

SVENSK STANDARD

SS-EN 17075:2018

Fastställt/Approved: 2018-12-19
Utgåva/Edition: 1
Språk/Language: engelska/English
ICS: 13.060.45

Vattenundersökningar – Allmänna krav och provningsmetoder för utrustning avsedd för övervakning av vattenkvalité – Mätutrustning

Water quality – General requirements and performance test procedures for water monitoring equipment – Measuring devices

This preview is downloaded from www.sis.se. Buy the entire standard via <https://www.sis.se/std-80008784>

Standarder får världen att fungera

SIS (Swedish Standards Institute) är en fristående ideell förening med medlemmar från både privat och offentlig sektor. Vi är en del av det europeiska och globala nätverk som utarbetar internationella standarder. Standarder är dokumenterad kunskap utvecklad av framstående aktörer inom industri, näringsliv och samhälle och befrämjar handel över gränser, bidrar till att processer och produkter blir säkrare samt effektiviserar din verksamhet.

Delta och påverka

Som medlem i SIS har du möjlighet att påverka framtida standarder inom ditt område på nationell, europeisk och global nivå. Du får samtidigt tillgång till tidig information om utvecklingen inom din bransch.

Ta del av det färdiga arbetet

Vi erbjuder våra kunder allt som rör standarder och deras tillämpning. Hos oss kan du köpa alla publikationer du behöver – allt från enskilda standarder, tekniska rapporter och standardpaket till handböcker och onlinetjänster. Genom vår webbtjänst e-nav får du tillgång till ett lättnavigerat bibliotek där alla standarder som är aktuella för ditt företag finns tillgängliga. Standarder och handböcker är källor till kunskap. Vi säljer dem.

Utveckla din kompetens och lyckas bättre i ditt arbete

Hos SIS kan du gå öppna eller företagsinterna utbildningar kring innehåll och tillämpning av standarder. Genom vår närhet till den internationella utvecklingen och ISO får du rätt kunskap i rätt tid, direkt från källan. Med vår kunskap om standarders möjligheter hjälper vi våra kunder att skapa verklig nytta och lönsamhet i sina verksamheter.

Vill du veta mer om SIS eller hur standarder kan effektivisera din verksamhet är du välkommen in på www.sis.se eller ta kontakt med oss på tel 08-555 523 00.



Standards make the world go round

SIS (Swedish Standards Institute) is an independent non-profit organisation with members from both the private and public sectors. We are part of the European and global network that draws up international standards. Standards consist of documented knowledge developed by prominent actors within the industry, business world and society. They promote cross-border trade, they help to make processes and products safer and they streamline your organisation.

Take part and have influence

As a member of SIS you will have the possibility to participate in standardization activities on national, European and global level. The membership in SIS will give you the opportunity to influence future standards and gain access to early stage information about developments within your field.

Get to know the finished work

We offer our customers everything in connection with standards and their application. You can purchase all the publications you need from us - everything from individual standards, technical reports and standard packages through to manuals and online services. Our web service e-nav gives you access to an easy-to-navigate library where all standards that are relevant to your company are available. Standards and manuals are sources of knowledge. We sell them.

Increase understanding and improve perception

With SIS you can undergo either shared or in-house training in the content and application of standards. Thanks to our proximity to international development and ISO you receive the right knowledge at the right time, direct from the source. With our knowledge about the potential of standards, we assist our customers in creating tangible benefit and profitability in their organisations.

If you want to know more about SIS, or how standards can streamline your organisation, please visit www.sis.se or contact us on phone +46 (0)8-555 523 00



Europastandarden EN 17075:2018 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN 17075:2018.

The European Standard EN 17075:2018 has the status of a Swedish Standard. This document contains the official version of EN 17075:2018.

© Copyright/Upphovsrätten till denna produkt tillhör SIS, Swedish Standards Institute, Stockholm, Sverige. Användningen av denna produkt regleras av slutanvändarlicensen som återfinns i denna produkt, se standardens sista sidor.

© Copyright SIS, Swedish Standards Institute, Stockholm, Sweden. All rights reserved. The use of this product is governed by the end-user licence for this product. You will find the licence in the end of this document.

