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miscellaneous terminals

retrofit

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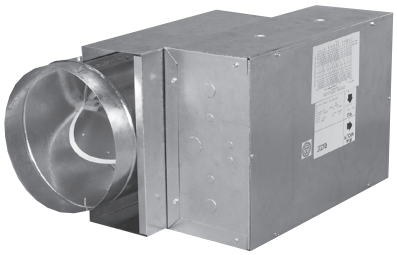
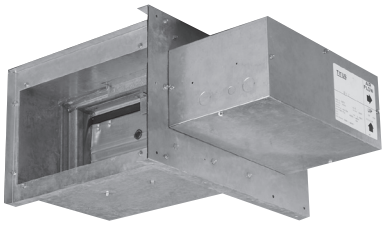


ZECV

ROUND DUCT BYPASS

- Bypass or discharge pressure control
- Sizes from 8 to 16 inches round
- Flow ranges to 4,000 cfm
- Electronic controls



ZQCV

RECTANGULAR DUCT BYPASS

- Bypass or discharge pressure control
- Sizes from 5 x 5 inches to 52 x 26 inches round
- Flow ranges to 15,000 cfm
- Electronic controls

balancing terminals

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PESM

BALANCING STATION

- AeroCross multi-point center averaging sensor
- Sizes from 4 inches round to 24 x 16 inches
- Manual operator with locking quadrant

BYPASS TERMINALS

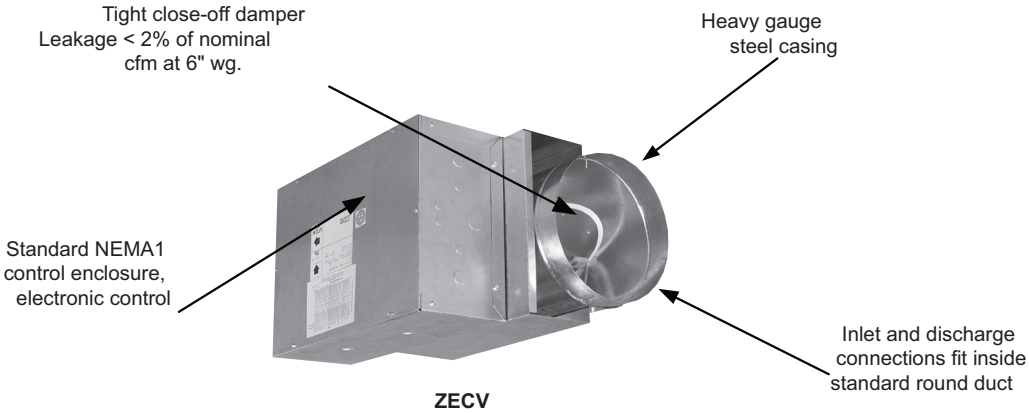
FEATURES AND BENEFITS

PRESSURE CONTROL TERMINALS

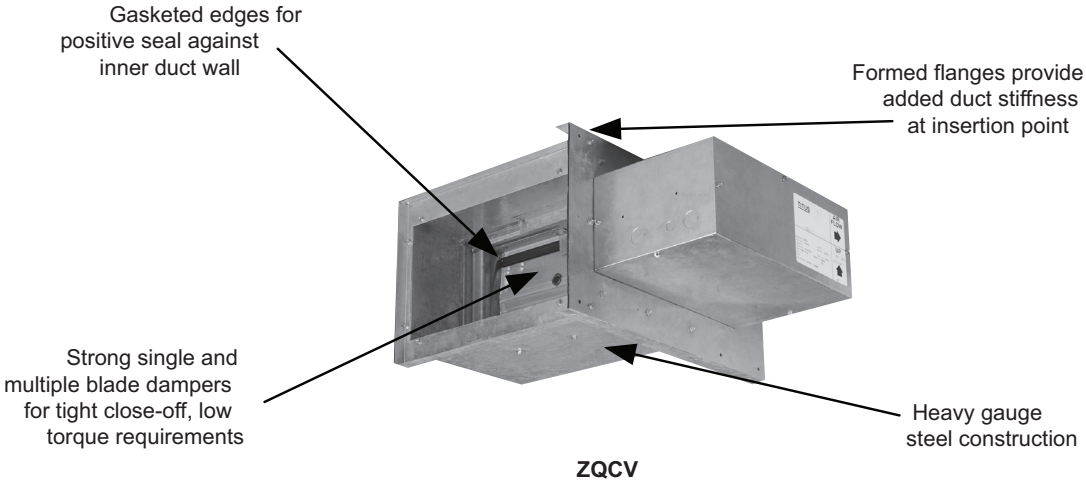
Whether yours is a new system or retrofit of an existing system, the ZECV and ZQCV bypass terminals are excellent choices for pressure control. Both the ZECV and ZQCV can be can be applied in either bypass or branch pressure control situations, with quick installation and setup. They are ideal for use in systems when constant volume supply fans are used with variable volume control.

Bypass pressure control is essential to prevent excess air delivery to uncontrolled zones in systems that are partially variable volume (when some zones have volume control and others do not). Discharge pressure control can be used to increase the effectiveness of dampers or diffusers used to control air delivery to zones, as well as to decrease sound levels in zones.

The standard electronic control package includes a pressure transducer with remote static pressure tap (for field installation), an electronic actuator and adjustable control module, installed in a NEMA1 enclosure. The control module can be located remotely for easier access. Control voltage is 24 VAC; optional transformers are available mounted and wired in primary voltages from 24 to 480 VAC to match building power.



ZECV



ZQCV

Contact your local Titus representative for solutions to your unique bypass terminal needs!

CONTROL STRATEGIES

HOW TO APPLY THE ZECV / ZQCV PRESSURE CONTROL TERMINALS

Bypass terminals should be used whenever VAV control devices handle more than 30 percent of the total airflow on a constant volume system. Dependent upon application, a bypass terminal can minimize the possibility of delivering excess air to uncontrolled zones, or can significantly improve the performance of controlled zones by increasing modulation capability and decreasing sound levels.

In Bypass Pressure Control applications, the ZECV or ZQCV relieves system pressure by opening to a return duct or ceiling plenum. The field installed static pressure tap (provided by Titus) is installed in the supply ductwork to sense system static pressure. When used for Bypass Pressure Control, the terminal should be sized to handle 80 percent of the total supply flow, less the airflow of the smallest controlled zone. A schematic of a bypass pressure control application appears below.

Care must be taken when installing the bypass damper. It should be installed as far downstream from the fan intake as is practical to maximize supply and return air mixing. This reduces the risk of unit cycling on high or low temperature limits.

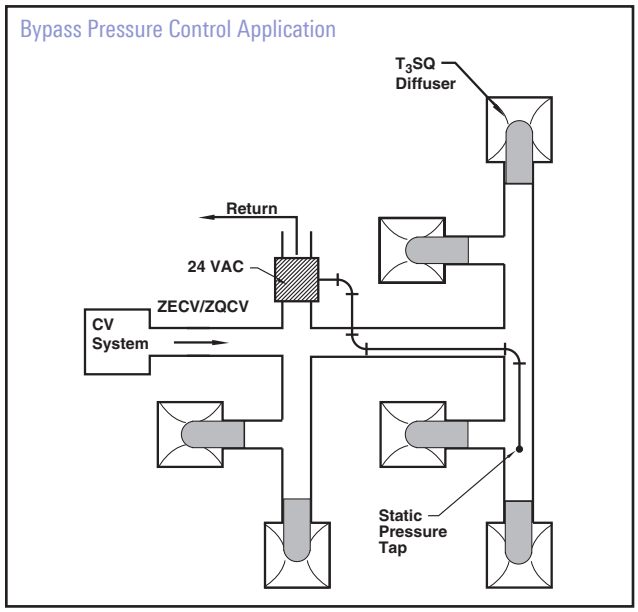
When using rooftop units with outside air economizer cycles, special attention must be given to building pressurization. Maintaining a slight positive building pressure is preferred; however, in light cooling situations when an economizer opens fully to supply outside air, the possibility of building over-pressurization exists. When this occurs, more air is entering the building than can be exhausted. This can result in reduced airflow to the zones, as well as entry doors that whistle or stand open.

An effective method of addressing this situation is an additional exhaust fan sequenced to energize whenever the outside air damper opens beyond minimum position. This will ensure the building receives the advantages of outside air supply while maintaining excellent comfort conditions.

