

2.6. Stair Pressurization System

2.6.1. The stair pressurization system shall comply with the general requirements for smoke control systems as per **Section 2.5** and **Table 10.4.**, Stair pressurization requirements.

Table 10.4.: Stair Pressurization Requirements

ITEMS	REQUIREMENTS
1. GENERAL	<ul style="list-style-type: none"> i. To limit smoke from entering the stairwell through the supply air intake, the supply air intake shall be separated from all building exhausts, outlets from smoke shafts, roof smoke, heat vents, open vents from elevator shafts, and other building openings that might expel smoke from the building in a fire. ii. Where air intakes are positioned in the façade or at a roof level there shall be two air intakes, spaced apart and facing different directions in such a manner that they could not be directly downwind of the same source of smoke. iii. Each such inlet shall be independently capable of providing the full air requirements of the system. Each inlet shall be protected by an independently operated smoke control damper system in such a way that if one damper closes due to smoke contamination, the other inlet will supply the air requirements of the system without interruption. The discharge point of a smoke ventilation duct shall be a minimum of 1 m above the air intake. iv. An override switch to reopen the closed damper and to close the open damper shall be provided at the smoke control panel (SCP). v. The calculations shall take into account the 2 (two) number of doors to be opened simultaneously, one door at the floor of fire origin and the exit door at discharge as a minimum. However, pressurization sizing shall be verified by Computer airflow models. vi. For stair pressurization systems in super highrise buildings special design provision shall be made taking into consideration the stack effect and the airflow resistance of the stair on pressure profile within the staircase. vii. For stairs pressurization systems in super Highrise buildings shall be determined either by analytical calculations, network modeling or CFD simulations that design pressure differences can be achieved taking into consideration stack effect and airflow resistance of the stair. viii. The stair pressurization can be either bottom fed or top fed. To avoid contamination of air intakes with smoke, it is recommended to apply bottom fed systems or alternatively to use two air intakes. ix. Supply air for the pressurization system shall be drawn directly from the external and its intake shall not be less than 5 m from any exhaust discharge openings.
2. SINGLE AND MULTIPLE INJECTIONS	<ul style="list-style-type: none"> i. In order to achieve an even pressure profile within the super highrise building, the stair shall be either divided into sections not higher than 90 m or provided with a compensated pressurization system counteracting the stack effect. ii. A single-point injection system shall be permitted to be used where the stairwell height is less than 30.5 m. See Figure 10.13. & Figure 10.14. for illustrations. iii. Stairwells more than 30.5 m high shall be provided with multiple-injection systems. See Figure 10.15. for illustrations.