INTERNATIONAL STANDARD

ISO/IEC 11160-1

First edition
1996-08-01

Information technology — Office equipment — Minimum information to be included in specification sheets — Printers —

Part 1:
Class 1 and Class 2 printers

Technologies de l'information — Équipements de bureau — Information minimale devant figurer dans les notices techniques — Imprimantes —

Partie 1: Imprimantes classe 1 et classe 2



Reference number
ISO/IEC 11160-1:1996(E)

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrical Commission) form the specialised system for worldwide standardisation. National Bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organisation to deal with particular fields of mutual interest. Other international organisations, governmental and non-governmental, in liaison with ISO and IEC, also take part to the work.

In the field of information technology, ISO and IEC have established a joint technical committee ISO/IEC JTC1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75% of the national bodies casting a vote.

International Standard ISO/IEC 11160-1, was prepared by Joint Technical Committee ISO/IEC JTC1, *Information technology*, Subcommittee SC28, *Office equipment.*

ISO/IEC 1160 consists of the following parts, under the general title *Information technology - Office equipment - Minimum information to be included in specification sheets - Printers:*

- *Part 1: Class 1 and Class 2 printers*
- *Part 2: Class 3 and Class 4 printers*

Annex A forms an integral part of this part of ISO/IEC 11160. Annexes B and C are for information only.

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Introduction

Printers of many different types and capacities are now available and their specifications vary so widely that it is difficult for potential users to assess which machine might best meet their requirements.

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Information technology - Office equipment - Minimum information to be included in specification sheets - Printers -

Part 1: Class 1 and Class 2 printers

1 Scope

This part of ISO/IEC 11160 specifies the minimum information that is to be included in the specification sheets of printers so that users may compare the characteristics of different machines and select a printer which meets their requirements.

It applies to printers that could be operated in an office environment. Printers requiring specially equipped rooms or specially instructed operators are not within the scope of this part of ISO/IEC 11160.

ISO/IEC 11160 will cover different classes of printers. This part covers Class 1 and Class 2 printers, as defined in annex A.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC 11160. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO/IEC 11160 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 216:1975 [1], *Writing paper and certain classes of printed matter - Trimmed sizes - A and B series.*

ISO 269:1985, *Correspondence envelopes - Designation and sizes.*

ISO 7779:1988 [1], *Acoustics - Measurement of airborne noise emitted by computer and business equipment.*

ISO 9295:1988, *Acoustics - Measurement of high-frequency noise emitted by computer and business equipment.*

ISO 9296:1988, *Acoustics - Declared noise emission values of computer and business equipment.*

ISO/IEC 10561:1991 [1], *Information technology - Printing devices - Method for measuring printer throughput.*

IEC 950:1991, *Safety of information technology equipment, including electrical business equipment.*

3 Conformance

In order to comply with this part of ISO/IEC 11160, specification sheets shall contain, in the order shown, all items listed in clause 5 which are relevant to the machine being described.

4 Test and measurement conditions

Unless otherwise specified, all tests and measurements shall be conducted at the following conditions:

- Temperature: 18 °C to 25 °C
- Relative humidity: 30 % to 70 %
- Line voltage: rated input voltage
- Line frequency: rated frequency
- Paper size: A4
- Paper weight: 60 g/m^2 to 90 g/m^2
- Paper transport direction: standard direction

[1] Currently under revision

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– Test pattern: as specified

Instead of A4 paper size, the size most commonly used in the country may be used, both for the test page and the copies. This shall be indicated in the specification sheet.

When weight of paper (g/m^2) is given, it is assumed that the paper has been conditioned in the standard atmosphere defined in ISO 3066 (temperature 20 °C ± 2 °C; relative humidity 60 % to 70 %).

5 Information to be included in the specification sheets

Table 1 defines, for each parameter, the number and name of the parameter and a short description of the entry. These constitute the information to be included in the specification sheet.

The heading of the specification sheet shall indicate that it has been prepared in accordance with this part of ISO/IEC 11160. The numbers and headings of table 1 shall be used. Parameters which are not applicable may be ignored; the number of the other parameters shall remain unchanged.

