

COPPER QUALIFIER with measurement bridge



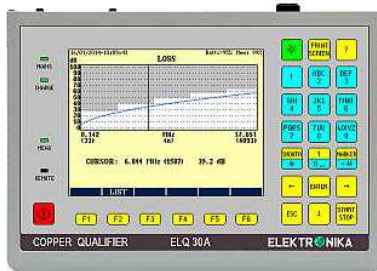
**KURTH
ELECTRONIC**

KE-LQ30A

IS THAT PAIR SUITABLE FOR YOUR SYSTEM?
IF NOT, WHERE IS THE ISSUE?



THE KE-LQ30A COPPER QUALIFIER ANSWERS!



FIVE MEASUREMENT INSTRUMENTS IN ONE

- **Level generator from 200 Hz to 30 MHz**
Selectable signals: Sinus, multitone, white noise
- **Receiver from 200 Hz to 30 MHz**
For selective, broadband and MTTs level measurement
- **Spectrum analyzer**
For disturbance, noise and PSD measurement
- **Impulse reflectometer**
For fault location as well as breaks, short circuits, contact errors, branches, XTALK etc.
- **Active AC-DC measurement bridge**
For AC/DC fault location using Murray, Küpfmüller, 3 point, repeated Küpfmüller and other methods

USAGE

The **KE-LQ30A** is a battery-powered handheld device for multifunctional usage like pre-qualification, installation, fault location and maintenance of symmetrical copper wires.

IMPORTANT PROPERTIES

■ Individual measurements

The KE-LQ30A works as a level generator, receiver and spectrum analyzer and can measure broadband noise, impulse noise, impedance, reflection attenuation, unsymmetry attenuation and near-end cross talk (NEXT)

■ Automatic single sequence measurements

The KE-LQ30A offers measurement sequences for the evaluation of data transfer capacity of a line for selected xDSL systems; no second device or operator needed at the end of the line.

■ Automatic MASTER-SLAVE measurements

A single person can perform measurements with the help of the communication between both measurement devices. This is handled through predefined automatic measurement sequences, the KE-LQ30A can be programmed as MASTER and SLAVE as well.

■ Preprogrammed tolerance masks

Tolerance masks for cable parameters like attenuation, LCL, reflection attenuation, impedance and the most important system parameters are preprogrammed for VDSL2, VDSL1, ADSL2+, ADSL, ADSL G LITE, READSL2, ADSL G.LITE 2, SHDSL, HDSL, ISDN and tone frequency systems.

■ Calculation of maximum data rate

■ Automatic suited/unsuited rating

When a measurement is completed, the results get compared to the tolerance masks and the required data rate to the calculated, theoretically achievable data rate and a suited/unsuited rating will be displayed. The results can be stored within the device to be transmitted to a PC.

■ USB ports for data transfer

■ Long time measurements of micro interruptions

The tester detects micro interruptions according to ITU O.62 and provides detailed information about number and relative duration of interruptions.

■ Long time impulse noise measurements

The tester displays the counted impulses in form of a histogram. The histogram has 60 time slices and specifies the time distribution of the interruptions.

■ Simultaneous event counting

The KE-LQ30A allows for simultaneous event counting of phase and amplitude jumps or impulse noise and interruptions.

■ Group delay distortion measurements

The KE-LQ30A uses the multi-tone testing method upon the recommendation of ITU-T O.81 appendix I.

■ PC supported spectrogram

Spectral measurements can be performed once per second for max. 72 hours and transferred to a PC. The results will be displayed in form of a waterfall diagram.

■ High resistance measurement probe

For PSD spectral measurement on xDSL lines without operational disruption

■ ESEL measurements up to 120 dB

The ESEL measurement is a useful tool for programming of frequency-dependent output line of local DSLAM.

■ ESEL-dependent templates

Data rate calculation of local participant lines, whereas the local DSLAM works with reduced transmission power (DPBO). Preprogrammed ESEL templates are provided for all ADSL2+ systems.



