B-WIC & B-SMC

Impedance Test Fixtures

User Manual

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Safety Instructions

1 Compliance Statements and Recycling

1.1 Declaration of Conformity (EU)

The *B-WIC and B-SMC* adhere to the guidelines of the council of the European Community for meeting the requirements of the member states regarding the RoHS directive.

1.2 Information for Disposal and Recycling

This test set (including all accessories) is not intended for household use. After use the test set cannot be disposed of as household waste!

For customers in EU countries (incl. European Economic Area):
OMICRON test sets are subject to the EU Waste Electrical and Electronic Equipment Directive (WEEE directive). As part of our legal obligations under this legislation, OMICRON offers to take back the OMICRON test set and ensure that it is disposed of by an authorized recycling facility.

For customers outside the European Economic Area:
Please contact the competent authorities for the relevant environmental regulations in your country and dispose the OMICRON test set only in accordance with your local legal requirements.

2 Safety

2.1 Disclaimer

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired. Opening the device invalidates all warranty claims. Before operating the *B-WIC and B-SMC*, read the safety instructions in this document carefully. If you do not understand some safety rules, contact OMICRON Lab before proceeding.

2.2 Safety Instructions

- The *B-WIC and B-SMC* are SELV (Safety Extra Low Voltage according to IEC 60950) devices, also known as protection class III equipment.
- Only use the *B-WIC and B-SMC* in conjunction with the Bode 100. Do not apply any external voltages or currents.

2.3 Designated Use

B-WIC and B-SMC have been especially designed to measure the impedance of passive components in conjunction with the *Bode 100* in laboratory or manufacturing environments.

2.4 Operator Qualification

Testing with *B-WIC and B-SMC* must only be carried out by qualified, skilled and authorized personnel.

Personnel receiving training, instructions, directions, or education on *B-WIC and B-SMC* must be under constant supervision of an experienced operator while working with the equipment. Testing with *B-WIC and B-SMC* must comply with the internal safety instructions as well as additional relevant documents.

2.5 Cleaning

To clean the *B-WIC and B-SMC*, use a cloth dampened with isopropanol alcohol. Prior to cleaning, always ensure that all connections to the *B-WIC and B-SMC* and DUT [1]are disconnected.

[1] Device Under Test

3 Device Overview

Delivery of *B-WIC or B-SMC* includes:

B-WIC – Impedance Test Fixture for Thru-hole type components:  • B-WIC Fixture • B-CAL Calibration Board 	**B-SMC** – Impedance Test Fixture for Surface Mount components:  • B-SMC Fixture • 6 pcs. 100 Ω ±0.1% Load Calibration Resistors (Size: 0603)

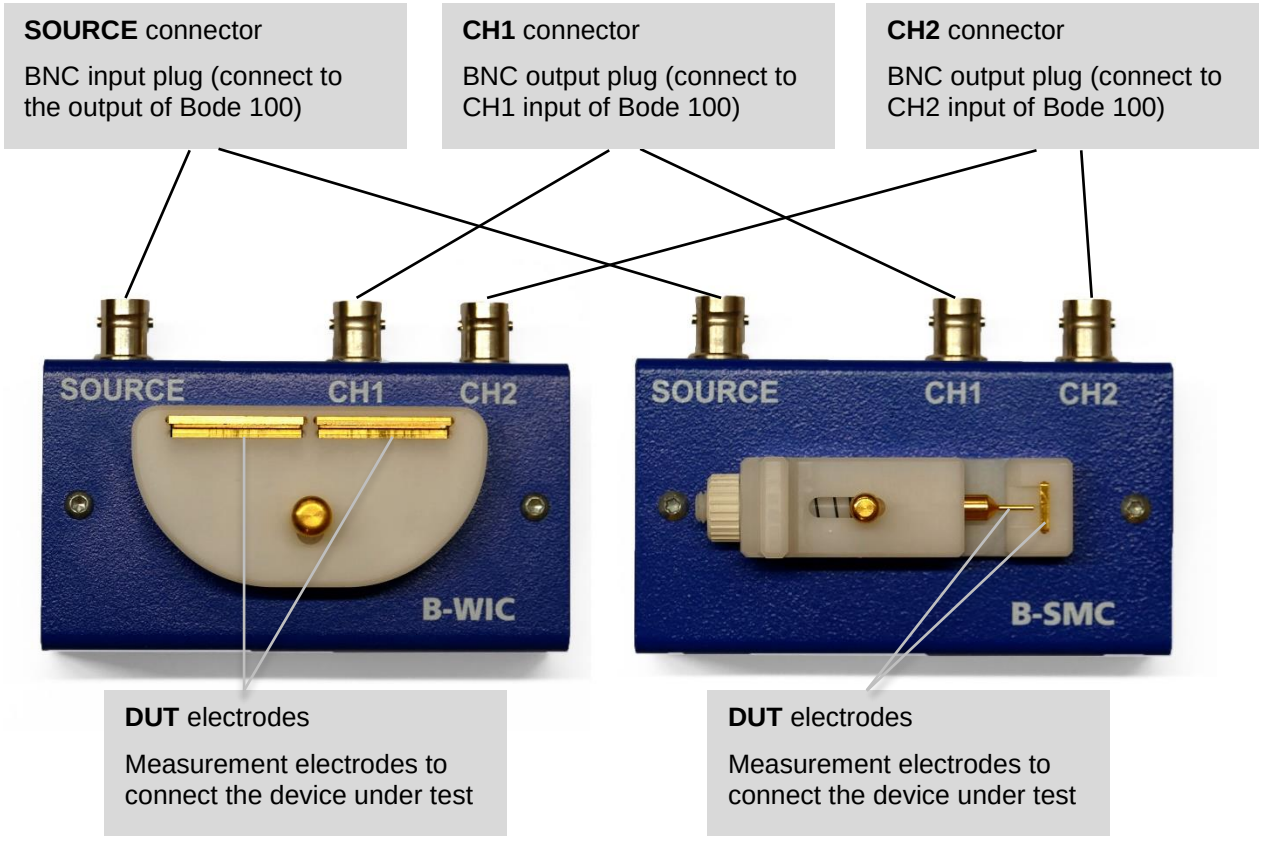


Figure 3-1: *B-WIC and B-SMC* connector description

4 Application Information

The *B-WIC and B-SMC* test fixtures are designed to measure the impedance of passive components in the frequency range from 1 Hz to 50 MHz in conjunction with the Bode 100 vector network analyzer.

