

TECHNICAL REPORT

Design and installation of on-line analyser systems – Guide to technical enquiry
and bid evaluation

(standards.iteh.ai)

IEC TR 61832:2015

<https://standards.iteh.ai/catalog/standards/sist/5181f375-a134-4285-bbf9-67098e4edd09/iec-tr-61832-2015>



THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2015 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

IEC Catalogue - webstore.iec.ch/catalogue

The stand-alone application for consulting the entire bibliographical information on IEC International Standards, Technical Specifications, Technical Reports and other documents. Available for PC, Mac OS, Android Tablets and iPad.

IEC publications search - www.iec.ch/searchpub

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,...). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and also once a month by email.

Electropedia - www.electropedia.org

The world's leading online dictionary of electronic and electrical terms containing more than 30 000 terms and definitions in English and French, with equivalent terms in 15 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC Glossary - std.iec.ch/glossary

More than 60 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: csc@iec.ch.

INTERNATIONAL STANDARD PREVIEW
(standards track)
IEC TR 61852-2:2015
<https://standards.iteh.ai/catalog/standards/iec-4/61852-2015-67098e4edd09/iec-tr-61852-2015>

TECHNICAL REPORT

Design and installation of on-line analyser systems – Guide to technical enquiry and bid evaluation

(standards.iteh.ai)

IEC TR 61832:2015

<https://standards.iteh.ai/catalog/standards/sist/5181f375-a134-4285-bbf9-67098e4edd09/iec-tr-61832-2015>

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 25.040.040; 71.040.40

ISBN 978-2-8322-2642-1

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

FOREWORD	4
1 Scope	6
2 Normative references	6
3 Preliminary details	6
3.1 Brief project description	6
3.2 Type of response expected from the vendor	7
3.3 Critical criteria on bid rejection	7
4 Scope of supply	7
4.1 General	7
4.2 Vendor/client interfaces	7
4.3 Procurement responsibilities	7
4.4 Standards and codes of practice	8
4.5 Documentation requirements	8
4.5.1 Quotation stage	8
4.5.2 Project stage	8
4.5.3 Project completion	9
4.6 General specification	9
4.6.1 Environment	9
4.6.2 Hazardous area classification	9
4.6.3 Equipment certification	9
4.6.4 Utility systems	10
4.6.5 Labelling	10
4.7 Analyser house specification	10
4.7.1 Overall layout, size constraints and location	10
4.7.2 Construction	11
4.7.3 Ventilation	11
4.7.4 Air conditioning	11
4.7.5 Power distribution	12
4.7.6 Safety systems	12
4.7.7 Monitoring and alarm systems	12
4.7.8 Signal Interfacing with control systems	13
4.8 Sample system specifications	13
4.8.1 Sample probe design and location	13
4.8.2 Sample conditioning	13
4.8.3 Sample transport	14
4.8.4 Safety (pressure and temperature considerations)	14
4.8.5 Analyser validation	14
4.9 Analyser specification	14
4.9.1 Description, tag numbers and control	14
4.9.2 Systems vendor responsibilities	14
4.9.3 Data sheets	14
4.9.4 Analyser certification	15
4.9.5 Analyser performance requirements	15
4.9.6 Materials of construction	15
4.9.7 Signal interface requirements	15
4.10 Inspection and testing	15

4.10.1	Analysers at analyser vendor's works	15
4.10.2	Analysers and systems at systems vendor's works	16
4.10.3	Commissioning and site acceptance tests.....	17
4.11	Training requirements	17
4.12	Spare parts requirements	17
5	Bid technical evaluation	17
5.1	Object.....	17
5.2	Correct response to the bid	18
5.3	Technical excellence.....	18
5.4	Comparative testing	18
5.4.1	Allowance for technical interpretation	18
5.4.2	Assigning key areas.....	18
5.4.3	Weighting functions	19
5.5	Bid qualification meetings	20
5.6	Reassessment of comparative testing	20
6	Sample analyser specification template	22

iTeh STANDARD PREVIEW (standards.iteh.ai)

IEC TR 61832:2015

<https://standards.iteh.ai/catalog/standards/sist/5181f375-a134-4285-bbf9-67098e4edd09/iec-tr-61832-2015>

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**DESIGN AND INSTALLATION OF ON-LINE ANALYSER SYSTEMS –
GUIDE TO TECHNICAL ENQUIRY AND BID EVALUATION**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

The main task of IEC technical committees is to prepare International Standards. However, a technical committee may propose the publication of a technical report when it has collected data of a different kind from that which is normally published as an International Standard, for example "state of the art".

IEC Technical report IEC 61832 has been prepared by subcommittee 65B: Measurement and control devices, of IEC technical committee 65: Industrial-process measurement, control and automation.

EEMUA Publication 226 "Design and Installation of On-Line Analyser Systems; A Guide to Technical Enquiry and Bid Evaluation"¹ has served as a basis for the elaboration of this technical report.

