

Smoke Master SMIA
Compact pressurisation and smoke exhaust system

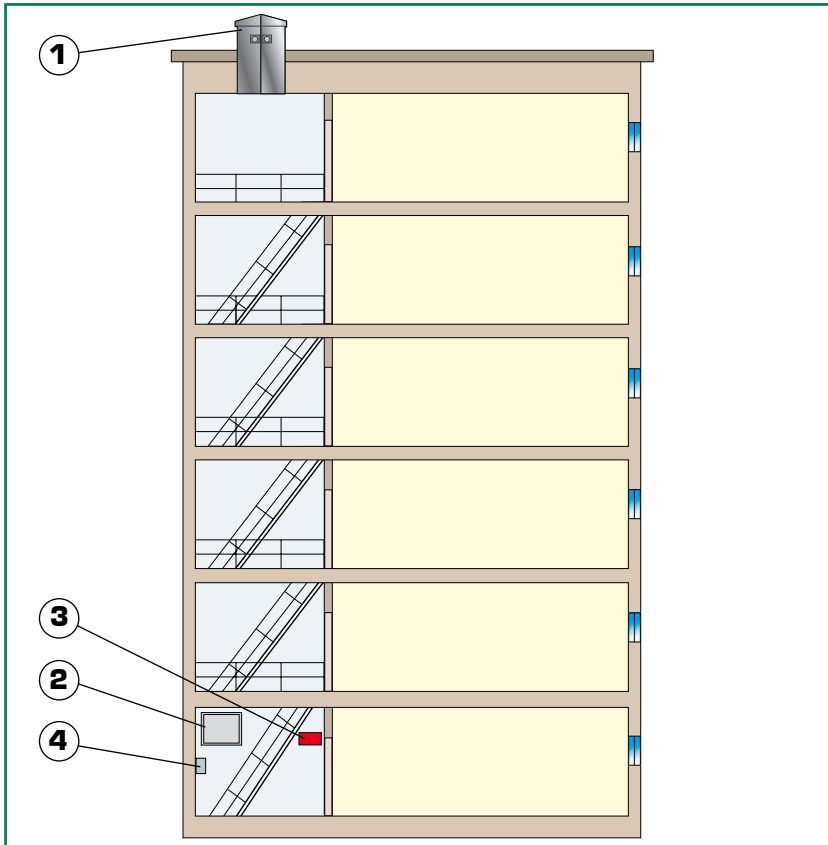


FläktWoods

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System overview



SMIA-1

1

Fan unit

SMOKE MASTER SMIA is an all-inclusive total solution for stairwell pressurisation and smoke exhaust. The system has been designed and the components have been constructed to the pressurisation standard EN 12101-6, and the smoke extract fans conform to EN 12101-3. SMIA is CE-marked according to EN 12101-3. The system has been tested by VTT Technical Research Centre of Finland, and it has also been subjected to full-scale fire tests, performed in Myllypuro, Helsinki, in a block of flats. SMIA has been designed for use in residential buildings up to eight storeys high.

The SMIA fan unit is, due to its compact external dimensions, suitable for use in new build as well as many refurbishment projects. For ease of design, it is only available in one size with constant air volumes that works for stairwells of many different heights.

An SMIA total solution comprises integrated smoke hatches, a fan unit, a control panel, and a control unit. The apartment air release path solutions with the necessary spindle motors, smoke detectors and control units are supplied by our partners.

A video illustrating the operation of SMOKE MASTER SMIA in the event of a fire is available on DVD. Please contact your local Fläkt Woods dealer for a copy.



SMIZ-2

2

Control unit



SMIZ-3

3

Control panel



SMIZ-4

4

Differential pressure transmitter

Design and operation

General

SMOKE MASTER SMIA is a complete system tested by VTT Technical Research Centre of Finland. It is designed for the pressurisation and ventilation of stairwells in residential buildings rising to a maximum height of eight storeys. The stairwell shall be pressurised at the earliest stages of a fire. With SMOKE MASTER SMIA, pressurisation is started within approximately 20 seconds of the activation of a smoke detector. It takes an average of 4–10 minutes, in urban areas, for the fire department to arrive. The fire fighters can then use the control panel to choose the pressurisation / smoke exhaust option that is most appropriate to the situation.

