
Cranes — Cabins and control stations —
Part 1:
General

*Appareils de levage à charge suspendue — Cabines et postes
de conduite —*

Partie 1: Généralités



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Foreword

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The main task of technical committees is to prepare International Standards. 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.

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.

ISO 8566-1 was prepared by Technical Committee ISO/TC 96, *Cranes*, Subcommittee SC 7, *Tower cranes*.

This second edition cancels and replaces the first edition (ISO 8566-1:1992), which has been technically revised.

ISO 8566 consists of the following parts, under the general title *Cranes — Cabins and control stations*:

- *Part 1: General*
- *Part 2: Mobile cranes*
- *Part 3: Tower cranes*
- *Part 4: Jib cranes*
- *Part 5: Overhead travelling and portal bridge cranes*

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Cranes — Cabins and control stations —

Part 1: General

1 Scope

This part of ISO 8566 specifies the general requirements for cabins and control stations from which cranes, as defined in ISO 4306-1, are operated.

It takes the conditions of use of the cabin into consideration.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3795, *Road vehicles, and tractors and machinery for agriculture and forestry — Determination of burning behaviour of interior materials*

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

ISO 5353:1995, *Earth-moving machinery, and tractors and machinery for agriculture and forestry — Seat index point*

ISO 7752-1, *Cranes — Controls — Layout and characteristics — Part 1: General principles*

ISO 11112, *Earth-moving machinery — Operator's seat — Dimensions and requirements*

ISO 11201, *Acoustics — Noise emitted by machinery and equipment — Measurement of emission sound pressure levels at a work station and at other specified positions — Engineering method in an essentially free field over a reflecting plane*

IEC 60204-32:2008, *Safety of machinery — Electrical equipment of machines — Part 32: Requirements for hoisting machines*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

crane cabin

space in a crane or in its immediate vicinity which is specially designed, built and equipped for operating the crane

3.2
control device
part of the control system of the crane, by means of which the desired control command is conveyed to the operating device

3.3
control element
part of a control device, such as push buttons, levers, pedals and switches, the manipulation of which creates the desired control command

3.4
seat index point
SIP
point on the central vertical plane of seat

NOTE Adapted from ISO 5353:1995, definition 3.1.

3.5
control station
permanent position of controls on or off the crane

4 Control stations

4.1 The crane operator's view, when the crane is in the prescribed operating position, shall enable the operator to monitor the movement of the crane and its load.

4.2 Control station dimensions shall be commensurate with the type of work and the length of continuous working periods of the crane operator. Minimum dimensions to permit ergonomically good working conditions and movements for the crane operator shall be as specified in the International Standards relevant to particular crane types.

4.3 Those parts of the control station where no seat is provided, or where the crane operator is required to work in a standing position, shall have a minimum free standing height of 2 m.

4.4 If vibration damping elements are also used as mountings for a control station, means shall be provided to prevent detachment of the control station in the event of failure of the damping elements.

4.5 Fixings used for mounting the control station shall be of a type which prevents unintentional loosening.

Fixings, excluding vibration damping elements, shall be made from fire retardant materials.

4.6 All standing areas shall be free of tripping hazards.

4.7 All standing and walking areas shall be slip resistant.

4.8 The strength of all parts of control stations and their supporting structure shall be considered as part of the crane structural design.

The rated capacity of the elevating control station shall include:

- at least 120 kg (one person, including his personal equipment);
- tools and equipment other than personal equipment.

The minimum rated capacity shall be 150 kg.

4.9 The control station shall be free of projecting parts. Edges shall have radii (minimum 2 mm) or be chamfered (minimum 2 mm × 2 mm).

4.10 Protection against electric shock for direct or indirect contact shall be as specified in Clause 6 of IEC 60204-32:2008.

5 Cabins

5.1 General

5.1.1 Requirements for the dimensions are given in the International Standards relevant to particular crane types.

5.1.2 The cabin interior shall be such that it can be quickly and easily cleaned.

5.1.3 If required, the cabin shall be equipped with sufficient and suitable interior lighting.

Local lighting for the controls, which is substantially free from glare and unwanted reflections, may be necessary; this light source shall be operated by a separate switch. A power socket shall be provided to facilitate maintenance activities.

