ENV432
Four-Line V-Network
For disturbance voltage measurements on three-phase EUTs

Test & Measurement

Product Brochure | 01.00

ROHDE&SCHWARZ

ENV432
Four-Line V-Network
At a glance

The ENV432 four-line V-network meets the requirements of CISPR 16-1-2, EN 55016-1-2 and ANSI C63.4 for V-networks with a simulated impedance of (50 µH + 5 Ω) || 50 Ω in the frequency range from 9 kHz to 30 MHz. The ENV432 comes with a Schuko socket (EUT 1) and a CEE 32 A socket (EUT 2) for connecting the equipment under test (EUT).

The ENV432 is ideal for disturbance voltage measurements on three-phase EUTs with a star-type alternating voltage up to 240 V (corresponds to a delta-type alternating voltage of 415 V) and direct voltages up to 350 V. The maximum constant current per phase is 32 A. Operation is briefly permissible with a peak current of 50 A per phase. Supplied accessories include the CEE coupling socket and CEE three-phase current plug needed to connect the ENV432 V-network to the mains supply and to the EUT.

For disturbance voltage measurements on single-phase EUTs with an alternating voltage up to 240 V, a Schuko socket (EUT 1) is provided on the front panel. When using this connector, the maximum constant current is 16 A.

The phase of the V-network can be selected manually using a front panel switch or automatically via TTL control inputs, which are compatible with the latest Rohde&Schwarz measuring receivers.

The operating voltage for the built-in fans and the logic circuit is obtained separately from the mains. The fans are automatically activated if the internal temperature limit of +50 °C is exceeded. If the upper limit of +100 °C is exceeded, a warning tone will be heard and the fan LED will turn red.

Since, due to their standard-compliant design, V-networks like the ENV432 produce high leakage currents, they must be connected to a low-impedance protective earth system. In uncertain cases, an isolating transformer should be used.

Key facts

- Frequency range from 9 kHz to 30 MHz
- Power-handling capacity up to 32 A, constant current
- Simulated impedance (50 µH + 5 Ω) || 50 Ω in line with CISPR 16-1-2
- V-network in line with CISPR, EN, VDE, ANSI, FCC Part 15 and MIL-STD-461D, E and F
- Calibrated in line with CISPR 16-1-2 and ANSI C63.4

ENV432 Four-Line V-Network Benefits and key features

Air-core design and artificial hand

The ENV432 four-line V-network is based on air-core inductances and contains an artificial hand.

Built-in 10 dB attenuator pad

To ensure standard impedance irrespective of the measuring receiver's input attenuation, the ENV432 is equipped with a 10 dB attenuator pad.

Built-in pulse limiter (can be switched off)

A built-in pulse limiter that can be switched off protects the measuring receiver's input.

Automatic temperature monitoring

When the temperature inside the housing reaches about +50 °C, the fans of the ENV432 automatically switch on. This protects the V-network in case of a high constant current load.

Remote control with TTL levels (compatible with Rohde & Schwarz measuring receivers)

TTL control inputs that can be driven by controllers or Rohde & Schwarz measuring receivers are provided for remote control of phase selection in an automatic test system.

Rear view.

