

VALLOX BLUESKY

Air Distribution System



VALLOX
HOME *of* FRESH AIR

Vallox BlueSky

FLEXIBLE AND EASY-TO-INSTALL AIR DISTRIBUTION SYSTEM

Vallox BlueSky is an easy-to-install air distribution system that consists of a flexible ventilation duct made from odourless polyethylene, sound-dampening air distribution boxes, and other necessary installation accessories.

Vallox BlueSky ventilation duct has a double-casing structure, which is protected against dents. It consists of a corrugated external envelope and an antistatic, air- and watertight, and anti-microbial inner surface. The smooth inner surface is dirt-repellent and easy to clean.

Supply and extract air ducts are led from the ventilation unit to the air distribution boxes, and from there Vallox BlueSky ducts are led to the valves. The Vallox BlueSky air distribution system is easily installed inside dividing walls, intermediate floors, false ceilings or enclosures, or embedded in concrete. The handy quick-release couplings speed installation.

Compact

- Outer diameter only 75 mm
- No large enclosures are needed, so the entire system can be installed in heated premises

Hygienic and easy to clean

- Smooth, antistatic, and anti-bacterial inner surface

Airtight structure and low rate of pressure loss

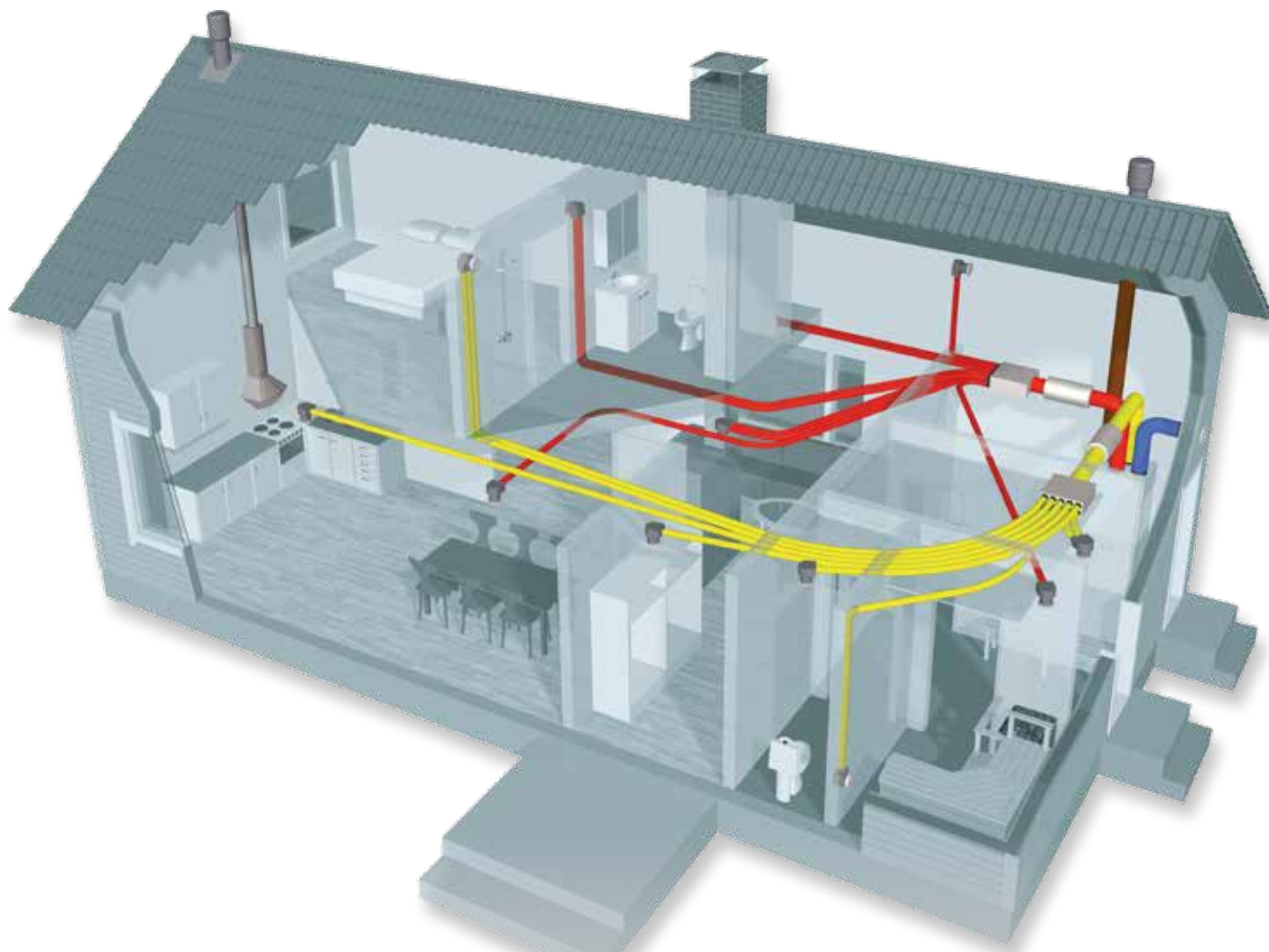
- reduces energy consumption

Quick to install

- Flexible duct allows installation without elbows
- Easy-to-use quick coupling. No drilling or riveting needed!
- Can be extended with quick couplings, reducing material waste
- Easy to install inside construction components during erection of the building frame similarly to electrical installations and the sewage system
- Usually no additional insulation is needed when installed inside blown wool insulation

Quick installation and low need for duct components makes the Vallox BlueSky duct affordable for both new construction and renovations.