Pressurisation

The system has been designed based on the requirements of EN 12101-6, pressurisation class A. The aim of pressurisation design is to make it possible to create, without delay, a positive pressure within the stairwell, 50 Pa higher than the pressure in the adjacent spaces, in the event of a fire in an apartment. The pressurisation fan is automatically activated by a smoke detector in the apartment on fire. The smoke detector shall also automatically control the opening of an air release path in the apartment (smoke extract window). The air re-

lease path shall have a minimum opening (free area) of 0.5 m^2 . If the door of the apartment on fire opens, the system automatically raises the air flow so that air flows through the door to the apartment at a velocity of 0.75 m/s .

Smoke exhaust and fire attack

The system has been designed based on the requirements of EN 12101-3. SMOKE MASTER SMIA provides a constant smoke exhaust air flow of $2.0 \text{ m}^3/\text{s}$. Smoke ventilation is started by the fire department using the control panel. When smoke ventilation starts, pressurisation automatically stops. While attacking the fire, the fire fighters can choose to use pressurisation for greater ease of entry to the apartment on fire. The smoke extract fan is CE marked and F400 rated ($400^\circ\text{C}/2\text{h}$).

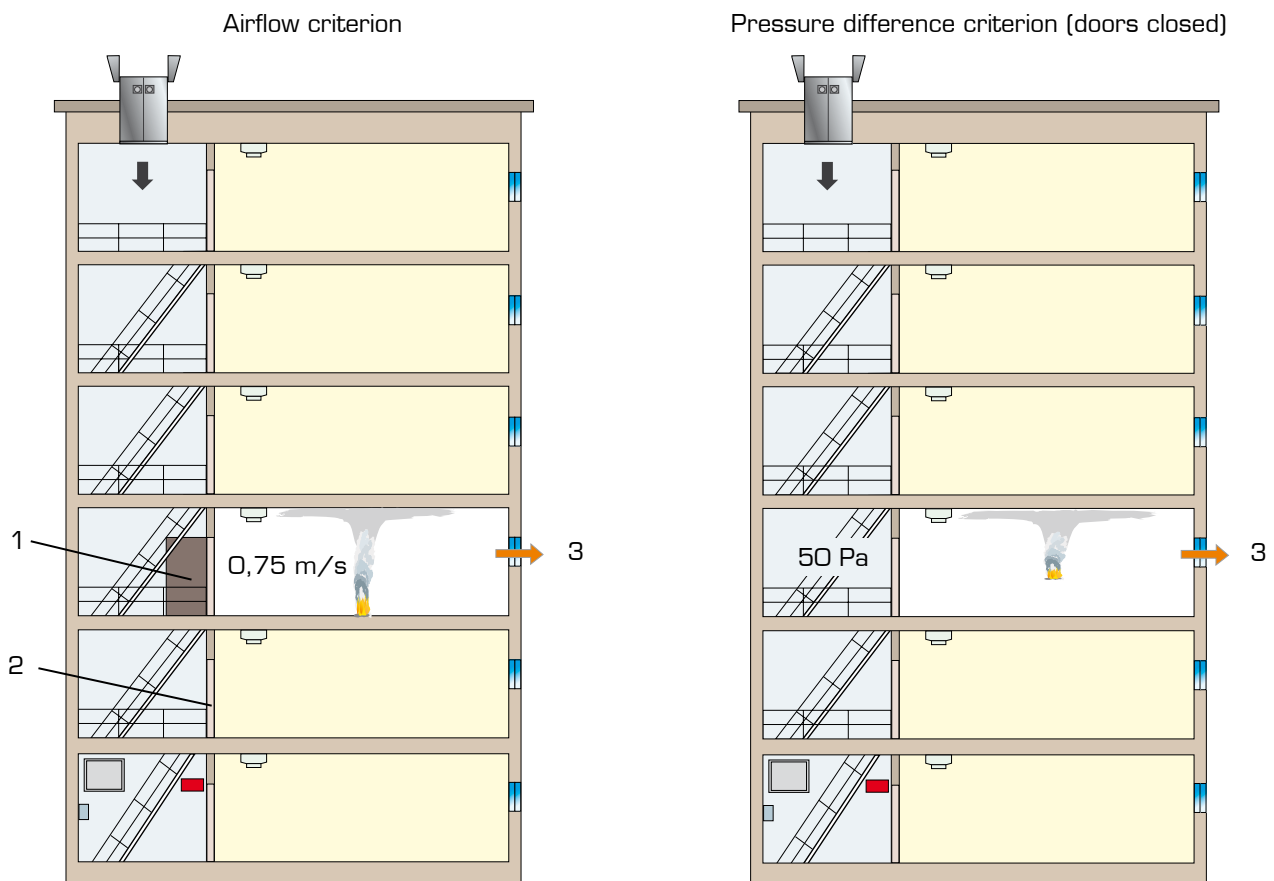
Quick guide

New build projects

The SMOKE MASTER SMIA system perfectly meets the above design criteria up to eight storeys.

Refurbishment projects

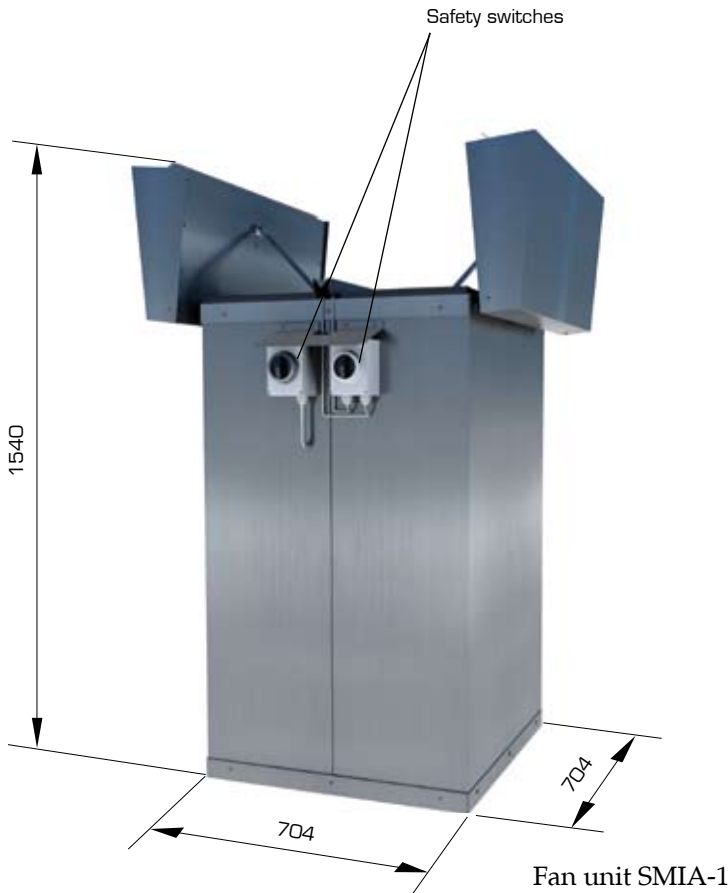
Please contact Fläkt Woods for expert consultation on the suitability of SMIA for the project.



Design conditions for pressurisation class A. 1. Door open. 2. Door closed. 3. Air release path.

Technical specification

Dimensions, materials and weight



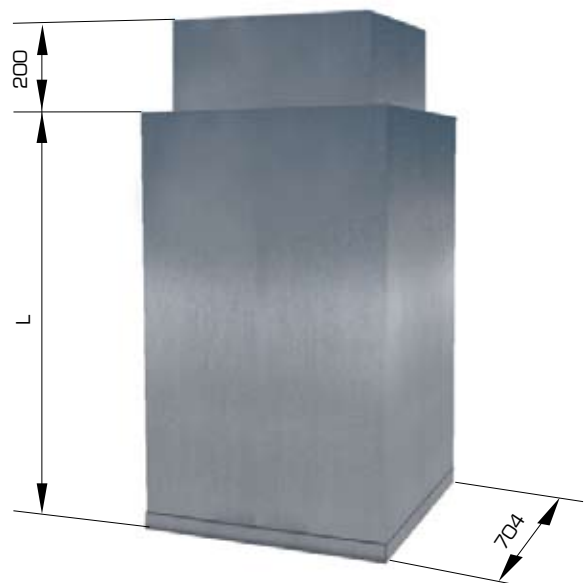
Materials:

Fan unit: The outer and inner casings are made of galvanised steel sheet, and the casing is insulated with 100mm of mineral wool. The smoke hatches are made of galvanised steel sheet and are insulated with mineral wool.

