

*Indian Standard*

**LIFTS FOR TRANSPORT OF PERSONS AND GOODS IS 17900  
PART 7 SECTION 6 OCCUPANT EVACUATION LIFTS SPECIFICATION**

व्यक्तियों और वस्तुओं के परिवहन के लिए लिफ्ट आईएस 17900  
भाग 7 अनुभाग 6 अधिभोगी निकासी लिफ्ट विशिष्टता

## **FOREWORD**

This Indian Standard (Part 7 Section 6) will be adopted by Bureau of Indian Standards, after the draft finalized by the Lift and Escalators Sectional Committee had been approved by the Electrotechnical Division Council.

This draft Indian Standard is a part of series of Indian Standards on ‘Lifts for the transport of persons and goods.’ Other parts of this series of standards cover various requirements like specifications for planning and selection, guide for inspection and maintenance of lifts, lifts for special applications, dumbwaiters etc. Parts 1, 2, 3 and 6 of this series of standards are being published as Indian Standards and other parts of this series are under development.

This document outlines the specifications for a lift intended for the evacuation of individuals, either in automatic mode, under the guidance of building management, or with the assistance of trained evacuation personnel.

Furthermore, it delineates supplementary requirements to IS 17900 Part 1 / Part 2 for passenger and goods lifts, aimed at facilitating a swifter evacuation of individuals in the event of a fire emergency.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated expressing the result of a test, shall be rounded off in accordance with IS 2: 2022 ‘Rules for rounding off numerical values (revised)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

## 1 SCOPE

This document specifies additional requirements to IS 17900 Part 1 / Part 2 for passenger and goods lifts which can be used to support faster evacuation of persons in case of a fire emergency.

This document does not apply to:

- Lifts installed into buildings which are not in accordance with the building interface requirements as specified in this document.
- Lifts for evacuation due to circumstances which introduce other hazards such as explosion threat, chemical or biological attack, flooding, storm damage, or earthquake. However, for such applications this document can be made use of as a guide.

The following significant hazards are out of the scope of this document

- Fire or smoke in the evacuation lift well, safe areas or machinery spaces.
- Ingress of water into the lift well during evacuation process;
- Insufficient or incorrectly located evacuation lifts;
- Insufficient evacuation capacity;
- Entrapment in waiting area (safe area) due to absence of lift service or adjacent stairs;
- Structural collapse or failure of building services (including public supply network, lighting, ventilation) before the evacuation using lifts has been completed)
- Presence of harmful gases, potentially explosive atmosphere, extreme climate conditions, transport of dangerous goods.

## 2 NORMATIVE REFERENCES

The standards listed below contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of these standards.

IS NO.	TITLE
SP 7: 2016	National Building Code of India
IS 17900 (Part 1 & Part 2) : 2022	Lifts for the transport of persons and goods: Part 1 Safety Rules; Part 2 Design Rules, Calculations, Examinations and Tests of Lift Components
IS 17900: Part 7 Section 4	Requirements of Lifts for Persons with Disabilities (Second Revision)

## 3 TERMINOLOGY

### 3.1 Evacuation Lift

A lift designed to be used for the evacuation of persons, in automatic mode, or under the direction of building management, or by trained evacuation person(s)

### **3.2 Evacuation Exit Lobby (EEL)**

Destination floor(s) for evacuating persons in the building using lift(s), determined by the fire evacuation plan and which has a safe area(s).

## **4 PREREQUISITES TO USING LIFTS FOR EVACUATION IN CASE OF FIRE**

### **4.1 Building Interface and Requirements for Implementing an Evacuation Lift(S)**

Evacuation Operation has been designed with the assumption that the following building provisions are in place.

**4.1.1** The building shall be constructed to conform to National Building Code of India & has not sustained structural damage e.g., from fire, explosion, flood, lightning strike, earthquake, storm, etc.

**4.1.2** The automatic sprinkler system required by the building code is installed except that sprinklers in elevator machine rooms and in hoist ways are prohibited.