5.1.4 If a cabin roof is intended to drain water off, the water shall not run over the windows or door.

5.1.5 The cabin shall include provisions for reducing the effects of glare and reflections.

When necessary, the cabin shall be fitted with shields that minimize glare without restricting visibility.

5.1.6 Electric wiring shall run separately from hydraulic lines. Electric wiring and hydraulic lines shall be effectively protected against damage where a risk exists.

5.2 Windows

5.2.1 Each floor window shall be fitted with a grid or be designed for loading (e.g. heavy-duty safety floor windows fitted with multi-layered laminated glass). When the window can be opened, protective means shall be provided to prevent persons and materials from falling.

5.2.2 Floor grids shall:

- a) not be supported by the window;
- b) allow cleaning of the window.

The design of the grid should be such that its effect on the crane operator's view is minimized.

5.2.3 Any wall window shall

- a) be able to withstand, without failure, the application of 1,25 kN applied at 90° to any 500 mm² area of the window and its mounting, or
- b) be provided with protection up to a minimum height of 1 m from the cabin floor level.
 - Where the protection is by means of horizontal bars, the spaces between the bars shall not exceed 0,4 m and the height between the cabin and the lowest bar shall not exceed 0,25 m.
 - Where the protection is by means of vertical bars, the spaces between the bars shall not exceed 0,3 m.

NOTE Vertical positioning of protective bars is known to cause less obstruction to the vision of crane operators.

5.2.4 If using glass for windows, the glass shall be tempered or laminated or both.

5.2.5 Windows that open shall be provided with a means to secure them in the closed and designated opening positions. Horizontal sliding windows shall be secured only in the closed position.

5.2.6 Means shall be provided to clear the external surfaces of the windows.

If necessary, windscreen wipers and washers shall be fitted to the windows to improve operator visibility. Particular attention should be paid to windshield and skylight windows.

NOTE Specific requirements are given in the appropriate International Standard for the particular crane type.

5.2.7 Glazing material shall be capable of maintaining its transparency when cleaned.

5.3 Entrance and exit

5.3.1 Normal entrance and exit

5.3.1.1 Any doors provided shall include a means to secure them in the closed and the designated opening positions.

5.3.1.2 If the cabin is located more than 1 m above ground level at the designated entering and leaving position(s), the door of the cabin shall give access to a platform or walkway.

5.3.1.3 Doors shall always be able to be opened from the inside, whether locked or not.

5.3.1.4 The minimum dimensions for effective door apertures for use in an upright posture shall be a width of 0,6 m by a height of 1,9 m. For apertures for use in other postures, the dimensions may be specified in International Standards relevant to particular crane types.

5.3.1.5 The minimum dimensions for effective hatch apertures shall be 0,6 m × 0,6 m, 0,5 m × 0,65 m or 0,6 m in diameter unless otherwise specified in International Standards relevant to particular crane types.

5.3.1.6 Where entrance is provided by a hatch in the floor, a minimum standing area of 0,4 m × 0,3 m shall be provided inside the cabin for each person expected to occupy the cabin when the hatch is in the open position.

5.3.1.7 Hatches shall be capable of being opened only against gravity and shall be self closing, e.g. by gravity.

5.3.1.8 The force necessary to open a hatch shall not exceed 135 N.

5.3.1.9 Provisions shall be made to provide the operator with simultaneous three-point support (two hands and one foot or two feet and one hand) while entering or leaving the cabin through a hatch.

5.3.1.10 The operator's seat or other permanent equipment in the cabin shall not prevent the hatch from being opened.

5.3.2 Emergency exit

5.3.2.1 If there is a risk of the normal exit becoming unusable (e.g. by a fire in the machinery room or overturning) in a manner that can block the normal exit, a means of escape in another direction shall be provided.

5.3.2.2 Emergency exits shall be capable of being secured in the fully open position.

5.3.2.3 The minimum dimensions for emergency exit effective apertures shall be those specified in 5.3.1.5.

5.3.2.4 If a cabin roof including any windows and hatches is expected to be used as a platform, e.g. for maintenance, inspection or emergency escape, the roof shall be designed for that purpose.

