ashirvad

by aliaxis

ACTIVE DRAINAGE VENTILATION

studor

Active Drainage Ventilation

Ashirvad offers a choice of building drainage ventilation options in the form of Primary ventilation, Secondary ventilation, Single stack system with stack-aerator and Active Drainage Ventilation.

Studor P.A.P.A. (Positive Air Pressure Attentuator) and Studor Air Admittance Valves (A.A.V.s) provide a complete Active Drainage Ventilation solution which is particularly suited to high-rise applications.

Core range


P.A.P.A.
Positive Air Pressure Attenuator
SEWER VENT
TERMINAL -
DO NOT REMOVE

About Ashirvad Pipes

Ashirvad Pipes, an Aliaxis group company, setup its Bengaluru units in 1998 and is a wholly owned company of Aliaxis group. Aliaxis group is a global leading manufacturer and distributor of plastic fluid handling systems used in residential, commercial and industrial buildings. Aliaxis, headquartered in Brussels, Belgium, is present over 40 countries with more than 100 manufacturing and commercial entities, employs over 15,700 people and generates more than 3 billion Euro (₹ 21, 600 crores approx.) in annual sales.

Ashirvad has always been relentless in its commitment to quality and services. Ashirvad pipes is a leading manufacturer and supplier of CPVC, uPVC, SWR plumbing systems and also the pioneer in designing and manufacturing of uPVC column pipes, which are used in the erection of submersible borehole pumps.
Today Ashirvad Pipes is the world's largest manufacturer of uPVC column pipes and successfully exporting to more than 40 countries. The CPVC Hot and Cold plumbing system is manufactured in collaboration with Lubrizol, USA.

Ashirvad, with a determination to be a one-stop shop for Plumbing, Agriculture, Sanitary and Fire Safety solutions, has recently expanded its product range and successfully introduced Agri Pipe, Casing Pipe, Blazemaster Fire Sprinklers.

Ashirvad today:

- Manufacturing capacity of more than 2,00,000 MT per annum
- Total factory area of 50 acres
- 500+ Strong Sales & marketing staff across India
- Strong team of 200+ at corporate office
- Over 4,500 manufacturing workforce
- 17 warehouses, 1,100 distributors, 53,000 dealers across India
- Exporting Column Pipes to more than 40 countries
- 2 factories in Bengaluru and another one in Bhiwadi (Rajasthan) near Delhi

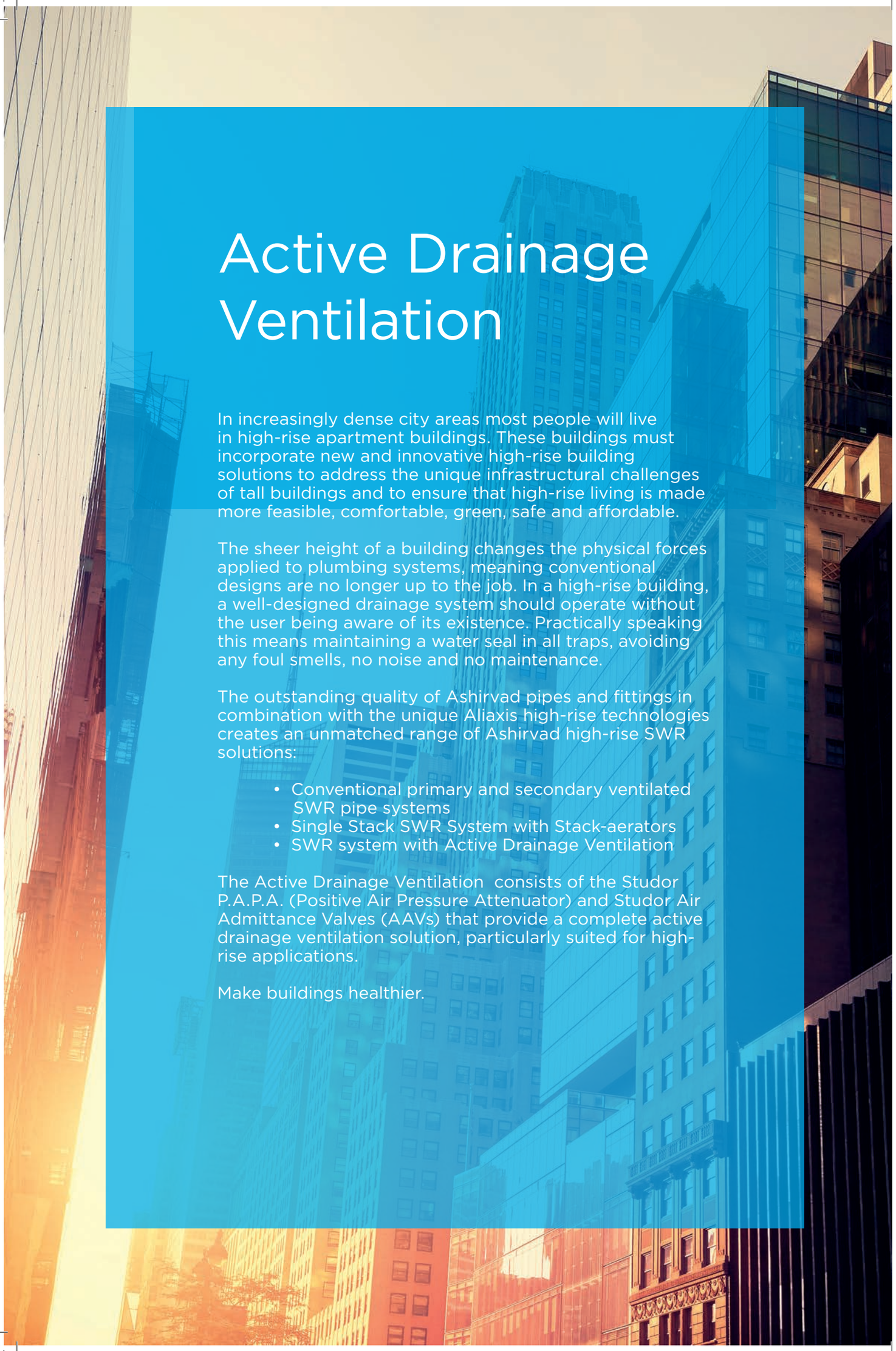
About Aliaxis

Aliaxis High-Rise Building Solutions is part of Aliaxis, a global leader in the manufacturing and distribution of advanced plastic piping systems. Comprised of more than 100 manufacturing and commercial businesses based in over 40 countries, we have a global workforce of 15,700 passionate individuals. With over 50 years of experience, extensive global resources and strong local brands, we offer a full portfolio of innovative systems for soil and waste, rainwater, water supply, energy and fire safety.

Through Ashirvad, Aliaxis offers different innovative plumbing, agriculture, sanitary, fine safety, drainage and high-rise solutions in India.

Our competence centres worldwide allow us to develop and test new approaches and set new standards in terms of noise reduction, system reliability and performance.

As experts in plastics, we have a track record of introducing new, non-conventional concepts to meet the specific challenges of high-rise buildings. We are committed to providing builders, architects, MEP consultants, contractors and installers with the most reliable and innovative solutions.



Active Drainage Ventilation

In increasingly dense city areas most people will live in high-rise apartment buildings. These buildings must incorporate new and innovative high-rise building solutions to address the unique infrastructural challenges of tall buildings and to ensure that high-rise living is made more feasible, comfortable, green, safe and affordable.

