

## Noise Logger Type 3659-A Portable Environmental SLM Protection Kit Type 3538

Noise monitoring is often required when new developments are planned or during compliance investigations. Assessments require sound levels to be measured over long periods of time to determine the impact on nearby communities, and it is not practical or efficient for acoustical experts to spend days or weeks on site taking continuous measurements.

Noise Logger Type 3659-A performs real-time, unattended noise measurements efficiently, accurately and reliably. The system is intelligently packaged for easy transportation and on-site setup and is ready to measure all the parameters you need right out of the box.

The system is available as Type 3659-A, a complete noise logger, or as Type 3538, a kit for use with your existing Hand-held Analyzer Type 2250, 2250-L or 2270.



### Uses and Features

#### Uses

- Measurements made:
  - Outdoors
  - Unattended
  - In workplaces and on construction sites
  - In remote locations
- Measurements for:
  - Area planning
  - Noise control
  - Complaint investigation
  - Venue licensing

#### Features

- Weather protection to min. IP 44
- Easy single-person transportation and setup
- Tamper protection
- 18 W solar panel for continuous usage in sunny conditions
- 32 Ah battery enabling at least six days use in winter conditions
- Microphone cable protected from weather and wildlife
- Hand-held Analyzer Type 2250
- Outdoor Microphone Type 4952 for long-term outdoor use
- Works with Measurement Partner Suite and with Noise Sentinel

#### Additional features with Type 2250/2250-L/2270 software:

- Type approved to Class 1
- Level trigger
- Sound recording of events
- Auto Charge Injection Calibration (CIC) check
- Remote 3G broadband operation \*
- Automatic status SMS text messages \*
- Automatic status email messages \*
- External trigger †
- Supply voltage check †
- Timer controlled measurement
- Periodic reports ‡

\* Requires router or similar (not included)

† Type 2250/2270 software only

‡ Type 2250/2270 Enhanced Logging software and Noise Monitoring Software only

Noise Logger Type 3659-A performs real-time, unattended noise measurements efficiently, accurately and reliably. Intelligently packaged for easy transportation and on-site setup, it is ready to measure all the parameters you need right out of the box, enabling you to take unattended noise measurements with confidence.

The logger includes Hand-held Analyzer Type 2250 and all of the software and accessories you need to complete your monitoring project, including full statistics, 1/3-octave band analysis, audio recording with event triggering and a memory card.

The logger's rugged case protects all of the contents from the elements and provides a solid base for the outdoor microphone. The microphone cable is contained within the mast for protection from weather and wildlife.

### Inside the Case

**Fig. 1**  
Contents of  
Type 3659-A



Compact 18 W solar panel and microphone mast stored in lid

32 Ah lithium iron phosphate battery

Detachable microphone mast and mounting bracket

Hand-held Analyzer Type 2250 with:

- BZ-7223: Frequency Analysis Software
- BZ-7225: Enhanced Logging Software
- BZ-7226: Signal Recording Option
- BZ-7232: Noise Monitoring Software

Outdoor Microphone Type 4952 stored below Type 2250

Rugged weatherproof case, (min. IP 44)

### Easy Transport, Easy Setup

Noise Logger Type 3659-A has been specifically designed to meet these needs. Everything is contained within a single case, there's no need to carry a separate tripod and microphone. It can be deployed within a few minutes and operates continuously logging noise data. At the heart of it is Hand-held Analyzer Type 2250 giving sound level meter class 1 measurements making it suitable for any monitoring application. It is paired with Outdoor Microphone Type 4952. Used in hundreds of airports and unattended monitoring systems around the world, it will withstand the rigours of the outdoors. No exposed cables and a strong mounting arrangement make it resistant to attention from wildlife.

### Protection of the Contents

Using proven equipment designed for outdoor use, Noise Logger Type 3659-A gives you the peace of mind that it's doing the job you put it out there to do.

During transportation all parts are secured.

During measurement, the microphone cable is contained within the mast for protection from weather and wildlife.

**Fig. 2**  
Noise Logger  
Type 3659-A under  
solar power



Type 3659-A comes with an 18 W solar panel and a powerful 32 Ah battery.

The solar panel enables long periods of operation without visits to change batteries. Operating life is dependent on the amount of sunlight. It will operate for at least 6 days during winter and continuously, self-sustained by the solar panel during the summer. These are worst case scenarios and data is available on our [website](#) to help you determine operating life based on time of year and location.