TECHNICAL SPECIFICATIONS

Material	Odourless, antistatic, food-grade HD polyethylene
Traverse profile rigidity	SR24 > 31,5 kN/m ²
Smallest bending radius	same as pipe diameter
Dimensions	outer diameter = 75 mm inner diameter = 63 mm r = 6 mm
Recognisability	Double-casing structure. Outer surface is blue with grooves at a 8.5 mm interval. The inner surface is smooth. Black 'Vallox' text on the outer surface at one-metre intervals.
Weight	0.35 kg/m
Roll length	50 m
Installation and operating temperature	-20°C...+90°C
Connections	Quick coupling and ring seal: air- and watertight in accordance with DIN EN 1610 standard
Burning behaviour	No fire rating
Measurements	
Emission measurement	VTT-S-00801-07
Dirt adhesion	VTT-S-04858-07
Cleanability	VTT-S-04858-07
Installability	VTT-S-04858-07
Fire test	VTT-S-03462-08
Fire test (duct)	VTT-R-04517-10

AIR DISTRIBUTION SYSTEM DESIGN

In the Vallox BlueSky air distribution system, one or two ducts lead to each valve from a sound-insulated air distribution box. The distribution boxes lessen the sound of the fans, and the sound from one room to another. However, it is recommended that a silencer be installed between the ventilation unit and the air distribution box.

To minimize the length of individual ducts and the pressure loss, use a star-shape design when installing the air duct system.

INSULATION

There is no need to insulate the supply and extract air ducts inside the vapour barrier. The outdoor and extract air ducts must be insulated with 19 mm plastic foam inside the vapour barrier and with 50 mm wool outside the vapour barrier (no vapour-tight surface).

FOLLOW THE APPLICABLE REGULATIONS

Vallox BlueSky air distribution system must be designed to comply with the regulations provided in sections D2, E1, E7, and C1 of the National Building Code of Finland.

INDICATIVE NEED FOR SUPPLIES FOR THE VALLOX BLUESKY AIR DISTRIBUTION SYSTEM

Ducts

The required volume is calculated in rolls based on the number of rooms. For two-storey buildings, one extra roll must be added to the volume calculated based on the number of rooms. For three-storey buildings, two extra rolls must be added.

The number of air distribution boxes, valves, and related connectors needed is calculated from the ventilation plan. Another way of calculating the number of valves needed is to multiply the number of rooms by 1.2 (to be rounded upwards). This takes account of the fact that every sauna must have two valves, as do some well large lounges.

Any premises with a ventilation valve counts as a room, including vestibules used for storing clothes and separate dining areas. Lobbies and halls are usually excluded from the calculations.

Other ducts needed

The outdoor air duct, exhaust air duct, and the duct between the unit and distribution box are always made from a hard duct. Silencers are located between the unit and the air distribution boxes. The cooker hood and fan extract ducts must always be made from a spiral duct.

INDICATIVE NEED FOR VALLOX BLUESKY ACCESSORIES

Item	Number of rooms		
	10 or less	11 – 15	16 – 20
Duct ø75 mm (50 m/roll)	2 rolls	3 rolls	4 rolls
External connector	4 pcs	6 pcs	8 pcs
Ring seal (10 pcs/package)	4 pcs	6 pcs	8 pcs
Air distribution box 6 outputs (connection 125 mm, H=200)	1 pc		
Air distribution box 10 outputs (connection 160 mm, H=200)	1 pc	2 pcs	
Air distribution box 15 outputs (connection 200 mm, H=300)			2 pcs
TINO-D supply air valve	= number of rooms x 1.2		
TINOi-D extract air valve	= number of rooms x 1.2		

PRESSURE LOSS

A well-planned and well-implemented Vallox BlueSky air distribution system provides the lowest possible pressure loss. Such a system is quiet, and the fans are energy-efficient.

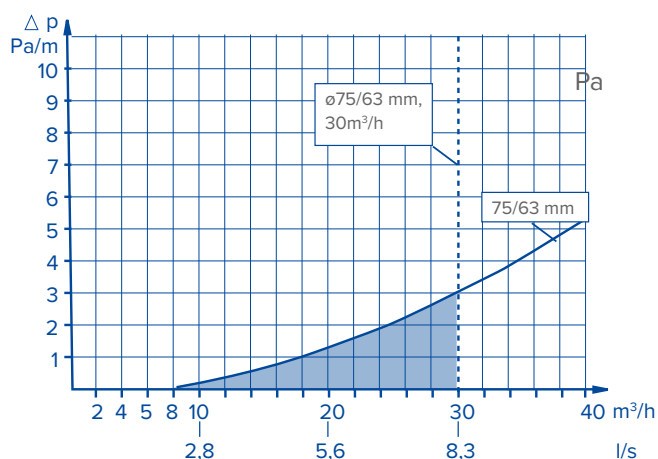
Example of pressure loss in the extract air duct system from the bathroom: 10 l/s

