IKONIX

LVB-2 INSTRUCTION SHEET

Leakage Current Verification Box

V 1.05 | 04.2024

RoHS 3 COMPLIANT 2015/863/EU

DECLARATION OF CONFORMITY CE UKCA

Manufacturer: Ikonix

Address: 28105 N. Keith Dr,
Lake Forest, IL 60045

Product Name: LLT Verification Box

Model Number: LVB-2

Conforms to the following Standards:

Safety: BS EN 61010-1:2010 + A1:2019

EMC: BS EN 61326-1:2013

Supplementary Information

The product herewith complies with the requirements of the Low Voltage Directive 2014/35/EU and the EMC Directive 2014/30/EU and the RoHS Directive 2015/863/EU with respect to the following substances: Lead (Pb), Mercury (Hg), Cadmium (Cd), Hexavalent chromium (Cr (VI)), Polybrominated biphenyls (PBB), Polybrominated diphenyl ethers (PBDE), Bisphthalate (DEHP), Dibutyl phthalate (DBP), Benzyl butyl phthalate (BBP), Diisobutyl phthalate (DIBP), Deca-BDE included.

The technical file and other documentation are on file with Ikonix.

Adam Braverman
President
Ikonix
Lake Forest, Illinois USA
December 2022

LVB-2 Technical Specifications

INPUT		CONNECTOR TERMINAL	
VOLTAGE	277V MAC through LLT Tester	**L, N, GND**	AC Socket
PROBE	L, N, GND, PH, PL	**PH, PL**	Alden Connector

PROBE CONFIGURATION	PROBE CONFIGURATION SWITCH
GND - LINE	ON/OFF by 10A power switch
PROBE HI - LINE	ON/OFF by 10A power switch
PROBE HI - PROBE LO	ON/OFF by 10A power switch
	Note: Only one switch can be CLOSED at a time

RESISTOR RANGE SPECIFICATION		RESISTOR RANGE SWITCH
7.5KΩ	300VAC / 20W / 2% +/- 100PPM	Select by Rotary Switch
15KΩ	300VAC / 10W / 2% +/- 100PPM	
30KΩ	300VAC / 5W / 2% +/- 100PPM	
150KΩ	300VAC / 2W / 2% +/- 100PPM	
350KΩ	300VAC / 0.5W / 2% +/- 100PPM	
1.47MΩ	300VAC / 0.25W / 2% +/- 100PPM	
2.97MΩ	300VAC / 0.25W / 2% +/- 100PPM	
6.37MΩ	300VAC / 0.25W / 2% +/- 100PPM	

GENERAL

TEST POINTS	TEST CONDITION	SPECIFICATION
PASS 15kΩ	1. LLT: 132VAC, 10,000uA High Limit 2. Maximum Voltage 277VAC 3. Ground = Open, Neutral = Closed, Reverse = Off	2%
FAIL 7.5kΩ	1. LLT: 132VAC, 10,000uA High Limit 2. Maximum Voltage 277VAC 3. Ground = Open, Neutral = Closed, Reverse = Off	2%
PASS 30kΩ	1. LLT: 132VAC, 6000uA High Limit 2. Maximum Voltage 277VAC 3. Ground = Open, Neutral = Closed, Reverse = Off	2%
FAIL 15kΩ	1. LLT: 132VAC, 6000uA High Limit 2. Maximum Voltage 277VAC 3. Ground = Open, Neutral = Closed, Reverse = Off	2%
PASS 150kΩ	1. LLT: 132VAC, 2000uA High Limit 2. Maximum Voltage 277VAC 3. Ground = Open, Neutral = Closed, Reverse = Off	2%