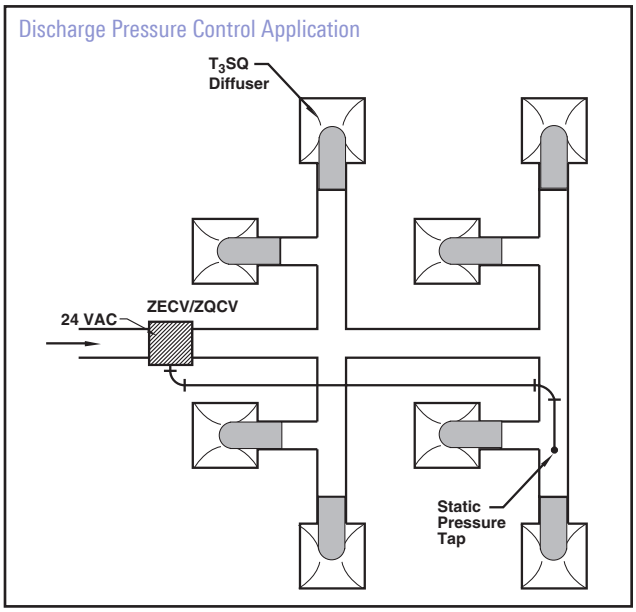
Discharge Pressure Control applications often involve the addition of a number of VAV devices on a constant volume system where it is necessary to reduce pressure to the inlets. The ZECV/ZQCV relieves individual branch pressure by closing to increase pressure drop to the VAV devices. The static pressure tap would be installed downstream of the bypass terminal to sense individual branch static pressure. A schematic of a discharge pressure control application appears below.

When used for Discharge Pressure Control, the terminal should be sized to handle the maximum calculated flow requirement of that branch.

Bypass Pressure Control Application



Discharge Pressure Control Application



ZECV

- Limits static pressure in duct systems feeding VAV devices
- Standard analog electronic controls
- In bypass pressure control applications, the static pressure tap must be installed downstream of the terminal. Pressure is relieved by opening the damper to the return duct or plenum.
- In discharge pressure control applications, the static pressure tap must be installed downstream of the terminal. Pressure is relieved by closing the damper to increase the pressure drop to the VAV devices.
- Tight close-off damper. Leakage is less than 2 percent of nominal cfm at 6-inch Ps wg.
- Heavy gauge steel casing
- Inlet and discharge connections fit inside standard round duct
- Maximum static pressure setpoint is adjusted at control module inside control enclosure

ZECV

retrofit energy solutions

See website for Specifications

MODEL:

ZECV

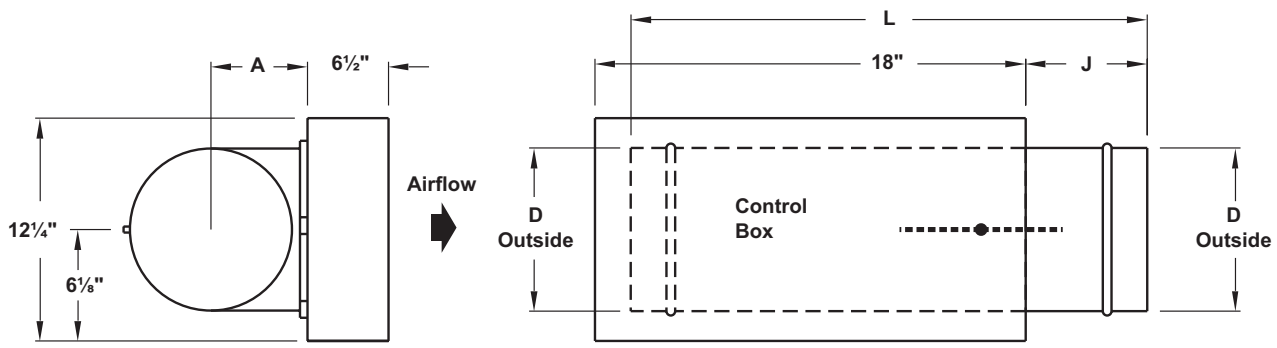
OVERVIEW

Bypass / Pressure Terminal Round Duct

The ZECV is an excellent unit for pressure control either in a new system or retrofitting an existing system. It particularly performs well in systems where constant volume supply fans are used with variable volume control. It has a tight close-off damper and leakage is less than 2% of nominal cfm at 6-inch Ps wg.

ZECV UNIT DIMENSIONS

Bypass / Pressure Terminal - Round Duct



An analog electronic controller is mounted inside the control enclosure with transducer and control module. Ten feet of plenum-rated tubing and a static pressure tap are also provided.

Size	cfm Range	A	D	J	L
8	0-900	4 9/16	7 7/8	2	16
10	0-1400	5 9/16	9 7/8	4	20
12	0-2000	6 9/16	11 7/8	4	20
14	0-3000	7 9/16	13 7/8	6	24
16	0-4000	8 9/16	15 7/8	6	24

ACCESSORIES (OPTIONAL)

- Dust-tight enclosure seal
- Disconnect switch
- 24 VAC control transformer
- Hanger brackets

All dimensions are in inches

ZECV / RADIATED SOUND PERFORMANCE

Size	cfm	Min ΔPs	Octave Band Sound Power, Lw																										
			0.5" ΔPs							1.0" ΔPs							1.5" ΔPs							2.0" ΔPs						
			2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC
08	600	0.11	46	38	39	39	43	38	**13**	51	44	45	45	48	44	**19**	54	48	49	48	51	47	**23**	56	50	51	51	53	49	**26**
	650	0.13	48	40	41	41	45	40	**15**	53	46	47	47	50	46	**21**	56	50	51	50	53	49	**25**	58	53	53	53	55	51	**28**
	700	0.15	50	42	43	43	47	42	**17**	55	49	49	49	52	47	**23**	58	52	53	52	55	51	**27**	60	55	55	55	57	53	**30**
	750	0.17	51	44	45	45	48	44	**18**	56	50	51	51	53	49	**25**	59	54	54	54	56	52	**29**	61	57	57	56	59	55	**32**
	800	0.20	53	46	46	47	50	45	**20**	58	52	52	52	55	51	**27**	61	56	56	56	58	54	**31**	63	58	59	58	60	56	**34**
10	900	0.10	47	39	40	39	44	39	**14**	52	45	46	45	49	45	**20**	55	49	49	48	52	48	**24**	58	51	52	50	54	51	**26**
	1000	0.13	50	42	42	41	46	42	**16**	55	48	48	47	51	47	**23**	58	52	52	51	54	51	**27**	60	54	55	53	57	53	**29**
	1100	0.16	52	45	45	44	48	44	**18**	57	51	51	50	54	50	**25**	60	54	55	53	57	53	**29**	62	57	57	56	59	55	**32**
	1200	0.18	54	47	47	46	50	46	**21**	59	53	53	52	55	52	**28**	62	57	57	55	59	55	**32**	64	59	59	58	61	58	**34**
	1300	0.22	56	49	49	48	52	48	**23**	61	55	55	54	57	54	**30**	64	59	59	58	60	57	**34**	66	61	61	60	63	60	**37**
12	1200	0.09	47	38	39	38	42	39	**12**	52	44	45	44	47	44	**19**	55	48	49	47	50	48	**23**	57	50	51	50	53	50	**26**
	1400	0.12	51	43	43	42	46	43	**17**	56	49	49	48	51	48	**23**	59	52	53	51	54	51	**27**	61	54	55	54	56	54	**30**
	1600	0.16	54	46	47	46	49	46	**20**	59	52	53	51	54	51	**27**	62	56	56	55	57	55	**31**	64	58	59	57	59	57	**34**
	1800	0.20	57	50	50	49	52	49	**24**	62	55	56	55	57	54	**31**	65	59	59	58	60	58	**34**	67	61	62	60	62	60	**37**
	2000	0.25	60	52	52	51	55	51	**27**	65	58	59	57	60	57	**34**	68	62	62	61	63	60	**38**	70	64	65	63	65	63	**40**
14	1500	0.07	47	37	38	37	42	39	**12**	52	44	44	43	47	44	**18**	55	47	48	46	50	48	**22**	57	50	50	48	52	50	**25**
	1800	0.11	51	42	43	42	46	43	**16**	56	49	49	47	52	49	**23**	59	52	53	51	54	52	**27**	61	55	55	53	57	54	**30**
	2100	0.15	55	47	47	46	50	47	**21**	60	53	53	52	55	53	**27**	63	56	57	55	58	56	**31**	65	59	59	57	60	58	**34**
	2400	0.19	58	50	50	49	53	50	**25**	63	56	57	55	58	56	**31**	66	60	60	58	61	59	**35**	68	62	63	61	63	61	**38**
	2700	0.24	61	53	53	52	56	53	**28**	66	59	60	58	61	59	**35**	69	63	63	62	64	62	**39**	71	66	66	64	66	64	**42**
16	2000	0.08	49	39	39	38	44	41	**14**	54	45	46	44	49	46	**19**	56	49	49	47	52	49	**23**	58	51	52	50	54	52	**26**
	2400	0.11	53	44	44	43	48	45	**18**	58	50	50	49	53	51	**25**	61	54	54	52	56	54	**29**	63	56	56	55	58	56	**31**
	2800	0.15	57	48	48	47	52	49	**22**	62	54	54	53	57	55	**29**	64	58	58	56	59	58	**33**	66	60	61	59	62	60	**36**
	3200	0.19	60	52	52	50	55	52	**26**	65	58	58	56	60	58	**33**	68	62	62	60	63	61	**37**	70	64	64	62	65	63	**40**
	3600	0.24	63	55	55	54	57	55	**30**	67	61	61	59	62	61	**36**	70	65	65	63	65	64	**40**	72	67	67	65	67	66	**43**

