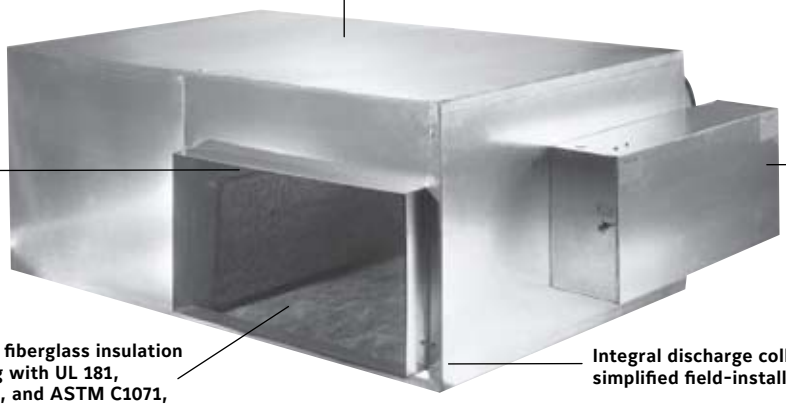
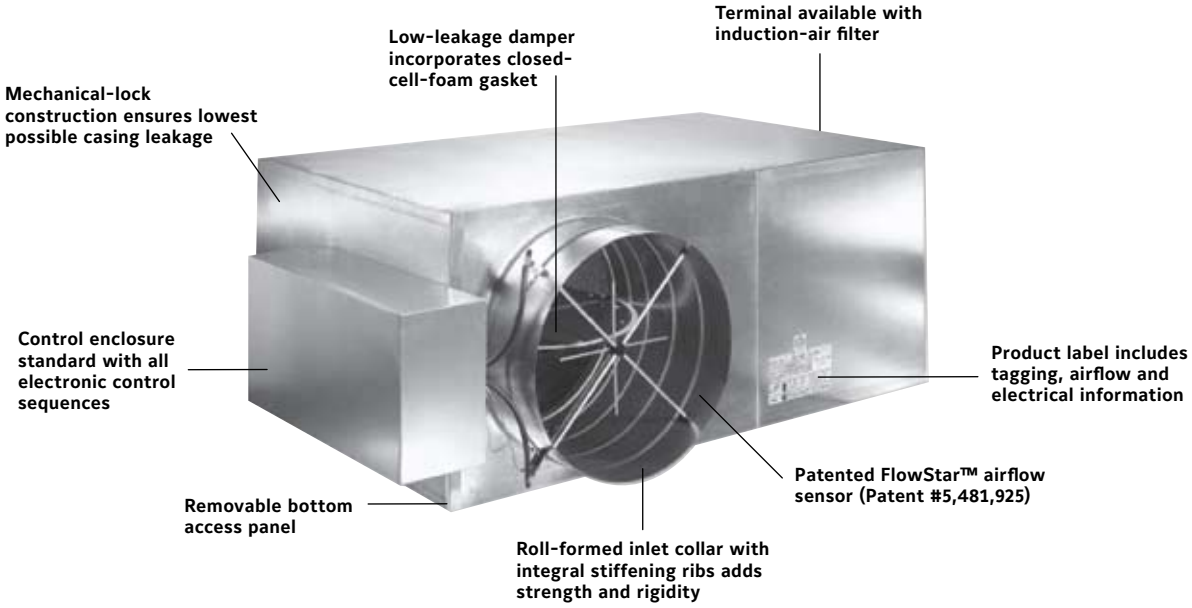
TVS Parallel-Flow, Fan-Powered, VAV Terminals

Johnson Controls

Model TVS construction features





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TVS Fan-Powered Terminals: Quiet operation for parallel airflow

Owners

TVS terminals are specifically designed for quiet operation. They also offer improved space comfort and flexibility for a wide variety of heating, ventilating and air-conditioning (HVAC) systems. This is critical in today's buildings where occupants are placing more emphasis on indoor acoustics.

Occupants benefit from a TVS design that minimizes low-frequency (125-250 Hz) sound levels that typically dominate the space sound level.

Superior flow-measuring allows control at lower minimum cubic-feet-per-minute (CFM) values, which reduces energy costs and sound levels while maintaining comfort in the occupied space.

