

EI-162BNSplit-Core Transformer

Users Manual

LIMITED WARRANTY AND LIMITATION OF LIABILITY

Each Fluke product is warranted to be free from defects in material and workmanship under normal use and service. The warranty period is one year and begins on the date of shipment. Parts, product repairs, and services are warranted for 90 days. This warranty extends only to the original buyer or end-user customer of a Fluke authorized reseller, and does not apply to fuses, disposable batteries, or to any product which, in Fluke's opinion, has been misused, altered, neglected, contaminated, or damaged by accident or abnormal conditions of operation or handling. Fluke warrants that software will operate substantially in accordance with its functional specifications for 90 days and that it has been properly recorded on non-defective media. Fluke does not warrant that software will be error free or operate without interruption.

Fluke authorized resellers shall extend this warranty on new and unused products to enduser customers only but have no authority to extend a greater or different warranty on behalf of Fluke. Warranty support is available only if product is purchased through a Fluke authorized sales outlet or Buyer has paid the applicable international price. Fluke reserves the right to invoice Buyer for importation costs of repair/replacement parts when product purchased in one country is submitted for repair in another country.

Fluke's warranty obligation is limited, at Fluke's option, to refund of the purchase price, free of charge repair, or replacement of a defective product which is returned to a Fluke authorized service center within the warranty period.

To obtain warranty service, contact your nearest Fluke authorized service center to obtain return authorization information, then send the product to that service center, with a description of the difficulty, postage and insurance prepaid (FOB Destination). Fluke assumes no risk for damage in transit. Following warranty repair, the product will be returned to Buyer, transportation prepaid (FOB Destination). If Fluke determines that failure was caused by neglect, misuse, contamination, alteration, accident, or abnormal condition of operation or handling, including overvoltage failures caused by use outside the product's specified rating, or normal wear and tear of mechanical components, Fluke will provide an estimate of repair costs and obtain authorization before commencing the work. Following repair, the product will be returned to the Buyer transportation prepaid and the Buyer will be billed for the repair and return transportation charges (FOB Shipping Point).

THIS WARRANTY IS BUYER'S SOLE AND EXCLUSIVE REMEDY AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. FLUKE SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES OR LOSSES, INCLUDING LOSS OF DATA. ARISING FROM ANY CAUSE OR THEORY.

Since some countries or states do not allow limitation of the term of an implied warranty, or exclusion or limitation of incidental or consequential damages, the limitations and exclusions of this warranty may not apply to every buyer. If any provision of this Warranty is held invalid or unenforceable by a court or other decision-maker of competent jurisdiction, such holding will not affect the validity or enforceability of any other provision.

Fluke Corporation P.O. Box 9090 Everett, WA 98206-9090 U.S.A.

Fluke Europe B.V. P.O. Box 1186 5602 BD Eindhoven The Netherlands

11/99

To register your product online, visit register.fluke.com

Table of Contents

Title	Pag
Introduction	1
Unpacking	1
Packing	
Safety Regulations	2
Symbols	
Accessories	4
Features	5
Using the Split-Core Transformer	
Installing Transformer around Pylon Footing	6
Determining Transformation Ratio Connections	
Connecting Transformer to Earth Ground Tester	
Maintenance	12
Cleaning	12
Corrosion Prevention	12
Specifications	13
General	13
Technical Data for Selective Earth Resistance Measurements	13
Service	14
Storage	14

EI-162BN

Users Manual

List of Tables

Table	Title	Page
1.	Features and Functions	5
2.	Transformation Ratios	8

EI-162BN

Users Manual

List of Figures

igure	Title	Page
1.	Features.	5
2.	Installing Transformer Around Pylon	7
3.	Transformation Ratio Connections	9
4.	Test Measurement Setup.	11

EI-162BN

Users Manual

El-162BN Split-Core Transformer

Introduction

The Fluke EI-162BN Split-Core Transformer (hereafter referred to as the "Transformer") is used with an earth ground tester (hereafter referred to as the "Tester") to make selective earth ground resistance measurements (RE) on transmission line pylons. The Transformer is designed to work with Fluke 1625 and 1623 GEO Earth Ground Testers.

This instrument is manufactured in compliance with quality assurance system DIN ISO 9001. Compliance with current applicable EMC regulations is documented by the attached CE sign.

Unpacking

Refer to "Accessories" while unpacking the Transformer and its accessories from the shipping carton. Keep the packing material for later transport.

