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BRITISH STANDARD

BS EN
12262:1999

Rotodynamic pumps — Technical documents — Terms, delivery range, layout

The European Standard EN 12262:1998 has the status of a British Standard

ICS 01.040.23; 23.080

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National foreword

This British Standard is the English language version of EN 12262:1998.

The UK participation in its preparation was entrusted to Technical Committee MCE/6, Pumps and pump testing, which has the responsibility to:

— aid enquirers to understand the text;

— present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;

— monitor related international and European developments and promulgate them in the UK.

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

Cross-references

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Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 11 and a back cover.

This British Standard, having been prepared under the direction of the Engineering Sector Committee, was published under the authority of the Standards Committee and comes into effect on 15 April 1999

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EUROPEAN STANDARD
NORME EUROPÉENNE
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EN 12262

November 1998

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Descriptors: pumps, rotodynamic pumps, technical documents, invitation of tenders, orders: sales document, user supplier relations, contracts, delivery, information, vocabulary

English version

Rotodynamic pumps — Technical documents — Terms, delivery range, layout

Pompes rotodynamiques — Documents techniques — Terminologie, étendue de la fourniture, présentation

Kreiselpumpen — Technische Unterlagen — Begriffe, Lieferumfang, Ausführung

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart 36, B-1050 Brussels

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 197, Pumps, the Secretariat of which is held by AFNOR.

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 1999, and conflicting national standards shall be withdrawn at the latest by May 1999.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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Introduction

This European Standard is to inform the purchaser and the manufacturer about the delivery range, layout and content of the technical documentation involved in enquiry, proposal, purchase order, during contract execution or delivery.

1 Scope

This European Standard establishes the technical documentation for the enquiry, proposal, purchase order for rotodynamic pumps during contract execution or deliveries to the industry.

NOTE The time schedule and cost of these technical documents are not the subject of this standard but should be specified in the respective purchase order (ordering letter/confirmation of order).

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 809, *Pumps and pump units for liquids — Common safety requirements.*

prEN 12723, *Liquid pumps — General terms for pumps and installations — Definitions, quantities, letter symbols and units.*

EN 20216, *Writing paper and certain classes of printed matter — Trimmed sizes — A and B series.*
(ISO 216:1975)

EN 25199, *Technical specifications for centrifugal pumps — Class II.*
(ISO 5199: 1986)

EN ISO 9905, *Technical specifications for centrifugal pumps — Class I.*
(ISO 9905: 1994)

EN ISO 9908, *Technical specifications for centrifugal pumps — Class III.*
(ISO 9908:1993)

ISO 3511-1, *Process measurement control functions and instrumentation — Symbolic representation — Part 1: Basic requirements.*

ISO 3511-2, *Process measurement control functions and instrumentation — Symbolic representation — Part 2: Extension of basic requirements.*

ISO 3511-3, *Process measurement control functions and instrumentation — Symbolic representation — Part 3: Detailed symbols for instrument interconnection diagrams.*

ISO 10628-1, *Flow diagrams for process plants — Part 1: General rules.*

3 Terms, definitions and information contents of the technical documents

For the purposes of this standard, the terms and definitions given in Table 1 apply for pumps and for pump units.

Table 1 — Terms and definitions

No.	Term	Definition	Information content
1	Data sheet	A data sheet is a statement of technical data for pumps, pump units or accessories and their installation location. It is to help the purchaser for enquiry, purchase order and engineering, and the vendor for his proposal and contract execution.	— Information on operating and rated conditions, design features, essential materials, inspections/tests, documentation, local conditions, pump application and type of driver, accessories. — Characteristic designation. NOTE For examples of rotodynamic pump data sheets see EN ISO 9905, EN 25199 or EN ISO 9908.
2	Performance curve	A performance curve is the representation of functional relationships between parameters which characterize a pump.	— Relationship between the total head of the pump, the power demand and the NPSHR, and the flow rate at constant speed under rated conditions (for definition of NPSHR see prEN 12723). — Speed. — Identification such as pump type and size, manufacturer's number, code. NOTE The purchaser should specify if a test-performance curve should be supplied with the documentation.

