INTERNATIONAL STANDARD

ISO 11660-3

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Cranes — Access, guards and restraints —

Part 3:
Tower cranes

Appareils de levage à charge suspendue — Moyens d'accès, dispositifs de protection et de retenue —

Partie 3: Grues à tour

Reference number
ISO 11660-3:1999(E)

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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 11660-3 was prepared by Technical Committee ISO/TC 96, *Cranes*, Subcommittee SC 7*, Tower cranes.*

ISO 11660 consists of the following parts, under the general title *Cranes — Access, guards and restraints:*

— *Part 1: General*

— *Part 2: Mobile cranes*

— *Part 3: Tower cranes*

— *Part 4: Jib cranes*

— *Part 5: Overhead travelling cranes and portal bridge cranes*

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Cranes — Access, guards and restraints —

Part 3:
Tower cranes

1 Scope

ISO 11660-1 establishes the general requirements for access to control stations and other areas of a crane, as defined in ISO 4306-1, during normal operations, maintenance, inspection, erection and dismantling. Guards and restraints are also dealt with in general, regarding the protection of persons on or near the crane in relation to moving parts, falling objects or live parts.

This part of ISO 11660 establishes the particular requirements relating to access, guards and restraints for tower cranes as defined in ISO 4306-1.

This part of ISO 11660 is applicable to:

— dismountable tower cranes for building and general construction work,

— permanently erected tower cranes,

— hammerhead cranes,

— dockside and shipbuilders tower cranes.

It does not apply either to access to control stations and installations or to guards and restraints for:

— power-driven mobile jib cranes which may be fitted with a tower attachment,

— erection masts with or without jibs.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 11660. 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 11660 are encouraged to investigate the possibility of applying the most recent editions of the standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 4306-1:1990, *Cranes — Vocabulary — Part 1: General*.

ISO 11660-1:—[1)], *Cranes — Access, guards and restraints — Part 1: General*.

3 Definitions

For the purposes of this part of ISO 11660, the definitions given in ISO 11660-1 apply.

1) To be published.

4 Access

4.1 General

All control stations and all other parts of the crane requiring inspection or regular maintenance shall be accessible by means of stairs, ladders, gangways and landings.

In order to carry out erection or dismantling operations, inspection, routine maintenance or replacement of parts located above the ground, the tower crane, including the jib, shall be provided with support equipment, handrails, handholds, platforms, safety equipment, etc. to ensure the safety of personnel and to allow them access to places of work.

4.2 Stairs

In addition to the dimensions given in ISO 11660-1, the recommended dimensions for steps are as follows:

Riser: 200 mm

Step width: 500 mm

4.3 Rung ladders

4.3.1 Recommended dimensions

In addition to the dimensions given in ISO 11660-1, the following dimension is recommended for rung ladders:

Toe clearance (measured from the centreline of the rung): 160 mm

4.3.2 Rest landings

4.3.2.1 In the crane tower, ladders shall have rest landings regularly spaced and placed in such a way that the first flight does not exceed a vertical climb of 12,5 m; subsequent flights shall not exceed 10 m.

4.3.2.2 In case of self-erecting cranes, a flight climb of 12,5 m may be exceeded provided that suitable equipment which provides at least an equivalent degree of safety (against falling as a result of fatigue) is installed.

4.3.3 Protection device for ladders in the tower

If the structural members of the tower ensure a dorsal protection, the hoop guard is not required for the following cases:

— square with sides ⩽ 750 mm (figure 1);

— equilateral triangle with sides ⩽ 1 1000 mm (figure 2);

— right isoceles triangle with the length of the sides of the right angle ⩽ 1 100 mm (figure 3);

— tubular tower with a diameter ⩽ 1 100 mm (figure 4).