The "Remarks and examples" column is provided to help prepare the information sheet, and is not intended to appear in the specification sheet. It is intended to be informative. Test methods to be applied, when not defined in other International Standards, are defined in this column.

Whenever a capacity is given in sheets, the reference paper weight shall be specified.

Table 1 - Information to be included

Parameter	Description of the entry	Remarks and examples
1 General data		
1.1 Printer class	Class 1 or Class 2 printer.	See annex A for description of classes.
1.2 Machine name, model and/or model number	Product name, model number.	
1.3 Type		State if the machine is desk-top, portable or floor-standing.
1.4 Printing method	The printing process used.	Non-impact: ink-jet, thermal transfer. Impact: daisy wheel, dot matrix.
1.5 Dot density	Horizontal and vertical dots per 25,4 mm. The design capability of the machine to place the dots.	Note that the theoretical writing resolution and the actual printing resolution may be different. If the dot positioning capability is adjustable, indicate the minimum and maximum capabilities.
1.6 Colour printing		
1.6.1 Monochrome	Specify which colour.	

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Table 1 (cont'd)

Parameter	Description of the entry	Remarks and examples
1.6.2 Multi-colour	Available/not available.	Also known as functional colour, spot colour, highlight or accent colour. State the number of discrete colours that can be printed by colorants residing in the machine.
1.6.3 Full colour	Available/not available.	The full colour is often described as YELLOW, MAGENTA, CYAN or YELLOW, MAGENTA, CYAN, BLACK. State if the machine can print full colour, continuos tone, half-tone or both. Applicable to class 2 printers only
1.6.4 Colour transparencies	Available/not available.	Indicate if the colour can be projected.
2 Performance data		
2.1 Printer throughput	Monochrome pages per hour (PPH) according to ISO 10561, colour pages per hour.	Specify if monochrome, colour or both rates are listed.
2.2 Recommended monthly print volume	Manufacturers recommended range of use: number of pages per month.	For the determination of this parameter, the month is considered consisting of 20 days of 8 hours each.
3 Control		
3.1 Interface for hardware connection	State the hardware connector used.	Centronics, RS232, others.
3.2 Interface for connection control	Identify communication protocols.	XON/XOFF.
3.3 Interface for printer control	Identify printer control languages, including version.	ISO 10180, ISO 6429, ISO 646.

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Table 1 (cont'd)

Parameter	Description of the entry	Remarks and examples
3.3 Memory		
3.3.1 Input buffer	Size in kilobytes.	
3.3.2 Font memory	Size in kilobytes.	Optional memory that can be added to support additional fonts or font processing.
4 Printing features		
4.1 Printing margins	In millimetres, from the top, bottom, left and right edges of the paper.	Area in which printing is not possible.(This area is given on the condition that the print paper is fed through its ideal position). If the printing margins vary with paper sizes, this situation should be described.
4.2 Printed image orientation	Portrait and/or landscape.	The capability of the printer to print in portrait and landscape orientation without changing the paper feed direction.
5 Fonts and character sets	Specify external cartridges or downloadable fonts applicable to this class of printers.	The capabilities of the basic machine and the capabilities that can be added by additional print elements (external cartridges, external print elements, downloaded fonts) shall be clearly identified.
5.1 Basic capability	List character sets and fonts supplied with the printer in basic configuration.	Indicate types of fonts (Times, Helvetica, OCR-A (ISO 1073-1), OCR-B (ISO 1073-2), others); supported orientation of fonts (portrait, landscape); support for bit-mapped and scaleable fonts per ISO 9541.

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Table 1 (cont'd)