Check for missing parts and inspect the unit carefully for damage, like cracks, dents or bent parts. If items are missing or any physical damage is apparent, call Fluke for assistance. Refer to "Service" for information on contacting Fluke.

Packing

Use only the original packing material to ship the Transformer.

Safety Regulations

This device is only to be installed and operated by qualified personnel in compliance with the safety precautions and regulations that follow. Additionally, use of this device requires compliance with all legal and safety regulations pertaining to each specific application. Similar regulations apply to the use of accessories.

Qualified personnel are persons familiar with the setup, installation and operation of the device, are formally qualified to perform activities like training and instruction, and are authorized to switch on and off, isolate, ground, and label electric circuits and instruments/systems in accordance with safety engineering standards.

In this manual, a **Awarning** identifies hazardous conditions and actions that could cause bodily harm or death. A **Caution** identifies conditions and actions that could damage the instrument or the equipment under test, cause permanent loss of data, or impair instrument performance. Disregarding warning and caution notices can lead to serious physical injury and material damage.

Fault-free and safe operation of this device requires suitable transport, storage, setting up, and assembly, as well as careful operation and maintenance.

If there is reason to believe that safe operation is no longer possible, the device must be put out of operation immediately and must be protected against accidental usage.

△ M Warning

Operating electrical devices implies that parts of the device could carry dangerous voltages. To avoid electrical shock or damage to the device:

- If this product is used in a manner not specified by the product specifications, the protection provided may be impaired.
- While a measurement is in progress, do not touch the Transformer, transmission line pylon, earth ground electrode, auxiliary electrode, or probe.

- Assume that safe operation of the device is not possible if it shows visible damage.
- Assume that safe operation of the device is not possible
 if it has been exposed to unfavorable conditions (for
 example, storage beyond the permissible climatic limits
 without adaption to the ambient climate and dewing).
- Assume that safe operation of the device is not possible if it has been exposed to major strain during transport (for example, dropped from some height without visible external damage).

Symbols

The following symbols are found on the Transformer or in this manual.

Δ	Hazardous voltage. Voltage >30 V dc or ac peak might be present.
Δ	Risk of danger. Important information. See <i>Users Manual</i> .
Т	Common
C€	Conforms to relevant European Union directives
<u></u>	Earth ground

Accessories

The following accessories are shipped with your Transformer:

- Two fasteners for holding Transformer halves together
- One cable bobbin with two 12-meter (40-foot) test leads for connecting the Transformer to the Tester's jack. The female red and blue leads then plug onto the male red and blue banana plugs on the sensing cable adapter used with the Fluke 1623 and 1625 for selective resistance measurements. (Sensing cable adapter, Fluke part number 2539195).
- One contact clamp for establishing an earth ground electrode connection point on the transmission line pylon. The clamp features a fastener that secures the clamp to the pylon's frame. The clamp also has a 4-mm bore hole that fits a standard banana plug, with a tightening screw for securing the plug.
- One carrying case
- Users manual

Features

See Figure 1 and Table 1 for Transformer features and functions.

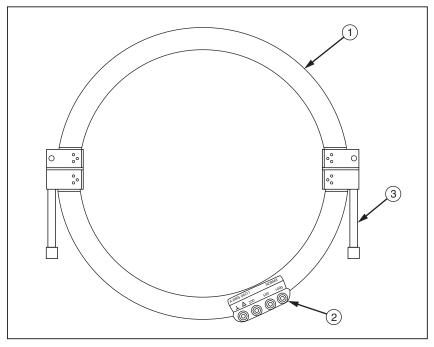


Figure 1. Features

evx01.eps

Table 1. Features and Functions

Item	Description
1	Transformer half (2)
	Transformer end faces have bolts that pivot to aid in separating the Transformer halves
	One Transformer end face has a slotted bolt hole that allows the bolt to pivot out of the end face
2	Transformation ratio connections: ⊥, 200, 500, and 1000
3	Fastener (2)

Using the Split-Core Transformer

Installing Transformer around Pylon Footing

To install the Transformer around a pylon footing:

- 1. Loosen (or if required, remove) the fasteners. See Figure 2. If extra leverage is needed to loosen a fastener, insert a lever (like a small screwdriver) into the 4 mm bore hole in the fastener.
- 2. On the end face with the slotted bolt hole, pivot the fastener/bolt out of the way, and then separate the two halves of the Transformer. See Figure 2.
- 3. Install the Transformer around the pylon footing. See Figure 2.

