AMPROBE®

CT235A, CT237A
AC/DC Current Probes

User Manual

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English

Limited Warranty and Limitation of Liability

Your Amprobe product will be free from defects in material and workmanship for 1 year from the date of purchase. This warranty does not cover fuses, disposable batteries or damage from accident, neglect, misuse, alteration, contamination, or abnormal conditions of operation or handling. Resellers are not authorized to extend any other warranty on Amprobe's behalf. To obtain service during the warranty period, return the product with proof of purchase to an authorized Amprobe Test Tools Service Center or to an Amprobe dealer or distributor. See Repair Section for details. THIS WARRANTY IS YOUR ONLY REMEDY. ALL OTHER WARRANTIES - WHETHER EXPRESS, IMPLIED OR STAUTORY - INCLUDING IMPLIED WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY, ARE HEREBY DISCLAIMED. MANUFACTURER SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOSSES, ARISING FROM ANY CAUSE OR THEORY. Since some states or countries do not allow the exclusion or limitation of an implied warranty or of incidental or consequential damages, this limitation of liability may not apply to you.

AC/DC Current Probes

Contents

Warnings and Precautions

PLEASE READ SPECIFICATIONS BEFORE OPERATING THE INSTRUMENT
Exceeding the maximum limits of this instrument is DANGEROUS. Exceeding these limits will expose you to physical injury or even death and will almost certainly damage your instrument. Even low-level voltages and currents are capable of causing serious injury or even death.

- **Please do not use this or any piece to test equipment without proper training.**
- **Individual functions and ranges have different overload limits.**
- **It is VERY IMPORTANT that you make yourself aware of these overload limits.**
- **Check the specifications of these overload limits.**

Symbols

⚠	Caution! Refer to this manual before using the probe.
⧈	Probe is protected by Reinforced or Double Insulation.
ϟ	Application around and removal from HAZARDOUS LIVE conductors is permitted.

Introduction

The CT235A and the CT237A current probes have been designed for use with digital multimeters, recorders and other suitable equipment for accurate non-intrusive measurement of AC, DC and complex waveform currents. Using advanced Hall Effect technology the CT237A can accurately measure currents up to 200 A rms over the frequency range of DC to 10 kHz, while the CT235A measures currents up to 1000A DC or AC peak. These features make them powerful tools for use in inverters, switch mode power supplies, industrial controllers, automotive diagnostics and other applications requiring accurate isolated current measurement.

Specifications

Electrical data

(All accuracies stated at 23°C ± 1°C)

Current ranges	
CT237A	20A and 200A DC and AC r.m.s.
CT235A	200A and 1000A DC and AC peak
Overload capacity 1000 %	
Overall accuracy	
CT237A, 20A range DC	±1% of rdg ± 0.03A
20A range AC, <5kHz	±1% of rdg ± 0.03A
5kHz to 10kHz	±2% of rdg ± 0.03A
CT237A, 200A range DC	±1% of rdg ± 0.3A
200A range AC, <2kHz	±1% of rdg ± 0.3A
2kHz to 5kHz:	±2% of rdg ±0.3A
5kHz to 10kHz:	±5% of rdg ±0.3A
CT235A, 200A/1000A range, DC	±1% of rdg ± 0.5A
200A/1000A range, AC, <10kHz	±1% of rdg ± 0.5A
Resolution	
CT237A, 20A range	± 10mA
CT237A, 200A range	± 100mA
CT235A, 200A range	± 100mA
CT235A, 1000A range	± 100mA
Temperature coefficient	± 0.1% of reading/°C
Output sensitivity	
CT237A, 20A range	10 mV/A
CT237A, 200A range	1mV/A
CT235A, 200A range	1 mV/A
CT235A, 1000A range	1 mV/A
Frequency range (-1dB)	DC to 10 kHz (limited by eddy current heating for Irms x f >400,000)
Dielectric strength	3.7kV r.m.s. 50 Hz for 1 min

Safety: Meets EN61010-1 Cat III 300V; EN61010-2-032

EMC: Meets EN50081-1, EN50082-1

CE EMC: This product complies with requirements of the following European Community Directives: 9/336/EEC (Electromagnetic Compatibility) and 73/23/EEC (Low Voltage) as amended by 93/68/EEC (CE Marking).