Vallox BlueSky extract air valve TINOi-D	10 Pa
Vallox BlueSky duct 2 m (1,5 Pa/m)	3 Pa
Vallox BlueSky distribution box 10	13 Pa
Extract and exhaust air duct 160 (4 m, 0.5 Pa)	2 Pa
Elbow 160/90, 160/45 (4 pcs, 1,5 Pa/pc)	6 Pa
Ceiling feed-through Vilpe 160	10 Pa
In total	44 Pa

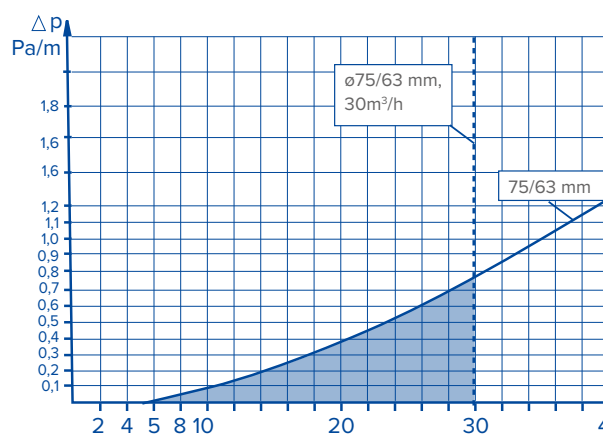
Example of pressure loss in the supply air duct system to the farthest bedroom: 8 l/s

Outdoor grille RIS-V 200 43 l/s	4 Pa
Outdoor and supply air duct 160 (5 m, 0.4 Pa/m)	2 Pa
Elbow 160/90 (3 pcs, 1 Pa/pc)	3 Pa
Adapter 160/200	0.5 Pa
Vallox BlueSky distribution box 10	10 Pa
Vallox BlueSky duct 11 m (3 Pa/m)	33 Pa
Supply air valve TINO-D	10 Pa
In total	62.5 Pa