Parameter	Description of the entry	Remarks and examples
5.2 Optional capability	List optional character sets and fonts available from suppliers.	Indicate additional types of fonts (Times, Helvetica, OCR-A (ISO 1073-1), OCR-B (ISO 1073-2), others); supported orientation of fonts (portrait, landscape); support for bit-mapped and scaleable fonts per ISO 9541. Obtained via external cartridges, downloaded fonts, etc.
5.3 Coded character set	List the number of the International Standard or the registration number.	ISO 6937, ISO 10646, ISO 8859 1-10, ISO/IEC 10367.
5.4 Character set	List character sets or glyph collections available.	ISO 10036.
5.5 Rendition appearance	Indicate which.	Normal, italic, bold, bold italic.
5.6 Inter-character spacing	Indicate character spacing method and maximum and minimum spacing.	Fixed pitch (10 characters per 25,4 mm), proportional spacing.
5.7 Inter-line spacing	Indicate line spacing method and maximum and minimum spacing.	Fixed spacing (6,8 lines per 25,4 mm), proportional spacing.
6 Output material		
6.1 Paper type		Plain, coated, thermal paper. The manufacturer shall specify for which characteristics of the paper, other than normal paper, normal warranted performance can be assured.
6.2 Special material		The manufacturer shall specify the printing materials that can be processed, possibly with degraded performances, e.g. Transparent sheets, labels, envelopes and recycled paper.

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Table 1 (cont'd)

Parameter	Description of the entry	Remarks and examples
6.3 Multi-part forms	Available/not available.	1 + *n*. Indicate the maximum number of copies (*n*) and carbons (if applicable). Also indicate the maximum weight of all parts (1+*n*). Indicate if the print head force is adjustable.
6.4 Paper size	State the minimum and maximum width and the minimum and maximum length of the paper. This indication can be given either in millimetres or by quoting standard paper sizes.	
6.4.1 Paper in sheets	Available/not available. Standard name and/or sizes of paper in millimetres.	A sizes (ISO 216), B sizes (ISO 216), North American sizes.
6.4.2 Paper in continuous forms (roll or fanfold)	Available/not available. Width, maximum and minimum in millimetres; length in meters; diameter of the roll, in millimetres.	Indicate if length is manually pre-selectable (maximum and minimum); and if the paper is cut automatically.
6.4.3 Envelopes	State minimum and maximum sizes of envelopes that can be printed.	Sizes according to ISO 269.
6.5 Paper weight	Minimum and maximum in g/m^2.	Specify if for sheet or roll.
7 Paper handling		
7.1 Paper supply device	Manual, cassette, tray.	Indicate which are standard and which are optional.
7.2 Paper supply capacity	For roll paper supply: diameter of the roll. For cut sheets paper supply: number of sheets for each paper supply device.	

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Table 1 (cont'd)

Parameter	Description of the entry	Remarks and examples
7.3 Paper feed orientation	Long edge feed or short edge feed.	Indicate the paper size.
8 Output handling		Indicate any special function.
9 Physical characteristics		
9.1 Dimensions	Width x depth x height (all expressed in centimetres or millimetres).	Indicate if it is the envelope around or if trays, knobs or other are not included.
9.2 Space required - operation	Width x depth (both expressed in centimetres or millimetres).	Varies with options. This parameter includes space for operator functions such as paper handling and jam removal. Indicate if it is with or without accessories.
9.3 Space required - maintenance	Width x depth (both expressed in centimetres or millimetres).	Varies with options. This parameter includes space for access to all service areas and the use of required tools. Indicate if it is with or without accessories.
9.4 Weight	Installed weight in kilograms.	Indicate if it is with or without accessories.
10 Operating environment	Minimum and maximum ambient temperature, and range of relative humidity.	This indication is intended to give the user a guide to the expected machine operating environment.
11 Power source	Power rating plate in accordance with IEC 950.	
11.1 Rated voltage or voltage range	Expressed in volts.	Indicate if AC or DC. For AC power: indicate the number of phases. For DC power: indicate if built-in battery. Indicate tolerances.
11.2 Rated frequency or frequency range	Expressed in hertz.	For AC power only. Indicate tolerance.

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Table 1 (cont'd)

Parameter	Description of the entry	Remarks and examples
11.3 Current	Maximum current in amperes.	The maximum current shall be measured and indicated in amperes. This measurement shall be made with all the settings that can have an influence on the current value set to produce the maximum value. The inrush current at the starting of the machine shall not be considered for this indication, but shall be taken into consideration for the specification of the fuses. Indicate if special mains fuses are required. Specify for both basic and maximum configuration.
11.4 Power	Maximum power in kilowatts or watts.	The maximum power shall be measured and indicated in kilowatts. This measurement shall be made with all the settings that can influence on the current value set to the case producing the maximum value. Indicate the value at the rated input voltage.