General data

Operating temperature	0°C to +50°C
Storage temperature with battery removed	- 20°C to +85°C
Power supply	9 V, Alkaline battery PP3, NEDA 1604 or IEC6F22
Battery life	50 hours typical
Load impedance (minimum) >10 k Ω and ≤100pF	
Conductor size	
CT237A	19 mm
CT235A	31 mm
Jaw opening	
CT237A	20 mm max.
CT235A	32 mm max.
Weight	
CT237A	250 g.
CT235A	295 g.
Output cable and connectors	1.5 m long terminated with 4mm safety plugs

Environmental

- indoor use
- altitude up to 2000m
- temperature 0°C to +50°C
- maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 40% relative humidity at 50°C.

Operating Instructions

Refer to Fig. 1. When the probe is switched on the red LED will illuminate. If the LED starts flashing this warns the user that the battery voltage is too low for normal operations and that it should be changed as described in Battery Replacement.

Switch On

When the probe is switched on, the red LED will illuminate. If the LED starts flashing this warns the user that the battery voltage is too low for normal operation and that it should be changed as described in Battery Replacement.

Zero Adjustment

The output zero offset voltage of the probe may change due to thermal shifts and other environmental conditions. To adjust the output voltage to zero depress the thumbwheel and rotate. Ensure that the probe is away from the current carrying conductor when the adjustment is made.

Current Measurement

Switch on the probe using the On - Off switch and check that the LED is lit. Select the required current range (20 Amp or 200 Amp for the CT237A; 200A or 1000A for the CT235A).

Connect the output lead to a multimeter. Select AC millivolts to measure Alternating Current and DC millivolts for Direct Current. Autoranging meters will automatically select the correct range.

If necessary adjust the probe output voltage to zero as described in Zero Adjustment. Clamp the jaws of the probe round the conductor ensuring a good contact between the closing faces of the jaws.

Observe and take measurements as required. Positive output indicates that the current flow is in the direction shown by the arrow on the probe. Multiply the reading dependent upon the range you are in. See Output sensitivity in the Specifications section for conversion.

True r.m.s. readings can be obtained by using an appropriate true r.m.s. reading multimeter. Core eddy current heating is produced when Irms x f >400,000.

Safety

Use of the probe on **uninsulated conductors** is limited to 300V r.m.s or d.c. and frequencies below 1kHz.

Safety in its use is the responsibility of the operator who must be a suitably qualified or authorized person.

Do not use the probe if any part of the probe including the lead and connector(s) appear to be damaged or if a malfunction of the instrument is suspected.

When using the probe ensure that your fingers are behind the **protective barrier** see Fig. 1

Clean the case periodically by wiping it with a damp cloth and detergent. Do not use abrasive cleaners or solvents. Do not immerse the probe in liquids.

Battery Replacement

⚠ Warning

Before removing the battery cover, make sure that the probe is remote from any live electrical circuit.

The red LED will flash when the minimum operating voltage is approached. Refer to Fig.1. and use the following procedure.

1. Unclamp the probe from the conductor, turn it off using the **On - Off** switch and disconnect the output leads from external equipment.
2. Loosen the captive screw which secures the battery cover.

3. Lift the cover through 30° and pull it clear of the probe body as shown in Fig 1. The battery is then accessible.
4. Replace the battery and re-fit the battery cover and fasten the screw.
5. Replacement with other than the specified type of battery will invalidate the warranty. Fit only Type 9 V PP3, Alkaline (MN 1604).

Frequency Response and Accuracy Curves

Refer to Fig. 2.

