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**ISO 8100-30**

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# Lifts for the transport of persons and goods —

## Part 30: Class I, II, III and VI lifts installation

*Ascenseurs pour le transport des personnes et des charges —*

*Partie 30: Installation d'ascenseurs des classes I, II, III et VI*



Reference number
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# Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 178, *Lifts, escalators and moving walks*.

This first edition of ISO 8100-30 cancels and replaces ISO 4190-1:2010, which has been technically revised. It also incorporates the Amendment ISO 4190-1:2010/Amd.1:2011. The main changes compared to the previous document are as follows:

— a reference to machine room-less lifts has been added and additional dimensions have been included to cope with common machine room-less lift configurations;

— Figure 7 has been changed to include sizes and dimensions of general-purpose lifts with counterweight to side;

— some new and revised car sizes have been included to provide for access by persons including persons with disability.

A list of all parts in the ISO 8100 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

NOTE 1 In certain instances, harmonization is not possible and these sizes are shown in Figures 10 to 13.

NOTE 2 National regulations can require greater dimensions in some instances.

This corrected version of ISO 8100-30:2019 incorporates the following corrections:

— Figure 2 has been corrected;

— references to Figures 10 to 13 have been corrected;

— the duplicated Subclause 5.2.5 has been removed.



# Introduction

This document reflects the requirements of the global marketplace and includes:

— the special needs, access and full manoeuvrability of persons including persons with physical disabilities;

— appropriate use of stretchers, beds and ancillary medical equipment in hospitals and nursing homes;

— a range of intensive-use lifts[1)] typically used for high-rise buildings for rated speeds of 2,5 m/s to 6,0 m/s;

— rated speeds mainly based on the Renard series for speeds of up to 2,5 m/s;

— improved utilization of building space by reducing well (hoistway) sizes where practicable.



1) Hereinafter, the term “lift” is used instead of the term “elevator”.

# Lifts for the transport of persons and goods —

# Part 30:
# Class I, II, III and VI lifts installation

## 1 Scope

This document specifies the necessary dimensions to permit the installation of passenger lifts of class I, II, III and VI.

These dimensions reflect the requirements for the apparatus.

This document is applicable to all new lift installations, irrespective of drive systems, including a car with one entrance, to be installed in a new building. However, for arrangements with counterweight at the side, a through-entrance configuration is possible. Where relevant, this document is also applicable to an installation in an existing building.

This document is not applicable to lifts of rated speed greater than 6,0 m/s.

NOTE It is the responsibility of the user to consult the manufacturer for such installations.

## 2 Normative references

There are no normative references in this document.

## 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:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

### 3.1 General

**3.1.1**
**car**
part of the *lift* (3.1.6) which carries the passenger and/or other loads

**3.1.2**
**headroom**
part of the *well* (3.1.8) situated above the highest landing served by the *car* (3.1.1)

**3.1.3**
**landing**
area providing access to the *car* (3.1.1) at each level of use

**3.1.4**
**machine room**
room in which the machine or machines and/or the associated equipment are placed

**3.1.5**
**machine room-less lift**
*lift* (3.1.6) whose machinery spaces, e.g. control cabinet(s) and drive system, lift machine, main switch(es), and means for emergency operations, are inside the *well* (3.1.8) or on the *landing(s)* (3.1.3)

**3.1.6**
**lift**, GB
**elevator**, US
permanent lifting appliance serving defined landing levels, comprising a *car* (3.1.1), the dimensions and means of construction of which, clearly permit the access of persons

**3.1.7**
**pit**
part of the *well* (3.1.8) situated below the lowest *landing* (3.1.3) served by the *car* (3.1.1)

**3.1.8**
**well**, GB
**hoistway**, US
space in which the *car* (3.1.1), the counterweight or the balancing weight travels

Note 1 to entry: This space is usually bounded by the bottom of the *pit* (3.1.7), the walls and the ceiling of the well.

## 3.2 Terms related to lift classes

**3.2.1**
**class I**
*lift* (3.1.6) designed for the transport of persons

**3.2.2**
**class II**
*lift* (3.1.6) designed mainly for the transport of persons, but in which goods can be carried

Note 1 to entry: This differs from a class I, III and VI lift, essentially, by the inner fittings of the *car* (3.1.1) and by the strength of the car floor, etc.

**3.2.3**
**class III**
*lift* (3.1.6) designed for health-care purposes, e.g. hospitals and nursing homes

**3.2.4**
**class VI**
*lift* (3.1.6) especially designed to suit buildings with intensive traffic, i.e. lifts with speeds of 2,5 m/s and above

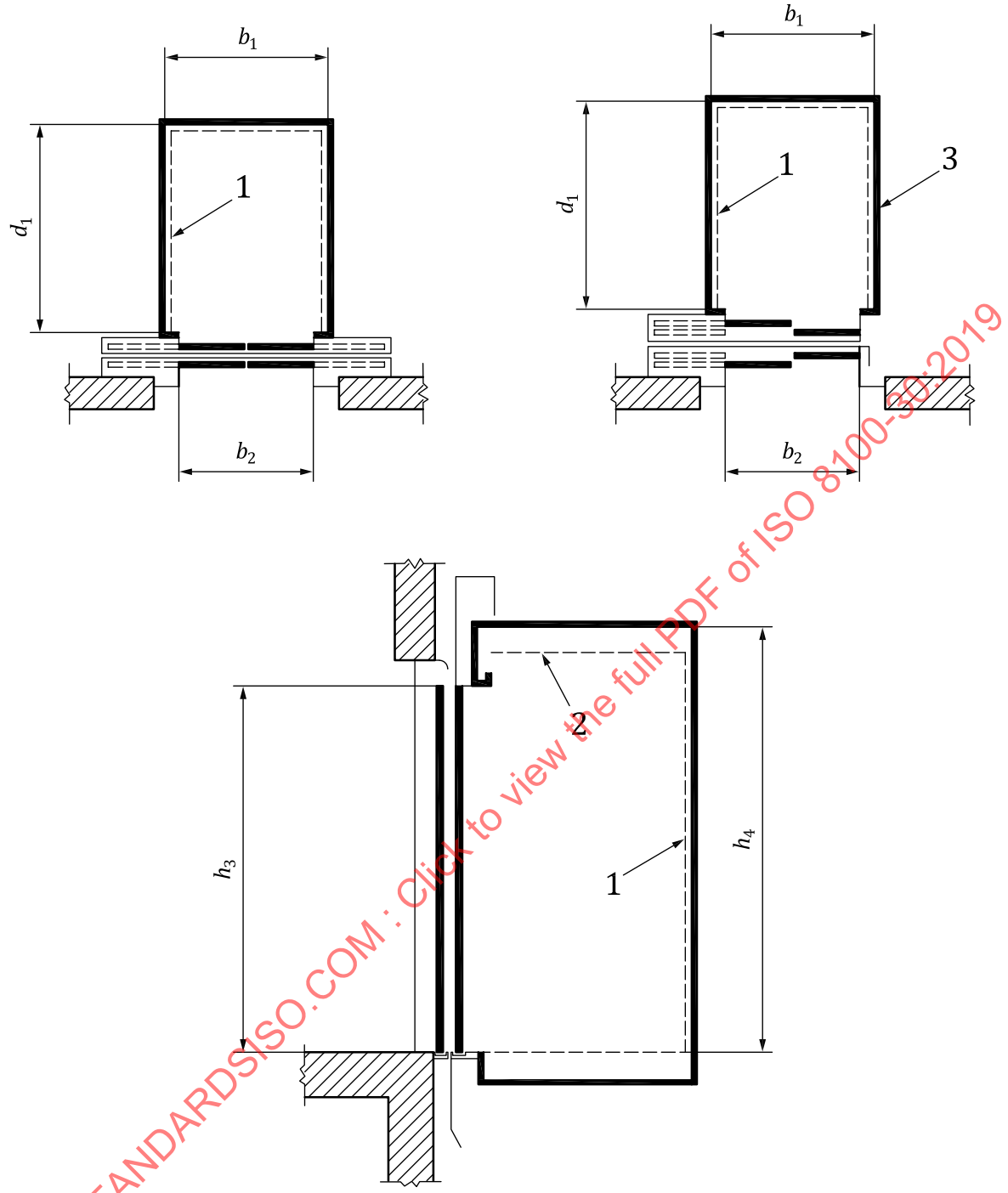
## 3.3 Terms related to dimensions

**3.3.1**
**car width**
$b_1$
horizontal distance between the inner surface of the car walls measured parallel to the front entrance side

Note 1 to entry: This dimension is measured as indicated in Figure 1, 1 m above the floor. In certain regions, e.g. Asia-Pacific and North American regions, the car width, $b_1$, is measured between the finished panels, whereas in Europe, the car width is measured excluding decorative or protective panels.