The sheer height of a building changes the physical forces applied to plumbing systems, meaning conventional designs are no longer up to the job. In a high-rise building, a well-designed drainage system should operate without the user being aware of its existence. Practically speaking this means maintaining a water seal in all traps, avoiding any foul smells, no noise and no maintenance.

The outstanding quality of Ashirvad pipes and fittings in combination with the unique Aliaxis high-rise technologies creates an unmatched range of Ashirvad high-rise SWR solutions:

- Conventional primary and secondary ventilated SWR pipe systems
- Single Stack SWR System with Stack-aerators
- SWR system with Active Drainage Ventilation

The Active Drainage Ventilation consists of the Studor P.A.P.A. (Positive Air Pressure Attenuator) and Studor Air Admittance Valves (AAVs) that provide a complete active drainage ventilation solution, particularly suited for high-rise applications.

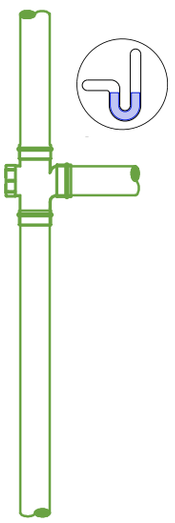
Make buildings healthier.

Ventilation of stacks

Fundamentally, an efficient drainage system design is about managing the mix of air and water. More precisely, it is about managing the air pressure regime within the boundaries that maintain a water seal in the trap. Ashirvad offers 4 different product solutions to manage this.

1. Primary Ventilation

Traditional drainage design of waste stacks with lower sanitary fixtures rely on a single pipe system to drain both the waste water and ventilate air to ensure this air pressure is maintained.



Waste stack capacity

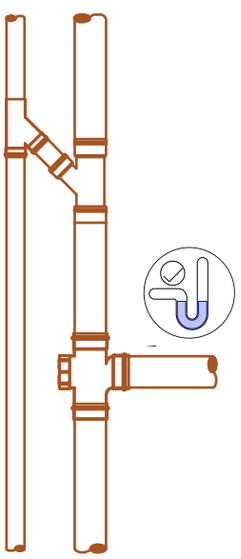
The capacity of the waste stack and size is taken from tables 11 & 12 of BS EN 12056-2: 2000.

	Stack size (mm)	Maximum capacity (l/s)*	
		Square branches	Swept branches
Primary ventilated stack	110	4.0	5.2
	160	9.5	12.4

* Primary ventilated stacks are not limited in height in the BS EN12056-2:2000. We recommend primary ventilated stacks typically for low - to medium rise buildings only.

2. Secondary Ventilation

Traditional drainage design incorporates the installation of a secondary ventilation stack and branch pipework system alongside the main stack to ensure this air pressure is maintained.



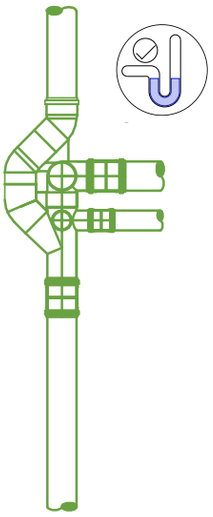
Soil stack capacity

The capacity of a soil stack can be increased by the installation of a secondary ventilated stack. The following information is taken from tables 11 & 12 of BS EN 12056-2: 2000 which illustrates this increase.

	Stack size (mm)	Secondary vent size (mm)	Maximum capacity (l/s)*	
			Square branches	Swept branches
Secondary ventilated stack	110	50 / 75	5.6	7.3
	160	75	12.4	18.3

* Secondary ventilated stacks are not limited in height in the BS EN12056-2:2000. We recommend for to the vent pipe to be equally sized as the wet stack for high-rise buildings.

3. Single Stack System with Stack-Aerator



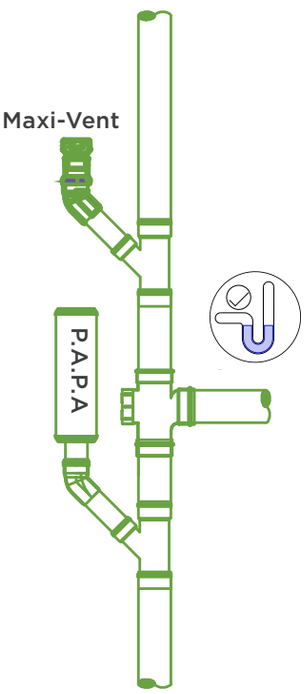
An alternative to secondary ventilation in high-rise applications is the use of a stack-aerator. A stack-aerator fitting breaks the discharge fall on each floor and, as a consequence, the secondary vent pipe is not required as the pressure difference stays well within the limits. The unique shape of the stack-aerator increases the capacity of the stack, allowing the soil and waste flow from the higher floors to smoothly converge with the flow on the lower floor.

Stack-aerator capacity

The capacity the Ashirvad stack-aerator has been validated by the Aliaxis Hydro-Dynamics Experience Centre and is illustrated below.

	Stack size (mm)	Maximum capacity (l/s)
Ashirvad stack - aerator	110	8.1

4. Active Drainage Ventilation



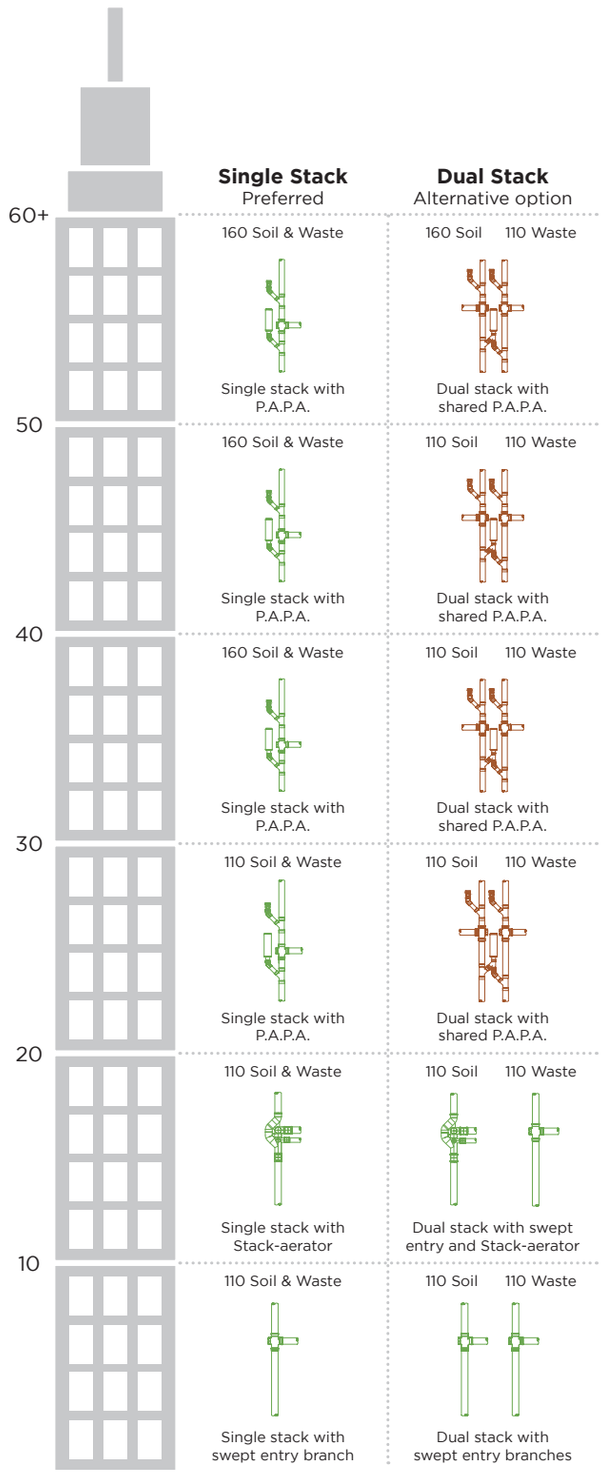
An active ventilated system provides relief at the Point Of Need (P.O.N) by removing or attenuating an incoming pressure transient that, if left, could lead to trap seal depletion. The single stack solution with the P.A.P.A.s and AAVs is an ideal solution for high-rise applications, eliminating the need for roof penetrations and secondary ventilation. The combination of the P.A.P.A., Maxi-Vent and Mini-Vent AAVs support a complete system to limit pressure fluctuations, guaranteeing the integrity of the traps.