This second edition cancels and replaces the first edition published in 1999. This edition constitutes a technical revision.

¹ This text is reproduced as an IEC Technical Report with the kind permission of EEMUA (The Engineering and Equipment Users Association – UK).

This edition includes the following significant technical changes with respect to the previous edition:

- a) Foreword: Foreword amended to indicate that this document covers the general principles but specific requirements must be developed for each project;
- b) Clause 1: Clarifications added to requirements for documentation and drawings required with bids;
- c) Clause 2: Further information added on technical information required with bids. Additional clauses added to specify training and spares information required with bids. Technical additions and clarifications made throughout to specific sub-clauses detailing technical information required with bids;
- d) Clause 3: Additional information and items added on key areas that need to be included in technical bid evaluations. Additional weighting factor added for engineering services;
- e) Annex A: Sample Analyser Specification Template replaced by a more comprehensive and detailed example.

This technical report is to be used in conjunction with IEC TR 61831, *On-line analyser systems – Guide to design and installation*.

The text of this standard is based on the following documents:

Enquiry draft	Report on voting
65B/960/DTR	65B/976/RVC

Full information on the voting for the approval of this technical report can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

DESIGN AND INSTALLATION OF ON-LINE ANALYSER SYSTEMS – GUIDE TO TECHNICAL ENQUIRY AND BID EVALUATION

1 Scope

This technical report is intended as a guide to assist in the development of a specification or material requisition for analysers and their associated support systems. It is intended to be used for enquiry purposes and the subsequent assessment of the bids presented by the prospective vendors. The intention is to cover the general principles and items that need to be addressed when purchasing large analyser systems.

This technical report is not intended as a design specification in its own right and design guidance has been deliberately omitted. It is to be read in conjunction with IEC TR 61831, *On-line analyser systems – Guide to design and installation*, which provides further guidance on specific design details which need to be included in the specification or material requisition used for the purchase of analysers and associated systems.

To simplify the specification and bid process it is desirable to have a standard format for both the enquiry documentation and the response from the analyser vendor. This technical report is intended to provide that framework.

Clause 4, 'Scope of supply' lays out the headings and any relevant associated comments for the specification of a complete analyser system. Analyser systems are not all the same and individual requirements for total content will invariably differ. However this technical report is laid out such that individual clauses can be selected or omitted as required. The recommended approach is to include all clause headings and where relevant state as "Not Applicable".

Clause 5, 'Bid technical evaluation' covers procedures for bid assessment and gives suggested points against which bids should be analysed.

2 Normative references

IEC TR 61831:2011, *On-line analyser systems – Guide to design and installation*

3 Preliminary details

3.1 Brief project description

The specification document should contain a brief description of the project associated with the analyser installations including site location, type and number of analyser houses, tag numbers for the proposed houses and analysers, and the major obligations expected of the systems vendor, e.g. design work, manufacture, procurement, testing, transportation to site, commissioning and training.

The analyser and installation may be supplied by the same or separate vendors. The normal preference is for the analyser vendor to also supply the sample conditioning system and housing of the installation as this gives a single point of responsibility. If several analysers are being installed at the same time, the complete installation can be supplied by a specialised analyser systems sub-contractor. See IEC TR 61831, *On-line analyser systems – Guide to design and installation*, for further information on analyser installation design.

3.2 Type of response expected from the vendor

The type of response required of the vendor should be clearly stated, e.g. answer all sections on an individual basis, highlight deviations from the specification with technical reasons for non-compliance and the alternatives proposed.

It should be made clear that any drawings and data presented with the bid should be relevant to that bid. Standard drawings are only acceptable if applicable for the specific application. Typical drawings or examples from other projects are generally unacceptable.

The language in which the bid is to be submitted should be specified.

3.3 Critical criteria on bid rejection

Consistency of response from all vendors is necessary to provide a fair basis for technical comparison of bids.

It should be made clear to the vendor that non-compliance with the requested response format may lead to automatic rejection of the bid.

A high degree of importance should be placed on technical competence in sample system design as this is the area whereby the analyser systems will most likely fail. Typical drawings or examples of past similar applications are generally not sufficient to determine the competence and quality of design being offered for the specific project.

Design for ease of maintenance should also be emphasised as an important aspect in assessing the bids.

4 Scope of supply

[IEC TR 61832:2015](https://standards.iteh.ai/catalog/standards/sist/5181f375-a134-4285-bb9-67098e4edd09/iec-tr-61832-2015)

<https://standards.iteh.ai/catalog/standards/sist/5181f375-a134-4285-bb9-67098e4edd09/iec-tr-61832-2015>

4.1 General

This clause covers typical items and technical requirements that should be included in the enquiry document with examples to emphasise the types of clause that should appear and the associated technical and scope considerations. It does not necessarily include the complete set of clauses or technical requirements that may be required for all projects. These need to be developed on a specific project basis.

