CHEMICAL BIOLOGICAL

Gas Filters, Blast Valves & Ventilation Systems

BY

ANDAIR AG

Andelfingen, Switzerland

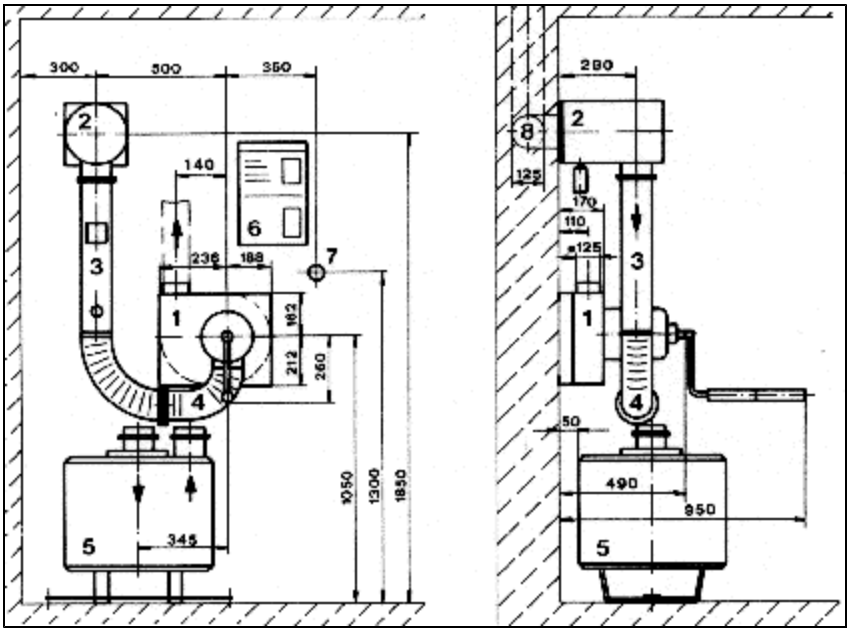
The Andair VA ventilating system is designed for safe rooms and blast and fallout shelters. It brings breathable air to shelter occupants and exhausts carbon dioxide. It produces a slight positive overpressure eliminating leaks of gases and air intruding from the outside. The optional gas filter protects against the admission of radiation, dust, and war gases. It is **not** a carbon monoxide or dioxide scrubber and must have a source of outside air.

This system comes complete with debris and splinters guards, and the anchor system protects the entire installation against the effects of shock waves associated with weapons effects and earthquakes.

The blast valves protect occupants against high overpressures and hot vapors which will intrude into all unprotected openings from the outside in the event of a nearby blast. For more information see the book, ***Nuclear Defense Issues.***

VA 150 Complete Ventilation System

NOTE: The ventilation system can be ordered separately from the gas filter and blast valves.



All measurements are in metric units.

1. Ventilation unit with ventilator, electric motor, generator, emergency light, crank handle
2. ESV/VF blast valve with airfilter
3. Air rate meter and throttle
4. Flexible hoses with coupling
5. Gas filter
6. Operating instruction
7. 3 x 400 V socket (not supplied)
8. Air intake (not supplied). We suggest using a 6" diameter schedule 40 steel pipe for air intake and exhaust. If using blast valves, the air intake pipe must come in horizontally.

The Swiss calculate an adequate air flow between 3.15 and 3.5 cubic feet per minute (cfm) per person. In metric units this calculates to between 5.35 and 6 meters cubed per hour (m3/h). In humid, hot areas this air flow requirement is doubled. The following chart is in metric units.

unit size	protected places	air rate (m^3/h) with gasfilter	air rate (m^3/h) without gasfilter
VA75	14-25	75	150
VA150	16-50	150	300
VA300	apx. 70	300	60

We are recommending the VA150 to adequately ventilate steel shelters 8 ft. to 10 ft. in diameter and 40 ft. to 50. ft long.