**3.3.2**
**car depth**
$d_1$
horizontal distance between the internal walls of the *car* (3.1.1), measured perpendicular to the front entrance side

Note 1 to entry: This dimension is measured as indicated in Figure 1, 1 m above the floor. In certain regions, e.g. Asia-Pacific and North American regions, the car depth, $d_1$, is measured between the finished panels, whereas in Europe, the car depth is measured excluding decorative or protective panels.






**Key**

1 decorative panels
2 false ceiling
3 car wall
$b_1$ car width
$b_2$ entrance width
$d_1$ car depth
$h_3$ entrance height
$h_4$ car height

**Figure 1 — Car and entrance dimensions**

**3.3.3**
**car height**
$h_4$
vertical inner distance between the entrance threshold and the constructional roof of the *car* (3.1.1)

Note 1 to entry: Light fittings and false ceilings should be accommodated within this dimension (see Figure 1).

Note 2 to entry: In certain regions, e.g. Asia-Pacific and North American regions, the car height, $h_4$, is measured between the floor and the underside of the false ceiling, whereas in Europe, the car height is measured to the underside of the structural roof.

**3.3.4**
**entrance width**
$b_2$
nominal clear width of the entrance, measured when the landing and car doors are fully open

Note 1 to entry: See Figure 1.

**3.3.5**
**entrance height**
$h_3$
clear height of the entrance, measured when the landing doors and car doors are fully open

Note 1 to entry: See Figure 1.

**3.3.6**
**well width**, GB
**hoistway width**, US
$b_3$
horizontal distance between the inner surface of the well walls, measured parallel to the *car width* (3.3.1)

Note 1 to entry: See Figures 2, 3 and 4.

**3.3.7**
**well depth**, GB
**hoistway depth**, US
$d_2$
horizontal dimension between the inner surface of the well walls, perpendicular to the width

Note 1 to entry: See Figures 2, 3 and 4.

**3.3.8**
**pit depth**
$d_3$
vertical distance between the finished floor of the lowest *landing* (3.1.3) served and the bottom of the *well* (3.1.8)

Note 1 to entry: See Figures 2, 3 and 4.

**3.3.9**
**headroom height**
$h_1$
vertical distance between the finished floor of the highest *landing* (3.1.3) served and the structural ceiling of the *well* (3.1.8)

Note 1 to entry: See Figures 2, 3 and 4.

**3.3.10**
**machine room width**
$b_4$
horizontal dimension between the inner surface of the walls, measured parallel to the *car width* (3.3.1)

Note 1 to entry: See Figures 3 and 4.

**3.3.11**
**machine room depth**
$d_4$
horizontal dimension between the inner surface of the walls, perpendicular to the width

Note 1 to entry: See Figures 3 and 4.

**3.3.12**
**machine room height**
$h_2$
smallest vertical distance between the finished floor and the room ceiling, satisfying both the requirements of the national building regulations and lift equipment

Note 1 to entry: See Figures 3 and 4.

## 3.4 Terms related to other characteristics

**3.4.1**
**rated speed**
$v_n$
speed in metres per second of the *car* (3.1.1) for which the equipment has been built

**3.4.2**
**rated load**
load which is intended to be carried in normal operation

**3.4.3**
**group collective lift**, GB
**group collective elevator**, US
group of electrically interconnected *lifts* (3.1.6) for which landing controls are common

# 4 Lift characteristics

## 4.1 Renard series

The dimensions of the car are related to the loads which have been selected to be close to the Renard R10 series of preferred numbers.

The dimensions of the pit, headroom and machine room have been determined in relation to the speeds which, up to 2,5 m/s, are based on the R5 series of preferred numbers.

NOTE The Renard series is a series of preferred numbers adopted at the international level in 1946 (Budapest International Congress).

The Renard series is a geometrical progression and has a multiplier selected on exponents of 10. For lifts, the multipliers are:

— car load: $R10 = \sqrt[10]{10} = 1{,}258\ 9$

— car speed: $R5 = \sqrt[5]{10} = 1{,}584\ 9$

The results are approximate, which gives:

— Loads (kg): 1 000 – 1 275 – 1 600

1 000 – 800 – 630

— Speeds (m/s): 1,00 – 1,60 – 2,50

1,00 – 0,63 – 0,40

### 4.2 Rated loads

The rated loads shall be, in kilograms:

450 — 630 — 800 — 1 000 — 1 275 — 1 350 — 1 600 — 1 800 — 2 000 — 2 500

NOTE 1 350 kg (3 000 lb) and 1 800 kg (4 000 lb) are not Renard numbers, but are popular sizes in the Asia-Pacific and North American regions.

### 4.3 Rated speeds

The rated speeds shall be, in metres per second:

0,40 — 0,63 — 0,75 — 1,00 — 1,50 — 1,60 — 1,75 — 2,00 — 2,50 — 3,00 — 3,50 — 4,00 — 5,00 — 6,00

NOTE 0,75, 1,50, 1,75, 2,00, 3,00, 3,50 and 5,00 are not Renard numbers, but are popular speeds in the Asia-Pacific and North American regions.

Speeds from 0,63 m/s to 6,00 m/s apply to electric lifts. Speeds from 0,40 m/s to 1,00 m/s apply to hydraulic lifts.

### 4.4 Selection of class of lift

Any type of building can be equipped with lifts of different classes. The lifts are grouped in Figures 5 to 13.

## 5 Dimensions

### 5.1 Inner dimensions of cars

#### 5.1.1 Accessibility

It is recommended that in multi-storey buildings, there should be at least one lift accessible to transport persons in wheelchairs.

This lift shall meet all conditions required for this application, and shall be indicated by graphical symbol ISO 7000-0100: 

NOTE 1 ISO 4190-5 provides requirements for control devices, signals and additional fittings for such lifts.

NOTE 2 In some regions, it is more usual for all lifts in a group to be accessible to persons with impaired mobility.

#### 5.1.2 Class I lifts

Class I lifts are passenger lifts (see Figures 5, 6 and 7 and Tables 2 and 3). Lifts for local markets are shown in Figures 10 to 13.

The following lifts for residential buildings are shown in Table 2:

a) cars for 450 kg rated load lifts allow only the transport of persons or a wheelchair, but without an accompanying person, but are not preferred for new buildings;

b) cars for 630 kg rated load lifts allow, in addition, the transport of a person in a wheelchair with an accompanying person (but do not allow full manoeuvrability, i.e. turning full-circle);

c) cars for 1 000 kg rated load lifts allow, depending on car size, the transport of stretchers with removable handles and of coffins and furniture or the transportation of a person in a wheelchair allowing full manoeuvrability, i.e. turning circle.

General-purpose lifts shall be used mainly in low- and medium-rise buildings, typically up to 15 floors, where lift speeds of up to 2,5 m/s are suitable. The dimensions of these lifts are shown in Table 2.

#### 5.1.3 Class II lifts

Class II lifts are passenger lifts in which goods can be carried (see Figures 5 to 9 and Tables 2 and 3). Lifts for local markets are shown in Figures 10 to 13.

The dimensions of class II lifts shall be selected from those of either class I or class VI lifts. It is particularly recommended that the dimensions of the 1 000 kg lift intended for residential buildings and/or class III lifts be used for this purpose.

#### 5.1.4 Class III lifts

Class III lifts are health-care lifts (see Figure 9 and Table 4). It should be noted that:

a) cars for 2 500 kg rated load lifts are particularly suitable for carrying persons in hospital beds of dimensions 1 000 mm × 2 300 mm, together with ancillary medical equipment and associated attendants;

b) cars for 2 000 kg lifts are suitable for carrying beds of dimensions 1 000 mm × 2 300 mm (excluding ancillary medical equipment) but with associated attendants;

c) cars for 1 600 kg lifts are primarily suitable for moving hospital beds of dimensions 900 mm × 2 000 mm; (excluding ancillary medical equipment) but with associated attendants;

d) cars for 1 275 kg lifts are suitable for beds of dimensions 900 mm × 2 000 mm in nursing homes (excluding ancillary medical equipment) but with one associated attendant.