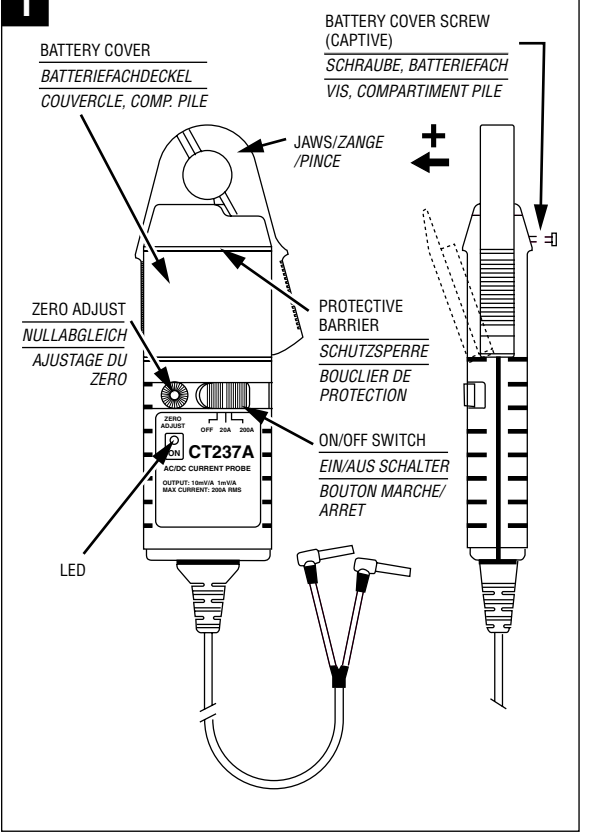
Repair

All test tools returned for warranty or non-warranty repair or for calibration should be accompanied by the following: your name, company's name, address, telephone number, and proof of purchase. Additionally, please include a brief description of the problem or the service requested and include the test leads with the meter. Non-warranty repair or replacement charges should be remitted in the form of a check, a money order, credit card with expiration date, or a purchase order made payable to Amprobe® Test Tools.

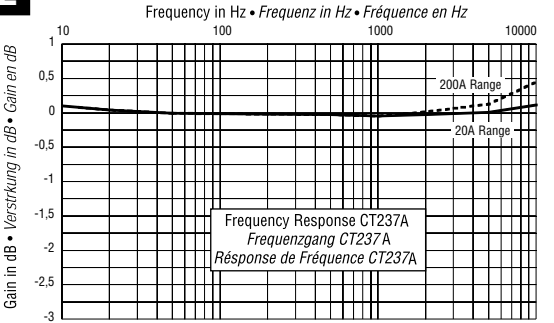
In-Warranty Repairs and Replacement – All Countries

Please read the warranty statement and check your battery before requesting repair. During the warranty period any defective test tool can be returned to your Amprobe® Test Tools distributor for an exchange for the same or like product.

1


BATTERY COVER
BATTERIEFACHDECKEL
COUVERCLE, COMP. PILE
BATTERY COVER SCREW (CAPTIVE)
SCHRAUBE, BATTERIEFACH
VIS, COMPARTIMENT PILE
JAWS/ZANGE /PINCE
ZERO ADJUST
NULLABGLEICH
AJUSTAGE DU ZERO
PROTECTIVE BARRIER
SCHUTZSPERRE
BOUCLIER DE PROTECTION
ON/OFF SWITCH
EIN/AUS SCHALTER
BOUTON MARCHE/ ARRET
LED
ZERO ADJUST
OFF 20A 200A
ON
CT237A
AC/DC CURRENT PROBE
OUTPUT: 10mV/A 1mV/A
MAX CURRENT: 200A RMS