5.3.3 Fire protection

5.3.3.1 Fire resistance

The floor of the cabins, as well as the interior, upholstery and insulation, shall be made of fire-retardant material. The material burning rate shall not exceed 150 mm/min when tested in accordance with ISO 3795.

5.3.3.2 Fire extinguisher

Space for a suitable fire extinguisher shall be provided on each crane, and a fire extinguisher shall be present in this space.

5.4 Crane operator's seat

The cabin shall be furnished with an adjustable seat

- a) having dimensions in accordance with ISO 11112, and
- b) outfitted with adjustments to accommodate the crane operator's size, the operation of which shall be achievable without the use of any tool.

NOTE For vibration reasons, an adjustment for the crane operator's weight can be necessary for certain crane types and use.

5.5 Control layout

The layout and characteristics of the control elements shall be in accordance with ISO 7752-1.

5.6 Information

5.6.1 Indicators, which are important operationally, shall have prominent displays and be conveniently located relative to the operator.

5.6.2 Indicators and warning lights shall be provided with clear and permanent identification markings.

5.6.3 Indicators shall have a suitable scale range and shall be arranged for easy legibility.

5.6.4 Warning lights shall be of an appropriate colour. Any indication of danger shall be given with a red light.

5.6.5 Control panel and indicator illumination, where provided, shall be non-glare and, where necessary, capable of being dimmed.

5.7 Noise

5.7.1 The cabin shall be designed and built in order to reduce, to the greatest extent, the sound levels measured at the operator's ear.

5.7.2 The measurement of the A-weighted emission sound pressure level at the operator's position shall be carried out in accordance with ISO 11201 (grade 2 of accuracy).

The A-weighted emission sound pressure level shall be measured with air conditioning at the maximum speed and windows closed in the operating conditions specified for each type of crane.

The emission sound pressure level shall be determined at least three times. If at least two of the determined values do not differ by more than 1 dB, further measurements shall not be necessary; otherwise the measurements shall be continued until two values differing by no more than 1 dB are obtained.

The value of the A-weighted emission sound pressure level to be retained is the arithmetic mean of the two highest values which do not differ by more than 1 dB.

NOTE The A-weighted emission sound pressure level at the operator's position should not exceed 85 dB.

5.7.3 Sound-insulating materials and accessories shall be firmly and securely fixed in place.

5.8 Heating and air conditioning

5.8.1 General

5.8.1.1 Heating and air conditioning shall be subject to agreement between the purchaser and the supplier.

5.8.1.2 Where necessary, noxious gases and excessive heat entering the cabin shall be limited to a level specified by agreement between the purchaser and the supplier.

5.8.2 Cabin climate

5.8.2.1 The cabin shall be provided with ventilation facilities, such that the operator is protected from draught when the door and windows are closed.

NOTE Ventilation can be achieved by natural circulation or mechanical means.

5.8.2.2 Within the limits of external climatic conditions given by the manufacturer in his instructions, the following requirements shall be fulfilled.

- a) It shall be possible to attain an operative temperature of more than $T_o = 18\text{ °C}$ in the working area of the crane operator, with a maximum operative temperature of $T_o = 30\text{ °C}$ being recommended.
- b) It shall be possible to adjust the internal climate to a level where the difference in operative temperatures within the area of the crane operator does not exceed 5 °C . Under these conditions, the air speed on unprotected parts of the body shall not exceed $0,2\text{ m/s}$ if the air temperature is less than 22 °C .
- c) There shall be means to keep the insides of the windows free from mist and frost.
- d) Equilibrium of the cabin climate condition shall be reached within 20 min after start-up of the climate system, assuming constant external weather conditions, unless otherwise specified by the manufacturer in his instructions.

5.8.2.3 If air conditioning or heating is used in the cabin, the system shall be installed in such a way that it is possible to let the airflow and temperature be symmetrical on the left- and right-hand side of the crane operator's prescribed position.

5.8.2.4 If heating is installed, it shall be such that its exhaust gases cannot ingress into the cabin climate.

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