∧ Caution

- Damage to the Transformer end faces can greatly impair performance. Use care when joining the end faces together.
- Foreign substances on the end faces can distort measurement results. Before fastening together, ensure the end faces are clean. If required, see "Cleaning."
- Airgaps between the end faces can distort measurement results. When fastening the end faces together, ensure the fasteners are tightened firmly.
- 4. Join the two halves of the Transformer so the end faces meet. On the end face with the slotted bolt hole, pivot the fastener/bolt into place. If fasteners were removed, install the fasteners. Tighten fasteners firmly. See Figure 2.

If extra leverage is needed to tighten a fastener, insert a lever (like a small screwdriver) into the 4 mm bore hole in the fastener.

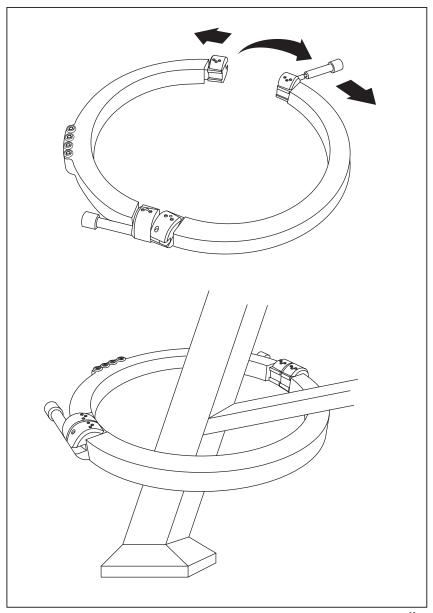


Figure 2. Installing Transformer Around Pylon

evx02.eps

Determining Transformation Ratio Connections

Before you connect the Transformer to the Tester, you need to determine a suitable transformation ratio for the minimum measuring and maximum parasitic currents expected to flow through the transmission line pylon.

The Transformer has 1000 windings, with connections at winding ratios of 1000, 500, 200 and 0 (\perp). Depending on the combination of connections used, the Transformer can provide transformation ratios of 1:1000, 1:800, 1:500, 1:300, and 1:200.

See Table 2 to determine a suitable transformation ratio for the expected minimum measuring and maximum parasitic currents, and then see Figure 3 for the Transformer connections that will provide that ratio. These connections will be used for connecting the Transformer to the Tester's piack.

Note

Be sure to adjust your earth ground tester to the selected transformation ratio.

Table 2. Transformation Ratios

Current	Ratio				
Current	1:1000 [1]	1:800	1:500	1:300	1:200
Min. Measuring Current [2]	0.50 mA	0.40 mA	0.25 mA	0.15 mA	0.10 mA
Max. Parasitic Current [3]	3.0 A	2.4 A	1.5 A	0.9 A	0.6 A

For nearly all selective earth ground resistance measurements, a ratio of 1:1000 is recommended

^[2] At 94, 105, 111, and 128 Hz

^[3] At 50, 60 and 16-2/3 Hz

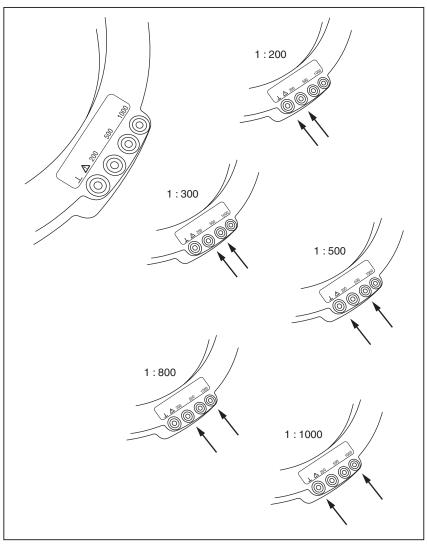


Figure 3. Transformation Ratio Connections

evx03.eps

Connecting Transformer to Earth Ground Tester

∧ Caution

Corrosion and paint on a pylon can impede the connection between the contact clamp and the pylon's frame. When installing the contact clamp, ensure the tip of the clamp fastener penetrates all layers of paint and corrosion.