- Radiated sound is the noise transmitted through the unit casing
- Min ΔPs is the static pressure drop from the unit inlet to the unit outlet with primary damper full open
- Sound power levels are in dB, ref 10^{-12} watts
- All performance based on tests conducted in accordance with ASHRAE 130-2008 and AHRI 880-2011
- All NC levels determined using AHRI 885-2008 Appendix E. See Terminal Unit Engineering Guidelines.
- Dash (-) in space denotes NC value less than NC10

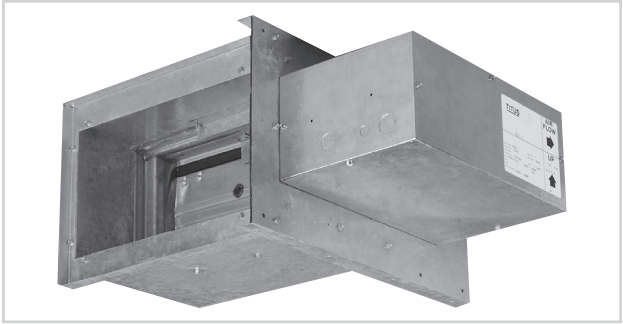
ZECV / DISCHARGE SOUND PERFORMANCE

Size	cfm	Min ΔPs	Octave Band Sound Power, Lw																										
			0.5" ΔPs							1.0" ΔPs							1.5" ΔPs							2.0" ΔPs						
			2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC
08	600	0.10	76	63	58	57	48	44	**32**	82	70	65	62	55	50	**40**	86	75	70	65	59	54	**44**	88	78	73	67	61	57	**47**
	650	0.12	77	63	59	58	49	45	**33**	83	71	66	63	55	51	**40**	87	75	70	66	59	55	**45**	89	78	73	68	62	58	**48**
	700	0.14	78	64	59	59	50	45	**33**	84	71	66	64	56	52	**41**	87	76	70	66	60	55	**46**	90	79	73	68	62	58	**49**
	750	0.16	78	64	59	60	50	46	**31**	84	71	67	64	57	52	**39**	88	76	71	67	60	56	**44**	90	79	74	69	63	59	**47**
	800	0.19	79	64	60	60	51	46	**32**	85	72	67	65	57	53	**40**	88	76	71	68	61	56	**44**	91	79	74	70	64	59	**48**
10	900	0.10	76	64	60	59	51	49	**29**	82	72	67	63	58	55	**36**	86	76	72	66	61	59	**41**	88	79	75	68	64	61	**44**
	1000	0.13	77	65	61	60	52	49	**30**	83	72	68	65	58	56	**38**	86	77	72	67	62	59	**42**	89	80	75	69	65	62	**45**
	1100	0.16	77	65	61	61	53	50	**31**	84	73	69	66	59	56	**39**	87	77	73	69	63	60	**43**	90	80	76	70	66	63	**46**
	1200	0.18	78	66	62	62	53	51	**32**	84	73	69	67	60	57	**39**	88	78	73	70	64	61	**44**	90	81	76	71	67	63	**47**
	1300	0.22	79	66	62	63	54	51	**32**	85	74	70	68	61	58	**40**	88	78	74	70	64	61	**45**	91	81	77	72	67	64	**48**
12	1200	0.09	68	58	56	55	55	51	**18**	73	63	60	59	59	56	**25**	76	66	63	61	61	59	**29**	78	68	64	62	62	61	**31**
	1400	0.12	70	60	58	57	57	53	**21**	75	65	62	61	61	58	**28**	78	68	65	63	63	61	**32**	80	70	67	64	64	63	**34**
	1600	0.16	72	62	60	59	59	54	**24**	77	67	64	63	63	59	**30**	80	70	67	65	65	62	**34**	82	72	69	66	66	64	**37**
	1800	0.20	74	64	62	61	61	56	**26**	79	69	66	64	64	60	**32**	82	72	68	66	66	63	**36**	84	74	70	68	68	65	**39**
	2000	0.25	75	66	63	62	63	57	**28**	80	71	67	66	66	61	**34**	83	74	70	68	68	64	**38**	85	76	72	69	69	66	**41**
14	1500	0.07	67	57	56	56	56	55	**18**	73	62	60	59	59	59	**25**	76	65	63	62	62	62	**29**	78	67	65	63	63	64	**31**
	1800	0.11	70	60	58	58	58	57	**21**	75	65	63	62	62	62	**28**	78	68	65	64	64	64	**32**	81	70	67	66	66	66	**35**
	2100	0.15	72	63	60	61	61	59	**24**	78	68	65	64	64	63	**31**	81	71	67	66	66	66	**35**	83	73	69	68	68	68	**38**
	2400	0.19	74	65	62	62	62	61	**26**	79	70	66	66	66	65	**33**	83	73	69	68	68	68	**37**	85	75	71	70	70	70	**40**
	2700	0.24	76	67	64	64	64	62	**28**	81	72	68	68	68	67	**35**	84	75	71	70	70	69	**39**	86	77	72	71	72	71	**42**
16	2000	0.08	63	59	59	58	58	58	**22**	70	64	63	61	62	62	**26**	74	67	66	64	64	65	**29**	77	69	68	65	65	67	**30**
	2400	0.11	64	62	62	61	61	60	**24**	71	67	66	64	64	65	**28**	75	70	68	66	66	67	**31**	78	72	70	68	68	69	**33**
	2800	0.15	65	65	64	63	63	62	**26**	72	70	68	66	67	67	**30**	76	73	71	68	69	69	**33**	79	75	72	70	70	71	**35**
	3200	0.19	65	67	66	65	65	64	**27**	73	72	70	68	69	68	**32**	77	75	73	70	71	71	**35**	80	77	74	72	72	73	**37**
	3600	0.24	66	69	67	67	67	65	**29**	73	74	72	70	70	70	**33**	77	77	74	72	72	72	**37**	80	79	76	74	74	74	**39**

- Discharge sound is the noise emitted from the unit discharge into the downstream ductwork
- Min ΔPs is the static pressure drop from the unit inlet to the unit outlet with primary damper full open
- Sound power levels are in dB, ref 10^{-12} watts
- All performance based on tests conducted in accordance with ASHRAE 130-2008 and AHRI 880-2011
- All NC levels determined using AHRI 885-2008 Appendix E. See Terminal Unit Engineering Guidelines.
- Dash (-) in space denotes NC value less than NC10

ZQCV

- Limits static pressure in duct systems feeding VAV devices
- Standard analog electronic controls
- Easy, low cost installation into rectangular duct. The installer simply cuts a rectangular hole in the side of the duct, cuts away the insulation (where present), slides the unit into the duct and screws the mounting plate to the side of the duct. Reinforcing angles are screwed to the top and bottom edges (see the illustration on next page)
- In bypass pressure control application the static pressure tap must be installed downstream of the terminal. Pressure is relieved by opening the damper to the return duct or plenum.
- In discharge pressure control applications, the static pressure tap must be installed downstream of the terminal. Pressure is relieved by closing the damper to increase the pressure drop to the VAV devices.
- Damper is constructed of 16-gauge galvanized steel
- Maximum static pressure setpoint is adjusted at control module inside control enclosure



ZQCV

- Tight close-off damper. Leakage is less than 2 percent of nominal cfm at 6-inch sp wg.
- Gaskets under the mounting plate and at the end of the orifice plate seal the unit to the sides of the duct (see the illustration on the next page)
- The hand of the terminal can be changed by flipping unit upside down. It is not position sensitive.

retrofit energy solutions

See website for Specifications

MODEL:

ZQCV

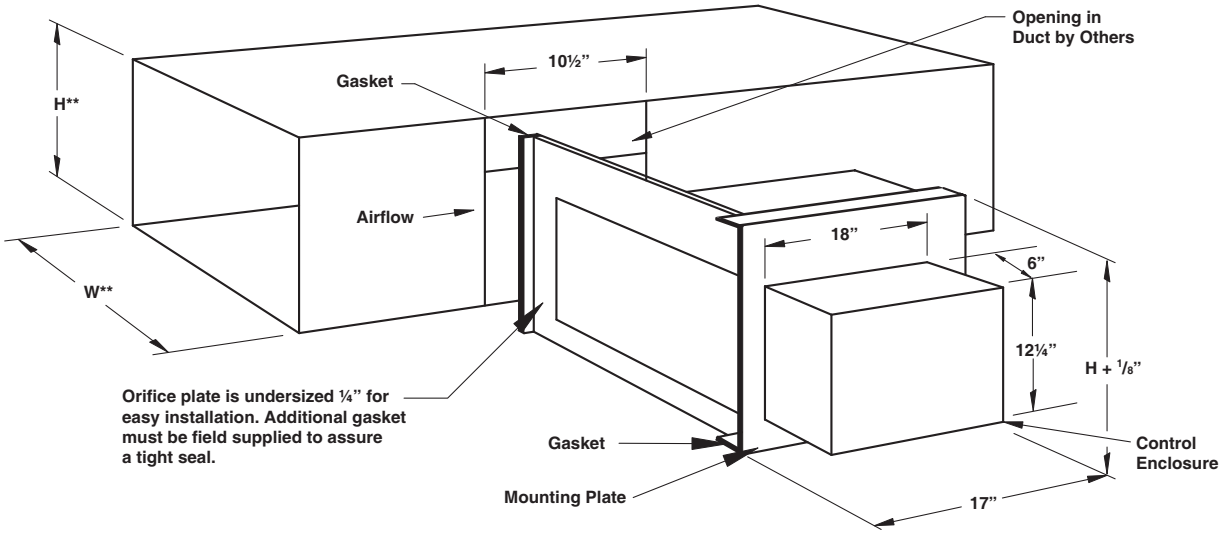
OVERVIEW

Bypass / Pressure Terminal Rectangular Duct

The ZQCV is an excellent unit for pressure control either in a new system or retrofitting an existing system. It particularly performs well in systems where constant volume supply fans are used with variable volume control. It has a tight close-off damper and leakage is less than 2% of nominal cfm at 6-inch Ps wg.

ZQCV UNIT DIMENSIONS

Bypass / Pressure Terminal - Rectangular Duct



An analog electronic controller is mounted inside the control enclosure with transducer and control module. Ten feet of plenum-rated tubing and a static pressure tap are also provided. ** Represents outside duct dimension.

AVAILABLE DUCT SIZES

Unit Size (Damper Size)	cfm Range	Available Duct Sizes*	
		Width W	Height H
A (5x5)	0 to 200	5, 6, 8, 10, 12 6, 8, 10, 12 8, 10, 12	5 6 8
B (6 x 6)	0 to 300	6, 8, 10, 12 8, 10, 12 10, 12	6 8 10
C (8 x 6)	0 to 400	8, 10, 12, 14, 16 8, 10, 12, 14, 16 10, 12, 14, 16	6 8 10
D (10 x 8)	0 to 700	10, 12, 14, 16, 18 10, 12, 14, 16, 18 12, 14, 16, 18	8 10 12
E (14 x 8)	0 to 1000	14, 16, 18, 20, 22 14, 16, 18, 20, 22 14, 16, 18, 20, 22	8 10 12
F (18 x 6)	0 to 1000	18, 20, 22, 24, 26 18, 20, 22, 24, 26 18, 20, 22, 24, 26	6 8 10
G (12 x 10)	0 to 1100	12, 14, 16, 18, 20, 22 12, 14, 16, 18, 20, 22 14, 16, 18, 20, 22	10 12 14
H (18 x 10)	0 to 1900	18, 20, 22, 24, 26, 28 18, 20, 22, 24, 26, 28 18, 20, 22, 24, 26, 28	10 12 14
J (18 x 12)	0 to 2400	18, 20, 22, 24, 26, 28 18, 20, 22, 24, 26, 28 18, 20, 22, 24, 26, 28	12 14 16
K (20 x 14)	0 to 3800	20, 22, 24, 26, 28, 30 20, 22, 24, 26, 28, 30 20, 22, 24, 26, 28, 30	14 16 18
L (30 x 12)	0 to 5400	30, 32, 34, 36 30, 32, 34, 36 30, 32, 34, 36	12 14 16
M (22 x 16)	0 to 5400	22, 24, 26, 28, 30, 32, 34, 36 22, 24, 26, 28, 30, 32, 34, 36 22, 24, 26, 28, 30, 32, 34, 36	16 18 20
N (24 x 18)	0 to 6700	24, 26, 28, 30, 32, 34, 36 24, 26, 28, 30, 32, 34, 36 24, 26, 28, 30, 32, 34, 36 24, 26, 28, 30, 32, 34, 36	18 20 24 26
P (30 x 20)	0 to 10	30, 32, 34, 36, 38, 40, 42, 44, 46 30, 32, 34, 36, 38, 40, 42, 44, 46 30, 32, 34, 36, 38, 40, 42, 44, 46	20 24 26
R (40 x 20)	0 to 15,000	40, 42, 44, 46, 48, 50, 52 40, 42, 44, 46, 48, 50, 52 40, 42, 44, 46, 48, 50, 52	20 24 26

* This is a sampling of common sizes. Any duct size larger than the damper size can be built.

