

RECOMMENDED PRACTICE

ISA–RP92.03.02–1999 (R2013)

**Installation, Operation, and
Maintenance of Ammonia
Detection Instruments
(25-500 ppm Full Scale)**

Reaffirmed 16 January 2013

ISA-RP92.03.02-1999 (R2013)
Installation, Operation, and Maintenance of Ammonia Detection Instruments
(25-500 ppm Full Scale)

ISBN: 978-1-937560-93-5

Copyright © 2013 by the International Society of Automation. All rights reserved. Printed in the United States of America. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means (electronic, mechanical, photocopying, recording, or otherwise), without the prior written permission of the Publisher.

ISA
67 Alexander Drive
P.O. Box 12277
Research Triangle Park, North Carolina 27709

Preface

This preface, all footnotes, and annexes are included for informational purposes and are not a part of ISA-RP92.03.02-1999 (R2013).

This recommended practice has been prepared as a 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 Standards and Practices Board Secretary; ISA; 67 Alexander Drive; P. O. Box 12277; Research Triangle Park, NC 27709; Telephone (919) 549-8411; Fax (919) 549-8288; Internet: 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 USA 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 endeavour to introduce SI-acceptable metric units in all new and revised standards, recommended practices, and technical reports to the greatest extent possible. IEEE/ASTM SI 10, *American National Standard for Metric Practice*, and future revisions, will be the reference guide for definitions, symbols, abbreviations, and conversion factors.

It is the policy of ISA to encourage and welcome the participation of all concerned individuals and interests in the development of ISA standards, recommended practices, and technical reports.

Participation in the ISA standards-making process by an individual in no way constitutes endorsement by the employer of that individual, of ISA, or of any of the standards that ISA develops.

CAUTION — ISA DOES NOT TAKE ANY POSITION WITH RESPECT TO THE EXISTENCE OR VALIDITY OF ANY PATENT RIGHTS ASSERTED IN CONNECTION WITH THIS DOCUMENT, AND ISA DISCLAIMS LIABILITY FOR THE INFRINGEMENT OF ANY PATENT RESULTING FROM THE USE OF THIS DOCUMENT. USERS ARE ADVISED THAT DETERMINATION OF THE VALIDITY OF ANY PATENT RIGHTS, AND THE RISK OF INFRINGEMENT OF SUCH RIGHTS, IS ENTIRELY THEIR OWN RESPONSIBILITY.

PURSUANT TO ISA'S PATENT POLICY, ONE OR MORE PATENT HOLDERS OR PATENT APPLICANTS MAY HAVE DISCLOSED PATENTS THAT COULD BE INFRINGED BY USE OF THIS DOCUMENT AND EXECUTED A LETTER OF ASSURANCE COMMITTING TO THE GRANTING OF A LICENSE ON A WORLDWIDE, NON-DISCRIMINATORY BASIS, WITH A FAIR AND REASONABLE ROYALTY RATE AND FAIR AND REASONABLE TERMS AND CONDITIONS. FOR MORE INFORMATION ON SUCH DISCLOSURES AND LETTERS OF ASSURANCE, CONTACT ISA OR VISIT WWW.ISA.ORG/STANDARDSPATENTS.

OTHER PATENTS OR PATENT CLAIMS MAY EXIST FOR WHICH A DISCLOSURE OR LETTER OF ASSURANCE HAS NOT BEEN RECEIVED. ISA IS NOT RESPONSIBLE FOR IDENTIFYING PATENTS OR PATENT APPLICATIONS FOR WHICH A LICENSE MAY BE REQUIRED, FOR CONDUCTING INQUIRIES INTO THE LEGAL VALIDITY OR SCOPE OF PATENTS, OR DETERMINING WHETHER ANY LICENSING TERMS OR CONDITIONS PROVIDED IN CONNECTION WITH SUBMISSION OF A LETTER OF ASSURANCE, IF ANY, OR IN ANY LICENSING AGREEMENTS ARE REASONABLE OR NON-DISCRIMINATORY.

ISA REQUESTS THAT ANYONE REVIEWING THIS DOCUMENT WHO IS AWARE OF ANY PATENTS THAT MAY IMPACT IMPLEMENTATION OF THE DOCUMENT NOTIFY THE ISA STANDARDS AND PRACTICES DEPARTMENT OF THE PATENT AND ITS OWNER.

ADDITIONALLY, THE USE OF THIS DOCUMENT MAY INVOLVE HAZARDOUS MATERIALS, OPERATIONS OR EQUIPMENT. THE DOCUMENT CANNOT ANTICIPATE ALL POSSIBLE APPLICATIONS OR ADDRESS ALL POSSIBLE SAFETY ISSUES ASSOCIATED WITH USE IN HAZARDOUS CONDITIONS. THE USER OF THIS DOCUMENT MUST EXERCISE SOUND PROFESSIONAL JUDGMENT CONCERNING ITS USE AND APPLICABILITY UNDER THE USER'S PARTICULAR CIRCUMSTANCES. THE USER MUST ALSO CONSIDER THE APPLICABILITY OF ANY GOVERNMENTAL REGULATORY LIMITATIONS AND ESTABLISHED SAFETY AND HEALTH PRACTICES BEFORE IMPLEMENTING THIS DOCUMENT.