Designers

Due to heightened interest in indoor air quality, many HVAC system designers are focusing on the effects of particulate contamination within a building's occupied space. Often, HVAC system noise is overlooked as a source of occupied-space contamination. The TVS terminal is specifically designed to eliminate obtrusive fan noise from reaching the occupants.

The TVS terminal is manufactured and assembled with a multi-axis, multi-point, center-averaging, airflow sensor. This sensor provides a signal to the controller enabling it to quietly and precisely measure airflow.

Applications for TVS terminals include:

- Parallel, Fan-Powered
- Parallel, Fan-Powered with Reheat

TVS-EH offers electric heat and model TVS-WC offers hot-water heat.

Contractors

An integrated VAV box with direct-digital controls eliminates the coordination and difficulties associated with field-mounting.

Bundled with the TVS terminal is a digital controller from the VAV Modular Assembly (VMA) Series or the LN Series, combining a controller, pressure sensor, and actuator housed in one pre-assembled unit. Features include automated commissioning, damper-stall detection, starved-box detection, actuator-motor duty cycle, box-flow test, and other diagnostics on most models.

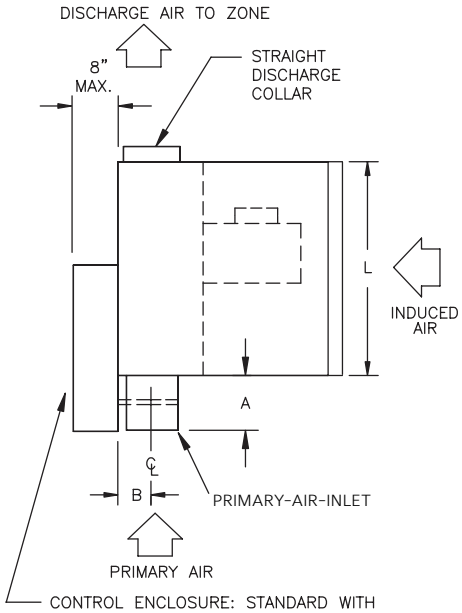
VMA Series Controller (left) and LN Series Controller (right)

Downloading of software, setting of parameters, addressing and testing at the factory reduce startup time and lessen risk.

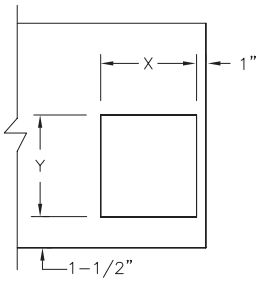
Installation is simple with low-profile, compact design, and standard metal hanging straps.

Complies with National Electric Code (NEC) wiring requirements and meets Air-Conditioning and Refrigeration Institute (ARI) Standard 880.