4.1 Measurement Principle

B-WIC and B-SMC contain a resistive measurement bridge with a voltage divider and a current shunt.

The measurement principle is a relative voltage / current method where CH1 receives a voltage signal proportional to the voltage at the DUT and CH2 receives a voltage signal proportional to the current flowing thru the DUT.

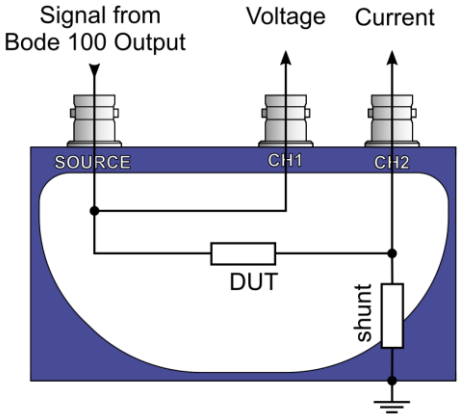


Figure 4-1: Measurement principle of *B-WIC and B-SMC*

Open / Short / Load calibration must be carried out to compensate for parasitic effects and non-ideal behavior occurring at higher frequencies. To learn how to calibrate the *B-WIC and B-SMC*, please refer to 4.4 Calibration / Correction on page 8.

4.2 Device Connection

The figure below shows the connection from Bode 100 to *B-WIC and B-SMC*. It is recommended to use the 0.5 m long BNC cables delivered with the Bode 100 for the connection.

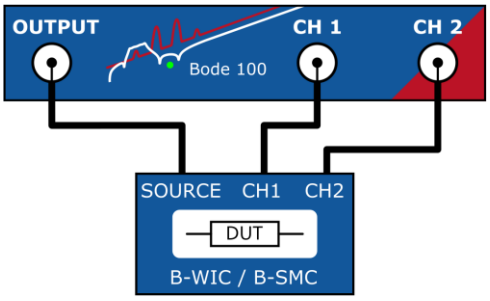
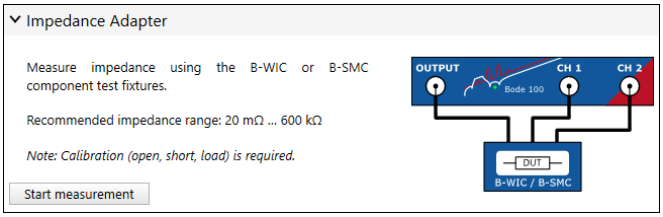


Figure 4-2: Connecting *B-WIC and B-SMC* to the Bode 100 VNA

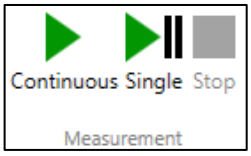
4.3 Software Settings & Configuration

When measuring with *B-WIC and B-SMC* make sure to use the *Impedance Adapter* measurement mode in the *Bode Analyzer Suite* as shown below:



Note, that you must perform an impedance calibration / correction before you can start measuring. Check out the next chapter to learn how to perform the Open / Short / Load calibration.

After the calibration has been performed, you can start either a single sweep or a continuous sweep by clicking on the corresponding icons.

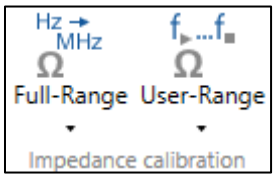


4.4 Calibration / Correction

Before you can start a measurement, Open / Short / Load calibration / correction must be performed. This moves the reference plane from the Bode 100 front panel to the DUT connection points of the *B-WIC and B-SMC* as shown below:

Figure 4-3: Reference plane after Open / Short / Load calibration

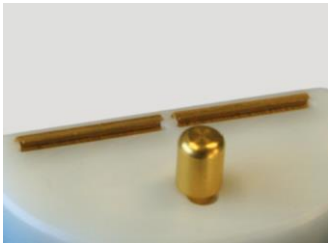
To start a calibration, select either the User-Range Impedance Calibration or the Full-Range Impedance calibration by clicking on the corresponding icon.



To learn about the difference between Full-Range and User-Range calibration, please refer to the Bode 100 User Manual.

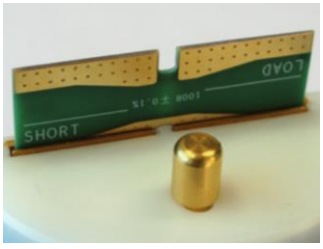
4.4.1 Calibrating B-WIC using B-CAL board

Open



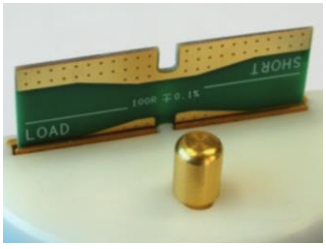
Place no DUT to the electrodes and start the Open calibration.

Short



Place the B-CAL board with the Short-side into the B-WIC electrodes and start the Short calibration.

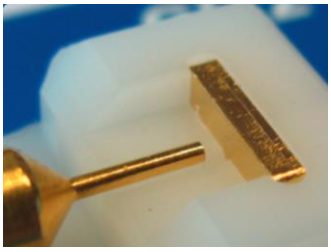
Load



Place the B-CAL board with the Load-side into the B-WIC electrodes and start the Load calibration.

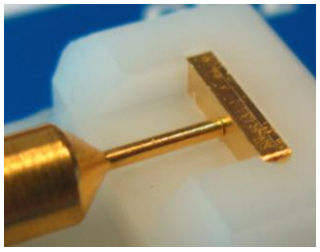
4.4.2 Calibrating B-SMC with a 100 Ω resistor

Open



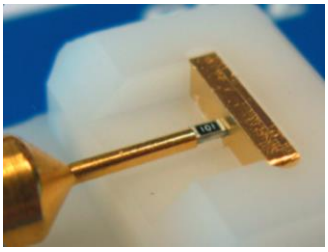
Use the knurled nut to adjust the distance of the electrode needle to the plate to match the DUT size to compensate for stray-capacitance and start the Open calibration.

