

MANUAL

HFCT Operating Manual



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Version History

Date	Version	Author(s)	Notes
01/03/2021	01.00.00	Sam Russell	Initial Release
06/04/2021	01.00.01 01.00.02	Jo Cahill	Minor formatting
12/08/21	01.00.03	Sam Russell	Replaced DoC Section with online reference to both UKCA and CE DoCs.

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Registered in England number 2566313

Safety Precautions and procedures

- The HFCT range is for use only with specified equipment and cables supplied by EA Technology. Misuse of the equipment can result in injury or death.
- Before installation and use, always check the condition of the connecting cable.
- The HFCT can be installed without de-energizing the local equipment, it must be considered under the relevant risk assessment.
- Do not apply around or remove the HFCT from UNINSULATED HAZARDOUS LIVE conductors, which may render electric shock, electric burn, or arc flash.
- The HFCT is designed for the measurement of conductors at earth potential only.
- If a HFCT has been heavily saturated for a long enough period, the HFCT jaws (ferrite core edges) may have risen in temperature, when handling a HFCT avoid touching the jaws where possible.
- The installation environment of HFCTs must be considered before installation, this includes the ambient environment and building conditions along with other local hazards.
- Local safety procedures and guidelines (including the use of personal protective equipment) must be followed during the installation and use of the HFCT.
- ALWAYS terminate the HFCT into a measurement device before commissioning the HFCT.
- Do not use the HFCT outside of its specified rated values (including saturation current).
- If the equipment is used in a manner not specified by the manufacturer, any protection provided by the equipment may be impaired.
- Modification of switchgear is outside the scope of this document. Adhere to all regulatory and manufacturer standards when considering modifications. Ensure that any such modifications do not reduce structural integrity or arc flash withstand of the switchgear.
- For application information email product-support@eatechnology.com.

Relevant Safety Symbols



Do not apply around or remove from UNINSULATED HAZARDOUS LIVE conductors, which may render electric shock, electric burn, or arc flash.



Caution, documentation must be consulted before installation, use, or decommissioning.

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1. General Description

This document provides safety information, specifications, and guidelines for using the High-Frequency Current Transformer (HFCT). HFCTs are designed to detect small high-frequency pulses on ground lines caused by partial discharge events whilst attenuating any circulating 50 Hz currents. The HFCT1-F range is a split toroid arrangement and comes in two aperture size variants (50 and 100mm) allowing for easy clamping around insulated cables. The HFCT1-F100 comes with a rubber insert for the aperture with a range of diameters to support the HFCT around the measured conductor and improve accuracy for smaller cable sizes.

Measurements from the HFCT can be taken from the insulated BNC connection when connected to a specified EA Technology product such as the UltraTEV[®] Plus² (UTP2) or UltraTEV[®] Monitor Cable PD Node (UTMN1-CPD).