**4.1.3** The building shall be provided with a means to protect the lift(s) from the effects of fire and smoke at every landing, a safe area directly outside lift door, and fire-resistant structure, etc.

**4.1.4** The elevator lobby at each floor shall be enclosed & separated from remainder of the floor by a smoke barrier. The lift lobby door shall be 2 hr. fire rated & shall close automatically upon initiation of building fire alarm. The lift lobby shall be large enough to accommodate at least 25 % of the floor population at 0.28 sq. m. per person.

**4.1.5** The lift lobbies & staircase shall be pressurized, if required as per the National Building Code of India.

**4.1.6** The lift lobbies shall be provided with CCTV cameras with the monitor located in FCC / BMS room.

**4.1.7** Fire / smoke / temperature detection shall be provided in the building in a thoughtful manner in all areas of the building including lift shaft, machine room, lift lobbies, etc.

**4.1.8** Activation of any of those detectors which signifies unsafe operating environment for the evacuation lift(s) shall initiate phase I operation of the fireman's / non fireman's lift; & suspend the evacuation operation.

**4.1.9** The fire alarm system may have a provision to automatically send public announcement messages to the residents of the floor with active alarm & to the residents of two upper & two lower contiguous floors.

**4.1.10** Power supplies shall be secure and reliable, the provision of a secondary supply is essential. The cable providing power to the lift(s) shall be fire protected to the same fire protection level as given to the lift well structure.

**4.1.11** The secondary power supply shall be sufficient to run the evacuation lift at the rated load and rated speed for a minimum period equal to the planned evacuation time consistent with the evacuation strategy.

**4.1.12** The car lighting shall be also supplied by secondary power supply.

**4.1.13** The normal power feeders & back up power feeders shall be provided with 2 hr. fire resistance rated enclosures until they reach the machine room/controller.

**4.1.14** The source of the secondary supply, the level of independence between the primary and secondary supplies to be followed as per National Building code requirements.

**4.1.15** The source of the secondary power supply and automatic switch gear shall be located in a fire protected area.

**4.1.16** The building shall be designed to minimize the risk of flooding into the lift or lift well. To this end; sprinkler discharge, burst pipes, fire hose, etc. should not be located to discharge towards the lift, and any water close to the lift should be directed away from it by sloping floors etc.

**4.1.17** Water sensor shall be provided in the pit to shut down the lift in case the operation becomes unsafe due to accumulation of water in the pit.

**4.1.18** Interior exit stairwell doors if locked, shall automatically unlock permitting exit & reentry upon setting of alarm.

**4.1.19** The lift shall be maintained and the evacuation operation shall be tested at suitable regular intervals.

**4.1.20** The building shall have a fire safety & evacuation plan specifically including procedures for evacuation using stairs & lifts, the role of wardens, a routine training & drills for occupants.

**4.1.21** Training shall include the message that lifts shall not be used for evacuation in buildings not having lifts provided with special Occupant Evacuation Operation.

**4.1.22** The machine room & lift lobbies shall be maintained with minimal fire load.

**4.1.23** Responsibility for safe evacuation shall rest with and shall be in the control of a trained person(s) located at the building premises.

**4.1.24** Those with a disability shall be evacuated with the help of specially trained persons or with their personal assistant.

## **4.2 Evacuation Lift (S) Requirements**

**4.2.1** The evacuation lift shall be designed as per IS 17900-1& 2 requirements and with additional protection, controls and signals required for evacuation operation.

**4.2.2** Minimum one of the evacuation lifts' car sizes shall be minimum Type 1 (1500mm x 1500mm) according to IS 17900 Part 7 Section 4.

**4.2.3** The lift shall be designed to operate during whole evacuation operation period as per building fire emergency evacuation procedure.

**4.2.4** Upon activation of an automatic fire alarm initiating device in the building in any area that does not initiate phase I of Fireman Operation in this group of lifts, the fire alarm system shall provide signals to the elevator system indicating the floors to be evacuated.

**4.2.5** The floors to be evacuated shall be a contiguous block of floors, consisting of at least the floor with an active alarm, two floors above and two floors below. The elevator system shall initiate Evacuation Service in accordance with evacuation process.