The final bid enquiry document should contain an itemised list or table identifying all the major hardware assemblies (with tag numbers and quantities as appropriate) and the engineering services (inspection, testing, site acceptance, documentation, training, etc.) that are included within the vendor's scope. This may also be used as the basis for a commercial breakdown of the costs.

4.2 Vendor/client interfaces

Interface points should be clearly defined in terms of site work tie-ins.

Where testing of the analyser installation is required it should be made clear who is responsible for providing any necessary test equipment and test gases/liquids.

The Vendor should make due allowances within the bid for inspection and quality assurance checks by the client/purchaser.

4.3 Procurement responsibilities

It should be made clear whether the systems vendor is to buy in the analysers or if the client will 'free issue' them to the vendor for installation.

When analysers are procured by the systems vendor the right for the client to inspect the analysers prior to dispatch to the systems vendor's works should be reserved. The systems vendor is to inform the client when inspections are due.

The client should reserve the right to override any vendor selection of type and make of analyser or pre-specify the required type and model(s) if only specific types are acceptable. This is also applicable to other systems components where specific equipment is preferred or required for consistency with other equipment already used on site.

When analysers are supplied 'free issue' to the systems vendor, this should not free the systems vendor from obligations to ensure the analysers meet performance requirements when installed within the overall system.

4.4 Standards and codes of practice

The specification should call up all codes and standards relevant to the work. A comprehensive list is given in IEC TR 61831. Additionally, there may be some project specific standards and client specific Codes of Practice which should be attached to the enquiry specification.

The systems vendor should acknowledge full conformity to all listed documents (or highlight any deviations) and be prepared to have all such documents available in the event of a dispute.

4.5 Documentation requirements

4.5.1 Quotation stage

The systems vendor is expected to respond to the specification in a systematic manner in order to be fairly assessed. The specification should identify all the drawings and documentation necessary to assess the bid.

4.5.2 Project stage

During the project the systems vendor should supply drawings for comment or approval by the client.

A test program document should be produced by the vendor to the satisfaction of the client/purchaser. This should incorporate all tests for all aspects of the hardware and software of the system. The object of the test program is to ensure that all testing required is identified and performed. The vendor should be required to produce record sheets for each test. The test program shall encompass, but not be limited to, the verification of compliance with each and every clause of this document calling for specific functions and installation of the hardware and software. All testing should be carried out to a pre-arranged schedule.

Completion and comment/approval of sample system design, house layout, electrical distribution, safety system logic and house/analyser system housekeeping logic and control should form a project milestone and, if required, be part of a stage payment scheme.

General assembly drawings are not a necessity for approval, as it is difficult to translate accurately to actual build, but the client should request the right to see these drawings (or insist on the production of such drawings) for comment prior to build. These are important in gaining a guide for ensuring accessibility for maintenance and correct positioning of drains and vents.

4.5.3 Project completion

The specification should require that the analysers and systems will not be accepted until completion and approval of all documentation requested in the specification. A useful mechanism is to include this requirement as a formal stage payment item.

On completion all tests, inspections and non-conformances wherever they are carried out should be documented and included in the hand-over dossier. The vendor should provide necessary documentation with the analyser. The index should be submitted to the company for approval prior to the manual being produced.

Final documentation requirements should be identified and included in the scope of supply, e.g. number of final operating manuals and as-built drawings. The final operating manuals should contain all operating instructions for the analysers and associated systems including specific instruction manuals and technical data sheets for all analysers and major systems components. The format of the final documentation (numbers of hard copies and/or software copies) should also be specified.

4.6 General specification

4.6.1 Environment

The environmental conditions in which the analysers and systems will be installed should be defined.

Information should include temperature extremes, humidity extremes, indication of salinity (e.g. coastal location) and indication of background contaminants (e.g. low levels of H₂S).

For house design and effects on ventilation requirements, information on wind speeds and directions should be given. Typically wind information should include expected gusting ratios, minimum average speeds exceeded 90 % of time and maximum average speeds exceeded 5 % of time.

4.6.2 Hazardous area classification

The area classification relating to where the analysers and systems are to be installed should be defined. Attention should be paid to any possible influence the analyser installation will impose on this classification. For example the area classification may be Zone 2, Gas Group IIB, Temperature Class T2. Installation of analysers utilising Hydrogen services would impose local requirements for Gas Group IIC or IIB + H₂. Installation of analysers working on samples or requiring services with auto ignition temperatures below 300 °C will impose local requirements for raising the Temperature Class to T3 or higher.

The specification should clearly indicate possible area classification differences inside and outside analyser houses.

4.6.3 Equipment certification

When installing houses the area classification within the house will be dependent on ventilation design, whether sources of internal release are normal or abnormal and samples/services associated with the analyser.

Certification of equipment may also depend on the intended application. For example the ventilation and safety system specified may justify a non-hazardous environment within a house in normal conditions. However if equipment is required to operate in the event of ventilation failure it should be specified to meet the potential hazard.