

LISN

Line Impedance Stabilization Network

V-network for interference measurements.

Data Sheet



Designed and manufactured in compliance with CISPR 16-1, for Measurements vs. commonly used Standards as EN, CISPR, FCC, ETS, VCCI and VDE, 9kHz to 30MHz frequency range, Up to 800Aamp capacity, Continuous rating, DC Measurements, DC to 63Hz supplies, manual and remote control,...

ARTIFICIAL MAINS NETWORK has to provide:

- Specified impedance over the working frequency range. Since the INPUT IMPEDANCE of the MEASURING RECEIVER is 50Ω , the SOURCE IMPEDANCE (output of the LISN), must also be 50Ω , over the specified frequency range.
- Sufficient isolation to spurious signals arising from the mains supply (such signals should be at least 10dB lower than the measurement level, at the measuring receiver), and also to prevent the mains voltage from being applied to the measuring receiver. The above must hold for each of the conductors of the mains.

The LISN also incorporate a switch to enable the connection of the measuring receiver to the conductor under test, providing the correct termination to the other mains conductors.

When a disturbance output terminal is not connected to the measuring receiver, it shall be terminated by 50Ω .



■ LS 16 LISN and ER55C Receiver

GENERAL

The **AFJ LISNs** have been developed for measurement of line-bound interference's according to CISPR 16-1. The construction uses **air coils** in the current path in order to avoid saturation effects with high current strengths. The continuous high current load-bearing capacity is ensured by the use of large wire cross-sections for the coils. For a short period (10 minutes), twice as high currents are admissible.

The compact form of construction, despite the high current-bearing capacity, makes easy use of the AFJ LISNs for the measurement of high currents directly at the piece of use of the consumer possible. In this way, measurements of mains-borne interference's can be carried out under conditions corresponding to practice.

CISPR COMPLIANCE

All our LISN's are multi-line Impedance Stabilization V-Networks, ($50\mu\text{H}+50\Omega$)// 50Ω or $50\mu\text{H}$ // 50Ω , constructed in full compliance with CISPR 16-1. These V-Networks are completed with an artificial hand as well as a PE simulating network.

LISN can also be used in DC conducted emission tests.

MODELS

LISN including switching operation measurement (power meter) for EN55014-1

- **LS16C**: 16A single phase
- **LT 32C**: 32A single/three phase

LISN without power meter

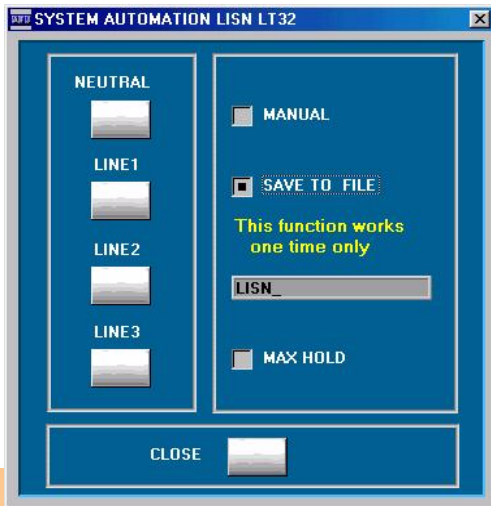
- **LT 100**: 100A single/three phase
- **2V-16**: 16A single phase
- **2V-10**: 10A, 120Vdc
- **2V-100/200**: 100A single phase
- **4V-100/200**: 100A three phase
- **4V-250-70VDC**: 250A, 70Vdc three phase
- **Custom models** are available, up to **800A**

Selection of the conductor under test

The "CONDUCTOR UNDER TEST" (L1, L2, or L1, L2, L3, N), can be selected in manual operation of the LISN via the relevant button on the LISN front panel.

In automatic operation, such selection is performed via control S/W of:

- AFJ ER 55 Receiver,
- AFJ CL55C Click Analyser.



Communication protocol data are also available to permit LISN remote control by any model of receiver/spectrum analyser.

THE ARTIFICIAL HAND

Artificial hand, simulating $510\Omega + 220\text{pF}$ impedance, in accordance with CISPR 16-1 requirements, is provided via a specific outlet on the front panel of the LISN models LS and LT 32.



■ CISPR 16-1 artificial earth

THE ARTIFICIAL EARTH

During normal operation, the artificial earth condition must be "non floating" (such condition is attained by the relevant pushbutton on the LISN front panel, and the LED must be OFF).