Pressure loss in Vallox BlueSky duct

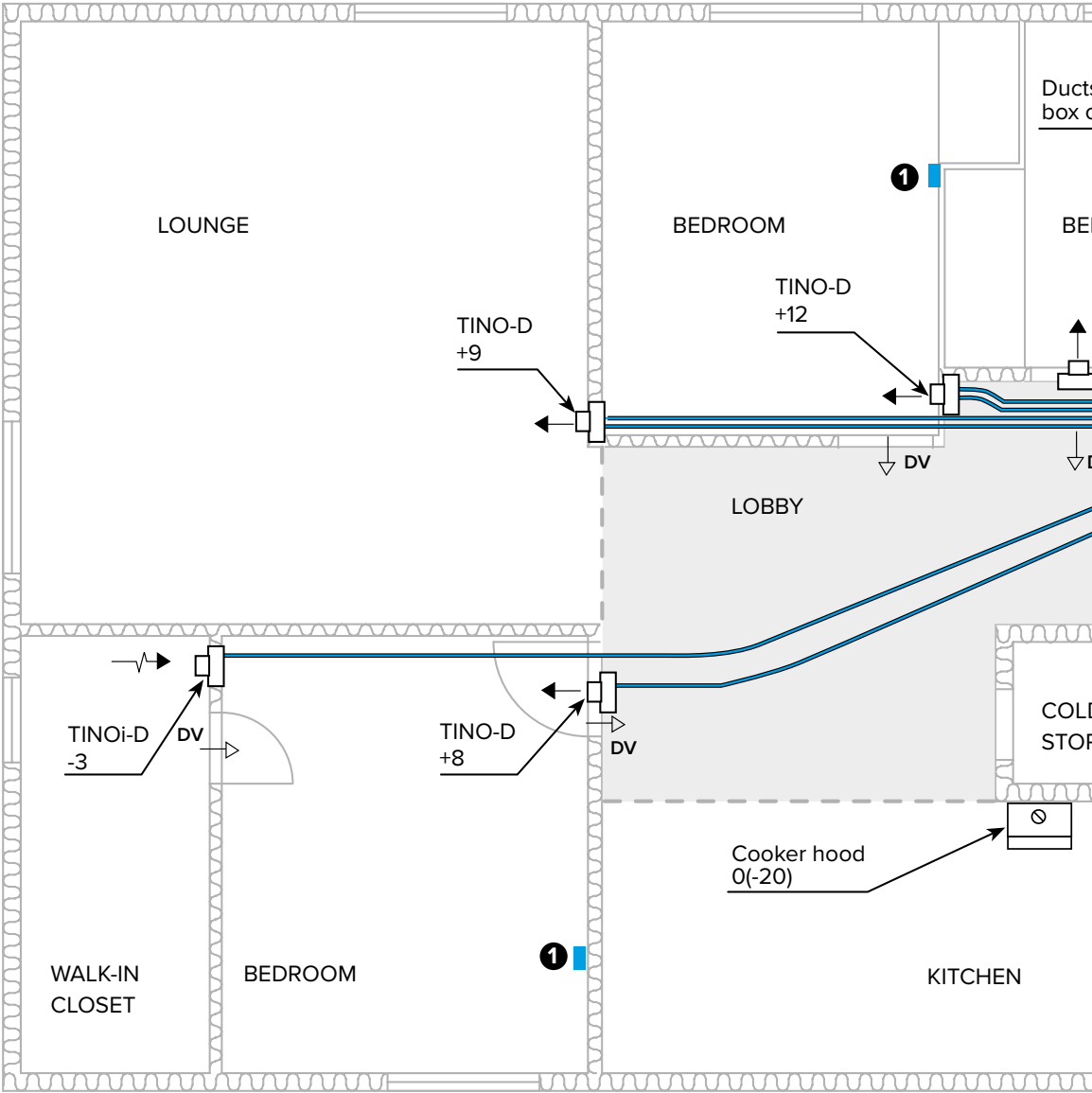


Pressure loss in Vallox BlueSky 90° elbow



DIMENSIONS AND ESTIMATED NEED FOR SUPPLIES AT THE SAMPLE SITE

Renovated building
 Net floor area: 120 m²
 Gross floor area: 140 m²



DIMENSIONING OF THE EXTRACT AND SUPPLY AIR DUCTS

Airflows

To ensure a quiet system and low loss of pressure, the recommended maximum airflow is 3 m/s.

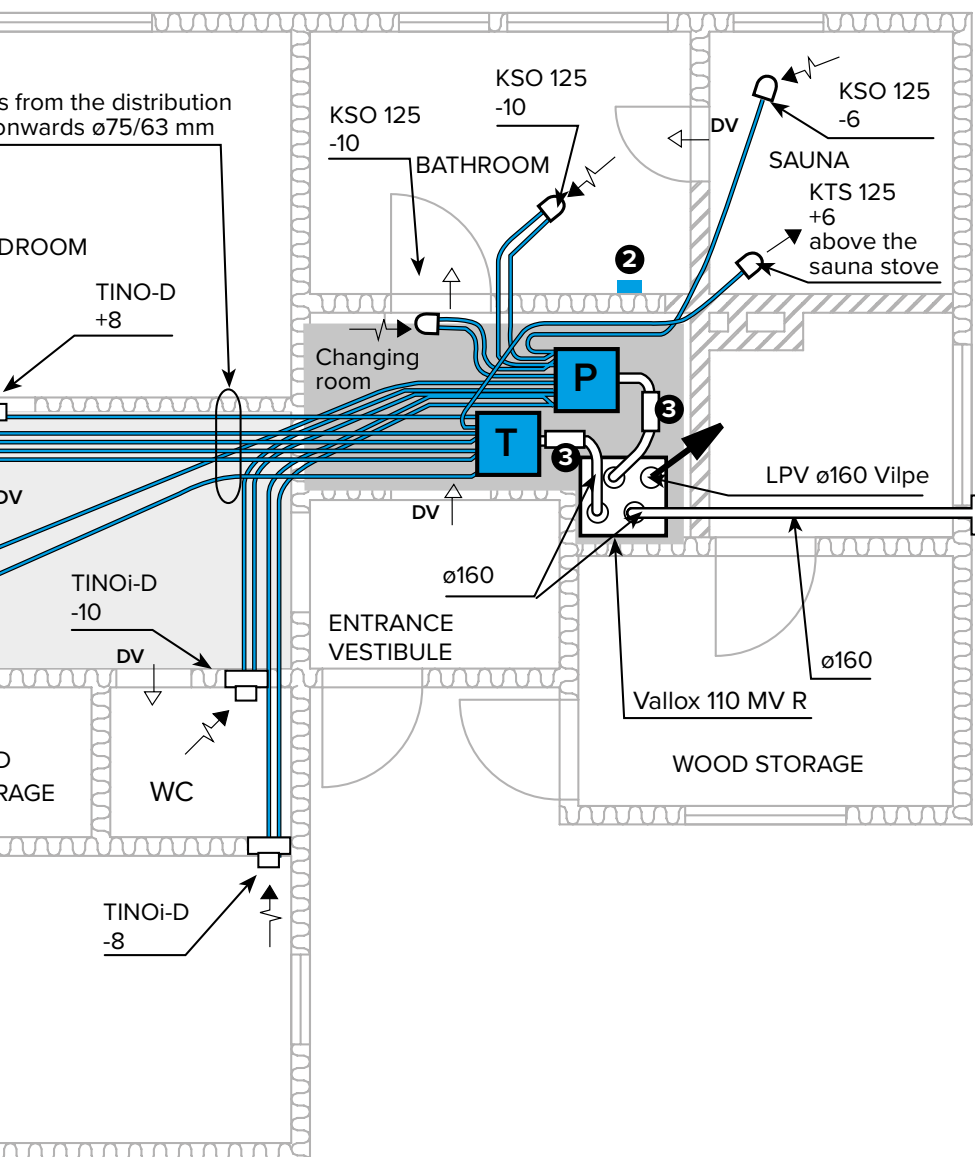
- The recommended maximum airflow of one valve is 8.3 l/s with one Vallox BlueSky duct, and 16.7 l/s with two ducts.
- The recommended maximum length of one Vallox BlueSky duct is 15 m when the airflow is 8.3 l/s. In this case, pressure loss is 45 Pa.