**4.2.6** The evacuation zone shall be expanded to include all floors with an active alarm, all floors between the highest and lowest floor with an active alarm plus two floors above the highest floor with an active alarm and two floors below the lowest floor with an active alarm.

**4.2.7** A position indicator shall be provided at the elevator discharge level above or adjacent to the entrance for each car. The position indicator shall be powered by the same power supply as the elevator, including emergency and standby power.

**4.2.8** Methods of fire detection are well established. If the lifts are to operate a safe evacuation service, good monitoring of the fire in relation to lift equipment is essential. However, any ambient temperature sensor shall not stop or start of the evacuation operation.

**4.2.9** The evacuation lift shall be provided with a means to start and suspend evacuation operation, which is part of elevator control panel and part of BMS system.

**4.2.10** No electrical fault / control failure of any other lift located in the same lift group as the evacuation lift shall affect the operation of the evacuation lift.

**4.2.11** During evacuation operation, the evacuation lift door shall open only where there is a safe area in front of the landing door.

**4.2.12** In the case of lifts with more than one car door, no more than one car door shall open at a time during evacuation operation.

**4.2.13** The landing and car doors shall be automatic power operated horizontally sliding doors.

**4.2.14** Evacuation operations shall not override any electric safety devices, suspend-service signal, inspection operation, emergency electrical operation, fireman's operation, behavior of the lift in seismic mode, and any maintenance operation.

**4.2.15** In case any evacuation operation signal comes to inactive state due to failure, the lift shall be prevented from unintentionally returning to normal operation by keeping the evacuation recall signal active during the evacuation operation.

**4.2.16** As a minimum a 3-way communication system shall be available for passenger use to permit direct communications between the Lift Car and the safe area at lift lobby and the BMS/FCC. Operation of the communication device in the lift car shall be simply by means of a single button, operation of which shall connect the system to the BMS/FCC. Further operation of the device in the lift car shall be hands free.

**4.2.17** At a given landing, activation of any landing control device or any accessibility button shall register a landing call; and the call-registration feedback shall be given according to IS 17900 Part 7 Section 4.

**4.2.18** Service capability and the active EEL location shall be visually indicated at EEL location indicator.

**4.2.19** When the lift is capable of serving landing calls, information about this service capability and the active EEL location of the lift shall be available for external systems.

**4.2.20** If evacuation operation is not available due to interrupted connection or lift malfunction, all existing landing calls shall be cancelled and call registration feedback shall not be given.

## **5 EVACUATION PROCESS**

There are 3 types of lift operation methods to hasten the building evacuation process.

- 1. Automatic Evacuation Operation** — The evacuation operation is completely automatic,
- 2. Remote Assisted Evacuation Operation** — The evacuation operation is controlled remotely by the “remote evacuation assistant”,
- 3. Manually Assisted Evacuation Operation** — The evacuation operation is controlled by an assistant in the car “manual evacuation assistant”.

The type of Evacuation Operation(s) to be deployed in a building shall depend on the specific building fire evacuation strategy.

### **5.1 Evacuation Process (Phase 1)**

Initiation of evacuation service

Evacuation service shall be initiated by a two-position switch. The two-position switch for the evacuation operation having START– STOP functions shall be provided at the EEL for the manually assisted evacuation operation (**S1**), &/or a switch at the remote-control panel located in FCC/BMS room for the remote assisted evacuation (**S2**), & / or another switch at the remote control panel for the automatic evacuation operation (**S3**).

This switch shall enable either starting (START) or stopping (STOP) the evacuation process. When this means is actuated by turning the switch to START position, the elevator system shall be ready to evacuate all floors served by that group of lifts.

The evacuation service shall be operational between the floors as decided by the building designer. The logic of operation shall be mutually agreed between the building designer, the lift designer, and the fire expert.