GENERAL CONTINUED		
TEST POINTS	**TEST CONDITION**	**SPECIFICATION**
FAIL 30kΩ	1. LLT: 132VAC, 2000uA High Limit 2. Maximum Voltage 277VAC 3. Ground = Open, Neutral = Closed, Reverse = Off	2%
PASS 350kΩ	1. LLT: 132VAC, 500uA High Limit 2. Maximum Voltage 277VAC 3. Ground = Open, Neutral = Closed, Reverse = Off	2%
FAIL 150kΩ	1. LLT: 132VAC, 500uA High Limit 2. Maximum Voltage 277VAC 3. Ground = Open, Neutral = Closed, Reverse = Off	2%
PASS 1.47MΩ	1. LLT: 132VAC, 100uA High Limit 2. Maximum Voltage 277VAC 3. Ground = Open, Neutral = Closed, Reverse = Off	2%
FAIL 350kΩ	1. LLT: 132VAC, 100uA High Limit 2. Maximum Voltage 277VAC 3. Ground = Open, Neutral = Closed, Reverse = Off	2%
PASS 2.97MΩ	1. LLT: 132VAC, 30uA High Limit 2. Maximum Voltage 277VAC 3. Ground = Open, Neutral = Closed, Reverse = Off	2%
FAIL 1.47MΩ	1. LLT: 132VAC, 30uA High Limit 2. Maximum Voltage 277VAC 3. Ground = Open, Neutral = Closed, Reverse = Off	2%
PASS 30kΩ	1. LLT: 264VAC, 10,000uA High Limit 2. Maximum Voltage 277VAC 3. Ground = Open, Neutral = Closed, Reverse = Off	2%
FAIL 15kΩ	1. LLT: 264VAC, 10,000uA High Limit 2. Maximum Voltage 277VAC 3. Ground = Open, Neutral = Closed, Reverse = Off	2%
PASS 150kΩ	1. LLT: 264VAC, 6000uA High Limit 2. Maximum Voltage 277VAC 3. Ground = Open, Neutral = Closed, Reverse = Off	2%
FAIL 30kΩ	1. LLT: 264VAC, 6000uA High Limit 2. Maximum Voltage 277VAC 3. Ground = Open, Neutral = Closed, Reverse = Off	2%
PASS 350kΩ	1. LLT: 264VAC, 2000uA High Limit 2. Maximum Voltage 277VAC 3. Ground = Open, Neutral = Closed, Reverse = Off	2%
FAIL 150kΩ	1. LLT: 264VAC, 2000uA High Limit 2. Maximum Voltage 277VAC 3. Ground = Open, Neutral = Closed, Reverse = Off	2%
PASS 1.47MΩ	1. LLT: 264VAC, 500uA High Limit 2. Maximum Voltage 277VAC 3. Ground = Open, Neutral = Closed, Reverse = Off	2%
FAIL 350kΩ	1. LLT: 264VAC, 500uA High Limit 2. Maximum Voltage 277VAC 3. Ground = Open, Neutral = Closed, Reverse = Off	2%

GENERAL CONTINUED		
TEST POINTS	**TEST CONDITION**	**SPECIFICATION**
PASS 2.97MΩ	1. LLT: 264VAC, 100uA High Limit 2. Maximum Voltage 277VAC 3. Ground = Open, Neutral = Closed, Reverse = Off	2%
FAIL 1.47MΩ	1. LLT: 264VAC, 100uA High Limit 2. Maximum Voltage 277VAC 3. Ground = Open, Neutral = Closed, Reverse = Off	2%
PASS 6.37MΩ	1. LLT: 264VAC, 30uA High Limit 2. Maximum Voltage 277VAC 3. Ground = Open, Neutral = Closed, Reverse = Off	2%
FAIL 2.97MΩ	1. LLT: 264VAC, 30uA High Limit 2. Maximum Voltage 277VAC 3. Ground = Open, Neutral = Closed, Reverse = Off	2%
SAFETY	CE	
ENVIRONMENT	0° - 40° C	
DIMENSIONS (W X H X D)	186mm x 75 x 146	
WEIGHT	1.3 lbs.	
STANDARD ACCESSORIES		
POWER CORD (10A)	x1	

MAINTENANCE:

To prevent electric shock do not remove the instrument cover. There are no user serviceable parts inside. Routine maintenance or cleaning of internal parts is not necessary. Any external cleaning should be done with a clean dry or slightly damp cloth. Avoid the use of cleaning agents or chemicals to prevent damage plastic parts or lettering.