Benefits of single stack with the Studor P.A.P.A system:

- Provides effective protection against positive pressures in the drainage system
- Scientifically proven and tested for total peace of mind
- Reduces installed service space and less slab & roof penetrations
- Product solutions for new buildings and retrofit projects
- Connects to all Ashirvad SWR systems
- Exclusively designed by in-house technical experts

Ashirvad high-rise design guidelines

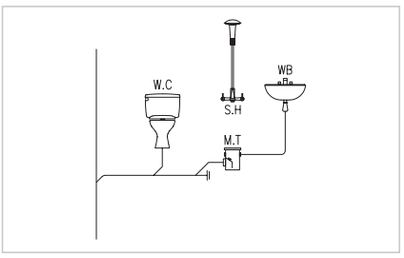
Single bathroom connected to stack



Quick guidance:

0 - 10	Ashirvad SWR Single Stack system with swept entry branch
10 - 20	Ashirvad SWR Single Stack system with Stack-aerators Complex layout with offsets : P.A.P.A. system
20 - 30+	Ashirvad Single Stack system with P.A.P.A.s

Typical bathroom:



ashirvad PIPES

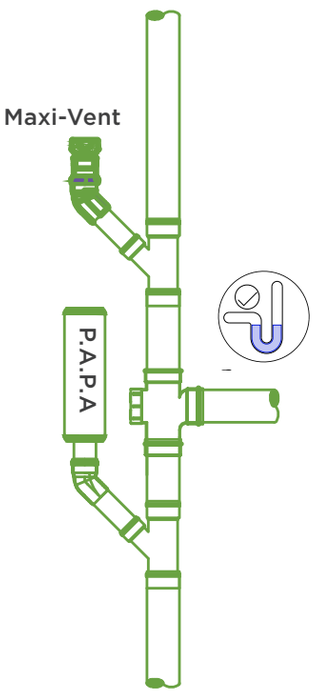
P.A.P.A. capacity

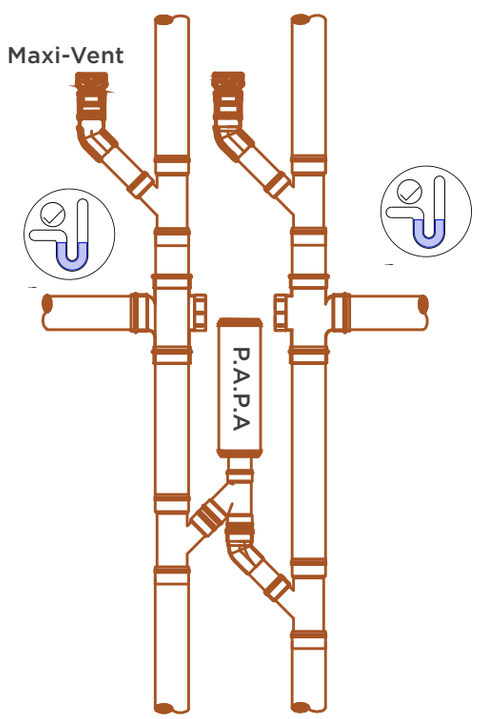
Maximum drainage flow for P.A.P.A. is illustrated below:

	Stack size (mm)	Maximum capacity (l/s)*
P.A.P.A capacity	110	7.3
	160	18.3

The pipe diameter is calculated as per BS-EN12056 using the maximum capacity of a secondary ventilated system. The capacity of the P.A.P.A. system does not depend on the use of square or swept entries. The Active Drainage Ventilation system can be used for single stack systems and dual stack system where soil and waste are separated.

Single stack system with integrated Soil & Waste	Dual stack system with separated Soil and Waste
Less stack pipes	Dual stack pipes
Maintain a high capacity	Maintain the highest capacity
Soil & Waste combined for central water re-use	Soil & Waste separated for in building Waste water re-use





P.A.P.A. (Positive Air Pressure Attenuator)

P.A.P.A. (Positive Air Pressure Attenuator) has been developed through years of research and development to solve the problems of positive pressures within drainage systems of multi-storey developments.

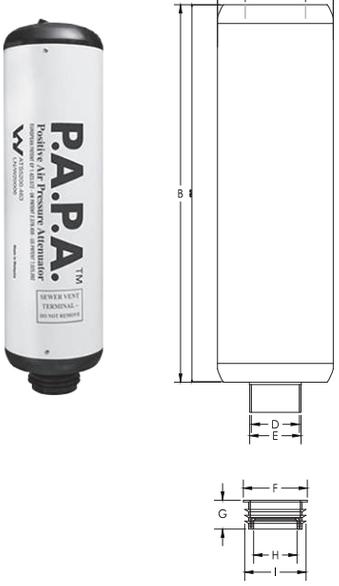
Features:

- Easy to install vertically or horizontally
- Lightweight and strong construction
- Push-fit connection
- Suitable for multi-storey developments
- Resistant to most chemicals

Installation

For installation instructions, please refer to page 24.

P.A.P.A.



Size mm	A	B	C	D	E	F	G	H	I	Colour
75/110	200	652	104	83	89	111	50	75	106	W

Materials

Component	Material
P.A.P.A. body	ABS
Internal container	Isoprene
Connector	Rubber

Volume Capacity

Series assembly	(litres)
1 unit	3.785
2 units	7.570
3 units	11.355
4 units	15.140

Temperature range	-20ºC to +60ºC -40ºF to +150ºF
Max. pressure rating	10,000 Pa (1m/40"H_2O) at 0 Pa or higher

Air Admittance Valves

Air Admittance Valves (A.A.V's) eliminate the need for passive pipe venting and roof penetrations with excellent performance as a result of their unique and patented design.

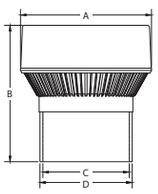
The negative pressure-activated, one-way A.A.V's vents to protect the trap seals in the drainage system by allowing the intake of air, so that the right level of pressure within the drainage system is maintained.

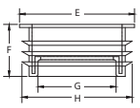
Their unique design guarantees a lifetime performance on quick opening reaction time, zero maintenance and a 100% closing ability that meets all leading international product standards.