THE USER OF THIS DOCUMENT SHOULD BE AWARE THAT THIS DOCUMENT MAY BE IMPACTED BY ELECTRONIC SECURITY ISSUES. THE COMMITTEE HAS NOT YET ADDRESSED THE POTENTIAL ISSUES IN THIS VERSION.

The following members of ISA92.03 approved ISA-RP92.03.02-1999:

NAME	COMPANY
B. Northam, Chairperson	Munro Electronics
D. Bishop, Managing Director	Chevron Petroleum Technology Company
W. Alexander	Mine Safety Appliances Company
S. Bruce	Delphian Corp.
J. Chilton	U.S. Bureau of Mines
M. Coppler*	AMETEK
T. Donkin	Enmet Corp.
A. Guerrero	Sola Communications, Inc.
B. Holcom	Gas Tech, Inc.
K. Johnson	KWJ Engineering, Inc.
B. Matheson	Sensidyne, Inc.
J. McCann	Advanced Instruments, Inc.
J. Miller	Detector Electronics Corp.
R. Novack*	AMETEK
R. Pellissier	RKI Instruments, Inc.
M. Schaeffer	Control Instruments Corp.
B. Shao	anadian Standards Association
J. Thomason	Omni Industrial Systems, Inc.
R. Walczak	Zellweger Analytics
R. Warburton	Industrial Scientific Corp.
F. Wewers	Manning Systems, Inc.
D. Wolsk	Wolsk Alarms, Ltd.

The following members of ISA92 approved ISA-RP92.03.02-1999:

NAME	COMPANY
J. Thomason, Chairperson	Omni Industrial Systems, Inc.
D. Bishop, Managing Director	Chevron Petroleum Technology Company
W. Alexander	Mine Safety Appliances Company
M. Coppler*	AMETEK
T. Donkin	Enmet Corp.
B. Henderson*	Chevron USA, Inc.
B. Holcom	Gas Tech, Inc.
K. Johnson	KWJ Engineering, Inc.
A. Maynard	Gas Measurement Instr. Ltd.
R. Menot	Factory Mutual Research Corp.
J. Miller	Detector Electronics Corp.

D. Mohla
G. Naujoks*
B. Northam
R. Novack*
R. Pellissier
M. Schaeffer
B. Shao
A. Spataru
M. Stryker
P. Stupay*
R. Warburton

Union Carbide Chemicals & Plastics
Keithley Instruments, Inc.
Munro Electronics
AMETEK
RKI Instrument, Inc.
Control Instruments Corp.
Canadian Standards Association
The Adept Group, Inc.
NCASI
Keithley Instruments, Inc.
Industrial Scientific Corp.

*One vote per company.

This recommended practice was approved for publication by the ISA Standards and Practices Board on October 15, 1997.

NAME

COMPANY

R. Webb
H. Baumann
D. Bishop
P. Brett
W. Calder III
M. Cohen
H. Dammeyer
W. Holland
A. Iverson
K. Lindner
V. Maggioli
T. McAviney
A. McCauley, Jr.
G. McFarland
E. Montgomery
D. Rapley
R. Reimer
J. Rennie
W. Weidman
J. Weiss
J. Whetstone
M. Widmeyer
H. Wiegler
C. Williams
G. Wood
M. Zielinski

Altran Corp.
H. D. Baumann, Inc.
Chevron Production Technology Company
Honeywell Industrial Automation Controls
Factory Mutual Research Corp.
Flexonics, Inc.
The Ohio State University
Southern Company Services, Inc.
Ivy Optiks
Endress + Hauser GmbH + Company
Feltronics Corp.
Instrumentation & Control Engineering Services
Chagrin Valley Controls, Inc.
Honeywell Industrial Automation Controls
Fluor Daniel, Inc.
VECO Rapley, Inc.
Rockwell Automation A-B
Factory Mutual Research Corp.
Parsons Energy and Chemicals Group
Electric Power Research Institute
National Institute of Standards & Technology
Consultant
Canus Corp.
Eastman Kodak Company
Graeme Wood Consulting
Fisher-Rosemount Systems, Inc.

The following members of ISA92 reaffirmed this document.

NAME	COMPANY
J. Miller, Chairman	Detector Electronics Corporation
R. Seitz, Vice Chairman	Artech Engineering
M. Coppler, Managing Director	Det Norske Veritas Certification Inc.
S. Baliga	General Monitors
W. Bennett	Mine Safety Appliances Co.
T. Crawford	Intertek Testing Services
G. Garcha	GE Energy
R. Goins	Lyondell Basell
K. Hedrick	MSHA Approval & Certification Center
S. Henney	FM Approvals
C. Lucarino	Sensient
R. Masi	Detcon Inc.
D. Mills	Underwriters Laboratories Inc.
L. Owen	Dooley Tackaberry Inc.
A. Skinner	GMI Gas Measurement Instruments LLC
J. Stratman	Honeywell Analytics Inc.
J. Thomason	Omni Industrial Systems Inc.
A. Vial	Shell Exploration & Production Co.
D. Wechsler	American Chemistry Council

This recommended practice was approved by the Standards and Practices Board on 16 January 2013.