Upplysningar om sakinnehållet i standarden lämnas av SIS, Swedish Standards Institute, telefon 08-555 520 00. Standarder kan beställas hos SIS som även lämnar allmänna upplysningar om svensk och utländsk standard.

Information about the content of the standard is available from the Swedish Standards Institute (SIS), telephone +46 8 555 520 00. Standards may be ordered from SIS, who can also provide general information about Swedish and foreign standards.

Denna standard är framtagen av kommittén för Kemiska vattenundersökningar, SIS/TK 424.

Har du synpunkter på innehållet i den här standarden, vill du delta i ett kommande revideringsarbete eller vara med och ta fram andra standarder inom området? Gå in på www.sis.se - där hittar du mer information.

EUROPEAN STANDARD

EN 17075

NORME EUROPÉENNE

EUROPÄISCHE NORM

December 2018

ICS 13.060.45

English Version

**Water quality - General requirements and performance
test procedures for water monitoring equipment -
Measuring devices**

Qualité de l'eau - Exigences générales et modes
opératoires d'essai de performance pour les
équipements de surveillance de l'eau - Dispositifs de
mesure

Wasserbeschaffenheit - Allgemeine Anforderungen und
Testverfahren zur Leistungsprüfung von Geräten zum
Wassermonitoring - Messgeräte

This European Standard was approved by CEN on 18 June 2018.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

SS-EN 17075:2018 (E)

Contents	Page
European foreword.....	4
Introduction	5
1 Scope.....	6
2 Normative references.....	6
3 Terms and definitions	6
4 Symbols.....	12
5 Principles	12
6 General requirements	13
6.1 Requirements for MDs	13
6.2 Requirements for MDs associated documents	14
7 Performance characteristics.....	15
7.1 Performance characteristics determined by laboratory testing.....	15
7.2 Performance characteristics determined by field testing.....	16
8 Performance testing.....	17
8.1 Quality requirements for testing.....	17
8.2 General requirements for testing.....	18
8.3 Test conditions.....	19
8.4 Reporting	20
9 Laboratory test procedures.....	20
9.1 Guidance for establishing a test plan.....	20
9.2 Verification by inspection	21
9.3 Performance tests.....	21
9.3.1 Response time	21
9.3.2 Bias, linearity, repeatability and LOQ.....	25
9.3.3 Interference effects	25
9.3.4 Ambient temperature and relative humidity	29
9.3.5 Sample temperature	30
9.3.6 Sample flow-rate	30
9.3.7 Sample pressure.....	31
9.3.8 Output impedance	31
9.3.9 Supply voltage	32
9.3.10 7-day drift	33
9.3.11 Loss of power.....	33
9.3.12 Warm-up drift.....	34
10 Field test procedures	34
10.1 Objective of field test	34
10.2 Planning for the field test.....	35
10.3 Error under field test conditions.....	37
10.4 Response time	37
10.5 Variation in sensitivity.....	38
10.6 Maintenance.....	38
10.7 Up-time	39

Annex A (informative) Example values for performance characteristics for a selection of MDs for monitoring waste water effluents and receiving waters.....	41
Annex B (normative) Evaluation of performance test data.....	47
Annex C (informative) Example calculations.....	53
Annex D (informative) Uncertainty of the reference quantity and error calculations	62
Annex E (informative) Example test report	64
Bibliography	68

SS-EN 17075:2018 (E)

European foreword

This document (EN 17075:2018) has been prepared by Technical Committee CEN/TC 230 “Water analysis”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2019, and conflicting national standards shall be withdrawn at the latest by May 2019.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

This document defines general requirements and test procedures for verifying the performance of measuring devices (MDs) used to monitor the quality of a wide range of waters including drinking waters, waste waters, and natural waters. It covers both portable measuring devices (PMDs) and fixed position measuring devices (FMDs). These devices include: sensors, single and multi-parameter instruments, discrete and batch instruments, probes and sondes. It excludes chemical test kits. For the purposes of this document the acronym MD(s) is used except where it is necessary to be specific about the particular type (e.g. PMDs, FMDs) or component of a MD (e.g. sensor).

