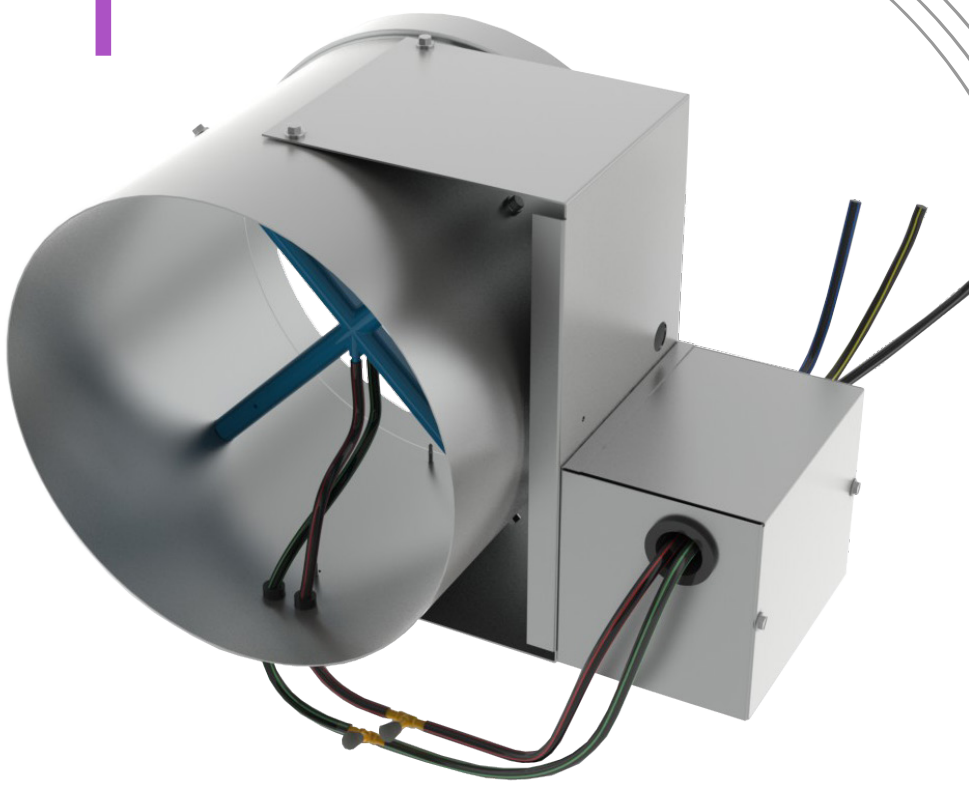
Titus
Redefine your comfort zone.™

vav retrofit terminals

retrofit

energy solutions

P



Titus
Redefine your comfort zone.™

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notice

APPLICATION ICONS KEY

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

VAV Retrofit Terminal Products

external round duct series

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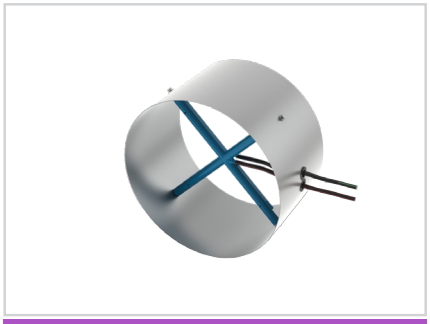
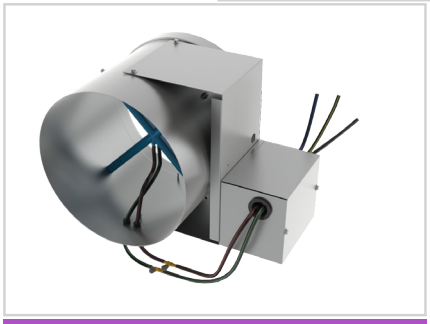


EXX

VARIABLE AIR VOLUME

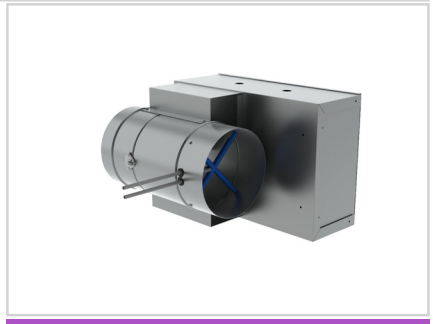
- Converts older constant volume systems into modern energy efficient variable air volume systems
- Flow measurement taps included for easy balancing connections
- Simple & easy installation



ECX

VARIABLE AIR VOLUME

- Converts older constant volume systems into modern energy efficient variable air volume systems
- Flow measurement taps included for easy balancing connections
- Simple & easy installation
- Metal cover protects pneumatic velocity controller



ECV

VARIABLE AIR VOLUME

- Converts older constant volume systems into modern energy efficient variable air volume systems
- Flow measurement taps included for easy balancing connections
- Simple & easy installation
- Metal cover protects velocity controller
- Variety of control options available

slide-in series

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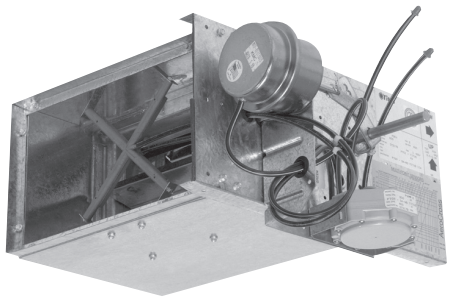

QCV

VARIABLE AIR VOLUME

- Converts older constant volume systems into modern energy efficient variable air volume systems
- Low installation costs
- Available in a variety of sizes
- The casing can be configured to mount on either the right or left side of the existing duct
- Variety of velocity control options available

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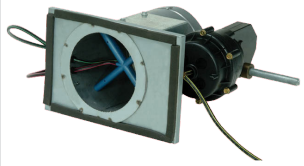
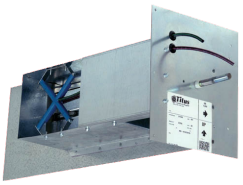
special purpose & internal retrofit series



ECT-AN

VARIABLE AIR VOLUME

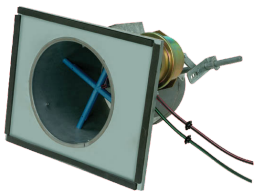
- Designed to retrofit Anemostat Terminals
- Can be adjusted for a minimum cfm setting of zero (full shutoff)
- Available with electric actuators for us with electronic or DDC retrofit controls



ECT-BC

VARIABLE AIR VOLUME

- Designed to retrofit Barber-Colman Terminals
- Performance after is similar to Titus ESV for single duct operation & Titus EDV for dual duct operation
- Minimum airflow can be adjusted for full shutoff
- Available with electric actuators for us with electronic or DDC retrofit controls



ECT-BU

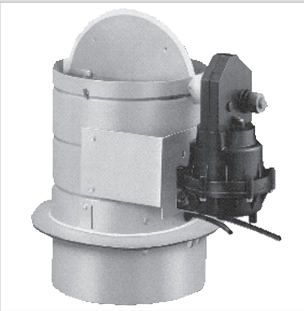
VARIABLE AIR VOLUME

- Designed to retrofit Buensod Terminals
- Can be adjusted for a minimum cfm setting of zero (full shutoff)
- Available with electric actuators for us with electronic or DDC retrofit controls

ECT-CN

VARIABLE AIR VOLUME

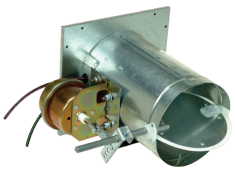
- Designed to retrofit Connor Terminals
- Can be adjusted for a minimum cfm setting of zero (full shutoff)
- Available with electric actuators for us with electronic or DDC retrofit controls



ECT-HC

VARIABLE AIR VOLUME

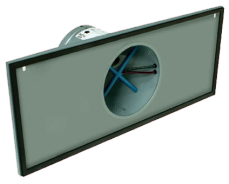
- Designed to retrofit Titus Terminals
- Performance after is similar to Titus ESV for single duct operation & Titus EDV for dual duct operation
- Can be adjusted for a minimum cfm setting of zero (full shutoff)
- High capacity valve can control up to 800 cfm
- Available with electric actuators for us with electronic or DDC retrofit controls



ECT-KR

VARIABLE AIR VOLUME

- Designed to retrofit Krueger Terminals
- Can be adjusted for a minimum cfm setting of zero (full shutoff)
- Available with electric actuators for us with electronic or DDC retrofit controls



ECT-TB

VARIABLE AIR VOLUME

- Designed to retrofit Tuttle & Bailey Terminals
- Minimum airflow can be adjusted for full shutoff
- Available with electric actuators for us with electronic or DDC retrofit controls

ECT-L

CONTROL BOXES

- Can control single or duct duct applications
- Pneumatic only

Overview – External Round Duct Series

FEATURES AND BENEFITS

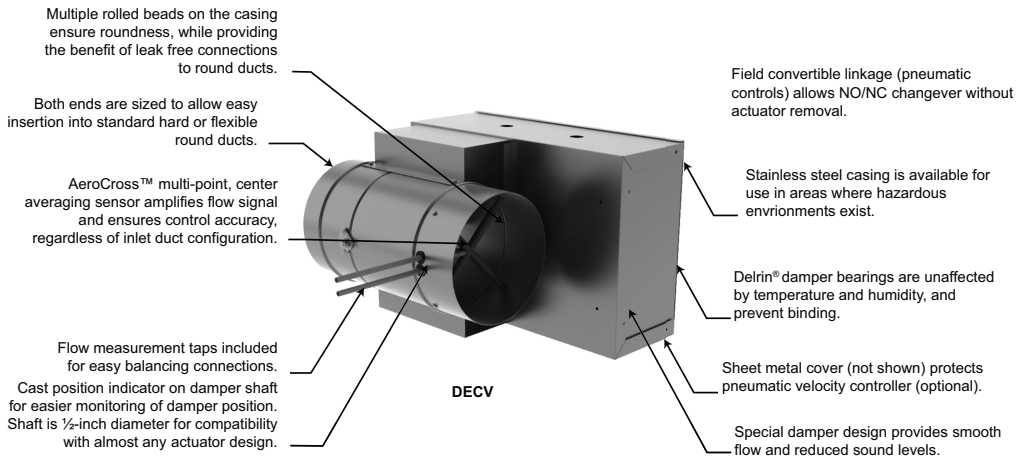
Titus External Round Retrofit Terminals can upgrade those old existing HVAC systems to current standards of energy efficiency and comfort!

External round retrofit terminals are designed to easily convert the old system powered or constant volume systems to more energy efficient variable volume systems. They may also be used in newly designed systems as air measuring devices and exhaust control valves.

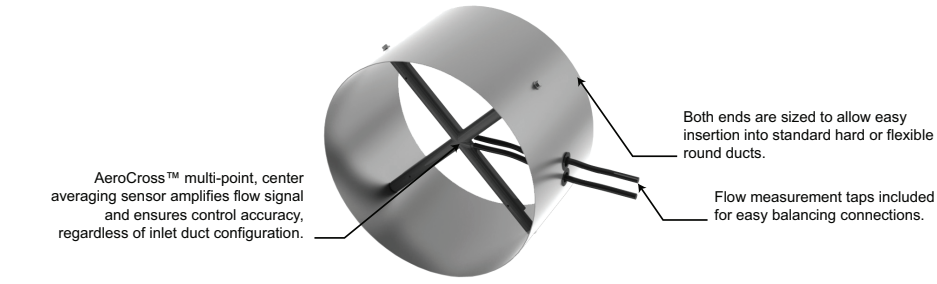
With Titus external round retrofit terminals, you never have to worry about a lengthy conversion process. Compact and light weight, these units install quickly in cramped spaces, supported only by the existing ductwork. The simple cylindrical casing matches standard round duct at both inlet and outlet.

ECV Series and PECX units can be inserted in branch ducts where no control units have been before. They may also be used to replace older units or added to the inlets of existing units that are entirely or partly deactivated.

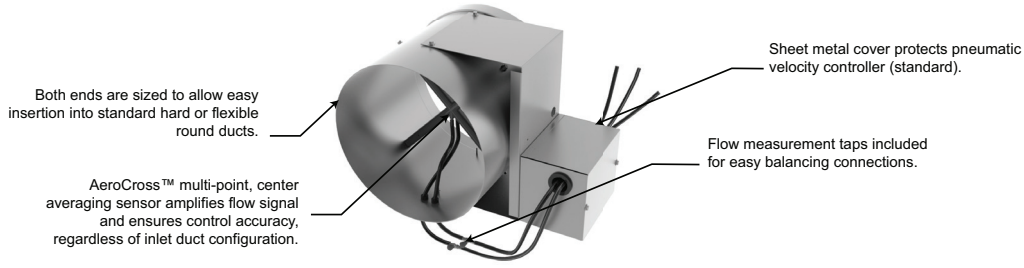
The ECV Series terminals are available from Titus with pneumatic, electric, analog electronic or direct digital controls (DDCs). Flexibility in application makes selecting Titus external round terminals the simple solution for any retrofit project.



DECV



EXX



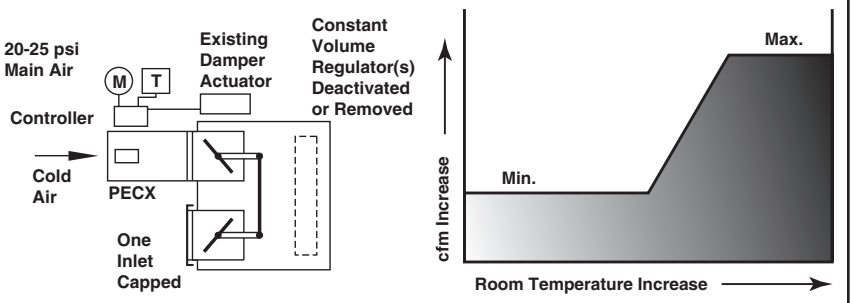
PECX

EXISTING PNEUMATIC DUAL DUCT UNIT: CONVERTING TO SINGLE DUCT VAV

One inlet is capped off. Constant volume regulators are removed. Titus PECX is installed on cooling inlet of existing unit. Existing thermostat and damper actuator now connect to controller on PECX.