EN 12380 A1 Rated

MAXI-VENT WITH CONNECTOR

Size mm	A	B	C	D	E	F	G	H
75/110	126	131	83	89	111	50	75	106





Performance parameter

Temperature range	-40ºC to +60ºC (CE) -40ºF to +150ºF (ASSE)
Opening pressure	-70 Pa (-0.010 PSI)
Max. pressure rating tightness	10,000 Pa (1m/40" H_2O) at 0 Pa or higher

Air flow capacity	Branch	Stack
Europe	32 l/s	32 l/s
AU/NZ	32 l/s / 1728 FU	32 l/s / 125 FU
USA	1 to 160 DFU	72 to 500 DFU

Materials

Component	Material
Maxi-Vent body	ABS
Maxi-Vent membrane	Synthetic rubber
Connector	Rubber

Features:

- 75/110mm pipe sizes (Maxi-Vent)
- 40/50mm pipe sizes (Mini-Vent)
- Prevents the release of foul air from the drainage system
- Can divert condensation away from the sealing membrane
- Double screen protection against foreign material or insects

Benefits

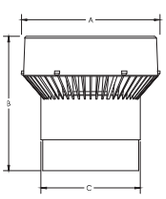
- Constant lifetime opening and closing
- Neutralise any internal condensation for constant membrane opening ability
- Dry membrane for consistent lifetime functioning, not depending on lubrication
- 500K cycle endurance testing
- Connects to all Ashirvad Plumbing & Drainage systems

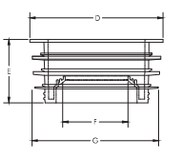
Installation

For full installation instructions, please refer to page 25.

MINI-VENT WITH CONNECTOR

Size mm	A	B	C	D	E	F	G
40/50	70	67	47	67	31.9	33	64





Performance parameter

Temperature range	-20ºC to +60ºC (CE) -40ºF to +150ºF (ASSE)
Opening pressure	-70 Pa (-0.010 PSI)
Max. pressure rating tightness	10,000 Pa (1m/40" H_2O) at 0 Pa or higher

Air flow capacity	Branch	Stack
Europe	7.5 l/s	7.5 l/s
AU/NZ	7.5 l/s / 94 FU	7.5 l/s / 7 FU
USA	1 to 160 DFU	8 to 24 DFU

Materials

Component	Material
Mini-Vent cap & body	ABS
Mini-Vent membrane	Synthetic rubber
Connector	TPE

Ashirvad and Aliaxis Technical Services

Each high-rise project is unique and requires customised design and engineering that goes far beyond any standard. Ashirvad, supported by Aliaxis Technical Services, offers full support in the design and engineering of systems, to ensure that the specifications of each building are considered and that the performance of the system aligns with your needs.

You can trust Ashirvad to develop a premium-quality design, based on the best system, to deal with pressure transients and ensure water trap seals protection. We offer extensive expertise in designing piping systems for all types of tall, complex buildings, according to their specific requirements.

Our technical team can help you specify the system you need

Years of experience mean that we can support you throughout your design process and assist with any technical and installation requirements.

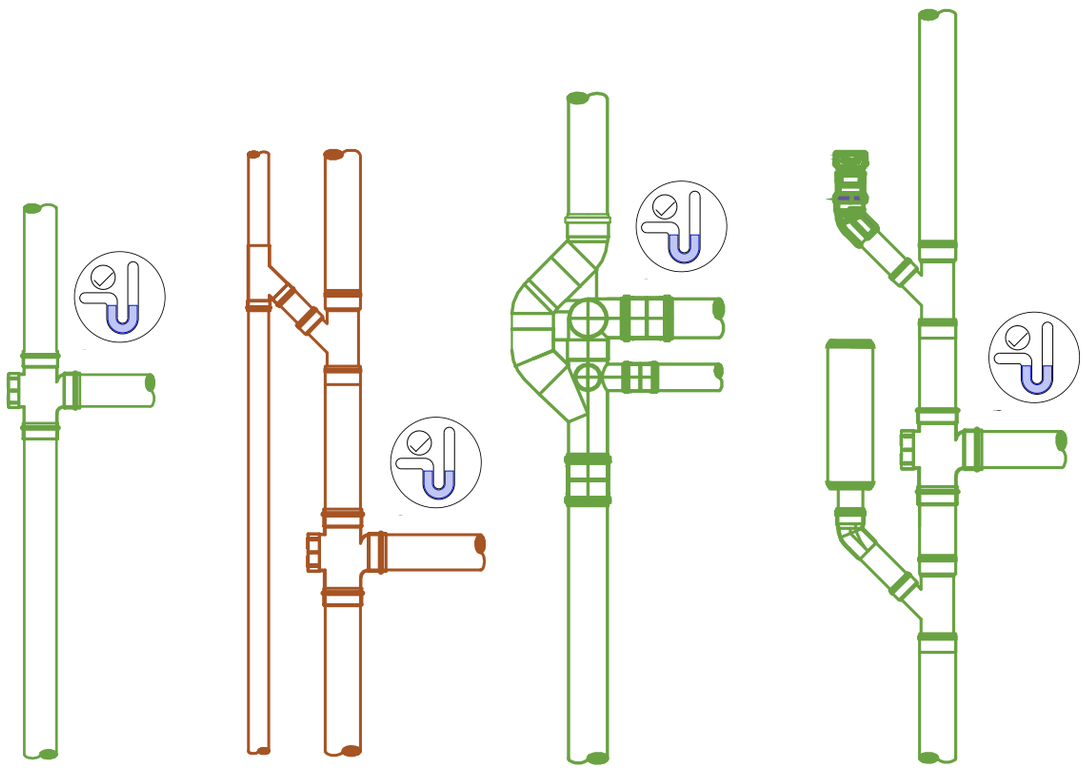
- DESIGN SERVICES
- VALUE ENGINEERING
- TECHNICAL ADVICE
- SEMINARS / PRESENTATIONS
- MATERIAL TAKE-OFFS
- CAD FILES
- FIELD AND SITE SUPPORT
- SPECIFICATION
- TRAINING

ashirvad by aliaxis

Design

Venting

Ashirvad Technical Services design drainage pipework systems using the four methods of ventilation. Primary ventilation, secondary ventilation, single stack system with stack-aerator and active drainage ventilation using Studor P.A.P.A. and A.A.V.s.



Primary ventilation

Secondary ventilation

Single stack system with Stack-aerator

Active Drainage Ventilation

Design Guidelines

When designing an active drainage ventilation system, the following should be considered:

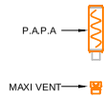
- Pressure within the pipework system is constantly changing
- Ensure the water seal in the trap is protected, due to the continual pressure changes in the pipework system

To create an effective active drainage ventilation system, P.A.P.A. should be installed throughout the pipework. Their position and layout will be designed by our in-house Technical Services team however this table provides general guidance on how many P.A.P.A.s may be required:

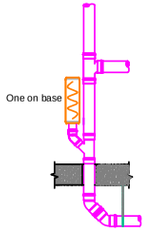
Design Guidelines Active Drainage Ventilation