#### 5.1.5 Class VI lifts

Class VI lifts are lifts for intensive use (see Figure 8 and Table 2).

Lifts for intensive use shall be used mainly in high-rise buildings, typically above 15 floors, where lift speeds of at least 2,5 m/s are needed. The dimensions of these lifts are shown in Table 2.

The precise load, speed and numbers of lifts should be the subject of a detailed traffic calculation.

### 5.2 Inner dimensions of well

#### 5.2.1 Plan dimensions

##### 5.2.1.1 General

For the incorporation of lifts in the building, the well shall have a certain free volume enclosed by a rectangular parallelepiped inscribed in the well, with vertical edges and bases formed by the bottom of the pit and the ceiling of the well.



At the planning stage, the well dimensions should be in accordance with those specified in this document but the dimensions may be modified at a later stage, if necessary, to meet the requirements of a specific product.

The plan dimensions of wells should be provided by the lift contractor and define the minimum clear plumb sizes.

The purchaser's representative should take into account the constructional tolerances appropriate to any particular building technique when specifying the well structural dimensions to meet the lift contractor's dimensional requirements. The purchaser's representative, in conjunction with the builder, should ensure that the minimum clear plumb sizes specified by the lift contractor are included in the building design and are obtained in the finished work.

For the lift well, plan dimensions include clear plumb tolerances (see Table 1). Dimensions $b_3$ and $d_2$ in Figures 2, 3 and 4 represent the minimum plumb requirement.

The architect or any person assuming such functions, in agreement with the builder, shall ensure that these tolerances are adequate for the specified dimensions of the finished work. Otherwise, additional tolerances shall be added to the lift well plan dimensions.

When a counterweight safety gear is required, the depths or the widths defined should be increased by up to 200 mm depending on the location of the counterweight.

#### 5.2.1.2 Dimensional tolerances

##### 5.2.1.2.1 General

The architect or any person assuming such functions, in agreement with the builder, should either ensure that the well dimensions are sufficient for the lift to be installed, or add additional tolerances to the nominal size dimensions for the well.

##### 5.2.1.2.2 Well dimensions

Lifts need to move vertically through a building and the car and landing door equipment have to interconnect. Therefore, the plumbness of the well and the alignment of the landing openings are of paramount importance. The well shall not be built to the usually applied construction industry practices, which allow deviations from the nominal sizes as both increased and decreased dimensions. It is also important to ensure that the well is built to a high degree of verticality, i.e. plumb. Decreased dimensions are, thus, not acceptable to the lift industry and allowances shall be made by the architect, builder or structural engineer to accommodate the high degree of verticality needed. Failure to do so can result in significant reworking and serious delays.

The purchaser's representative, in conjunction with the builder, should ensure that dimensions in excess of the recommended minimum plumb dimensions for wells and openings do not exceed the maximum values shown in Table 1, beyond which changes in design can be necessary.

**Table 1 — Limits of accuracy of well plumb dimensions**

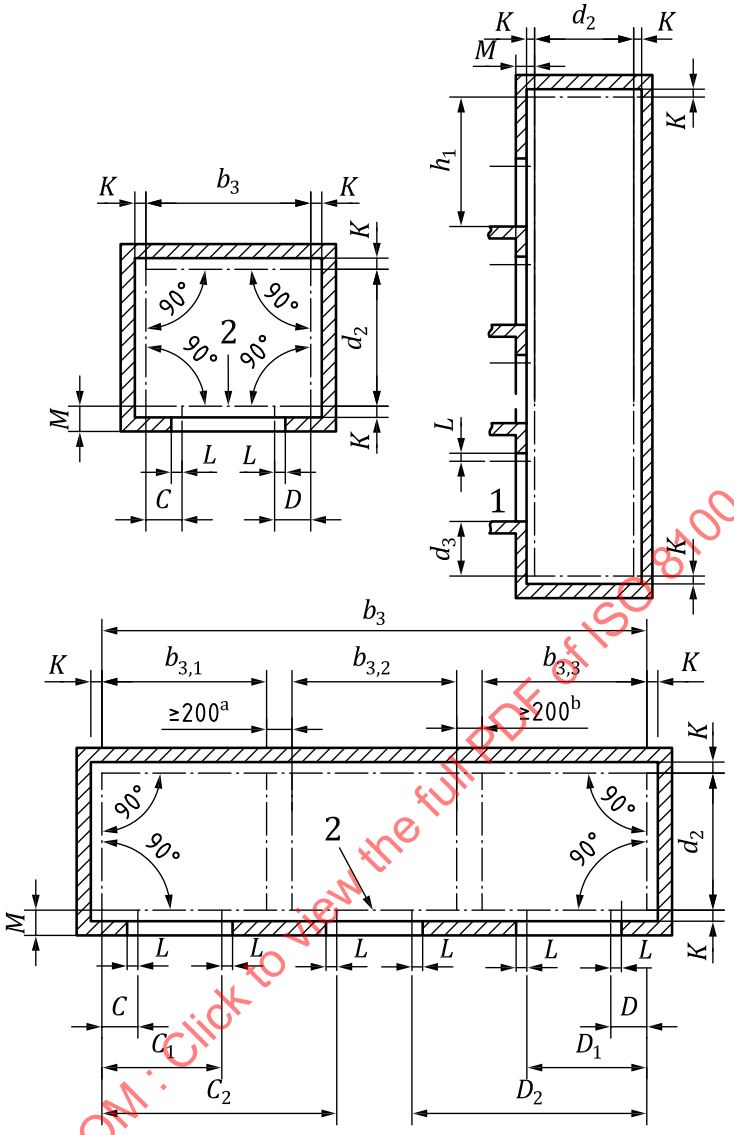
| **Well height** | **Dimensional tolerance, $K$** | |
|---|---|---|
| number of storeys | min. | max. |
| <20 | −0 mm | +50 mm |
| >20 | −0 mm | +50 mm + 1,0 mm per extra storey up to a maximum of 100 mm |

NOTE 1 The dimensional tolerance, $K$, is a positive value only. Unlike other building tolerances, $K$ cannot have a negative value.

If the well is built with a negative value of $K$, this can require reconstruction of the well in the affected areas or extensive modifications to the lift equipment, if this is possible, resulting in delays.

Figure 2 illustrates the structural limits of accuracy pertaining to single and multiple well arrangements. If the net well dimensions $b_3$ (well width) and $d_2$ (well depth) and the nominal structural entrance opening dimensions, $C$ and $D$, are defined by plumb lines, it is essential that the actual wall does not encroach upon the space bounded by those dimensions. Dimension $K$ in Figure 2, which is the limit of accuracy of dimensions $b_3$ and $d_2$, should not exceed the value given in Table 1 for the relevant well height.

NOTE 2 In the case of multiple lifts situated side by side, $K$ is not applicable to the space between the plumb wells. This document and ISO 4190-2 specify a minimum of 200 mm for this space.




**Key**

| | |
|---|---|
| 1 | finished floor level of landing (FFL) |
| 2 | lift contractor's ref. line (most prominent point of wall) |
| $b_3$ | well width |
| $b_{3,1}$, $b_{3,2}$, $b_{3,3}$ | minimum clear well dimensions (individual lifts) |
| $C$ | distance from the lift contractor's reference line to the boundary of landing entrance (left side) |
| $D$ | distance from the lift contractor's ref. line to the boundary of landing entrance (right side) |
| $d_3$ | distance from the lowest landing finished floor level to the lift contractor's ref. line at the bottom of the well (pit depth) |
| $h_1$ | distance from the top landing finished floor level to the lift contractor's ref. line at the top of the well (headroom height) |
| $K$ | limit of accuracy of the well construction |
| $L$ | difference between the rough opening and the finished opening |
| $M$ | distance from the outside wall of the well to the lift contractor's ref. line |
| a | If solid dividing wall, refer to single well installation. |
| b | Minimum shaft trimmer width (mm). |

**Figure 2 — Structural limits of accuracy**

#### 5.2.2 Individual lifts

The dimensions of the well shall have the values shown in Figures 5 to 13.

