

### Measurement Solutions



#### Introduction

Calibration certificates are technical documents that convey copious amounts of information and detail. This guide is intended to help readers contextualize some of the features and functions of our new calibration certificate.

The primary goal for developing a new calibration certificate was to establish a foundation for our growing certified calibration program. The new document harmonizes several disparate calibration certificates and processes currently used in our production facility. The new certificate greatly improves our efficiency and reduces opportunities for human error. This new document will serve as the foundation for all certified calibration activities at NOSHOK. Calibration certificates are an essential part of some business activities and we wanted ours to stand out as one of the best.

NOSHOK's new calibration certificate manifests an engineered approach to everything about the certificate document. Rather than simply codifying all necessary information in one place, on a single page, the new calibration certificate carefully arranges all of the necessary information in a more useful format. The new certificate is structured as a multi-page document that is optimized for clarity over brevity.

#### Foundation Guidelines

As a start to evaluate NOSHOK's new calibration certificate, it is helpful to know that we consider a certified calibration to be a "data collection event". Furthermore, a single unit under test can have many separate data collection events over its lifespan. In this context, the value of a multi-page document becomes more relevant. Take for example a pressure gauge with a maximum indicating pointer. A complete certified calibration of this device would best include two calibration data sets with the maximum indicating pointer engaged and disengaged. Both of these operating conditions abide by different accuracy statements and therefore should be tested. If the data sets include increasing and decreasing test points (repeatability and hysteresis), multiple pages quickly become valuable. A similar scenario can be highlighted for units under test being recalibrated with as found and as left data sets.

Certified calibration events must be traceable. As such, unique identifiers become a very important aspect of calibration activities. Within the framework of a NOSHOK certified calibration, there are two related identifiers that users encounter. The first is the unique identifier of the unit under test. If the device is built new after the release date of the new calibration certificate format, the unique identifier will be

automatically generated for the device and is a derivative of NOSHOK's sales order number. Devices with pre-existing unique identifiers will continue to use their pre-existing identifiers.

The second unique identifier that users will encounter is the certificate number. This is the unique number that corresponds with a given certified calibration document (and by proxy, a particular collection of data collection events for a unit under test). The format for the certificate number is as follows:

Unit Under Test Unique Identifier-YYYYMMDD-HHMMSS

By using the unit under test unique identifier and a related date string, easy management of calibration certificates over time can be achieved. With this format, searching for certificate documents by device ID and date/time for both end users and NOSHOK becomes easy. The number format is sufficiently unique to identify calibration events as rapidly as they can be produced.

Lastly, NOSHOK uniquely identifies a customer order for a certified calibration with a certificate number. We do not uniquely identify each individual data collection event within a customer order (for the same unit under test). Using the above example of a pressure gauge with a maximum indicating pointer, both data collection events will reside on the same calibration certificate and that document will be assigned a single certificate number.

## Document Overview

All pages of the new calibration certificate include a header and footer. Here the user will find overall document information. Page one header includes NOSHOK's business information and the document title. All subsequent headers include certificate number and the certification date. With this information, users can be assured that all pages of the document belong together as a collection under one certificate number. The footers of all pages include the calibration certificate document number (NOSHOK's internal document number), page numbers and total number of pages to provide the user with confidence the certificate is complete.

Page one of the calibration certificate is broken up into three sections. The top third specifies document information - certificate number and date as well as specific information regarding the unit under test. NOSHOK's quality statements appear in the middle third of the page. NOSHOK certified calibrations are traceable to the National Institute of Standards and Technology (NIST). The bottom third of page one includes the authorizing signature and date.

Page two is divided into two sections. The top section of the document is reserved for the data associated with the standards used in the calibration data collection events. Here, users will find information regarding the standards (pressure instruments, environmental monitors, etc.) used during any of the data collection events. Most significantly, this is where the calibration due dates of the standards used can be found. The second section of page two is reserved for annotations including any notes significant to the calibration activities. For routine calibrations, this section will often times remain blank. Special instructions to customers or performance characteristics observed during data collection or similar may also be included in this section.

Pages three and beyond are reserved for all the data associated with a data collection event. There will be one data collection event per page unless a very large data set requires multiple pages. On these pages, users will find the following four sections of information:

1. A data table showing data points taken during the calibration event with a clear indication of standard uncertainty and allowable tolerance (by unit under test accuracy statement)
2. A graph of the data collection results for clear visualization of the instrument's performance
3. Laboratory conditions during the data collection event
4. Calibration data including the technician name, instrument grade / status, data collection type, and corresponding accuracy statement

## Additional Highlights

It is typical that customers will request their information to be listed within the calibration certificate. NOSHOK takes the position that a certified calibration belongs to the unit under test and not the instigating enterprise. Furthermore, NOSHOK's typical business includes several entities in the purchase of a device and ultimate delivery to an end user. In this case, the purchasing agent may be several organizations removed from the end user. Additionally, some certified calibrations performed by NOSHOK are initiated without an order. In these cases, certificates have no owner and reference the unit under test. In many instances, customer information may not be present on calibration certificates. When customer information is reported, it will appear in the annotations section of the document on page two.