Figure 1 HFCT1-F50

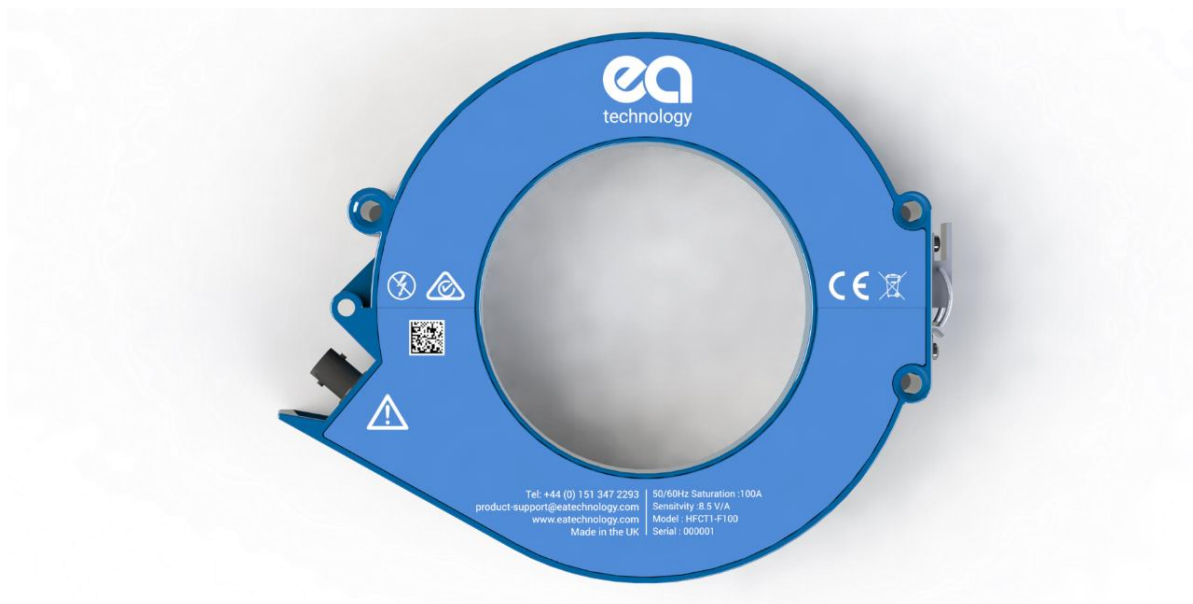


Figure 2 HFCT1-F100

2. Preparations for Use

2.1 Installation

Installation requirements can vary but the HFCT allows for easy installation due to its non-invasive ability to clamp around a cable. The HFCT should only be installed by competent persons with the required work permits for the environment of the installation. This document offers guidance on the installation procedure. For assistance regarding installation, contact EA Technology.

2.1.1 Pre-Connection/Disconnection Assessment

A risk assessment should always be carried out dependant on the installation environment. HFCTs by nature will be installed within dangerous locations such as substations and these should have their own risk assessments and procedures in place and must be followed. Certain environments such as installation within cable chambers on switchgear may require the system to be proven de-energised amongst other requirements, in case of doubt when installing contact the manufacturer.

2.1.2 Connecting/Disconnecting the HFCT procedure

A visual inspection for signs of damage to the HFCT and connecting cables is to be carried out. Connect the supplied HFCT cable to the measurement device as specified in the relevant equipment manual, push and twist the cable connector into the BNC on the HFCT until the cable is locked in place. To disconnect the HFCT, gently push and twist before pulling the BNC connector off. The HFCT must always be terminated into the measurement device before clamping/unclamping the HFCT around a measurement point, failure to do so increases the risk of electric shock.

2.1.3 HFCT Mounting Guidance

The HFCT1-F50 and HFCT1-F100 each have three mounting holes that can be utilised for permanent installations and secured using either cable ties or screws. Before installation, the best method for mounting the HFCT in the associated environment should be considered. For more repeatable readings keeping the conductor being measured central in the aperture of the HFCT is advised. The HFCT1-F100 comes with a rubber insert which can help when measuring smaller conductors down to 50mm, any smaller and the HFCT1-F50 should be used in place of the HFCT1-F100.

If permanent installation of HFCTs is being considered, contact Product Support for guidance notes.

2.1.4 HFCT Configurations for Installation

Before starting an install, ensure parts 2.1.1 to 2.1.2 have been completed. The HFCT is best installed by directly mounting around an earth cable, if this is not possible alternative configurations are listed below, for more guidance contact the manufacturer.

Connections can be made:

1. By monitoring the earth cable only (Figure 3), this is the preferred connection method.
2. By monitoring the line conductor without the earth (Figure 4) or,
3. By monitoring the line conductor and earth within the sheathing and the earth cable external to the sheathing when passed back through the HFCT (Figure 6).

If the HFCT is placed over both the line conductor and earth cable at the same time, the discharge currents are cancelled (Figure 5). The method to counter this effect is shown in Figure 6.

