



# EMI Accessories

Accessories and transducers  
compliant to CISPR 16 International Standard for measurements  
of conducted and radiated electromagnetic interference  
in accordance with requirements of EMI International,  
European and Product standards.

# LS16C/10 LT32C/10

## LISN

Line Impedance Stabilization Networks (LISN) are designed and manufactured compliant to CISPR 16-1-2 International Standard for measurements of conducted electromagnetic interference from 9kHz to 30MHz on power lines in accordance with requirements of EMI International, European and Product standards.

LS16C/10 and LT32C/10 LISN are Multi-Line Impedance Stabilization V-Networks, (50 $\mu$ H+5 $\Omega$ )/50 $\Omega$  impedance, completed with artificial hand as well as PE simulating network, built-in pulse limiter and 10dB attenuator.

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.

The compact form of construction, despite the high current-bearing capacity, makes easy use of the LISN for the measurement of high consumer possible. In this way, measurements of mains-borne interferences can be carried out under conditions corresponding to practice.



**LT32C/10**  
32A Three Phase V-Network



### LS16C/10 16A Single Phase V-Network

The line under test (L1, N or L1, L2, L3, N) can be selected manually via the relevant button on the front panel. Such selection is automatically performed via remote control software of AFJ EMI Receivers and Click Analysers.

Artificial hand is provided via a specific outlet on the front panel, simulating  $510\Omega + 220\text{pF}$  impedance as per CISPR 16-1-2 requirements.

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 built-in artificial protective earth (earth floating).

LISN are manufactured with internal current meter to measure current variation for evaluating switching operations when used in conjunction of AFJ Click Analyzers as per CISPR 14-1 (household appliances industry) requirements .

TECHNICAL SPECIFICATIONS	LS16C/10	LT32C/10
Design	Fully compliant to CISPR 16-1-2 standard	Fully compliant to CISPR 16-1-2 standard
Frequency range	9kHz-30MHz	9kHz-30MHz
Impedance	$(50\mu\text{H}+5\Omega) // 50\Omega$	$(50\mu\text{H}+5\Omega) // 50\Omega$
Rated AC voltage load	230V AC	230V AC / 450V AC
Rated DC voltage load	150V DC	150V DC / 300V DC
Number of phases	1 + N	3 + N
Rated current load	2 x 16A	4 x 32A
Max permitted frequency	DC to 63Hz supplies	DC to 63Hz supplies
Output impedance	50 $\Omega$	50 $\Omega$
Connector	BNC female	BNC female
Artificial hand	$510\Omega + 220\text{pF}$	$510\Omega + 220\text{pF}$
Artificial protective earth (earth floating)	$50\mu\text{H} // 50\Omega$	$50\mu\text{H} // 50\Omega$
Built-in pulse limiter and attenuator	10dB	10dB
Interface	DB15 M/F for AFJ equipment	DB15 M/F for AFJ equipment
Operating temperature	0 to 45°C	0 to 45°C
Storage temperature	-20° to 70°C	-20° to 70°C
Size (W x H x D)	350 x 200 x 520mm	480 x 280 x 550mm
Weight	11kg	28kg

# SW04/32 SW04/100

## Switching Boxes



### SW04/32

#### 32A Three Phase Switching Box

SW04/32 and SW04/100 Switching Boxes are used in connection with the AFJ Click Analysers and any brand LISN to measure current variation for evaluating switching operations as per CISPR 14-1 (household appliances industry) requirements.

The construction uses air coils in the current path in order to avoid saturation effects with high current strengths. The continuous current load-bearing capacity is ensured by the use of large wire cross-sections for the coils.