Single pipe system with single bathroom

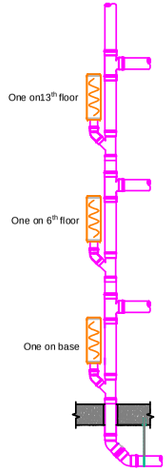
Floors	Code	Single bathrooms	Maximum P.A.P.A.s (can be less)
0-10	(0)	1 x PAPA at base (0)	1
10-20	(0,6,13)	1 x PAPA at base (0) 2 x PAPAs divided (6,13)	3
20-30	(0,5,12,20)	1 x PAPA at base (0) 3 x PAPAs divided (5, 12, 20)	4
30-40	(0,5,10,15,25,35)	1 x PAPA at base (0) 3 x PAPA up to 20th (5,10,15) 1 x PAPA on every 10th floor level after that (25,35)	6
40+	(0,0,5,10,15,25,35,45,55,...)	2 x PAPA at base (0,0) 3 x PAPA up to 20th (5,10,15) 1 x PAPA on every 10th floor level after that (25,35,45,55,..)	8+
Offset		Maximum 7 floors above offset : no PAPA required Between 8-20 floor levels above offset : 1 at base and then every 7th floor level Above 20 floor levels the offset is base of stack and begin again	
Maxi-Vent		Every 5 floors	



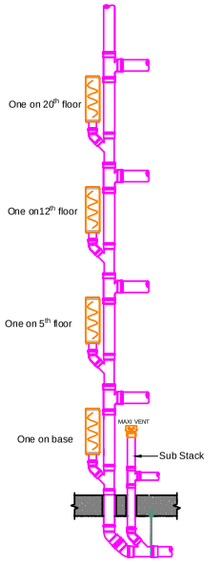
Maxi-Vent at Every 5 floors
for main stack



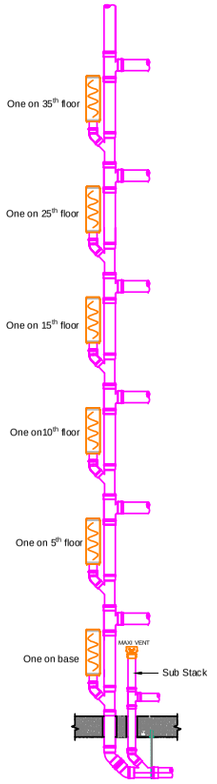
0 - 10 FLOORS



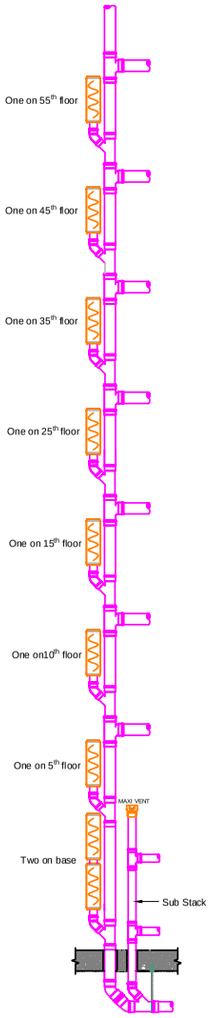
10 - 20 FLOORS



20 - 30 FLOORS



30 - 40 FLOORS



40+ FLOORS

SINGLE PIPE SYSTEM WITH SINGLE BATHROOM

Dual pipe system with single bathroom

Floors	Code	Single bathrooms	Maximum P.A.P.A.s (can be less)
0-10	2 x (0)	1 x PAPA at base per stack 2 x (0)	2
10-20	2 x (0) 1 x (6,13)	1 x PAPA at base per stack 2 x (0) 2 x PAPAs divided and shared 1 x (6,13)	4
20-30	2 x (0) 1 x (5,12,20)	1 x PAPA at base per stack 2 x (0) 3 x PAPAs divided and shared (5, 12, 20)	5
30-40	2 x (0) 1 x (5,10,15,25,35)	1 x PAPA at base per stack 2 x (0) 3 x shared PAPA up to 20th (5,10,15) 1 x shared PAPA on every 10th floor level after that (25,35)	7
40+	2 x (0) 1 x (5,10,15,25,35,45,55,...)	2 x PAPA at base (0,0) 3 x shared PAPA up to floor level 20 (5,10,15) 1 x shared PAPA on every 10th floor level after that (25,35,45,55,..)	8+
Offset		Maximum 7 levels above offset : no PAPA required Between 8-20 floor levels above offset : 1 shared at base and a shared PAPA every 7th floor level Above 20 floor levels the offset is base of stack and begin again (dedicated at the base)	
Maxi-Vent		Every 5 levels dedicated per stack	

For back to back bathroom, single pipe & dual pipe design please contact Ashirvad team.

Bathroom up to 6 appliances so from typical (WC, basin, shower) to a higher loaded bathroom (WC, double basin, shower, bath, bidet).

The loading calculation (Qww) determines the pipe diameter and the maximum levels depending on the appliances.

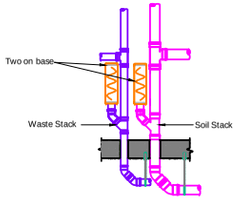
Active Drainage Ventilation is about zonal protection that operates independent from diameter.

These are design guidelines and we estimate the maximum number of PAPAs used in a project. Depending on the design there could be less.

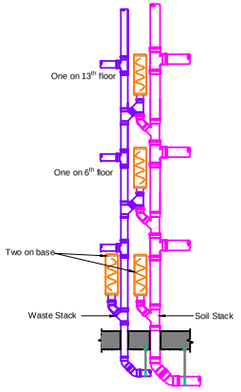
Minimum distance

- Stack extending no more than 5 floors above the base of the stack or offset: 0.60 metres
- Stack extending more than 5 floors above the base of the stack or offset : 1 metre
- Stack receiving suds discharges: as close as possible to the first horizontal branch
- Minimum distance shall be measured from centre to centre

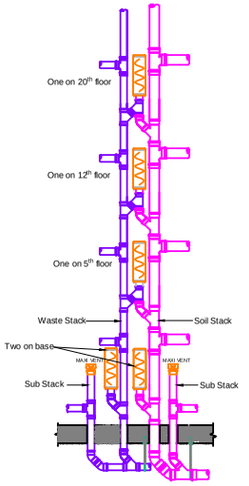
Maxi-Vent at Every 5 floors separate for soil stack & waste stack