Extension: If the length of SMIA-1 is not sufficient, it can be extended with SMIZ-1, available as an optional extra. The outer and inner casings of the extension are made of galvanised steel sheet, and the casing is insulated with 100mm of mineral wool. The telescopic inner tube (200mm) is adjusted during installation to give the desired total length. The joint shall be sealed with fire sealant, and the exposed part of the telescopic tube shall be insulated with mineral wool (included). Moreover, the bottom grille incorporated into SMIA-1 shall be transferred to the extension.

Weights

SMIA-1: 145 kg
 SMIZ-1: 60 kg/m



Extension SMIZ-1

L = a multiple of 100mm as ordered, max. 2000mm

Electrical and control equipment

General:

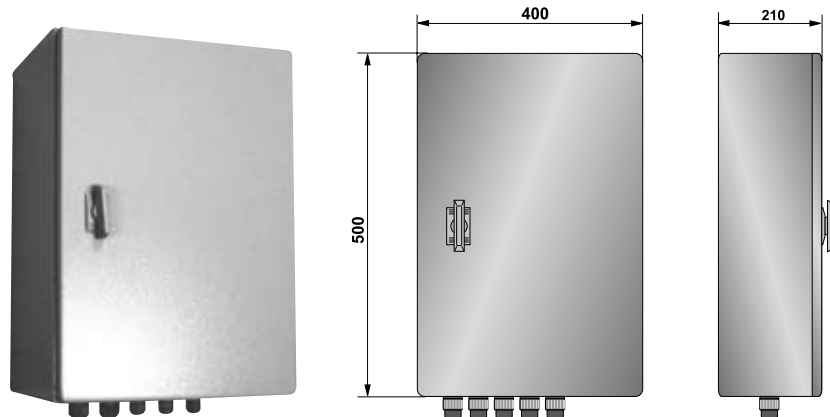
Every SMOKE MASTER SMIA system comes with the necessary electrical and control equipment.

The SMIA basic package includes the following electrical and control equipment:

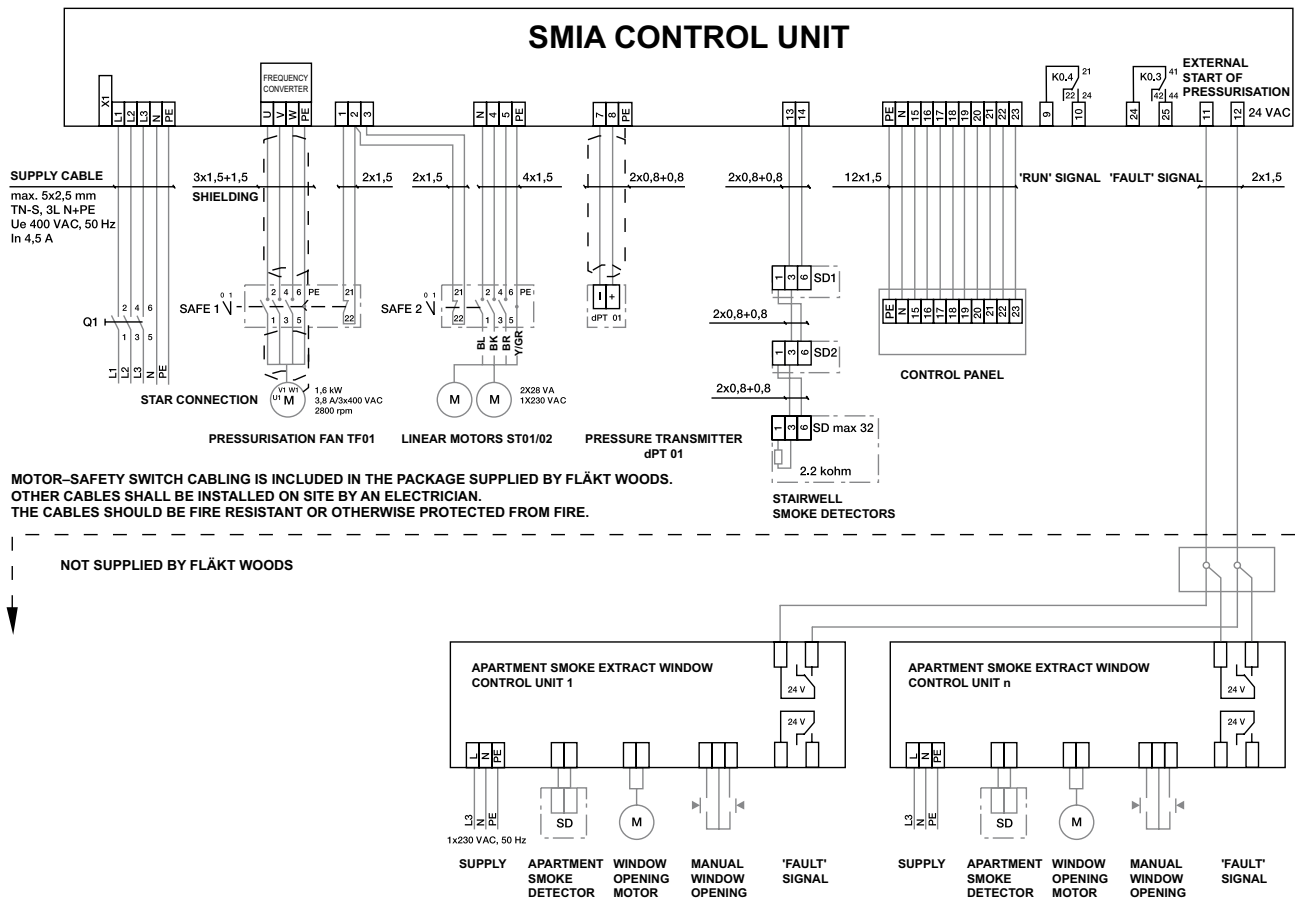
- control unit SMIZ-2
- control panel SMIZ-3
- differential pressure transmitter SMIZ-4
- safety switches