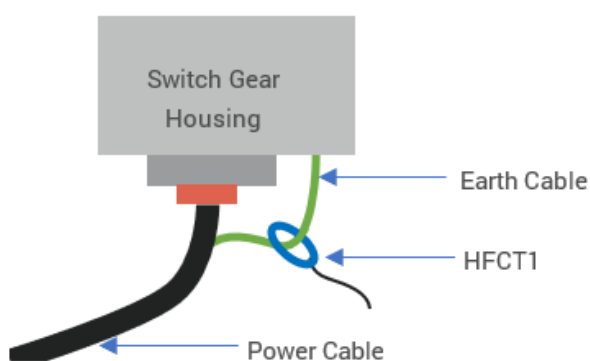


Figure 3

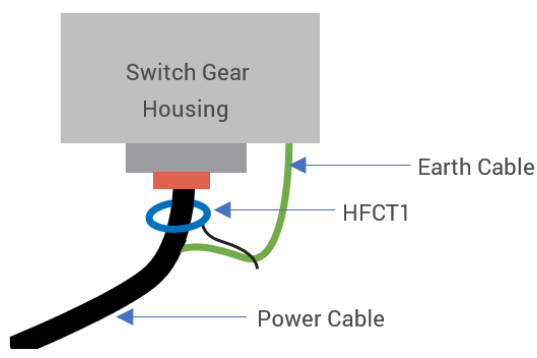


Figure 4

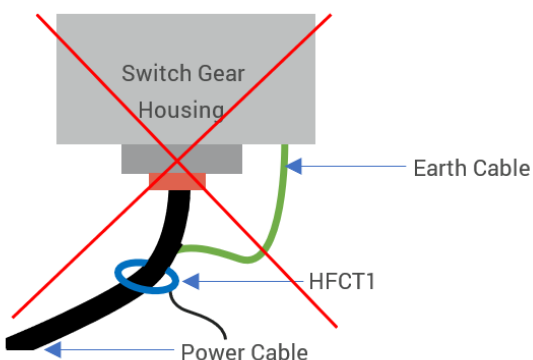


Figure 5



Figure 6

3. Maintenance

Calibration

No regular maintenance or calibration is required for the HFCT.

Cleaning and Storage

The HFCT should be stored in clean and dry conditions. If cleaning is deemed necessary, it is advised to disconnect the HFCT as per 2.1.2 and clean with a damp cloth (do not use harsh chemicals) with the HFCT closed shut. No attempt to gain access to the internal circuitry should be made. If any doubt exists, contact the manufacturer. The HFCT can become damaged by dropping and care should be taken to ensure the HFCT is secured and handled correctly. The core of the HFCT can fracture internally without visible effects, if damage is suspected due to an impact, contact the manufacturer.

Waste electrical and electronic equipment directive (WEEE)

EA Technology is a member of an approved compliance scheme as defined by the WEEE directive. When an EA Technology product reaches the end of its operational life, it must be recycled by a licensed waste management operator or returned to EA Technology for recycling.

4. HFCT1-F50 Technical Specification

Wideband Frequency Response and Range

Nominal Low Frequency -3dB Point	1 MHz
Nominal High Frequency -3dB Point	70 MHz
Nominal Sensitivity	8.5 V/A
Standalone Minimum Pulse Detection	10pC
Nominal Accuracy	+/- 1V/A
Terminating impedance	50 Ohm
Enclosure Insulation Rating	CAT IV (150V)

50Hz Response and Saturation

Saturation Current at 50Hz	> 100 A
50Hz Frequency Response	< -70 dB

Hardware

Enclosure Aperture Diameter	48 mm
Enclosure Diameter	101 mm
Enclosure Depth	22 mm
Clamping Mechanism	Magnetic / Cable Tie
Connection	Insulated BNC (female)
Mounting Capability	3x M5 Mounting Holes
Enclosure Impact Rating	IK08