2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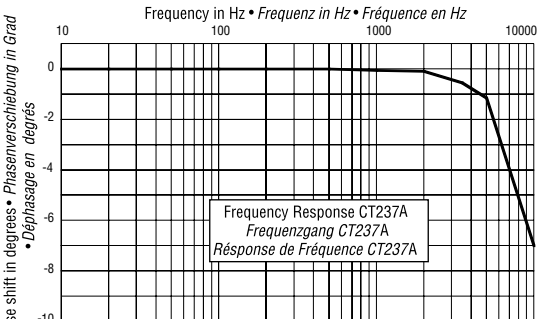
-2,5
-3
Gain in dB • Verstrkung in dB • Gain en dB
200A Range
20A Range
Frequency Response CT237A
Frequenzgang CT237A
Réponse de Fréquence CT237A


Frequency in Hz • Frequenz in Hz • Fréquence en Hz
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1000
10000
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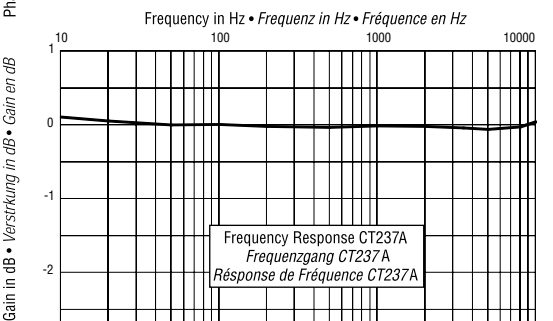
-6
-8
-10
Phase shift in degrees • Phasenverschiebung in Grad • Déphasage en degrés
Frequency Response CT237A
Frequenzgang CT237A
Réponse de Fréquence CT237A


Frequency in Hz • Frequenz in Hz • Fréquence en Hz
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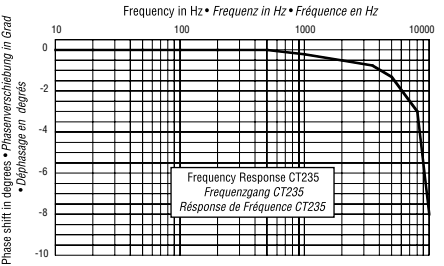
Gain in dB • Verstrkung in dB • Gain en dB
Frequency Response CT237A
Frequenzgang CT237A
Réponse de Fréquence CT237A

2 Continued


Frequency in Hz • Frequenz in Hz • Fréquence en Hz
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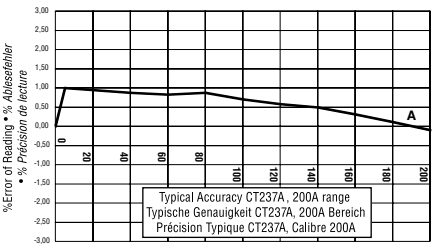
Phase shift in degrees • Phasenverschiebung in Grad • Déphasage en degrés
Frequency Response CT235
Frequenzgang CT235
Réponse de Fréquence CT235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140
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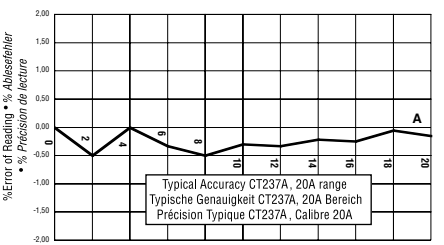
200
A
Typical Accuracy CT237A, 200A range
Typische Genauigkeit CT237A, 200A Bereich
Précision Typique CT237A, Calibre 200A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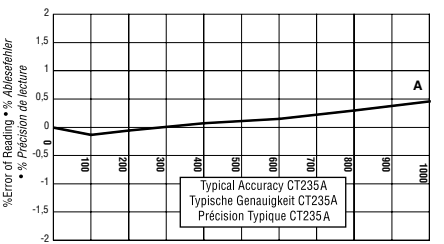
A
Typical Accuracy CT237A, 20A range
Typische Genauigkeit CT237A, 20A Bereich
Précision Typique CT237A, Calibre 20A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Typische Genauigkeit CT235A
Précision Typique CT235 A