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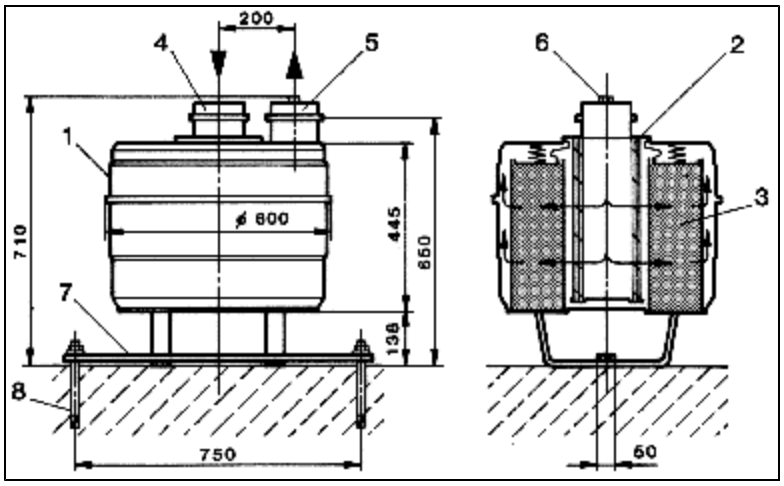
ANDAIR AG - Gas Filter



This gas filter eliminates all known war chemical and bacteriological bodies from the outside air. It requires an outside source of air and does not act as a carbonmonoxide or carbondioxide scrubber.

(all measurements are in metric units)

1. filter casing
2. high efficiency filter
3. activated carbon filter
4. air inlet with closing
5. air outlet with closing
6. pressure compensation screw
7. floor fastening bracket
8. steel anchors (for concrete installation)

Andair gas filters protect against the following war gases:

Nerve gases
Organic phosphoric acid compounds: e.g. Tabune; Sarine; Somane; Tammelin Esters (VX)

Blister agents (Vesicants)
Organic arsenic compounds: e.g. Dichloro-(2-chlorovinyl) arsine; Ethylarsine dichloride; Methylarsine dichloride

Organic sulfur and nitrogen compounds (mustard gases): e.g. S-Lost (HD); N-Lost (HN); Lewisite (L);

Nettle Rush gases: e.g. Phosgene oxime; Trichloromethylchloroform oxime; Trichloroacetophenone

Tear and harassing gases
Halogenated organic compounds: e.g. Bromoacetone; Chloroacetophenone; Bromobenzoic cyanide

Blood gases
Arsine (Hydrogen arsenide); Hydrogen cyanide; Cyanogen chloride; Potassium fluoro acetate etc.

Incapacitants
LSD, BZ; Indole amino alcanes, Phenyl amino alcanes etc.

Toxines (Biotoxics)
Bacteriological Toxines miscellaneous
Zoological Toxines miscellaneous
Botanical Toxines

Choking agents
Phosgene, Di-phosgene, Tri-phosgene;
Chloropicrin;

miscellaneous

Herbicides
Gas filters do not protect against carbon monoxide and dioxide

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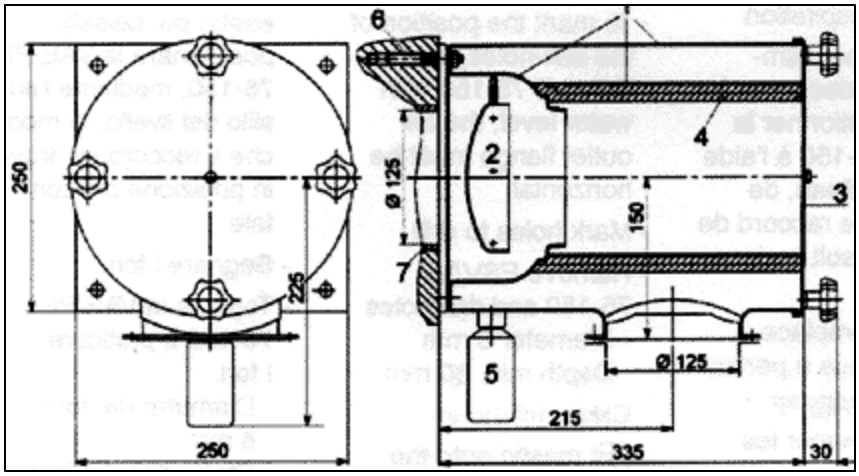
ANDAIR AG - Blast Valves

ESV/VF 75-150 1 bar (15 psi)
Intake Blast Valve

Tested and approved by the Swiss Defense Procurement Agency; Homologation No. BZS T 96-007



1. Casing with outlet connection and flange, valve casing, air filter grid, hot galvanized
2. Valve disc and shutting device in stainless steel
3. Access cover (hot galvanized)
4. Air filter
5. Collector for condensed water
6. Anchors (not supplied) This illustration is for a concrete shelter installation. Please indicate if installation will be onto a steel shelter. The proper retrofitting piece will be sent for the size pipe indicated.