Unit now provides pressure independent variable air volume, cooling (or heating) only, regardless of whether existing thermostat is direct acting or reverse acting, or whether damper is normally open or normally closed.

Converting Existing Pneumatic Dual Duct to Single Duct VAV



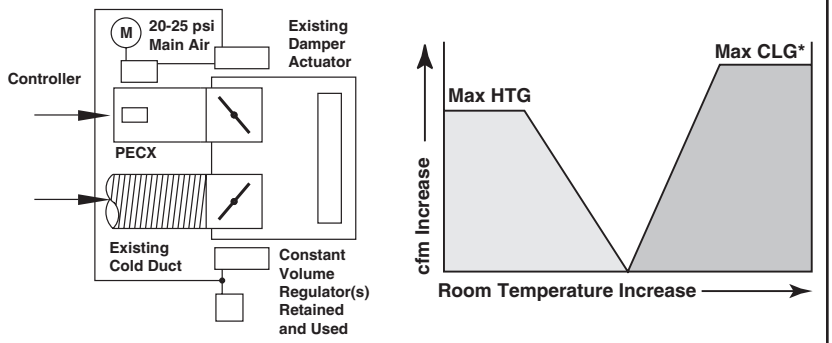
EXISTING PNEUMATIC DUAL DUCT: CONVERTING TO DUAL DUCT VAV; TWO EXISTING DAMPER ACTUATORS

(Option 1)

Existing constant volume regulators are retained and used. Cooling inlet is left as is. PECX is installed on heating inlet. Existing room thermostat is connected to both existing cooling damper actuator and to the Titus controller on the PECX, which controls existing heating damper actuator.

This conversion provides variable air volume without wasteful simultaneous heating and cooling. Heating control is pressure independent; cooling is pressure dependent. Maximum cooling cfm is limited by existing constant volume regulators. Maximum heating cfm (less than cooling) is limited by adjustment of PECX. A mixing minimum airflow can be obtained with a start point adjustment using the Titus II Controller.

Converting Existing Pneumatic Dual Duct to Single Duct VAV (Option 1)



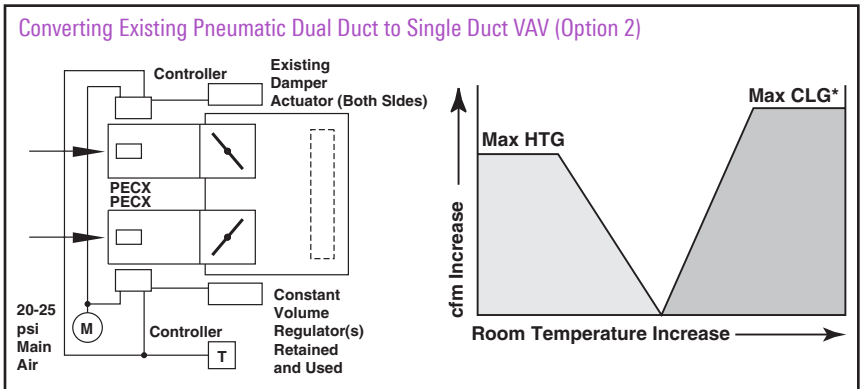
* Max CLG is determined by existing constant volume regulator setting

(Option 2)

For pressure independent control of both heating and cooling, constant volume regulators are deactivated or removed. PECXs are installed on both heating and cooling inlets.

Existing room thermostat is connected to Titus controllers on both PECXs, which control both existing damper actuators. A mixing minimum airflow can be obtained with a start point adjustment using the Titus II Controller.

Converting Existing Pneumatic Dual Duct to Single Duct VAV (Option 2)



* Max CLG is determined by existing constant volume regulator setting

EXISTING PNEUMATIC DUAL DUCT: CONVERTING TO DUAL DUCT VAV; SINGLE EXISTING DAMPER ACTUATOR WITH INTERLINKED DAMPERS

Constant volume regulators are deactivated or removed. PECX is installed on heating inlet, PECV on cooling. Existing thermostat is connected to both PECX and PECV. PECX controls existing damper actuator. PECV has its own damper and is set either normally open or normally closed to match action of existing cooling damper. Controllers are set either direct acting or reverse acting to match existing thermostat. VAV control is pressure independent for both heating and cooling. A mixing minimum airflow can be obtained with a start point adjustment using the Titus II Controller.

EXISTING PNEUMATIC DUAL DUCT: CONVERTING TO DUAL DUCT VAV; EXISTING DAMPER AND ACTUATOR NOT USED

(EXCESSIVE OLD VALVE LEAKAGE)

Constant volume regulators and dampers are blocked open or removed. A PECV is installed on each inlet. Existing thermostat is connected to both PECVs.

Each PECV has its own damper and is set either normally open or closed to match desired control sequence. Controls are set either direct or reverse acting to match thermostat. VAV control is pressure independent. Leakage problem of old assembly is now overcome with new dampers. Digital controls can be substituted for pneumatic controls.

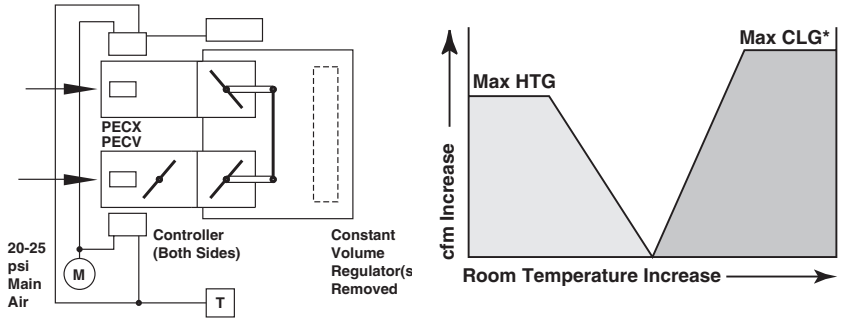
CONVERTING SINGLE DUCT CONSTANT VOLUME TO VAV

Constant Volume Regulator(s) is blocked fully open or removed. If some heating is still required, retain the coil. If not, remove or deactivate. Install PECV on inlet of box to provide VAV with or without reheat. Controls are now pressure independent. Digital controls can be substituted for the pneumatic controls described previously.

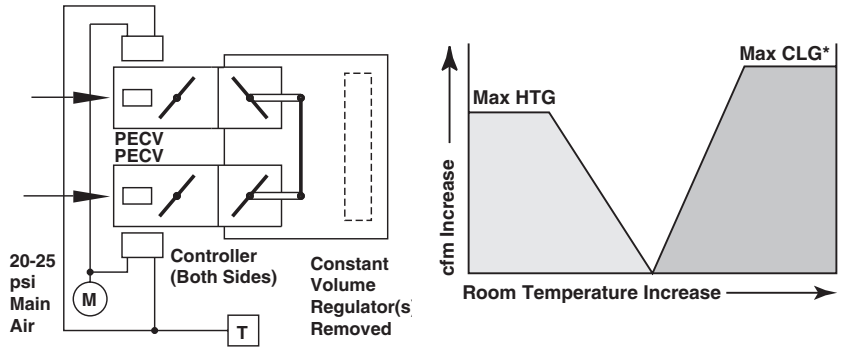
RETROFIT OLD SYSTEM POWERED HIGH PRESSURE VAV BOXES

Pneumatic, analog or digital controls can be used with an ECV assembly to retrofit existing system powered units to operate at lower static pressure. Perimeter zones of cooling and heating can be controlled with one thermostat, avoiding simultaneous heating and cooling.

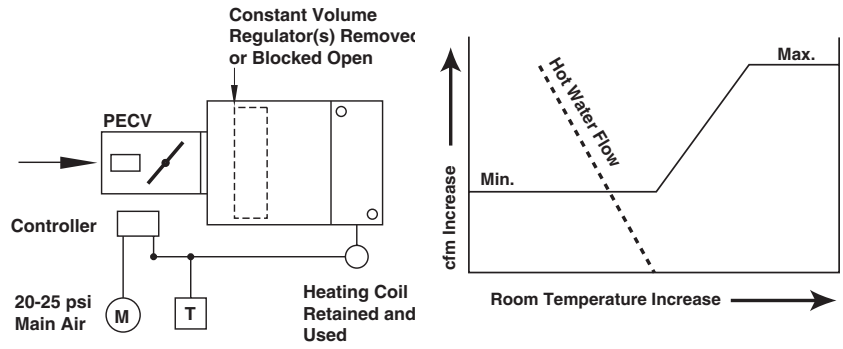
Converting Pneumatic Dual Duct to Dual Duct VAV with Single Existing Damper Actuator with Interlink Dampers



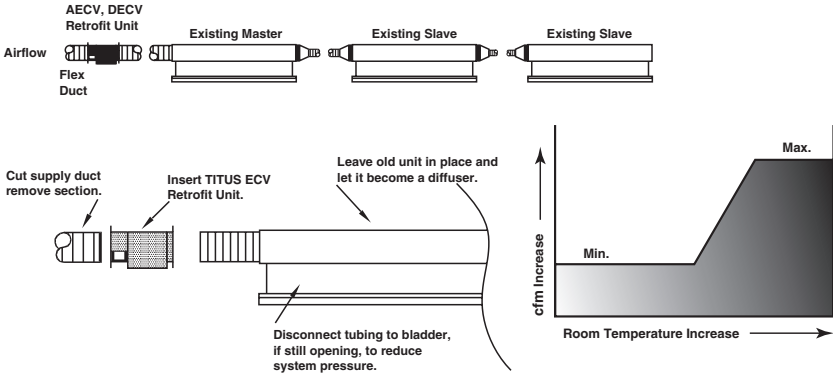
Converting Pneumatic Dual Duct VAV with Existing Damper and Actuator Not Used



Converting Single Duct Constant Volume to VAV



Retrofitting Old System Powered High Pressure VAV Boxes



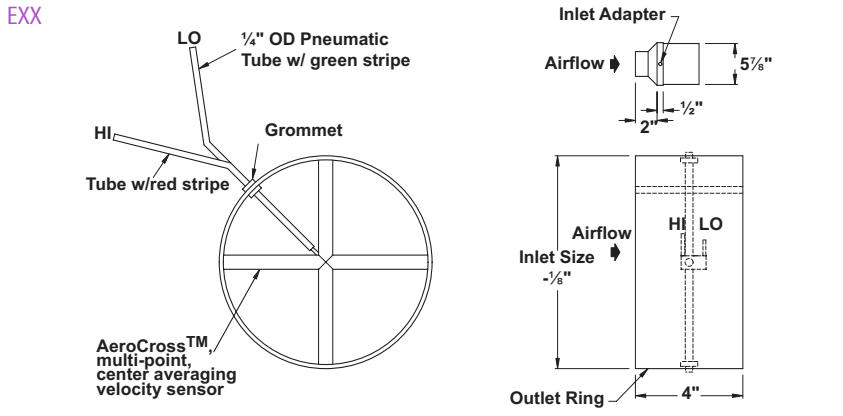
DIMENSIONS

Available Models:
EXX, PECX and
ECV Series

Note: Units are not insulated

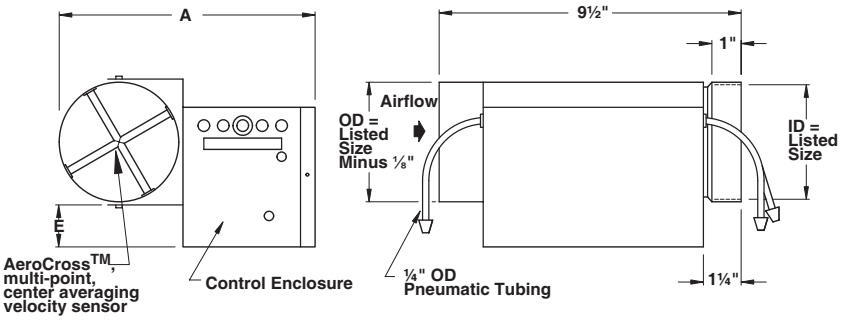
Inlet Size	Total cfm Range
4	0-225
5	0-350
6	0-500
7	0-650
8	0-900
9	0-1050
10	0-1400
12	0-2000
14	0-3000
16	0-4000
18	0-5200

EXX



Size	cfm Range	A	E
4	0-225	8	2¾
5	0-350	9	2¾
6	0-500	10	2¾
7	0-650	11	2¼
8	0-900	12	1¾
9	0-1050	13	1¼
10	0-1400	14	¾
12	0-2000	16	0
14	0-3000	18	0
16	0-4000	20	0

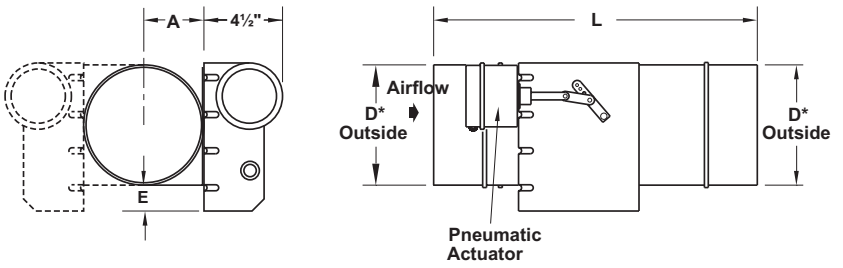
PECX



Note: Right hand control location, as shown, is standard on all models. Left hand is optional.