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Table 1 — Terms and definitions *(continued)*

No.	Term	Definition	Information content
3	Dimension drawing	A dimension drawing shows important dimensions or information for a pump, pump unit or accessory element.	— Simplified outline with main dimensions for installation or required space. — Important dimensions of connections. — Designation.
4	Arrangement drawing	An arrangement drawing is a simplified representation of the pump or pump unit complete with its important accessories but without reference to neighbouring equipment, showing basic design characteristics for a foundation to anchor or support the items and with foundation load data. The arrangement drawing need not be to scale.	— Arrangement of the pump or pump unit, its major accessories and foundation anchoring elements. — Dimensions defining the position and form of the connections at the boundary limits. — Space requirement for installation, operation and maintenance. — Data to define the position and shape of anchor bolt holes, anchoring elements and of recesses and openings in the foundation. — Operating weight of the pump or pump unit and its accessories. — Allowable forces and moments at the pump inlet and outlet flanges. — Load data for the foundation design. — Designation.
5	Assembly drawing	An assembly drawing is a representation of the pump, a component group or an individual component identified by its item number and, if required, parts list. It is a sectional drawing of the assembled item and need not be to scale.	— Shapes and relative arrangement of the items and their item numbers. — Designation. NOTE 1 The shaft seal need not be shown on the pump assembly drawing if the position of the seal relative to the pump is clearly defined by an additional drawing and if all required parts which differ from the pump assembly drawing are shown on this additional shaftseal drawing. NOTE 2 In the case of multi-stage pumps, the drawing need not show the precise number of stages required for a particular application. NOTE 3 The assembly drawing may be used for information in conjunction with the spare parts list.
6	Parts list	A parts list is a list of the individual parts shown on the associated assembly drawing. The parts list may also form an integral part of the assembly drawing.	— Part no. and description of the individual part. — Designation.
7	List of spare parts	A list of spare parts is a summary of information about spare parts for one or more pumps.	— Item no. of the spare part. — Description and designation of the spare part. — Item to which the spare part belongs. — Design characteristics. — Quantity. — No. of the associated assembly drawing.

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Table 1 — Terms and definitions *(continued)*

No.	Term	Definition	Information content
8	Operating instructions	The operating instructions are a written piece of information prepared for the user for a pump or pump unit or for its accessories, providing information on the equipment item and its intended use and maintenance, and containing information for its correct transportation, erection, and connection.	— Essential arrangement and design data (see **A.3**). — Intended use. — Pump function. — Essential requirements regarding transport and storage. — Tools, implements, hoists and moving tackle for erection, assembly and maintenance. — Requirements regarding the proposed location, for example quality of the foundation, and any allowable environmental effects. — Safety instructions (see EN 809). — Type, sequence and conditions of essential working steps and inspections of installation. — Sequence of commissioning and operating steps. — Required maintenance work. — Potential malfunctions, their origins, detection and correction. — Activities to replace major spare parts. — Designation.
9	Operation manual	An operation manual is a compilation of technical documents for the construction, transport, installation, operation and maintenance of pumps or pump units of a project.	— Summary of the information from all technical documents.
10	Start-up torque curve	The start-up torque curve shows the pump torque as a function of pump starting speed.	— Pump torque as a function of speed increasing from zero to operating speed for start-up with and without load. — Moment of inertia of the pump mass. — Designation. — Maximum allowable start-up torque of the motor (for instance in the case of pumps with permanently magnetic drive).
11	List of material tests	A materials tests list is a list of all material tests made on the blanks and components of pumps of a project.	— Test location. — Tested objects (blanks and components). — Type of material tests. — Type of required certificates. — Agency for inspection or test to be witnessed or observed. — Designation.