ENTRETIEN:

Pour éviter les chocs électriques ne pas enlever le couvercle de l'instrument. Il n'y a aucune pièce reparable par l'utilisateur. L'entretien de routine ou le nettoyage des pièces internes ne sont pas nécessaires. Tout nettoyage externe doit être fait avec un chiffon sec ou légèrement humide. Éviter l'utilisation de produits de nettoyage ou des produits chimiques pour éviter d'effacer les lettres ou d'abimer les pièces en plastique.

OPERATING ENVIRONMENT:

This instrument may be operated in environments with the following limits:
- Indoor Use Only
- Altitude: 2000 m
- Temperature: 0°C to 40°C
- Humidity: Maximum 80% RH at 31°C decreasing to 50% RH at 40°C
- Pollution Degree: 2

Symbols Explanation:

Please refer to the instruction manual for specific warning or caution information to avoid personal injury or damage to the product.

S'il vous plaît se référer au manuel d'instructions de mise en garde ou information sur la prudence pour éviter des blessures ou des dommages au produit

To indicate hazardous voltages may be present.

Avertissement des tensions dangereuses qui peuvent être présentes

Note: pay close attention to the maximum voltage and duty cycle limitations of each resistor. Applying voltages that are higher than the recommended maximum setting or duty cycles greater than indicated can cause damage to the LVB-2.

Note: attention à la tension maximale et les limites du cycle de travail de chaque résistance. L'application de tensions plus élevées que le réglage maximum recommandé ou cycles de travail supérieures à celles indiquées peut causer des dommages à la LVB-2

WARNING

The LVB-2 works with test voltages and currents which can cause harmful or fatal electric shock. To prevent accidental injury or death, these safety procedures must be strictly observed when handling and using the test instrument.

Les tensions et les courants qui peuvent causer des chocs électriques dangereux ou fatal. Pour éviter les blessures accidentelles ou la mort, ces procédures de sécurité doivent être strictement observées lors de la manipulation et l'utilisation de l'instrument de test

Not rated for measurements within MEASUREMENT CATEGORIES II, III, or IV

N'est pas classé pour les catégories de surtension II, III ou IV

DO NOT TOUCH WHEN TESTING OR AFTER A MALFUNCTION HAS OCCURRED.

NE TOUCHEZ PAS LORS DE L'ESSAI OU APRÈS UN DYSFONCTIONNEMENT DU PRODUIT.

CAUTION: Never connect LVB-2 to any mains circuit directly

ATTENTION: Ne jamais connecter directement le LVB-2 à un circuit d'alimentation.

General Information

The LVB-2 is a load box used for the following applications:

- Verifying that the failure detectors for a leakage current test sequence of your Ikonix electrical safety testing instrument are functioning properly.
- Verifying failure limit thresholds for a leakage current test.
- Verifying the three probe configurations of the instrument (G-L, PH-L and PH-PL) are functioning properly.

The LVB-2 consists of loads based on the 132V/264V test voltages and failure limits listed in the IEC60601-1 test standard for different types of leakage tests.

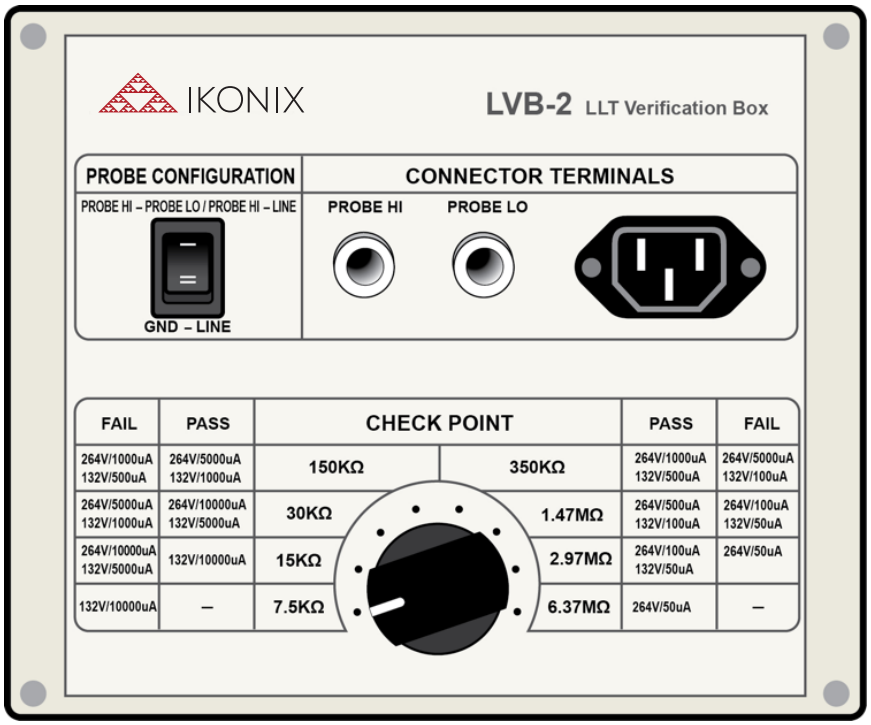
Note: The LVB-2 is not intended to comply with any specific safety agency standard.