#### 5.2.3 Multiple lifts situated side by side

In the case of a common well, the internal dimensions shall be determined in the following manner:

a) the total width of the common well shall be equal to the sum of the individual well widths plus the sum of the boundary widths between the wells, each boundary width being at least 200 mm;

b) the depths of the constituent parts of the common well shall be the same as those laid down for the individual lifts.

#### 5.2.4 Distance between landings

The recommended minimum distance between two successive landings to permit the accommodation of landing doors is:

— 2 450 mm for a landing door height of 2 000 mm;

— 2 550 mm for a landing door height of 2 100 mm.

### 5.3 Dimensions of landings

#### 5.3.1 General

The landing depth specified in subsequent clauses shall at least be maintained over the whole width of the well (individual or common).

These dimensions do not take into account the possibility of through traffic of persons not using the lifts, the needs for any fire protected lobbies, safe areas, refuges or space for evacuation or firefighting.

#### 5.3.2 Class I lifts particularly intended for residential buildings

These can be individual lifts or multiple lifts situated side by side.

For this category of lifts, a maximum number of four group collective lifts should be placed side by side. For hydraulic lifts, a maximum of two group collective lifts is generally recommended.

The minimum depth of the landing measured wall to wall and in the same direction as the depth(s) of the car(s) should be equal to the depth of the deepest car. However, the depth of landings served by lifts for persons with disabilities shall be at least 1 500 mm.

The turning space for a wheelchair should be considered.

#### 5.3.3 Class I (other than those particularly intended for residential buildings), II, III and VI lifts

##### 5.3.3.1 Individual lifts or multiple lifts situated side by side

In the case of group collective lifts, the maximum number shall be four.

The minimum depth of the landing measured wall to wall and in the same direction as the depth(s) of the car(s) should be equal to 1,5 $d_1$ (where $d_1$ is the depth of the deepest car). For group collective lifts with four lifts, other than class III, this depth shall not be less than 2 400 mm.

##### 5.3.3.2 Lifts arranged face to face

In the case of group collective lifts, the maximum number shall be eight (2 × 4).

The distance between facing walls shall be at least equal to the sum of the depths of two facing cars. For group collective lifts, other than class III, this distance shall not be more than 4 500 mm.

## 5.4 Dimensions of machine room for electric lifts

### 5.4.1 General

Where required, at the planning stage, the machine room dimensions should be in accordance with those specified in this document, but the dimensions may be modified at a later stage, if necessary, to meet the requirements of a specific product. The dimensions of any machine rooms should be provided by the lift contractor. The purchaser's representative, in conjunction with the builder, should ensure that the machine room sizes specified by the lift contractor are included in the building design and are obtained in the finished work.

### 5.4.2 Individual lifts

Where required, the dimensions of the machine room shall be as indicated in Tables 3 and 4.

### 5.4.3 Multiple lifts

#### 5.4.3.1 Class I lifts particularly intended for residential buildings

##### 5.4.3.1.1 Floor area

a) Multiple lifts having the same rated load: the minimum floor area of the common machine room shall be equal to the sum of the minimum areas required for the individual lifts.

b) Two lifts having different rated loads: the minimum floor area of the common machine room shall be equal to the sum of the minimum areas required for the individual lifts plus the difference between the well areas of the two lifts.

c) A group of more than two lifts having different rated loads: the minimum floor area of the common machine room shall be equal to the sum of the minimum areas required for the individual lifts, plus the sum of the differences between the well area of the largest lift and the well areas of each of the other lifts.

##### 5.4.3.1.2 Width

The actual dimensions shall provide a floor area at least equal to the one specified for the total area.

The minimum width of the common machine room shall be equal to the total of the common well plus a lateral extension corresponding to that appropriate to the lift with the greatest individual requirement.

##### 5.4.3.1.3 Depth

The actual dimensions shall provide a floor area at least equal to the one specified for the total area.

The minimum depth of the common machine room shall be equal to the depth of the deepest individual well plus 2 100 mm.

##### 5.4.3.1.4 Height

The minimum height of the common machine room shall be equal to the height of the machine room having the greatest height.

#### 5.4.3.2 Class I (other than those particularly intended for residential buildings), II, III and VI lifts

##### 5.4.3.2.1 Symbols

The following symbols are used for the determination of the dimensions:

— $b_4$ machine room width for one single lift

— $d_4$ machine room depth for one single lift

— $A$ floor area for one single lift

— $b_{3,x}$ well width for one single lift e.g. $b_{3,1}$, $b_{3,2}$, $b_{3,3}$ in Figure 2

— $d_2$ well depth for one single lift

— $n$ total number of lifts

##### 5.4.3.2.2 Lifts situated side by side

The total area shall be: $A + 0{,}9A(n - 1)$

The actual dimensions shall provide a floor area at least equal to the one specified for the total area.

Minimum width: $b_4 + (n - 1)\ (b_{3,x} + 200)$

Minimum depth: $d_4$

##### 5.4.3.2.3 Lifts arranged face to face

The total area shall be: $A + 0{,}9A(n - 1)$

The actual dimensions shall provide a floor area at least equal to the one specified for the total area.

Minimum width:

$$b_4 + \frac{n(n-1)}{2}\left(b_{3,x} + 200\right)$$

Minimum depth: $2d_2$ + distance between the wells

In the case of an odd number of lifts, $n$ is rounded up to the next even number.

##### 5.4.3.2.4 Height

The minimum height of the common machine room shall be equal to the height of the machine room having the greatest height.

### 5.5 Dimensions of machine room for hydraulic lifts

#### 5.5.1 General

Where required, at the planning stage, the machine room dimensions should be in accordance with those specified in this document, but the dimensions may be modified at a later stage, if necessary, to meet the requirements of a specific product. The dimensions of any machine rooms should be provided by the lift contractor. The purchaser's representative, in conjunction with the builder, should ensure that the machine room sizes specified by the lift contractor are included in the building design and are obtained in the finished work.

### 5.5.2 Individual lifts

Where required, the dimensions of the machine room shall be as indicated in Tables 3 and 4.

### 5.5.3 Duplex group lifts

Where required, a common machine room is recommended.

The floor area shall be as follows:

a) duplex group lifts having the same rated load: the minimum floor area of the common machine room shall be equal to the sum of the minimum area required for machine rooms placed behind the well of individual lifts;

b) duplex group lifts having different rated loads: the minimum floor area of the common machine room shall be equal to the sum of the minimum areas required for machine rooms placed behind the well of individual lifts plus the difference between the well area of the two lifts.