Short



Loosen the knurled nut until the needle touches the electrode and start the Short calibration.

Load



Place a 100 Ω resistor between needle and electrode and start the Load calibration. For best accuracy, use a precision thin-film 100 Ω resistor with low temperature coefficient as included in the delivery of B-SMC.

4.5 Connecting the DUT

Please follow the rules outlined in this section to ensure best measurement accuracy using *B-WIC and B-SMC*

4.5.1 Avoid Leads and Large DUTs

Do not use extra leads to connect the DUT to the *B-WIC and B-SMC* test fixtures. Extra leads will introduce stray capacitance to ground / housing. This can cause currents to bypass the internal measurement bridge, causing errors in the measurement. The same is true for physically large DUTs.

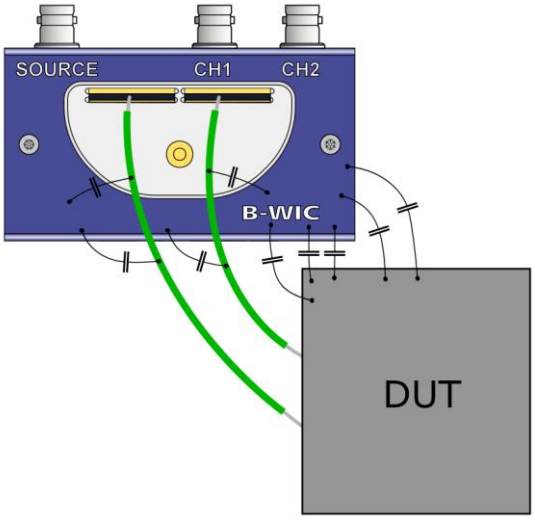
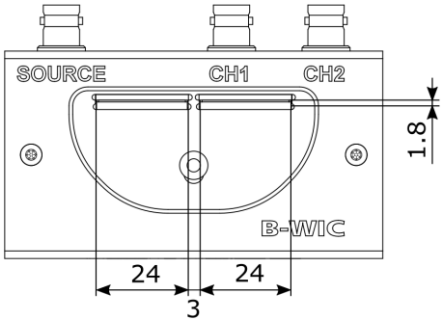


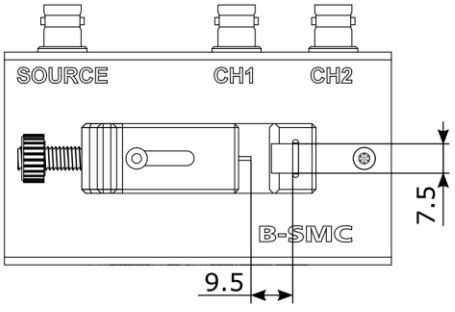
Figure 4-4: Stray capacitance of leads and physically large DUTs

4.5.2 Electrode Dimensions

The following pictures show the geometry of the *B-WIC and B-SMC* electrodes.



Maximum DUT wire diameter is 1.8 mm. Minimum spacing of DUT wires (clearance) is 3 mm. The electrode length is 24 mm.



Maximum DUT size that can be placed in the B-SMC is of 9.5 mm length and 7.5 mm width. Note that the needle electrode is in the center.

Figure 4-5: Electrode geometry of *B-WIC and B-SMC*

4.6 Measurement Range and Accuracy

Measurement accuracy and measurable impedance range are limited by the following factors:

- Open / Short / Load calibration respectively correction:
  The measurement is relative to the calibration elements. Hence, accuracy depends on the accuracy of the calibration elements.
- Noise:
  Especially when reducing the signal level or increasing receiver bandwidth values, noise can be the limiting factor. To reduce noise, use a higher signal level and lower receiver bandwidth setting.
- Contact resistance:
  Both, the *B-WIC and B-SMC* are subject to contact resistance. The gold plating of the electrodes lowers the contact resistance to around 0.5 mΩ. Make sure to have clean contacts before performing Short calibration and low value impedance measurements!

The following figure shows the measurement range and the typical relative accuracy that can be expected when measuring impedance with *B-WIC and B-SMC*:

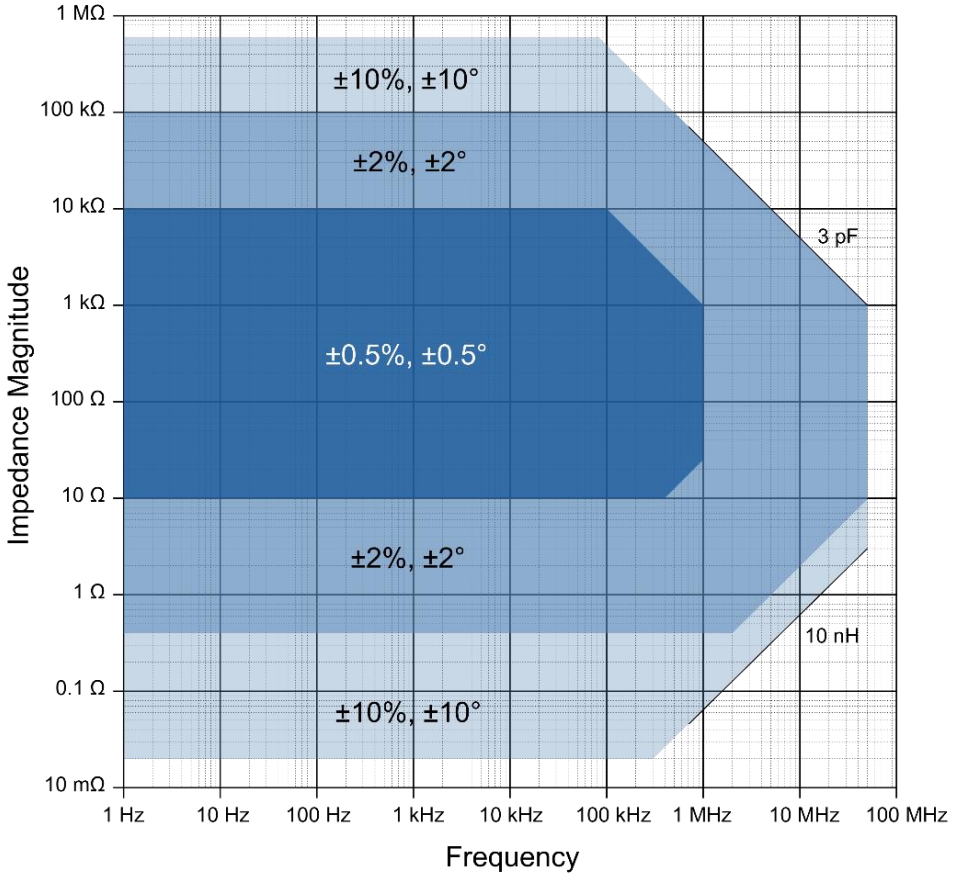


Figure 4-6: Typical relative accuracy achievable with *B-WIC and B-SMC*

Note: The relative accuracy results were determined using an Agilent E4980A precision LCR meter as reference. The measurements were done using 10 Hz receiver bandwidth setting to reduce noise.

Note: Accuracy rating can change without notice.

5 Technical Data

Note: Technical data can change without notice.

For geometrical specification of the electrode dimensions (dimension of the DUT), please refer to Electrode Dimensions on page 10.

Table 5-1 Specifications

Characteristics	Rating
Frequency range	1 Hz to 50 MHz
Recommended impedance measurement range	20 mΩ to 600 kΩ
B-CAL-3 load accuracy	100 Ω ± 0.1%, 15 ppm/°C
0603 load resistors	100 Ω ± 0.1%, 15 ppm/°C

Table 5-2 Environmental conditions

Characteristic	Rating
Operating temperature	5 °C … +40 °C / 41 °F … +104 °F
Storage temperature	-35 °C … +60 °C / -31 °F … +140 °F
Relative humidity	20 % … 80 %, non-condensing

Table 5-3 Mechanical data

Characteristic	Rating
Dimensions (with connectors)	100.5 mm x 68.2 mm x 55.5 mm 3.96 inch x 2.69 inch x 2.19 inch
Weight	B-WIC: 0.16 kg / 0.35 lbs B-SMC: 0.13 kg / 0.29 lbs

6 Technical Support

When you are working with our products we want to provide you with the greatest possible benefits. If you need any support, we are here to assist you!

Technical Support - Get Support

www.omicron-lab.com/support

support@omicron-lab.com

At our technical support hotline, you can reach well-educated technicians for all your questions. Competent and free of charge.

Make use of our technical support hotlines:

Americas:	+1 713 830-4660 or +1 800-OMICRON
Asia-Pacific:	+852 3767 5500
Europe / Middle East / Africa:	+43 59495 4444

Additionally, you can find the OMICRON Lab Service Center or Sales Partner closest to you at www.omicron-lab.com → Contact.

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7 Safety Instructions

EN Safety instructions, designated use and operator qualifications

Safety Instructions:

- The B-WIC and B-SMC are SELV (Safety Extra Low Voltage according to IEC 60950) devices, also known as protection class III equipment.
- Only use the B-WIC and B-SMC in conjunction with the Bode 100. Do not apply any external voltages or currents.

Designated Use:

B-WIC and B-SMC have been especially designed to measure the impedance of passive components in conjunction with the Bode 100 in laboratory or manufacturing environments.

Operator qualifications:

Testing with B-WIC and B-SMC must only be carried out by qualified, skilled and authorized personnel.
Personnel receiving training, instructions, directions, or education on B-WIC and B-SMC must be under constant supervision of an experienced operator while working with the equipment. Testing with B-WIC and B-SMC must comply with the internal safety instructions as well as additional relevant documents.

DE Sicherheitshinweise, bestimmungsgemäße Verwendung und Qualifikation des Bedienpersonals

Sicherheitshinweise:

- Die Impedanzmessadapter B-WIC und B-SMC sind SELV-Geräte (Sicherheitskleinspannung) gemäß IEC 60950 und erfüllen die Anforderungen der Schutzklasse III.
- Die Impedanzmessadapter B-WIC und B-SMC dürfen nur in Verbindung mit dem Bode 100 verwendet werden. Legen Sie niemals Fremdspannungen oder -ströme an die Messadapter an.

Bestimmungsgemäße Verwendung:

Die Impedanzmessadapter B-WIC und B-SMC sind ausschließlich für die Messung der Impedanz von passiven Komponenten mit dem Bode 100 in Labor- und Produktionsumgebungen vorgesehen.

Qualifikation des Bedienpersonals:

Prüfungen mit den Impedanzmessadaptern B-WIC und B-SMC dürfen nur durch autorisierte, qualifizierte und dafür ausgebildete Personen durchgeführt werden.
Zu schulendes, anzulernendes, einzuweisendes oder im Rahmen einer Ausbildung befindliches Personal darf nur unter ständiger Aufsicht einer erfahrenen Person mit den Impedanzmessadaptern B-WIC und B-SMC arbeiten. Prüfungen mit den Impedanzmessadaptern B-WIC und B-SMC müssen immer unter Beachtung der internen Sicherheitsbestimmungen und aller sonstigen relevanten Dokumente erfolgen.

BG Указания за безопасност, предназначение и квалификации на оператора

Указания за безопасност:

- B-WIC и B-SMC представляват SELV (безопасни свръх нисковолтови в съответствие с IEC 60950) устройства, известни също така и като оборудване с клас на защита III.
- Използвайте B-WIC и B-SMC съвместно с Bode 100. Не прилагайте никакви външни напрежения или токове.

Предназначение:

B-WIC и B-SMC са били специално конструирани за измерване на импеданса на пасивни компоненти съвместно с Bode 100 в лабораторна или производствена среда.