ACCESSORIES

- Dust-tight enclosure seal
- Disconnect switch
- 24 VAC control transformer

ZQCV / RADIATED SOUND PERFORMANCE

Inlet Size	cfm	Min. ΔPs	Octave Band Sound Power, Lw																									
			0.5" ΔPs							1.0" ΔPs							1.5" ΔPs							2.0" ΔPs						
			2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC
A (5 x 5)	75	0.06	50	48	34	26	24	24	**16**	57	58	47	37	35	33	**27**	61	64	55	43	41	38	**34**	63	68	60	48	46	42	**39**
	100	0.10	51	48	34	26	24	25	**16**	58	58	47	37	35	34	**28**	62	64	55	43	41	39	**34**	65	68	60	48	46	43	**39**
	125	0.16	52	48	35	26	24	26	**16**	59	58	48	37	35	35	**28**	63	64	55	43	41	41	**34**	66	68	61	48	46	44	**39**
	150	0.23	53	48	35	26	24	27	**16**	60	58	48	37	35	36	**28**	64	64	55	43	41	41	**35**	67	68	61	48	46	45	**39**
	200	0.40	55	48	35	26	24	29	**16**	61	58	48	37	35	38	**28**	65	64	56	43	41	43	**35**	68	69	61	48	46	47	**40**
B (6 x 6)	100	0.04	49	48	34	25	23	23	**16**	56	58	47	36	34	32	**27**	60	64	54	43	41	37	**34**	63	68	60	47	45	41	**39**
	150	0.10	51	48	34	25	23	25	**16**	58	58	47	36	34	34	**28**	62	64	55	43	41	39	**35**	65	68	60	47	45	43	**39**
	200	0.18	53	48	34	25	23	27	**16**	60	58	48	36	34	36	**28**	63	64	55	43	41	41	**35**	66	69	61	47	45	45	**40**
	250	0.28	54	48	35	25	23	28	**16**	61	58	48	36	34	37	**28**	65	64	55	43	41	42	**35**	67	69	61	47	45	46	**40**
	325	0.47	55	48	35	25	23	29	**16**	62	59	48	36	34	38	**28**	66	64	56	43	41	43	**35**	69	69	61	47	45	47	**40**
C (8 x 6)	150	0.04	51	49	34	26	23	25	**17**	57	59	47	37	34	33	**28**	61	65	55	43	40	38	**35**	64	69	60	48	45	42	**40**
	250	0.10	53	49	35	25	23	27	**17**	60	59	48	36	34	36	**28**	63	65	56	43	40	41	**35**	66	69	61	48	45	44	**40**
	350	0.20	55	49	36	25	23	29	**17**	61	59	49	36	34	37	**28**	65	65	56	43	40	43	**35**	68	69	62	47	45	46	**40**
	450	0.33	56	49	37	25	23	30	**17**	63	59	49	36	34	39	**28**	66	65	57	43	40	44	**35**	69	69	62	47	45	47	**40**
	550	0.49	57	49	37	25	23	31	**18**	64	59	50	36	34	40	**28**	67	65	57	42	40	45	**35**	70	69	63	47	45	48	**40**
D (10 x 8)	200	0.05	45	46	29	22	19	19	**13**	52	56	42	34	31	28	**25**	56	62	50	41	38	33	**32**	59	66	56	46	43	37	**37**
	300	0.11	48	46	30	23	20	22	**13**	55	57	44	35	32	31	**26**	59	63	52	42	39	36	**33**	62	67	58	47	44	40	**38**
	400	0.20	50	47	32	23	21	24	**14**	57	57	46	35	32	33	**26**	61	63	54	42	39	39	**33**	64	68	59	47	44	42	**39**
	500	0.31	52	47	33	23	21	26	**14**	59	58	47	35	33	35	**27**	63	64	55	42	40	40	**34**	66	68	60	47	44	44	**39**
	600	0.44	53	47	34	23	21	27	**15**	60	58	47	35	33	36	**27**	64	64	55	42	40	42	**34**	67	68	61	47	45	46	**39**
E (14 x 8)	500	0.14	52	49	35	26	24	26	**17**	58	59	48	37	34	35	**28**	62	64	55	43	40	40	**35**	65	68	60	48	45	43	**39**
	625	0.22	54	50	36	26	24	28	**17**	60	59	49	37	34	36	**28**	63	65	56	43	41	41	**35**	66	69	61	48	45	44	**40**
	750	0.32	55	50	37	26	24	29	**18**	61	59	49	37	35	37	**29**	65	65	57	43	41	42	**35**	67	69	62	48	45	46	**40**
	875	0.43	56	50	37	26	24	30	**18**	62	60	50	37	35	38	**29**	66	65	57	43	41	43	**36**	68	69	62	48	45	47	**40**
	950	0.51	N/A	N/A	N/A	N/A	N/A	N/A	**N/A**	63	60	50	37	35	39	**29**	66	65	57	43	41	44	**36**	69	69	63	48	46	47	**40**
F (18 x 6)	500	0.16	51	48	34	25	23	26	**16**	58	58	47	36	34	34	**27**	62	64	54	43	40	39	**34**	64	68	60	47	44	43	**39**
	625	0.24	53	49	35	25	23	27	**16**	59	59	48	36	34	36	**28**	63	64	55	43	40	41	**35**	66	68	61	48	45	44	**39**
	750	0.35	54	49	36	25	23	28	**17**	61	59	49	36	34	37	**28**	65	65	56	43	41	42	**35**	67	69	61	48	45	46	**40**
	875	0.48	55	49	36	25	24	29	**17**	62	59	49	37	34	38	**29**	66	65	57	43	41	43	**35**	68	69	62	48	45	47	**40**
	950	0.56	N/A	N/A	N/A	N/A	N/A	N/A	**N/A**	62	59	50	37	35	38	**29**	66	65	57	43	41	44	**36**	69	69	62	48	45	47	**40**
G (12 x 10)	500	0.12	50	48	32	24	22	24	**15**	56	57	45	35	33	32	**27**	60	63	53	42	39	37	**33**	63	67	59	47	44	41	**38**
	650	0.21	52	48	34	24	22	26	**16**	58	58	47	36	33	34	**27**	62	64	54	42	40	40	**34**	65	68	60	47	44	43	**39**
	800	0.31	53	49	35	25	23	27	**16**	60	59	48	36	34	36	**28**	64	64	56	43	40	41	**35**	67	68	61	47	45	45	**39**
	950	0.44	55	49	36	25	23	29	**17**	61	59	49	36	34	38	**28**	65	65	57	43	41	43	**35**	68	69	62	48	45	46	**40**
	1100	0.59	N/A	N/A	N/A	N/A	N/A	N/A	**N/A**	63	59	50	37	34	39	**29**	66	65	57	43	41	44	**36**	69	69	63	48	46	47	**40**
H (18 x 10)	700	0.08	53	51	38	28	26	28	**19**	59	60	49	38	35	35	**29**	62	65	56	44	41	39	**35**	64	69	60	48	45	43	**40**
	1000	0.17	55	52	39	29	26	30	**20**	61	61	50	38	36	37	**30**	64	66	57	44	42	42	**36**	67	69	62	48	46	45	**40**
	1300	0.29	57	52	40	29	27	31	**20**	62	61	51	39	36	39	**31**	66	66	58	44	42	43	**37**	68	70	63	48	46	46	**41**
	1600	0.44	58	53	41	29	27	33	**21**	64	61	52	39	37	40	**31**	67	66	59	45	42	45	**37**	69	70	63	49	46	48	**41**
	1900	0.62	N/A	N/A	N/A	N/A	N/A	N/A	**N/A**	65	62	53	39	37	41	**31**	68	67	59	45	43	46	**37**	70	70	64	49	47	49	**42**
J (18 x 12)	1000	0.10	55	53	40	29	27	29	**21**	60	61	50	38	36	36	**31**	63	66	57	44	41	40	**36**	65	69	61	48	45	43	**40**
	1300	0.17	57	54	41	30	28	31	**22**	62	62	52	39	37	38	**31**	65	66	58	44	42	42	**37**	67	70	62	48	46	45	**41**
	1600	0.26	58	54	42	30	28	33	**23**	63	62	53	39	37	40	**32**	66	67	59	45	43	44	**37**	68	70	63	49	46	47	**41**
	1900	0.37	59	55	43	31	29	34	**23**	64	63	53	40	38	41	**33**	67	67	60	45	43	45	**38**	70	70	64	49	47	48	**42**
	2200	0.50	60	55	43	31	29	35	**24**	65	63	54	40	38	42	**33**	68	68	60	46	43	46	**38**	71	71	65	50	47	49	**42**
K (20 x 14)	2000	0.17	59	57	45	33	31	31	**26**	64	64	54	41	39	38	**34**	67	68	60	46	43	43	**38**	68	70	64	49	47	46	**42**
	2400	0.24	61	58	46	33	32	31	**27**	65	64	55	42	39	39	**35**	68	68	61	46	44	43	**39**	70	71	65	50	47	46	**43**
	2800	0.32	62	58	47	34	32	32	**27**	67	65	56	42	40	39	**35**	69	69	62	47	45	44	**40**	71	72	66	50	48	47	**43**
	3200	0.42	63	59	48	35	33	32	**28**	68	65	57	43	41	40	**36**	70	69	63	48	46	44	**40**	72	72	66	51	49	47	**44**
	3600	0.53	N/A	N/A	N/A	N/A	N/A	N/A	**N/A**	69	66	58	43	41	40	**36**	71	70	63	48	46	45	**41**	73	72	67	52	49	48	**44**
L (18 x 12)	2800	0.08	63	62	55	41	38	35	**32**	66	67	63	47	44	41	**38**	69	70	68	51	48	45	**43**	70	72	71	54	51	47	**47**
	3450	0.12	64	62	55	41	38	36	**32**	68	68	63	48	44	42	**39**	70	71	68	51	48	45	**44**	71	73	71	54	51	47	**47**
	4100	0.17	66	63	56	41	38	36	**33**	69	68	64	48	44	42	**39**	71	71	68	52	48	45	**44**	73	73	72	54	50	48	**48**
	4750	0.23	67	64	56	41	37	36	**34**	70	69	64	48	44	42	**40**	72	72	69	52	48	46	**45**	74	74	72	54	50	48	**48**
	5400	0.29	68	64	56	42	37	36	**34**	71	69	64	48	44	42	**40**	73	72	69	52	48	46	**45**	75	74	72	55	50	48	**49**
M (20 x 14)	2800	0.11	63	60	53	38	38	34	**30**	66	66	62	45	44	40	**37**	68	69	67	50	48	44	**43**	70	71	71	53	51	46	**47**
	3450	0.16	65	61	54	39	39	35	**31**	68	67	62	46	45	41	**38**	70	70	68	50	48	45	**43**	72	72	71	53	51	47	**47**
	4100	0.23	66	62	54	39	39	36	**32**	70	68	63	47	45	42	**38**	72	71	68	51	49	45	**44**	73	73	72	54	51	48	**48**
	4750	0.31	67	63	54	40	39	36	**33**	71	68	63	47	45	43	**39**	73	71	68	52	49	46	**44**	75	74	72	55	52	49	**48**
	5400	0.40	68	63	54	40	39	37	**33**	72	69	63	48	46	43	**40**	74	72	68	52	49	47	**44**	76	74	72	55	52	49	**48**

ZQCV / RADIATED SOUND PERFORMANCE CONT.