Size	cfm Range	A	D*	E	L
4	0-225	3 9/16	3 7/8	2 1/8	20
5	0-350	3 9/16	4 7/8	2 1/8	20
6	0-500	3 9/16	5 7/8	2 1/8	16
7	0-650	4 1/16	6 7/8	1 5/8	16
8	0-900	4 9/16	7 7/8	1 1/8	16
9	0-1050	5 1/16	8 7/8	5/8	20
10	0-1400	5 9/16	9 7/8	1/8	20
12	0-2000	6 9/16	11 7/8	0	20
14	0-3000	7 9/16	13 7/8	0	24
16	0-4000	8 9/16	15 7/8	0	24

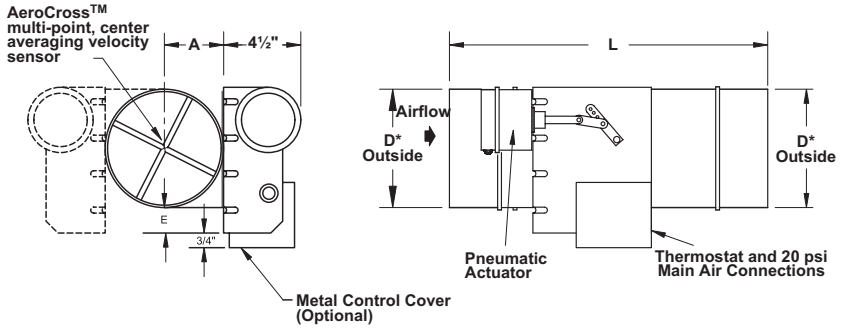
PECV / Pressure Dependant



Note: Right hand control location, as shown, is standard on all models. Left hand is optional.

Size	cfm Range	A	D*	E	L
4	0-225	3 9/16	3 7/8	2 1/8	20
5	0-350	3 9/16	4 7/8	2 1/8	20
6	0-500	3 9/16	5 7/8	2 1/8	16
7	0-650	4 1/16	6 7/8	1 5/8	16
8	0-900	4 9/16	7 7/8	1 1/8	16
9	0-1050	5 1/16	8 7/8	5/8	20
10	0-1400	5 9/16	9 7/8	1/8	20
12	0-2000	6 9/16	11 7/8	0	20
14	0-3000	7 9/16	13 7/8	0	24
16	0-4000	8 9/16	15 7/8	0	24

PECV / Pressure Independant

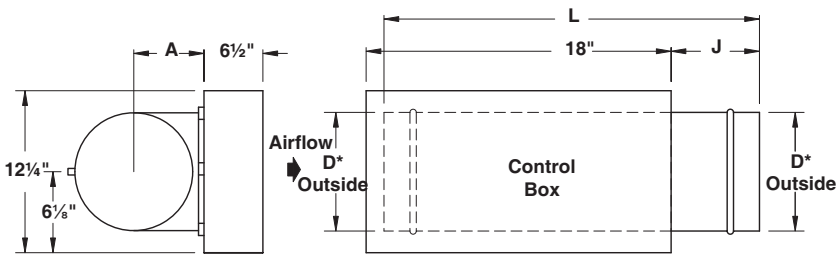


Note: Right hand control location, as shown, is standard on all models. Left hand is optional.

DIMENSIONS

Size	cfm Range	A	D*	J	L
4	0-225	3 9/16	3 7/8	4	20
5	0-350	3 9/16	4 7/8	4	20
6	0-500	3 9/16	5 7/8	2	16
7	0-650	4 1/16	6 7/8	2	16
8	0-900	4 9/16	7 7/8	2	16
9	0-1050	5 1/16	8 7/8	4	20
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

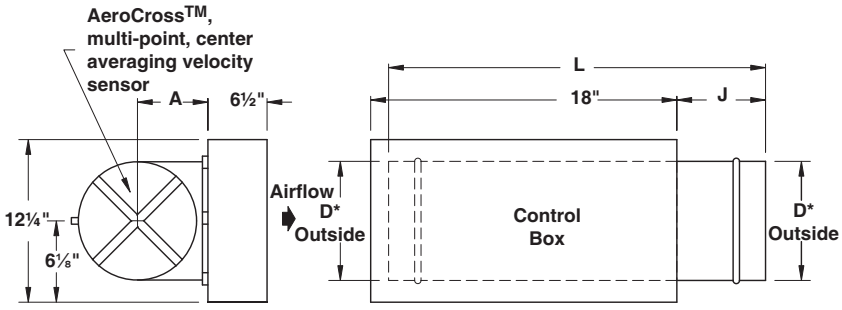
EECV



Note: Right hand control location, as shown, is standard on all models. Left hand is optional.

Size	cfm Range	A	D*	J	L
4	0-225	3 9/16	3 7/8	4	20
5	0-350	3 9/16	4 7/8	4	20
6	0-500	3 9/16	5 7/8	2	16
7	0-650	4 1/16	6 7/8	2	16
8	0-900	4 9/16	7 7/8	2	16
9	0-1050	5 1/16	8 7/8	4	20
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

AECV

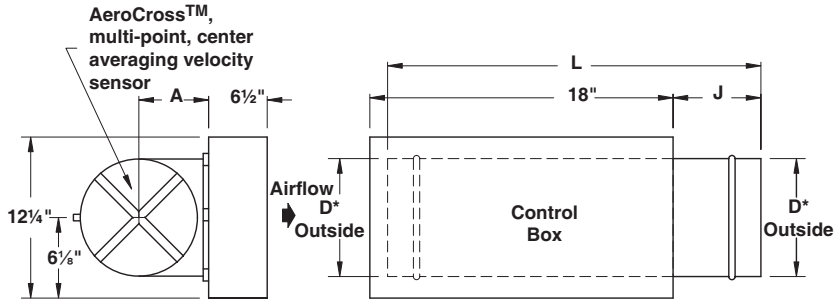


Note: Right hand control location, as shown, is standard on all models. Left hand is optional.

Size	cfm Range	A	D*	J	L
4	0-225	3 9/16	3 7/8	4	20
5	0-350	3 9/16	4 7/8	4	20
6	0-500	3 9/16	5 7/8	2	16
7	0-650	4 1/16	6 7/8	2	16
8	0-900	4 9/16	7 7/8	2	16
9	0-1050	5 1/16	8 7/8	4	20
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

Note: Units are not insulated. Sizes 4 and 5 built with the same casing as Size 6, with a duct adapter added to each end to accommodate the smaller duct size.

DECV



Note: Right hand control location, as shown, is standard on all models. Left hand is optional.

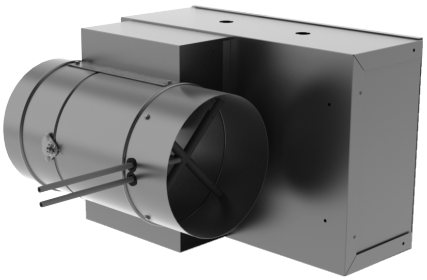
EXTERNAL ROUND DUCT RETROFIT TERMINAL UNITS

RECOMMENDED CFM RANGES

Available Models:

- PECV / Pneumatic
- EECV / Electric
- AECV / Analog Electronic
- DECV / Digital Electronic

Available in stainless steel for exhaust applications. Straight tube design.



Inlet Size	Total cfm Range	cfm Ranges of Minimum and Maximum Settings							
		PECV Pneumatic Titus II Controller		PECV Pneumatic Titus I Controller		AECV Analog Electronic TA1 Controller		DECV Typical Digital Controller	
		Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
4	0–225	45*–170	80–225	55*–170	80–225	30*–225	30–225	30*–225	30*–225
5	0–350	65*–270	120–350	85*–270	120–350	50*–350	50–350	40*–500	40*–500
6	0–500	80*–330	150–500	105*–330	150–500	60*–500	60–500	45*–500	45*–500
7	0–650	105*–425	190–650	135*–425	190–650	75*–650	75–650	70*–650	70*–650
8	0–900	145*–590	265–900	190*–590	265–900	105*–900	105–900	90*–900	90*–900
9	0–1050	175*–700	315–1050	225*–700	315–1050	125*–1050	125–1050	120*–1050	120*–1050
10	0–1400	230*–925	414–1400	300*–925	415–1400	165*–1400	165–1400	145*–1400	145*–1400
12	0–2000	325*–1330	600–2000	425*–1330	600–2000	235*–2000	235–2000	190*–2000	190*–2000
14	0–3000	450*–1800	810–3000	575*–1800	810–3000	320*–3000	320–3000	300*–3000	300*–3000
16	0–4000	580*–2350	1100–4000	750*–2350	1100–4000	420*–4000	420–4000	385*–4000	385*–4000

Note 1: An asterisk (*) indicates Factory cfm settings (except zero) will not be made below this range because control accuracy is reduced

Note 2: On pressure dependent units, minimum cfm is always zero, and there is no maximum. On controls mounted by Titus but supplied by others, Factory Mounting Authorization (FMA) these values are guidelines only. Controls mounted on an FMA basis are calibrated in the field.

PECV, AECV, DECV, EECV / RADIATED SOUND POWER LEVELS

Inlet Size	cfm	Min. ΔPs	Sound Power Octave Bands																										
			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
04	100	0.07	29	20	21	24	28	20	-	34	26	27	30	33	26	-	37	30	31	33	36	29	-	40	33	34	36	39	32	-
	125	0.12	34	26	27	30	33	26	-	40	33	33	35	39	31	-	43	36	37	39	42	35	**12**	45	39	40	41	44	37	**14**
	150	0.17	39	31	32	34	38	30	-	44	38	38	40	43	36	**13**	47	41	42	44	46	39	**16**	49	44	44	46	48	42	**18**
	175	0.23	42	36	36	38	41	34	**11**	48	42	42	44	47	40	**17**	51	46	46	48	50	43	**20**	53	48	49	50	52	45	**23**
	200	0.30	46	39	39	42	44	37	**14**	51	46	46	48	50	43	**20**	54	49	49	51	53	46	**24**	56	52	52	53	55	49	**26**
05	150	0.07	30	21	22	25	29	22	-	36	28	29	30	35	28	-	39	31	32	34	38	31	-	41	34	35	36	40	33	**10**
	200	0.12	37	29	30	32	36	29	-	43	35	36	38	41	35	**11**	46	39	40	41	45	38	**15**	48	42	43	44	47	40	**17**
	250	0.19	43	35	36	38	41	35	**11**	48	42	42	44	47	40	**17**	51	45	46	47	50	43	**20**	53	48	49	50	52	45	**23**
	300	0.27	47	40	41	43	46	39	**16**	52	47	47	49	51	45	**21**	56	50	51	52	54	48	**25**	58	53	54	54	56	50	**28**
	350	0.37	51	44	45	47	49	43	**19**	56	51	51	53	55	48	**26**	59	55	55	56	58	51	**30**	61	57	58	58	60	54	**33**
06	300	0.09	41	33	33	34	38	32	-	46	39	39	40	44	37	**14**	49	42	43	43	47	41	**17**	51	45	46	46	49	43	**20**
	350	0.12	44	37	37	38	42	36	**12**	49	43	44	44	47	41	**17**	52	46	47	47	50	44	**21**	54	49	50	50	52	47	**24**
	400	0.16	47	40	41	42	45	39	**15**	52	46	47	48	50	45	**21**	55	50	51	51	53	48	**25**	57	52	53	53	55	50	**28**
	450	0.20	50	44	44	45	48	42	**18**	55	50	50	51	53	48	**24**	58	53	54	54	56	51	**28**	60	56	56	57	58	53	**31**
	500	0.25	52	47	47	48	50	45	**20**	58	53	53	54	56	50	**27**	60	56	57	57	59	53	**31**	63	59	59	59	61	56	**34**
07	450	0.11	44	36	37	38	41	36	**11**	49	42	43	44	47	42	**17**	52	46	47	47	50	45	**21**	54	48	50	49	52	47	**24**
	500	0.13	47	39	40	40	44	39	**14**	52	45	46	46	49	44	**20**	55	49	50	50	52	47	**24**	57	51	52	52	55	50	**27**
	550	0.16	49	42	42	43	46	41	**16**	54	48	49	49	51	47	**23**	57	51	52	52	55	50	**27**	59	54	55	55	57	52	**30**
	600	0.19	51	44	45	45	48	43	**18**	56	50	51	51	53	49	**25**	59	54	55	54	57	52	**29**	61	56	57	57	59	54	**32**
	650	0.22	53	46	47	47	50	45	**21**	58	52	53	53	55	51	**28**	61	56	57	56	58	54	**32**	63	58	59	59	61	56	**34**
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**
09	800	0.12	49	40	42	41	45	40	**15**	54	47	48	47	51	46	**22**	57	50	51	50	54	49	**26**	59	53	54	53	56	52	**28**
	850	0.14	50	42	43	42	47	42	**17**	55	48	49	48	52	48	**24**	58	52	53	52	55	51	**27**	60	55	55	54	57	53	**30**
	900	0.16	51	44	45	44	48	43	**19**	56	50	51	50	53	49	**25**	59	54	54	53	56	52	**29**	61	56	57	56	59	55	**32**
	950	0.17	53	45	46	45	49	45	**20**	58	51	52	51	55	50	**27**	61	55	56	55	58	54	**31**	63	58	58	57	60	56	**33**
	1000	0.19	54	47	48	46	51	46	**22**	59	53	54	52	56	52	**28**	62	56	57	56	59	55	**32**	64	59	60	59	61	57	**35**
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