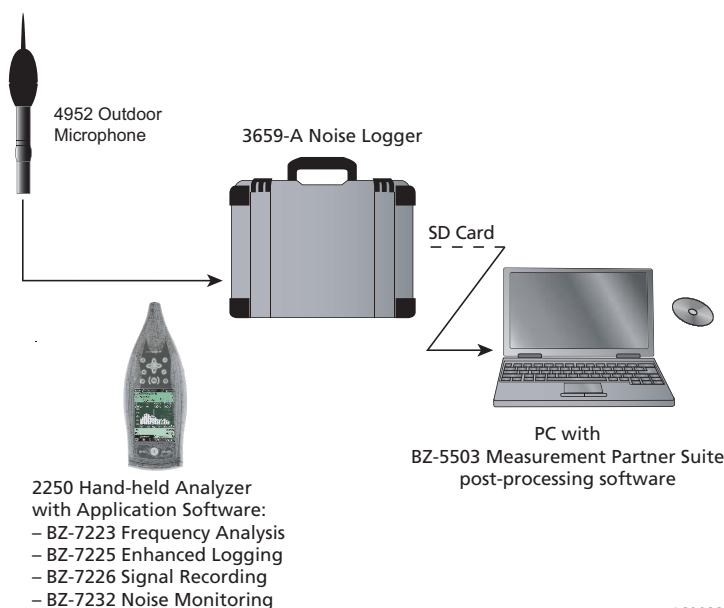
## Type 3659-A Solution

Noise Logger Type 3659-A is available as a fully equipped logger for long-term deployment. Data is transferred from site by swapping SD cards.

The noise logger features are:

- Simple to install – set up in a matter of minutes
- Convenient – one rugged outdoor case for easy transport
- Solar powered – continuous operation in many conditions
- Robust outdoor microphone and mountable microphone and enclosed cables – prevent damage from weather and wildlife
- Flexible – also available with an accessory pack for use as a hand-held analyzer

**Fig. 3**  
Type 3659-A system



Noise Logger SLM Accessory Pack Type 3659-UPG includes ½" free-field microphone, preamplifier, windscreen, hinged instrument cover, black leather carry case, power supply, back-pack, wrist strap and tripod extension – everything you need to use the sound level meter hand-held for the variety of applications available for Type 2250 excluding building acoustics, tone assessment and FFT Analysis.

If you already own a Hand-held Analyzer Type 2250 or Type 2270, Portable Environmental SLM Protection Kit Type 3538 will turn it into a Type 3659-A provided you also have the appropriate applications on the instrument.

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The compact and lightweight Outdoor Microphone Type 4952 is suitable for long periods of unattended outdoor operation. The microphone is protected against the effects of wind, rain and perching birds and, with the hand-held analyzer, fulfils IEC 61672 Class 1 requirements. The reference direction angle of incidence can be set to 0° or 90°, dependent on the noise monitoring application. Inside the microphone is a highly stable prepolarized free-field ½" microphone cartridge with a stainless steel diaphragm.

**Table 1**  
Items included in  
Types 3659-A and 3538

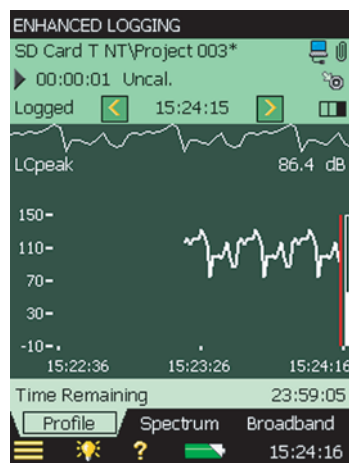
Item	Noise Logger Type 3639-A	Portable Environmental SLM Protection Kit Type 3538
Waterproof case	✓	✓
Type 2250 hand-held analyzer with: • BZ-7223 Frequency Analysis • BZ-7225 Enhanced Logging • BZ-7226 Signal Recording • BZ-7232 Noise Monitoring	✓	✗
8 GB SD card	✓	✗
Type 4952 outdoor microphone	✓	✓
Microphone cable	✓	✓
Microphone mast	✓	✓
Aluminium mast mount	✓	✓
18 W solar panel	✓	✓
32 Ah backup battery	✓	✓
Mains power supply	✓	✓

## Application Software

Noise Logger Type 3659-A is ready to measure all the parameters you need right out of the box, including full statistics, 1/3-octave band analysis and audio-recording. Noise data can be processed using the Measurement Partner post-processing suite.