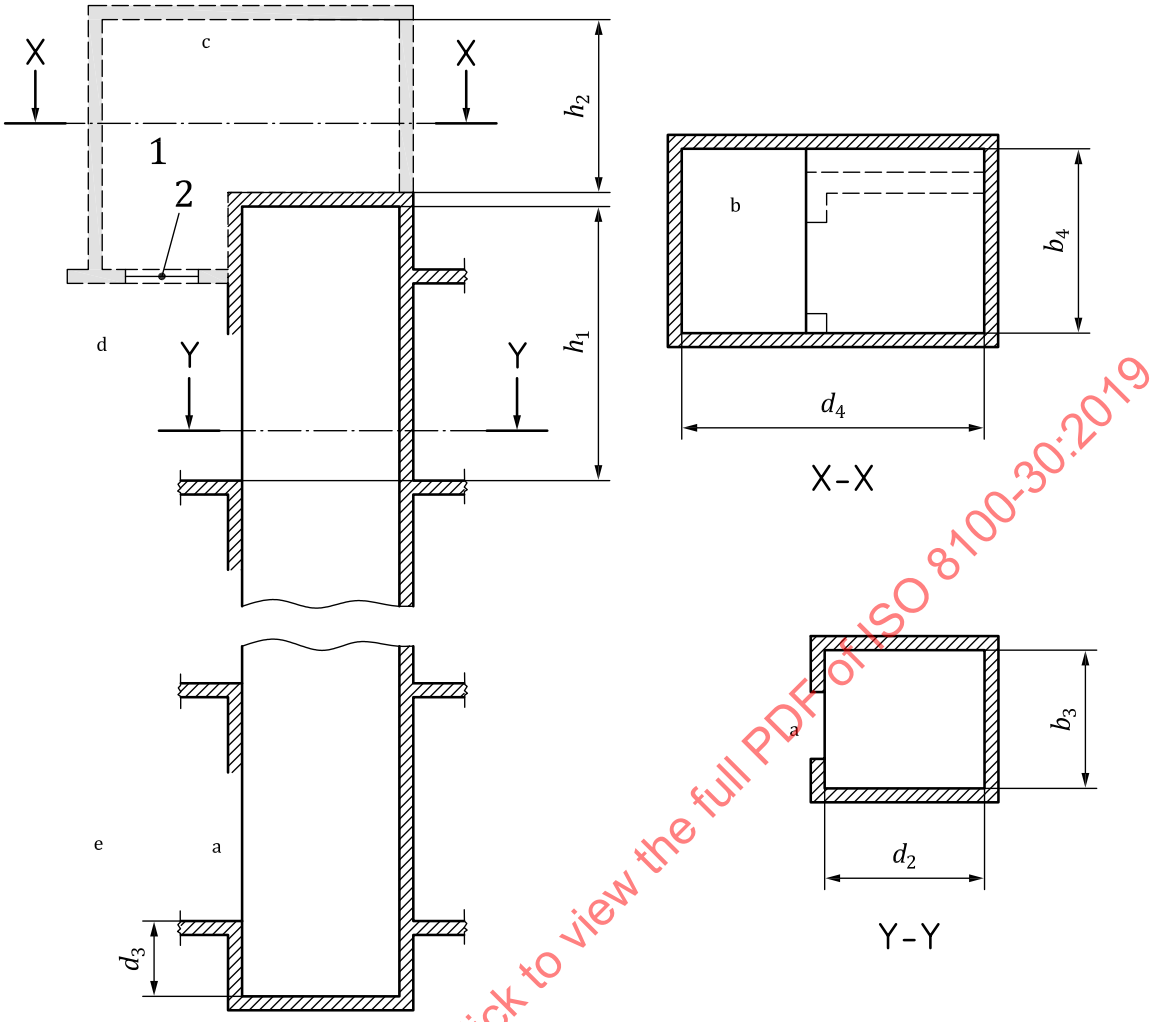
## 5.6 Arrangement of machine room (where applicable)

### 5.6.1 Individual or common arrangement

A machine room may not be required, e.g. for a machine roomless lift. Where required for electric lifts, this document is based on a configuration of a machine room above the well. The lateral extension of the machine room with respect to the well (or common well) can be taken on either the right or the left of the well (see Figure 3).

Where required for hydraulic lifts, the machine room is preferably placed beside or behind the well in the lower part of the building (see Figure 4).

The machine room should have adequate ventilation.

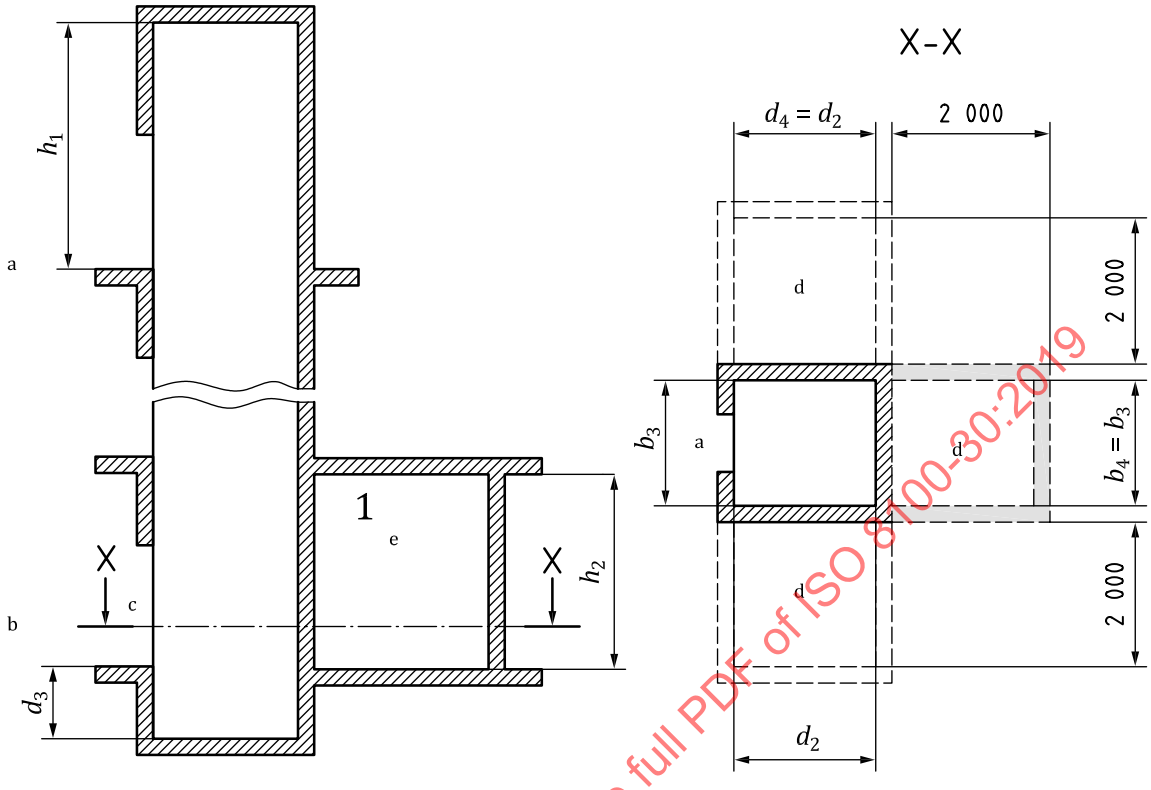



**Key**

1 machine room (where applicable)
2 trap door
$b_3$ well width
$b_4$ machine room width (where applicable)
$d_2$ well depth
$d_3$ pit depth
$d_4$ machine room depth (where applicable)
$h_1$ headroom height
$h_2$ machine room height (where applicable)
a For door details, see Figures 5 to 13.
b It is necessary to have an access door to the machine room, although this is not indicated in the figure.
c See 3.3.12.
d Highest level served.
e Lowest level served.

**Figure 3 — Electric lifts with machine room**

Dimensions in millimetres




**Key**

| | |
|---|---|
| 1 | machine room (where applicable) |
| $b_3$ | well width |
| $b_4$ | machine room width (where applicable) |
| $d_2$ | well depth |
| $d_3$ | pit depth |
| $d_4$ | machine room depth (where applicable) |
| $h_1$ | headroom height |
| $h_2$ | machine room height (where applicable) |
| a | Highest level served. |
| b | Lowest level served. |
| c | For door details, see Figures 5 to 13. |
| d | It is necessary to have an access door to the machine room, although this is not indicated in the figure. |
| e | See 3.3.12. |

**Figure 4 — Hydraulic lifts with adjacent machine room**



### 5.6.2 Arrangement for individual lifts and multiple lifts side by side with common machine room

For electric lifts, the rear wall of the machine room shall be in line with the corresponding well wall (or of the deepest well) and one of the lateral walls shall be in line with the corresponding well wall (or of the common well).

The depth extension of the machine room, with respect to the well, shall be taken on the landing side.

For duplex group hydraulic lifts, the common machine room is preferably placed behind the well in the lower part of the building.

### 5.6.3 Arrangement for lifts face to face with a common machine room (for electric lifts only)

It is recommended that any depth extension not be greater than 0,5 m from the rear walls of the wells and be at the same level as the slab supporting the machinery.