Specifications

Specifications		
Frequency range		9 kHz to 30 MHz
Simulated impedance		(50 µH + 5 Ω) || 50 Ω
Error limits in line with CISPR 16-1-2	magnitude and phase	±20 % and ±11.5°
Decoupling attenuation between power supply and measuring receiver port in line with CISPR 16-1-2	9 kHz to 50 kHz	> 0 dB to > 40 dB (increases linearly with logarithm of frequency)
	50 kHz to 30 MHz	> 40 dB
Test path to EUT		
Maximum permissible constant current	EUT 1	16 A
Mains voltage	EUT 1	0 V to 240 V AC + 10 %
DC voltage	EUT 1	0 V to 350 V DC + 10 %
Maximum permissible constant current	EUT 2	32 A
Peak current (brief)	EUT 2	50 A (2 minutes)
Mains voltage	EUT 2	0 V to 240/415 V AC + 10 %
DC voltage	EUT 2	0 V to 350 V DC + 10 %
Mains frequency		0 Hz to 60 Hz + 5 %
Test path to measuring receiver		
Maximum permissible RF disturbance power from EUT		5 W
Voltage division factor between EUT and measuring receiver port	built-in attenuator pad, calibration data supplied with V-network	10 dB – 0.5 dB/+ 2.0 dB
Response threshold of built-in pulse limiter	can be switched off	140 dB (µV) (nom.)
Power supply for fans and control logic		
Mains voltage	115 V setting	100 V to 120 V AC ± 10 %
	230 V setting	220 V to 240 V AC ± 10 %
Mains frequency		50 Hz to 60 Hz ± 5 %
Power consumption		100 VA (nom.)
Connectors		
Mains and DC voltage output	front panel, EUT 1	Schuko socket
Mains and DC voltage output	front panel, EUT 2	CEE socket (6 h)
RF output	front panel, TO TEST RECEIVER	N female, 50 Ω
Artificial hand	front panel	4 mm connector, female, with knurled clamp
Mains and DC voltage input	rear panel, MAINS	CEE built-in connector (6 h)
Mains voltage input (auxiliary voltage)	rear panel, POWER FOR FAN AND REMOTE CONTROL	low-temperature connector with mains filter
Remote control input	rear panel, REMOTE CONTROL	25-contact, D-Sub, female
Protective earth	front panel and rear panel	M8 threaded bolt
RF reference ground	on both sides	ground bar with seven M6 threads
General data		
Operating temperature range		+5 °C to +45 °C
Storage temperature range		–40 °C to +70 °C
Dimensions, overall	W × H × D	446 mm × 289 mm × 500 mm
Weight		24 kg
Electrical safety	observe notes in manual	in line with EN 61010-1
EMC		in line with IEC/EN 61326-1
Emission		class B, in line with residential environment requirements
Immunity		in line with industrial environment requirements

Specifications with limits: Represent warranted product performance by means of a range of values for the specified parameter. These specifications are marked with limiting symbols such as <, ≤, >, ≥, ±, or descriptions such as maximum, limit of, minimum. Compliance is ensured by testing or is derived from the design. Test limits are narrowed by guard bands to take into account measurement uncertainties, drift and aging, if applicable.
Specifications without limits: Represent warranted product performance for the specified parameter. These specifications are not specially marked and represent values with no or negligible deviations from the given value (e.g. dimensions or resolution of a setting parameter). Compliance is ensured by design.
Nominal values (nom.): Characterize product performance by means of a representative value for the given parameter (e.g. nominal impedance). In contrast to typical data, a statistical evaluation does not take place and the parameter is not tested during production.

Ordering information

Designation	Type	Order No.
Base unit		
Four-Line V-Network	ENV432	1326.6105.02
Accessories supplied		
▮ Operating manual with calibration data and CD-ROM with service manual and voltage division factor ▮ CEE coupling socket and CEE three-phase current plug ▮ Power cables for fans and control logic ▮ Screws to connect RF reference ground		
Recommended extras		
Control Cable, length: 3 m [1]	EZ-21	1107.2087.03
Control Cable, length: 10 m [1]	EZ-21	1107.2087.10
Control Cable, length: 3 m [2]	EZ-29	1326.6470.03
Control Cable, length: 10 m [2]	EZ-29	1326.6470.10
150 kHz Highpass [3]	EZ-25	1026.7796.03

1) 25-wire remote control cable for ESxS, ESIBx, ESPIx, ESCIx and ESUx test receivers
(male-to-male, wired 1:1; two EZ-21 and a 25-wire filtered feedthrough are required for shielded chambers).
2) 25-wire to 9-wire remote control cable for ESLx, ESRPx and ESRx test receivers
(male-to-male; one EZ-21, one EZ-29 and a 25-wire filtered feedthrough required for shielded chambers).
3) Required for high disturbance voltages below 150 kHz, e.g. for disturbance voltage measurements in line with EN 50065 Part 1.

Service options		
Extended Warranty, one year	WE1	Please contact your local Rohde&Schwarz sales office.
Extended Warranty, two years	WE2	
Extended Warranty, three years	WE3	
Extended Warranty, four years	WE4	
Extended Warranty with Calibration Coverage, one year	CW1	
Extended Warranty with Calibration Coverage, two years	CW2	
Extended Warranty with Calibration Coverage, three years	CW3	
Extended Warranty with Calibration Coverage, four years	CW4	