LINE QUALIFICATION

MANUAL MEASUREMENTS WITH ONE KE-LQ30A

- **Level generator**
Single frequency measurement signal
MTTS signal with 30 / 36 frequencies
- **Receiver**
Single frequency
MTTS signal mit 30 / 36 frequencies
Broadband
- **Single sided**
Combined FDR/TDR
- **NEXT**
Single frequency / Wobbler
- **LCL unsymmetry attenuance**
Single frequency / Wobbler
- **Impedance**
Single frequency / Wobbler
- **Reflection attenuance**
Single frequency / Wobbler
- **Noise**
Broadband
Rated
Psophometric
- **Impulse noise**
Short-time
Longtime with histogram for max. 72 hours
- **Spectrum analyzer**
With reference to a previous measurement result
- **Spectrogram**
Waterfall diagram for max. hours
- **Echo Test**
With a 1020 Hz signal package
- **Telephone simulator**

MANUAL MEASUREMENTS WITH TWO KE-LQ30A

- **Two-sided insertion attenuation**
Single frequency measurement signal
at MTTS signal with 30 / 36 frequencies
- **Micro attenuation**
List and histogram with 240 time splices
- **Noise with tone**
With a 1020 Hz notch filter
- **Phase jitter und frequency errors**
With a 1020 Hz measurement signal
- **Simultaneous event counting**
Simultaneous counting of
Amplitude jumps
Phase jumps
Interruptions
Noise impulses
- **Group delay distortion measurement**
At MTTS signal with 30 / 36 frequencies

AUTOMATIC MASTER/SLAVE OPERATIONAL MODE

Selectable measurements for xDSL systems

- **Two-sided insertion attenuation**
With ~300 frequencies
- **Noise spectrum**
With ~300 frequencies
- **Bitload calculation**
In both directions
- **Achievable data rate calculation**
In both directions
- **LCL unsymmetry attenuation**
From both ends
- **Reflection attenuation**
From both ends
- **Impedance**
From both ends
- **NEXT**
From both ends
- **FEXT**
From both ends
- **ESEL measurement**
Up to 120 dB for ADSL2+ systems
- **ESEL dependent templates for ADSL2+**

Selectable measurements for tone frequency systems

- **Two-sided attenuation measurement**
With 36 frequency Wobbler
- **Noise spectrum measurement**
From both ends
- **Total distortion measurement**
For PCM or line amplifier
- **Reflection attenuation measurement**
From both ends
- **Impedance measurement**
From both ends
- **LCL unsymmetry attenuation measurement**
From both ends
- **Group delay distortion measurement**
With a 36 frequency MTTS signal
- **Phase jitter and frequency error**
With a 1020 Hz measurement signal
- **Simultaneous event counting**
Simultaneous counting of
Amplitude jumps
Phase jumps
Interruptions
Noise impulses



PREPROGRAMMED STANDARD PARAMETER SETS

VDSL 2 (ITU-T G.993.2) via ISDN

998-M2x-B8	Data rate: 25.000 to 50.000 kbps
998-M1x-B	Data rate: 34.000 to 68.000 kbps
998-M2x-B	Data rate: 34.000 to 68.000 kbps
998-M2x-B-17	Data rate: 50.000 to 100.000 kbps

VDSL 2 (ITU-T G.993.2) via ISDN without US0

998-M1x-NUS0	Data rate: 34.000 to 68.000 kbps
998-M2x-NUS0	Data rate: 34.000 to 68.000 kbps

VDSL 2 (ITU-T G.993.2) via POTS

997-M1c-A7	Data rate: 25.000 to 50.000 kbps
997-M2x-A	Data rate: 25.000 to 50.000 kbps
998-M1x-A	Data rate: 34.000 to 68.000 kbps
998-M2x-A	Data rate: 34.000 to 68.000 kbps