- 1. Install the contact clamp to the pylon and tighten the clamp fastener. The contact clamp can now be used as the connection point for the Tester's earth ground electrode test lead. See Figure 4.
- 2. Install a test lead from the Tester's earth ground electrode jack to the contact clamp. Plug the test lead into the bore hole in the clamp and tighten the tightening screw. See Figure 4.
 - For Fluke 1625 / 1623 GEO Earth/Ground Testers, the earth ground electrode jack is labeled C1 or E.
- 3. Install the 12-m (40-ft) test leads from the Tester's ≥ jack to the Transformer's transformation ratio connections. To determine which transformation ratio connections to use, see "Determining Transformation Ratio Connections."
- 4. In accordance with the Tester's users manual, install test leads from Tester to the probe and auxiliary earth electrode, and then perform your earth ground resistance measurement (RE).

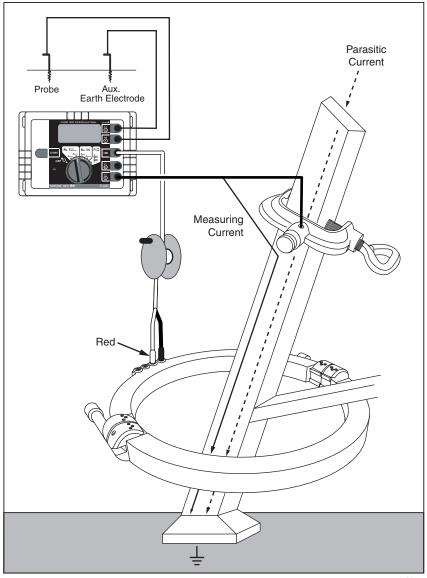


Figure 4. Test Measurement Setup

evx04.eps

Maintenance

Only trained and qualified staff should perform maintenance on this instrument

In all repair and reconditioning work, ensure the Transformer's design parameters are not modified to the detriment of safety, that only authorized parts are used, and that parts are reassembled to their factory-issued configuration.

Cleaning

∧ Caution

To prevent damage to the Transformer when cleaning:

- Do not use strong cleaning detergents or solvents (like trichloroethylene).
- Do not allow liquid to get inside the instrument.
- Do not use sharp tools to clean the end faces.

If your Transformer requires cleaning, wipe it with a cloth lightly dampened with a mild rinsing agent.

Corrosion Prevention

To help prevent corrosion to the Transformer end faces, the cleavage planes should be lightly oiled.

Specifications

Note

Fluke reserves the right to modify specifications without notice for the purpose of product improvement.

General

Temperature Range	
Working Temperature	10 °C to +50 °C (+14 °F to +122 °F)
Storage Temperature	30 °C to +60 °C (-22 °F to +140 °F)
Dimensions	
Outer diameter	377 mm (15 in)
Inner diameter	310 mm (12 in)
Depth	30 mm (1.25 in)
Weight	
Split-core transformer	4.9 kg (11 lb)
Total (with accessories and packaging)	7.7 kg (17 lb)
Transformation Ratios	1 : 1000
	1 : 800
	1 : 500
	1:300
	1 : 200

Technical Data for Selective Earth Resistance Measurements

Insulation voltage	. 2 kV (core against secondary winding)	
Max. current through split-core transformer	.3 A (primary current, transformation ratio 1:1000)	
Additional Error for Selective Earth Resistance Measurements		

Primary current >2.5 mA	±2 % (transformation ratio 1:1000)
Primary current <2.5 mA	±5 % (transformation ratio 1:1000)

Service

If your Transformer is operated and handled properly, it should not require servicing. However, if you suspect that the Transformer has failed, review this manual to ensure you are operating it correctly. If it still fails to operate properly, pack securely using the original packing material (if available) and forward, postage paid, to the nearest Fluke Service Center. Include a brief description of the problem. Fluke assumes *no* responsibility for damage in transit.

To locate an authorized service center, call Fluke using the phone numbers listed below:

USA: 1-888-99-FLUKE (1-888-993-5853) Canada: 1-800-36-FLUKE (1-800-363-5853)

Europe: +31-402-675-200 Japan: +81-3-3434-0181 Singapore: +65-738-5655

Anywhere in the world: +1-425-446-5500

You may visit us on the World Wide Web at http://www.fluke.com.

To register your product, visit http://register.fluke.com.

Storage

When your Transformer is not going to be used, store it in the carrying case provided.



Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «JONHON», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «FORSTAR».



«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«**FORSTAR**» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: ocean@oceanchips.ru

Web: http://oceanchips.ru/

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А