Note: The trip setting may vary up to 10% of the set value based on the combined tolerances of the instrument and the components used in the LVB-2.

Using the LVB-2

The LVB-2 can be used with the following Ikonix instrument models:

	Model	Capability
ASSOCIATED RESEARCH	OMNIA 2 8206	GB/GC, ACW, DCW, IR, RUN, LLT
	OMNIA 2 8207	GB/GC, ACW, DCW, IR, RUN, LLT, Built-in 500VA AC Source
	OMNIA 2 8256	GB/GC, ACW(500VA), DCW, IR, RUN, LLT
	OMNIA 2 8257	GB/GC, ACW(500VA), DCW, IR, RUN, LLT, Built-in 500VA AC Source
	LINECHEK II 620L	LLT, RUN
SCI	SCI 6330	GB, ACW, DCW, IR, RUN, LLT



The LVB-2 load box consists of resistors designed to induce a PASS or FAIL condition:

- The Check Point knob position determines which resistor is set in the LVB-2
- Each check point has a PASS and FAIL condition.
- For a list of all PASS and FAIL condition test settings, refer to the LVB-2 Technical Specifications table.
- There is no PASS condition for the 7.5kΩ check point.
- There is no FAIL condition for the 6.37MΩ check point

The Probe Configuration switch can be set to two different positions depending on the verification type.

Figure 2 shows the two different settings of the switch. This setting should match with the Probe Configuration setting on the Leakage Current test instrument.

An example of the Probe Configuration setting on the instrument is shown in Figure 3 along with the corresponding leakage test type. On the test instrument the Probe Configuration is programmed depending on the type of leakage test needed to be performed.