Environmental

Temperature	-20 to 50°C
Humidity	0-80%RH
IP Rating	IP2X

HFCT-F50 Frequency Response

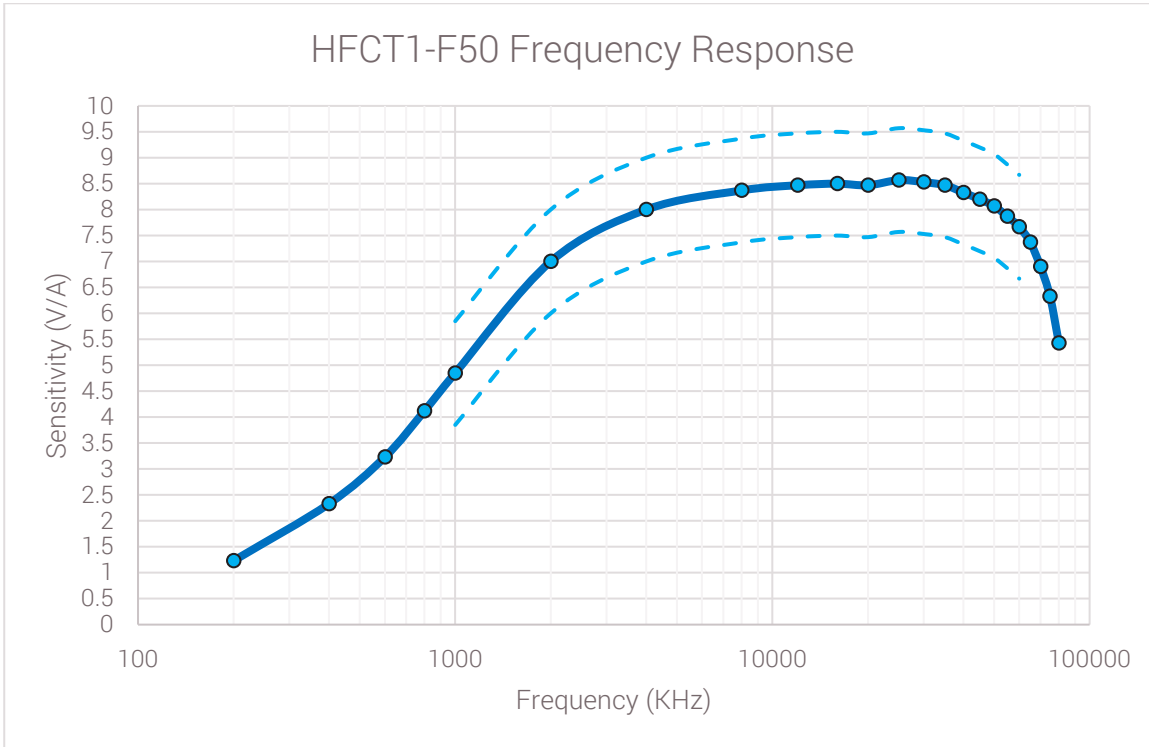


Figure 7 HFCT1-F50 Response Curve

5. HFCT1-F100 Technical Specification

Wideband Frequency Response and Range

Nominal Low Frequency -3dB Point	0.8 MHz
Nominal High Frequency -3dB Point	80 MHz
Nominal Sensitivity	8.5 V/A
Standalone Minimum Pulse Detection	10pC
Nominal Accuracy	+/- 1V/A
Terminating impedance	50 Ohm
Enclosure Insulation Rating	CAT IV (150V)

50Hz Response and Saturation

Saturation Current at 50Hz	> 100 A
50Hz Frequency Response	< -70 dB

Hardware

Enclosure Aperture Diameter	94 mm
Enclosure Diameter	158 mm
Enclosure Depth	33.5 mm
Clamping Mechanism	Metal Clamp / Cable Tie
Connection	Insulated BNC (female)
Mounting Capability	3x M5 Mounting Holes
Enclosure Impact Rating	IK08

Environmental

Temperature	-20 to 50°C
Humidity	0-80%RH
IP Rating	IP2X

HFCT-F100 Frequency Response

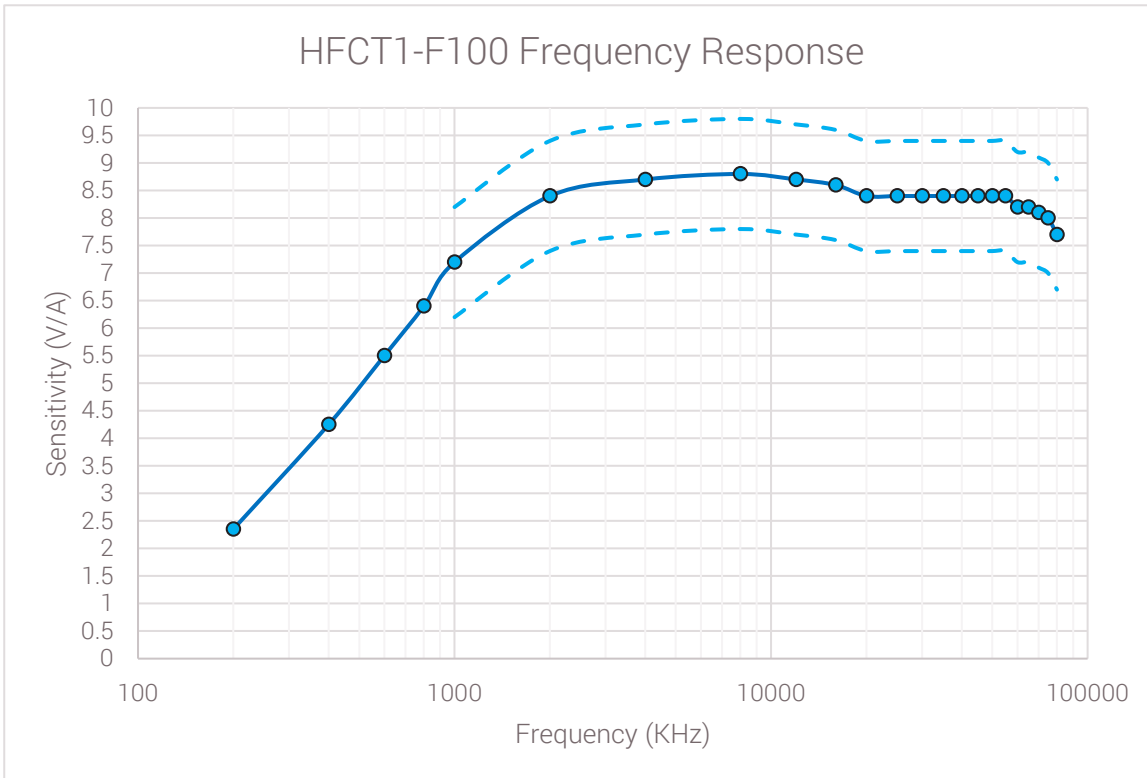
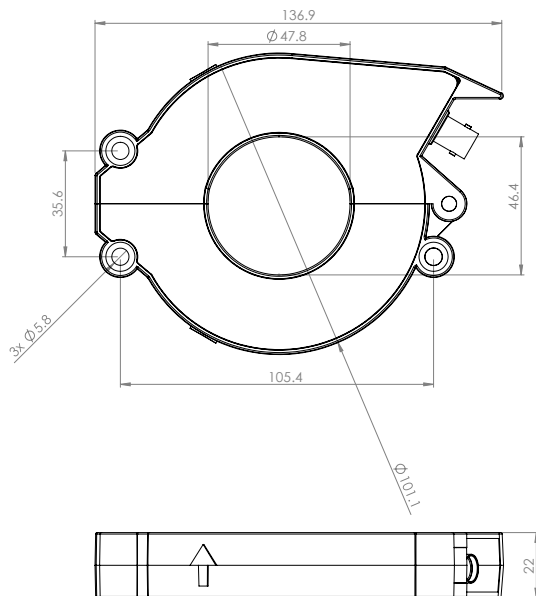