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Table 1 (cont'd)

Parameter	Description of the entry	Remarks and examples
11.5 Average power consumption	Average power consumption per hour in kilowatts - operating - standby - power saver mode. For operating mode, indicates the average power consumption for continuous printing on A4 paper of a document with 4 % to 7 % image coverage. Useful for estimating air conditioning requirements. Specify for both basic and maximum configuration.	The average power consumption per hour shall be stated in kilowatts. The measurement shall be made with the machine in a steady state, during a test period of not less than 10 minutes. An integrating measuring instrument shall be used. The power consumption shall be measured under the following conditions: – standby status (machine ready to work) – "power saver mode" condition – continuous printing in A4 size paper of a document with a 4% to 7% image coverage.
12 Safety		
12.1 Safety regulations	Applicable standards.	Indicate the national standards applicable in the relevant market area.
12.2 Safety data sheets	Available/not available.	Indicate the hazardous material and the way to dispose of it, if required. This indication depends on market areas.
13 Electromagnetic compatibility (EMC)	State the specifications, standards or regulation that the equipment complies with.	Standards or other requirements to be listed. Emission and susceptibility data to be considered.

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Table 1 (concluded)

Parameter	Description of the entry	Remarks and examples
14 Emissions		
14.1 Acoustical noise	Sound power levels and sound pressure levels.	Measured in accordance with ISO 7779 and ISO 9295. The reference box specified in ISO 7779 includes, unless otherwise specified, cassette, trays and raised parts of the printer. Declared in accordance with ISO 9296. The determination shall be made according to clause 4.1.1 of ISO 9296. Specify the configuration used.
14.2 Heat emission	For estimating purposes it may be considered that the power consumed by a printer is nearly completely transformed in heat.	The heat emission per hour shall be indicated in kW, for the three conditions specified under 11.5. heat emission per hour = $\frac{\text{power consumption[kW]}}{3600}$
15 Consumable supplies	List the consumable items and the packaging.	Customer replaceable items.
16 Optional equipment		Peripheral equipment that changes the functionality of the machine (e.g. extra memory, elements for duplex printing, addressable bins, special handling of output paper).
17 Accessory equipment		Peripheral equipment that does not change the functionality of the machine (e.g. acoustic cover).
18 Others	An entry category for the supplier to highlight features or functionality that does not fit in any of the previous listed parameters.	Diagnostic capability, user interfaces, connectivity.

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Annex A
(normative)

Classification of printers - Class 1 and Class 2

A.1 Specific terminology

A.1.1 printer

The physical device which contains the image transducer, the marking process and paper transport mechanism device. This may also contain other functional unit such as RIP.

A.1.2 page

A collection of text and graphic objects intended to print on one side of a sheet of paper.

A.1.3 RIP

A device which converts coded character data and/or vector data into a raster bit stream.

A.1.4 Unit of printing

A source file can be partitioned into blocks of data that correspond to a mechanical unit. The size of such a partition is the unit of printing.

A.1.5 Mechanical operation unit

Electronic printing is the process of converting signals to mechanical operations that (for example) move the print head, move the paper, and operate the print head. Within the printer, there is a certain mechanical operation unit - that is, a sequence of mechanical operation that, once begun, must be carried out in order from beginning to end without interruption.

In a daisy wheel printer, this mechanical unit may be to move the print head, strike a single character, and restore the print head to a resting position. In an electrophotographic printer, this mechanical unit is the entire sequence of operations that move a sheet of paper through the machine while printing an entire page image on it.

A.2 Elements for classification of printers

A.2.1 Characteristics of the input data to the printer

- Character data or coded character data
- Raster image data
- Vector data

A.2.2 Smallest unit of printing

A.3 Class 1 printer

A.3.1 Definition

- Input data to the printer is only coded glyph (character set) data and command codes.
- The smallest unit of printing is less than one page.

A.3.2 Comments

- No vector data in the source file.
- The printer may have a buffer.

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- These devices are typically characterised by the ability to encode commands in the source file which directly sequence the movement of the print head, the paper, and the characters that are marked on the paper. Buffered characters are marked before the next movement is processed.