VDSL 2 (ITU-T G.993.2) via POTS, expanded US0

998-M2x-M8	Data rate: 25.000 to 50.000 kbps
997-M1x-M8	Data rate: 25.000 to 50.000 kbps
997-M2x-M8	Data rate: 25.000 to 50.000 kbps
997-M1x-M	Data rate: 25.000 to 50.000 kbps
997-M2x-M	Data rate: 25.000 to 50.000 kbps
998-M2x-M	Data rate: 34.000 to 68.000 kbps
998-M2x-M-17	Data rate: 50.000 to 100.000 kbps

VDSL 1 (ITU-T G.993.1)

997-P1.M2	Data rate: 20.000 to 40.000 kbps
998-P1.M2	Data rate: 20.000 to 40.000 kbps
997-P2.M2	Data rate: 20.000 to 40.000 kbps
998-P2.M2	Data rate: 20.000 to 40.000 kbps

ADSL2+ (ITU-T G.992.5 annex A, B, I, J, M)

Spectrum: FDD/EC, ADLU selectable 32 to 64
Data rate: 448 to 17.696 kbps

ADSL2 (ITU-T G.992.3 annex A, B, I, J, M)

Spectrum: FDD/EC, ADLU selectable 32 to 64
Data rate: 448 to 6656 kbps

ADSL (ITU-T G.992.1 annex A, B)

Spectrum: FDD/EC Data rate: 448 to 6656 kbps

ADSL G.LITE2 (ITU-T G.992.4 annex A, I)

Spectrum: FDD/EC Data rate: 448 to 2304 kbps

READSL2 (ITU-T G.992.3 annex L)

Spectrum: FDD/EC Up band: wide/narrow
Data rate: 448 to 2304 kbps

HDSL (ITU-T G.991.1)

2B1Q, CAP

SHDSL (ITU-T G.991.2 annex B)

16 TC PAM Data rate: 256 to 2304 kbps

SHDSL (ETSI TS 101 524 v 1.3.1 annex E)

16 UC PAM Data rate: 512 to 3848 kbps
32 UC PAM Data rate: 768 to 5696 kbps

ISDN ETSI ETR080

Primary rate

ISDN ITU-T G.962

Basic rate

tone FREQUENCY

ITU-T M.1020, ITU-T M.1025, ITU-T M.1040

Active / passive

Dedicated line / Dial-up line

SYSTEM INDEPENDENT TEST SEQUENCES

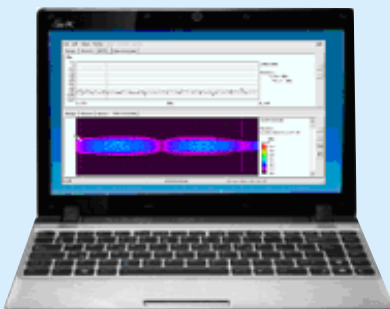
KE-LQ30A allows for system independent test sequences for measuring selected cable parameters

- in preprogrammed frequency bands (10 selectable frequency bands)
- with a user defined frequency

LONG TIME SPECTROGRAM MEASUREMENT (optional)

KE-LQ30A's optional **spectrogram** is a great tool that helps the user to identify an error within the communication line. Finding a disrupter is hard, especially if:

- the disturbing signals occur at an unexpected point in time and/or
- the disturbing signals occur within an unexpected frequency range



In spectrogram mode, the KE-LQ30A measures the noise spectrum once per second. The result gets transmitted to a PC or memory stick via USB port.