Logging software will log data down to 1 s resolution and log  $L_{AF}$  and  $L_{Aeq}$  at 0.1 s resolution. Broadband data, statistics and frequency spectra can be logged, and markers can be set manually or by level triggers. Graphical displays include an overview profile of the entire measurement, and a detailed profile for a selected period.

**Fig. 4**  
Enhanced Logging  
with Type 2250/2270



Enhanced Logging provides  $L_{dn}$ ,  $L_{den}$ ,  $L_{evening}$  and  $L_{night}$  calculations as well as two concurrent  $L_{eq}$  periods. With long-duration measurements, it provides periodic reports, continuous measurement, automatic reboot and resumption of operations in case of power failure.

Brüel & Kjær's patented Charge Injection Calibration (CIC) is available in the Logging and Enhanced Logging applications. For 10 seconds CIC injects an electrical signal into the microphone diaphragm, checks the entire measurement chain and delivers a pass result to show that all is in order. CIC can be activated manually or automatically at preset time intervals.

With Sound Recording software, you can initiate a sound recording manually, automatically using level triggers (both broadband and frequency based level triggers) or at set time intervals. Pre-recording lets you record sound occurring before sound recording is triggered, and memory space is saved by setting a suitable recording quality and maximum duration.

**Fig. 5**  
*Type approval:  
independently  
approved to Class 1  
accuracy by PTB in  
Germany*

**Physikalisch-Technische Bundesanstalt**  
Braunschweig und Berlin

21.21
05.02

**Innerstaatliche Bauartzulassung vom 02.11.2005**  
Type-approval certificate under German law, dated 02.11.2005

**2. Neufassung der Anlage**  
Revision 2 of the Annex

Seite 1 von 11 Seiten  
 Page 1 of 11 pages

**Zulassungsinhaber:** Brüel & Kjaer GmbH  
Issued to:

Linzer Str. 3  
 28359 Bremen

**Bauart:** Integrierender Schallpegelmessser Brüel & Kjaer 2250  
In respect of:

**Zertifikatsgeschichte**

Zertifikats-Ausgabe	Datum	Änderungen
21.21 / 05.02, 2. Neufassung	25.02.2009	Prüfung mit Außenmikrofon 4952
21.21 / 05.02, 1. Neufassung	07.05.2007	Prüfung nach DIN EN 61672
21.21 / 05.02	02.11.2005	Erstbescheinigung

Die 2. Neufassung ersetzt die 1. Neufassung der Anlage vom 07.05.2007, Geschäftszeichen PTB-1.72-4027414 zum oben genannten Zulassungsschein sowie die für diese Fassung erteilten Nachträge:
 

- Nr. 1 vom 26.06.2007 Geschäftszeichen PTB-1.72-4030327
- Nr. 2 vom 01.10.2007 Geschäftszeichen PTB-1.72-4032119
- Nr. 3 vom 28.09.2006 Geschäftszeichen PTB-1.72-4036491

Für die Messgeräte der zugelassenen Bauart gelten:

**Rechtsvorschriften:**

- Allgemeine Vorschriften der Eichordnung (EO-AV) vom 12. August 1988 (BGBl. I S. 1657), zuletzt geändert am 02.02.2007 (BGBl. I S. 58)
- Anlage 21 zur Eichordnung vom 12. August 1988, zuletzt geändert durch die 3. Verordnung zur Änderung der Eichordnung vom 18. August 2000 (BGBl. I S. 1307)

**Hinweise**  
 Neufassungen ohne Unterschrift und Siegel haben keine Gültigkeit. Diese Neufassung ist Bestandteil der Bauartzulassung und darf nur unersodert weiterverbreitet werden. Auszüge bedürfen der Genehmigung der Physikalisch-Technischen Bundesanstalt.

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**Rechtsbehelfsbelehrung**  
 Gegen diesen Bescheid kann innerhalb eines Monats nach Bekanntgabe schriftlich oder zur Niederschrift Widerspruch bei der Physikalisch-Technischen Bundesanstalt unter einer der nachstehenden Adressen eingelegt werden.