Inlet Size	cfm	Min. ΔPs	Octave Band Sound Power, Lw																										
			0.5" ΔPs							1.0" ΔPs							1.5" ΔPs							2.0" ΔPs						
			2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC
N (24 x 18)	3000	0.06	62	61	54	38	37	34	**30**	65	66	62	45	43	40	**37**	67	69	67	49	47	43	**43**	69	71	70	52	49	46	**46**
	3925	0.11	64	62	54	39	38	34	**32**	68	67	63	46	44	41	**38**	70	70	67	50	47	44	**43**	71	72	71	53	50	47	**47**
	4850	0.16	66	63	55	40	38	35	**32**	69	68	63	47	44	41	**39**	71	71	68	51	48	45	**44**	73	73	71	54	50	47	**48**
	5775	0.23	67	63	55	41	38	36	**33**	70	68	64	48	44	42	**39**	72	71	68	52	48	45	**44**	74	74	72	55	50	48	**48**
	6700	0.31	68	64	56	42	39	36	**34**	72	69	64	49	45	42	**40**	74	72	69	53	48	46	**45**	75	74	72	56	51	48	**48**
P (30 x 20)	3600	0.05	61	59	53	38	36	32	**29**	64	65	61	45	43	39	**36**	67	68	66	49	46	43	**42**	68	70	69	52	49	45	**45**
	5200	0.10	63	60	54	38	37	33	**30**	67	66	62	45	43	40	**37**	69	69	67	49	47	43	**42**	71	72	70	52	49	46	**46**
	6800	0.17	65	61	55	38	37	34	**31**	69	67	63	46	43	40	**38**	71	70	67	50	47	44	**43**	72	72	71	53	50	47	**47**
	8400	0.25	66	62	55	39	37	34	**32**	70	68	63	46	43	41	**38**	72	71	68	50	47	44	**44**	74	73	71	53	50	47	**47**
	10000	0.36	67	63	55	39	37	35	**33**	71	68	63	46	44	41	**39**	73	71	68	50	47	45	**44**	75	74	72	53	50	48	**48**
R (40 x 20)	7000	0.10	64	61	54	41	38	34	**31**	67	66	62	47	44	40	**37**	69	69	67	50	47	44	**42**	71	72	70	53	50	46	**46**
	9000	0.16	65	62	55	41	38	34	**32**	69	67	63	47	44	41	**38**	71	70	67	51	47	44	**43**	73	72	71	53	50	47	**47**
	11000	0.24	67	63	55	42	38	35	**33**	70	68	63	48	44	41	**39**	72	71	68	51	48	44	**43**	74	73	71	53	50	47	**47**
	13000	0.34	68	63	55	42	39	35	**33**	71	68	63	48	44	41	**39**	73	71	68	51	48	45	**44**	75	73	71	54	50	47	**47**
	15000	0.45	69	63	56	42	39	35	**34**	72	69	64	48	44	41	**40**	74	72	68	52	48	45	**44**	76	74	72	54	50	47	**48**

- Radiated sound is the noise transmitted through the unit casing
- Min ΔPs is the static pressure drop from the unit inlet to the unit outlet with primary damper full open
- Sound power levels are in dB, ref 10^{-12} watts
- All performance based on tests conducted in accordance with ASHRAE 130-2008 and AHRI 880-2011
- All NC levels determined using AHRI 885-2008 Appendix E. See Terminal Unit Engineering Guidelines.
- Dash (-) in space denotes NC value less than NC10

