

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Rotating electrical machines –
Part 7: Classification of types of construction, mounting arrangements
and terminal box position (IM Code)**

**Machines électriques tournantes –
Partie 7: Classification des modes de construction, des dispositions
de montage et position de la boîte à bornes (Code IM)**



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ROTATING ELECTRICAL MACHINES –

**Part 7: Classification of types of construction,
mounting arrangements and terminal box position (IM Code)**

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International Standard IEC 60034-7 has been prepared by IEC technical committee 2: Rotating machinery.

This third edition cancels and replaces the second edition, published in 1992, and its Amendment 1:2000. It constitutes a technical revision.

The main technical changes with regard to the previous edition are as follows:

- 5.4 Note on twin motors added.
- 5.5 Reference to 4.3 instead of duplication of text.
- 5.7 New subclause on marking of shaft inclination or declination.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
2/2010/FDIS	2/2018/RVD

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

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

A list of all parts in the IEC 60034 series, published under the general title *Rotating electrical machines*, can be found on the IEC website.

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

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- withdrawn,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

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ROTATING ELECTRICAL MACHINES –

Part 7: Classification of types of construction, mounting arrangements and terminal box position (IM Code)

1 Scope

This part of IEC 60034 specifies the IM Code, a classification of types of construction, mounting arrangements and the terminal box position of rotating electrical machines.

Two systems of classification are provided as follows:

- Code I (see Clause 4): An alpha-numeric designation applicable to machines with end-shield bearing(s) and only one shaft extension.
- Code II (see Clause 5): An all-numeric designation applicable to a wider range of types of machines including types covered by Code I.

The type of machine not covered by Code II is fully described in words.

The relationship between Code I and Code II is given in Annex A.

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2 Normative references

[IEC 60034-7:2020](#)

There are no normative references in this document.

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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

type of construction

arrangement of machine components with regard to fixings, bearing arrangement and shaft extension

[SOURCE: IEC 60050-411:1996, 411-43-34]

3.2

mounting arrangement

orientation on site of the machine as the whole with regard to shaft alignment and position of fixings

[SOURCE: IEC 60050-411:1996, 411-43-35]

3.3 shaft extension

portion of a shaft extending beyond an extreme bearing

Note 1 to entry: The bearing may be on the machine itself or be part of an assembly comprising a machine and (an) additional bearing(s).

[SOURCE: IEC 60050-411:1996, 411-43-07]

3.4 drive-end of a machine D-end

that end of the machine which accommodates the shaft end

Note 1 to entry: This is normally the driving end of a motor or the driven end of a generator.

Where for some machines the above definition is inadequate, the D-end is defined as follows:

- a) Machine with two shaft extensions of different diameter: the end with the larger shaft diameter;
- b) Machine with a cylindrical shaft extension and a conical shaft extension of the same diameter: the end with cylindrical shaft extension;
- c) Machine with other arrangements: according to IEC 60034-8 if applicable; otherwise by agreement.

Note 2 to entry: The outer diameter of a forged-on flange is taken to be the diameter of the shaft extension.

[SOURCE: IEC 60050-411:1996, 411-43-36]

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3.5 non-drive end of the machine (standards.iteh.ai)

N-end

that end of the machine opposite to the drive end

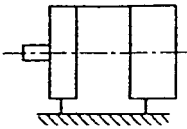
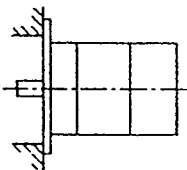
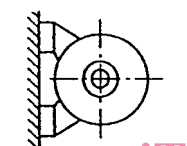
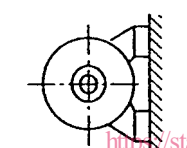
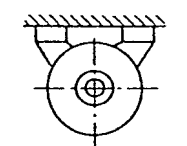
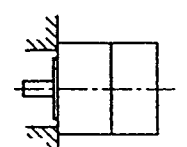
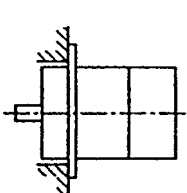
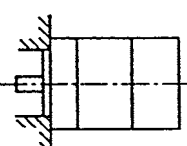
[SOURCE: IEC 60050-411:1996, 411-43-37]

4 Code I (alpha-numeric designation)

4.1 Designation of machines with horizontal shafts

In Code I, a machine with a horizontal shaft is designated by the code letters IM (International Mounting), followed by a space, the letter B, one or two numerals as shown in Table 1 and an optional letter as shown in 4.3.

Table 1 – Designations for machines with horizontal shafts (IM B...)