Information on legal remedies available  
 Objection may be made to this notification within one month of its receipt either in writing or orally recorded, to the Physikalisch-Technische Bundesanstalt at one of the following addresses:

**Physikalisch-Technische Bundesanstalt**  
 Bundesallee 100  
 38116 Braunschweig  
 DEUTSCHLAND

Abbestraße 2-12  
 10587 Berlin  
 DEUTSCHLAND

090112

Measurement integrity is of primary importance in noise measurement situations, whether for inside or outside or for attended or unattended measurements. Class 1, as described in the current sound level meter standard IEC 61672-1:2002, is the grade of accuracy often required for hand-held measurements.

In addition nothing less than Class 1 accuracy is required for outdoor measurement systems incorporating rain shields, wind shields or any other form of environmental protection used in microphone systems. Placing a small device, such as a rain guard, in close proximity to the microphone diaphragm may produce significant acoustic disturbance and thus measurement errors at mid and high frequencies.

Hand-held Analyzer Type 2250 and Outdoor Microphone Type 4952 are a type approved system combination, independently approved to Class 1 accuracy by PTB in Germany (see type approval certificate: Fig. 5). This ensures that the measurement system complies with the minimum requirements of accuracy for unattended noise measurement, a consideration often overlooked in portable noise measurement systems. Type approval of the system to IEC 61672-1:2002 also permits the weather-protected measurement system to be laboratory calibrated in accordance with part III of this sound level meter standard.

## Post-processing

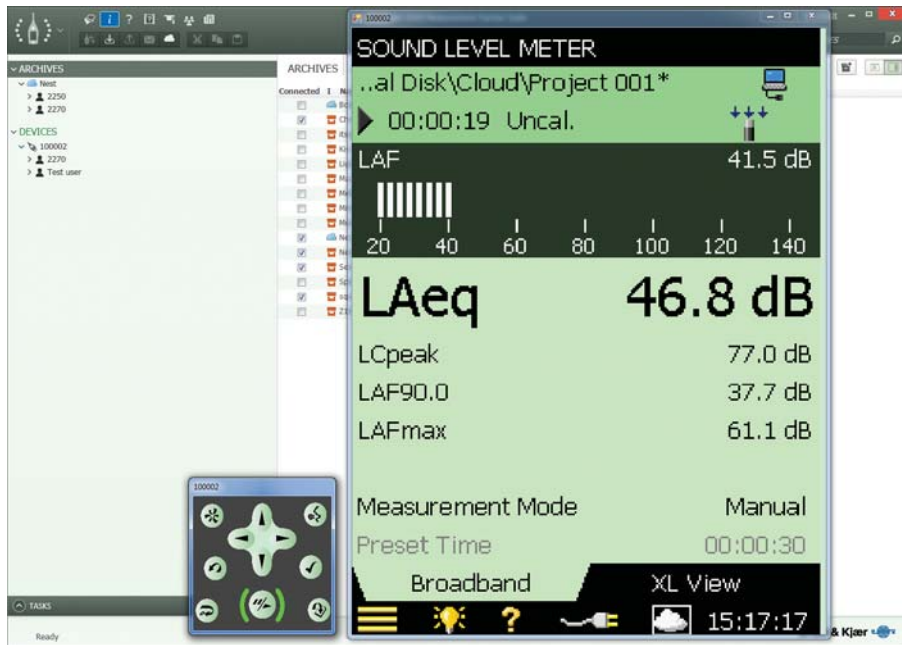
When the logger is used with Enhanced Logging software, Measurement Partner Suite BZ-5503 provides essential post-processing tools for the measurement data. In its basic configuration as standard PC software, Measurement Partner Suite provides an advanced viewing and maintenance platform for your hand-held analyzer, and includes Measurement Partner Field App to help you with field measurements. In addition, valuable post-processing modules are available on time-limited subscriptions. For more information see Measurement Partner Suite BZ-5503 ([BP 2430](#)).

Measurement Partner Suite BZ-5503 is an all-purpose program that forms the information link to (and from) your analyzer, see Fig. 6. Its primary functions are to manage and archive user data, manage the data transfer from a remote noise monitoring location and handle application software updates, upgrades and licensing. It enables you to perform the following:





- Use the extensive preview functions to listen to recordings and annotations, and view results and photographs including spectra and profiles
- Export data to Microsoft® Excel® or export in XML or delimited text format

Measurement Partner Suite BZ-5503 is supplied with all Type 2250, 2250-L and 2270 hand-held analyzers.