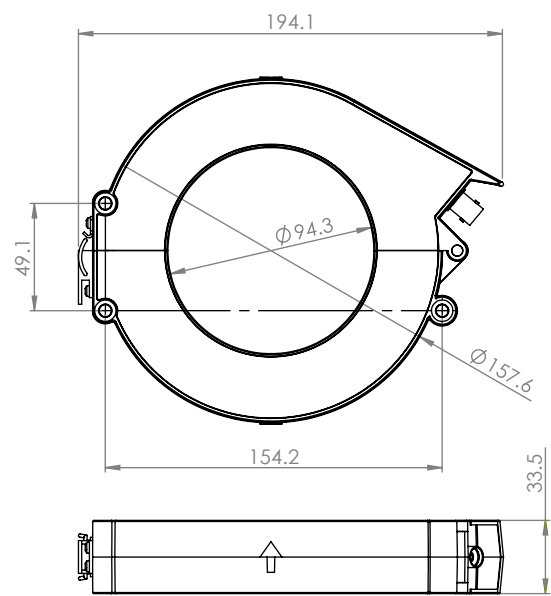
Figure 8 HFCT1-F100 Response Curve

HFCT Enclosure Dimensions

HFCT1-F50 Dimensions



HFCT1-F100 Dimensions



6. Sales and Service

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For details of EA Technology's international offices and distributors, please visit our website:
www.eatechnology.com/contact-us/corporate-offices

Sales

Email: sales@eatechnology.com

Product Support

Email: product-support@eatechnology.com
Tel: +44 (0)151 347 2293

Warranty Policy

What Does the Warranty Policy Cover?

EA Technology products and accessories are warranted against defects in material and workmanship. During the warranty period, EA Technology will, at its option, either repair or replace products, parts or accessories which prove defective.

What is Not Covered by the Warranty Policy?

The following are not covered: damage caused by accident, misuse, abuse, product modification or neglect; damage resulting from failure to follow instructions contained in your operating manual; damage resulting from the performance of repairs by someone not authorised by EA Technology.

Warranty Policy for Repairs

Repaired products are warranted against defects in workmanship and materials for a period of six months, or the remainder of the original warranty period, whichever is greater.

Continuous Improvement

EA Technology has a policy of continual product development and enhancement. Consequently, there may be minor variations in specifications or operation that are not covered in this operating manual.

Every effort has been made to ensure that the information provided in this operating manual is accurate at the time of going to print.

If any errors or omissions are noticed, please notify: product-support@eatechnology.com

7. HFCT1-F Declaration of Conformity

Hereby,EA Technology declares that the equipment described in this document is in compliance with all applicable EU Directives and UK Statutory Instruments.

The full text of the EU and UK declarations of conformity are available at the following internet address:

www.eatechnology.com/declaration

Claims of compliance made in any document other than the relevant declaration of conformity are for guidance only.



Safer, Stronger, Smarter Networks

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