS232 optical:	Connector 2 x HFBRx523 socket for 1 mm fiber optic cable with length between 5 m and 30 m with 115200 Bd, for other distances 38400 Bd, max. 50 m
Size (W x H x D):	45 cm (19") x 15 cm (3HU) x 42.3 cm (with handle bar and foot)
Weight:	approx. 15 kg
Cardboard box:	60 cm x 55 cm x 37 cm, weight of cardboard box approx. 2.3 kg (empty)

General specifications NSG 4060-1 Extension Unit

Input / output connectors:	4 mm safety bananas
Size (W x H x D):	45 cm (19") x 15 cm (3HU) x 37.5 cm
Weight:	approx. 35 kg
Packing case:	66 cm x 55 cm x 32 cm, approx. 10 kg (empty)

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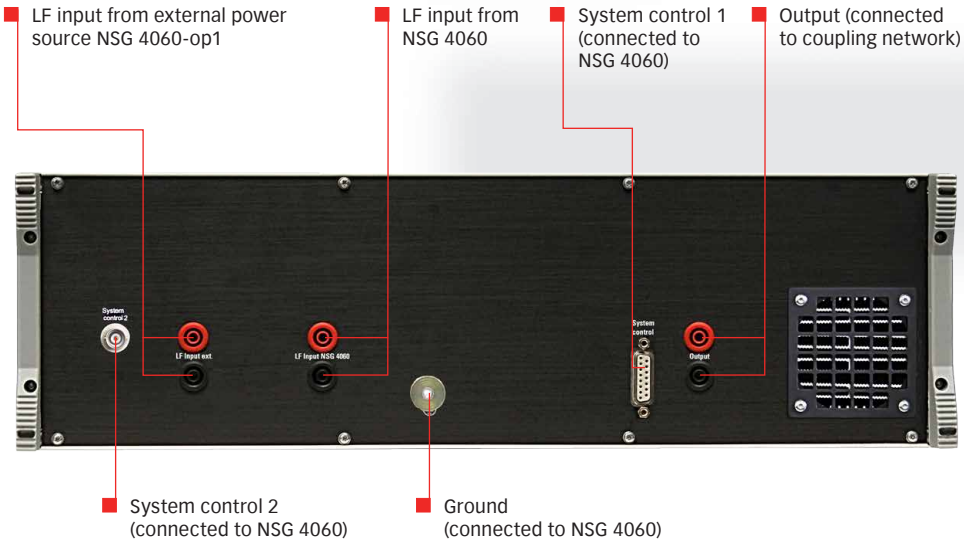
View to the back plane of NSG 4060-1 Extension Unit



Technical specifications NSG 4060 in combination with NSG 4060-1 [4] and NSG 4060-op1

IEC/EN 61000-4-16	
Application:	IEC 61000-4-16 edition 2.0, EN 61000-4-16:1998/FprA3:2015
Frequency range	
Short duration test 1 s:	DC
Output voltage	
Short duration test 1 s:	1 V to 330 V DC
Continuous test:	1 V to ≥30 V DC
Resolution:	0.01 V
Rise and fall time of the DC output voltage at on/off switching:	between 1 to 5 µs
Output impedance:	50 Ω ±10%

Mechanical specifications NSG 4060-op1

Size (W x H x D):	45 cm (19") x 15 cm (3HU) x 37.5 cm
Weight:	approx. 35 kg

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Application range

Product picture	IEC/EN 61000-4-16	IEC/EN 61000-4-19	Generator	Level	Modulation	Frequency range	Impedance	Phase synchronisation	Harmonic distortion
	■		NSG 4060 + NSG 4060-1	Continuous level: 1 to ≥30 V	-	DC	50 Ω, Note 1	-	-
				Short time level 1 to 100 V					
				Short time level 0.1 to ≥300 V_{rms}, Note 3		$16^2/_3$ to 200 Hz		to 0°	<10%
				Continuous level: 0.1 to ≥30 V_{rms}		13 Hz to 150 kHz		-	<1%
	■		NSG 4060 + NSG 4060-1 [4] + NSG 4060-op1	see above					
				Short time level 1 to 330 V	-	DC	50 Ω, Note 1	-	-
		■	NSG 4060 + CDND M316-2	Continuous voltage level: 0.1 to ≥20 V_{rms}	CW + pause/pulse modulation + pause	2 kHz to 150 kHz	10 Ω, Note 2	-	<5%
		■	NSG 4060 + CT 419-5	Continuous current level: 2 kHz - 30 kHz, up to ≥4 A_{rms}, 30 kHz - 150 kHz, up to ≥2 A_{rms}			1 Ω, Note 2	-	

Note 1: Included in NSG 4060-1 Extension Unit
Note 2: In combination with the coupling network/current transformer
Note 3: Max. 2 A
Note 4: Requires NSG 4060-1 with hardware version 1A (manufacture date after June 2016)