Control unit SMIZ-2

- junction box
- frequency converter
- automatic control system



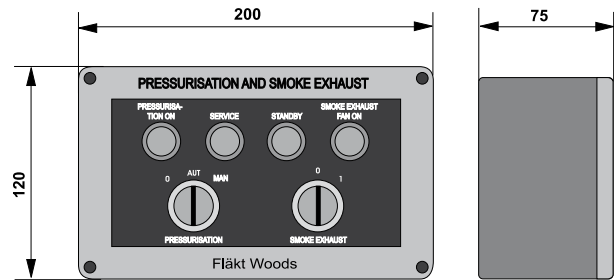
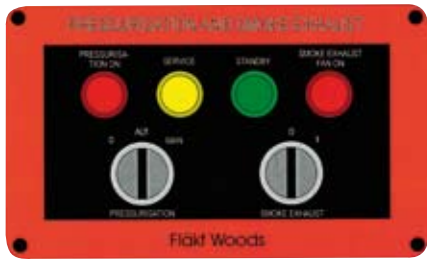
Wiring diagram and electrical connections



Electrical and control equipment

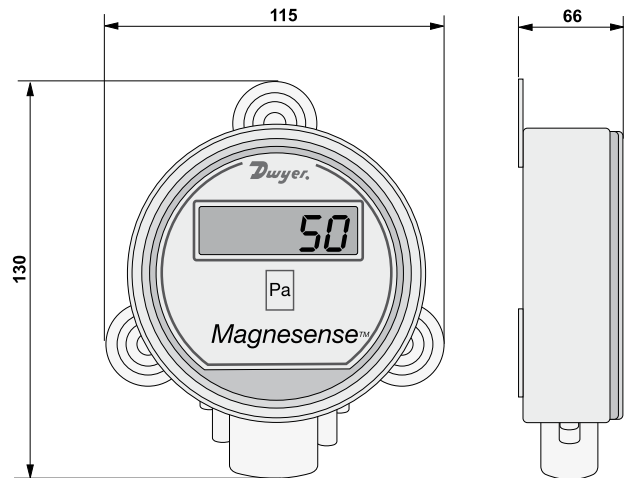
Control panel SMIZ-3

- for controlling pressurisation and smoke ventilation
- with indicator lights

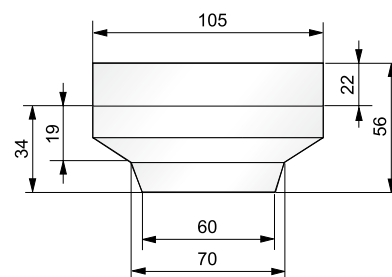


Differential pressure transmitter SMIZ-4

- for controlling the fan
- to be installed in the stairwell



Smoke detector FDRC-2-SMIA (Optional extra)