ZQCV / DISCHARGE SOUND PERFORMANCE

Inlet Size	cfm	Min. ΔPs	Octave Band Sound Power, Lw																										
			0.5" ΔPs							1.0" ΔPs							1.5" ΔPs							2.0" ΔPs						
			2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC
A (5 x 5)	75	0.06	74	57	45	33	35	26	**33**	82	67	56	42	45	34	**44**	87	74	63	47	51	39	**50**	90	78	68	51	55	42	**54**
	100	0.10	75	57	45	35	36	26	**35**	83	67	57	44	46	35	**45**	88	73	63	49	52	40	**51**	91	78	68	53	56	43	**55**
	125	0.16	76	56	45	36	36	27	**36**	84	67	57	45	46	35	**46**	89	73	64	50	52	40	**52**	92	77	68	54	56	44	**56**
	150	0.23	77	56	46	37	36	27	**36**	85	67	57	46	47	36	**46**	89	73	64	51	53	41	**52**	93	77	69	55	57	44	**57**
	200	0.40	78	56	46	38	37	28	**37**	86	66	57	47	47	37	**48**	90	72	64	52	53	42	**54**	93	77	69	56	57	45	**58**
B (6 x 6)	100	0.04	73	55	46	32	35	24	**30**	80	66	58	41	45	33	**40**	85	72	66	46	51	38	**46**	88	77	71	50	55	42	**51**
	150	0.10	74	55	46	34	36	25	**32**	82	66	58	43	46	34	**42**	86	72	66	48	52	39	**48**	90	76	71	52	56	43	**52**
	200	0.18	75	54	46	35	37	26	**33**	83	65	58	45	47	35	**43**	87	71	66	50	52	40	**49**	91	76	71	54	57	44	**54**
	250	0.28	76	54	46	37	37	27	**34**	84	65	58	46	47	36	**44**	88	71	66	51	53	41	**50**	91	76	71	55	57	44	**55**
	325	0.47	77	54	46	38	37	28	**32**	84	65	58	47	48	36	**42**	89	71	66	53	53	41	**48**	92	75	71	56	58	45	**52**
C (8 x 6)	150	0.04	73	55	46	33	36	25	**30**	80	65	59	42	46	34	**40**	85	72	66	47	52	39	**46**	88	76	71	51	56	42	**50**
	250	0.10	74	54	46	36	37	27	**33**	82	65	58	44	47	35	**42**	86	71	66	50	53	40	**48**	90	75	71	53	57	44	**52**
	350	0.20	75	54	46	37	38	28	**30**	83	64	58	46	47	36	**40**	87	70	65	51	53	41	**46**	91	75	71	55	57	45	**50**
	450	0.33	76	54	46	39	38	28	**31**	84	64	58	48	48	37	**41**	88	70	65	53	54	42	**47**	92	75	70	56	58	45	**51**
	550	0.49	77	53	46	40	38	29	**32**	85	64	58	49	48	37	**42**	89	70	65	54	54	42	**48**	92	74	70	57	58	46	**52**
D (10 x 8)	200	0.05	66	51	41	26	32	21	**22**	74	62	54	36	42	30	**33**	79	68	62	41	48	35	**39**	82	73	68	45	52	39	**43**
	300	0.11	68	51	42	30	33	23	**21**	76	62	55	39	44	32	**32**	81	68	63	45	50	37	**38**	84	73	68	49	54	41	**42**
	400	0.20	70	51	42	32	34	24	**23**	78	62	56	42	45	33	**34**	83	68	63	47	51	38	**40**	86	73	69	51	55	42	**44**
	500	0.31	71	51	43	34	35	25	**25**	79	62	56	43	46	34	**35**	84	69	64	49	52	40	**41**	87	73	69	53	56	43	**46**
	600	0.44	72	51	43	35	36	26	**26**	80	62	56	45	46	35	**36**	85	69	64	50	52	40	**42**	88	73	70	54	57	44	**47**
E (14 x 8)	500	0.14	71	53	45	34	37	26	**24**	78	63	57	43	46	35	**34**	82	69	64	48	52	39	**39**	85	73	69	51	56	43	**43**
	625	0.22	72	53	46	36	38	27	**26**	79	63	58	44	47	35	**35**	83	69	65	49	53	40	**41**	86	73	70	53	56	44	**44**
	750	0.32	73	53	46	37	38	28	**24**	80	63	58	46	48	36	**34**	84	69	65	51	53	41	**39**	87	73	70	54	57	45	**43**
	875	0.43	73	53	46	38	39	28	**25**	81	63	58	47	48	37	**35**	85	69	65	52	54	42	**40**	88	73	70	55	58	45	**44**
	950	0.51	N/A	N/A	N/A	N/A	N/A	N/A	**N/A**	81	63	58	47	48	37	**35**	85	69	65	52	54	42	**41**	88	73	70	56	58	45	**45**
F (18 x 6)	500	0.16	70	52	44	34	36	25	**23**	78	62	56	42	46	34	**33**	82	68	64	48	51	39	**39**	85	73	69	51	56	43	**43**
	625	0.24	71	52	44	35	37	26	**25**	79	62	57	44	47	35	**35**	83	69	64	49	52	40	**40**	86	73	69	53	56	44	**44**
	750	0.35	72	52	45	36	37	27	**23**	80	62	57	45	47	36	**33**	84	69	65	50	53	41	**39**	87	73	70	54	57	44	**43**
	875	0.48	73	52	45	38	38	28	**24**	80	62	58	46	48	36	**34**	85	69	65	51	53	41	**40**	88	73	70	55	57	45	**44**
	950	0.56	N/A	N/A	N/A	N/A	N/A	N/A	**N/A**	81	63	58	47	48	37	**35**	85	69	65	52	54	42	**41**	88	73	70	56	58	45	**45**
G (12 x 10)	500	0.12	68	51	43	32	35	24	**22**	76	62	56	40	45	33	**31**	80	68	63	46	50	38	**37**	83	72	68	49	54	42	**41**
	650	0.21	70	51	44	34	36	25	**24**	77	62	56	43	46	34	**33**	82	68	64	48	51	39	**39**	85	72	69	52	56	43	**43**
	800	0.31	71	51	44	36	37	26	**23**	79	62	57	45	47	35	**32**	83	68	64	50	52	40	**38**	86	73	69	53	56	44	**42**
	950	0.44	72	52	45	37	38	27	**24**	80	62	57	46	47	36	**34**	84	68	65	51	53	41	**40**	87	73	70	55	57	45	**44**
	1100	0.59	N/A	N/A	N/A	N/A	N/A	N/A	**N/A**	81	62	58	47	48	37	**35**	85	68	65	52	54	42	**41**	88	73	70	56	58	46	**45**
H (18 x 10)	700	0.08	70	54	47	36	39	27	**23**	77	63	58	43	47	35	**32**	81	69	65	48	52	39	**37**	83	72	69	51	56	43	**41**
	1000	0.17	72	54	48	38	40	29	**24**	79	63	59	46	48	37	**33**	82	69	66	50	53	41	**36**	85	73	70	53	57	44	**42**
	1300	0.29	73	54	48	40	41	30	**25**	80	64	60	47	49	38	**34**	84	69	66	52	54	42	**39**	87	73	71	55	58	45	**43**
	1600	0.44	74	54	49	41	41	31	**26**	81	64	60	49	50	38	**35**	85	69	66	53	55	43	**40**	88	73	71	56	58	46	**44**
	1900	0.62	N/A	N/A	N/A	N/A	N/A	N/A	**N/A**	82	64	60	50	50	39	**36**	86	69	67	54	55	44	**41**	89	73	71	57	59	47	**46**
J (18 x 12)	1000	0.10	71	56	50	38	41	28	**23**	78	64	60	45	49	36	**31**	81	69	66	49	53	40	**35**	84	72	70	52	56	43	**39**
	1300	0.17	73	56	50	40	42	30	**25**	79	64	60	47	50	37	**33**	83	69	66	51	54	41	**37**	85	73	71	54	57	44	**41**
	1600	0.26	74	56	51	42	43	31	**26**	80	65	61	48	51	38	**34**	84	69	67	52	55	42	**39**	86	73	71	55	58	45	**42**
	1900	0.37	75	57	51	43	44	31	**28**	81	65	61	50	51	39	**35**	85	70	67	54	56	43	**40**	87	73	72	57	59	46	**43**
	2200	0.50	76	57	52	44	44	32	**29**	82	65	62	51	52	39	**37**	86	70	68	55	56	44	**41**	88	73	72	58	60	47	**44**
K (20 x 14)	2000	0.17	75	59	54	42	44	32	**27**	81	66	63	49	51	39	**34**	84	70	68	52	55	42	**39**	86	73	71	55	58	45	**42**
	2400	0.24	76	59	54	43	44	33	**28**	81	66	63	49	51	40	**36**	85	71	68	53	55	44	**40**	87	74	72	56	59	46	**43**
	2800	0.32	77	60	55	44	44	34	**29**	82	67	64	50	51	41	**37**	85	71	69	54	56	44	**41**	88	74	72	57	59	47	**44**
	3200	0.42	77	60	55	44	44	35	**30**	83	67	64	51	51	41	**37**	86	71	69	55	56	45	**41**	88	74	73	57	59	48	**44**
	3600	0.53	N/A	N/A	N/A	N/A	N/A	N/A	**N/A**	83	67	65	51	51	42	**38**	87	71	70	55	56	46	**42**	89	74	73	58	59	49	**45**
L (18 x 12)	2800	0.08	78	63	59	46	48	36	**32**	82	68	66	51	54	41	**38**	85	72	70	54	57	44	**41**	87	74	72	56	59	46	**43**
	3450	0.12	79	64	61	47	49	37	**33**	83	69	67	52	54	43	**39**	86	72	71	55	58	46	**42**	88	74	74	57	60	48	**44**
	4100	0.17	80	64	61	48	49	38	**34**	84	69	68	53	55	44	**40**	87	73	72	56	58	47	**43**	88	75	74	58	60	49	**45**
	4750	0.23	81	65	62	49	50	39	**35**	85	70	69	54	55	45	**41**	87	73	73	57	58	48	**44**	89	75	75	59	61	50	**46**
	5400	0.29	81	65	63	49	50	40	**36**	86	70	69	54	56	45	**42**	88	73	73	57	59	48	**45**	90	76	76	59	61	51	**47**
M (20 x 14)	2800	0.11	78	62	58	46	48	35	**32**	82	68	65	51	53	41	**37**	85	71	69	54	57	44	**41**	87	74	72	56	59	46	**43**
	3450	0.16	80	62	59	47	48	36	**34**	84	68	66	52	54	42	**39**	86	72	70	55	57	45	**43**	88	74	73	57	60	48	**45**
	4100	0.23	81	63	60	49	49	37	**36**	85	69	67	54	55	43	**41**	88	72	71	57	58	46	**44**	89	75	74	59	61	49	**47**
	4750	0.31	82	63	61	50	50	38	**37**	86	69	68	55	55	44	**42**	89	73	72	58	59	47	**46**	90	75	75	60	61	50	**48**
	5400	0.40	83	64	62	51	50	39	**38**	87	70	69	56	56	45	**44**	90	73	73	59	59	48	**47**	91	75	76	61	62	50	**49**

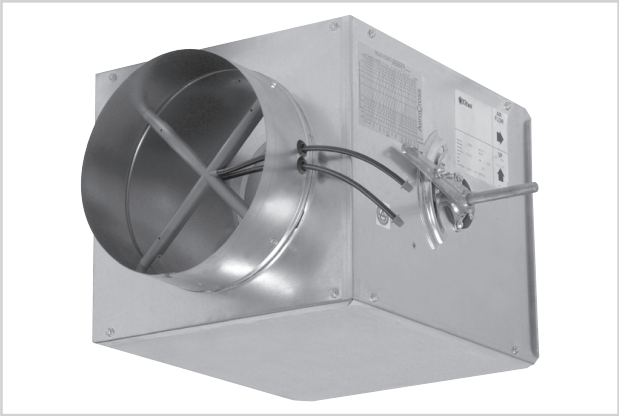
ZQCV / DISCHARGE SOUND PERFORMANCE CONT.

Inlet Size	cfm	Min. ΔPs	Octave Band Sound Power, Lw																										
			0.5" ΔPs							1.0" ΔPs							1.5" ΔPs							2.0" ΔPs						
			2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC
N (24 x 18)	3000	0.06	77	62	59	45	47	35	**30**	81	68	65	50	53	40	**36**	84	71	69	53	57	43	**39**	86	73	72	55	59	45	**41**
	3925	0.11	79	63	60	46	48	36	**32**	83	69	67	51	54	42	**37**	85	72	70	55	57	45	**40**	87	74	73	57	59	47	**43**
	4850	0.16	80	64	61	47	48	38	**33**	84	69	68	53	54	43	**39**	86	72	72	56	58	46	**42**	88	75	74	58	60	49	**44**
	5775	0.23	80	64	62	48	49	39	**34**	85	70	69	54	54	44	**40**	87	73	73	57	58	47	**43**	89	75	75	59	60	50	**45**
	6700	0.31	81	65	63	49	49	40	**35**	85	70	70	54	55	45	**41**	88	73	73	57	58	48	**44**	89	76	76	59	61	51	**46**
P (30 x 20)	3600	0.05	76	62	57	44	46	33	**28**	80	67	64	50	52	38	**33**	82	70	67	53	56	42	**36**	84	73	70	55	59	44	**40**
	5200	0.10	77	63	60	46	47	35	**30**	81	68	66	51	53	40	**35**	84	71	70	54	57	44	**38**	86	73	72	56	59	46	**42**
	6800	0.17	78	63	61	47	47	36	**31**	83	69	67	52	53	42	**37**	85	72	71	55	57	45	**40**	87	74	74	57	59	48	**43**
	8400	0.25	79	64	62	47	48	38	**32**	84	69	69	53	54	43	**38**	86	72	72	56	57	46	**41**	88	75	75	58	60	49	**44**
	10000	0.36	80	64	63	48	48	38	**33**	84	70	70	53	54	44	**39**	87	73	73	56	57	47	**42**	89	75	76	58	60	50	**46**
R (40 x 20)	7000	0.10	77	62	60	45	46	33	**30**	81	68	66	50	52	39	**35**	83	71	69	54	56	43	**38**	85	73	72	56	59	45	**40**
	9000	0.16	78	63	61	46	46	34	**31**	82	68	67	51	53	41	**36**	84	71	71	54	57	44	**39**	86	74	73	57	59	47	**42**
	11000	0.24	78	63	62	47	47	36	**32**	83	69	68	52	53	42	**37**	85	72	72	55	57	46	**40**	87	74	75	57	59	48	**43**
	13000	0.34	79	64	63	47	47	37	**33**	83	69	69	52	53	43	**38**	86	72	73	56	57	47	**41**	87	74	76	58	60	49	**43**
	15000	0.45	80	64	64	48	47	38	**33**	84	69	70	53	54	44	**39**	86	72	74	56	57	48	**42**	88	75	76	58	60	50	**44**