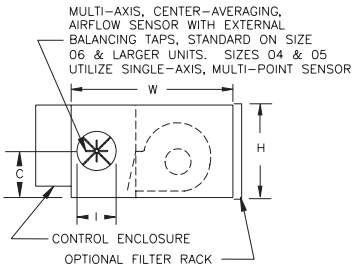
Model TVS



TOP VIEW



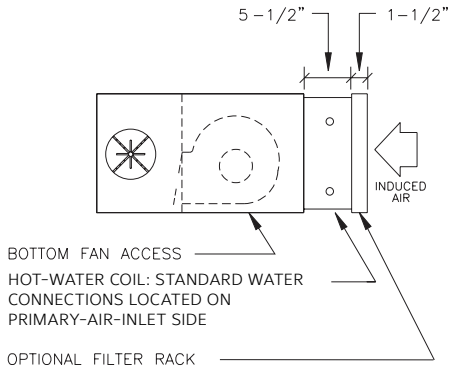
DISCHARGE COLLAR DETAIL



END VIEW

Unit Size	A	B	C	I	X	Y	W	H	L
0404	10-1/2" [254]	5" [127]	7" [178]	3-7/8" [98}	8" [203]	7" [178]	29" [737]	14" [356]	23-1/2" [597]
0504	10-1/2" [254]	5" [127]	7" [178]	4-7/8" [124]	8" [203]	7" [178]			
0604	6-1/2" [165]	5" [127]	7" [178]	5-7/8" [149]	8" [203]	7" [178]			
0606									
0804	6-1/2" [165]	6" [152]	7" [178]	7-7/8" [200]	11" [279]	7" [178]			
0806									
0811									
1006	6-1/2" [165]	7" [178]	8-1/2" [216]	9-7/8" [251]	14" [356]	10" [254]	37" [940]	17" [432]	29-1/2" [749]
1011									
1018									
1211	6-1/2" [165]	8" [203]	8-1/2" [216]	11-7/8" [302]	16" [406]	10" [254]			
1218									
1221									
1411	6-1/2" [165]	9" [229]	9-1/2" [241]	13-7/8" [352]	22" [559]	12" [305]	45" [1143]	19" [483]	
1418									
1421									
1424	6-1/2" [165]	9" [229]	9-1/2" [241]	13-7/8" [352]	22" [559]	12" [305]	49" [1245]		
1621	6-1/2" [165]	10" [254]	9-1/2" [241]	15-7/8" [403]	24" [610]	12" [305]	45" [1143]		
1624	6-1/2" [165]	10" [254]	9-1/2" [241]	15-7/8" [403]	24" [610]	12" [305]	49" [1245]		

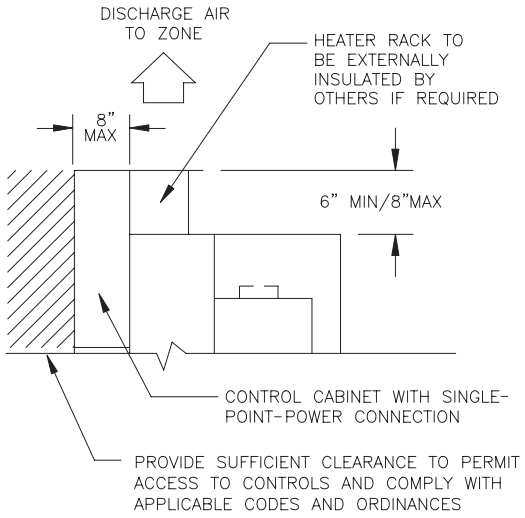
Model TVS-WC (Hot-Water Coil)



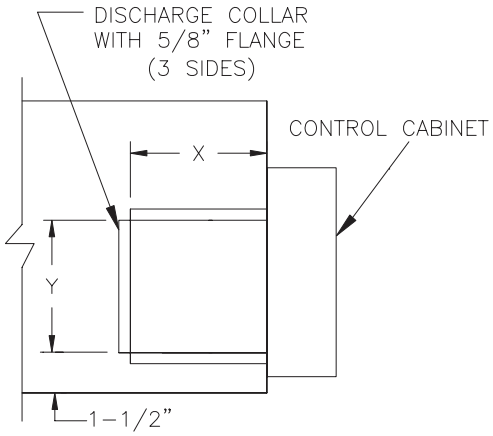
END VIEW

NOTE: Drawings are not to scale and are not for installation purposes. Contact your Johnson Controls representative for more information. All data and dimensions are subject to change without notice.

Model TVS-EH (Electric Heat)

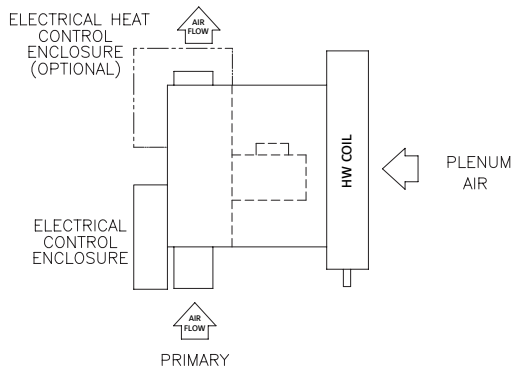


ELECTRIC HEATER DETAIL
(TOP VIEW)