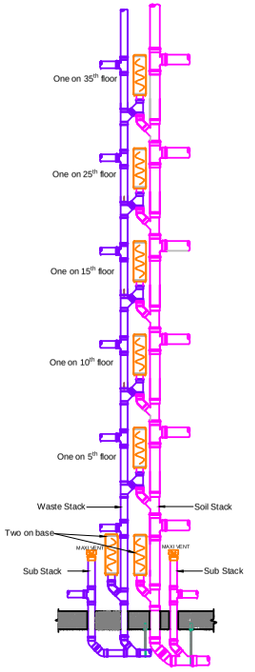
0 - 10 FLOORS



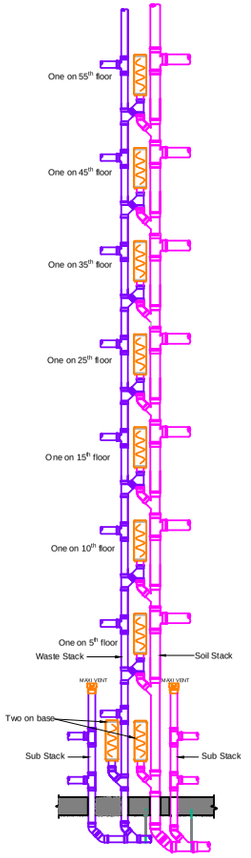
10 - 20 FLOORS



20 - 30 FLOORS



30 - 40 FLOORS



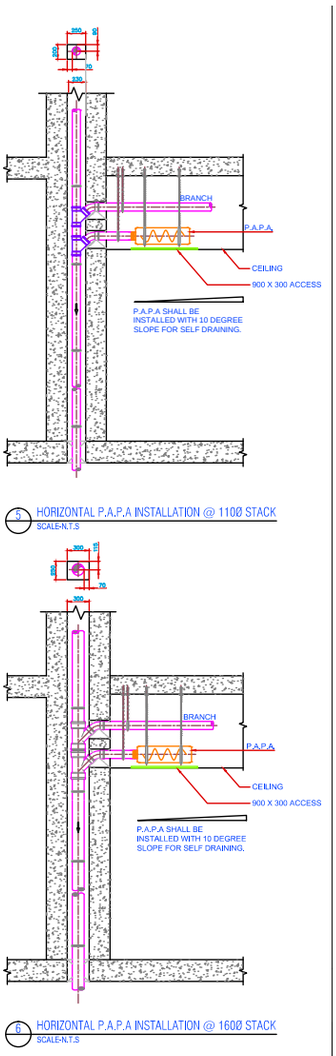
40+ FLOORS

DUAL PIPE SYSTEM WITH SINGLE BATHROOM

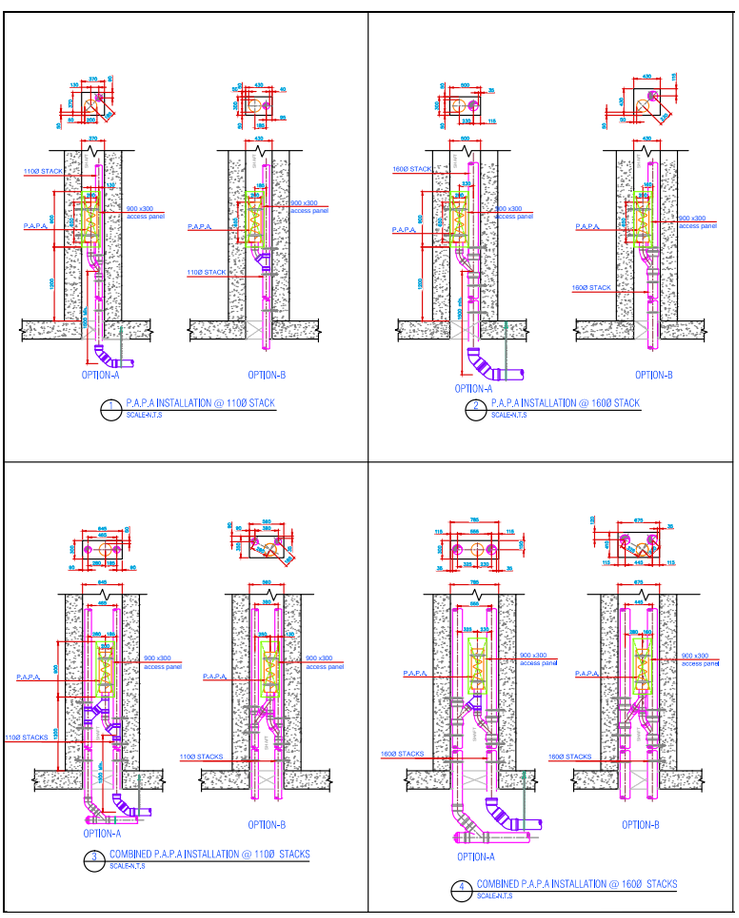
Sizing of stacks

It is recommended that the guidance given within BS EN 12056, part 2 be adopted when sizing stacks. Ashirvad technical services team offer design and installation advice, including the sizing of stacks, for those customers who make a commitment to use Ashirvad Plumbing & Drainage products.

Accurate design and correct installation is key to the continuous efficiency of the drainage system. Please refer to full installation information in conjunction with the above standard.



Horizontal floor installation



Vertical duct installation


P.A.P.A.™
Positive Air Pressure Attenuator
EUROPEAN PATENT EP 1.423.572 - UK PATENT 2.379.459 - US PATENT 7,025,092
ATS5200.463
LN/W20006
Made in Malaysia
SEWER VENT
TERMINAL -
DO NOT REMOVE

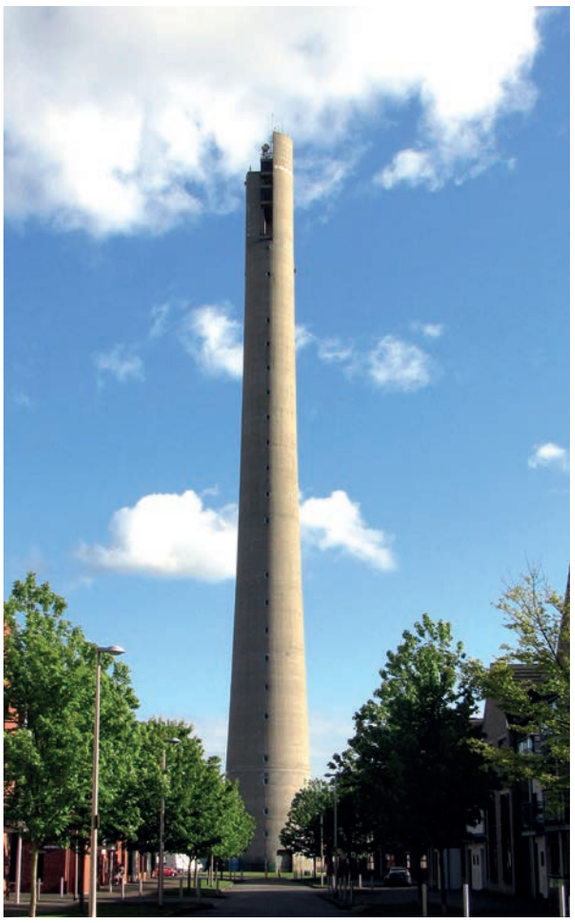
Test facilities

Seeing is believing

See how water and air interacts in a true high-rise setting. The ‘Seeing is Believing’ experience is available in two unique testing facilities located in the UK and the Netherlands. They utilise clear pipe and completely visible products and fittings to demonstrate the occurrences within a real high-rise drainage system and how they are managed by the P.A.P.A. System versus a conventional vent pipe system.

Aliaxis High-rise Research Centre

The Aliaxis High-rise Research Centre is hosted by the National Lift Tower in Northampton (United Kingdom). It is the world’s tallest drainage testing installation, comprising a 96 metre soil stack fitted with the P.A.P.A. System (P.A.P.A. and AAVs) for active ventilation. Electronic pressure sensors in the test rig allow readings in the pipework to be recorded and used to objectively analyse the performance of the P.A.P.A. System versus alternative configurations.



The National Lift Tower

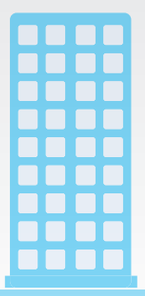
Where to use active drainage ventilation

Low-rise buildings

In low-rise buildings (up to 4 floors) the standardised plumbing design has proven to work without using active drainage ventilation. Typical residential roof penetrations, however, can be avoided using a Maxi-Vent; keeping the roof intact and the plumbing system internal for better insulation.

Medium-rise buildings

In medium-rise buildings (4 to 12 floors) traps can be depleted by induced siphonage, a phenomena in which a flush on one level causes negative pressures in the pipe system which acts on traps of other levels. The Mini-Vent placed on each horizontal branch will eliminate any negative pressure and protect the traps. The Maxi-Vent will avoid a roof penetration.