Valve outlets

Using one or two ducts at the maximum airflow creates natural standard adjustment, allowing easy measurement of final airflows.

DIMENSIONING			
Flow speed	Air volume		Flow resistance
m/s	m3/h	l/s	
0.5	6.0	1.6	0.0
1.0	11.0	3.1	0.5
1.5	17.0	4.7	0.8
2.0	22.0	6.2	1.5
2.5	28.0	7.8	2.2
2.7	30.0	8.3	3.0
3.0	33.0	9.3	4.0
3.5	39.0	10.8	5.0
4.0	45.0	12.5	6.0

Pipe diameter: Outer ø: 75 mm, inner ø: 63 mm,
 A=0.0031 m²



- DROPPED CEILING 200 MM
- DROPPED CEILING 100 MM
- ❶ CARBON DIOXIDE SENSOR
- ❷ HUMIDITY SENSOR
- ❸ SILENCER

KSO Extract air valve
 KTS 125 Supply air valve
 LPV 125 Extraction to the roof
 DV Door vent
 Rooms supplied with air: 15...20 mm.
 Rooms from which air is extracted: approx. 10 mm.
 The door between the bathroom that is adjacent to sauna and the apartment: 20 mm



ESTIMATED NEED FOR SUPPLIES



LIST OF SUPPLIES		
	Unit	Volume
Vallox 110 MV R	pcs	1
Silencers	pcs	2
Carbon dioxide sensor	pcs	2
Vallox BlueSky duct ø75 mm (50 m/roll)	roll	3
External connector	pcs	4
Ring seal (10 pcs/package)	package	4
Distribution box 10	pcs	2
Valve connector, side connection 125	pcs	4
Supply air valve TINO-D	pcs	4
Supply air valve KTS 125	pcs	1
Extract air valve TINOi-D	pcs	3
Extract air valve KSO-125	pcs	3
Outdoor grille RIS-V 200	pcs	1
Ceiling feed-through Vilpe 160	pcs	1
Spiral duct 160	m	12
Elbows 160	pcs	7


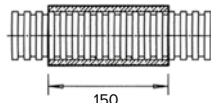



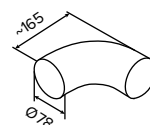
VALLOX BLUESKY PRODUCTS

DUCT AND DUCT SUPPLIES

VALLOX BLUESKY DUCT		
	Vallox product number	380750
	<ul style="list-style-type: none">Roll length: 50 linear metresRoll weight: 17.5 kg	
	<div><div>DIMENSIONS</div></div>	


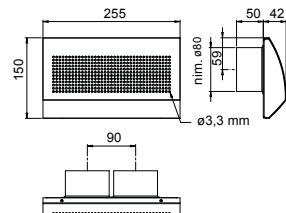
RING SEAL		
	Vallox product number	382750
	<div> <div>DIMENSIONS</div>  </div>	


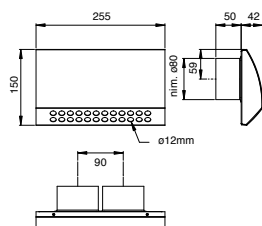
OUTER CONNECTOR		
	Vallox product number	381750
	<div> <div>DIMENSIONS</div>  </div>	

BEND 90°		
	Vallox product number	384759
	<ul style="list-style-type: none">Galvanized sheet metalFor narrow spaces where the bending radius of the Vallox BlueSky duct is inadequate	
	<div><div>DIMENSIONS</div></div>	

VALVES


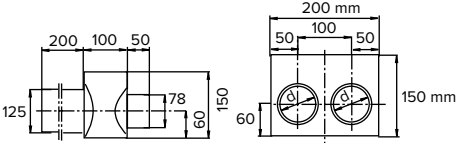
TINO-D supply air and TINOi-D extract air valves can be connected directly with the Vallox BlueSky duct. No valve connector is needed.

SUPPLY AIR VALVE TINO-D		
	Vallox product number	386760
	<ul style="list-style-type: none">• There are two 75 mm outlet collars in the valve frame for the BlueSky duct• Meets the throttling requirement set for fire dampers (42 l/s/100 Pa)	
	<div>DIMENSIONS</div> 	


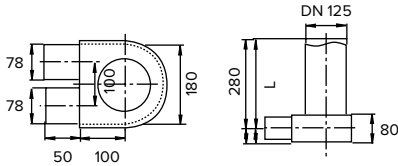
EXTRACT AIR VALVE TINOI-D		
	Vallox product number	386770
	<ul style="list-style-type: none">• There are two 75 mm outlet collars in the valve frame for the BlueSky duct.• Meets the throttling requirement set for fire dampers (42 l/s/100 Pa)	
	<div><div>DIMENSIONS</div></div>	