On activation of the evacuation service, the lift shall behave as described below:

- a)** All registered car and landing calls shall be cancelled and no new calls shall be registered;
- b)** In the car the door re-open button, the door close button, and the door protective device shall remain operative.
- c)** The lift, occupied or un-occupied, shall proceed to the EEL as follows; except in case of Automatic evacuation operation wherein the lift if unoccupied, shall proceed to the affected floor directly as per the pre-determined priority logic for serving the affected floors; and park there with doors closed till a landing call from the affected floor is initiated.
  - 1)** A car stationary at a landing in no call condition, shall close the doors if open, and travel nonstop to the active EEL;
  - 2)** Visual indication in car operating panel shall display “Evacuation Service”;
  - 3)** A car travelling away from the active EEL shall make a normal stop at the nearest landing without opening the doors, make an audible message such as “Evacuation Service” and return to the active EEL;
  - 4)** A car travelling towards the active EEL shall continue its travel nonstop to EEL;
  - 5)** If the lift has already started stopping at a level, it shall continue to make a normal stop and without opening the doors, with message displayed “Evacuation Service”, proceed to the active EEL;
  - 6)** On reaching at the active EEL, the car shall open its door and shall make audible speech message for the passengers, along with a visual indication to leave the lift. The audible signal and visual indication shall be according to IS 17900 P7 S4;
  - 7)** If the door is not closed at the active EEL after 20 s, the protective device shall be made inactive, the doors shall attempt to close and an audible signal shall sound in the car until the doors are closed; and
- 8)** To start the evacuation service:
  - i.** In case of Automatic evacuation operation, any landing call at the affected floor(s) shall initiate the travel of the lift to that floor as per priority logic decided,



**ii.** In case of Remote assisted evacuation operation, the person-in-charge at the remote-control panel shall initiate the travel of the lift to the affected floor,

**iii.** In case of manually - assisted evacuation operation, pressing the car call button at car operating panel (COP) shall initiate the travel of the lift to the affected floor.

## **5.2 Evacuation Service (Phase 2)**

After the evacuation service (Phase 1) is completed and any type of evacuation operation signal is active, the lift shall operate in Phase 2 as follows:

### **5.2.1 Automatic Evacuation Operation**

**a)** When automatic evacuation signal (S3) is active and when no higher priority signal is active, the lift shall operate in automatic evacuation operation and shall serve registered landing calls;

**b)** The priority of answering the landing calls shall be based on the distance from the active EEL, with the furthest landing call getting highest priority;

**c)** On arrival at a landing other than the active EEL, the car shall open the doors and give a voice announcement as “Evacuation Service. Enter the car”;

**d)** Once the doors are closed, the car shall proceed towards the active EEL. If the car is empty, it may respond the next landing call without visiting the active EEL;

**e)** The car if not full, may serve other landing calls on the way to the active EEL. If the car makes stops on the way to the active EEL, it shall display message “Do Not Exit”. The audible signal shall be according to IS 17900 P7 S4;

**f)** Actuation of the landing call booking device shall not prevent a loaded car from closing its doors and leaving the floor; and

**g)** On arriving at the active EEL, the evacuation lift car shall open its door and shall make an audible and visual indication “Exit Lift”. The audible signal shall be according to IS 17900 P7 S4.

**5.2.1.1 Deactivation of automatic evacuation operation** — Automatic evacuation operation shall be ceased when

- a) the automatic evacuation signal is deactivated; or
- b) the remote assisted evacuation signal is activated; or
- c) the manually assisted evacuation signal is activated; or
- d) the suspend service signal is activated; or
- e) The lift receives phase1 signal of the fireman's control.

In these cases, the car shall return to the active EEL.

**5.2.2 Remote Assisted Evacuation Service** — Remote assisted evacuation is the evacuation under the control of an authorized person (“remote evacuation assistant”), who controls the lift from remote evacuation control panel located in BMS/FCC room in the same building.

**NOTE** — Remote assisted evacuation operation shall be subjected to cybersecurity. Cybersecurity of industrial control systems are specified in the IEC 62443 series of standards and in the cybersecurity standard ISO 8102-20.

In the remote assisted evacuation operation, control from outside the lift car i.e., from a remote location, is permitted provided there are communication means between the remote-control location and the lift car. The use of remote assisted evacuation and the communication means shall be selected based on building evacuation strategy.