Apartment air release path

General

For proper operation of the pressurisation system, there must be an automatic opening air release path in the apartment on fire that opens at the same time as the smoke detector is activated, allowing gases to escape outside. The air release path shall be located near the apartment entrance to prevent interior doors, etc. from restricting the gas flow. The air release path can be a window, a smoke extraction damper, or other appropriate solution. A key design principle to consider is that the minimum free area of the air release path shall be 0.5 m². Air release paths to be incorporated into the facade shall always be designed in close consultation with the architect and fire authorities, which means that the need for smoke extract solution in apartments is an issue that should be addressed as early as the initial meeting of a new project.

The SMOKE MASTER SMIA control unit needs a signal from the apartment system via a volt-free normally open contact. Total smoke extract window solutions (complete with spindle motors, control units and smoke detectors) facilitate the design and implementation process. The following companies supply smoke extract window solutions that are compatible with the SMOKE MASTER SMIA system:

MOVETEC Oy, ESPOO, FINLAND
Tel. +358 400 412543, +358 9 5259230
www.movetec.fi

ROCA Finland Oy, TURKU, FINLAND
Tel. +358 20 7438937
www.roca.fi

Pressurisation without apartment air release path

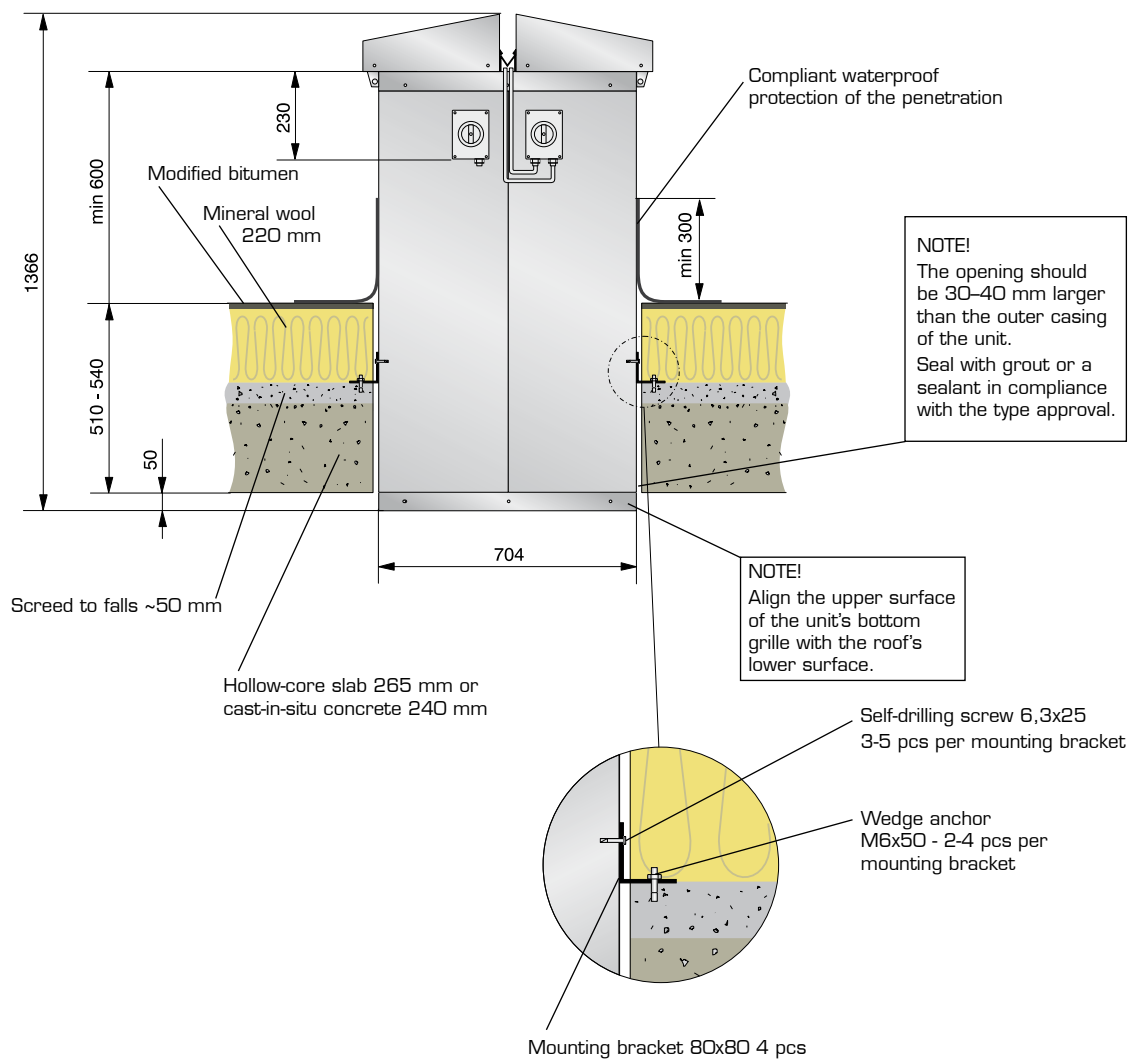
For the pressurisation system to comply with the relevant standards, there should be a air release path in each apartment. In reality, however, it may not always be possible, for some reason or another, to use apartment smoke extract windows.