**Table 2 — Classes I, II, and VI lifts — Dimensions of headroom, pit depth, car and door height**

Dimensions in millimetres

<table>
<tr><th rowspan="3">Parameter</th><th rowspan="3">Rated speed $V_n$ m/s</th><th colspan="12">Rated load (mass) kg</th></tr>
<tr><th colspan="3">Lifts in residential buildings</th><th colspan="3">General-purpose lifts</th><th colspan="6">Intensive-use lifts</th></tr>
<tr><th>450</th><th>630</th><th>1 000</th><th>630</th><th>800</th><th>1 000/ 1 275</th><th>1 350</th><th>1 275</th><th>1 350</th><th>1 600</th><th>1 800</th><th>2 000</th></tr>
<tr><td>Height of car, $h_4$</td><td></td><td colspan="5">2 200</td><td colspan="2">2 300</td><td colspan="5">2 400</td></tr>
<tr><td>Height of car door and landing doors, $h_3$</td><td></td><td colspan="12">2 100</td></tr>
<tr><td rowspan="12">Pit depth[a,e], $d_3$</td><td>0,40[b]</td><td>1 400</td><td colspan="11">c</td></tr>
<tr><td>0,63</td><td colspan="7" rowspan="3">1 400</td><td colspan="5" rowspan="6">c</td></tr>
<tr><td>0,75</td></tr>
<tr><td>1,00</td></tr>
<tr><td>1,50</td><td colspan="7" rowspan="3">1 600</td></tr>
<tr><td>1,60</td></tr>
<tr><td>1,75</td></tr>
<tr><td>2,00</td><td>c</td><td colspan="2">1 750</td><td>c</td><td colspan="7">1 750</td></tr>
<tr><td>2,50</td><td>c</td><td colspan="2">2 200</td><td>c</td><td colspan="7">2 200</td></tr>
<tr><td>3,00</td><td colspan="7" rowspan="5">c</td><td colspan="5">3 200</td></tr>
<tr><td>3,50</td><td colspan="5">3 400</td></tr>
<tr><td>4,00[d]</td><td colspan="5">3 800</td></tr>
<tr><td>5,00[d]</td><td colspan="5">3 800</td></tr>
<tr><td>6,00[d]</td><td colspan="5">4 000</td></tr>
</table>

[a] Some countries require additional headroom, $h_1$, and pit depth, $d_3$.

[b] For hydraulic lifts only.

[c] Non-standard configuration.

[d] Assumes advantages taken of reduced stroke buffering.

[e] Specific pit and headroom sizes apply in Japan.

**Table 2** *(continued)*

| Parameter | Rated speed $V_n$ m/s | Rated load (mass) kg | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Lifts in residential buildings | | | General-purpose lifts | | | | Intensive-use lifts | | | | |
| | | 450 | 630 | 1 000 | 630 | 800 | 1 000/ 1 275 | 1 350 | 1 275 | 1 350 | 1 600 | 1 800 | 2 000 |
| Headroom[a,e], $h_1$ | 0,40[b] | 3 600 | | | c | | | | | | | | |
| | 0,63 | 3 600 | | | 3 800 | | 4 200 | | c | | | | |
| | 0,75 | | | | | | | | | | | | |
| | 1,00 | 3 700 | | | | | | | | | | | |
| | 1,50 | 3 800 | | | 4 000 | | 4 200 | | | | | | |
| | 1,60 | | | | | | | | | | | | |
| | 1,75 | | | | | | | | | | | | |
| | 2,00 | c | 4 300 | | c | 4 400 | | | | | | | |
| | 2,50 | | 5 000 | | c | 5 000 | | 5 200 | 5 500 | | | | |
| | 3,00 | c | | | | | | | 5 500 | | | | |
| | 3,50 | | | | | | | | 5 700 | | | | |
| | 4,00[d] | | | | | | | | 5 700 | | | | |
| | 5,00[d] | | | | | | | | 5 700 | | | | |
| | 6,00[d] | | | | | | | | 6 200 | | | | |

[a] Some countries require additional headroom, $h_1$, and pit depth, $d_3$.

[b] For hydraulic lifts only.

[c] Non-standard configuration.

[d] Assumes advantages taken of reduced stroke buffering.

[e] Specific pit and headroom sizes apply in Japan.

## Table 3 — Classes I, II and VI lifts — Machine room dimensions

Dimensions in millimetres

| | Rated speed $V_n$ m/s | Rated load (mass) kg | | | |
|---|---|---|---|---|---|
| | | 450 to 630 $b_4 \times d_4$ | 800 to 1 000 $b_4 \times d_4$ | 1 275 to 1 600 $b_4 \times d_4$ | 1 800 to 2 000 $b_4 \times d_4$ |
| Machine room (where needed) for electric lifts | 0,63 to 1,75 | 2 500 × 3 700 | 3 200 × 4 900 | 3 200 × 4 900 | 3 000 × 5 000 |
| | 2,0 to 3,0 | | 2 700 × 5 100 | 3 000 × 5 300 | 3 300 × 5 700 |
| | 3,5 to 6,0 | | 3 000 × 5 700 | 3 000 × 5 700 | 3 300 × 5 700 |
| Adjacent machine room (where needed) for hydraulic lifts[a,b] | 0,4 to 1,0 | Width or depth of well × 2 000 mm for residential buildings | | | |

[a] Site conditions and location can require different machine room dimensions ($b_4$, $d_4$, $h_2$).

[b] For other machine room locations, and where a remote machine room is specified, the purchaser's representative and/or builder should contact the lift contractor for machine room dimensions.

**Table 4 — Class III lifts (Health-care lifts) — Functional dimensions**

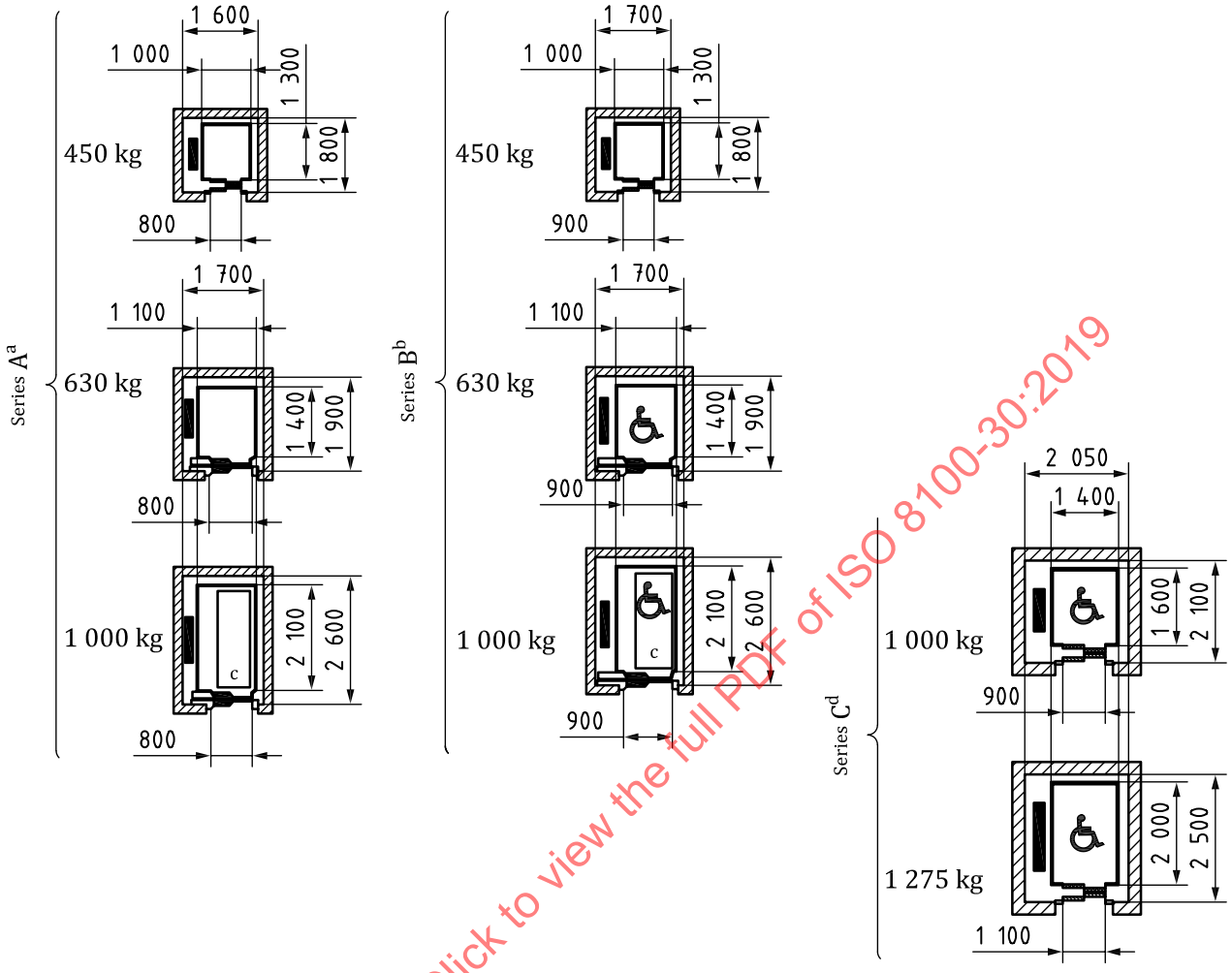
| Parameter | Rated speed $V_n$ m/s | | Rated load (mass) kg | | | |
|---|---|---|---|---|---|---|
| | | | 1 275 | 1 600 | 2 000 | 2 500 |
| Car | | Height, $h_4$ (mm) | 2 300 | | | |
| Car door and landing doors | | Height, $h_3$ (mm) | 2 100 | | | |
| Pit depth, $d_3$ | 0,63 | | 1 600 | | | 1 800 |
| | 1,00 | | 1 700 | | | 1 900 |
| | 1,60 | | 1 900 | | | 2 100 |
| | 2,00 | | 2 100 | | | 2 300 |
| | 2,50 | | 2 500 | | | |
| Headroom, $h_1$ | 0,63 | | 4 400 | | | 4 600 |
| | 1,00 | | 4 400 | | | 4 600 |
| | 1,60 | | 4 400 | | | 4 600 |
| | 2,00 | | 4 600 | | | 4 800 |
| | 2,50 | | 5 400 | | | 5 600 |
| Machine room[a] (where needed) | 0,63 to 2,50 | Surface, $A$ ($m^2$) | 25 | | 27 | 29 |
| | | Width$_b$, $b_4$ (mm) | 3 200 | | | 3 500 |
| | | Depth[b], $d_4$ (mm) | 5 500 | | 5 800 | |