Квалификация на оператора:

Изпитванията с B-WIC и B-SMC трябва да се извършват само от квалифициран, опитен и упълномощен персонал.
Служителите, които се обучават или инструктират за работа с B-WIC и B-SMC , трябва да бъдат под постоянния надзор на опитен оператор, докато работят с апаратурата. При извършване на изпитвания с B-WIC и B-SMC трябва да се спазват вътрешните указания за безопасност и допълнителни приложими документи.

CS Bezpečnostní pokyny, určené použití a kvalifikace operátora

Bezpečnostní pokyny:

- Zařízení B-WIC a B-SMC nesou ochranu SELV (Safety Extra Low Voltage (Bezpečnostní velmi nízké napětí) podle směrnice IEC 60950), která je také známa jako třída krytí III.
- Zařízení B-WIC a B-SMC používejte ve spojení s analyzátorem Bode 100. Neaplikujte jakákoli vnější napětí nebo proudy.

Určené použití:

Zařízení B-WIC a B-SMC byla vyvinuta speciálně k měření impedance pasivních komponent ve spojení s analyzátorem Bode 100 pro použití v laboratořích a výrobních zařízeních.

Kvalifikace operátora:

Testování pomocí zařízení B-WIC a B-SMC smí provádět pouze kvalifikovaná, vyškolená a pověřená osoba.
Osoby, které jsou školeny, poučovány a trénovány v použití zařízení B-WIC a B-SMC, musí být při práci se zařízením pod neustálým dohledem zkušeného operátora. Testování se zařízením B-WIC a B-SMC musí vyhovovat interním bezpečnostním pokynům a dalším relevantním dokumentům.

DA Sikkerhedsanvisninger, tilsigtet brug og operatørkvalifikationer

Sikkerhedsanvisninger:

- B-WIC og B-SMC er SELV-enheder (Safety Extra Low Voltage iht. IEC 60950), der også kaldes udstyr i beskyttelsesklasse III.
- Brug kun B-WIC og B-SMC sammen med Bode 100. Anvend ikke eksterne spændings- eller strømkilder.

Tilsigtet brug:

B-WIC og B-SMC er særligt udviklet til måling af impedansen for passive komponenter i forbindelse med Bode 100 i laboratorie- og produktionsmiljøer.

Operatørkvalifikationer:

Tests med B-WIC og B-SMC må kun udføres af kvalificeret, uddannet og autoriseret personale.
Personale, der modtager oplæring, anvisninger, instruktioner eller er under oplæring til at arbejde med B-WIC og B-SMC, skal være under konstant opsyn af en erfaren operatør, når de arbejder med udstyret. Test med B-WIC og B-SMC skal være i overensstemmelse med de interne sikkerhedsanvisninger samt supplerende relevante dokumenter.

EL Οδηγίες ασφαλείας, προβλεπόμενη χρήση και προσόντα χειριστών

Οδηγίες ασφαλείας:

- Οι B-WIC και B-SMC είναι συσκευές τύπου SELV (Συσκευές ασφαλείας εξαιρετικά χαμηλής τάσης σύμφωνα με το πρότυπο IEC 60950). Αυτές οι συσκευές είναι επίσης γνωστές ως "εξοπλισμός κατηγορίας III".
- Οι B-WIC και B-SMC πρέπει να χρησιμοποιούνται μόνο σε συνδυασμό με το Bode 100. Μην εφαρμόζετε οποιεσδήποτε εξωτερικές τάσεις ή εντάσεις ρεύματος.

Προβλεπόμενη χρήση:

Οι συσκευές B-WIC και B-SMC έχουν σχεδιαστεί ειδικά για μέτρηση της σύνθετης αντίστασης των παθητικών στοιχείων σε συνδυασμό με το Bode 100 σε περιβάλλοντα εργαστηρίου ή εγκαταστάσεων παραγωγής.

Προσόντα χειριστών:

Οι δοκιμές με τις συσκευές B-WIC και B-SMC πρέπει να εκτελούνται μόνο από πιστοποιημένο, ειδικευμένο και εξουσιοδοτημένο προσωπικό.
Το προσωπικό που εκτελεί πρακτική εξάσκηση ή λαμβάνει εντολές, οδηγίες ή εκπαίδευση σχετικά με τις συσκευές B-WIC και B-SMC πρέπει να βρίσκεται υπό τη συνεχή επίβλεψη ενός έμπειρου χειριστή όταν εργάζεται με τον εξοπλισμό. Η εκτέλεση δοκιμών με τις συσκευές B-WIC και B-SMC πρέπει να συμμορφώνεται με τις εσωτερικές οδηγίες ασφαλείας και με οποιαδήποτε επιπρόσθετα σχετικά έγγραφα.

ES Instrucciones de seguridad, aplicación prevista y cualificaciones de los operadores

Instrucciones de seguridad:

- Los accesorios B-WIC y B-SMC son dispositivos SELV (Safety Extra Low Voltage, tensión de seguridad extrabaja, según la norma IEC 60950), denominados también equipos de clase III.
- Utilice los accesorios B-WIC y B-SMC exclusivamente con el instrumento Bode 100. No aplique tensiones o corrientes externas.

Aplicación prevista:

Los accesorios B-WIC y B-SMC están especialmente diseñados para medir la impedancia de los componentes pasivos junto con el instrumento Bode 100 en entornos de laboratorio o de fabricación.

Cualificaciones de los operadores:

Solo el personal cualificado, experimentado y autorizado debe realizar pruebas con B-WIC y B-SMC.
El personal no experimentado en el manejo de los accesorios B-WIC y B-SMC debe estar en todo momento bajo la supervisión de un operador experimentado mientras trabaja con el equipo. Al realizar pruebas con los accesorios B-WIC y B-SMC se deben cumplir todas las instrucciones de seguridad internas, así como las instrucciones proporcionadas en cualquier otro documento que resulte pertinente.

ET Ohutusjuhised, kasutusotstarve ja kasutaja kvalifikatsioon

Ohutusjuhised:

- B-WIC ja B-SMC on maandamata kaitseväikepingega (Safety Extra Low Voltage, SELV) seadmed (kooskõlas standardi IEC 60950 nõuetega), mida teatakse ka kui III kaitseklassi seadmeid.
- Kasutage seadmeid B-WIC ja B-SMC ainult koos seadmega Bode 100. Ärge kasutage mis tahes välist pinget või voolu.