Dimensions in millimetres

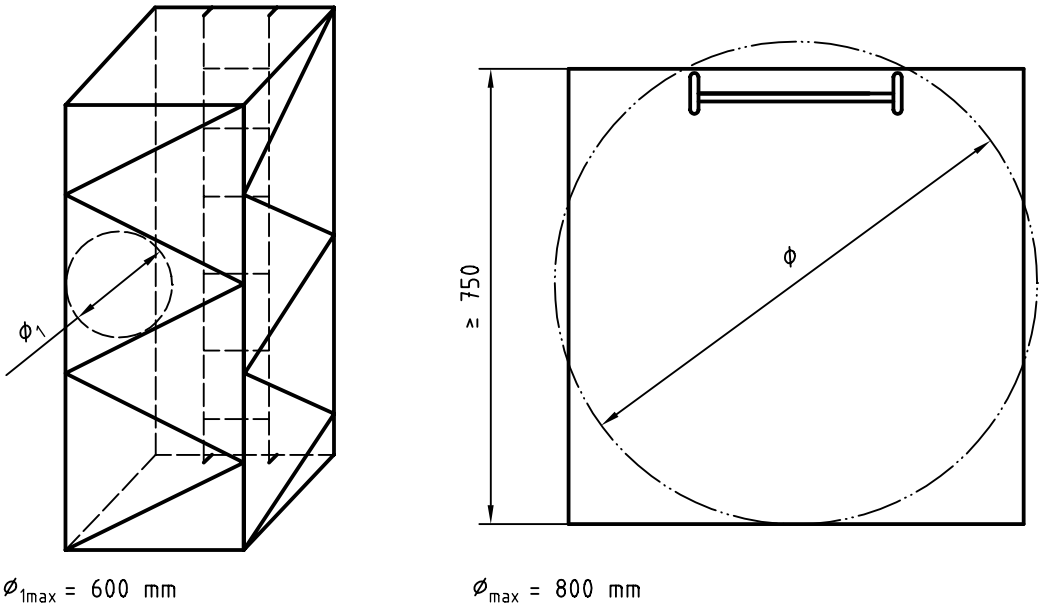
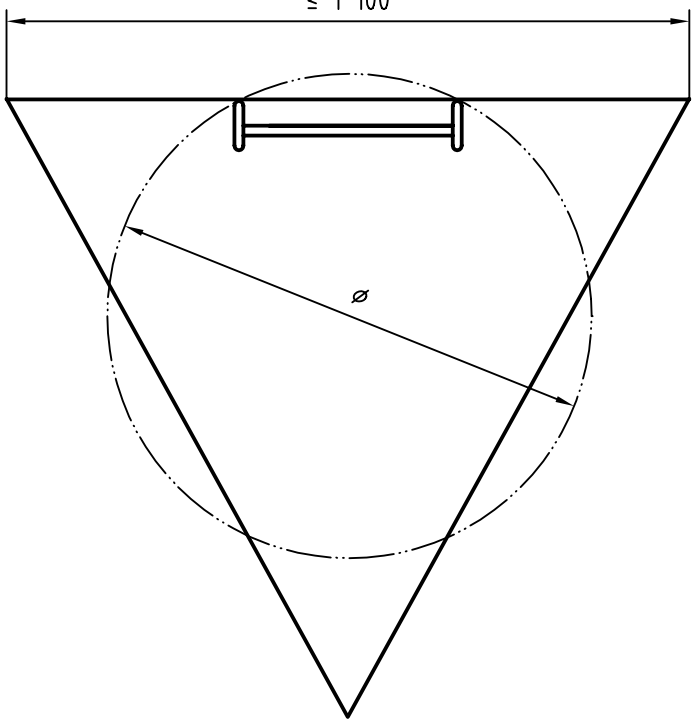


