

SMOKE & HEAT REMOVAL ROOF VENTILATOR



MODEL: SV40



Overview

SV40



Model SV40

The Model SV40 combines year-round powered ventilation with smoke and heat removal capabilities. This ventilator is designed to be used as a standard roof exhaust fan and a high temperature smoke and heat removal fan. It is a three-part assembly consisting of:

1. Stack cap damper assembly with fusible link kit
2. Curb cap
3. High temperature, belt driven tubeaxial fan with a welded steel impeller

Typical Industries Include

Warehouse and Factory Ventilation, Manufacturing Process Exhaust, Foundry, Textile and Heat Treat Process Exhaust

Configurations

Upblast Exhaust featuring a stack cap damper fitted with fusible links (provides natural smoke relief in the event of electrical failure in the building)

Impeller Types

Welded Steel Impellers

Standard Construction

Heavy-Gauge Galvanized Steel

Certifications

UL Listed for Smoke Control Systems, UL 705 Listed for Electrical



Welded Steel Impeller Assembly



cULus 705 listed, for electrical, File No. E158680.

Model SV40 is UL listed for Smoke Control Systems, 500°F for 4 hours and 1000°F for 15 minutes.



Aerovent, A Twin City Fan Company, certifies that the Model SV40 Roof Ventilators shown herein are licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and AMCA Publication 311 and comply with the requirements of the AMCA Certified Ratings Program.



For complete product performance, drawings and available accessories, download our Fan Selector program at aerovent.com.

Overview

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Standard Features

- Motor cover
- Heat slinger
- Heat shield
- Factory-mounted NEMA 3R non-fused disconnect switch

The tall design of this ventilator is especially useful in the discharge of smoke and/or fumes high above the roof line and away from surrounding ventilation systems.

Standard construction is of heavy-gauge steel finished with polyester powder coating.

If the fan fails to energize in an emergency situation, such as a fire, a thermally activated fusible link assembly will automatically open the stack cap damper and provide venting. The fusible link will retain a spring loaded actuator until the temperature melts the fusible link (160°F or 212°F), at which time the dampers open.

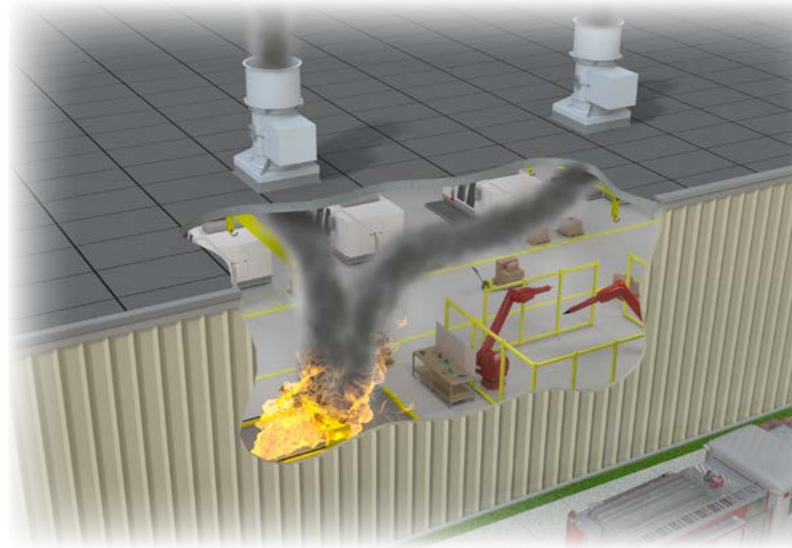
The Model SV40 features a fixed pitch, welded steel, 5-bladed impeller. Steel blades are continuously welded to a heavy-gauge hub at the customer's selected blade angle.

Capabilities and Testing

The Model SV40 high temperature roof ventilator is designed specifically to comply with Industrial Risk Insurers' (IRI) recommendations for smoke and heat ventilation and is UL Certified for Smoke Control Systems.