PECV, AECV, DECV, EECV / DISCHARGE SOUND POWER LEVELS

Inlet Size	cfm	Min. ΔPs	Sound Power Octave Bands																										
			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
04	100	0.07	65	51	46	45	35	35	**21**	75	60	53	51	38	40	**34**	82	66	57	54	40	42	**42**	86	70	60	57	41	44	**48**
	125	0.11	64	52	48	46	38	38	**20**	75	61	55	52	41	43	**34**	81	67	59	56	43	45	**42**	85	71	62	58	44	47	**47**
	150	0.17	64	53	49	47	41	41	**20**	74	62	56	53	44	45	**33**	81	68	60	57	46	48	**41**	85	71	63	60	47	50	**47**
	175	0.22	64	53	50	48	44	43	**19**	74	63	57	54	47	47	**33**	80	68	61	58	49	50	**40**	84	72	64	60	50	52	**46**
	200	0.29	63	54	51	49	46	44	**19**	74	63	58	55	49	49	**32**	80	69	62	59	51	51	**40**	84	73	65	61	52	53	**46**
05	150	0.07	71	53	49	46	36	39	**28**	81	62	56	52	39	43	**41**	87	67	60	56	41	46	**49**	91	71	63	58	42	48	**54**
	200	0.12	70	55	51	48	41	43	**27**	80	64	58	54	44	47	**40**	86	69	62	58	46	50	**48**	90	73	65	60	47	52	**54**
	250	0.19	69	56	53	50	45	46	**27**	80	65	59	56	47	50	**40**	86	70	63	59	49	53	**47**	90	74	66	62	50	55	**53**
	300	0.27	69	57	54	52	47	49	**22**	79	66	61	57	50	53	**36**	85	71	65	61	52	55	**43**	89	75	67	63	53	57	**43**
	350	0.37	69	58	55	53	50	51	**22**	79	67	62	59	53	55	**35**	85	72	66	62	55	58	**43**	89	76	68	64	56	59	**43**
06	300	0.09	74	59	54	52	43	37	**29**	80	67	61	56	50	44	**37**	84	71	65	59	54	47	**41**	86	74	68	61	56	50	**44**
	350	0.12	75	60	55	53	44	38	**30**	81	68	62	58	51	45	**38**	85	72	66	61	55	49	**43**	88	75	69	63	58	51	**46**
	400	0.16	76	61	55	55	46	39	**32**	83	69	63	60	52	46	**40**	86	73	67	62	56	50	**44**	89	76	70	64	59	52	**48**
	450	0.20	78	62	56	56	47	40	**33**	84	69	63	61	53	47	**41**	87	74	68	64	57	50	**46**	90	77	71	66	60	53	**49**
	500	0.25	78	63	57	58	47	41	**34**	85	70	64	62	54	47	**42**	88	75	68	65	58	51	**47**	91	78	71	67	61	54	**50**
07	450	0.11	75	62	57	55	46	41	**31**	82	69	64	60	53	48	**39**	85	73	68	63	57	51	**43**	88	76	71	65	59	54	**47**
	500	0.13	76	62	57	56	47	42	**32**	83	70	65	61	54	48	**40**	86	74	69	64	57	52	**45**	89	77	72	66	60	55	**48**
	550	0.16	77	63	58	58	48	43	**33**	83	71	65	62	54	49	**41**	87	75	69	65	58	53	**46**	90	78	72	67	61	56	**49**
	600	0.19	78	64	58	59	49	43	**34**	84	71	66	63	55	50	**42**	88	76	70	66	59	54	**46**	90	79	73	68	62	56	**50**
	650	0.22	78	64	59	59	49	44	**35**	85	72	66	64	56	50	**43**	88	76	70	67	60	54	**47**	91	79	73	69	62	57	**51**
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**
09	800	0.12	77	64	60	58	51	47	**30**	83	71	68	63	57	53	**38**	87	75	72	66	61	57	**43**	89	78	75	68	64	60	**46**
	850	0.14	78	64	60	59	51	47	**31**	84	71	68	64	58	54	**39**	87	76	72	66	62	58	**43**	90	79	75	68	64	60	**46**
	900	0.16	78	64	61	60	52	48	**31**	84	72	68	64	58	54	**39**	88	76	73	67	62	58	**44**	90	79	76	69	65	61	**47**
	950	0.17	79	65	61	60	52	48	**32**	85	72	69	65	59	55	**40**	88	77	73	68	63	59	**44**	91	80	76	70	65	61	**48**
	1000	0.19	79	65	61	61	53	49	**33**	85	73	69	66	59	55	**40**	89	77	73	68	63	59	**45**	91	80	76	70	66	62	**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

Overview – QCV Slide–In Series

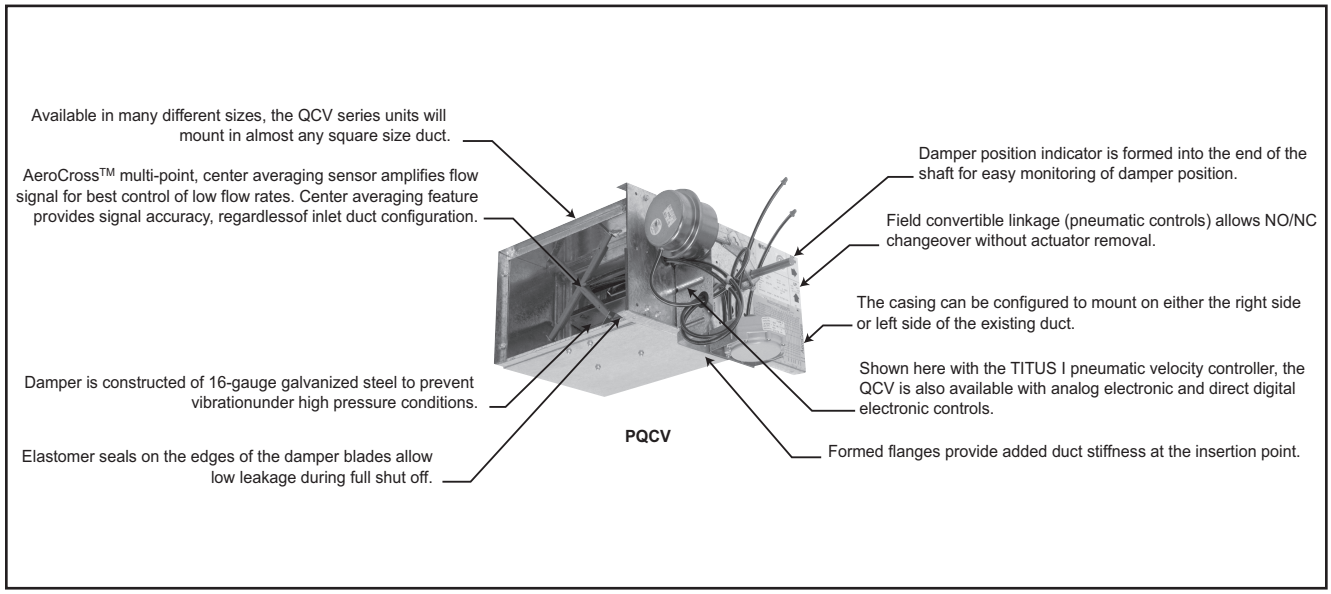
FEATURES AND BENEFITS

Titus Slide-In Retrofit Terminals convert those old constant volume systems to modern and energy efficient variable air volume.

Slide-in retrofit terminals are designed to transform inefficient constant volume systems to present day variable volume systems with very low installation costs. The resulting performance of a system incorporating Titus QCV series terminals approaches that of a VAV system using ESV series single duct terminals.

With the simple installation method, conversion costs are minimized. The installer simply cuts a rectangular hole in the side of the duct, cuts away the insulation (if present), slides the unit into the duct, and screws the mounting plate to the side of the duct.

Take a look at many of the unique features of a Titus QCV series retrofit terminal!



LOW PRESSURE, CONSTANT VOLUME REHEAT SYSTEM

Cold air from the central air handler is distributed through the original duct system. The QCV retrofit terminals convert the system to variable air volume operation.

Each QCV terminal is signaled by a direct acting thermostat. In the pneumatic example shown in the diagram, the pressure independent minimum airflow is set at a thermostat output pressure of 8 psi or less, while the maximum is set at 13 psi or greater.

The existing reheat coil in each zone is actuated on a fall in room temperature as the thermostat output decreases from 8 to 3 psi.

MULTI-ZONE SYSTEM

Hot or cold air from the central multi-zone air handler is distributed through the original zone ducts. The QCV retrofit terminals convert the system to variable air volume operation.

The multi-zone dampers provide a mixed airflow temperature of air at minimum airflow. The PQCV valves provide VAV and pressure independent flow. Very little work is required to convert a multi-zone pressure dependent set of zones to an energy saving series of VAV zones. Each zone now has fixed maximum and minimum airflow without system hunting.

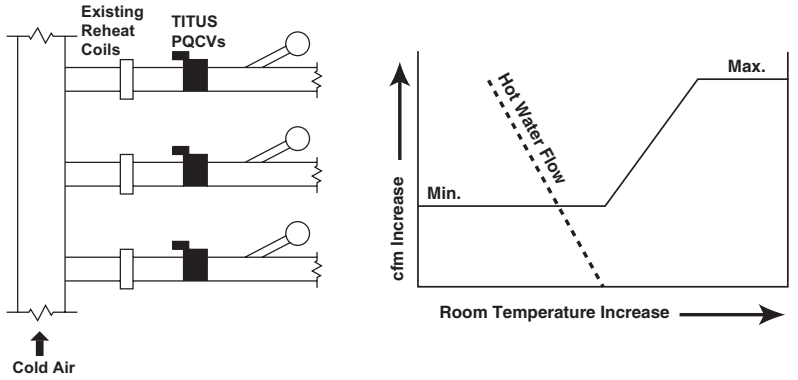
DUAL DUCT SYSTEM

Hot and cold air from the central air handler is distributed through the original supply ducts and terminals. The QCV retrofit terminals convert the system to variable air volume operation.

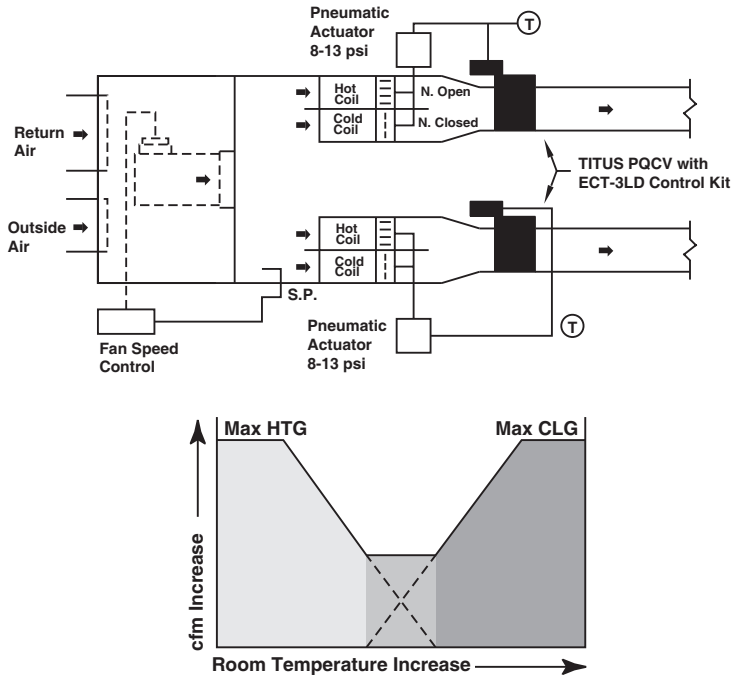
The mechanical constant volume regulator is removed from each existing terminal, while a QCV is installed in the discharge duct. A direct acting thermostat controls both the PQCV and the modulating splitter damper in the existing terminal.

On a rise in room temperature, the PQCV reduces the hot airflow. At the minimum airflow setting, the damper in the existing unit, which in this example has an 8 to 13 psi actuator, begins to modulate and mixing occurs. A further temperature rise increases the cold airflow to the maximum. Since the total air volume is reduced, the fan may need to be slowed down.

