



BSI Standards Publication

Ships and marine technology — Specifications for gas detectors intended for use on board ships

Part 1: Portable gas detectors for
atmosphere testing of enclosed spaces

National foreword

This Published Document is the UK implementation of ISO/PAS 19891-1:2016.

The UK participation in its preparation was entrusted to Technical Committee SME/32, Ships and marine technology - Steering committee.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2016. Published by BSI Standards Limited 2016

ISBN 978 0 580 89252 3

ICS 13.220.20; 47.020.01

Compliance with a British Standard cannot confer immunity from legal obligations.

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 31 March 2016.

Amendments issued since publication

Date	Text affected
------	---------------

**PUBLICLY
AVAILABLE
SPECIFICATION**

**ISO/PAS
19891-1**

First edition
2016-03-15

**Ships and marine technology —
Specifications for gas detectors
intended for use on board ships —**

**Part 1:
Portable gas detectors for atmosphere
testing of enclosed spaces**

*Navires et technologie maritime — Spécifications pour les détecteurs
de gaz destinés à être utilisés à bord des navires —*

*Partie 1: Détecteurs de gaz portables pour les essais atmosphériques
des espaces clos*



Reference number
ISO/PAS 19891-1:2016(E)

© ISO 2016



COPYRIGHT PROTECTED DOCUMENT

© ISO 2016. Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

	Page
Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Specification of portable gas detectors for atmosphere testing of enclosed spaces	2
4.1 General requirements.....	2
4.1.1 Gases required to be measured.....	2
4.1.2 Method of measurement.....	3
4.1.3 Basic performance.....	3
4.1.4 Portability.....	4
4.2 Sensitivities, indications, and alarms.....	4
4.3 Robustness and electrical safety.....	4
4.4 Marking and manual.....	4
4.4.1 Marking.....	4
4.4.2 Instruction manual.....	5
5 Testing	5
Bibliography	6

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 8, *Ships and marine technology*, Subcommittee SC 1, *Lifesaving and fire protection*.

ISO 19891 consists of the following parts, under the general title *Ships and marine technology — Specifications for gas detectors intended for use on board ships*:

- *Part 1: Portable gas detectors for atmospheric testing of enclosed spaces* [Publicly Available Specification]

Introduction

This part of ISO/PAS 19891 specifies performance, gases to be measured, tolerances for gas measurement, and testing requirements of portable gas detectors used for testing of the atmosphere in enclosed spaces on board ships prior to entry into those spaces, as required by SOLAS regulation XI-1/7 “Atmosphere testing instrument for enclosed spaces”.

This part of ISO/PAS 19891 specifies the characteristics that portable gas detectors should be assessed against for items such as: which gases can be measured, sensitivities, indications, alarm levels, protection against shock, temperature and water ingress, and additional requirements for spaces or areas where a risk of explosion exists.

This part of ISO/PAS 19891 specifies the marine environmental conditions in which portable gas detectors are expected to be used.

This part of ISO/PAS 19891 does not define differences between gases and vapours, nor does it give technical detail on calculations and methodology for explosive limits or operational exposure levels. The intent of this part of ISO/PAS 19891 is to simplify the subject to the essentials and use references for the actual scientific standards if more detailed explanations are required.

This part of ISO/PAS 19891 does not provide a specification on how to use portable gas detectors, or how to enter enclosed spaces.

Currently in preview, click buy full version

Ships and marine technology — Specifications for gas detectors intended for use on board ships —

Part 1: Portable gas detectors for atmosphere testing of enclosed spaces

1 Scope

This part of ISO/PAS 19891 provides specifications in performance, gases to be measured, sensitivities, indications, alarm levels, protection against shock, temperature and water ingress, and testing requirements of portable gas detectors used for atmosphere testing of enclosed spaces on board ships prior to entry into those spaces.

This part of ISO/PAS 19891 specifies suitable portable gas detectors for compliance with SOLAS regulation XI-1/7 “Atmosphere testing instrument for enclosed spaces” and can be used for deciding whether portable gas detectors available on the market are suitable for compliance with these SOLAS requirements.

NOTE 1 SOLAS regulation XI-1/7 requires appropriate portable atmosphere testing instrument or instruments to be carried on board ships by 1 July 2016. The SOLAS regulation states that, as a minimum, the appropriate portable atmosphere testing instrument or instruments be capable of measuring concentrations of oxygen, flammable gases or vapours, hydrogen sulphide and carbon monoxide prior to entry into enclosed spaces.

For the purpose of measurement of concentrations of flammable gases or vapours, this part of ISO/PAS 19891 specifies the flammable gas as either “methane” or “propane and butane”, and requires clear marking of types of flammable gases which can be measured by the portable gas detectors. For an optimal use of ISO/PAS 19891, it should be noted that flammable vapours/gases which are not marked, cannot be measured, or detected by the portable gas detector.

NOTE 2 Iso-butane can be used as calibration gas of portable gas detectors measuring propane and butane.

This part of ISO/PAS 19891 does not give any indication of the toxicity of the flammable gases.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

SOLAS regulation XI-1/7, *Atmosphere testing instrument for enclosed spaces*

IMO resolution A.1050(27), *Revised recommendations for entering enclosed spaces aboard ships*, Annex, section 7, *Testing the atmosphere*

IEC 60079-0:2011, *Explosive atmospheres- Part 0: Equipment — General requirements*

IEC 60079-29-1:2007, *Explosive atmospheres — Part 29-1: Gas detectors — Performance requirements of detectors for flammable gases*

IEC 60079-29-2:2015, *Explosive atmospheres — Part 29-2: Gas detectors — Selection, installation, use and maintenance of detectors for flammable gases and oxygen*