Figure 2 – Probe Configuration Switch Positions

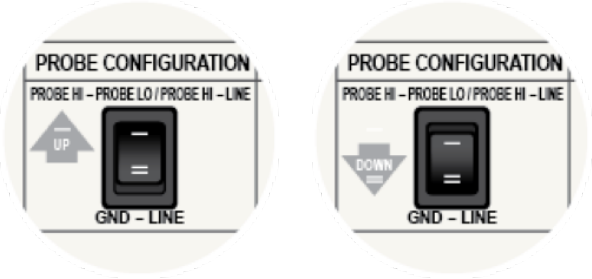
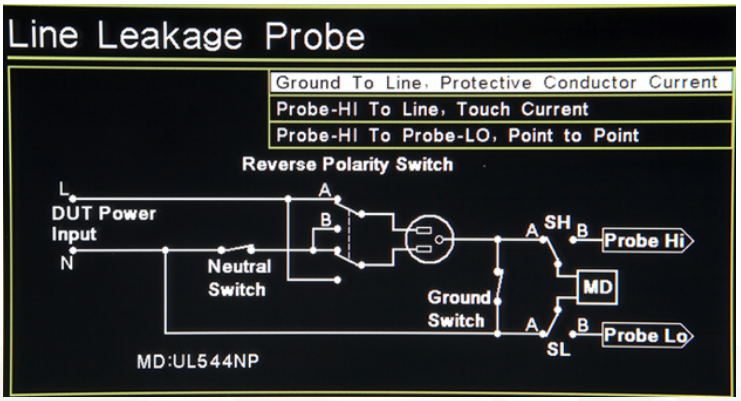
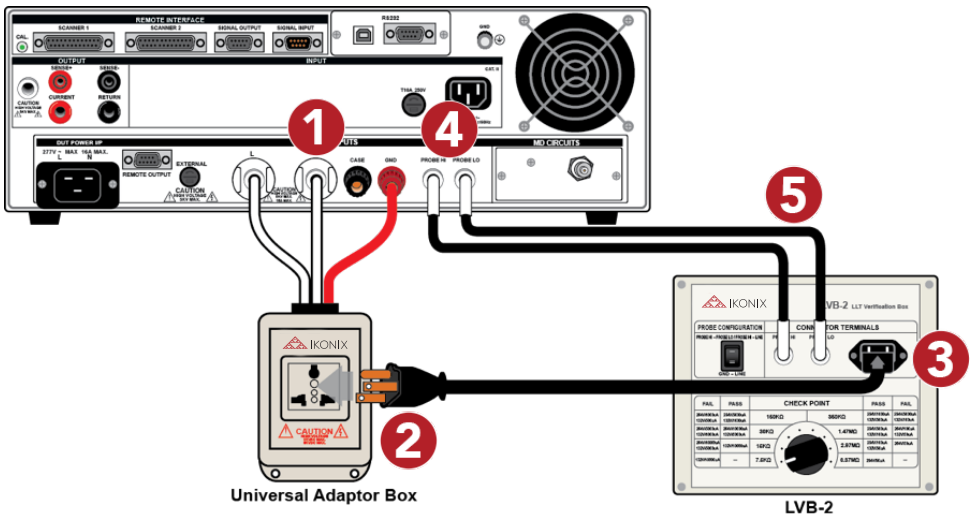


Figure 3 - Instrument Probe Configuration Setup



Instrument Connections

The diagram below shows all the connections needed to be made between the instrument and the LVB-2:



1. DUT Output connections - Line, Neutral and Ground of the DUT outputs connect to the DUT adapter box.
2. DUT Adapter box – DUT adapter box for connection of Line, Neutral and Ground to the LVB-2 connector terminal.
3. L, N and G connections – This is the socket for the standard IEC320 connector. The line cord from the DUT adapter box connects these ports for making the Line, Neutral and Ground connections to the LVB-2 box.
4. Probe connections (Instrument) – Probe Hi and Probe Lo ports on the instrument.
5. Probe connections (LVB-2) – Probe Hi and Probe Lo connections on the LVB-2.

Test Setup

To setup a test, connect the DUT outputs (L, N and G) of the leakage instrument to the line cord connector on the LVB-2. The two probe connections will also need to be made between the instrument and the LVB-2 for the verification of additional leakage test types Program a test sequence based on the parameters listed on the test box for each load type. Select the appropriate Probe Configuration on the LVB-2 using the Probe Confguration switch.

Refer to the specifications table and use the rotary switch to select the appropriate Check Point by rotating it clockwise or counter-clockwise:

FAIL	PASS	CHECK POINT		PASS	FAIL
264V/1000uA 132V/500uA	264V/5000uA 132V/1000uA	150KΩ	350KΩ	264V/1000uA 132V/500uA	264V/5000uA 132V/100uA
264V/5000uA 132V/1000uA	264V/10000uA 132V/5000uA	30KΩ	1.47MΩ	264V/500uA 132V/100uA	264V/100uA 132V/50uA
264V/10000uA 132V/5000uA	132V/10000uA	15KΩ	2.97MΩ	264V/100uA 132V/50uA	264V/50uA
132V/10000uA	–	7.5KΩ	6.37MΩ	264V/50uA	–

Ensure that the settings on your electrical safety tester are less than or equal to the maximum recommended voltage, current and duty cycle settings of the LVB-2. For each Check Point a PASS test and a FAIL test will be needed to programmed into the leakage test instrument for the pass/fail verifcation. When all connections have been made and the appropriate test programmed in the instrument, press the TEST button to begin the test. With the correct settings entered into the leakage test instrument, the leakage test instrument should record a failure for the FAIL settings and a pass for the PASS settings.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