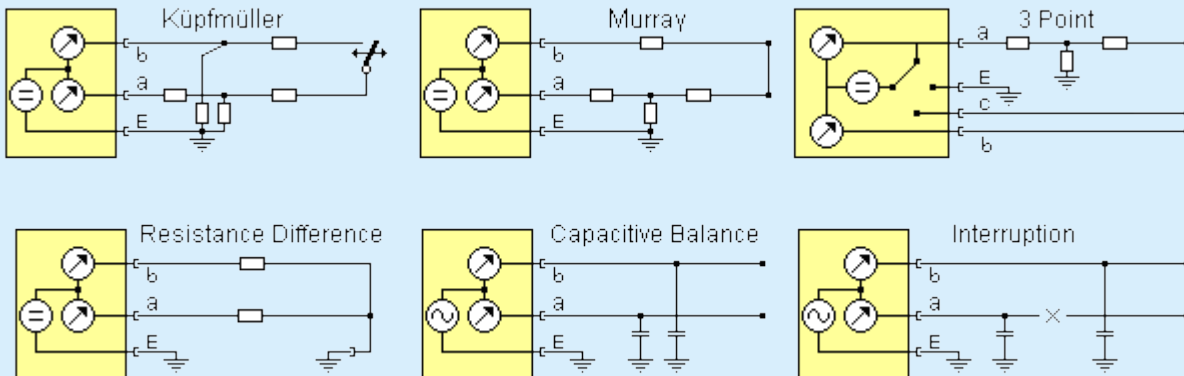
Because of the big storage capacity and big screen of a PC, the result can be displayed in form of a waterfall diagram:

- Running time is displayed on the vertical axis
- Frequency is displayed on the horizontal axis
- Noise level is displayed with colours

FAULT LOCATION WITH BRIDGE MEASUREMENTS

The KE-LQ30A's measurement bridge allows for a series of elaborate methods of fault location:

- Measurement of cable parameters
- DC / AC fault location methods
- Automatic measurement sequences allows fast and efficient work



MEASUREMENT OF CABLE PARAMETERS

- **AC / DC voltage measurement**
Between two leads
Between leads and ground
- **Resistance measurement**
2 leads (loop resistance)
2 leads and ground
- **Isolation resistance measurement**
Two-pole
- **Capacity measurement**
Physical, two-pole and with short circuits (Rec. EN 50289-1-5: 2001)

AUTOMATIC MEASUREMENT SEQUENCES

- **Quick test**
To gather information about an unknown pair quickly (AC-DC voltage, isolation resistance, capacities und capacitive symmetry)
- **Quality test**
To qualify the most important parameters (like isolation resistances, capacities, capacitive symmetry, loop resistance and resistance difference) of a known good pair in order to display an acceptance certificate. In order to do so, the loop switch ELC 30 is used.
- **Condition pre-measurement**
To detect the optimal fault location mode.

DC FAULT LOCATION

- **Resistance difference measurements**
In sensitive or protected mode
- **Murray method**
In sensitive or protected mode
- **Küpfmüller method**
In sensitive or protected mode
- **3 point method**
In sensitive or protected mode
- **Repeated Küpfmüller method (DC)**
With histogram

AC FAULT LOCATION

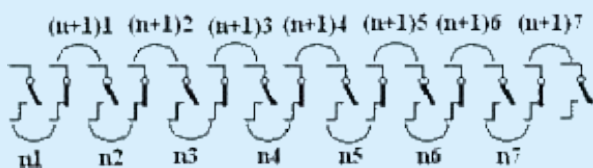
- **Measurement of capacitive symmetry**
In sensitive or protected mode
- **Interruption measurement**
In sensitive or protected mode
- **Repeated Küpfmüller method (AC)**
With histogram

REPEATED KÜPFMÜLLER METHOD

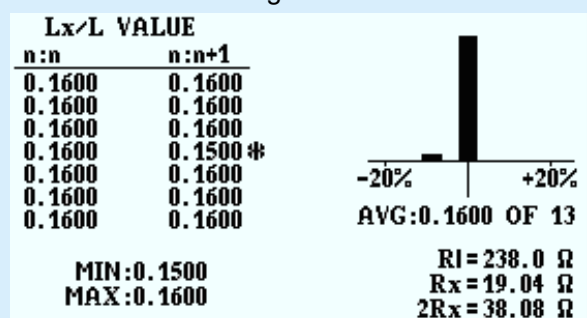
This method is a series of Küpfmüller measurements composed of 15 partial measurements, alternating:

- 8 measurements with an open far end
- 7 measurements with a short-circuited far end

The alternating measurements provide 14 Lx/L values.