7. Air intake tube (not supplied) We recommend a 6" diameter schedule 40 steel pipe. If using a steel shelter, this pipe must protrude slightly into the shelter and meet the blast valve

horizontally as shown.

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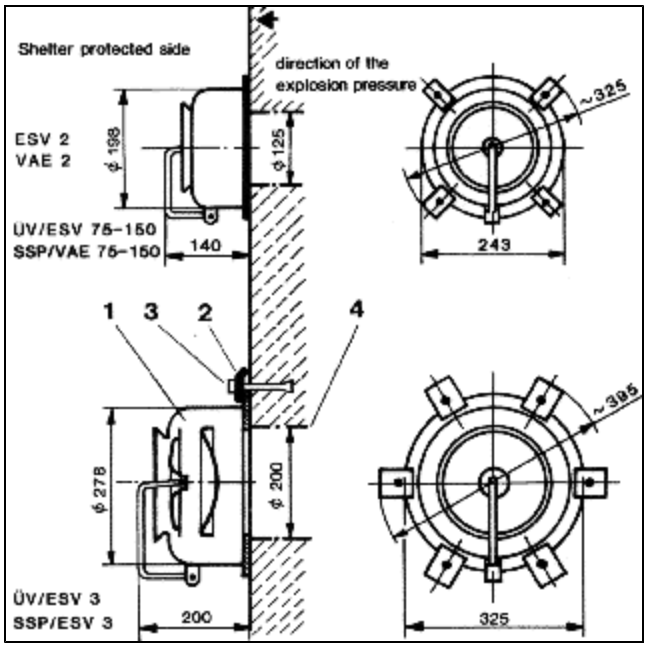
UV/ESV 75-150 1 bar (15 psi)
Exhaust Blast Valve



1. Overpressure explosion protection valve UV/ESV
2. Fastening brackets
3. Steel dowels (not supplied). This illustration is for a concrete shelter. Please note Inlet Blast Valve explanation # 6.
4. air outlet tube (not supplied). Reference # 7 above.

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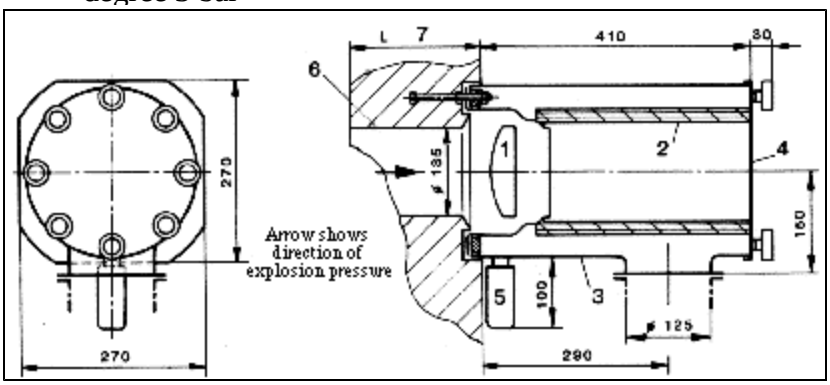
ESV/VF 150 3 bar (45 psi)
Intake Blast Valve

UV/ESV 150 3 bar (45 psi)
Exhaust Blast Valve

Design according to the directives of the Swiss Federal Office of Civil Defense (BZS).

Type tested and approved by the Swiss Armament

Technology and Procurement Group. Protection degree 3 bar



(all measurements are in metric units)

1. Explosion protection valve
2. Air filter
3. Casing with connection and flange ND 125
4. Access door with star shaped handle
5. Collector for condensed water
6. Wall frame
7. Wall thickness according to your specs

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