Hydro-Dynamics Experience Centre

Hydro-Dynamics Experience Centre

The state-of-the-art Hydro-Dynamics Experience Centre (HDEC), located in Panningen (Netherlands), combines a testing facility with a customer experience centre, where customers can see precisely how water and air actually flow through our pipe systems. The HDEC is instrumental in testing new solutions and also simulates the performance of systems in specific situations for increasingly complex and/or high-rise buildings.

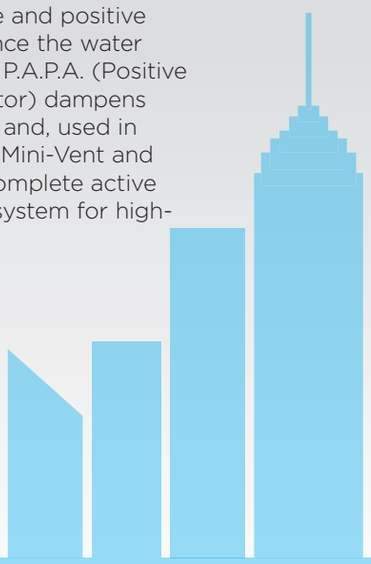
Heriot-Watt University

Founded in 1821 in Edinburgh, Scotland, and has established a reputation as a leading research-led university and provider of education around the world, with campuses in several locations including Dubai and Malaysia. Heriot-Watt and Studor have collaborated for over 20 years on research and development on a range of innovative new products. The P.A.P.A. (Positive Air Pressure Attenuator) is one of the results of this partnership; many other developments are currently in process, with the potential to revolutionise the high-rise building drainage market.

HERIOT WATT UNIVERSITY

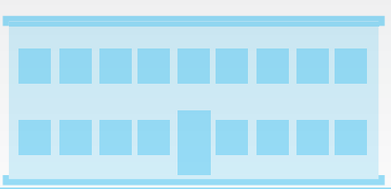
High-rise buildings

In high-rise buildings (above 12 floors) there will be negative and positive pressures that influence the water seal in the traps. The P.A.P.A. (Positive Air Pressure Attenuator) dampens the positive pressure and, used in conjunction with the Mini-Vent and Maxi-Vent, offers a complete active drainage ventilation system for high-rise buildings.



Retro-fit buildings

In existing buildings, drainage problems like slow wastewater drainage, gurgling noises, foul odours and trap seal depletion are largely due to negative pressures and can be solved by adding air admittance valves (AVVs). Retrofitting vertical stacks with P.A.P.A.s. will combat existing positive pressure problems in high rise buildings.

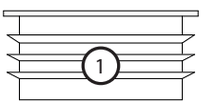


Installation data

P.A.P.A. (Positive Air Pressure Attenuator)

P.A.P.A. is a device used to eliminate the harmful effects of positive transients generated in gravity fed systems in multi-storey buildings

The P.A.P.A. is provided with a rubber connector on the base to allow greater versatility.

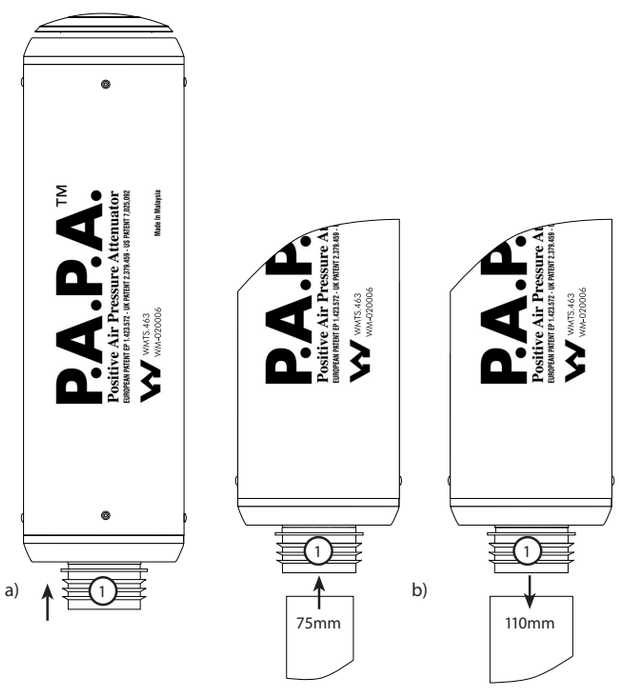


Rubber connector

Installing P.A.P.A. with a rubber connector:

a) Ensure the rubber connector is securely fitted to the base of the P.A.P.A.;

b) Push-fit the rubber connector fitted to the base of the P.A.P.A. onto a 75mm or into a 110mm pipe connection.



Maxi-Vent

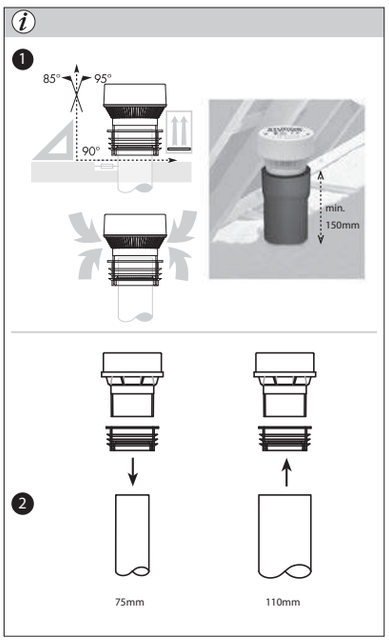
1. The Maxi-Vent must be installed vertically and upright to permit its correct operation (within 5°of vertical).

   Place the valve in an accessible location, allowing free air movement.

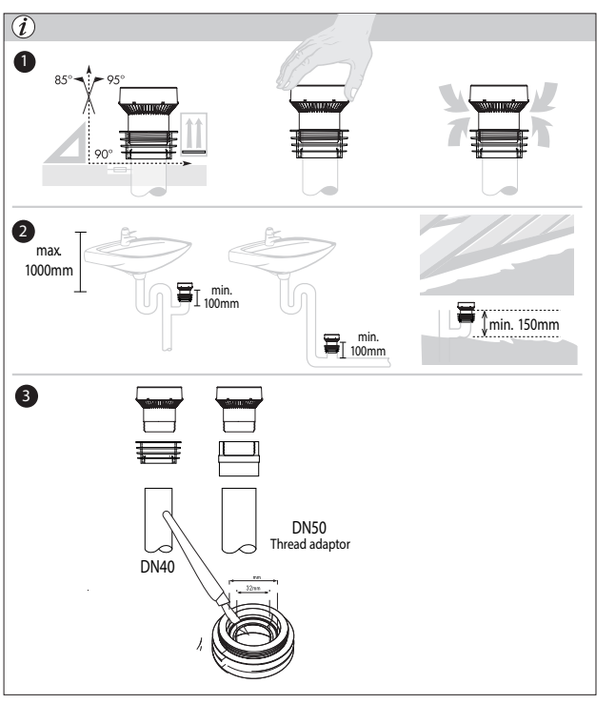
   Install 150mm above the insulation in attic installations.

   Install the Maxi-Vent after the drainage system has been tested.

2. As standard, the Maxi-Vent is provided with a push-fit connector allowing its fixture to stack pipes sized 75mm to 110mm.