The Lx/L values are displayed in two columns and a histogram.



SPECIFICATIONS

Level generator

Output impedance (symmetrical)
 10 kHz to 30 MHz 100, 135, 150 Ω
 200 Hz to 10 kHz 600 Ω

Frequency
 Frequency range.....200 Hz to 30 MHz
 Resolution.....1 Hz
 Accuracy..... $2 \times 10^{-6} \pm 1$ Hz

Level generator modes:
 Single frequency
 Multi-tone signal (30 frequencies)
 Wobbler generator

Output level in single frequency mode
 10 kHz to 30 MHz +10 to -40 dBm
 200 Hz to 10 kHz +4 to -45 dBm
 Resolution..... 0.1 dB

Accuracy at 0 dBm
 200 Hz to 10 kHz ± 0.5 dB
 10 kHz to 5 MHz ± 0.3 dB
 5 MHz to 30 MHz ± 1 dB

Receiver

Input impedance (symmetrical)
 10 kHz to 30 MHz 100, 135, 150 Ω or high
 200 Hz to 10 kHz 600 Ω or high

Selective level measurement

Frequency
 Frequency range.....200 Hz to 30 MHz
 Resolution..... 1 Hz
 Accuracy..... $2 \times 10^{-6} \pm 1$ Hz

Receiver modes:
 Single frequency
 multi-tone signal (30 frequencies)
 Wobbler signal receiver

Bandwidths
 200 Hz to 10 kHz 20 Hz
 10 kHz to 5 MHz ... 20, 200 Hz, 1.74, 1.95, 3.1 kHz
 5 MHz to 18 MHz 200 Hz, 1.74, 1.95, 3.1 kHz
 18 MHz to 30 MHz 1.74, 1.95, 3.1 kHz

Measuring range with 20 Hz bandwidth
 10 kHz to 30 MHz -120 to +10 dBm
 200 Hz to 10 kHz -120 to +4 dBm
 Resolution..... 0.1 dB

Accuracy at 0 dBm
 200 Hz to 10 kHz ± 0.5 dB
 10 kHz to 5 MHz ± 0.3 dB
 5 MHz to 30 MHz ± 1 dB

Broadband level measurement

Frequency range.....200 Hz to 30 MHz

Measuring range
 10 kHz to 30 MHz -50 to +10 dBm
 200 Hz to 10 kHz -50 to +4 dBm
 Resolution..... 0.1 dB

Accuracy at 0 dBm
 200 Hz at 10 kHz ± 0.5 dB
 10 kHz at 5 MHz ± 0.3 dB
 5 MHz at 30 MHz ± 1 dB

Spectrum analyzer

Frequency range..... 200 Hz to 30 MHz
 Input impedance (symmetrical)
 10 kHz to 30 MHz 100, 135, 150 Ω or high
 200 Hz to 10 kHz 600 Ω or high
 Display range..... down to -140 dBm/Hz

Maximum input level
 W/ active high-impedance meas. probe.... +20 dBm
 Without high-impedance measurement probe
 200 Hz to 10 kHz +4 dBm
 10 kHz to 30 MHz +10 dBm

Bandwidths and frequency steps

Frequency range	Bandwidth and frequency step
30 MHz	500 Hz to 100 kHz
18 MHz	500 Hz to 60 kHz
12 MHz	500 Hz to 40 kHz
9 MHz	500 Hz to 30 kHz
3 MHz	500 Hz to 10 kHz
1.5 MHz	500 Hz to 5 kHz
600 kHz	500 Hz to 2 kHz
300 kHz	500 Hz to 1 kHz
20 kHz	50 Hz to 100 Hz
4 kHz	10 Hz to 20 Hz
0.3 kHz	1 Hz

Number of displayed frequencies.....300
 The entire measurement result can be saved
 Analysis..... NORM, PEAK, AVG, SAVG
 Units..... dBm, dBm/Hz

Unsymmetry attenuation measurement (LCL)