CONNECTORS

VALVE CONNECTOR / REAR CONNECTION

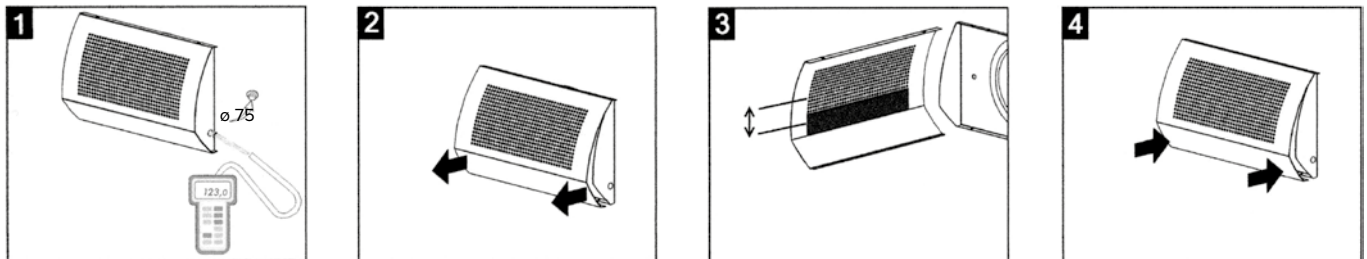
	Vallox product number 384751 <ul style="list-style-type: none"> Duct ø: 125 mm Maximum air volume: 17 l/s, 8 Pa Duct outlets, 2x75 mm Stop plug 	DIMENSIONS 
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VALVE CONNECTOR / SIDE CONNECTION

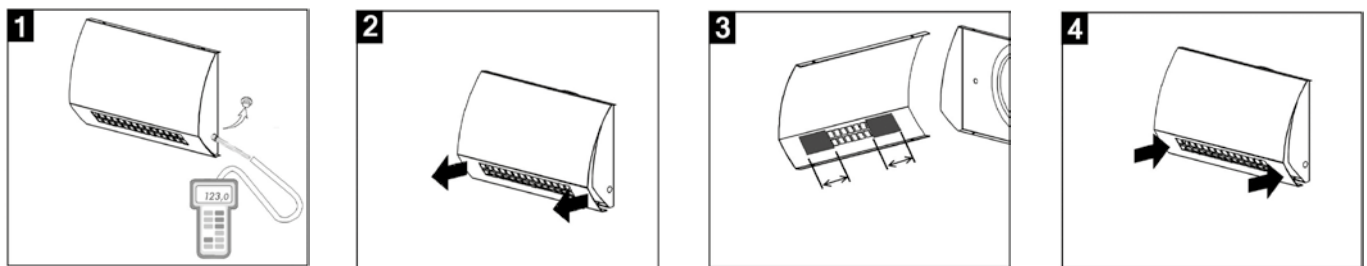
	Vallox product number 385750 <ul style="list-style-type: none"> Duct ø: 125 mm Maximum air volume: 17 l/s, 4/6 Pa Duct outlets, 2x75 mm Stop plug 	DIMENSIONS 
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VALVE ADJUSTMENT

TINO-D supply air valve adjustment



TINOi-D extract air valve adjustment



TINO-D ADJUSTMENT VALUES

		k
Number of openings		12*37
A		4.5
Number of closed rows	2	3.6
	4	2.7
	6	2.0
	8	1.3
	10	0.6

$$q_v = k \times \sqrt{\Delta p_m}$$


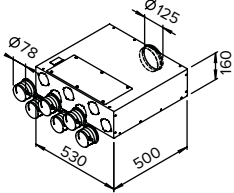
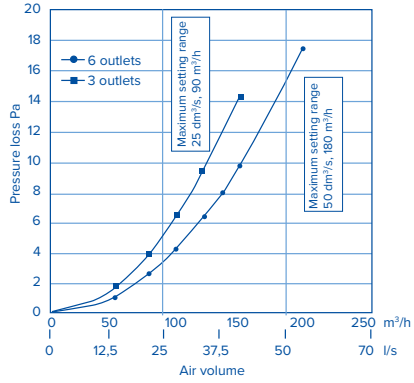
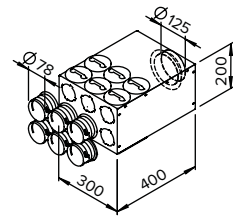

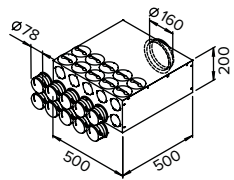
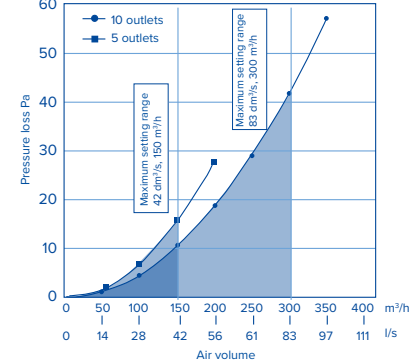

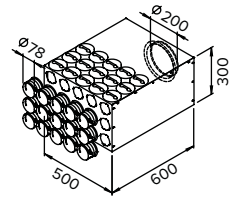
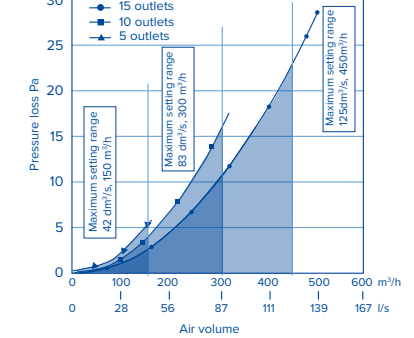
TINOi-D ADJUSTMENT VALUES

		k
Number of openings		12*2
A		2.4
Number of closed rows	2	2.0
	4	1.6
	6	1.2
	8	0.8
	10	0.4

$$q_v = k \times \sqrt{\Delta p_m}$$

AIR DISTRIBUTION BOXES

Vallox BlueSky air distribution boxes are made from galvanized sheet metal. They have a maintenance door and a sound-dampening structure. The duct is locked to the outlet collar with two locking devices.