If a decision is made, in consultation with rescue authorities and building control officers, to deviate from the standards and use the SMOKE MASTER SMIA pressurisation system without air release paths in the apartments, the following should be observed: To minimise the risk of having a door open to a burning apartment, door closers or similar equipment should be used to ensure that the doors close in the event of a fire. Moreover, through guidance and fire drills the occupants can be advised to close the apartment doors in case of fire. If the smoke detectors are placed in the stairwell, there should be detectors at each landing. Fläkt Woods supplies smoke detectors (FDRC-2-SMIA) that allow direct connection to the control unit.

Installation

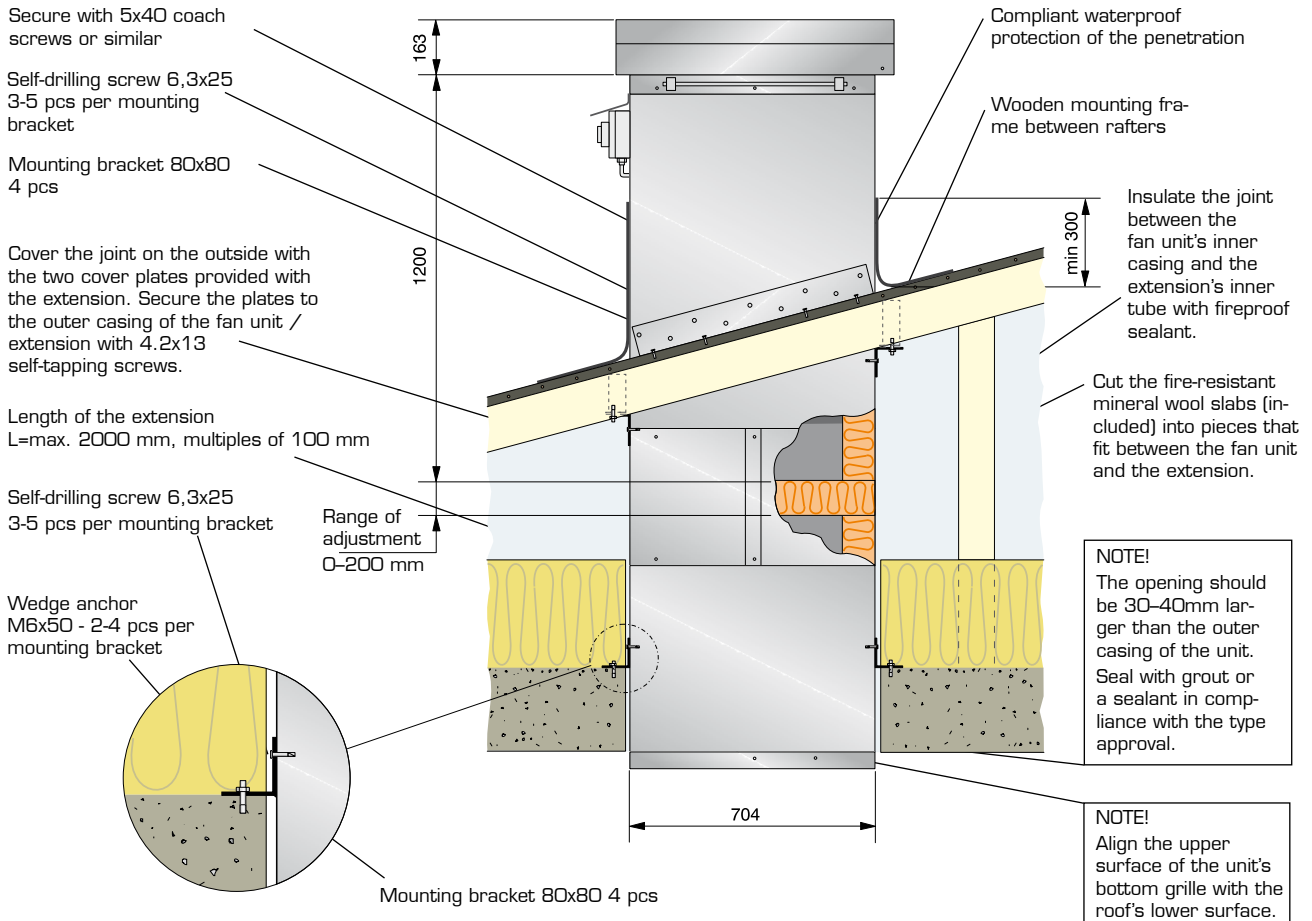
These instructions are also supplied with every SMIA system. For more information, please contact your local Fläkt Woods dealer.