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Table 1 — Terms and definitions *(continued)*

No.	Term	Definition	Information content
12	List of product tests	This is a list of all inspections and tests of parts, components, pumps and pump units of a project.	— Location. — Tested object identification. — Type of product test. — Type of certificate. — Agency for inspection or test to be witnessed or observed. — Designation.
13	Material test certificate	A material test certificate is a certificate recording the results of material tests, especially those made on materials and components.	— Type of certificate. — Type of test or inspection. — Object to be tested or inspected (blank, component). — Test method. — Test results. — Interpretation of results. — Agency for inspection or test to be witnessed or observed. — Designation.
14	Product test certificate	A product test certificate is a certificate recording the inspections of components, pumps, pump units and accessories and test results.	— Type of certificate. — Type of inspection and test. — Object to be tested or inspected. — Test method. — Test results. — Interpretation of results. — Agency for inspection or test to be witnessed or observed. — Designation.
15	Piping drawing	A piping drawing is a one-line or three-line diagram of the piping to be supplied together with the pump. The representation need not be to scale.	— Dimensions defining the pipe routing, and sizes of piping. — Dimensions and sizes defining the position of piping items, valves, instruments and pipe hangers, and sizes. — Direction of flow. — Drains and vents. — Dimensions defining the position and shape of connections, and sizes. — Thermal insulation and heat tracing. — Reference to connecting points, connecting drawings and list of piping materials, if necessary. — Designation. NOTE The piping drawing may be integrated in the arrangement drawing, provided that the drawing does not become unclear.

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Table 1 — Terms and definitions *(continued)*

No.	Term	Definition	Information content
16	Piping and instrumentation diagram (Also termed P&I diagram)	A P&I diagram is a diagram showing the technical equipment of a pump, pump unit or accessory item by means of graphic symbols which are interconnected by lines. Its drawing layout conforms to ISO 10628-1. NOTE The graphic symbols stand for machines, vessels, piping items or measuring and control instrumentation. The lines represent pipelines or other transport routes, or material, energy and signal flows.	— All equipment including drivers and installed standby units with their functional relationships. — Supply limits and supply limit conditions. — Flow direction of fluids, energy and signals. — Designations of machines, vessels, instruments and piping. — Thermal insulation data. — Measurement and control functions to ISO 3511. — Instrumentation to ISO 3511.
17	Instrument list	An instrument list is a list of all measuring and control instruments shown on the P&I diagram.	— Designation of each instrument. — Precision class of instruments. — Quantity. — Characterizing design and operating data such as pressure, temperature, signal types, fluids. — Other characteristic data such as material, type of enclosure, explosion-proofing.
18	Electrical connection diagram	An electrical connection diagram is a schematic representation of electrical connections at the terminal strips.	— Designation of electrical lines. — Terminal bridges. — Designation of the terminal strips and cables.
19	Cable drawing	A cable drawing shows the routing of the electrical supply cables for the pump unit.	—Cable connection at the pump unit. — Routing of cables relative to the location of the pump unit. — Designation of cables and connections. — Identifying the beginning and end of the cable connections. — Dimensions defining the location and shape of cableways.
20	Utility summary[1)]	A working materials list shows the materials necessary for the function of the pump (e.g. for cooling, heating, lubrication, buffering, injection, quenching, etc.) and their consumption rates for the specified scope of supplies.	— User function designation. — Working material description. — Working material flow rates at the consumption points under all possible operating conditions. — Characteristic operating data such as pressure, temperature.
21	Technical document	A technical document is any document whose information serves some technical purpose.	The information content is dependent on the intended use of the technical document.

[1)] Also designated a working materials list.

NOTE The term "Designation" as given above means that all drawings and data should show project, appropriation, purchase order, and item numbers in addition to the plant location/unit.

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4 Technical documents required

The totality of all technical documents is commonly termed the documentation. As defined in **4.5** of this standard, the documentation evidences that the execution of the work conforms to the requirements of the purchase order and to the relevant codes and standards.

4.1 Enquiry documents

The enquiry technical documents define the subject of work to be made available to the manufacturer and/or supplier together with the enquiry. It shall be recognized that incorrect or incomplete data with the enquiry will result in incorrect or incomplete proposals.