DISTRIBUTION BOX 6			
	Vallox product number 383277 <ul style="list-style-type: none"> H=160 Duct outlets at one end 	DIMENSIONS 	AIR VOLUMES 
	Vallox product number 383278 <ul style="list-style-type: none"> H=200 Duct outlets at one end or on top 	DIMENSIONS 	
DISTRIBUTION BOX 10			
	Vallox product number 383676 <ul style="list-style-type: none"> H=200 Duct outlets at one end or on top 	DIMENSIONS 	AIR VOLUMES 
DISTRIBUTION BOX 15			
	Vallox product number 383876 <ul style="list-style-type: none"> H=300 Duct outlets at one end or on top 	DIMENSIONS 	AIR VOLUMES 

DISTRIBUTION BOX SUPPLIES

The Vallox BlueSky air distribution boxes are delivered with the standard number of outlet collars, locks, covers, and plugs. Accessories are also sold separately.

OUTLET COLLAR AND TWO LOCKING DEVICES			
	Vallox product number	985023	DIMENSIONS
	• 75 mm bayonet locks		
PLUG AND SEAL FOR THE OUTLET COLLAR			
	Vallox product number	386751	DIMENSIONS
			
LOCKING DEVICE			
	Vallox product number	386752	DIMENSIONS
	• 10 pcs/bag		
DISTRIBUTION BOX COVER			
	Vallox product number	985024	DIMENSIONS
			

MEDIUM FREQUENCY OF THE OCTAVE BAND HZ / SOUND-DAMPENING DB								
Hz	63	125	250	500	1000	2000	4000	8000
Distribution box 6, dB	13	17	17	23	25	20	25	31
Distribution box 10, dB	12	19	20	24	15	29	25	36
Distribution box 15, dB	17	23	17	26	19	28	34	37

VALLOX BLUESKY INSTALLATION

INSTALLATION INSTRUCTIONS

Always check before installation that Vallox BlueSky components have not been damaged during transportation, and that they are clean.

It is best to use a star-shape design when installing the air duct system. This makes the duct system symmetrical and short. To make installation quicker, the duct system can be assembled in the correct dimensions on the floor. Then the ducts and related distribution boxes can be lifted and fixed in place.

Air distribution boxes, valve connectors, and TINO-D valves have outlet collars that are compatible with Vallox BlueSky ducts. To make the connections as tight as they need to be, a ring seal must be inserted in the first groove at the end of the duct. For easier installation, the ring seal can be moistened with water before installation. Vallox BlueSky ducts are fastened into place beside every connection and on either side of extensions to ensure tightness of the connections during cleaning. No other fastening is needed unless required by the particular installation method.

After installation, the ends of the ducts must be protected against dust and other dirt with the shield plugs delivered with the system. The shield plugs must be in place until the system is taken into use.

To ensure that the vapour barrier is as air- and watertight as possible, it is recommended that the Vallox BlueSky duct system be installed either fully inside or fully outside the vapour barrier.

INSTALLATION REGULATIONS

- The Vallox BlueSky air distribution system must be installed in accordance with the regulations in sections D2, E1, E7, and C1 of the National Building Code of Finland.
- Throttle valves used must comply with section E7 6.1 of the National Building Code of Finland.
- When the Vallox BlueSky system is installed in an apartment, the duct system must be covered after installation with (e.g. 2x15 mm) fire-rated gypsum board. Only tested fire valves must be used.

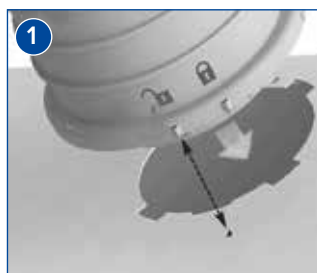
Fire protection and encasing

- The fire-safety of the Vallox BlueSky ventilation duct system has been proven in VTT's research report VTT-S-04517-10.
- When the Vallox BlueSky system is installed inside P3-rated buildings (detached, terraced, and semi-detached houses), the ducts must be encased using D-s2, d2 -rated material (or higher) or covered with mineral wool.



INSTALLATION OF AIR DISTRIBUTION BOXES AND VALVE CONNECTORS

- Installation elbows including the screws and outlet collars and related locking devices are delivered with the Vallox BlueSky air distribution box (see Figures 1-2).
- A ring seal is installed in the first groove of each connection of the Vallox BlueSky ventilation duct (see Figure 3).
- Once the ring seal is in place, the Vallox BlueSky duct is pushed into the outlet collar of the air distribution box and fixed in place with two locking devices (see Figure 4). There is an outlet collar with a rubber ring for the duct from the ventilation unit.
- The valve connector must be fastened on the structures before the ducts can be connected to it.
- A 125 mm valve is installed in the valve connector. Either a spring valve or a 125 mm mounting frame must be used.
- TINO-D and TINOi-D valves have two duct outlets. The Vallox BlueSky duct (with the ring seal in place) is pushed into the duct outlet. The locking mechanism locks the duct in the duct outlet.
- If only one of the duct outlets of the valve or the connector is used, the other outlet must be closed with the shield plug delivered with the system (see Figures 5-6). The shield plug is installed inside the duct outlet.