Figure 1

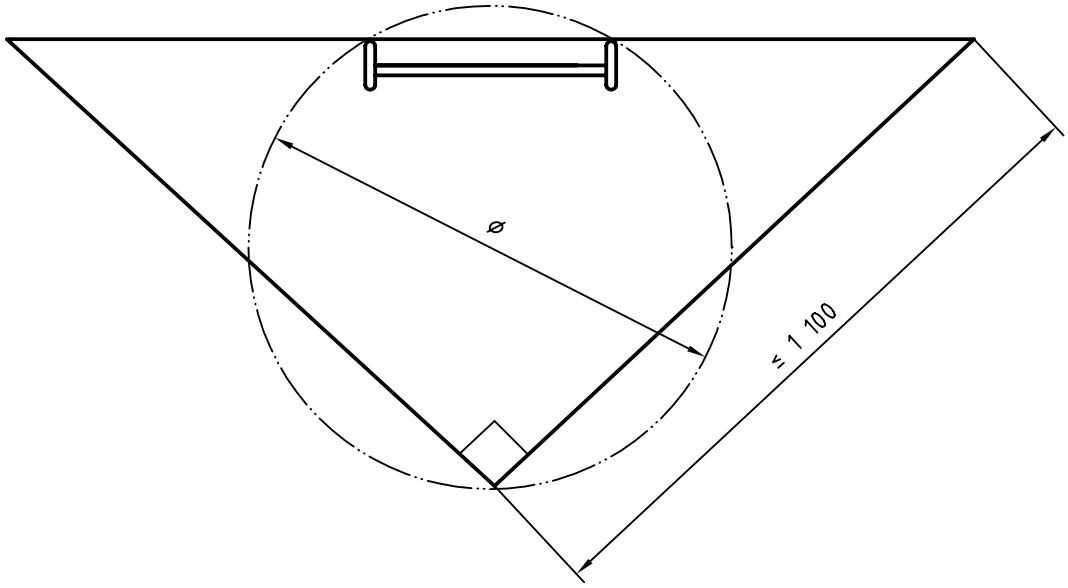
Dimensions in millimetres



$\varnothing_{max}$ = 800 mm

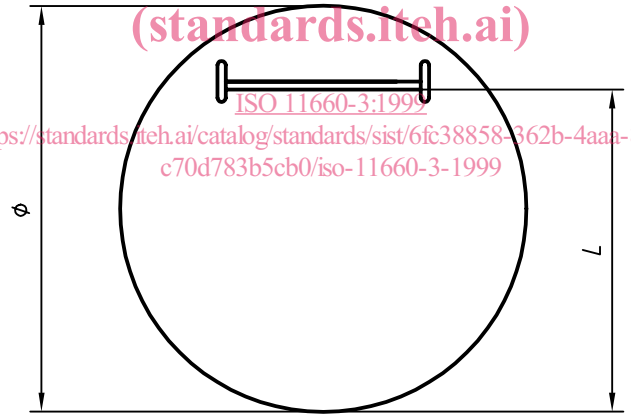
Figure 2

Dimensions in millimetres



$\varnothing_{max}$ = 800 mm

Figure 3



$\varnothing_{max} \leqslant$ 1 000 mm

600 mm $\leqslant L \leqslant$ 800 mm

Figure 4

4.4 Gangways along the jib

4.4.1 General

A gangway is not required

a) when the jib height is less 850 mm;

b) if the jib can be self-lowered to enable a complete visual inspection to be carried out, or where another appropriate means of carrying out a visual inspection is provided for in the construction.

In all other cases, a gangway at least 300 mm wide, with toeguards 30 mm in height at both sides, shall be fitted along the jib.

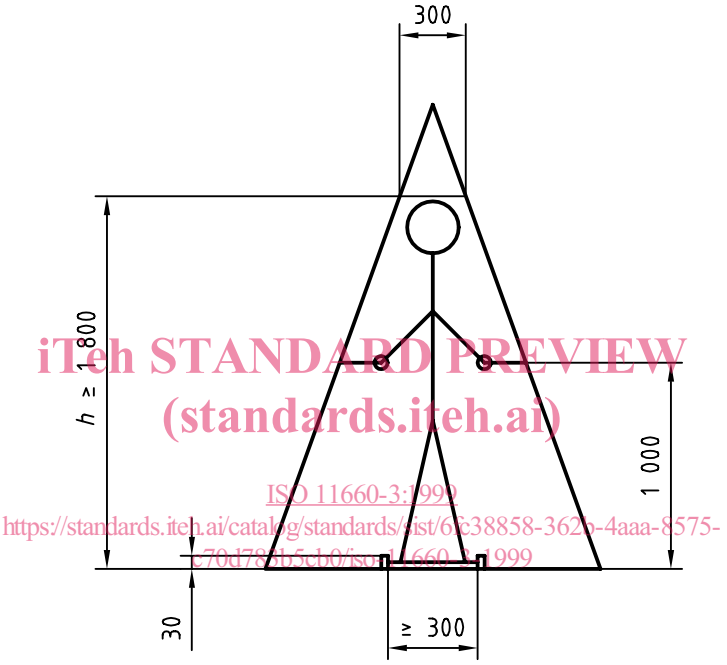
As a protection against falling, a handrail or guard/wire, to which the worker's safety belt can be attached, shall be fitted all along the length of the gangway.

The gangway shall be fitted in or on top of the jib according to the size and disposition of the jib, as detailed hereafter.

4.4.2 Jib with triangular section pointing up

4.4.2.1 When the jib height allows a clearance height *h* of 1 800 mm or greater, the gangway shall be fitted in the jib as shown in figure 5.

Dimensions in millimetres



h Clearance height (defined by a clearance width at least 300 mm at both head and foot levels)

Figure 5

The handrail shall be fitted 1 000 mm above the gangway on at least one side and if possible on both sides.