**Fig. 6**  
 Measurement Partner  
 Suite BZ-5503  
 online display



## Compliance with Standards

   	<p>The CE marking is the manufacturer's declaration that the product meets the requirements of the applicable EU directives</p> <p>RCM mark indicates compliance with applicable ACMA technical standards – that is, for telecommunications, radio communications, EMC and EME</p> <p>China RoHS mark indicates compliance with administrative measures on the control of pollution caused by electronic information products according to the Ministry of Information Industries of the People's Republic of China</p> <p>WEEE mark indicates compliance with the EU WEEE Directive</p>
<b>Safety</b>	<p>EN/IEC 61010–1: Safety requirements for electrical equipment for measurement, control and laboratory use</p> <p>ANSI/UL 61010–1: Safety requirements for electrical equipment for measurement, control and laboratory use</p>
<b>EMC Emission</b>	<p>EN/IEC 61000–6–3: Generic emission standard for residential, commercial and light industrial environments</p> <p>EN/IEC 61000–6–4: Generic emission standard for industrial environments</p> <p>CISPR 22: Radio disturbance characteristics of information technology equipment. Class B Limits</p> <p>FCC Rules, Part 15: Complies with the limits for a Class B digital device</p> <p>This ISM device complies with Canadian ICES–001 (standard for interference-causing equipment)</p>
<b>EMC Immunity</b>	<p>EN/IEC 61000–6–1: Generic standards – Immunity for residential, commercial and light industrial environments</p> <p>EN/IEC 61000–6–2: Generic standards – Immunity for industrial environments</p> <p>EN/IEC 61326: Electrical equipment for measurement, control and laboratory use – EMC requirements</p> <p><b>Note:</b> The above is only guaranteed using accessories listed in this Product Data sheet</p>
<b>Temperature</b>	<p>IEC 60068–2–1 &amp; IEC 60068–2–2: Environmental Testing. Cold and Dry Heat</p> <p>Operating Temperature:</p> <ul style="list-style-type: none"> <li>Battery powered: 0 to 45 °C (32 to 113 °F); 0 to +40 °C (32 to 104 °F) for compliance with IEC 61672 Class 1</li> </ul> <p>Charge Temperature: 0 to 45 °C (32 to 113 °F)</p> <p>Storage Temperature: 0 to 40 °C (32 to 104 °F)</p>
<b>Humidity</b>	<p>IEC 60068–2–78: Damp Heat: 93% RH (non-condensing 40 °C (104 °F)). Recovery time 2 ~ 4 hours</p>
<b>Mechanical</b>	<p>Non-operating:</p> <p>IEC 60068–2–6: Vibration: 0.3 mm, 20 m/s<sup>2</sup>, 10 – 500 Hz</p> <p>IEC 60068–2–27: Shock: 1000 m/s<sup>2</sup></p> <p>IEC 60068–2–29: Bump: 1000 bumps at 250 m/s<sup>2</sup></p>
<b>Enclosure</b>	<p>IEC 60529: Protection provided by enclosures: min. IP 44</p>

## Specifications – Noise Logger Type 3659-A

Battery	
Approval	UN 38.3
Chemistry	Li Fe Po
Weight	4.8 kg (10.6 lb)
Nominal Voltage	12.8 V
Rated Capacity	32 Ah typical
Rated Energy	410 Wh
Expected Life Cycles	>2000 cycles at 100% discharge >80% rated capacity
Charge Retention in Storage	1 year at 30 °C (86 °F) to > 90% charge retained
Solar Panel	
Weight	0.29 kg (10.2 oz)
Nominal Voltage	12 V
Rated Capacity	18 W
Open-circuit Voltage	23.7 V
Charger	
Mains Input	100 – 240 V AC, 50 – 60 Hz
DC Outputs	16.0 V, max. 4 A
Physical	
Dimensions (L × W × D)	524 × 428 × 206 mm (20.6 x 16.9 x 8.1")
Weight (with analyzer)	16.3 kg (35.9 lb)
Logging Capacity (8GB memory card): minimum durations when logging all parameters	
Logging only	15 Days*
Logging and continuous 16-bit/8 kHz audio	4 Days†
Logging and continuous 24-bit/48 kHz audio	15 hours†
Operating Life	
Minimum sunlight for continuous operation	> 4 ½ solar hours/day
Worst-case winter (1 solar hours/day)	6 days
Worst-case summer (5 solar hours/day)	Continuous