Impedance
 10 kHz to 30 MHz 100, 135, 150 Ω
 200 Hz to 10 kHz 600 Ω

Display range..... 0 to 70 dB
 Accuracy at 35 dB with highsymmetrical cable
 200 Hz to 100 kHz ± 2 dB
 100 kHz to 5 MHz ± 1 dB
 5 MHz to 30 MHz ± 2.5 dB

Impedance measurement

Measuring range
 10 kHz to 30 MHz 50 to 400 Ω
 200 Hz to 10 kHz 300 to 1600 Ω

Accuracy
 200 Hz to 10 kHz $\pm 10\% \pm 5$ Ω
 10 kHz to 18 MHz $\pm 5\% \pm 5$ Ω
 18 MHz to 30 MHz $\pm 10\% \pm 5$ Ω

Reflection attenuation measurement

Impedance
 10 kHz to 30 MHz 100, 135, 150 Ω
 200 Hz to 10 kHz 600 Ω

Display range..... up to 40 dB
 Accuracy at 20 dB
 200 Hz to 18 MHz ± 2 dB



SPECIFICATIONS

Single-sided insertion attenuation measurement

Frequency range.....1.5, 3, 9, 12, 18, 30 MHz
 Line length.....100 m to 6 km
 Direct measurement.....100 kHz to 6 MHz or
 up to 45 dB cable attenuation
 Extrapolation..... over 6 MHz or
 over 45 dB cable attenuation
 Vertical axis.....0 to 80 dB
 Accuracy.....2 to 4 dB
 (Accuracy and maximum cable length
 depending on cable type)

NEXT and attenuation measurement

Frequency range.....200 Hz to 30 MHz
 Impedance (symmetrical)
 10 kHz to 30 MHz..... 100, 135, 150 Ω
 200 Hz to 10 kHz.....600 Ω
 Modes.....Single frequency and wobbler
 Measuring range
 NEXT.....up to 80 dB
 Attenuation..... up to 90 dB

Broadband noise measurement

Frequency range.....200 Hz to 30 MHz
 Filter for noise measurement..... Psophometric
 3,1 kHz flat, 1020 Hz notch
 ADSL, ADSL 2+, VDSL 1,
 VDSL 2-8, VDSL 2-12,
 VDSL 2-17, VDSL 2-30

Measuring time....selectable between 1 s and 72 h
 Analysis..... for 1 s up to 1 min quasi analog
 over 1 minute histogram with 60 time slots

Impulse noise measurement

Pulse width >500 ns
 Safety interval..... 10 ms
 Threshold range..... 0 to -60 dBm
 Maximum event count..... 65.000
 Measuring time....selectable between 1 s and 72 h
 Analysis..... for 1 to 30 seconds numeric
 over 30 seconds histogram with 60 time slots

Micro interruption measurement

Measuring signal.....1020 Hz, 0 to -30 dBm
 Impedance..... 600 Ω
 Threshold under normal level with
3, 6, 10, 20 dB
 Threshold accuracy
 for 3, 6, 10 dB..... - 1 dB
 for 20 dB..... - 2 dB
 Measuring time.....sel. between 4 min and 72 h
 Interruption categories.....0.6 ms to 3 ms
 3 ms to 30 ms
 30 ms to 300 ms
 300 ms to 1 min
 >1 min
 Analysis.....relative downtime, disturbed seconds,
 interruption count, time distribution

Phase jitter and frequency fault measurement

Measuring signal.....1020 Hz, 0 to -30 dBm
 Measuring range..... 0.2 to 30.0 degree p-p
 Filter4 to 300 Hz

Simultaneous event count

Measuring time.....5, 15, 30, 60 minutes
 Measuring signal.....1020 Hz, 0 to -30 dBm
 Maximum event count.....65.000
 Counter for amplitude jumps (O.95)
 Treshold range.....2 to 9 dB
 Protection interval.....4 ms
 Idle period.....125 – 25 ms
 Idle period after interruption (>10 dB decline)..... 1 s
 Counter for phase jumps (O.95)
 Treshold range..... 5 to 45 degrees
 Protection interval.....4 ms
 Idle period.....125 – 25 ms
 Counter for interruptions (O.61)
 Treshold range.....6, 10 dB
 Protection interval.....2 ms
 Idle period.....3 – 1 ms
 Counter for impulse noise (O.71)
 Filter1020 Hz notch
 Protection interval.....20 ms
 Idle period.....125 – 25 Hz
 Treshold range..... 0 to -50 dBm