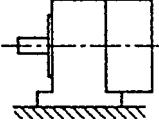
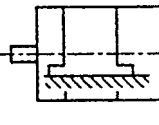
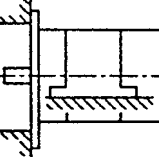
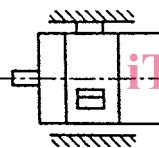
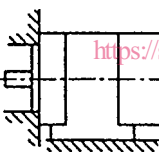
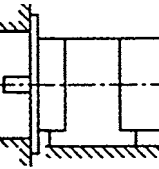
Designation	Sketch	Type of construction				Mounting arrangement (Horizontal shaft)
		Number of endshields bearings	Feet	Flange	Other details	
IM B3		2	With feet	–	–	Mounted by feet, feet down
IM B5		2	–	With flange	Endshield flange at D-end with access to back	Mounted on D-end side of flange
IM B6		2	With feet	–	–	Mounted by feet, feet left (viewed from D-end)
IM B7		2	With feet	–	–	Mounted by feet, feet right (viewed from D-end)
IM B8		2	With feet	–	–	Mounted by feet, feet up
IM B9		1	–	–	No endshield or bearing at D-end	Mounted on end face of frame at D-end
IM B10		2	–	With flange	Special flange at D-end	Mounted on D-end side of flange
IM B14		2	–	With flange	Endshield spigot. No access to back Flange at D-end	Mounted on D-end side of flange

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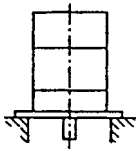
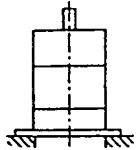
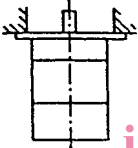
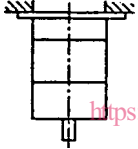
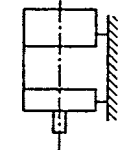
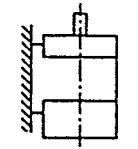
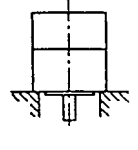
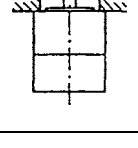
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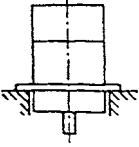
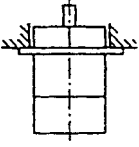
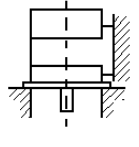
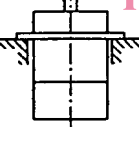
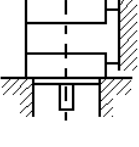
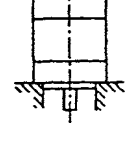
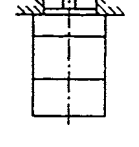
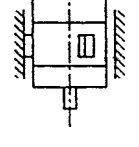
Designation	Sketch	Type of construction				Mounting arrangement (Horizontal shaft)
		Number of endshields bearings	Feet	Flange	Other details	
IM B15		1	With feet	–	No endshield or bearing at D-end. Additional mounting provisions on D-end of frame	Mounted by feet, feet down, with additional mounting on end face of frame
IM B20		2	With raised feet	–	–	Mounted by feet, feet down
IM B25		2	With raised feet	With flange	Endshield flange at D-end with access to back	Mounted by feet, feet down, with additional mounting on flange
IM B30		2	–	–	3 or 4 pads on endshield(s) or frame	Pad mounted
IM B34		2	With feet	With flange	Endshield spigot No access to back Flange at D-end	Mounted by feet, feet down, with additional mounting on D-end side of flange
IM B35		2	With feet	With flange	Endshield flange at D-end with access to back	Mounted by feet, feet down, with additional mounting on D-end side of flange

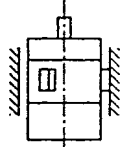
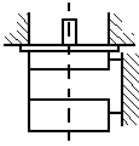
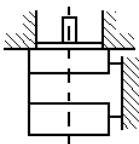
4.2 Designation of machines with vertical shafts

In Code I, a machine with a vertical shaft is designated by the code letters IM (International mounting), followed by a space, the letter V, one or two numerals as shown in Table 2 and an optional letter as shown in 4.3.

Table 2 – Designations for machines with vertical shafts (IM V...)

Designation	Sketch	Type of construction				Mounting arrangement (Vertical shaft)
		Number of endshields bearings	Feet	Flange	Other details	
IM V1		2	–	With flange	Endshield flange at D-end with access to back	Mounted on D-end side of flange, D-end down
IM V2		2	–	With flange	Endshield flange at N-end with access to back	Mounted on N-end side of flange, D-end up
IM V3		2	–	With flange	Endshield flange at D-end with access to back	Mounted on D-end side of flange, D-end up
IM V4		2	–	With flange	Endshield flange at N-end with access to back	Mounted on N-end side of flange, D-end down
IM V5		2	With feet	–	–	Mounted by feet, D-end down
IM V6		2	With feet	–	–	Mounted by feet, D-end up
IM V8		1	–	–	No endshield or bearing at D-end	Mounted on end face of frame at D-end, D-end down
IM V9		1	–	–	No endshield or bearing at D-end	Mounted on end face of frame at D-end, D-end up