\* Based on complete logging of all broadband and spectral parameters at 1 s, plus 100 ms  $L_{Aeq}$  and  $L_{AF}$ , plus full statistical distribution, plus spectrum statistics with Enhanced Logging Software

† Based on 16-bit 8 kHz audio quality and complete logging with Enhanced Logging Software. Event audio will reduce this depending on the frequency of events

### MEASUREMENT CAPABILITY

See also the Product Data:

- Hand-held Analyzer Types 2250 and 2270 (BP 2025)
- Noise Monitoring Terminals Types 3639 and 3655 (BP 2379)

## Ordering Information

### Type 3538 Portable Environmental SLM Protection Kit

Including:

- KE-1031: Carrying Case
- QB-0090: Battery, 32 Ah Lithium Iron Phosphate
- UA-4117: Solar Panel Kit
- DE-0019: Microphone Mast (4 pcs)
- DE-0020: Microphone Mast Mount
- DD-0050: Solar Panel Bracket for microphone mast
- ZG-0874: Power supply for Type 3538
- Type 4952: Outdoor Microphone
- AO-0787-D-030: Microphone Cable, 3.0 m (10 ft), long Lemo connector

### Noise Monitoring Systems

#### Type 3659-A Noise Logger

Including:

- Type 3538 (see above) plus
- Type 2250-N-D02 Hand-held Analyzer G4 without microphone and preamplifier with:
  - BZ-7223 Frequency Analysis Software
  - BZ-7225 Enhanced Logging Software
  - BZ-7226 Signal Recording Option
  - BZ-7232 Noise Monitoring Software
- QB-0089: Battery for Type 2250, 4.55 Ah, Lithium-ion
- UL-1017: 8 GB SD Memory Card

#### Type 3659-UPG Noise Logger SLM Accessory Pack

Including:

- Type 4189: ½" Prepolarized Free-field Microphone
- ZC-0032: Microphone Preamplifier for Hand-held Analyzer
- QB-0061: Battery, 5.2 Ah, Lithium-ion
- UA-1710-D00: Standard Accessory Kit

## Accessories and Components Available Separately

### TYPE 3538

AO-0787-D-030	Microphone Cable, 3.0 m (10 ft), long Lemo connector
Type 2250-N-D02	2250 base unit without accessories
Type 4952	Microphone
UA-4117	Solar Panel Kit
DE-0019	Microphone Mast
DE-0020	Microphone Mast Mount
DD-0050	Solar Panel Bracket
ZG-0874	Power Supply, 16 V, 4 A

### FIELD CALIBRATION

Type 4231	Sound Calibrator
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### MEASURING

Type 4952	Outdoor Microphone for 1" thread pole mounting
Type 4952-A	Outdoor Microphone including Tripod Adaptor UA-1707
AO-0645-D-100	Microphone Extension Cable for Type 4952, 7-pin LEMO to 10-pin LEMO, 10 m (33 ft)

AO-0441-D-030	Microphone Extension Cable, 10-pin LEMO, 3 m (10 ft)
AO-0441-D-100	Microphone Extension Cable, 10-pin LEMO, 10 m (33 ft)
UA-0587	Tripod
UA-0588	Microphone Holder
UA-0801	Small Tripod
UA-1317	Microphone Holder
UA-1707	Tripod Adaptor for Type 4952
MM-0256-A	Six-parameter Weather Station Kit
MM-0316-A	Two-parameter Weather Station Kit

### POST-PROCESSING

BZ-5503	Measurement Partner Suite
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### ACCREDITED CALIBRATION

2250/2270-CAI	Accredited Initial Calibration of Types 2250/2270
2250/2270-CAF	Accredited Calibration of Types 2250/2270
2250/2270-CTF	Traceable Calibration of Types 2250/2270
3639-TCF	Type 2250 and 4952 Conformance Test
3639-CTF	Type 2250 and 4952 Traceable Calibration
3639-CTO	Type 2250 and 4952 On site Traceable Calibration

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Local representatives and service organizations worldwide

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