Group delay distortion (O.81 app. I)

Measuring signal..... 36 MTT, 200 to 3700 Hz
 Measuring signal level... -20 dBm/tone (3dBm peak)
 Input level range..... -50 to -10 dB/tone
 Group delay distortion range..... 0 to 5 ms
 Resolution.....1 ms

Impulse reflectometer measurements

Measurement modes
 Normal measurement at a twin leadL1
 Long-time measurement at a twin lead L1 LZ
 Comparison w/ memory content... L1 & SP, L1 - SP
 XTALK fault location..... transm. at L2, rec. at L1
 Impedance 100 Ω
 Measurement range..... 16 m to 32 km
 Zoom1 to 5
 Amplifying range.....0 to 90 dB
 Pulse amplitude..... ~3 V
 Pulse width6 ns to 6 ms
 Wave propagation velocity
 V90 to 299 m/ms
 V/2.....45 to 150 m/ms
 PVF 0.3 to 0.999
 Accuracy..... -0.5% – 1m

Telephone simulator

Dialing.....pulse & tone
 Dialing number memory.....available
 Measurement values
 Line voltage.....up to 100 V
 Loop voltage.....up to 100 mA
 Ring tone voltage.....up to 100 V p-p

Echo test

Measuring range.....0 to 2500 ms
 Resolution.....5 ms
 Result range.....0 to -50 dB



SPECIFICATIONS OF THE AC-DC MEASUREMENT BRIDGE

MEASUREMENTS

Voltage

DC voltage.....up to 400 V
 AC voltage.....up to 250 V eff
 Accuracy.....-3% - 1 V
 Frequency range.....15 to 300 Hz
 Input resistance..... 1 or 2 MΩ

Loop resistance

Measuring range..... 1 Ω to 10 kΩ
 Accuracy.....- 0.3% - 0.1 Ω

Resistance difference

Loop resistance range..... 5 Ω to 5000 Ω
 Accuracy.....-0.2% at RI - 0.2 Ω

Isolation resistance

Measuring range..... 10 kΩ to 1000 MΩ
 Measuring voltage.....100 V
 Accuracy
 10 kΩ to 300 MΩ..... 2 to 5% - 1 kΩ
 over 300 MΩ..... 10% - 1 MΩ

Capacity

Measuring range.....1 nF to 2 (10) μF
 Measuring voltage..... 11 Hz, 5 V
 Accuracy.....-2% - 0.2 nF

Capacitive symmetry

Measuring range..... 1 nf to 2000 nF
 Measuring voltage..... 11 Hz, 5 V
 Accuracy of Lx/L value-2 % - 0,2 nF

DC fault location

Measuring modes..... Murray, Küpfmüller, 3 point
 Loop resistance range..... 1 Ω to 10 kΩ
 Fault resistance range.....up to 100 MΩ
 Measuring voltage..... 100 V
 Accuracy (RI=2 kΩ, Lx/L=0,1 to 1)
 Fault resistance < 1 MΩ..... - 0.2 %
 Fault resistance 1 MΩ to 5 MΩ..... - 0.3 %
 Fault resistance 5 MΩ to 25 MΩ..... - 0.5 %
 Fault resistance 25 MΩ to 100 MΩ..... - 2 %

AC interruption fault location

Range.....20 km (depending on cable type)
 Accuracy..... -2% - 0.2 nF

REPEATED TWO-POLE DMM MEASUREMENTS

Disturbance voltage

DC voltage.....up to 400 V
 AC voltage.....up to 250 V eff
 Accuracy.....-3% - 1 V
 Frequency range.....15 to 300 Hz
 Input resistance.....2 MΩ