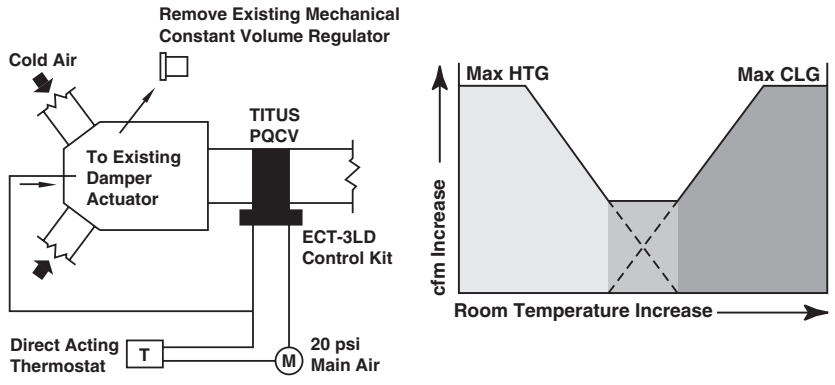
Low Pressure, Constant volume Reheat System Example



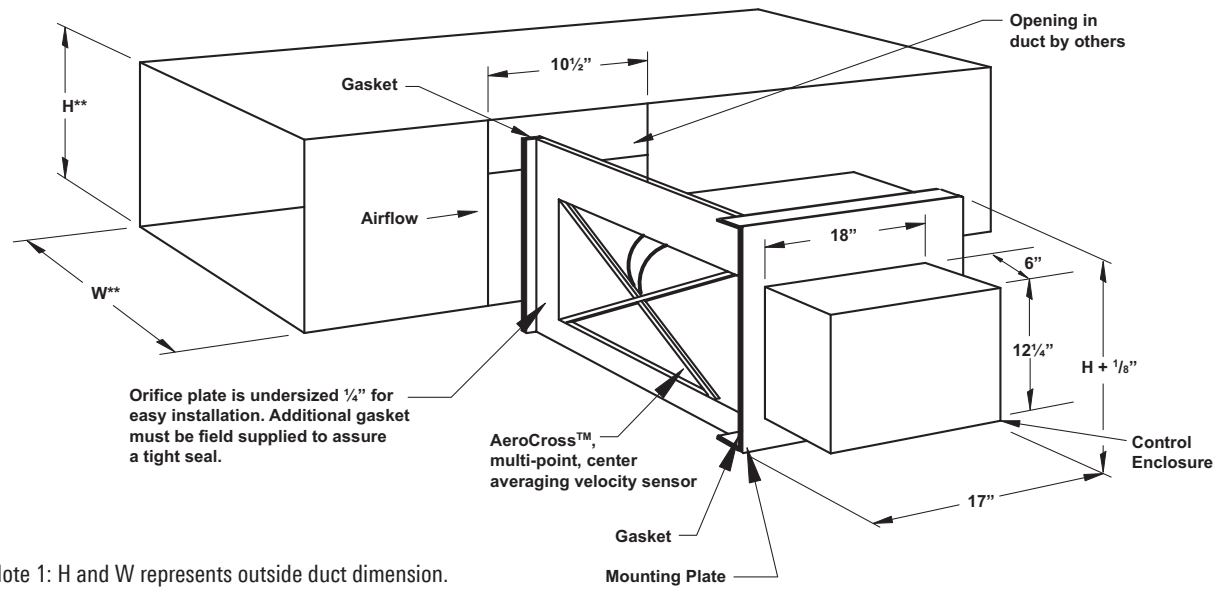
Multi-Zone System Example



Dual Duct System Example



Available Model:
QCV Series



Note 1: H and W represents outside duct dimension.

Note 2: Analog/digital (AQCV/DQCV) shown. Contact your Titus representative for control enclosure location and dimensions. Available with pneumatic controls.

QCV SERIES / AVAILABLE DUCT SIZES*

Unit/ Damper Size	cfm Range	Max cfm Range	Available Duct Sizes* Width W	Height H
A (5x5)	0 to 200	100 to 200	5, 6, 8, 10, 12 6, 8, 10, 12 6, 8, 10, 12	5 6 8
B (6x6)	0 to 300	150 to 300	6, 8, 10, 12, 14 8, 10, 12, 14 8, 10, 12, 14	6 8 10
C (8x6)	0 to 400	20 to 400	8, 10, 12, 14, 16 8, 10, 12, 14, 16 8, 10, 12, 14, 16	6 8 10
D (10x8)	0 to 700	350 to 700	10, 12, 14, 16, 18 10, 12, 14, 16, 18 10, 12, 14, 16, 18 10, 12, 14, 16, 18	8 10 12 14
E (14x8)	0 to 1000	500 to 1000	14, 16, 18, 20, 22, 24 14, 16, 18, 20, 22, 24 14, 16, 18, 20, 22, 24	8 10 12
F (18x6)	0 to 1000	500 to 1000	18, 20, 22, 24, 26 18, 20, 22, 24, 26 18, 20, 22, 24, 26	6 8 10
G (12x10)	0 to 1100	600 to 1100	12, 14, 16, 18, 20, 22 12, 14, 16, 18, 20, 22 12, 14, 16, 18, 20, 22	10 12 14
H (18x10)	0 to 1900	800 to 1900	18, 20, 22, 24, 26, 28, 30 18, 20, 22, 24, 26, 28, 30 18, 20, 22, 24, 26, 28, 30	10 12 14

Unit/ Damper Size	cfm Range	Max cfm Range	Available Duct Sizes* Width W	Height H
J (18x12)	0 to 2400	1000 to 2400	18, 20, 22, 24, 26, 28 18, 20, 22, 24, 26, 28 18, 20, 22, 24, 26, 28	12 14 16
K (20x14)	0 to 3800	1350 to 3800	20, 22, 24, 26, 28, 30 20, 22, 24, 26, 28, 30 20, 22, 24, 26, 28, 30	14 16 18
L (30x12)	0 to 5400	1800 to 5400	30, 32, 34, 36 30, 32, 34, 36 30, 32, 34, 36	12 14 16
M (22x16)	0 to 5400	1750 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 (24x18)	0 to 6700	2300 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 (30x20)	0 to 10000	4000 to 10000	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 (40x20)	0 to 15000	5000 to 15000	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 only a sampling of sizes available for the QCV Series. Any duct size larger than the damper size can be built.

Note 1: The cfm Range column shows ranges from lowest minimum setting to highest maximum setting for pneumatic controls.

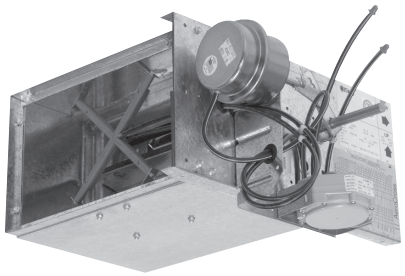
Note 2: The column, Max cfm Range shows the range of maximum cfm settings, for pneumatic controls.

SLIDE-IN RETROFIT TERMINAL UNITS

RECOMMENDED CFM RANGES

Available Models:

PQCV / Pneumatic
AQCV / Analog Electronic
DQCV / Digital Electronic



Inlet Size	Damper Size	Total cfm Range	cfm Ranges of Minimum and Maximum Settings					
			PQCV Pneumatic TITUS II Controller		AQCV Analog Electronic Controller		DQCV Typical Digital Controller	
			Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
A	5 x 5	0–200	*55–200	100–200	*55–200	55–200	*55–200	55–200
B	6 x 6	0–300	*80–300	100–200	*80–300	80–300	*80–300	80–300
C	8 x 6	0–400	*110–400	195–400	*110–400	110–400	*110–400	110–400
D	10 x 8	0–700	*180–700	320–700	*180–700	180–700	*180–700	180–700
E	14 x 8	0–1000	*260–1000	475–1000	*260–1000	260–1000	*260–1000	260–1000
F	18 x 6	0–1000	*250–1000	455–1000	*250–1000	250–1000	*250–1000	250–1000
G	12 x 10	0–1100	*280–1100	510–1200	280–1100	280–1100	*280–1100	280–1100
H	18 x 10	0–1900	*435–1775	795–2000	*435–1900	435–1900	*435–1900	435–1900
J	18 x 12	0–2400	*540–2180	980–2400	*540–2400	540–2400	*540–2400	540–2400
K	20 x 14	0–3800	*725–2945	1320–3800	*725–3800	725–3800	*725–3800	725–3800
L	30 x 12	0–5400	*980–3975	1780–5500	*980–5400	980–5400	*980–5400	980–5400
M	22 x 16	0–5400	*970–3870	1735–5500	*970–5400	970–5400	*970–5400	970–5400
N	24 x18	0–6700	*1220–4975	2225–6700	*1220–6700	1220–6700	*1220–6700	1220–6700
P	30 x 20	0–10000	*1860–7500	3400–10000	*1860–10000	1860–10000	*1860–10000	1860–10000
R	40 x 20	0–15000	*2750–11000	5000–15000	*2750–15000	2750–15000	*2750–15000	2750–15000

Note: An asterisk (*) indicates factory settings (except zero) will not be made below this range because control accuracy would be reduced.

- Total cfm range refers to the overall range of adjustment of the pneumatic velocity controller, from the lowest MIN setting to the highest MAX setting
- Minimum cfm range refers to the range of adjustment of the MIN setting of the pneumatic velocity controller
- Maximum cfm range refers to the range of adjustment of the MAX setting of the pneumatic velocity controller

PQCV, AQCV, DQCV / SOUND APPLICATION DATA / NC VALUES

Inlet Size	cfm	Min Ps	Sound Noise Criteria (NC)							
			Radiated Sound				Discharge Sound			
			ΔPs (in wg)				ΔPs (in wg)			
			0.5	1.0	1.5	2.0	0.5	1.0	1.5	2.0
A (5 x 5)	75	0.06	16	27	34	39	33	44	50	54
	100	0.10	16	28	34	39	35	45	51	55
	125	0.16	16	28	34	39	36	46	52	56
	150	0.23	16	28	35	39	36	46	52	57
	200	0.40	16	28	35	40	37	48	54	58
B (6 x 6)	100	0.05	16	27	34	39	30	40	46	51
	150	0.10	16	28	35	39	32	42	48	52
	200	0.18	16	28	35	40	33	43	49	54
	250	0.28	16	28	35	40	34	44	50	55
	325	0.47	16	28	35	40	32	42	48	52
C (8 x 6)	150	0.04	17	28	35	40	30	40	46	50
	250	0.10	17	28	35	40	33	42	48	52
	350	0.20	17	28	35	40	30	40	46	50
	450	0.33	17	28	35	40	31	41	47	51
	550	0.49	18	28	35	40	32	42	48	52
D (10 x 8)	200	0.05	12	25	32	37	22	31	41	47
	300	0.11	13	26	33	38	21	30	40	46
	400	0.20	14	26	33	39	23	32	42	48
	500	0.31	14	27	34	39	25	34	44	50
	600	0.44	15	27	34	39	26	35	45	51
E (14 x 8)	500	0.14	17	28	35	39	24	34	39	43
	625	0.22	17	28	35	40	26	35	41	44
	750	0.32	18	29	35	40	24	34	39	43
	875	0.43	18	29	36	40	25	35	40	44
	950	0.51	N/A	29	36	40	N/A	35	41	45
F (18 x 6)	500	0.16	16	27	34	39	23	33	39	43
	625	0.24	16	28	35	39	25	35	40	44
	750	0.35	17	28	35	40	23	33	39	43
	875	0.48	17	29	35	40	24	34	40	44
	950	0.56	N/A	29	36	40	N/A	35	41	45
G (12 x 10)	500	0.12	15	27	33	38	22	31	37	41
	650	0.21	16	27	34	39	24	33	39	43
	800	0.31	16	28	35	39	23	32	38	42
	950	0.44	17	28	35	40	24	34	40	44
	1100	0.59	N/A	29	36	40	N/A	35	41	45
H (18 x 10)	700	0.08	19	29	35	40	20	29	34	38
	1000	0.17	20	30	36	40	23	31	36	40
	1300	0.29	20	31	37	41	24	33	38	42
	1600	0.44	21	31	37	41	26	34	40	43
	1900	0.62	N/A	31	37	42	N/A	36	41	44

Inlet Size	cfm	Min Ps	Sound Noise Criteria (NC)							
			Radiated Sound				Discharge Sound			
			ΔPs (in wg)				ΔPs (in wg)			
			0.5	1.0	1.5	2.0	0.5	1.0	1.5	2.0
J (18 x 12)	1000	0.10	21	31	36	40	23	31	35	39
	1300	0.17	22	31	37	41	25	33	37	41
	1600	0.26	23	32	37	41	26	34	39	42
	1900	0.37	23	33	38	42	28	35	40	43
	2200	0.50	24	33	38	42	29	37	41	44
K (20 x 14)	2000	0.17	26	34	38	42	27	34	39	42
	2400	0.24	27	35	39	43	28	36	40	43
	2800	0.32	27	35	40	43	29	37	41	44
	3200	0.42	28	36	40	44	30	37	41	44
	3600	0.54	N/A	36	41	44	N/A	38	42	45
L (30 x 12)	2800	0.08	32	38	43	47	32	38	41	43
	3450	0.12	32	39	44	47	33	39	42	44
	4100	0.17	33	39	44	48	34	40	43	45
	4750	0.23	34	40	45	48	35	41	44	46
	5400	0.29	34	40	45	49	36	42	45	47
M (22 x 16)	2800	0.11	30	37	43	47	32	37	41	43
	3450	0.16	31	38	43	47	34	39	43	45
	4100	0.23	32	38	44	48	36	41	44	47
	4750	0.31	33	39	44	48	37	42	46	48
	5400	0.40	33	40	44	48	38	44	47	49
N (24 x 18)	3000	0.06	30	37	43	46	30	36	39	41
	3925	0.11	32	38	43	47	32	37	40	43
	4850	0.16	32	39	44	48	33	39	42	44
	5775	0.23	33	39	44	48	34	40	43	45
	6700	0.31	34	40	45	48	35	41	44	46
P (20 x 30)	3600	0.05	29	36	42	45	28	33	36	38
	5200	0.10	30	37	42	46	30	35	38	41
	6800	0.17	31	38	43	47	31	37	40	42
	8400	0.25	32	38	44	47	32	38	41	43
	10000	0.36	33	39	44	48	33	39	42	44
R (20 x 40)	7000	0.10	31	37	42	46	30	35	38	40
	9000	0.16	32	38	43	47	31	36	39	42
	11000	0.24	33	39	43	47	32	37	40	43
	13000	0.34	33	39	44	47	33	38	41	43
	15000	0.45	34	40	44	48	33	39	42	44

RADIATED

- Radiated sound is the noise transmitted through the duct wall
- 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

DISCHARGE

- 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

Overview – Special Purpose and Internal Series

FEATURES AND BENEFITS

Titus Internal Retrofit Terminals convert those old mechanically regulated terminals to energy efficient VAV terminals!

Existing constant volume systems retrofitted to variable air volume conserve energy by reducing reheat requirements, reducing refrigeration loads and reducing fan horsepower by taking advantage of building load diversity. Titus provides an easy, effective means to retrofit existing mechanical constant volume terminals without replacing the existing terminal or interrupting ductwork.