NAME	COMPANY
E. Cosman, Vice President	The Dow Chemical Company
D. Bartusiak	ExxonMobil Chemical Co.
P. Brett	Honeywell Inc.
J. Campbell	Consultant
M. Coppler	Det Norske Veritas Certification Inc
B. Dumortier	Schneider Electric
D. Dunn	Aramco Services Co.
J. Federlein	Federlein & Assoc. Inc.
J. Gilsinn	NIST/EL
E. Icyan	ACES Inc.
J. Jamison	EnCana Corporation Ltd.
K. P. Lindner	Endress + Hauser Process Solutions AG
V. Maggioli	Feltronics Corp.
V. Mezzano	Fluor Corporation
T. McAviney	Instrumentation and Control Engineering, LLC
C. Monchinski	Automated Control Concepts Inc.,
R. Reimer	Rockwell Automation
S. Russell	Valero Energy Corp.
N. Sands	DuPont
H. Sasajima	Azbil Corp.
T. Schnaare	Rosemount Inc.
J. Tatera	Tatera & Associates Inc.
I. Verhappen	Yokogawa Canada Inc.
W. Weidman	WCW Consulting
J. Weiss	Applied Control Solutions LLC
M. Wilkins	Yokogawa IA Global Marketing (USMK)
D. Zetterberg	Chevron Energy Technology Co.

CONTENTS

1	Scope	8
2	Purpose	8
3	General requirements	8
4	Unpacking	8
5	Storage	8
6	User record-keeping	9
7	Maintenance	9
8	Preparing instruments for use	9
9	Installation of stationary instruments	9
9.1	Installation in hazardous (classified) locations	10
9.2	Detector-head locations	10
9.3	Installation considerations	10
10	Equipment checkout procedures	11
10.1	Portable instruments	11
10.2	Stationary instruments	12
11	General considerations	13
11.1	General	13
11.2	Atypical mixtures	14
11.3	Desensitizing agents	14
11.4	Entering atmospheres potentially containing ammonia	14
11.5	Use of appropriate accessories	14
11.6	Electromagnetic interference (EMI)	15
11.7	Maintenance schedule	15
12	Operational checks	15
13	Maintenance procedures	16
13.1	General	16
13.2	Preliminary checkout	16
13.3	Detector head	17
13.4	Sample-draw system	17
13.5	Readout devices	17
13.6	Alarms	18
13.7	Calibration test	18

14	External power supply systems	19
14.1	General	19
14.2	AC supplies	19
14.3	DC supplies	19
Annex A (Informative)	— Environmental and application checklist for ammonia detectors (typical) ...	21
Annex B (Informative)	— Instrument maintenance record for ammonia detectors (typical)	23
Annex C (Informative)	— References	25

1 Scope

1.1 This Recommended Practice applies to all ammonia gas-detection instruments that satisfy the performance requirements in ISA-S92.03.01.

1.2 Reference Clause 3 of ISA-S92.03.01 for definitions of terms as used herein.

1.3 References useful in the installation, operation, and maintenance of ammonia gas-detection instruments are listed in Annex C. These references are not considered to be part of this document, except for those specific sections of documents referenced elsewhere in this Recommended Practice.

2 Purpose

ISA-RP92.03.02 establishes user criteria for the installation, operation, and maintenance of ammonia gas-detection instruments.

Its companion standard, ISA-S92.03.01, "Performance Requirements for Ammonia Detection Instruments," has been prepared to provide minimum requirements for the performance of ammonia gas-detection instruments.

3 General requirements

To assure that the instrument is suitable for the application and is compatible with its operating environment:

- a) the user should provide the potential supplier with detailed information on the conditions that exist in the area(s) in which the instrument is to be used;
- b) the instrument must meet the requirements of the applicable regulating agency having jurisdiction; and
- c) the instrument must be compatible with the environmental conditions (e.g., relative humidity, temperature, and atmospheric contaminants), in which the instrument is to operate. A typical "Environmental and Application Checklist" is included as Annex A and is intended to aid users in properly specifying requirements for their specific applications.

4 Unpacking

4.1 Unpack the shipping carton(s) and determine whether the order is complete "as received." Check for main assembly, accessories, spare parts, and instruction manual. Understanding the manufacturer's instruction manual is of vital importance to the future operation and maintenance of the ammonia gas-detection instrument.

4.2 In the event of shipment damage, or for purposes of future correspondence, record the following:

- a) user's purchase order number and manufacturer's order number, and their respective dates;
- b) carrier waybill number and date received in case of transit claim; and
- c) instrument serial number and user identification (ID) number, if assigned.

5 Storage

5.1 When storing ammonia gas-detection instruments, leave them in their original containers or provide suitable protective covers.