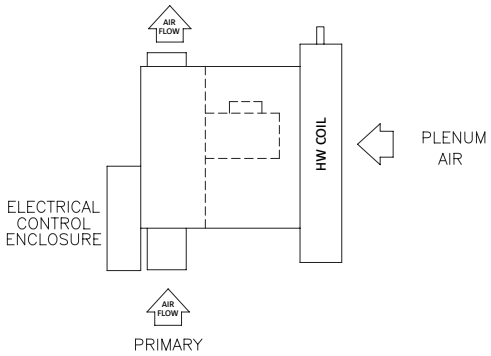


DISCHARGE
COLLAR DETAIL

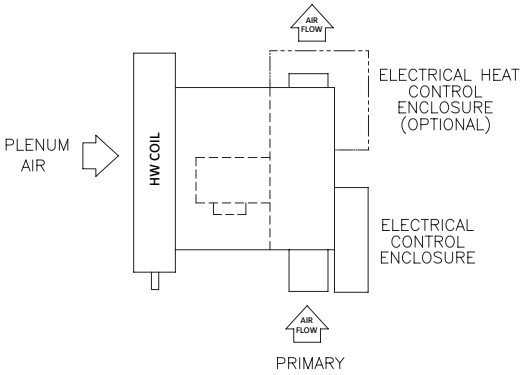
Model TVS Arrangements



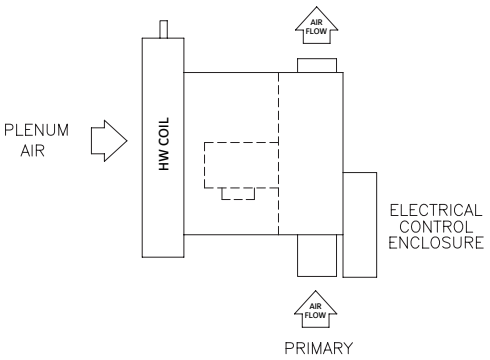
ARRANGEMENT 1
(Left-Hand Control Unit with Left-Hand Coil)



ARRANGEMENT 2
(Left-Hand Control Unit with Right-Hand Coil)



ARRANGEMENT 3
(Right-Hand Control Unit with Right-Hand Coil)



ARRANGEMENT 4
(Right-Hand Control Unit with Left-Hand Coil)

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TVS Terminal Features

STANDARD FEATURES:

Construction
- ARI Standard 880-certified and labeled
- 22-gauge, galvanized-steel casing and valve
- 3/4" thick, fiberglass insulation, mechanically fastened for added security

Hot-Water Coils
- ARI Standard 410-certified and labeled
- 1, 2, 3, 4-row coils
- Tested at a minimum of 350 psig under water

Fan Assemblies
- Forward-curved, dynamically-balanced, direct-drive, galvanized blower wheel
- 115 to 277-volt, single-phase, three-tap, permanent-split-capacitor (PSC) motor
- SCR fan-speed controller
- Quick-select, motor-speed terminal
- Permanently lubricated motor bearings
- Thermally protected motor
- Vibration-isolation motor mounts
- Single-point wiring

Primary Air Valve
- Embossed rigidity rings
- Low-thermal-conductance damper shaft with position indicator
- Mechanical stops for open and closed position
- Multi-point, center-averaging, airflow sensor
- Balancing tees
- Plenum-rated sensor tubing

Electrical Components
- cETL listed for safety compliance
- NEMA Type 1 wiring enclosure

Electric Heat
- ETL-listed as an assembly for safety compliance
- Integral, electric-heat assembly
- Automatic-reset primary and back-up secondary thermal limits
- Single-point-power connection
- Hinged, electrical-enclosure door
- Fusing per NEC

OPTIONAL FEATURES:

Construction
- 20-gauge, galvanized-steel construction
- 1" insulation
- Scrim-reinforced, foil-faced insulation meeting American Society for Testing and Materials (ASTM) C1136 for mold, mildew, and humidity resistance
- Double-wall construction with 22-gauge liner
- Mounting brackets to accept all threaded hanging rods or wire hangers
- Low-velocity, low-pressure-drop, filter rack and filters located at induction inlet
- Hot-water, steam, or electric heating coils

Fan Assemblies
- 208, 230, 240 and 480-volt, single-phase, PSC motors
- 220/240-volt, 50 Hz motors

Electrical Components
- Full-unit, toggle disconnect and inline motor fusing
- Primary and secondary transformer fusing

Electric Heat
- Proportional, solid-state-relay (SSR), heater control
- Mercury contactors
- Door-interlocking disconnect switches

Controls
- Factory-provided controls include:
  - Direct-digital controls (DDC) for BACnet, N2, or LON® networks
  - Pneumatic controls
  - Analog electronic controls
- Consignment DDC controls (factory-mount and wire controls provided by others)

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