1. Installation in a flat roof insulated with hard mineral wool



Installation and Product code

2. Installation in a pitched roof



Product code

Pressurisation and smoke exhaust system

SMOKE MASTER SMIA

The basic package includes:

Fan unit	SMIA-1
Control unit	SMIZ-2
Control panel	SMIZ-3
Differential pressure transmitter	SMIZ-4

Component codes

(when ordering individual components):

Fan unit	SMIA-1
Control unit	SMIZ-2
Control panel	SMIZ-3
Differential pressure transmitter	SMIZ-4

Optional extras:

Extension **SMIZ-1-aaaa**

Length L (mm) _____
L to be expressed in multiples of 100 mm, max. length L=2000 (see page 6)

Smoke detector **FDRC-2-SMIA**

We Bring Air to Life

Fläkt Woods is a global leader in air management. We specialise in the design and manufacture of a wide range of air climate and air movement solutions. And our collective experience is unrivalled.

Our constant aim is to provide systems that precisely deliver required functions and performance, as well as maximise energy efficiency.

Solutions for all your air climate and air movement needs

Fläkt Woods is providing solutions for ventilation and air climate for buildings as well as fan solutions for industry and infrastructure.

● Air Handling Units (AHUs)

Modular, compact and small AHU units. Designed to ensure optimisation of indoor air quality, operational performance and service life.

● Air Terminal Devices and Ducts

Supply and exhaust diffusers and valves for installation on walls, ceiling or floor are all included in our large range and fit all types of applications.

● Chilled Beams

Active induction beams for ventilation, cooling and heating, and passive convection beams for cooling. For suspended or flush-mounted ceiling installation - and multi-service configuration. With unique Comfort Control and Flow Pattern Control features.

● Residential ventilation

A complete range of products for residential ventilation. Consists of ventilation units, exhaust air fans and cooker hoods designed to optimise indoor comfort and save energy.

● Fans

Advanced axial, centrifugal and boxed fans for general and specialist applications. Comprehensive range including high temperature and ATEX compliant options. Engineered for energy efficiency and minimised life cycle cost.

● Chillers

Air-cooled and water-cooled chillers with cooling capacity up to 1800 kW. Designed to minimise annual energy consumption in all types of buildings.

● Controls and drives

Variable speed drives and control systems, all tested to ensure total compatibility with our products. Specialist team can advise on energy saving and overall system integration.

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The logo for Fläkt Woods, featuring the company name in a bold, green, sans-serif font. A stylized green swoosh or arc is positioned above the 't' in 'Woods' and below the 'ä' in 'Fläkt'.