Whenever the EUT dimensions are such that the protective earth conductor is long enough to show a significant impedance, or be close to $\frac{1}{4}$ of a possible wavelength, or the enclosure has poor conductivity, the test will be performed using the non-fused, built-in artificial protective earth.



■ LT 32 and ER55CR Receiver



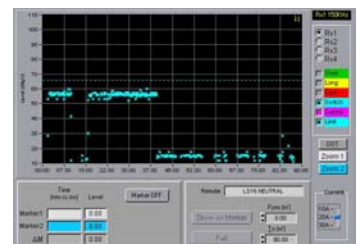
■ LS 16C LISN

SWITCHING OPERATION (CISPR 14-1)

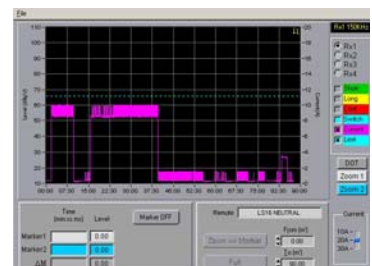
LISN mod **LS16C** and **LT32C** have been optioned with internal **current meter** to read and measure the EUT Switching Operations and EUT absorption current, when used in conjunction of **AFJ CL55C Click Analyzer**, as per CISPR 14-1 requirements. No particular connections are required.

Example of appliances for which the click rate N is derived from the number of switching operations:

- Thermostats for room heating equipment;
- Refrigerators;
- Freezers;
- Cooking with automatics plates;
- Appliances with one or more boiling plates controlled by thermostats;
- Irons;
- Sewing machine speed controls;
- Electro mechanical officer machines;
- Slide projector picture change device.



■ Switching Operation display



■ Current Absorption display



■ **LS16C**

Single Phase, 16A (32A)
V-Network

$f = 9\text{kHz} \pm 30\text{MHz}$

$Z = (50\mu\text{H} + 5\Omega) // 50\Omega$

Artificial Hand and PE

Manual and Remote Control

- DC Measurements
- Switching Operations and EUT absorption current measurements (CISPR 14-1)



■ **L 2V-100/200**

Single Phase, 100A (200A)
450VAC, V-Network

$f = 150\text{kHz} \pm 30\text{MHz}$

$Z = (50\mu\text{H} + 5\Omega) // 50\Omega$

Artificial PE $50\mu\text{H} // 50\Omega$

Pre-filtering for high frequency separation between DUT and mains side

Switchable pulse limiter for EMI receiver protection



■ **LT32C**

Three Phases, 32A (64A)
V-Network

$f = 9\text{kHz} \pm 30\text{MHz}$

$Z = (50\mu\text{H} + 5\Omega) // 50\Omega$

Artificial Hand and PE

Manual and Remote Control

- DC Measurements
- Switching Operations and EUT absorption current measurements (CISPR 14-1)



■ **L 4V-100/200**

Three Phases, 100A (200A)
450VAC, V-Network

$f = 150\text{kHz} \pm 30\text{MHz}$

$Z = (50\mu\text{H} + 5\Omega) // 50\Omega$

Artificial PE $50\mu\text{H} // 50\Omega$

Pre-filtering for high frequency separation between DUT and mains side

Switchable pulse limiter for EMI receiver protection



■ **L 4V-250-70VDC**

Three Phases, 250A, 70VDC

$f = 150\text{kHz} \pm 30\text{MHz}$

$Z = (50\mu\text{H} + 5\Omega) // 50\Omega$

Switchable Artificial PE
 $50\mu\text{H} // 50\Omega$

Pre-filtering for high frequency separation between DUT and mains side

Switchable pulse limiter for EMI receiver protection



■ **L 4V-50**

Three Phases, 50A, 400Hz

nominal voltage: 470VAC
(50/60Hz) / 130V (400Hz)

nominal current: 4x50A (63A for 20min in 1hour)

frequency range: 10kHz-50MHz.
Pre-filtering for high frequency separation between DUT and mains side

Switchable pulse limiter for EMI receiver protection



■ **LT 400/800**

CISPR 16-1

$f = 50\text{kHz} - 30\text{MHz}$

Current:

- Rated 4x400A permanent
- Max. Operating: 4x800A 10 minutes

Connection:

- EUT side: flat clamb binding posts
- Main side: flat clamb binding posts



■ **CISPR 25**

Automotive Networks

Three current ratings versions (continuous)
25, 100, 500Arms AC or DC

$f = 100\text{kHz} \pm 108\text{MHz}$

Line voltage up to 100VDC