The enquiry documents include in particular:

a) general information and construction requirements:

— general data (see data sheet to EN 25199);

— applicable codes and standards;

— ambient conditions (see data sheet to EN 25199);

b) local conditions;

c) functional description;

d) scope of supplies and boundary limits;

e) information regarding material tests and product tests/inspections;

f) information on shipment, storage, installation, maintenance, operator training;

g) scope of the documentation (type, layout, number of copies, language ...) (see **4.5**).

4.2 Proposal documents

The proposal technical documents serve as a basis for the assessment of offers and selection of rotodynamic pumps.

Unless otherwise agreed between the purchaser and the vendor, the technical documents as shown in Table 2, Document group 1, shall be supplied in duplicate in the language as specified.

Table 2 — Proposal documents, scope of work

No. as per clause 3	Documents to be submitted			
	Description	Document group		
		1[1)]	2[2)3)]	3[2)]
1	Data sheet		x	Scope subject to agreement
2	Characteristic curve	x	x	
3	Dimension drawing	x	x	
4	Arrangement drawing		x	
5	Assembly drawing	x	x	
6	Parts list		x	
7	List of spare parts			
11	List of material tests			
12	List of product tests			
16	P&I diagram			

[1)] The documents of Group 1 may be compiled in the form of a brochure.

[2)] Groups 2 and 3 according to agreement in writing.

[3)] Group 2 conforms to the requirements as per EN 25199.

4.3 Purchase order documents

Essentially, the technical purchase order technical documents consist of the documents described in **4.1**, amended and/or completed by data from the proposal (see **4.2**).

4.4 Contract handling documents

The contract handling documents are to ensure that the contract is performed within the specified time and cost frame. The scope of the contract handling documents with the respective time schedule or, if applicable, the right to pass them on to third parties, shall be agreed in the purchasing contract. Typical examples of contract handling documents are:

a) time schedules;

b) previous examination documents;

c) arrangement drawing;

d) foundation and connection drawings;

e) shipping documents.

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4.5 Documentation

The documentation serves as evidence that the scope of work has been executed in conformity with the requirements of the purchase order and the relevant codes and standards. Unless otherwise agreed between the purchaser and the manufacturer, the technical documents as shown in Table 3, Document group 1, shall be submitted in triplicate in the language as specified.

The manufacturer or vendor undertakes to enter the registration numbers (for instance drawing numbers) of the individual documents in the centrifugal pump data sheet (for example to EN 25199).

Table 3 — Purchase order documents, scope of work

No. as per clause 3	Documents to be submitted			
	Description	Document group		
		1	2[1)2)]	3[1)]
1	Data sheet		x	Scope subject to agreement
2	Characteristic curve		x	
3	Dimension drawing		x	
4	Arrangement drawing		x	
5	Assembly drawing			
6	Parts list			
7	List of spare parts		x	
8	Operating instructions	x	x	
9	Operation manual			
10	Start-up torque curve			
11	List of material tests			
12	List of product tests			
13	Material test certificate			
14	Product test certificate			
15	Piping drawing			
16	P&I diagram			
17	Instrument list			
18	Electrical connection diagram			
19	Cable drawing			
20	Utility list			

[1)] Groups 2 and 3 according to agreement in writing.

[2)] Group 2 conforms to the requirements as per EN 25199.

5 Drawing layout

Technical drawings shall be in sizes A1 to A4 according to EN 20216 and suitable for reproduction (including electronic reproduction). All other documents (including free-hand drawings) shall also be suitable for reproduction. Suitability for electronic reproduction shall be separately agreed upon.

6 Status

The assignment of status is an activity to be undertaken by someone who is not directly involved in the preparation of the documents to add new information or render the documents suitable for further use.

NOTE This does not include modifications since they are the result of errors or changes in the original information.

Status: **"For review and approval"**

All documents bearing this mark have to be reviewed and approved by a third party. The document auditor, the audit, the scope of work and the activity for which approval is granted shall be agreed between the recipient and the issuer of the document.