Available models:

- SW04/32 Switching Box up to 32A Three Phase
- SW04/100 Switching Box up to 100A Three Phase

TECHNICAL SPECIFICATIONS	SW04/32	SW04/100
Frequency range	9kHz-30MHz	9kHz-30MHz
Rated AC voltage load	230V AC	230V AC / 450V AC
Rated DC voltage load	150V DC	150V DC / 300V DC
Number of phases	3 + N	3 + N
Rated current load	4 x 32A	4 x 100A
Max permitted frequency	DC to 63Hz supplies	DC to 63Hz supplies
Interface	DB15 M/F for AFJ equipment	DB15 M/F for AFJ equipment
Operating temperature	0 to 45°C	0 to 45°C
Storage temperature	-20° to 70°C	-20° to 70°C
Size (W x H x D)	510 x 180 x 340mm	510 x 180 x 340mm
Weight	2,7kg	4kg

*Subject to change without notice*

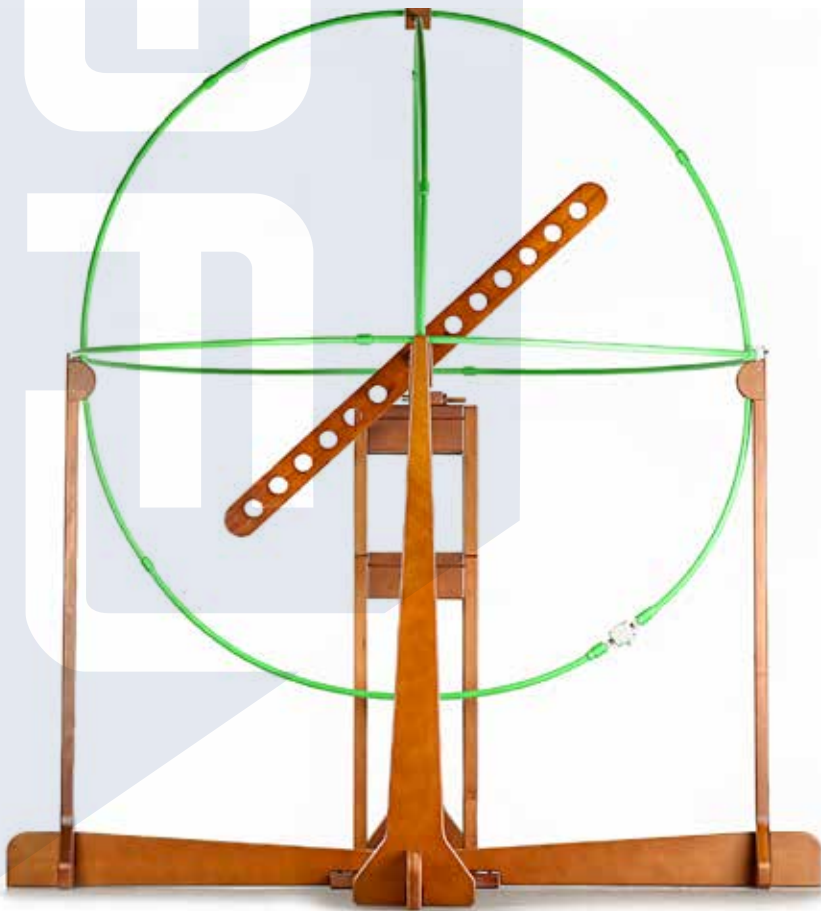
## VVL 1530

### Large Loop Antenna

VVL 1530 Large Loop antenna system (LLAS) is designed and manufactured compliant to CISPR 16-1-4 requirements for measurements of radiated electromagnetic disturbances from 9kHz to 30MHz. CISPR 15 (lighting equipment industry) and CISPR 14-1 (household appliances industry) product standards as well as others require this kind of measurements.

The current probes around the inner conductor of each coaxial antenna-cables have a sensitivity of 1V/A from 9kHz to 30MHz, so no antenna factor is needed to use during measuring.

VVL 1530 is a complete 3-axis antenna with a manual switching unit to select each loop in turn. The loops are 2m in diameter with the lowest point 0.5m above ground and are fitted with specially designed current transducers in fully screened housings. Environment interference is strongly suppressed in open area measurements.