Ettenähtud kasutusotstarve:

B-WIC ja B-SMC on spetsiaalselt mõeldud mõõtma koos seadmega Bode 100 passiivsete komponentide näivtakistust labori- ja tootmiskeskkondades.

Kasutaja kvalifikatsioon:

seadmetega B-WIC ja B-SMC võivad testimist läbi viia üksnes vastavate volitustega kogenud ja väljaõppega töötajad.
Töötajad, kes läbivad seadmete B-WIC ja B-SMC kasutamise väljaõpet või koolitust või keda juhendatakse selles valdkonnas, peavad seadmega töötamise ajal olema kogenud kasutaja pideva järelevalve all. Seadmetega B-WIC ja B-SMC testimine peab toimuma ettevõtte sisemiste ohutusnõuete ja ohutusega seotud lisadokumentide kohaselt.

FI Turvallisuusohjeet, käyttötarkoitus ja käyttäjän pätevyys

Turvallisuusohjeet:

- B-WIC ja B-SMC ovat SELV-laitteita (Safety Extra Low Voltage, suojaava pienoisjännite standardin IEC 60950 mukaan), jotka tunnetaan myös suojausluokan III laitteina.
- Käytä B-WIC- ja B-SMC -laitteita vain yhdessä Bode 100 -laitteen kanssa. Älä käytä mitään ulkoisia jännitteitä tai virtoja.

Käyttötarkoitus:

B-WIC ja B-SMC -laitteet on erityisesti kehitetty mittaamaan passiivisten komponenttien impedanssia yhdessä Bode 100 -laitteen kanssa laboratorio- ja tuotantoympäristöissä.

Käyttäjän pätevyys:

B-WIC ja B-SMC -laitteilla tehtävään testaukseen osallistuvilla henkilöillä tulee olla asianmukainen pätevyys, ammattitaito ja valtuutus.

Henkilöiden, joille annetaan B-WIC ja B-SMC -laitteita koskevaa koulutusta, ohjeistusta, opastusta tai valmennusta, tulee olla kokeneen käyttäjän jatkuvan valvonnan alaisina käsitellessään laitteistoa. B-WIC ja B-SMC -laitteilla tehtävän testauksen täytyy olla sisäisten turvallisuusohjeiden sekä muiden asianmukaisten dokumenttien mukaista.

FR Consignes de sécurité, utilisation prévue et qualifications des opérateurs

Consignes de sécurité :

- Le B-WIC ou le B-SMC et un dispositif TBTS (Très Basse Tension de Sécurité, au sens de la norme CEI 60950), également connu sous le nom d'équipement de protection de classe III.
- Utilisez exclusivement le B-WIC ou le B-SMC en association avec le Bode 100. N'appliquez aucune tension ni courant externe.

Utilisation prévue :

Le B-WIC ou le B-SMC est spécifiquement destiné à mesurer l'impédance des composants passifs en association avec le Bode 100 dans les laboratoires ou centres de production.

Qualifications des opérateurs :

Les essais effectués à l'aide du B-WIC ou du B-SMC doivent être exclusivement réalisés par du personnel qualifié, compétent et agréé.

Le personnel qui reçoit une formation, des instructions ou des directives quant à l'utilisation du B-WIC ou du B-SMC doit rester sous la supervision permanente d'un opérateur expérimenté pendant le travail avec l'équipement. Les essais effectués à l'aide du B-WIC ou du B-SMC doivent être conformes aux consignes de sécurité internes et à tout autre document pertinent.

HR Sigurnosne upute, predviđena namjena i kvalifikacije rukovatelja

Sigurnosne upute:

- B-WIC i B-SMC su SELV uređaji (engl. Safety Extra Low Voltage prema standardu IEC 60950) poznati i kao zaštitna oprema III. klase.
- Koristite B-WIC i B-SMC samo u spoju s uređajem Bode 100. Ne upotrebljavajte bilo kakav vanjski napon ili struju.

Predviđena namjena:

B-WIC i B-SMC posebno su dizajnirani za mjerenje impendancije pasivnih komponenti u spoju s uređajem Bode 100 u laboratoriju ili u proizvodnom okruženju.

Kvalifikacije rukovatelja:

Ispitivanje pomoću B-WIC i B-SMC uređaja smiju provoditi samo kvalificirani, stručni i ovlašteni zaposlenici.

Zaposlenici koji prolaze obuku, instrukcije, poduku ili tečaj o uređajima B-WIC i B-SMC moraju biti pod stalnim nadzorom iskusnog rukovatelja prilikom rada s opremom. Ispitivanje uređajima B-WIC i B-SMC mora biti u skladu s unutarnjim sigurnosnim uputama i dodatnim relevantnim dokumentima.

HU Biztonsági utasítások, rendeltetésszerű használat és kezelői szakképesítési követelmények

Biztonsági utasítások:

- A B-WIC és B-SMC (az IEC 60950 szabvány szerinti) biztonsági törpefeszültségű (SELV) – más jelölés szerint III. érintésvédelmi osztályú – készülék.
- A B-WIC és a B-SMC készülék csak a Bode 100 készülékkel együtt használható. Tilos külső feszültségeket vagy áramokat alkalmazni.

Rendeltetésszerű használat:

A B-WIC és a B-SMC készülék kifejezetten passzív alkatrészek impedanciájának a Bode 100 készülékkel végzett, laboratóriumi vagy gyártási környezetekben történő mérésére készült.

Kezelői szakképesítési követelmények:

A B-WIC és a B-SMC készülékkel csak szakképzett, gyakorlattal rendelkező és ezzel megbízott személyek végezhetnek vizsgálatokat.

A B-WIC és a B-SMC készülék kezelésére vonatkozó betanításban, utasításokban, útmutatásban vagy oktatásban részesülő személyeket a készülék használata során folyamatosan felügyelnie kell egy tapasztalt kezelőnek. A B-WIC és a B-SMC készülékkel végzett vizsgálatok során be kell tartani a belső biztonsági utasításokat és a további vonatkozó dokumentumokban foglaltakat.