Unit testing was conducted at Aerovent's certified test lab using a 4 million BTU gas fired burner capable of generating airstream temperatures in excess of 1000°F. Airstream temperatures were precisely monitored using potentiometers with chromel-alumel thermocouples. Temperatures were monitored at several vital areas within the ventilator assembly: inlet side of the fan impeller, fan bearings, bearing housing, belt tube and the motor compartment.

The Model SV40 is capable of emergency smoke and heat evacuation (500°F for 4 hours and 1000°F for 15 minutes per UL Standard) to protect your facility and help meet insurance regulations. With modifications, the SV40 can withstand continuous operation at 600°F. Consult your local Aerovent sales representative for details.



Manufacturing Plant Fire Application

Sizes

24" to 60" impeller diameters

Performance

Airflow to 70,700 CFM

Static pressure to 1.50 inches w.g.

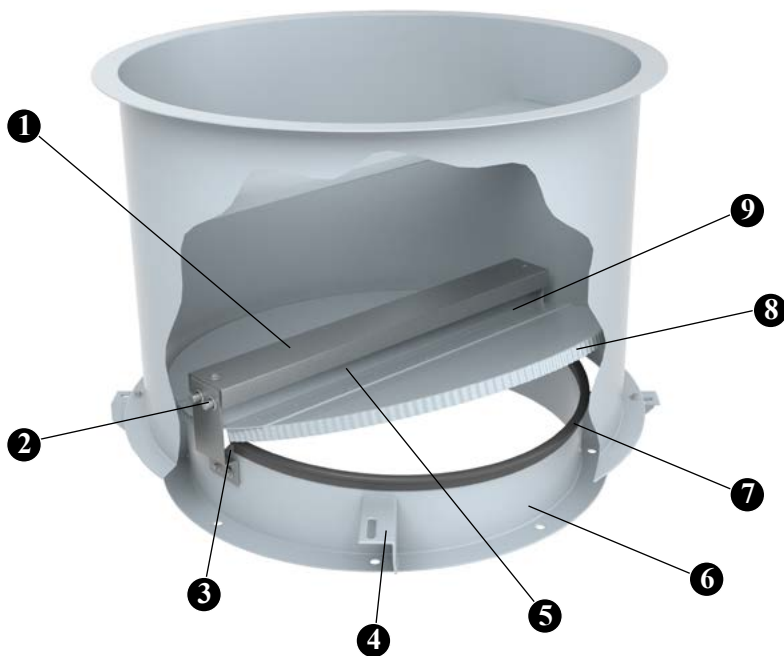


NEMA 3R Disconnect Switch

Disconnect switches provide positive electrical shutoff during fan cleaning or maintenance. A NEMA 3R, rain proof, disconnect is available shipped loose for field mounting and wiring or factory mounted and wired externally.



Stack Cap Features



- 1 Splash guard
- 2 Oil impregnated bronze bushings and plated steel damper rods
- 3 Drain channel
- 4 Welded brackets provide support for wind band.
- 5 Thermally activated fusible link assembly
- 6 Sloped throat
- 7 Rubber bulb seal eliminates noise when damper is closed.
- 8 Damper lip design forms a tight seal around perimeter to prevent water and light from entering the building. "Pie crust" lip adds strength and rigidity.
- 9 Turned up edge prevents water from entering pivot area.

Application

The application of smoke and heat venting requires special considerations. In some applications, the mechanical exhaust fans may be used to provide up to one-half of the venting requirements. However, in trapped and low hazard areas where smoke may be the primary concern, the mechanical exhaust fans may provide all of the venting. The minimum fan capacity where all mechanical venting is used must be the same as would be required for a gravity method. The authority having jurisdiction will establish the total ventilation required for a specific area. Typical ventilation requirements are shown on the chart below.

Typical Ventilation Requirements

MAXIMUM OCCUPATION CLASSIFICATION HAZARD	DISTANCE BETWEEN CENTER LINES OF ANY TWO VENTS	MAX. RATIO OF GRAVITY VENT AREA TO FLOOR AREA	MIN. CFM PER SQ. FT. OF FLOOR AREA
LOW	150 FT.	1:150	2
AVERAGE	125 FT.	1:100	3
HIGH	100 FT.	1:50	6
VERY HIGH	75 FT.	1:30	10

Mechanical exhaust ventilation, when combined with emergency gravity ventilation, can serve a dual purpose of providing the necessary process ventilation while also contributing to insurance companies' recommended requirements for providing emergency ventilation, even in the event of power failure.