[a] Site conditions and national regulations can require different machine room dimensions ($b_4$, $d_4$, $h_2$).

[b] $b_4$ and $d_4$ are minimum values. The actual dimensions shall provide a floor area at least equal to $A$.

NOTE Non-standard configuration for general-purpose or intensive-use lifts.

Dimensions in millimetres






**Key**

a 800 mm entrances, car height 2 200 mm, entrance height 2 100 mm.

b 900 mm entrances, car height 2 200 mm, entrance height 2 100 mm.

c Dimensions of stretcher: 600 mm × 2 000 mm.

d 900 mm (1 000 kg) or 1 100 mm entrance (1 275 kg), car height 2 200 mm, entrance height 2 100 mm.

NOTE 1 Lifts suitable for speeds up to and including 2,5 m/s.

NOTE 2 The selection of 900 mm door (series B and series C, 1 000 kg) and 1 100 mm door (series C, 1 275 kg) is preferred on new projects.

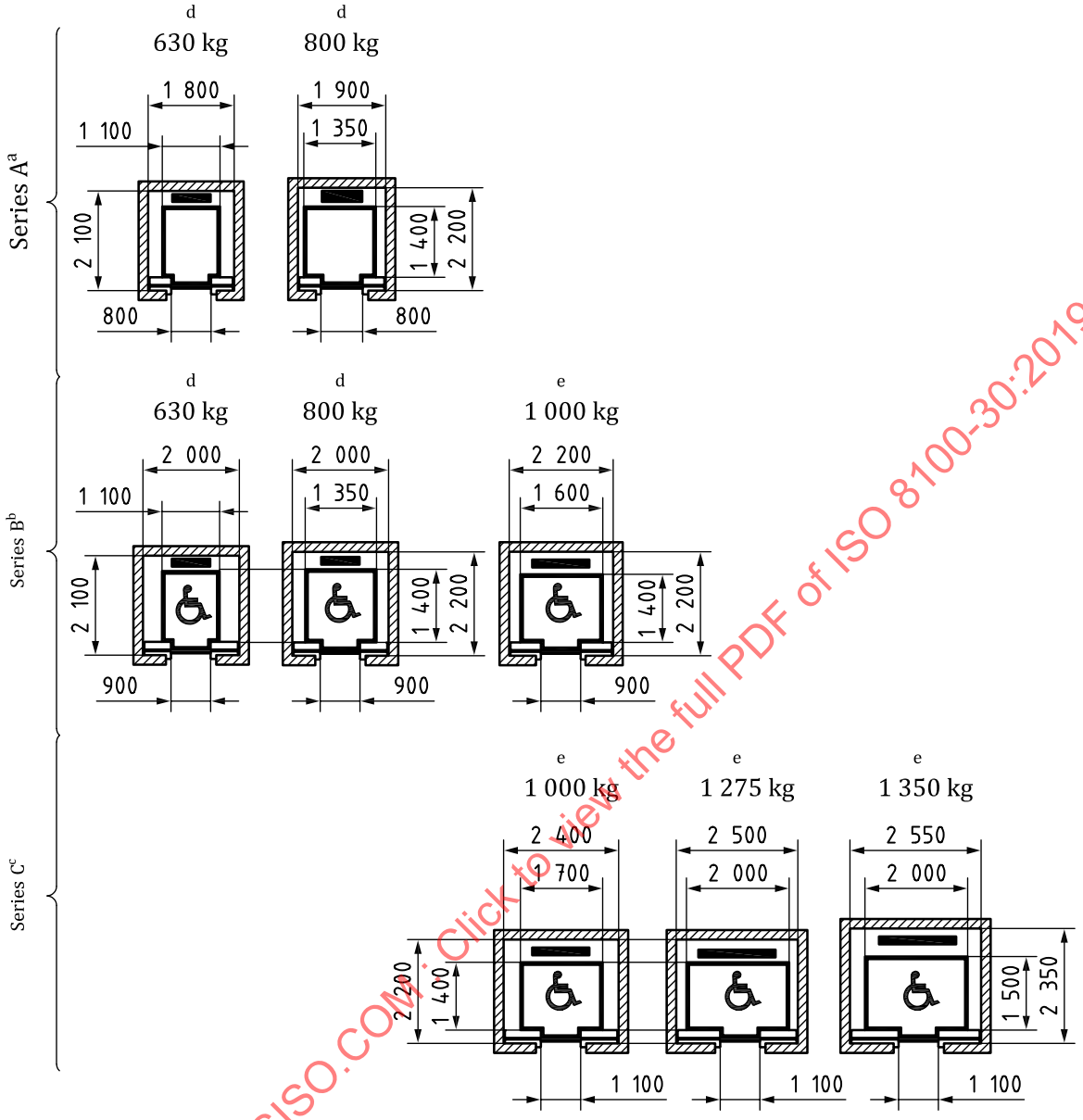
NOTE 3 Series A, B and C fulfilling the requirements for accessibility by a wheelchair user carry graphical symbol ISO 7000-0100.

NOTE 4 Even though counterweights are shown in the diagrams, the dimensions apply to all lifts irrespective of the drive system and whether the lift has a machine room or not.

NOTE 5 450 kg size is not preferred for new buildings.

**Figure 5 — Class I — Residential and general purpose lifts with counterweight to the side**

Dimensions in millimetres






**Key**

a 800 mm entrances.

b 900 mm entrances.

c 1 100 mm entrances.

d Car height 2 200 mm, entrance height 2 100 mm.

e Car height 2 300 mm, entrance height 2 100 mm.

NOTE 1 Lifts suitable for speeds up to and including 2,5 m/s (when higher speeds are used, add 100 mm to the well width and depth).