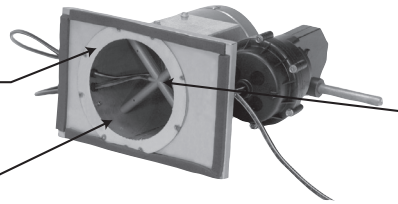
Titus internally mounted, or ECT series, terminals are the most unique line of retrofit devices in the HVAC industry. Specifically designed to quickly replace mechanical regulators in existing terminals, each ECT series valve is unique. By replacing the mechanical regulators with ECT valves, the inefficient constant volume system is transformed into an energy saving, comfort providing variable volume system.

Mechanically regulated terminals were produced by many different manufacturers over the years, including Titus. Today, a different model of ECT series retrofit variable air volume valve is used to replace the old mechanical regulators for each different manufacturer of terminals. Best of all, this is done with very little effort since each retrofit valve is designed to be installed while the supply air system is still running and without removing the existing terminals.

Each ECT series valve is designed for maximum efficiency in operation and installation. Let's look at some of the features found in Titus ECT series internal retrofit terminals.

All ECT series terminals are designed to be installed through existing access panels so no extensive sheet metal rework is required.

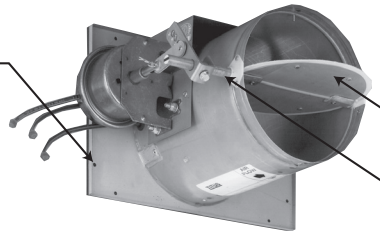
Heavy gauge galvanized steel construction ensures quiet and durable operation.



AeroCross™ multi-point, center-averaging sensor amplifies flow signal for best control of low flow rates. Center-averaging feature provides signal accuracy, regardless of inlet duct configuration.

ECT-AN

Prepunched holes on the mounting flange match up with existing mounting bolts for the old regulators, making installation simple.



Retrofit valve damper is normally open for ease of installation with supply air system operating.

Delrin® damper bearings are unaffected by temperature and humidity, and prevent binding.

ECT-KR

ECT-L series control packages, in conjunction with ECT series valves, can operate virtually any kind of control sequence.

All control components found in an ECT-L series control package are protected by a heavy gauge metal enclosure.

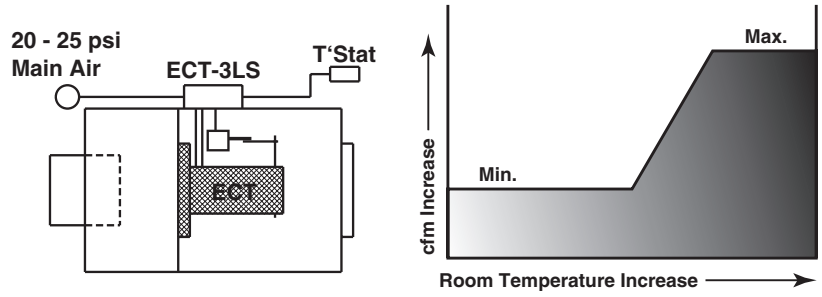
Multiple ECT series valves can be operated from one ECT-L series control package.

ECT-L

CONVERTING SINGLE DUCT CONSTANT VOLUME TO VAV

In the preceding diagram, the original single duct constant volume, cooling only terminal has been converted to single duct VAV cooling only. The constant volume regulators have been replaced with a Titus ECT series internal retrofit terminal. The Titus ECT-3LS pneumatic control package provides pressure independent VAV control.

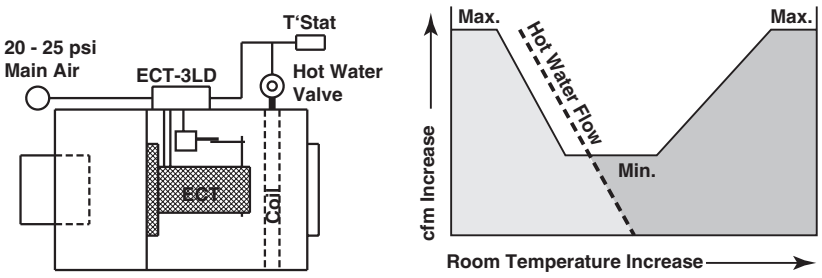
Converting Single Duct Constant Volume to VAV



CONVERTING SINGLE DUCT CONSTANT VOLUME WITH REHEAT TO VAV

In the preceding diagram, the original single duct constant volume unit with reheat has been converted to single duct VAV. The constant volume regulators have been replaced with a Titus ECT series internal retrofit terminal. The Titus ECT-3LD pneumatic control package provides pressure independent VAV control for both cooling and heating. The heating airflow increases with an increase in water flow for more accurate constant discharge air temperature.

Converting Single Duct Constant Volume with Reheat to VAV

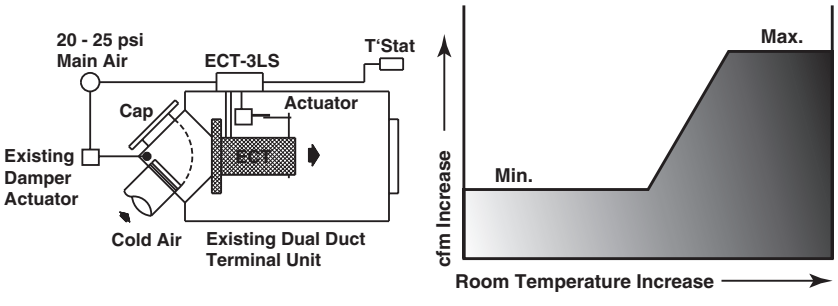


CONVERTING DUAL DUCT CONSTANT VOLUME TO SINGLE DUCT VAV COOLING

In the preceding diagram, the original dual duct terminal has been converted to single duct, cooling only, to serve an interior zone.

Notice that the hot duct connection has been capped. The damper is normally closed with respect to the cold air duct. Since the main control air feeds directly into the existing damper actuator, the damper goes fully open when the main control air is turned on. The Titus ECT-3LS then provides pressure independent VAV control.

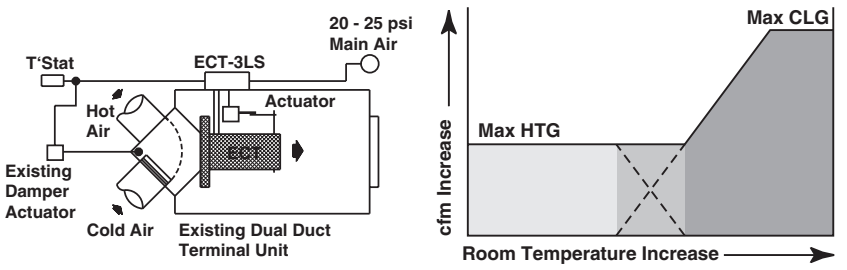
Converting Dual Duct Constant Volume to Single Duct VAV Cooling



CONVERTING DUAL DUCT CONSTANT VOLUME TO DUAL DUCT VAV, WITH MINIMUM MIX AND EQUAL TO MAXIMUM HEATING (BLENDING)

In the preceding diagram, the dual duct function is retained for use in an interior or exterior zone. The Titus ECT-3LS provides pressure independent control for both cooling and heating. Cooling is variable air volume, while heating is constant air volume at the minimum cfm setting of the Titus II controller. The original pneumatic inlet damper modulates from 100 percent cold to 100 percent hot as the thermostat calls for more heat. The Titus II start point is adjusted to 13 psi.

Converting Dual Duct Constant Volume to Dual Duct VAV (Minimum Mix and Equal to Maximum Heating)



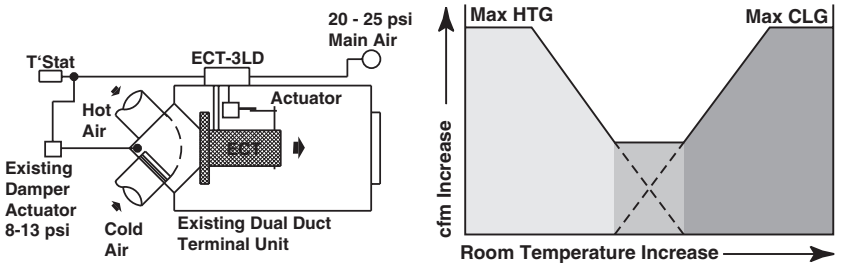
Refer to the topic, "Internal Retrofit" in this section for piping details.

CONVERTING DUAL DUCT CONSTANT VOLUME TO DUAL DUCT VAV, WITH MINIMUM MIX AND EQUAL TO MAXIMUM FLOWS (BLENDING)

In the preceding diagram, the addition of a reversing relay and a high pressure selector allows pressure independent VAV control of heating, as well as cooling, in the dual duct unit.

In this example the reversing relay bias is set at 10.5 psi. The Titus ECT-3LD is set for minimum cooling cfm at 13 psi thermostat output pressure. From 13 to 8 psi the original dual duct unit damper modulates from cooling to heating, so that there is mixing at the minimum cfm. From 8 to 3 psi the Titus control modulates from minimum to maximum heating cfm. The Titus II start point is adjusted to 13 psi.

Converting Dual Duct Constant Volume to Dual Duct (Minimum Mix and Equal to Maximum Flow)



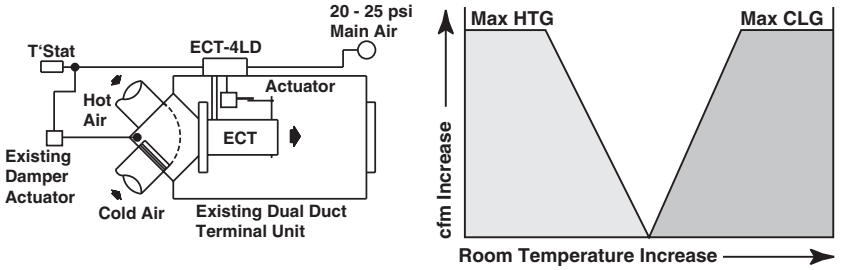
Refer to the topic, "Internal Retrofit" in this section for piping details.

CONVERTING DUAL DUCT CONSTANT VOLUME TO DUAL DUCT VAV, WITH ZERO MINIMUM FLOW (NON-BLENDING)

In the preceding diagram, the physical hookup is the same as in the diagram, Converting Dual Duct Volume to Single Duct VAV Cooling, except for the addition of a snap acting diverting relay with its own air supply.

Here both the reversing relay bias and the ECT-4LD start point are set at 8 psi. The ECT-4LD is also set for a minimum cfm of zero. The original dual duct unit damper snaps from 100 percent cooling to 100 percent heating at 8 psi. Below 8 psi this damper remains in full heating position, while the Titus control modulates from minimum to maximum heating cfm.

Converting Dual Duct Constant Volume to Dual Duct VAV with Zero Minimum Flow



Refer to the topic, "Internal Retrofit" in this section for piping details.

ECT-AN (Anemostat Terminals)

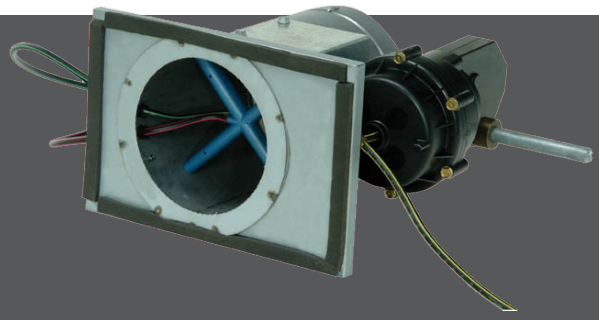
OVERVIEW

Variable Volume

ECT-AN is a variable volume, retrofit control valve. Designed for retrofitting Anemostat mechanically controlled terminals, it directly replaces the mechanical constant volume regulators. This change out is easily done through the access panel in the bottom of the existing Anemostat terminal.

The Titus ECT-AN valve fits the same space as the original volume regulator. The mounting holes in the ECT-AN inlet panel are prepunched to fit the existing bolts. While most Anemostat terminals will require no additional modifications, exceptions may be encountered because of minor variations in original manufacture. Simple relocation of the mounting holes, the valves or the sound/mixing baffle may be necessary to overcome space limitations.

See the topic, "Control Boxes ECT-L Series" in this section for optional pneumatic control packages.



ECT-AN (INLET VIEW)

retrofit energy solutions

See website for Specifications

AVAILABLE MODEL:

ECT-AN / HV-C series only Constant Volume* Options E, D, O or R
ECT-AN / Dual Duct or Single Duct Applications

SELECTION GUIDE

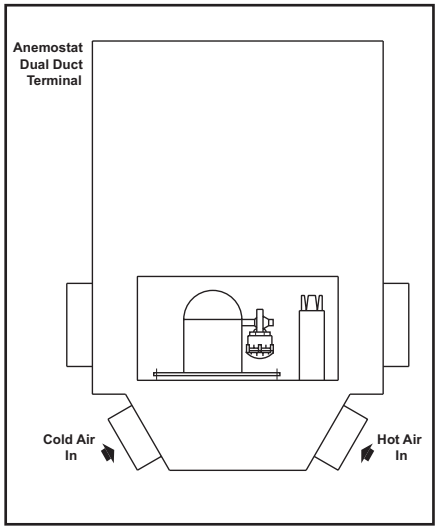
The table shows the number of original mechanical regulators in each Anemostat terminal size. It also shows the corresponding sizes of Titus ECT-AN valves needed to replace these regulators. Each cfm range is the total for the entire terminal. The ECT-AN cfm range represents the typical limit settings for the reset span of a pneumatic velocity controller.

The minimum should be equal to or greater than 50 percent of the maximum airflow setting. The ECT-AN retrofit valve can be adjusted for a minimum cfm setting of zero (full shutoff).