Loop resistance

Measuring range..... 1 Ω to 10 kΩ
 Accuracy.....-0.5 % - 0.2 Ω

Isolation resistance

Measuring range..... 10 kΩ to 300 MΩ
 Measuring time..... ~ 3 sec
 Measuring voltage.....100 V
 Accuracy (without disturbance voltage) in % of
 measurement result.....20 %

DC current

Measuring range..... 5 μA to 0,1A
 Accuracy.....-3% 0.1 μA

Capacity

Measuring range.....10 nF to 2 μF
 Measuring current..... 11 Hz, 5 V
 Accuracy.....-3% - 0.3 nF

AUTOMATIC MEASUREMENT SEQUENCES

Quick test

To gather information on an unknown pair quickly

Quality test

To help the user create a detailed acceptance certificate of a known good pair

Condition pre-measurement

To determine the condition of a wire on order to choose the optimal fault location method for a defective pair



LOOP SWITCH ELC 30 (HW Option)

Functions

Opens and closes the end of the tested pair if a person wants to conduct a measurement solo, in which the far end of the measured pair needs to be opened or short-circuited.

The KE-ELQ30A operates the loop switch over the measured pair of wires.

Specifications

Ports..... 4 mm banana plugs
 Power supply
 AA alkaline cells 3 pieces
 Operating time..... approx. 1000 hours
 Automatic switch off..... after 4 hours
 Dimensions..... 110 x 60 x 25 mm
 Weight (with batteries)approx. 0.2 kg





HIGH IMPEDANCE ACTIVE MEASUREMENT HEAD ELQP 30 (HW Option)

Usage

The active measurement head ELQP 30 is used for PSD spectrum measurement on lines in usage. In order to do so, the measurement device input must be set up parallel to the active modem. However, the high capacity of the normal measurement cable interferes with the data transmission of the digital system; this is why the measurement head must be used with an extremely small input capacity.

Specifications

Frequency range.....5 kHz to 30 MHz
 Attenuation..... 15 dB
 Input Impedance.....5 kOhm || 5pF
 Accuracy
 5 kHz to 25 kHz..... ±1 dB
 25 kHz to 5 MHz..... ±0.3 dB
 5 MHz to 30 MHz ±1 dB
 Power supply..... from KE-LQ30A

GENERAL SPECIFICATIONS KE-LQ30A

Power supply

Internal rechargeable NiMH battery pack
 Operating time without backlight approx. 8 h

Charging

From 230V AC grid.....with grid adapter
 From 12 V car battery.....with charging adapter
 Charging time with fast charging..... max. 3 h

Display 320 x 240 Color LCD TFT

Ports

For grid and 12 V charging adapter.. 2.1/5.5 mm coax
 Power supply for measurement head..... Mini-din-4P
 Measuring line ports..... 4 mm banana plugs
 USB AUSB 1.1 port for USB stick
 USB B USB 1.1 port for PC

High voltage protection

Between a and b or ground.....200 V DC
 Longitudinal voltage.....60 V AC

Environmental conditions

Reference range.....23 – 5 °C
 Rel. humidity 45% to 75%*
 Operational range.....0 to +40 °C
 Rel. humidity 30% to 75%* (< 25 g/m³)
 Border range.....-5 to +45 °C
 Rel. humidity 5% to 95%* (< 29 g/m³)
 Transportation / storage.....-40 to +70 °C
 Rel. humidity 95% at +45°C* (< 35 g/m³)

* without thawing

Dimensions 224 x 160 x 65 mm

Weightapprox. 1.5 kg

Article no.	Type	Description
KE-LQ30A	KE-LQ30A	Line qualifier for ADSL, VDSL, SHDSL and other services. Big graphical display. Built-in rechargeable battery. Incl. measuring lines, power supply, PC software und carrying bag. Available optionally: AC/DC measurement bridge, TDR measurements up to 32 km cable length and various software options.