

R&S® ENV432

Four-Line V-Network

For disturbance voltage measurements on three-phase EUTs



R&S®ENV432

Four-Line V-Network

At a glance

The R&S®ENV432 four-line V-network meets the requirements of CISPR 16-1-2, EN 55016-1-2 and ANSIC63.4 for V-networks with a simulated impedance of $(50 \mu\text{H} + 5 \Omega) \parallel 50 \Omega$ in the frequency range from 9 kHz to 30 MHz. The R&S®ENV432 comes with a Schuko socket (EUT 1) and a CEE 32 A socket (EUT 2) for connecting the equipment under test (EUT).

The R&S®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 R&S®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.

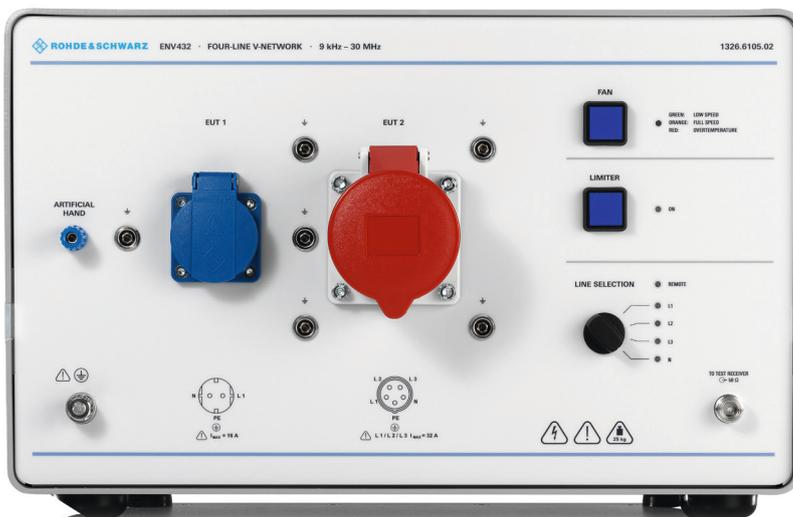
The phase of the V-network can be selected manually using a front panel switch or automatically via TTL control inputs, which are compatible with the latest Rohde&Schwarz measuring receivers.

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 R&S®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 $(50 \mu\text{H} + 5 \Omega) \parallel 50 \Omega$ 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 ANSIC63.4



R&S®ENV432

Four-Line V-Network

Benefits and key features

Air-core design and artificial hand

The R&S®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 R&S®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 R&S®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 μ H + 5 Ω) 50 Ω |
| Error limits in line with CISPR 16-1-2 | magnitude and phase | $\pm 20\%$ and $\pm 11.5^\circ$ |
| 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 can be switched off | 10 dB – 0.5 dB/+ 2.0 dB |
| Response threshold of built-in pulse limiter | | 140 dB (μ V) (nom.) |
| Power supply for fans and control logic | | |
| Mains voltage | 115 V setting | 100 V to 120 V AC \pm 10% |
| | 230 V setting | 220 V to 240 V AC \pm 10% |
| Mains frequency | | 50 Hz to 60 Hz \pm 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 x H x D | 446 mm x 289 mm x 500 mm |
| Weight | | 24 kg |
| Electrical safety | observe notes in manual | in line with EN61010-1 |
| EMC | | in line with IEC/EN61326-1 |
| 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 <, \leq , >, \geq , \pm , 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 | R&S®ENV432 | 1326.6105.02 |
| Accessories supplied | | |
| <ul style="list-style-type: none"> ▮ 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⁾ | R&S®EZ-21 | 1107.2087.03 |
| Control Cable, length: 10 m ¹⁾ | R&S®EZ-21 | 1107.2087.10 |
| Control Cable, length: 3 m ²⁾ | R&S®EZ-29 | 1326.6470.03 |
| Control Cable, length: 10 m ²⁾ | R&S®EZ-29 | 1326.6470.10 |
| 150 kHz Highpass ³⁾ | R&S®EZ-25 | 1026.7796.03 |

¹⁾ 25-wire remote control cable for R&S®ESxS, R&S®ESIBx, R&S®ESPIx, R&S®ESCIX and R&S®ESUX test receivers (male-to-male, wired 1:1; two R&S®EZ-21 and a 25-wire filtered feedthrough are required for shielded chambers).

²⁾ 25-wire to 9-wire remote control cable for R&S®ESLx, R&S®ESRPx and R&S®ESRx test receivers (male-to-male; one R&S®EZ-21, one R&S®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 | R&S®WE1 | Please contact your local Rohde & Schwarz sales office. |
| Extended Warranty, two years | R&S®WE2 | |
| Extended Warranty, three years | R&S®WE3 | |
| Extended Warranty, four years | R&S®WE4 | |
| Extended Warranty with Calibration Coverage, one year | R&S®CW1 | |
| Extended Warranty with Calibration Coverage, two years | R&S®CW2 | |
| Extended Warranty with Calibration Coverage, three years | R&S®CW3 | |
| Extended Warranty with Calibration Coverage, four years | R&S®CW4 | |

Service that adds value

- ▮ Worldwide
- ▮ Local and personalized
- ▮ Customized and flexible
- ▮ Uncompromising quality
- ▮ Long-term dependability

About Rohde & Schwarz

The Rohde & Schwarz electronics group is a leading supplier of solutions in the fields of test and measurement, broadcasting, secure communications, and radiomonitoring and radiolocation. Founded more than 80 years ago, this independent global company has an extensive sales network and is present in more than 70 countries. The company is headquartered in Munich, Germany.

Sustainable product design

- ▮ Environmental compatibility and eco-footprint
- ▮ Energy efficiency and low emissions
- ▮ Longevity and optimized total cost of ownership

Certified Quality Management

ISO 9001

Certified Environmental Management

ISO 14001

Rohde & Schwarz GmbH & Co. KG

www.rohde-schwarz.com

Regional contact

- ▮ Europe, Africa, Middle East | +49 89 4129 12345
customersupport@rohde-schwarz.com
- ▮ North America | 1 888 TEST RSA (1 888 837 87 72)
customer.support@rsa.rohde-schwarz.com
- ▮ Latin America | +1 410 910 79 88
customersupport.la@rohde-schwarz.com
- ▮ Asia Pacific | +65 65 13 04 88
customersupport.asia@rohde-schwarz.com
- ▮ China | +86 800 810 8228 | +86 400 650 5896
customersupport.china@rohde-schwarz.com

R&S® is a registered trademark of Rohde & Schwarz GmbH & Co. KG

Trade names are trademarks of the owners

PD 3607.0652.12 | Version 01.00 | October 2014 (ch)

R&S®ENV432 Four-Line V-Network

Data without tolerance limits is not binding | Subject to change

© 2014 Rohde & Schwarz GmbH & Co. KG | 81671 Munich, Germany



3607065212