Power for roof ventilators installed under IRI recommendations should be independent of the general building power supply. Wiring should be on the roof of the building or outside of the hazardous area. The electrical control system should provide for continuous power supply to the ventilators, even in the event the main power to the building is cut or turned off. The ventilator controls should be located near the points of entrance into the building area. These controls should

be wired so automatic devices activated by the sprinkler system, smoke or heat sensors, or other similar devices can override them.

This information is to provide general guidelines. Details for installation of ventilators and their control systems should be determined for each individual application. Final approval of the total installation design should be obtained from the authority having jurisdiction.

Selection

- When capacity is expressed in total CFM, select ventilators from the performance data on page 4 or 5.
- When capacity is expressed in CFM per square foot of floor area, calculate the required CFM:

$$\text{CFM} = \text{Sq. Ft. of Floor Area} \times \text{CFM/Sq. Ft.}$$

- When capacity is expressed in square feet of gravity ventilator area, the CFM can be calculated by multiplying the gravity ventilator area by 300:

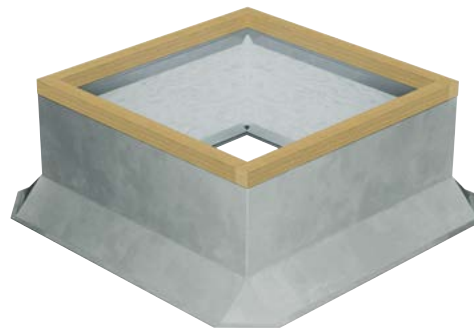
$$\text{CFM} = 300 \times \text{Required. Sq. Ft. of Gravity Ventilator Area}$$

All models of the SV40 Roof Ventilators shown in this catalog have sufficient velocity to fully open steel dampers in the ventilator stack cap. The table below lists the minimum CFM requirement for each fan size for fully open damper operation. Minimum CFM required to open aluminum dampers are also shown in the table below.

DAMPER MATERIAL	CFM PER DAMPER SIZE							
		24"	30"	36"	42"	48"	54"	60"
STEEL	MIN.	5450	8480	12350	16950	22025	27780	34205
	MAX.	9615	14965	21785	29885	38865	49020	60355
ALUM.	MIN.	4170	6485	9445	12955	16845	21245	26155
	MAX.	9615	14965	21785	29885	38865	49020	60355

Canted Roof Curbs

- Constructed of 18-gauge galvanized steel with continuous welded seams
- Large 3" built-in 45° cant to accommodate roofing material to top of curb. Cant is beveled at corners for better support of roofing material
- Wood nailer (1½") secured to top ledge
- Lined with 1½" fiberglass fire-resistant, sound-absorbing insulation
- Damper shelf standard
- Options: Aluminum (16-gauge) construction, burglar security bars, metal liner (galvanized or aluminum), special heights up to 24", single- or double-pitched curbs for sloping roofs



Self-Flashing & Straight-Sided Roof Curbs

- Constructed of 18-gauge galvanized steel with continuous welded seams
- Wide base plate (flashing) to insure watertight seal to roof
- Top ledge covered with 3/16" polystyrene gasket (self-flashing) for weather seal and to reduce metal-to-metal conducted noise
- Wood nailer secured to top ledge (straight-sided)
- Lined with 1½" fiberglass fire-resistant, sound-absorbing insulation
- Damper shelf standard
- Straight-sided roof curbs are constructed with the same features as the self-flashing curbs, but are one dimensional to allow for field supplied cants and roofing material to be brought up to the top of the curb
- Options: Aluminum (16-gauge) construction, burglar security bars, metal liner (galvanized or aluminum), special heights up to 24", single- or double-pitched curbs for sloping roofs