Designation	Sketch	Type of construction				Mounting arrangement (Vertical shaft)
		Number of end-shields bearings	Feet	Flange	Other details	
IM V10		2	–	With flange	Special flange at D-end	Mounted on D-end side of flange, D-end down
IM V14		2	–	With flange	Special flange at D-end	Mounted on D-end side of flange, D-end up
IM V15		2	With feet	With flange	Endshield flange at D-end with access to back	Mounted by feet, with additional mounting on D-end side of flange, D-end down
IM V16		2	–	With flange	Special flange at D-end	Mounted on N-end side of flange, D-end up
IM V17		2	With feet	With flange	Endshield spigot no access to back Flange at D-end	Mounted by feet, with additional mounting on D-end side of flange, D-end down
IM V18		2	–	With flange	Endshield spigot no access to back Flange at D-end	Mounted on D-end side of flange, D-end down
IM V19		2	–	With flange	Endshield spigot No access to back Flange at D-end	Mounted on D-end side of flange, D-end up
IM V30		2	–	–	3 or 4 pads on endshield(s) or frame	Pad-mounted D-end down

Designation	Sketch	Type of construction				Mounting arrangement (Vertical shaft)
		Number of endshields bearings	Feet	Flange	Other details	
IM V31		2			3 or 4 pads on endshield(s) or frame	Pad-mounted, D-end up
IM V35		2	With feet	With flange	Endshield flange at D-end with access to back	Mounted by feet, with additional mounting on D-end side of flange, D-end up
IM V37		2	With feet	With flange	Endshield spigot no access to back Flange at D-end	Mounted by feet, with additional mounting on D-end side of flange, D-end up

iTeh STANDARD PREVIEW

4.3 Terminal box location (standards.iteh.ai)

When designated, the terminal box position shall be coded with a final letter in accordance with the following rules:

[IEC 60034-7:2020](https://standards.iteh.ai/catalog/standards/sist/c60f2f4c-8389-4d98-b345-495081c05d68/iec-60034-7-2020)

<https://standards.iteh.ai/catalog/standards/sist/c60f2f4c-8389-4d98-b345-495081c05d68/iec-60034-7-2020>

- a) machines with feet shall be viewed from the D-end with the feet at 6 o'clock;
- b) machines with flange only and with drains shall be viewed from the D-end and with the drains at 6 o'clock;
- c) other configurations shall not have a coding.

The coding shall conform to Table 3.

Table 3 – Code letter for terminal box location

Letter designation	Terminal box location	
R	Right	3 o'clock
B	Bottom	6 o'clock
L	Left	9 o'clock
T	Top	12 o'clock
None	Unspecified	

5 Code II (all-numeric designation)

5.1 Designation

In Code II, a machine is designated by the Code letters IM (International Mounting) followed by a space and four numerals.

The first, second and third numerals designate aspects of construction (see 5.2 and 5.4).

The fourth numeral designates the type of shaft extension (see 5.3).

When used, a letter following the four numerals shall designate the terminal box position, see 5.5.

5.2 Significance of the first numeral

The significance of the first numeral is given in Table 4.

Table 4 – Significance of the first numeral

First numeral	Significance	Table relevant to the second and third numerals
0	Not allocated	–
1	Foot-mounted machines with endshield bearing(s) only	5
2	Foot-and-flange-mounted machines with endshield bearing(s) only	6
3	Flange-mounted machines with endshield bearing(s) only, with a flange part of an endshield	7
4	Flange-mounted machines with endshield bearing(s) only, with a flange not part of an endshield but an integral part of the frame or other component	8
5	Machines without bearings	9
6	Machines with endshield bearing(s) and pedestal bearing(s)	10
7	Machines with pedestal bearing(s) only	11
8	Vertical machines of construction not covered by first numeral 1 to 4	12
9	Machines with special mounting arrangements	13

5.3 Significance of the fourth numeral

The significance of the fourth numeral is given in Table 5.

Table 5 – Significance of the fourth numeral

Fourth numeral	Significance
0	No shaft extension
1	One cylindrical shaft extension
2	Two cylindrical shaft extensions
3	One conical shaft extension
4	Two conical shaft extensions
5	One flanged shaft extension
6	Two flanged shaft extensions
7	Flanged shaft extension (D-end) and cylindrical shaft extension (N-end)
8	(Not allocated)
9	Other arrangement

5.4 Significance of the second and third numerals

The significance of the second and third numerals is specified in Table 6 to Table 14 depending on the first numeral with which they are associated (see Table 4).