The ECT-AN retrofit is also available with electric actuators for use with electronic or DDC retrofit controls. Before the retrofit valves and controls are ordered, Titus recommends spot checking the existing terminals to determine the condition of the inlet dampers and actuators. The interiors should also be checked for space limitations and mounting conflicts.

ANEMOSTAT TERMINALS

Type and Size	Terminal Max cfm Range	Regulator Size / cfm Range per Terminal					
		Original Anemostat			Titus ECT-AN		
HV*–5–C	80–325	4 S 80–109	4 110–174	8 175–300	4 115–175	8 170–325	
HV*–6–C	175–500	8 200–299	12 300–500		8 170–325	12 225–500	
HV*–7–C	300–750	12 300–449	18 450–750		12 300–449	18 370-750	
HV*–8–C	450–1050	18 450–749	28 750–1050		18 370–750	28 550–1050	
HV*–10–C	700–1500	18 700–749	28 750–1049	18T 1050–1500	18 700–749	28 700–1049	18T 900–1500
HV*–12–C	900–2100	18T 1000–1499	28T 1500–2100		18T 900–1500	28T 1100–2100	
HV*–14–C	1500–3600	1–23L 1500–2500	1–23L+1–18 2501–3600		1–23L 1100–2500	1–23L+1–18 2500–3600	
HV*–16–C	2600–5000	1–23L+1–23 2600–4000	2–23L 4001–5000		1–23L+1–23 1100–4000	2–23L 2200–5000	



* E=End Discharge D=Diffuser Discharge O=Octopus Discharge R=Reheat
RW=Reheat (Hot Water) RS=Reheat (Steam)
RE=Reheat (Electric)

ECT-BC (Barber-Colman Terminals)

OVERVIEW

Variable Volume

ECT-BC is a variable air volume, retrofit control valve. Designed for retrofitting Barber-Colman mechanically controlled terminals, it directly replaces the mechanical constant volume regulators. This change out is easily done by removing the existing mechanical regulator from the side mounting channels and installing the new Titus ECT-BC valve in the same channels.

The resulting performance approaches that of the current Titus Model ESV for single duct operation and EDV for dual duct operation.

The hand of the ECT-BC retrofit valve can be changed by inverting it before sliding it in place. If using pneumatic velocity controllers as illustrated, simply snap the controller back into its bracket to maintain a dials-down orientation.

ECT-BC

retrofit energy solutions

See website for Specifications

AVAILABLE MODELS:

ECT-BC / Single Duct Models: HSCE, HSCM, HSCT
ECT-BC / Dual Duct Models: HDCE, HDCM, HDCD

SELECTION GUIDE

The table shows the retrofit valve size for each size of Barber-Colman terminal, together with the selection range for maximum airflow (retrofitted). The minimum airflow can be adjusted for full shut-off.

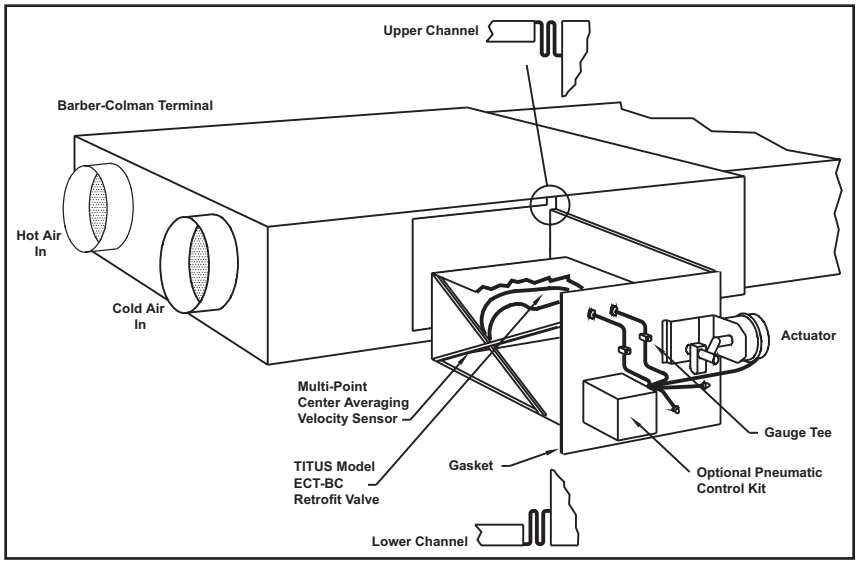
Notice that some sizes have two flow ranges. Choose the retrofit valve size for the flow range desired.

The minimum flow setting should be equal to or greater than 25 percent of the lowest maximum flow setting. Exception: The ECT-BC retrofit valve can also be adjusted for a minimum flow setting of zero (full shut-off).

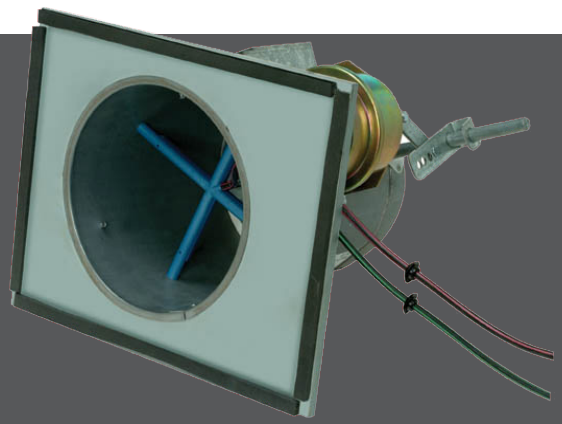
BARBER-COLMAN TERMINALS

Barber-Colman Inlet Duct Size	Maximum cfm Control Range	Titus ECT-BC Size
4	150–250	4
5	150–250 250–350	5A 5B
6	300–450	6
8	450–600 600–850	8A 8B
10	750–1000 1000–1300	10A 10B
12	1200–1500 1500–2100	12A 12B
14	2000–3000	14
16	3000–4000	16

See the topic, "Control Boxes ECT-L Series" in this section for optional pneumatic control packages.



ECT-BU (Buensod Terminals)



ECT-BU (INLET VIEW)

OVERVIEW

Variable Volume

ECT-BU is a variable air volume, retrofit control valve. Designed for retrofitting Buensod design 14 and 16 mechanically controlled terminals. It directly replaces the mechanical constant volume regulators. This change out is easily done through the access panel in the bottom of the existing Buensod terminal.

The old regulator flange is used as a pattern for drilling the mounting holes in the ECT-BU inlet panel. While most design 14 and 16 terminals will require no additional modifications, exceptions may be encountered because of minor variations in original manufacture. Simple relocations of the valves or of the sound baffle may be necessary to overcome space limitations.

See the topic, "Control Boxes ECT-L Series" in this section for optional pneumatic control packages.

retrofit energy solutions

See website for Specifications

AVAILABLE MODEL:

ECT-BU / H-Series, Designs 14 and 16

SELECTION GUIDE

The table shows the number of original mechanical regulators in each Buensod terminal size. It also shows the corresponding sizes of Titus ECT-BU valves needed to replace these regulators. Each cfm range is the total for the entire terminal. The ECT-BU cfm range represents the typical limit settings for the reset span of a pneumatic velocity controller.

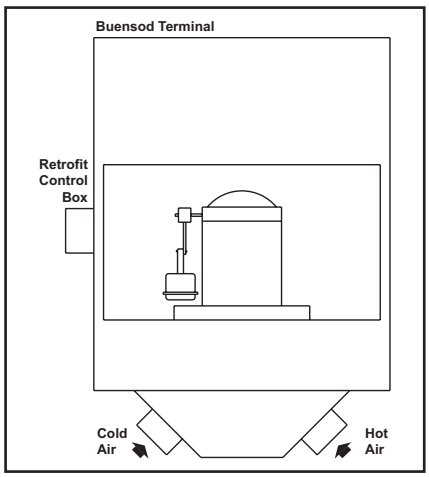
The minimum should be equal to or greater than 50 percent of the maximum airflow setting.

The ECT-BU retrofit valve can be adjusted for a minimum cfm setting of zero (full shut-off) with leakage less than 10 cfm at 3 inches pressure differential. The ECT-BU is also available with electric actuators for use with electronic or DDC retrofit controls.

Before the retrofit valves and controls are ordered, we recommend spot checking the existing terminals to determine the condition of the inlet dampers and actuators. The interiors should also be checked for space limitations and mounting conflicts.

BUENSOD TERMINALS

Design	Single Duct	Single Duct with Reheat	Dual Duct	Buensod Regulatory Quantity and Size	Titus ECT-BU Quantity and Size	Titus Retrofit cfm Range
14 and 16		4HS(R) 5HS(R) 6HS(R) 7HS(R) 8HS(R) 9HS(R) 10HS(R)	4–H 5–H 6–H 7–H 8–H 9–H 10–H	1–2 1–4 1–4 1–6 1–10 1–10 1–12	1-A 1-B 1-C 1-D 1-E 1-E 1-F	45–200 65–350 85–450 115–650 150–800 150–800 245–1350
14	2010 HLA 2010 HLB 2212 HLC			2–10 3–10 4–10	2-E 3-E 4-E	300–1600 450–2400 600–3200
16	1413A 1413B 1615A 1615B	HLAS(R) HLBS(R) HLCS(R) HLDS(R)	HLA HLB HLC HLD	2–10 2–12 3–10 3–12	2-E 2-F 3-E 3-F	300–1600 500–2700 450–2400 750–4000



ECT-CN (Connor Terminals)

OVERVIEW

Variable Volume

ECT-CN is a variable air volume, retrofit control valve. Designed for retrofitting Connor mechanically controlled terminals, it directly replaces the mechanical constant volume regulators. This change out is easily done through the access panel in the bottom of the existing Connor terminal.

The Titus ECT-CN valve fits the same space as the original constant volume regulator(s). The mounting holes in the ECT-CN inlet panel are pre-punched to fit the existing mounting bolts on sizes 4 to 10. On unit sizes 12 to 16, mounting holes must be drilled to match original bolt locations on the Connor regulator panel. Only a single ECT-CN is required to replace as many as four of the original mechanical regulators.

While most Connor terminals will require no additional modifications, exceptions may be encountered because of minor variations in original manufacture.

ECT-CN

retrofit energy solutions

See website for Specifications

AVAILABLE MODEL:

ECT-CN / 45 Series Dual Duct Models: DDC, DDV, DSC

SELECTION GUIDE

The table shows the original Connor terminal size, and corresponding sizes of Titus ECT-CN valves needed.

Each cfm range is the total for the entire terminal. The ECT-CN cfm range represents the typical limit settings for the reset span of a pneumatic velocity controller. The minimum should be equal to or greater than 50 percent of the maximum airflow setting.

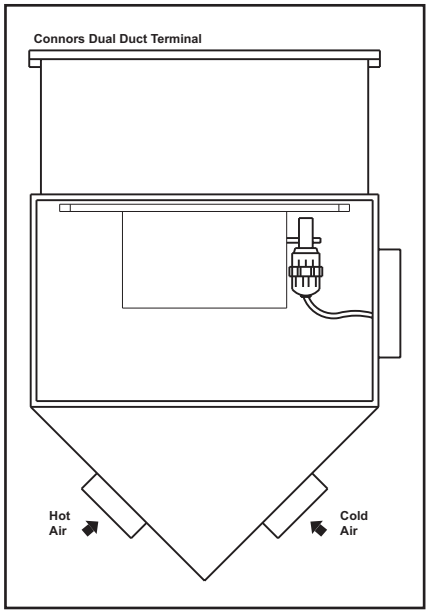
CONNOR TERMINALS

Inlet	Dual Duct Models: DDC, DDV DSC	Titus ECT-CN Size	Titus Retrofit cfm Range
4	100-200	4	75-200
5	175-325	5	100-325
6	250-125	6	135-425
7	400-650	7	225-650
8	500-850	8	275-850
10	650-1200	10	360-1200
12	1050-2000	12	700-2000
14	1500-3000	14	850-3000
16	2200-4000	16	1200-4000

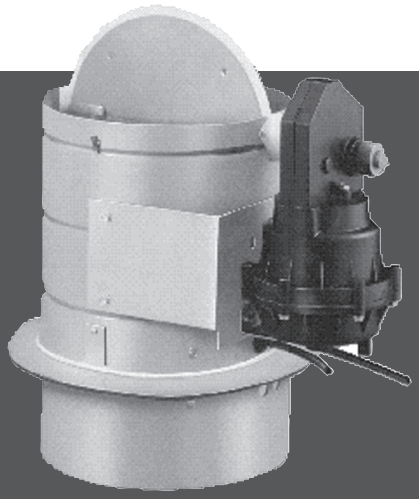
See the topic, “Control Boxes ECT-L Series” in this section for optional pneumatic control packages.

The ECT-CN retrofit valve can also be adjusted for a minimum cfm setting of zero (full shut-off) with leakage less than 20 cfm at 3 inches pressure differential. The ECT-CN is also available with electric actuators for use with electronic or DDC retrofit controls.

Before the retrofit valves and controls are ordered, we recommend spot checking the existing terminals to determine the condition of the inlet dampers and actuators. The interiors should also be checked for space limitations and mounting conflicts.



ECT-HC (Titus Terminals)



ECT-HC

OVERVIEW

Variable Volume

The ECT-HC is a variable air volume, retrofit control valve. Designed for Titus mechanically controlled terminal units, it directly replaces the mechanical constant volume regulators in those models. This change out is easily done through the access panel in the bottom of the existing Titus terminal.

The resulting performance approaches that of the current Titus Model ESV and EDV terminals.