A.3.3 Example

Simple use of daisy wheel or dot matrix printer.

A.4 Class 2 printer

A.4.1 Definition

- Input data to the printer is only "coded glyph (character set) and command codes" and/or "raster bit stream".
- The source of this raster bit stream is not specified. It may be host RIP, scanner, hand coding, etc.
- The unit of printing is less than one page.

A.4.2 Comments

- The source file from the user may have vector data if the system has a Host RIP, but the file sent to the printer does not contain any vector data.
- The printer may have a buffer.
- These devices are typically characterised by the ability to encode commands in the source file which directly sequence the movement of the print head, the paper, and the characters that are marked on the paper. Buffered characters are marked before the next movement is processed.

A.4.3 Example

Dot matrix printer (impact or non impact) used to print graphics or to print text as graphics.

A.4 Classification

The classification of printers is given in table A.1

Table A.1 - Classification of printers

No.	Definition item	Class 1	Class 2	Class 3	Class 4
1	Input data (to printing machine)	Stream of coded glyph (character set)	Bit stream or coded glyph and bit stream	Bit stream or coded glyph and bit stream	Coded glyph, bit stream, or vector data
2	Unit of printing	Less than one page	Less than one page	One page	One page
3	Comments		The source file from the user may have vector data if the system has a host RIP, but the file sent to the printer does not contain any vector data. Dumb printers are also included in this class.	The source file from the user may have vector data if the system has a host RIP, but the file sent to the printer does not contain any vector data. Emulation of serial printers may be supported. Input data may be compressed. Dumb printers are also included in this class.	Supports PDL. Emulation of serial printers may be supported. Has a RIP. Does not include the class of plotters.
4	Printer examples	Character printers only Daisy wheel Wire dot Ink-jet printer Thermal	PC and hard copy printer Wire dot Ink-jet Thermal	Laser printer LED printer LCD printer Ink-jet printer	Laser printer LED printer LCD printer Ink-jet printer

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Annex B
(informative)

Classification of printers - Class 3 and Class 4

B.1 Specific terminology

See A.1

B.2 Elements for classification of printers

See A.2

B.3 Class 1 printer

See A.3

B.4 Class 2 printer

See A.4

B.5 Class 3 printer

B.5.1 Definition

- Input data to the printer is only "bit stream" or "coded glyph and bit stream".
- The smallest unit of printing is one page.

B.5.2 Comments

- The source file from the user may have vector data if the system has a RIP, but the file sent to the printer does not contain any vector data.
- Input data may be compressed.

B.5.3 Example

- Laser printer receives bit stream of Kanji characters that are generated in the host computer.

B.6 Class 4 printer

B.6.1 Definition

- Input data to the printer are coded glyph, bit stream or vector.
- The smallest unit of printing is one page.

B.6.2 Comments

- Emulation of serial printers may be supported.
- Page Description Language (PDL) is supported.
- This class excludes plotters.

B.6.3 Example

- Laser printer that accepts PDL input.

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B.6 Classification

The classification of printers is given in table B.1.

Table B.1 - Classification of printers

No.	Definition item	Class 1	Class 2	Class 3	Class 4
1	Input data (to printing machine)	Stream of coded glyph (character set)	Bit stream or coded glyph and bit stream	Bit stream or coded glyph and bit stream	Coded glyph, bit stream, or vector data
2	Unit of printing	Less than one page	Less than one page	One page	One page
3	Comments		The source file from the user may have vector data if the system has a host RIP, but the file sent to the printer does not contain any vector data. Dumb printers are also included in this class.	The source file from the user may have vector data if the system has a host RIP, but the file sent to the printer does not contain any vector data. Emulation of serial printers may be supported. Input data may be compressed. Dumb printers are also included in this class.	Supports PDL. Emulation of serial printers may be supported. Has a RIP. Does not include the class of plotters.
4	Printer examples	Character printers only Daisy wheel Wire dot Ink-jet printer Thermal	PC and hard copy printer Wire dot Ink-jet Thermal	Laser printer LED printer LCD printer Ink-jet printer	Laser printer LED printer LCD printer Ink-jet printer

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Annex C
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