INSTALLATION OPTIONS

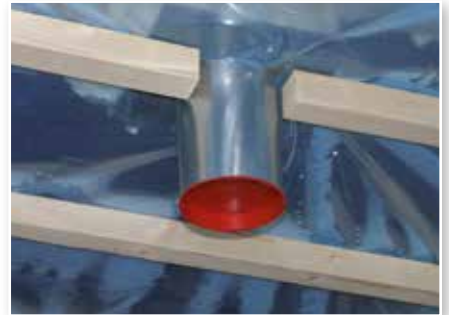
INSTALLATION INSIDE A DROPPED CEILING OR IN AN ENCLOSURE

If the ducts are installed in a warm space, no heat insulation is needed. However, condensate insulation must be used if the ducts are used for cooled air.



INSTALLATION IN THE ROOF

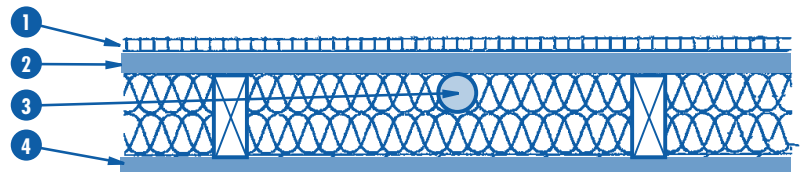
If the ducts are installed in roof insulation, it is recommended that the ducts be installed immediately outside the vapour barrier. No additional insulation is needed in addition to roof insulation. Any feed-throughs made in the vapour barrier must be sealed.



INSTALLATION IN THE INTERMEDIATE FLOOR

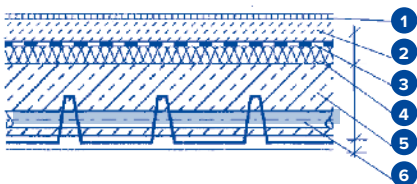
The ducts can also be installed in the intermediate floor as shown in the structural drawing.

1. Flooring
2. Wooden or gypsum board
3. Vallox BlueSky duct inside insulation
4. Ceiling structure



INSTALLATION INSIDE CAST CONCRETE

The Vallox BlueSky air duct system is installed between reinforcements, either in the reinforcement layer or in the top slab. The duct system is fixed in place with tie straps. Once all HVAC installations (including the duct system) have been completed, any other surface reinforcements are put in place before casting.



1. Flooring
 2. Cement mortar
 3. Plastic building film
 4. Sound-proofing depending on the need
 5. Concrete slab that complies with strength calculations.
 6. Vallox BlueSky duct
- The ducts are installed inside these slabs.



INSULATION OF VALLOX BLUESKY DUCTS IN THE INTERMEDIATE FLOOR AND IN COLD SPACES

If Vallox BlueSky ducts are installed inside the vapour barrier, the plastic vapour barrier remains undamaged. This minimizes heat loss from the duct system in winter. Also, the cooling capacity of the ventilation unit is not wasted in summer by cooling the hot attic.

If Vallox BlueSky ducts are installed in the attic near the vapour barrier, no other insulation is normally needed in addition to blown wool. If the duct is installed far away from the vapour barrier, adequate insulation must be ensured on top of the duct.

Valve connectors must be fastened to roof structures. The 125 mm pipe that passes through the vapour barrier must be sealed to the vapour barrier.



Ducts in warm spaces

The temperature of the air passing through the duct is above $+10^{\circ}\text{C}$

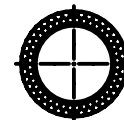
- Extract air duct
- Supply air duct



No insulation

The temperature of the air passing through the duct is below $+10^{\circ}\text{C}$

- Outdoor air duct to the ventilation unit
- Extract air duct from the ventilation unit
- Supply air duct

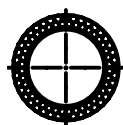


Closed cell insulation (2 cm)

Ducts in cold and warm spaces

The temperature of the air passing through the duct is below $+17^{\circ}\text{C}$, cooling, e.g. with a ventilation unit

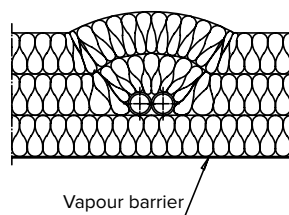
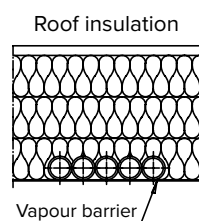
- Supply air duct



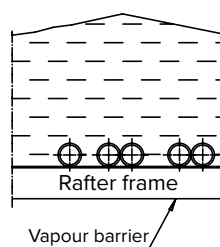
Closed cell insulation (2 cm)

Ducts in cold spaces (in the attic, in and above roof insulation)

- Supply air duct
- Extract air duct



Ducts inside blown wool



NOTE! Outdoor and extract air ducts must never be installed inside the roof insulation. Any special local authority requirements must be followed.

VALLOX

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