Self-Flashing Vented Roof Curbs

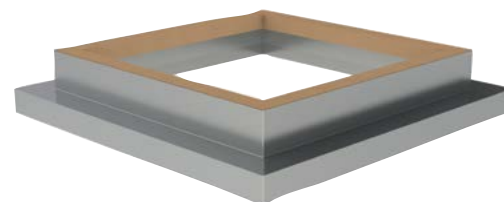
For High Temperature Applications

- Completely assembled unit, easier to install and less expensive than a field constructed curb
- Constructed of 18-gauge galvanized steel with continuous welded seams and wide base flashing for watertight seal to roof
- Meets NFPA-96 code requirements
- Top ledge covered with 3/16" polystyrene gasket
- Furnished with ventilation slots

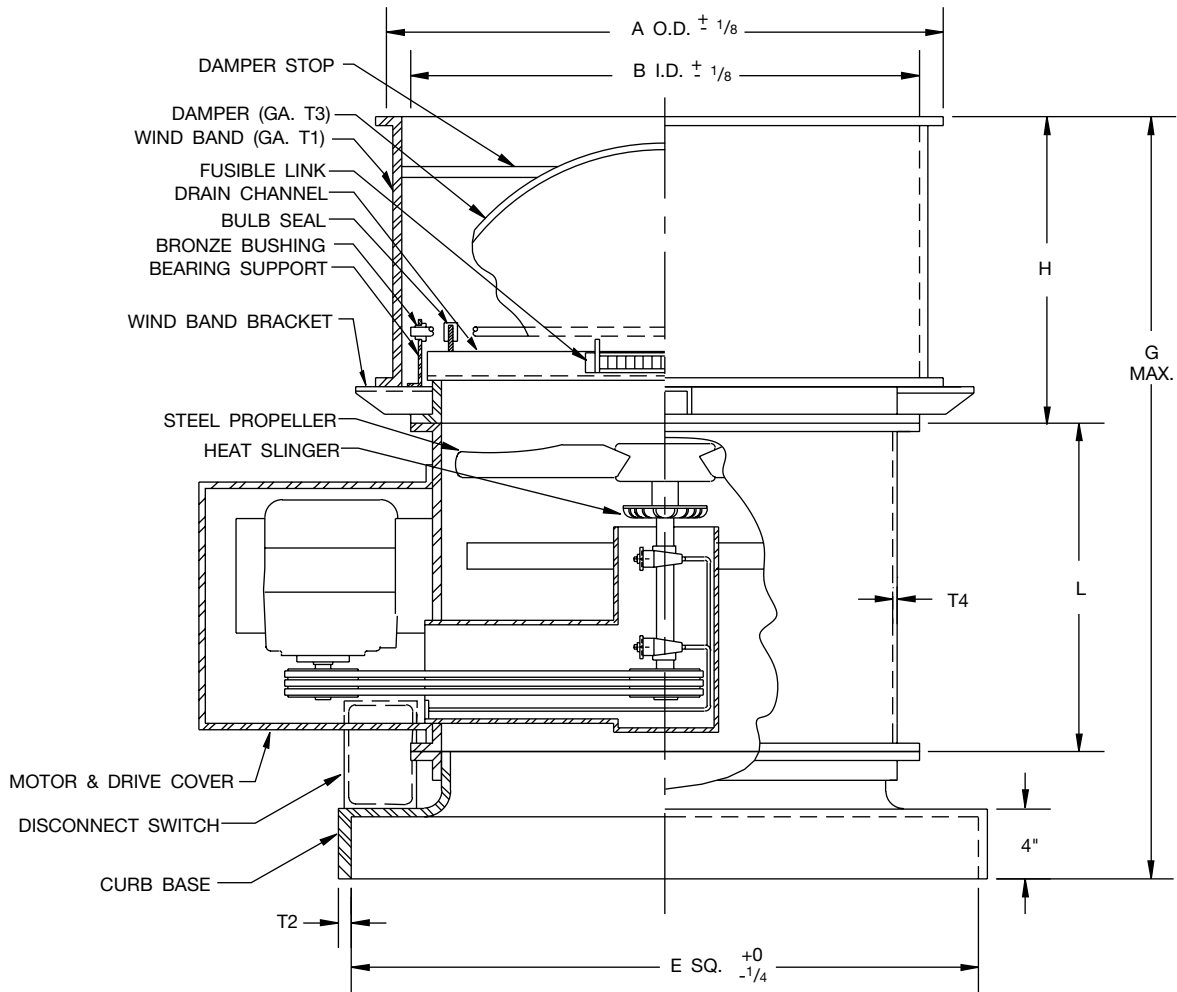


Curb Adapters

- Constructed of heavy-gauge galvanized steel with continuous welded seams
- Top ledge covered with 3/16" polystyrene gasket to reduce metal-to-metal conducted noise and act as a weather seal
- Available in enlarger or reducer (shown) models



Dimensional Data



SIZE	A	B	E	G	H	L	GAUGE STEEL				MTR. FRAME SIZE	
							T1	T2	T3	T4	MIN.	MAX.
24	31 ³ / ₄	28 ⁷ / ₈	35 ⁷ / ₈	60 ¹ / ₄	24 ³ / ₄	24	14 GA.	14 GA.	24 GA.	12 GA.	48	184T/U
30	39 ³ / ₄	36 ⁷ / ₈	43 ⁷ / ₈	66 ³ / ₄	27 ³ / ₄	27	14 GA.	14 GA.	20 GA.	12 GA.	48	215T/U
36	45 ³ / ₄	42 ⁷ / ₈	49 ⁷ / ₈	76 ³ / ₄	30 ³ / ₄	34	14 GA.	14 GA.	20 GA.	10 GA.	56	256T/U
42	51 ³ / ₄	48 ⁷ / ₈	55 ⁷ / ₈	79 ³ / ₄	33 ³ / ₄	34	14 GA.	14 GA.	20 GA.	10 GA.	143T/U	256T/U
48	57 ³ / ₄	54 ⁷ / ₈	61 ⁷ / ₈	84 ³ / ₄	36 ³ / ₄	36	14 GA.	14 GA.	20 GA.	7 GA.	143T/U	256T/U
54	64	60 ³ / ₄	67 ³ / ₄	99 ³ / ₄	39 ³ / ₄	48	14 GA.	12 GA.	20 GA.	7 GA.	143T/U	256T/U
60	70	66 ³ / ₄	74 ³ / ₄	103 ³ / ₄	43 ³ / ₄	48	14 GA.	12 GA.	20 GA.	7 GA.	143T/U	286T/U

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DIMENSIONS ARE NOT TO BE USED FOR CONSTRUCTION.



Model

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SV40 Smoke and Heat Roof Ventilators, where indicated on drawings and schedules, shall be of the belt driven tubeaxial type, Arrangement 9, as manufactured by Aerovent, Minneapolis, Minnesota and shall be of the size and capacity as indicated in the fan schedule. Fans shall have the impellers mounted on separate shaft and bearing assemblies in an enclosed tube with V-belt drives with a minimum 1.3 service factor. Units shall be complete with a factory mounted NEMA 3R nonfused disconnect switch, motor cover, stack cap damper assembly with fusible link for vertical upblast discharge and a curb cap to facilitate mounting the roof ventilator assembly to a roof curb. SV40 Smoke and Heat Roof Ventilators shall be designed to withstand continuous operation with internal airstream temperatures of 600°F and a minimum of 8 hours with internal airstream temperatures of 1000°F. SV40 Smoke and Heat Ventilators shall be UL Certified for Smoke Control Systems. SV40 Smoke and Heat Roof Ventilators shall be tested and certified in accordance with industry accepted test codes and guaranteed by the manufacturer to deliver at the rated published performance levels. In addition, each unit shall be factory run tested prior to shipment.