Status: **"Approved for fabrication"**

Documents marked in this way have been approved for fabrication by a duly authorized official. This approval does not imply any auditing for correctness of the drawings and data.

Status: **"Revised after shop test"**

Documents marked in this way have been changed by the manufacturer after inspection when the pump design has been modified in order to satisfy specified requirements (such as the total head).

Status: **"Revised after startup"**

Documents bearing this mark have been changed by the user or at his request after the item had been handed over. The reason for doing so may only lie in a subsequent modification of the subject or a specified application, but not in any faulty or incomplete information.

Status: **"No changes permitted"**

Documents marked in this way shall not be changed unless specific, previously agreed prerequisites and conditions are satisfied. This mark shall be applied to the original document.

Applying marks to the technical documents

The above marks shall be stamped or handwritten on the document in a clear legible way.

References

All references to other documents shall clearly identify their status.

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Annex A (informative)

Worksheet defining the scope of supplies and the time schedule for technical documents

A.1 General

The drawing and data requirements sheet (DDRS) below contains a recommendation for the form in which technical documents for rotodynamic pumps are requested in an enquiry or purchase order for delivery together with the tender or after the order has been placed.

The quoted documents conform to those in clause **3**.

A.2 Instructions on how to fill in the worksheet

— Enter the date by which the buyer should have the document in hand in the “date” column.

— Enter the date after which no change of the document is permitted any more in the column “no changes permitted” (see also clause **6**).

— Enter an “x” in the column “revised after shop inspection” for that technical document which needs to be revised after the pump has been inspected/tested at the manufacturer’s workshop.

Example of a required revision: the impeller diameter was changed in the light of the test results in order to reach the specified design head (see also clause **6**).

— The blank lines in the “language” column may be used to specify other languages.

— The purchaser should enter an “x” in lines 3 to 5 and 20 to 22 (marked by ■).

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A.3 Drawing and data requirements sheet

Line	Rotodynamic Pumps **Technical documents** Scope of supplies and Dates Drawing and Data requirements												
1	**PROPOSAL DOCUMENTS**												
2	Language					Scope of supplies							
3	■	German	■	English	■	Group 1	2 prints each						
4	■	French	■	Spanish	■	Group 2	2 prints each						
5	■		■		■	Group 3	to be agreed upon						
6	Scope of supplies for Group 3 (to be agreed upon)												
7	Document			Number of prints		Notes							
	No.	Description											
8	1	Data sheet											
9	2	Characteristic curve											
10	3	Dimension drawing											
11	4	Arrangement drawing											
12	5	Assembly drawing											
13	6	Parts list											
14	7	List of spare parts											
15	11	List of material tests											
16	12	List of product tests											
17	16	P&I diagram											
18	**CONTRACT HANDLING DOCUMENTS AND DOCUMENTATION**												
19	Language					Scope of supplies							
20	■	German	■	English	■	Group 1	3 prints each						
21	■	French	■	Spanish	■	Group 2	3 prints each						
22	■		■		■	Group 3	to be agreed upon						
23	Scope of supplies for Group 3 (to be agreed upon)												
24	Document		For review and approval					After approval				No change perm. after date	Revised after shop inspec. "x"
			Number of			Date		Number of			Date		
	No.	Description	Prints	Transparencies	Microfilms			Prints	Transparencies	Microfilm			
25	1	Data sheet											
26	2	Characteristic curve											
27	3	Dimension drawing											
28	4	Arrangement drawing											
29	5	Assembly drawing											
30	6	Parts list											
31	7	List of spare parts											
32	8	Operating instructions											
33	9	Operation manual											
34	10	Start-up torque curve											
35	11	List of material tests											
36	12	List of product tests											
37	13	Material test certificate											
38	14	Product test certificate											
39	15	Piping drawing											
40	16	P&I diagram											
41	17	Instrument list											
42	18	Electrical connection diagram											
43	19	Cable drawing											
44	20	Utility list											
Remarks:													

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BSI
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W4 4AL