Activation of the remote assisted evacuation operation shall override the automatic evacuation signal, if any.

**5.2.2.1 Remote assisted evacuation operation** — After the completion of Phase1 of evacuation service, if the remote assisted evacuation signal is active and no higher priority signal is active, the lift shall operate as per details below.

- a) Information sharing between the lift and the remote evacuation control panel shall be opened by the lift control.
- b) After communication sync is established, the remote evacuation control panel is activated to operate in remote control mode.
- c) The alarm button and door open button in the car operating panel shall remain operative; and other controls of the lift shall be operable solely from the remote evacuation control panel.
- d) The remote evacuation control panel shall have displays indicating the registered landing calls, car position and direction of travel, and car door status.
- e) A call registered through remote evacuation control panel shall cause the lift doors to close and the car to travel to the required landing.
- f) If the door closing is prevented by a door protective device, a separate door close command from remote evacuation control panel shall bypass the protective device and the doors shall attempt to close as defined in IS 17900-1, 5.3.6.2.2.1 b) 4).
- g) At any time, it shall be possible to register a new call from the remote evacuation control panel. The previous call shall be cancelled. The car shall travel in the shortest time to the newly registered landing.
- h) On arrival at a landing, the lift shall open the doors and give a voice announcement to inform persons to enter the car (message such as “Evacuation Service. Enter the car”). The audible signal shall be according to IS 17900 P7 S4.
- i) On arrival at the active EEL, the evacuation lift shall make audible and visual indication such as “Exit now”. The audible signal shall be according to IS 17900 P7 S4.

**5.2.2.2 Deactivation of remote assisted evacuation** — Remote assisted evacuation operation shall be ceased when

- a) The remote assisted evacuation signal is deactivated; or
- b) The remote evacuation control panel becomes inactive; or
- c) The connection between the remote evacuation control panel and the lift is interrupted for more than 30 s; or
- d) The audible or video communication system is interrupted for more than 30 s; or
- e) The manually assisted evacuation signal is activated; or
- f) The suspend service signal is activated; or
- g) The lift receives phase 1 signal of the fireman's control.

In these cases, the car shall return to the active EEL.

**5.2.3 Manually Assisted Evacuation Operation** — Manually assisted evacuation operation shall override the automatic evacuation operation and remote assisted evacuation operation.

Manually assisted evacuation is the evacuation under the control of an authorized trained person(s), who controls the lift from car operating panel and assists occupants to evacuate the building.

After the completion of Phase1 of evacuation service, if the manually-assisted evacuation operation signal is active, the lift shall operate as per details below.

- a) Registered landing calls shall be indicated in the car operating panel by blinking car call acceptance light of the given landings.
- b) Where multiple lifts in a group are in evacuation operation, all registered landing calls shall be indicated in each lift. If one of the lifts serves the landing call, the landing call shall be cancelled from the other lift(s) as well.
- c) The active EEL location shall be indicated in the car;
- d) All heat and smoke sensitive door protection devices shall be made inactive.
- e) Constant pressure on any car call button or on the door close button shall cause the car door to close. Closing shall start only after 1 to 2 s delay. If the button is released before the car door is fully closed, the doors shall automatically reopen.
- f) When the car door is fully closed, the car call can be registered and the car shall start to travel to the destination landing.
- g) If car doors are closed by the door-close button and car call is not registered within 15 s, the car shall travel to the active EEL and open its doors.
- h) At any time, it shall be possible to register a new call from within the car. The previous car call shall be cancelled. The car shall travel in the shortest time to the newly registered landing.

i) On arrival at any destination, the car shall automatically open its selected door and remain at the landing until the car door is closed by the attendant and a new car call is registered or until timeout expires.

## **6 DEACTIVATION OF DRIVER ASSISTED EVACUATION OPERATION**

Manually- assisted evacuation operation shall stop when the car is at the EEL; and when the manually assisted evacuation operation signal is no longer active or when the suspend service signal is active or when the lift receives phase 1 signal of the fireman's control.