Considering the circumstances referenced above, the calibration date of a certified device, and by association, the next calibration date (calibration due date) can become unclear. Unless otherwise specified, it is the responsibility of the end user to define the next calibration date in accordance with its intended application and any other requirements applied. Also associated with the device is the date of calibration (applied by the calibration service provider). Certified devices that remain in storage or unused for an extended period of time can be problematic for circumstances that require strict (and potentially short) calibration cycles. Consider a device calibrated on January first, installed on August first, with a required one-year calibration cycle from date of calibration. In this case, the user would only realize five months of use from the device before a second calibration was required. To mitigate this problem, NOSHOK has included on our new calibration certificate a place for end users to indicate the date of installation of the certified device. With this additional flexibility, quality managers can alleviate the problem of shortened calibration cycles by using installation dates as the start of the calibration cycle.

All calibration certificates will be kept on file at NOSHOK and can be reprinted or supplied electronically upon request to customer support.

## Calibration lab and document title



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Berea, Ohio 44017  
+1 440.243.0888

Web: [www.noshok.com](http://www.noshok.com)  
Email: [noshok@noshok.com](mailto:noshok@noshok.com)

## Calibration Certificate

ISO 9001:2015 Certified



Certificate Date **2021-02-15**

Certificate Number **633899111-20210215-101412**

Certificate number and date

Instrument Nomenclature Pressure Gauges 400 Series

Instrument Unique Identifier **633899111**

Manufacturer NOSHOK

Unit under test unique identifier

Instrument Model Number 40-400-160-psi-MIP-CC

Instrument Description 4" 304SS Case, 316SS Internals, 160 psi, 1/2 NPT Male Bottom Conn, Maximum Indicating Pointer, Certified Calibration

Instrument Accuracy  $\pm 1.0\%$  Full Scale |  $\pm 2.0\%$  Full Scale

## Calibration installation and due dates

The certification of the instrument identified above is traceable to the International System of Units (SI) through the National Institute of Standards and Technology, or through globally recognized natural physical constants.

The above mentioned certification was completed in accordance with NOSHOK Quality System document NPRD019. Calibration reports without signatures are not valid.

This report applies to only the item identified above and it must not be reproduced, except in full, without the specific written consent of NOSHOK.

Calibration Due Date: \_\_\_\_\_

Date gauge is to be recertified. This date is filled in by user based on installation date and user's QA program.

Installation Date: \_\_\_\_\_

Date calibration cycle begins. Filled in by user when gauge is installed

NOTE: It is recommended that gauges that are stored for longer periods of time are calibrated and/or verified for accuracy prior to installation.

Authorized Signature B. Rowley

Authorizing signature and date

Date 2021-02-15

Signature

# Annotated Calibration Certificate

Page header – certificate number and date

Certificate Number: **633899111-20210215-101412**

Certification Date: **2021-02-15**

## Standards Used

Standard used and calibration due dates

Nomenclature	Model Number	Unique Identifier	Calibration Due Date
meriSense Pressure Standard	ZMS7000X-CI1000	1727900004	<b>2021-09-10</b>
Room Atmosphere Monitor	NOSHOK	RM001	<b>2021-07-29</b>

## Annotations

Customer Information  
NOSHOK - Internal Misc. Customers  
1010 West Bagley Rd.  
Berea OH, 44017  
United States

Data set 1 without MIP engaged

Customer information and notes

Page footer – NOSHOK document number and page number

Document NCC0720 Rev 00

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# Annotated Calibration Certificate

Certificate Number: **633899111-20210215-101412**

Certification Date: **2021-02-15**

## Data Table

Unit Under Test psi	Standard psi	Standard Uncertainty psi	Residual psi	Tolerance psi
0.0	-0.016	0.200	0.0	1.6
40.0	40.494	0.202	-0.5	1.6
80.0	80.271	0.204	-0.3	1.6
120.0	119.797	0.206	0.2	1.6
160.0	160.171	0.208	-0.2	1.6
120.0	119.834	0.206	0.2	1.6
80.0	80.022	0.204	0.0	1.6
40.0	39.954	0.202	0.0	1.6
0.0	-0.461	0.200	0.5	1.6

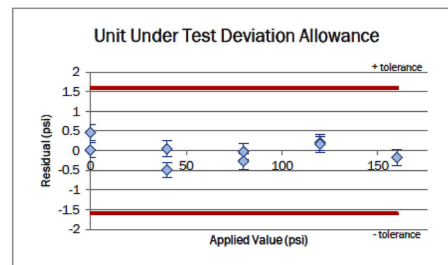
Data table

## Event data

Data Collection Date 2021-02-15  
Data Type As New  
Instrument Status In Tolerance  
Accuracy Statement  $\pm 1.0\%$  Full Scale  
Calibration Technician R. Kress

## Laboratory conditions

Laboratory Conditions  
Temperature 21.8 °C  
Relative Humidity 15.1 %  
Barometric Pressure 99.5 kPa



Data table graph