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Application range (continued)

Product picture	IEC / EN 60255-26 Annex A	Generator	Level	Modulation	Frequency range	Impedance	Phase synchronisation	Harmonic distortion
	■	NSG 4060 + NSG 4060-1 [4] + CN 60255-26	Short time level: 0.3 to >10 s Test level: 0.1 to ≥300 V_{rms}	-	$16^2/_3$ to 60 Hz	50 Ω, Note 1	to 0°	<10%

Note 1: Included in NSG 4060-1 Extension Unit
Note 4: Requires NSG 4060-1 with hardware version 1A (manufacture date after June 2016)

Delivery items for the NSG 4060 series

NSG 4060: NSG 4060 main unit; RS232 cable (Nullmodem); USO 4013 (USB to serial / optical converter with 20 m optical cable); mains cable GB, CH, USA / JP, EU; LE 261 sensor cable, USB stick with Report Program; operating manual

NSG 4060-1: NSG 4060-1 extension unit; LE 260 earth cable; 2x safety banana cable 25 cm; safety banana to BNC cable 160 cm; system control cables BNC and LE 262 with SUB-D-15

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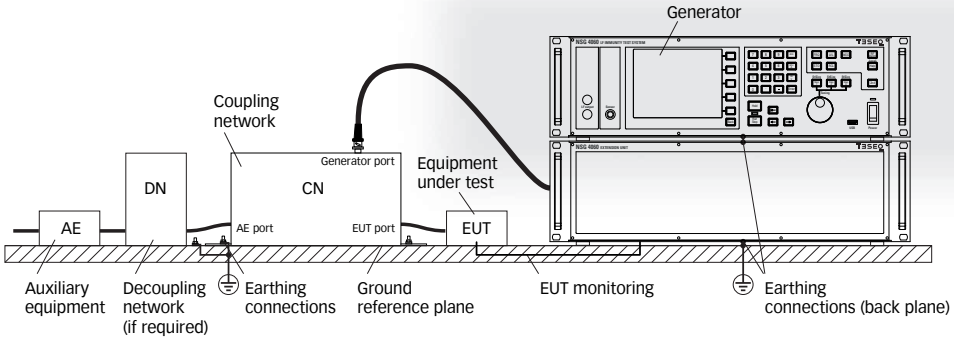
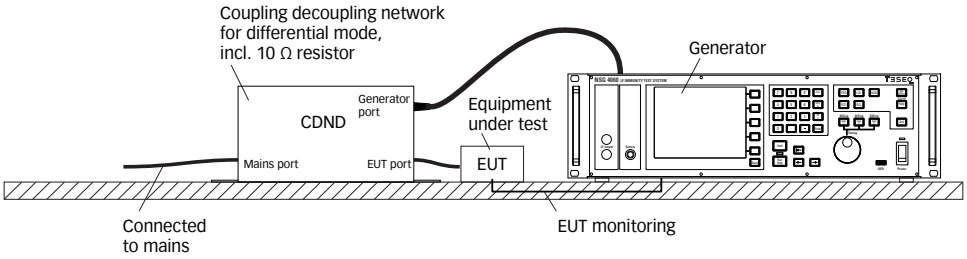
Application example for IEC / EN 61000-4-16 testing



Application example for IEC / EN 61000-4-19 voltage testing



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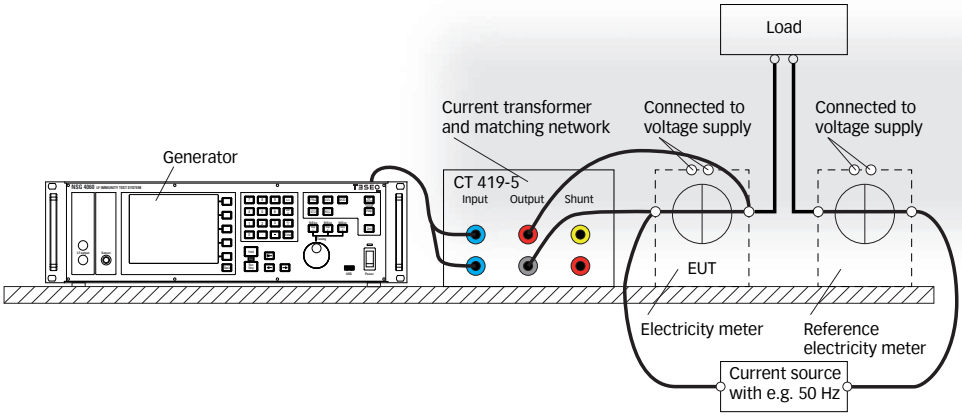
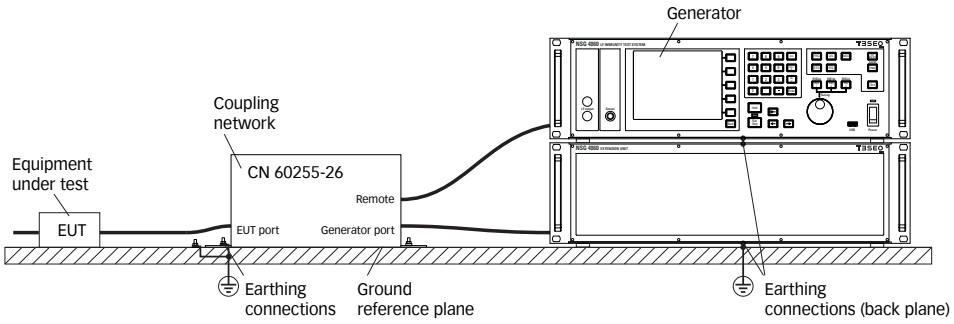
Application example for IEC / EN 61000-4-19 current testing