This document is associated with EN 16479 [1] which covers automated sampling devices (samplers) for water and waste water.

The general requirements include several features that are necessary to meet users' applications and information that has to be included in associated documents.

The performance tests comprise testing carried out under laboratory and field conditions. They are designed to determine, in a systematic and consistent way, the capability of MDs to make reliable measurements. The testing focuses on key performance characteristics. Statistical procedures are defined for evaluation of the test data.

The range of measurements over which the test procedures will be applied, the test range, is not specified. It is for the MD manufacturer and/or the user to decide on the test range. Similarly, it is for the MD manufacturer and/or the user to decide on the intended uses (applications) which will inform the design of the field trial.

Water monitoring equipment is widely used for compliance monitoring purposes under national and European regulations. This document supports the requirements of the following EU Directives:

- Industrial Emissions Directive (2010/75/EU) [2];
- Water Framework Directive (2000/60/EC) [3];
- Marine Strategy Framework Directive (2008/56/EC) [4];
- Drinking Water Directive (98/83/EC) [5];
- Technical Specifications for Chemical Analysis and Monitoring of Water Status (2009/90/EC) [6].

SS-EN 17075:2018 (E)

1 Scope

This document specifies general requirements and performance test procedures for portable and fixed position measuring devices that are used in an in-line or online operating position to measure physical and chemical measurands in water. It excludes chemical test kits and laboratory analysers.

The general requirements include functional facilities that MDs need to meet users' applications and information that needs to be included in associated documents.

The test procedures specify uniform methods to be used when determining key performance characteristics of MDs. The performance tests comprise testing carried out under laboratory and field conditions. It is recognized that for some devices certain test procedures are not applicable.

Statistical procedures are defined for evaluation of the test data.

Example values for performance characteristics for a selection of MDs for monitoring waste water effluents and receiving waters are detailed in Annex A for guidance.

This document requires the manufacturer of a MD to provide more technical data for verification than does EN ISO 15839:2006 [7]. Consequently, EN ISO 15839 [7] will be of greater assistance to manufacturers wishing to characterize a new device whereas this document is more focussed on user requirements for the verification of manufacturer's claims.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN ISO 5814:2012, *Water quality - Determination of dissolved oxygen - Electrochemical probe method (ISO 5814:2012)*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1 measuring device

MD

device, used in an in-line or on-line operating position, which continuously (or at a given frequency) gives an output signal proportional to the value of one or more measurands in waters which it measures

Note 1 to entry: The device can be portable or fixed in position.

Note 2 to entry: The term "on-line measuring device" is often used for a MD used in an online position.

[SOURCE: EN ISO 15839:2006 [7], 3.26, modified]

3.2

portable measuring device

PMD

measuring device that can be moved from one measuring point to another and used in an in-line or on-line operating position

3.3

fixed measuring device

FMD

measuring device that can be fixed in position and used in an in-line or on-line operating position

3.4

sensor

electronic device that senses a physical condition or chemical compound and delivers an electronic signal proportional to the observed characteristic

[SOURCE: ISO/IEC 19762:2016 [8], 06.02.08]

3.5

in-line measuring device

in situ measuring device

system of automatic measurement in which at least the sensor is sited in the body of water

[SOURCE: ISO 6107-2:2006[9], 54, modified — term “analysis” replaced by term “measuring device” and within definition “analysis” replaced by “measurement”]

3.6

on-line measuring device

system of automatic measurement in which the sample is taken from the body of water through a probe to the measuring device by means of an appropriate conduit

Note 1 to entry: Sometimes referred to as an extractive measuring device.

[SOURCE: ISO 6107-2:2006+A1:2012 [10], 71, modified — term “analysis” replaced by term “measuring device”, within definition “analysing equipment” replaced by “measuring device” and Note 1 to entry added]

3.7

percentage error

error in measurement expressed as a percentage of the reference value

3.8

measurement bias

bias

estimate of a systematic measurement error

[SOURCE: ISO/IEC Guide 99:2007 [11], 2.18]

3.9

measurement repeatability

repeatability

precision under a set of repeatability conditions of measurement

[SOURCE: ISO/IEC Guide 99 [11], 2.21]