IT Istruzioni di sicurezza, utilizzo previsto e qualifiche degli operatori

Istruzioni di sicurezza:

- Il B-WIC e il B-SMC sono dispositivi SELV (Safety Extra Low Voltage, vale a dire a bassissima tensione di sicurezza, secondo IEC 60950), chiamati anche apparecchi con classe di protezione III.
- Utilizzare il B-WIC e il B-SMC esclusivamente in associazione al Bode 100. Non applicare tensioni o correnti esterne.

Utilizzo previsto:

Il B-WIC e il B-SMC sono stati appositamente progettati per misurare l'impedenza dei componenti passivi congiuntamente al Bode 100 nei laboratori e negli ambienti di produzione.

Qualifiche degli operatori:

Le prove con il B-WIC e il B-SMC devono essere condotte solo da personale esperto autorizzato e qualificato.
Quando utilizza l'apparecchiatura, il personale che riceve addestramento, istruzioni o formazione sul B-WIC e il B-SMC deve trovarsi sotto la costante supervisione di un operatore esperto. Le prove eseguite con il B-WIC e il B-SMC devono rispettare le istruzioni di sicurezza interne e i relativi documenti aggiuntivi.

LT Saugos nurodymai, numatytasis naudojimas ir operatoriaus kvalifikacijos

Saugos nurodymai

- B-WIC ir B-SMC yra saugios žemiausiosios įtampos (angl. „Safety Extra Low Voltage“, SELV pagal IEC 60950) prietaisai, dar vadinami III apsaugos klasės įranga.
- B-WIC ir B-SMC naudokite tik kartu su Bode 100. Neprijunkite jokių išorinių įtampų ar srovių.

Numatytasis naudojimas

B-WIC ir B-SMCkonkrečiai skirti laboratorijose arba gamybinėse patalpose pasyvių komponentų pilnutinei varžai matuoti, kartu su Bode 100.

Operatoriaus kvalifikacijos

Bandymus su B-WIC ir B-SMC leidžiama atlikti tik kvalifikuotiems, įgudusiems ir įgaliotiems darbuotojams.
Darbuotojai, kurie mokomi, instruktuojami ir kuriems nurodoma arba aiškinama, kaip dirbti su B-WIC ir B-SMC, turi būti nuolat, kol dirbama su įranga, prižiūrimi patyrusio operatoriaus. Bandymai su B-WIC ir B-SMCturi būti atliekami laikantis vidaus saugos nurodymų ir kitų svarbių dokumentų.

LV Drošības instrukcijas, paredzētā izmantošana un operatora kvalifikācija

Drošības instrukcijas

- B-WIC un B-SMC ir SELV (Safety Extra Low Voltage — sevišķi zema drošības sprieguma — atbilstoši IEC 60950) ierīces jeb III aizsardzības klases aprīkojums.
- Lietojiet B-WIC un B-SMC tikai kopā ar Bode 100. Nepievienojiet ārēju spriegumu vai strāvu.

Paredzētā izmantošana

B-WIC un B-SMC ir īpaši izstrādāti pasīvo komponentu pretestības mērīšanai laboratoriju vai ražošanas vidē, lietojot to kopā ar Bode 100.

Operatora kvalifikācija

Testēšanu ar B-WIC un B-SMC atļauts veikt tikai atbilstoši pilnvarotiem un kvalificētiem darbiniekiem ar nepieciešamajām prasmēm. Strādājot ar aprīkojumu, darbiniekiem, kas piedalās apmācībās, saņem instrukcijas, norādījumus vai izglītojošu informāciju par B-WIC un B-SMC, jāatrodas nepārtrauktā pieredzējuša operatora uzraudzībā. Testēšanai ar B-WIC un B-SMC jāatbilst iekšējām drošības instrukcijām un attiecīgajiem papildu dokumentiem.

NL Veiligheidsinstructies, beoogd gebruik en kwalificaties van de bediener

Veiligheidsinstructies:

- De B-WIC- en B-SMC-apparaten zijn SELV-apparaten (Safety Extra Low Voltage, volgens IEC 60950), ook wel bekend als apparatuur van beschermingsklasse III.
- Gebruik de B-WIC en B-SMC alleen in combinatie met de Bode 100. Pas geen externe spannings- of stroombronnen toe.

Beoogd gebruik:

De B-WIC en B-SMC zijn speciaal ontworpen om in combinatie met de Bode 100 in laboratorium- of productieomgevingen de impedantie van passieve onderdelen te meten.

Kwalificaties van de bediener:

Tests met de B-WIC en B-SMC mogen alleen worden uitgevoerd door ervaren, gekwalificeerd en hiertoe bevoegd personeel. Personen die een training, cursus, instructies of aanwijzingen voor de B-WIC en B-SMC krijgen, moeten continu onder toezicht van een ervaren bediener staan wanneer ze met de apparatuur werken. Het testen met de B-WIC en B-SMC moet aan de interne veiligheidsinstructies en aanvullende veiligheidsrelevante documenten voldoen.

PL Instrukcje bezpieczeństwa, przeznaczenie i kwalifikacje operatora

Instrukcje bezpieczeństwa:

- B-WIC i B-SMC to zabezpieczone urządzenia niskonapięciowe (ang. Safety Extra Low Voltage — SELV) zgodne z normą IEC 60950, zwane też urządzeniami zabezpieczającymi o stopniu ochrony III.
- Urządzeń B-WIC i B-SMC można używać wyłącznie z urządzeniami Bode 100. Nie wolno podłączać do nich żadnych zewnętrznych napięć ani prądów.

Przeznaczenie:

Urządzenia B-WIC i B-SMC służą do pomiaru impedancji elementów pasywnych współpracujących z urządzeniami Bode 100 w warunkach laboratoryjnych lub produkcyjnych.