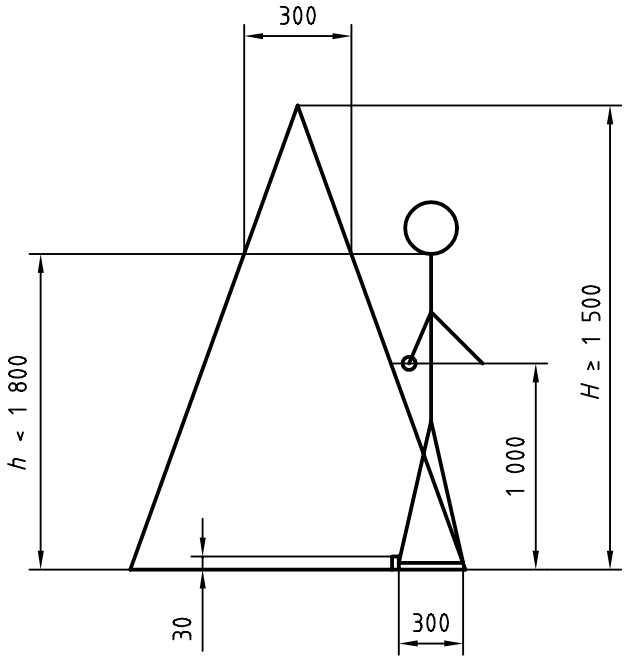
4.4.2.2 When the jib height does not allow a clearance height of 1 800 mm, but is equal to or greater than 850 mm, the gangway shall be fitted along the side of the jib, as shown in figure 6 or figure 7.

It is accepted that the diagonal side-bars have to be stepped over.

— When the jib height is equal to or greater than 1 500 mm, the handrail shall be fitted 1 000 mm above the gangway, as shown in figure 6.

— When the jib height is less than 1 500 mm (but greater than 850 mm), the handrail shall be fitted on the top of the jib, as shown in figure 7.

Dimensions in millimetres

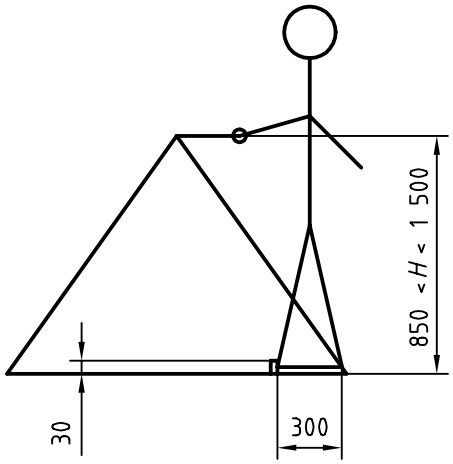


H Height of jib

h Clearance height (defined by a clearance width at least 300 mm at both head and foot levels)

Figure 6

Dimensions in millimetres



H Height of jib

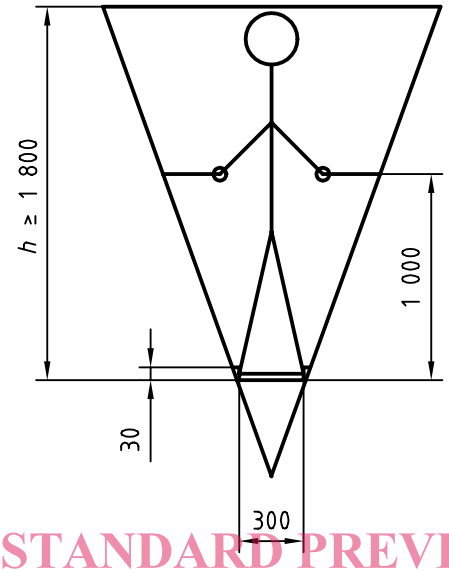
Figure 7

4.4.3 Jib with triangular section pointing down

4.4.3.1 When the jib height allows a clearance height *h* of 1 800 mm or greater, the gangway shall be fitted in the jib as shown in figure 8.

The handrail shall be fitted 1 000 mm above the gangway on at least one side and if possible on both sides.

Dimensions in millimetres



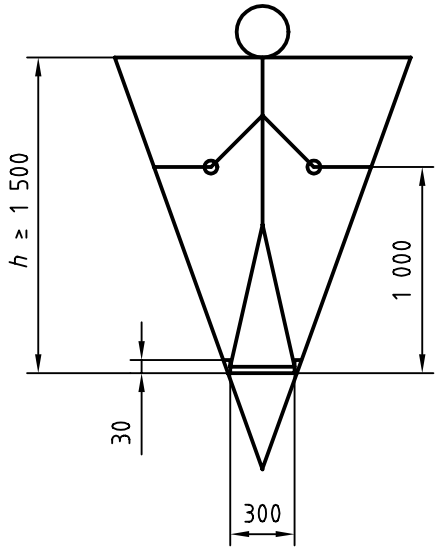
h Clearance height (defined by a clearance width at least 300 mm at both head and foot levels)

Figure 8

4.4.3.2 When the jib is latticed, the necessary clearance height may be reduced to 1500 mm (see figure 9).

In this case, it is accepted that the person walking the gangway has to duck to pass under the horizontal upper bars.

Dimensions in millimetres



h Clearance height (defined by a clearance width at least 300 mm at both head and foot levels)

Figure 9