- Discharge sound is the noise emitted from the unit discharge into the downstream ductwork
- Min ΔPs is the static pressure drop from the unit inlet to the unit outlet with primary damper full open
- All performance based on tests conducted in accordance with ASHRAE 130-2008 and AHRI 880-2011
- All NC levels determined using AHRI 885-2008 Appendix E. See Terminal Unit Engineering Guidelines
- Dash (-) in space denotes NC value less than NC10

PESM

- Titus PESM balancing terminals are an accurate and convenient means of measuring airflow, as well as balancing the system. They can also be fitted with water reheat coils.
- The exclusive Titus measuring device incorporated in these balancing stations provides accurate readings at extremely low pressure drops. These readings can be taken over a wide range of velocities—from less than 500 fpm to over 3000 fpm—without changes or adjustments. No orifice plates or other restrictions are used.
- Titus sensing element produces amplified velocity pressure reading directly
- Built-in pressure taps for convenient connection of gauge (gauge by others)
- Manual damper operator with external lever and locking quadrant
- Tight close-off. Damper leakage is less than 2 percent of nominal cfm at 3-inch sp.
- Casing is solidly constructed of heavy gauge galvanized steel



PESM

retrofit

See website for Specifications

MODEL:

PESM

OVERVIEW

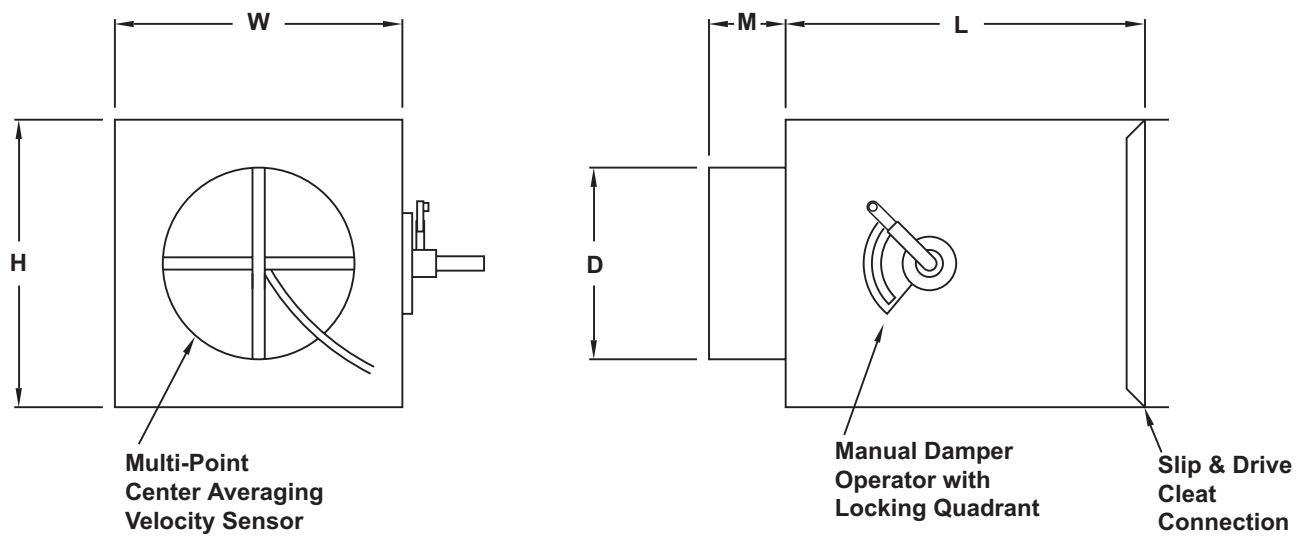
Titus PESM balancing terminals are an accurate and convenient means of measuring airflow as well as balancing the system. They can also be fitted with water reheat coils. The exclusive Titus measuring device incorporated in these balancing stations provides accurate readings at extremely low pressure drops.

ADVANTAGES

- Insulation is coated to resist air erosion. Meets requirements of NFPA 90A and UL 181.
- Optional reheat coils are available with right or left hand connections (Hand is determined by looking with the airflow in plan view)
- PESM sound performance is identical to Titus ESV series terminals. Please refer to performance data shown in Section M of this catalog

PESM UNIT DIMENSIONS

PESM

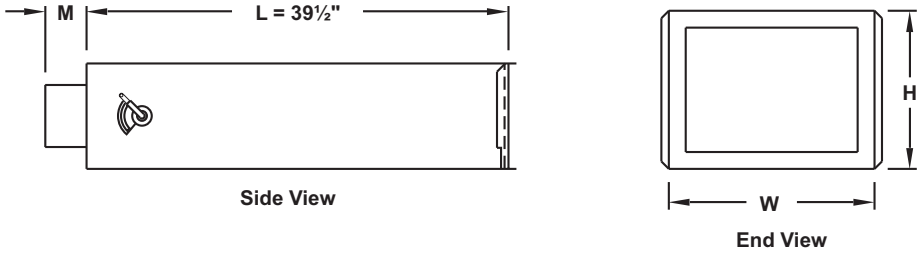


Unit Size	cfm Range	D	H	L	M	W
4	0-225	3 7/8	8	15 1/2	5 3/8	12
5	0-350	4 7/8	8	15 1/2	5 3/8	12
6	0-500	5 7/8	8	15 1/2	3 3/8	12
7	0-650	6 7/8	10	15 1/2	3 3/8	12
8	0-900	7 7/8	10	15 1/2	3 3/8	12
9	0-1050	8 7/8	12 1/2	15 1/2	3 3/8	14
10	0-1400	9 7/8	12 1/2	15 1/2	3 3/8	14
12	0-2000	11 7/8	15	15 1/2	3 3/8	16
14	0-3000	13 7/8	17 1/2	15 1/2	3 3/8	20
16	0-4000	15 7/8	18	15 1/2	3 3/8	24
24 x 16	0-8000	23 7/8 x 15 7/8	18	15 1/2	3 3/8	38

All dimensions are in inches

Integral Sound Attenuator

Titus' unique integral design minimizes casing leakage and disturbance to airflow with no casing or insulation seams

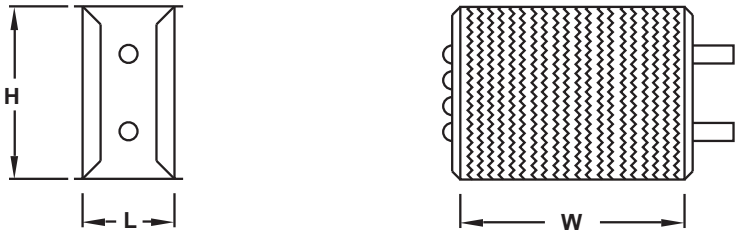


Side View

End View

Hot Water Reheat Coils

Details on water coil features are shown on performance pages M17–M20



Side View

End View

Inlet Size	H	M	W	Water Coil	
				L (1-2 Row)	L (3-4 Row)
4	8	5 3/8	12	5	7¼
5	8	5 3/8	12	5	7¼
6	8	3 3/8	12	5	7¼
7	10	3 3/8	12	5	7¼
8	10	3 3/8	12	5	7¼
9	12½	3 3/8	14	5	7¼
10	12½	3 3/8	14	5	7¼
12	15	3 3/8	16	5	7¼
14	17½	3 3/8	20	7½	9¾
16	18	3 3/8	24	7½	9¾
24 x 16	18	3 3/8	38	5	7¼

All dimensions are in inches

Icons

contributes toward energy savings by reducing operating costs of air distribution devices

energy solutions

for use in retrofitting older products into modern designs & systems

retrofit