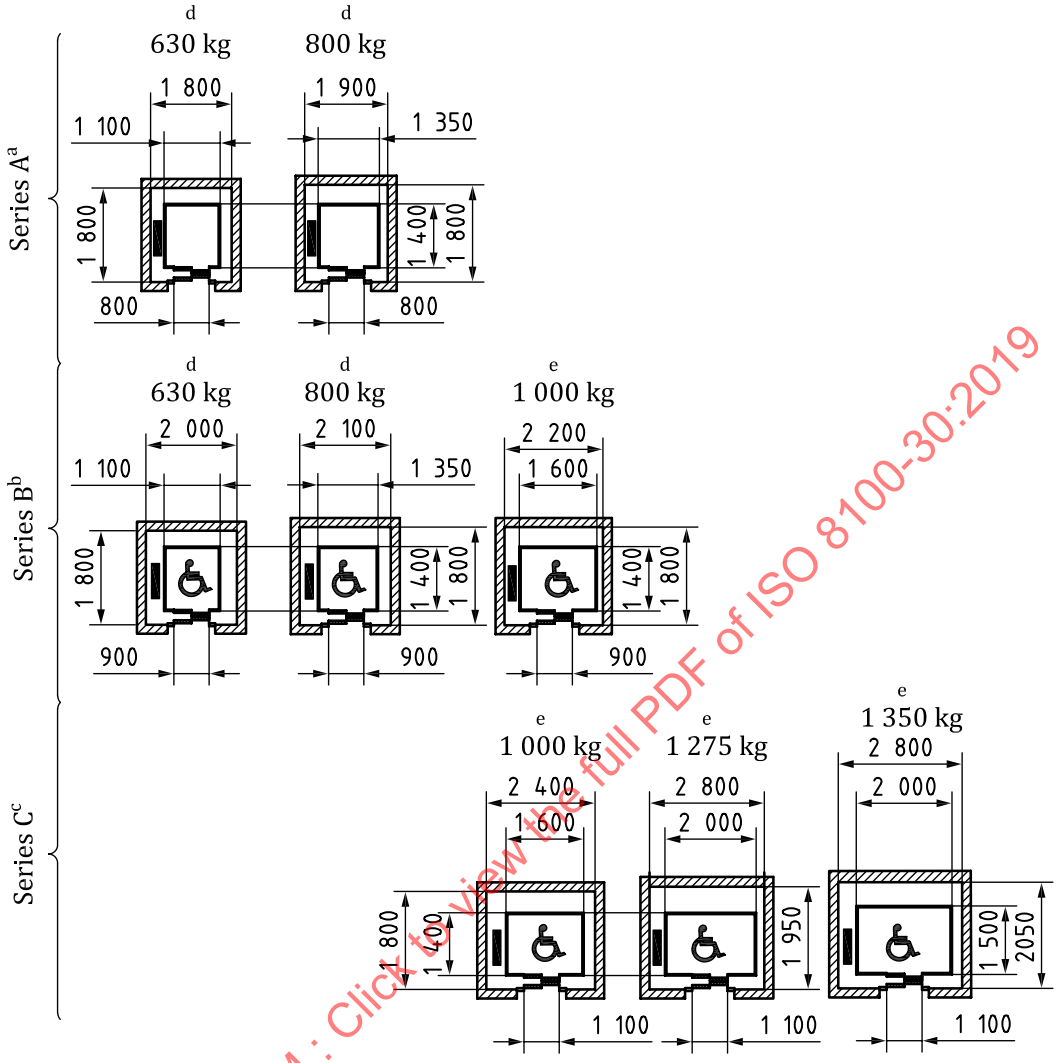
NOTE 2 The selection of either series A, B or C depends on the location or market requirements.

NOTE 3 Series A, B and C fulfil requirements for accessibility by a wheelchair user and carry graphical symbol ISO 7000-0100. However, the selection of either an 800 mm or 900 mm door depends on the location.

NOTE 4 1 275 kg and 1 350 kg lifts in Series C marked with: allow full manoeuvrability (3-point turn) of a wheelchair.

**Figure 6 — Class I — General-purpose lifts with counterweight to rear**

Dimensions in millimetres




**Key**

a 800 mm entrances.

b 900 mm entrances.

c 1 100 mm entrances.

d Car height 2 200 mm, entrance height 2 100 mm.

e Car height 2 300 mm, entrance height 2 100 mm.

NOTE 1 Lifts suitable for speeds up to and including 2,5 m/s (when higher speeds are used, add 100 mm to the well width and depth).

NOTE 2 The selection of either series A, B or C depends on the location or market requirements.

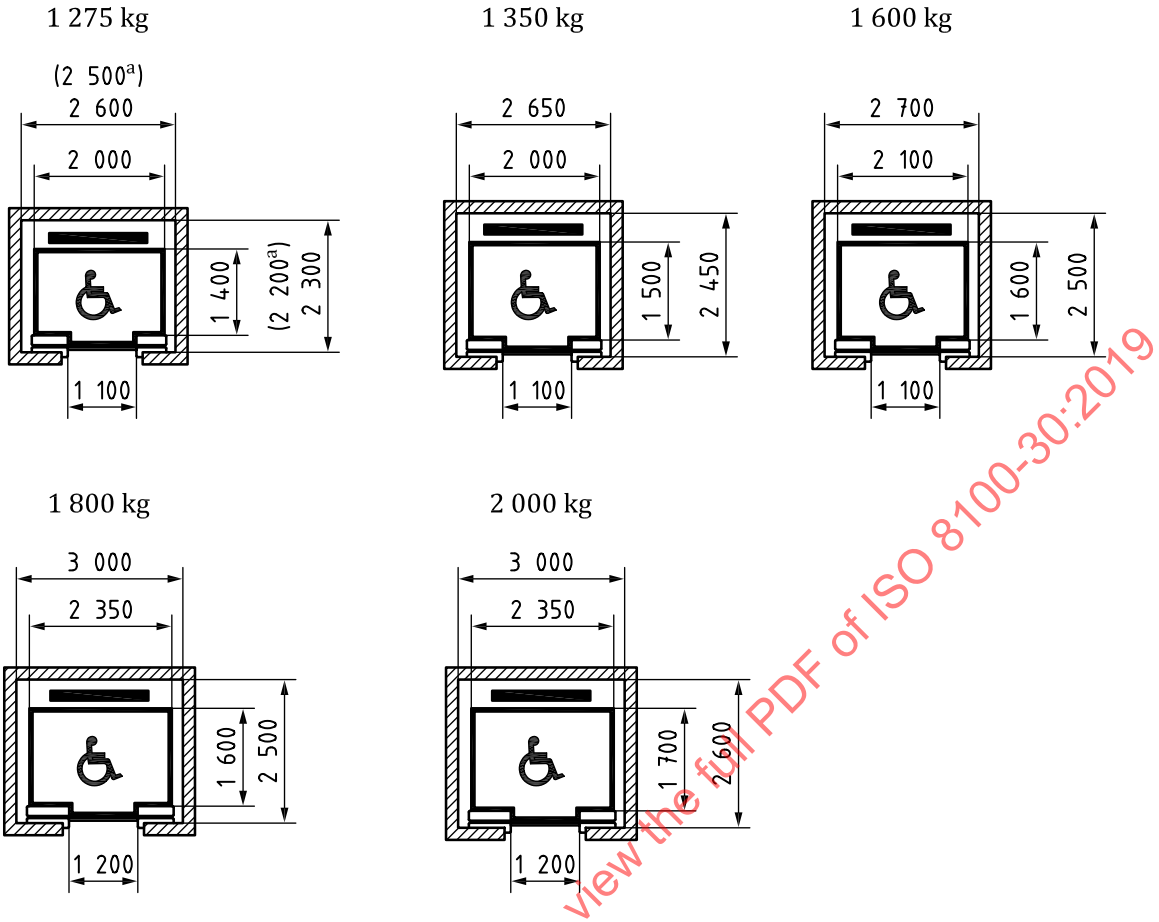
NOTE 3 Series A, B and C fulfil requirements for accessibility by a wheelchair user and carry graphical symbol ISO 7000-0100. However, the selection of either an 800 mm or 900 mm door depends on the location.

NOTE 4 1 275 kg and 1 350 kg lifts in Series C Lifts marked with: allow full manoeuvrability (3-point turn) of a wheelchair.

NOTE 5 Centre-opening doors can be used where they can be accommodated in the lift well sizes shown.

**Figure 7 — Class I — General-purpose lifts with counterweight to side**

Dimensions in millimetres




**Key**

[a] Only for lifts with 1 275 kg rated load and 2,50 m/s rated speed (see Figures 6 and 7).

The car height shall be 2 400 mm. The entrance height shall be 2 100 mm.

NOTE 1 Lifts suitable for speeds 2,5 m/s up to and including 6,0 m/s because of having larger well sizes.

NOTE 2 Lifts marked with ♿ allow full manoeuvrability (3-point turn) of a wheelchair.

**Figure 8 — Class VI — Intensive-use lifts**