Application example for IEC / EN 60255-26 Annex A testing



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Model No. and options

Product picture	Product name	Description	Part number
	NSG 4060A	Low frequency immunity test system, 15 Hz to 150 kHz generator, 3 Hz to 10 kHz modulator, EUT monitoring ports, 600 W amplifier, 5.7" color display, 3 HU rack version, combined with option NSG 4060-1 for IEC/EN 61000-4-16, combined with option CDND M316-2 for IEC/EN 61000-4-19 voltage testing, combined with option CT 419-5 for IEC/EN 61000-4-19 current testing	258090
	NSG 4060A	Low frequency immunity test system, 15 Hz to 150 kHz generator, 3 Hz to 10 kHz modulator, EUT monitoring ports, 600 W amplifier, 5.7" color display, 3 HU desktop version, combined with option NSG 4060-1 for IEC/EN 61000-4-16, combined with option CDND M316-2 for IEC/EN 61000-4-19 voltage testing, combined with option CT 419-5 for IEC/EN 61000-4-19 current testing	258091
	NSG 4060-1	Extension unit of NSG 4060 for IEC 61000-4-16 testing, provides 50 Ω output impedance, short time testing and DC test function, 3 HU rack version, incl. 2x cable banana, BNC/banana cable, LE 260 earth cable, LE 262 system control cable, BNC system control cable	255501
	NSG 4060-1	Extension unit of NSG 4060 for IEC 61000-4-16 testing, provides 50 Ω output impedance, short time testing and DC test function, 3 HU desktop version, incl. 2x cable banana, BNC/banana cable, LE 260 earth cable, LE 262 system control cable, BNC system control cable	255504
	NSG 4060-op1	External DC power source 2.4 KW, requires 200 to 240 Vac mains	255507
	Option 4060-front	Option for NSG 4060, output located on front panel, factory fitted	257095
	Option 4060-1-front	Option for NSG 4060-1, LF input and LF output located on front panel, factory fitted	257096
	NSG 4060-TC	Traceable calibration (ISO17025) of NSG 4060 combined with NSG 4060-1 for IEC 61000-4-16, order only with the device	97-255500
	NSG 4060-DAkkS	DAkkS calibration (ISO17025) of NSG 4060 combined with NSG 4060-1 for IEC 61000-4-16, order only with the device	98-255500
	SW 4060	Switch for combining NSG 4060, NSG 4060-1 and CDND M316-2	255505
	SW 4060 (Rack)	Switch for combining NSG 4060, NSG 4060-1 and CDND M316-2, recommended for Rack 4060-23H or Rack 4060-37H	255508

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Product picture	Product name	Description	Part number
	Rack 4060-23H	Rack 23 HU for NSG 4060, NSG 4060-1, CDND M316-2 and ITF 14, front panels, connectors and wheels included	257510
	Rack 4060-37H	Rack 37 HU for NSG 4060, NSG 4060-1, CDND M316-2 and ITF 14, front panels, connectors and wheels included	257511
	CDND M316-2	Coupling Decoupling Network for IEC 61000-4-19 DM voltage, type M3 (M2), 16 A, banana Datasheet: http://www.teseq.com/products/CDND-series.php	247757
	CDND 419-TC	Traceable calibration (ISO17025) for IEC 61000-4-19 requirements, order only with NSG 4060 and CDND M316-2	97-247757
	CDND 419-DAkkS	DAkkS accredited calibration (ISO17025) for IEC 61000-4-19 requirements, order only with NSG 4060 and CDND M316-2	98-247757
	CT 419-5	Current transformer, 1:1, 5 A for DM current IEC 61000-4-19 Datasheet: http://www.teseq.com/products/CT-series.php	255650
	CT 419-TC	Traceable calibration (ISO17025) for IEC 61000-4-19 requirements, order only with NSG 4060 and CT 419-5	97-255650
	CT 419-DAkkS	DAkkS accredited calibration (ISO17025) for IEC 61000-4-19 requirements, order only with NSG 4060 and CT 419-5	98-255650

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