Mini-Vent



1. The Mini-Vent must be installed vertically and upright to permit its correct operation (within 5°of vertical).

   Place the valve in an accessible location, allowing free air movement.

2. Install the Studor Mini-Vent no more than 1,000mm below the flood level of the fixture to which it is connected.

   The valve must be installed 100mm above the horizontal waste.

   In attic installations, place the valve 150mm above the insulation.

   Install the valve after the drainage system has been tested.

3. To prepare the connector to fit to DN40 pipe: on the underside of the connector use a cutter to make a small incision in the indentation of the second marked ring. Tear off excess material.

Standards & Accreditations

BS EN 12380: 2002

The first European standard (EN 12380:2002) to cover the requirements, test methods and evaluation of conformity for Air Admittance Valves (AAVs) for drainage systems installed within buildings (in accordance with European Standard EN 12056-2:2002)

BS EN 12056-2: 2000

(GRAVITY DRAINAGE SYSTEMS INSIDE BUILDINGS – PART 2: SANITARY PIPEWORK, LAYOUT AND CALCULATION) WAS PUBLISHED IN JUNE 2000.

The standard provides different options for handling primary and secondary ventilation and, for the first time within a standard, it specifies AAVs as a legal alternative to the traditional pipe ventilation. Guidelines for the use of AAVs are detailed, including the requirement for them to comply with EN 12380.

EN 12056-2 provides a table based on the fixture units within the drainage system in order to calculate the required airflow. Studor developed the Airflow Calculator as a valuable tool to simplify the calculation process.

AS/NZS 3500.2: 2015

(PLUMBING AND DRAINAGE – PART 2: SANITARY PLUMBING AND DRAINAGE)

Table 6.2(A) provides a table detailing the fixture unit ratings for all fixtures, which are to be used for the sizing of drains, stacks and graded discharge pipes. Section 6.9 of the standard provides the guidelines for how AAVs may be used.

Section 6.10 was added as part of the November 2005 amendment, and provides guidelines on how devices to attenuate positive pressure transients in plumbing stacks, i.e. the P.A.P.A. (Positive Air Pressure Attenuator), may be used.

USA AND CANADIAN REGULATIONS

STUDOR ADHERES TO THE FOLLOWING USA AND CANADIAN REGULATIONS AND PLUMBING CODES:

- International Plumbing Code (IPC).
- International Residential Code (IRC).
- Uniform Plumbing Code (UPC).
- National Standard Plumbing Code (NSPC).
- Canadian National Plumbing.

BBA APPROVAL INSPECTION TESTING CERTIFICATION CERT NO 15/5234

ICC ES PMG PMG-1482

WMTS-463
WM-020006
WM-022831

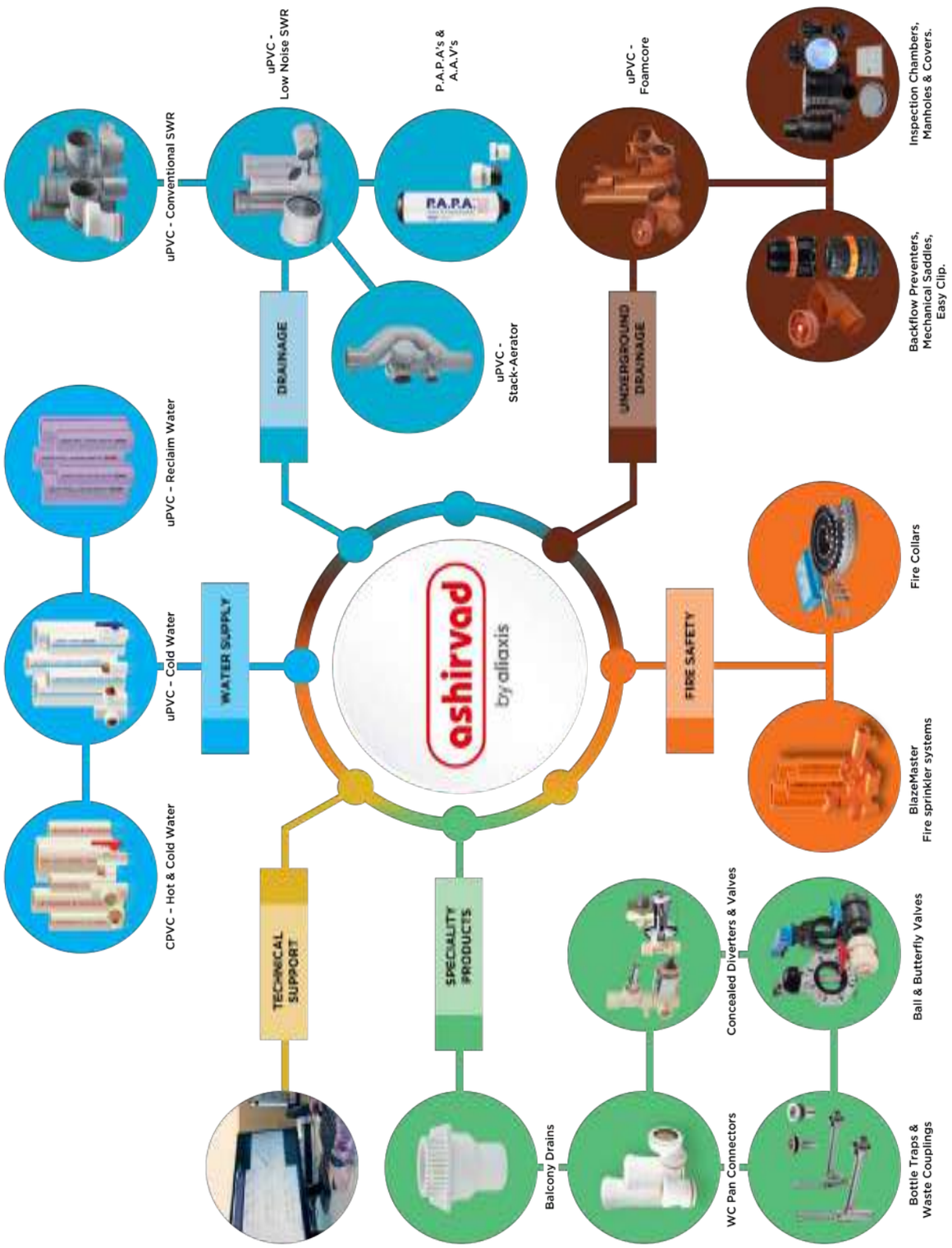
DIN Geprüft 011-7B003 011-7B008

CE

P.A.P.A.™ Positive Air Pressure Attenuator

ashirvad by aliaxis

Ashirvad Range of Products



Ashirvad Pipes Pvt. Ltd., 4-B, Attibele Industrial Area, Hosur Road, Bengaluru - 562 107, Karnataka, INDIA.
T +91 80 2806 1000 / 2806 1700 **F** +91 80 2806 1080 **M** +91 9902 333 333 **E** info@ashirvad.com

SMART WATER MANAGEMENT PLUMBING . SANITARY . AGRICULTURE

STUDOR_TM - Ver 01_Feb 2019

ashirvad
by aliaxis

National Award Winner

ISO 9001, ISO 14001 & ISO 45001 Certified

Construction Industry Development Council Certified

Awarded by World Consulting and Research Corporation

www.aliaxis.com/high-rise

www.ashirvad.com