- Usable with any brand CISPR 16-1-1 EMI receiver
- Few minutes to assembly and disassembly without screws
- Easy to store
- Calibration loop (option)
- EUT support (option)

TECHNICAL SPECIFICATIONS	VVL 1530
Design	Fully compliant to CISPR 16-1-4 standard
Frequency range	9kHz-30MHz
Loops	Triple independent 2m diameter loops switchable among X, Y, Z
Loop selector	Manual switching unit
Output impedance	50Ω
Connector	N Female
Operating temperature	0 to 45°C
Storage temperature	-20° to 70°C
Size (W x H x D)	2,1 x 2,6 x 2,1m

*Subject to change without notice*

# PAT20M

## Attenuator & Pulse Limiter



PAT20M Attenuator & Pulse Limiter is designed for pulse voltages up to 1Ws to protect the input stage of EMI receivers with 20dB attenuation.

The input attenuators, the preamplifiers, the pre-selectors or the input mixer can be destroyed during conducted emission measurements due to a very high spectral density/pulse energy. For high voltage spikes as occur for example in measurements with LISN, the usage of PAT20M attenuator & Pulse Limiter is strongly recommended with any kind of EMI Receiver.

TECHNICAL SPECIFICATIONS	PAT20M
Frequency range	9kHz-30MHz
Low pass filter up to	100MHz
Max continuous input power	1W
Max pulse input energy	1Ws (500µs)
Input / Output VSWR	1.05 / 1.15
Impedance	50Ω
Attenuator	20dB ± 0.3dB
Input / Output RF connectors	BNC - BNC, N - BNC, N - N (female - male)
Operating temperature	0 to 45°C
Storage temperature	-20° to 70°C
Size (W x H x D)	96 x 23 x 28mm
Weight	70g

*Subject to change without notice*



# VDH 30

## Test System

VDH 30 Van Der Hoofden test head allows to determine the human exposure to electromagnetic fields caused by luminaries from 20kHz to 10MHz according to IEC 62493 Ed. 2.0: 2015-03.

Through different ways of coupling between luminaries and humans, a level of exposure of a person to electromagnetic fields can be derived. One part of the exposure is based on capacitive coupling between lighting equipment and person. This creates induced internal electric field that must be evaluated using an EMI receiver and a Van Der Hoofden test head.

VDH 30 consists of electrically conductive sphere with 210mm diameter, connection line of 300mm length, protection network for the EMI receiver and wooden tripod.

The EMI receiver measures a voltage across 50Ω. It must be connected to the N connector of the protection network.

To determine the compliance of a luminary to the standard the measured voltage must be converted into induced internal electric field. The measured, weighted and summarized induced internal electric field compliance factor F due to the external electric field from 20kHz to 10MHz shall not exceed the value of 1.



### TECHNICAL SPECIFICATIONS

### VDH 30

Design	Fully compliant to IEC 62493 Ed. 2.0: 2015-03 standard
Frequency range	20kHz-10MHz
Output impedance	50Ω
Connector	N Female
Operating temperature	0 to 45°C
Storage temperature	-20° to 70°C
Diameter of the sphere	210mm
Weight	8kg
Tripod	Wooden support with height adjustment

*Subject to change without notice*

Available upon request:

- High Voltage Probes for conducted emission measurements from 9kHz to 30MHz on load and control lines
- ISN for conducted emission measurements from 9kHz to 30MHz on I/O data lines
- Absorbing Clamp for radiated power emission measurements from 30MHz to 300MHz according to CISPR 14-1 (household appliances industry)
- CDNE for radiated emission measurements from 30MHz to 300MHz according to CISPR 15 (lighting equipment industry)
- Dummy Lamps and Balanced Unbalanced Transformer for insertion loss measurements according to CISPR 15 (lighting equipment industry)
- Conical Metal Housing for self-ballasted fluorescent lamps according to CISPR 15 (lighting equipment industry)
- LISN for conducted emission measurements from 150kHz to 108MHz according to CISPR 25 (automotive industry)
- Near Field Probes for EMI debugging
- Antennas for radiated emission measurements



**AFJ INSTRUMENTS SRL**

Via Gavirate 16 - 20148 Milan – Italy

Phone +39 02 91434850

sales@afj-instruments.com

苏州安辐捷电子科技有限公司

地址：江苏省昆山市玉山镇新南中路567号1号楼A座

1918-1919室 邮编：215300

电话：+86 512 50125796; +86 18994427687

邮件：sales@afj-china.cn



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