CONSTRUCTION — Fan casings shall be welded 12-gauge hot rolled steel in sizes 24" and 30" diameter, 10-gauge hot rolled steel in sizes 36" and 42" diameter and 7-gauge hot rolled steel in sizes 48" diameter and larger. Inlet and outlet flanges shall be integrally rolled mechanically from fan casing sheet steel to insure concentricity and alignment of flanges. Fan casing flanges shall be match drilled to facilitate bolted connection to the stack cap and curb cap. Concentricity of fan casing shall be insured through the use of welding jigs and fixtures. A fabricated adjustable steel, multi-frame jack-screw type motor support of minimum 3/16" steel plate supported by threaded rod shall be welded to the exterior of the fan casing.

IMPELLERS — The impeller blades and hub shall be of heavy-gauge steel and shall be statically balanced and then attached to a step shaft with a retaining bolt and washer.

BEARINGS — All fans are to be supplied with sealed pillow block bearings with grease lines brought to the outside of the fan casing to facilitate servicing. Bearings shall have a minimum L-10 life as defined by AFBMA of at least 20,000 hours (100,000 hours average life). All bearings shall be lubricated with high temperature grease.

MOTORS — Fan motors shall be foot mounted NEMA Design B, standard industrial, continuous duty, ball bearing (ODP or TEFC), variable torque type, suitable for operation on voltage, phase and hertz, as listed in the fan schedule. An OSHA type louver ventilated motor cover shall be bolted to the exterior of the fan to provide personnel and drip-proof protection of the motor and drive tube.

HIGH TEMPERATURE CONSTRUCTION — High temperature construction features shall include a heat slinger cast of A240 high temperature aluminum alloy. This radial bladed heat sink fan impeller shall draw cooling air from the exterior of the fan housing through the drive tube and over the bearings, absorbing and dissipating shaft heat. A heat shield shall be provided to protect the motor from radiated heat.

Sheaves shall be cast iron with two heat-resistant static conducting belts. Bearings and belts are enclosed in an air insulated housing for protection.

CURB CAP — Cap shall be fabricated from a minimum of 14-gauge steel in sizes 24" through 48" diameter, 12-gauge steel in sizes 54" and 60" diameter. The curb cap shall have a smoothly radiused integral inlet bell to minimize inlet losses to the fan.

STACK CAP DAMPERS ASSEMBLY — Dampers shall be heavy-duty butterfly type. The windband shall be rolled of 14-gauge steel. Damper blades shall be fabricated from 24-gauge steel in 24" fan diameter and 20-gauge steel from 30" through 60" fan diameter. All edges of the damper blades are to have a formed pie crust edge to provide maximum strength and rigidity. Heavy-duty steel damper rods shall rotate on rustproof oil impregnated bronze bushings.

For emergency situations if the fan fails to energize, a thermally activated fusible link kit shall be supplied. This will automatically open the stack cap damper and provide venting in case of fire. The fusible link shall retain a spring loaded actuator until the temperature reaches 160°F or 212°F, at which time the dampers open.

BALANCING — The impeller assembly shall be statically and dynamically balanced in accordance with ANSI/AMCA 204-96 "Balance Quality and Vibration Levels for Fans" to Fan Application Category BV-3, Balance Quality Grade G6.3. In addition, belt driven fan impellers shall be balanced on the fan shaft after final assembly in the fan casing, in the manufacturing facility, to the following peak velocity values, filter-in, at the fan test speed:

Fan Application Category	Rigidly Mounted (in./s)	Flexibly Mounted (in./s)
BV-3	0.15	0.20

FINISH — The units, after fabrication, shall be cleaned and chemically pretreated by a phosphating process and shall be painted inside and outside with an alkyd primer and finish painted with an air dry enamel.

OPTIONAL ACCESSORIES — The fan(s) shall be furnished complete with:

- ♦ Bird Screen / Outlet Safety Screen
- ♦ Inlet Safety Screen

**WALL MOUNTED FANS | TUBEAXIAL & VANEAXIAL FANS | CENTRIFUGAL FANS & BLOWERS |
ROOF VENTILATORS | AIR HEATERS & COOLERS | AIR MAKE-UP | FIBERGLASS FANS | CUSTOM FANS**



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5959 Trenton Lane N | Minneapolis, MN 55442 | Phone: 763-551-7500 | Fax: 763-551-7501