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Environmental Conditions for Process Measurement and Control Systems: Temperature and Humidity

ANSI/ISA-S71.01 — Environmental Conditions for Process Measurement and Control Systems: Temperature and Humidity

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Preface

This preface is included for informational purposes and is not part of ISA-S71.01.

This standard has been prepared as part of the service of ISA toward a goal of uniformity in the field of instrumentation. To be of real value, this document should not be static, but should be subject to periodic review. Toward this end, the Society welcomes all comments and criticisms, and asks that they be addressed to the Secretary, Standards and Practices Board, ISA, 67 Alexander Drive, P.O. Box 12277, Research Triangle Park, NC 27709, Telephone (919) 549-8411, e-mail: standards@isa.org.

The ISA Standards and Practices Department is aware of the growing need for attention to the metric system of units in general, and the International System of Units (SI) in particular, in the preparation of instrumentation standards. The Department is further aware of the benefits to U.S.A. users of ISA standards of incorporating suitable references to the SI (and the metric system) in their business and professional dealings with other countries. Toward this end, this Department will endeavor to introduce SI-acceptable metric units in all new and revised standards to the greatest extent possible. *The Metric Practice Guide*, which has been published by the Institute of Electrical and Electronics Engineers as ANSI/IEEE Std. 268-1982, and future revisions will be the reference guide for definitions, symbols, abbreviations, and conversion factors.

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The information contained in the preface, footnotes, and appendices is included for information only and is not a part of the standard.

This document is one of several standards covering various environmental conditions affecting process measurement and control systems. In developing this standard, the committee goals included the following:

1) To provide a practical standard that can be applied with a minimum of research and technical effort by the user.

2) To provide a concise method of stating environmental classifications for convenient communication between all users of the standard.

3) To cover real-world ranges of each classified parameter.

In order to be compatible with international standards, the SP71 committee used the same limit values, wherever appropriate, as presented in Publication 654-1, First edition (1979), of the International Electrotechnical Commission: "Operating Conditions for Industrial-Process Measurement and Control Equipment, Part 1: Temperature, Humidity and Barometric Pressure."

For Classes B3 and B4 described in this standard, the committee specified limits of 5 to 90 percent relative humidity instead of 5 to 95 percent relative humidity as specified by the International Electrotechnical Commission. The committee concluded that for this class (Class B), relative humidity values above 90 percent should be covered in Severity Level X.

The persons listed below served as members of ISA Committee SP71, which prepared this standard.

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Contents

1 Purpose

The purpose of this standard is to establish uniform classifications of temperature and humidity conditions for industrial process measurement and control systems. This document is one of a series of standards on environmental conditions for process measurement and control systems.

2 Scope

2.1 This standard covers temperature and humidity environmental conditions for industrial process measurement and control equipment. Specifications for other environmental conditions are beyond the scope of this standard.

2.2 This standard establishes temperature and humidity classes for fixed (non-mobile) installations during normal operation (nonemergency conditions) or during transportation and storage.

2.3 The classes of temperature and humidity conditions stated in this standard are suitable for use in activities related to process instrumentation, including design, manufacturing, sales, installation, test, use, and maintenance. These classes may also be used as a guide when establishing requirements for environmental control of buildings or other protective housings for industrial process measurement and control systems.

2.4 These classifications pertain only to the environment external to the equipment which may affect the equipment externally or internally.

2.5 The effects of environmental conditions on safety, comfort, and performance of operating and maintenance personnel are not considered in this standard.

3 Introduction

3.1 Environmental classifications have been established according to the type of location. Within each classification, severity levels have also been established. Parameter limit values are tabulated for each classification and severity level of the location. These values are shown in Table 1 of this standard. The classification consists of a class location letter followed by a severity identification numeral.

EXAMPLE: Temperature and Humidity Classification A2 would represent Class A Location and Level 2 Severity.

3.2 The manufacturer and/or user should specify the equipment performance in a stated environmental Class and Severity Level. The following example shows how a manufacturer or user might specify several sets of environmental classes for operating or maintaining the same equipment.