Kwalifikacje operatora:

Testy za pomocą urządzeń B-WIC i B-SMC mogą być prowadzone wyłącznie przez wykwalifikowany i autoryzowany personel mający odpowiednie umiejętności.
Podczas pracy ze sprzętem przeszkolony personel zapoznany z instrukcjami, wytycznymi i obsługą urządzeń B-WIC i B-SMC musi znajdować się pod stałym nadzorem doświadczonej osoby. Testy przeprowadzane przy użyciu urządzeń B-WIC i B-SMC muszą być zgodne z wewnętrznymi instrukcjami bezpieczeństwa oraz dodatkowymi obowiązującymi dokumentami.

PT Instruções de segurança, uso designado e qualificações do operador

Instruções de segurança:

- Os dispositivos B-WIC e B-SMC são dispositivos SELV (Tensão de segurança extrabaixa conforme a IEC 60950), também conhecidos como equipamentos de proteção classe III.
- Utilize o B-WIC e o B-SMC apenas em conjunto com o Bode 100. Não aplique nenhuma tensão ou corrente externa.

Uso designado:

O B-WIC e o B-SMC foram especialmente criados para medir a impedância de componentes passivos em conjunto com o Bode 100 em laboratórios ou ambientes de produção.

Qualificações do operador:

Testes com o B-WIC e o B-SMC devem ser realizados apenas por pessoal autorizado, capacitado e qualificado.
Pessoal em fase de treinamento, instrução, orientação ou aprendizado sobre o B-WIC e o B-SMC deve permanecer sob a constante supervisão de um operador experiente ao trabalhar com o equipamento. O teste com o B-WIC e o B-SMC deve estar em conformidade com as instruções de segurança internas e com os documentos relevantes adicionais.

RO Instrucțiuni de siguranță, destinația de utilizare și calificările operatorului

Instrucțiuni de siguranță:

- B-WIC și B-SMC sunt dispozitive SELV (cu tensiune foarte joasă pentru siguranță conform IEC 60950), cunoscute și drept echipamente din clasa de protecție III.
- A se utiliza B-WIC și B-SMC doar în combinație cu dispozitivul Bode 100. A nu se aplica tensiuni și intensități din surse externe.

Destinația de utilizare:

B-WIC și B-SMC au fost proiectate special pentru măsurarea impedanței componentelor pasive în combinație cu dispozitivul Bode 100 în medii de laborator sau de producție.

Calificările operatorului:

Testarea cu B-WIC și B-SMC trebuie efectuată exclusiv de personal calificat, instruit și autorizat.
Personalul în curs de instruire, dirijare și educare privind produsele B-WIC și B-SMC trebuie să se afle sub supravegherea permanentă a unui operator experimentat când efectuează lucrări cu echipamentul. Testarea cu B-WIC și B-SMC trebuie să se conformeze instrucțiunilor de siguranță internă, precum și documentației suplimentare relevante.

SK Bezpečnostné pokyny, určené použitie a kvalifikácia obsluhy

Bezpečnostné pokyny:

- B-WIC a B-SMC sú zariadenia typu SELV (s bezpečným veľmi nízkym napätím podľa STN EN 60950), známe aj ako zariadenia ochrannej triedy III.
- Zariadenia B-WIC a B-SMC používajte len v spojení so zariadením Bode 100. Neaplikujte žiadne vonkajšie napätie ani prúd.

Určené použitie:

Zariadenia B-WIC a B-SMC sú konštruované špeciálne na meranie impedancie pasívnych komponentov v spojení so zariadením Bode 100 v laboratórnom alebo výrobnom prostredí.

Kvalifikácia obsluhy:

Testovanie pomocou zariadení B-WIC a B-SMC môže vykonávať len vyškolený, skúsený a oprávnený personál.
Na pracovníkov, ktorí momentálne absolvujú školenie, zaúčajú sa alebo sa vzdelávajú v súvislosti so zariadeniami B-WIC a B-SMC, musí pri práci so zariadením vždy dohliadať skúsený operátor. Testovanie pomocou zariadení B-WIC a B-SMC sa musí vykonávať v zhode s internými bezpečnostnými pokynmi, ako aj ďalšou príslušnou dokumentáciou.

SL Varnostna navodila, predvidena uporaba in kvalifikacije upravljavca

Varnostna navodila:

- B-WIC in B-SMC sta napravi z napetostjo SELV (varna zelo nizka napetost v skladu s standardom IEC 60950) znani tudi kot oprema z zaščitnim razredom III.
- Naprave B-WIC in B-SMC uporabljajte samo skupaj z napravo Bode 100. Ne uporabljajte zunanjih virov napetosti ali toka.

Predvidena uporaba:

Napravi *B-WIC* in *B-SMC* sta bili zasnovani posebej za merjenje upora pasivnih komponent skupaj z napravo *Bode 100* v laboratorijih in proizvodnih obratih.

Kvalifikacije upravljavca:

Preizkušanje z napravo B-WIC in B-SMC lahko izvaja samo kvalificirano, usposobljeno in pooblaščeno osebje.
Osebje, ki se usposablja, prejema navodila ali se izobražuje o napravah B-WIC in B-SMC, mora biti med delom z opremo pod stalnim nadzorom izkušenega upravljavca. Preizkušanje z napravami B-WIC in B-SMC mora biti skladno z notranjimi varnostnimi navodili in dodatnimi ustreznimi dokumenti.

SV Säkerhetsinstruktioner, avsedd användning och användarkvalifikationer

Säkerhetsinstruktioner

- B-WIC och B-SMC är SELV-enheter (Safety Extra Low Voltage enligt IEC 60950), som också kallas utrustning i skyddsklass III.
- Använd bara B-WIC och B-SMC i kombination med Bode 100. Anslut inte externa spänningar eller strömmar.

Avsedd användning:

B-WIC och B-SMC har utformats speciellt för att mäta passiva komponenters impedans i kombination med Bode 100 i laboratorie- eller tillverkningsmiljöer.

Användarkvalifikationer:

Test med B-WIC och B-SMC ska endast utföras av kvalificerad, kunnig och auktoriserad personal.
Personal som får utbildning, instruktioner, anvisningar eller undervisning om B-WIC och B-SMC måste vara under ständig övervakning av en erfaren operatör medan de arbetar med utrustningen. Test med B-WIC och B-SMC måste följa interna säkerhetsinstruktioner, samt ytterligare relaterade dokument.

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