Some installations require fewer ECT-HC valves than the number of existing mechanical regulators. In those cases the extra regulators are removed and the openings are covered with metal plates.

The pneumatic actuators of as many as three ECT-HCs can be controlled by one Titus II controller. Any number of controllers can be signaled by one thermostat.

retrofit energy solutions

See website for Specifications

AVAILABLE MODEL:

ECT-HC / Models: TDH, TDL, TSH, TSHR, HD, LD, HS, and HSR

SELECTION GUIDE

The table shows the maximum number of original constant volume regulators in each terminal model and size. It also shows the number of Model ECT-HC retrofit valves required to replace these regulators.

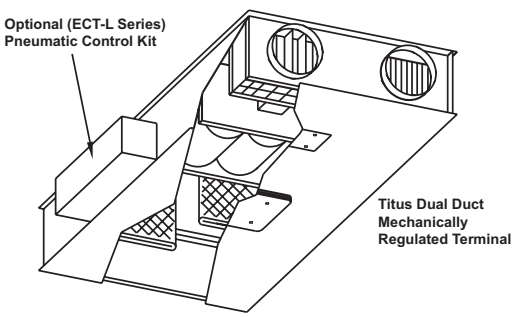
Each ECT-HC high capacity valve can control up to 800 cfm. Pneumatic or electric actuators are available. Each cfm range is a total for the entire terminal. It represents typical limit settings for the reset span of the pressure independent pneumatic controller.

The ECT-HC valve can also be adjusted for a minimum cfm setting of zero (full shut-off) with leakage of less than 2 percent.

TITUS TERMINALS

Design	Single Duct	Single Duct with Reheat	Dual Duct	Size	cfm Range	No. of Titus Regulators	No. of Titus ECT-HC Valves
1 Shipment 1968 through 1973	TSH	TSHR	TDH	4	75-250	1	*
				5	115-350	1	*
				6	115-450	2	*
				7	230-650	2	1
				8	250-850	3	1
				9	250-1050	3	2
				10	375-1350	4	2
				12	500-2000	5	3
				14	625-2700	7	4
				16	750-4000	9	5
2 Shipments 1974 through 1984	HS	HSR	HD	A	125-400	1	*
				B	250-800	2	1
				C	250-1200	3	2
				D	375-1600	4	2
				E	500-2300	5	3
				F	750-3200	7	4
				G	875-4100	9	5
				H	1200-5100	11	7
				J	1400-6000	13	8

Model TDH



Contact factory for availability

See the topic, "Control Boxes ECT-L Series" in this section for optional pneumatic control packages.

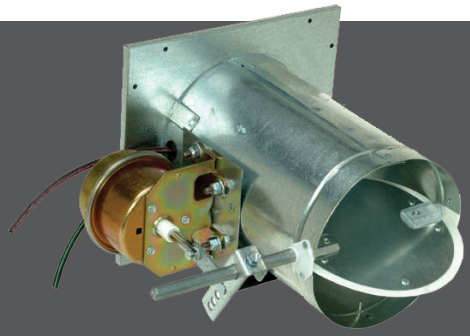
ECT-KR (Krueger Terminals)

OVERVIEW

Variable Volume

ECT-KR is a variable air volume, retrofit control valve. Designed for retrofitting Krueger mechanically controlled terminals, it directly replaces the mechanical regulators in those models. This change out is easily done through the access panel in the bottom of the existing Krueger terminal.

In some installations the new air volume is much less than the original, so that the terminals require fewer ECT-KR valves than the number of existing mechanical regulators. In those cases the extra regulators are removed and the openings are covered with metal plates.



ECT-KR

retrofit energy solutions

See website for Specifications

AVAILABLE MODEL:

ECT-KR / Single Duct Models: CVM-ES, CVM-MS, CVM-RA, CVM-RB
ECT-KR / Dual Duct Models: CVM-ES, CVM-M, CVM-D

SELECTION GUIDE

ECT-KR is a variable air volume, retrofit control valve. Designed for retrofitting Krueger mechanically controlled terminals, it directly replaces the mechanical regulators in those models. This change out is easily done through the access panel in the bottom of the existing Kruger terminal.

Each cfm range is the total for the entire terminal. The ECT-KR cfm range represents the typical limit settings for the reset span of a pneumatic velocity controller.

KRUEGER TERMINALS

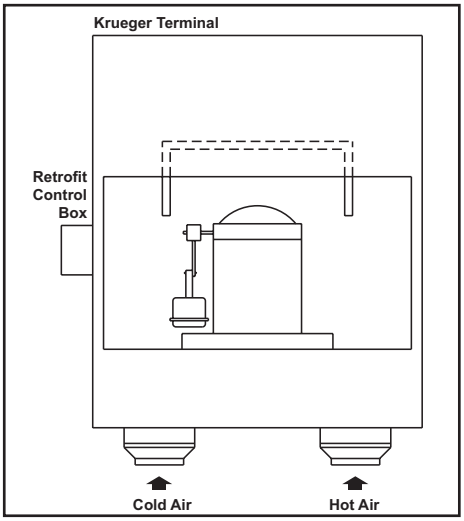
Krueger Terminal Size	Original cfm Range	Retrofitted cfm Range	Number of Original Regulators	Number of ECT-KR Retrofit Valves	ECT-KR Valve Size
4	100-200	45-200	1	1	N/A
5	175-300	65-350	1	1	N/A
6	300-450	85-450	1	1	C
7	400-600	115-650	1	1	D
8	500-800	150-850	1	1	E
9	700-1000	300-1000	2	2	E
10	800-1200	245-1300	1	1	F
12	1000-1600	300-1600	2	2	E
12 x 12	1500-2500	460-2500	4	4	D
16 x 14	1800-3000	600-3000	2	2	G
20 x 14	2400-3900	600-3600	2	2	G

See the topic, "Control Boxes ECT-L Series" in this section for optional pneumatic control packages.

The minimum should be equal to or greater than the 50 percent of the maximum airflow setting.

The ECT-KR retrofit valve can also be adjusted for a minimum cfm setting of zero (full shut-off) with leakage less than 10 cfm at 3 inches pressure differential. The ECT-KR is also available with electric actuators for use with electronic or DDC retrofit controls.

Before the retrofit valves and controls are ordered, we recommend spot checking the existing terminals to determine the condition of the inlet dampers and actuators. The interiors should also be checked for space limitations and mounting conflicts.



ECT-TB (Tuttle & Bailey Terminals)

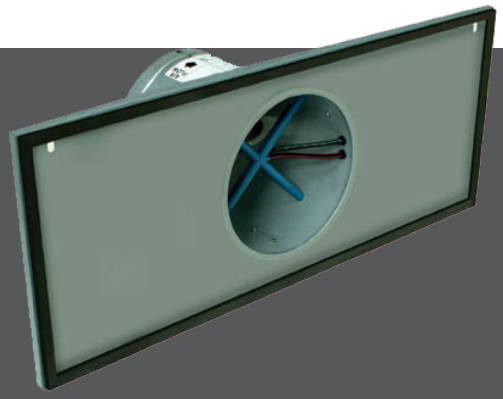
OVERVIEW

Variable Volume

ECT-TB is a variable air volume, retrofit control valve. Designed for retrofitting Tuttle & Bailey mechanically controlled terminals, it directly replaces the mechanical constant volume regulators. This change out is easily done through the access panel in the bottom of the existing Tuttle & Bailey terminal.

The Titus ECT-TB valve fits the same space as the original constant volume regulator. The old regulator flange is used as a pattern for drilling the mounting holes in the mounting panel. While most Tuttle & Bailey terminals will require no additional modifications, exceptions may be encountered because of minor variations in original manufacture. Simple relocations of the valves or of the sound baffle may be necessary to overcome space limitations.

See the topic, "Control Boxes ECT-L Series" in this section for optional pneumatic control packages.



ECT-TB

retrofit energy solutions

See website for Specifications

AVAILABLE MODEL:

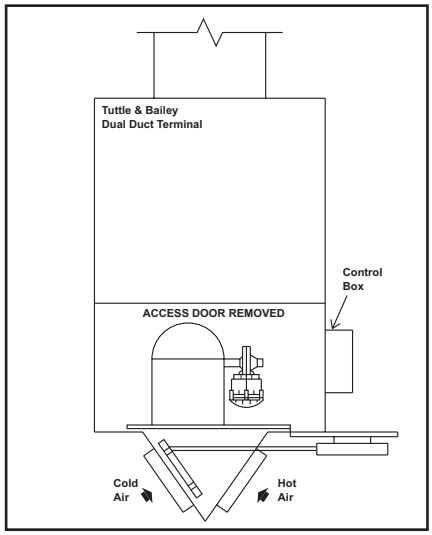
ECT-TB / Single Duct Model: MPMC-MVC
ECT-TB / Dual Duct Models: MPM-MVC, MPMD-MVC, MPM4-MVC

SELECTION GUIDE

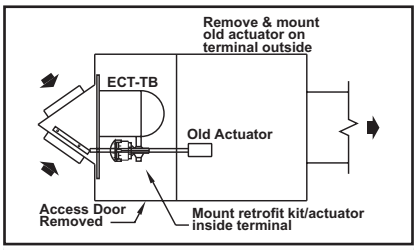
The table shows the retrofit valve size for each size of Tuttle & Bailey terminal, together with the selection range for maximum airflow (retrofitted). The minimum airflow can be adjusted for full shut-off.

TUTTLE & BAILEY TERMINALS

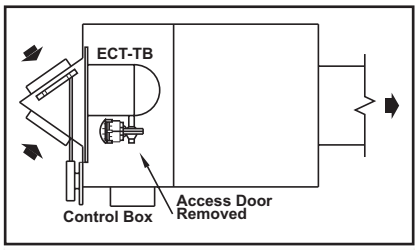
TB Unit Size	TB Inlet Size	Titus ECT-EB Size	Maximum cfm Settings
A	5	A	90-200
AB	5	AB	130-350
B	6	B	170-450
C	7	C	250-700
D	8	D	425-900
E	10	E	600-1400
F	12	F	700-2000
G	18 x 10	G	1400-3500
H	18 x 14	H	2300-4600



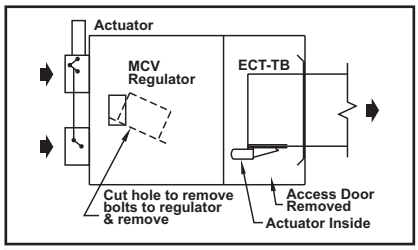
RETROFIT PROCEDURES FOR VARIOUS SIZES OF TUTTLE & BAILEY TERMINALS



Sizes A, AB, B, C, D



Sizes E, F



Sizes G, H

ECT-L Series

CONTROL BOXES

Available Models:

- ECT-3LS
- ECT-3LD
- ECT-4LD

The pneumatic control connections in most installations are made as shown in the ECT-3LS diagram at the right. Just one Titus II pneumatic controller can control as many as four retrofit valves.

Although just one controller is shown in the diagram, any number of Titus II controllers can be connected in parallel to one room thermostat.

Note:

SCFM	Standard Cubic Feet Per Minute
SCFH	Standard Cubic Feet Per Hour

SCFM = SCFH/60

The ECT-3LD control box is used in both single duct and dual duct applications. Included are a high pressure selector switch and a reversing relay with its bias adjusted to match the start point of the water valve opening for single duct applications.

For dual duct applications, the reversing relay is normally adjusted to the mixing damper actuator start point pressure plus the actuator throttling pressure range, divided by two.

The ECT-4LD control box is typically used only in dual duct applications. In addition to the high pressure selector switch and reversing relay, a snap acting diverting relay is included.

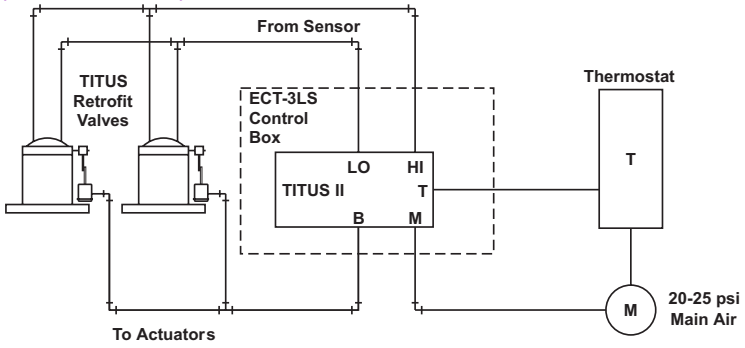
The start point of the Titus II controller is normally set at 8 psi, and the switch point of the snap acting diverting relay is also set at 8 psi.

The diverting relay is also adjusted so that 8 psi in equals 8 psi out.

Note: Compressed air consumption values shown are for the Titus ECT-L control box only and do not include the thermostat.

ECT-3LS

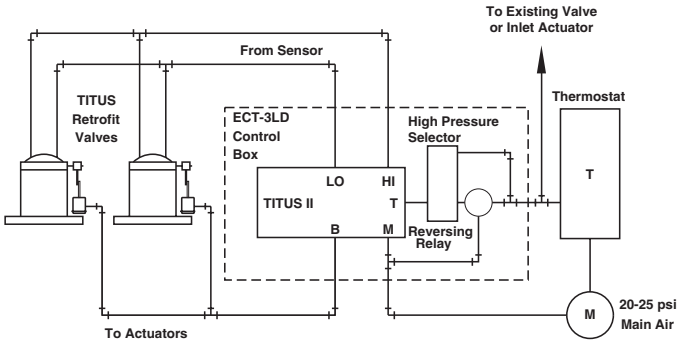
Compressed Air Consumption = 1.2 SCFH + Thermostat Loss



See the topic, ECT Series Applications in this section for Airflow Control Sequence

ECT-3LD

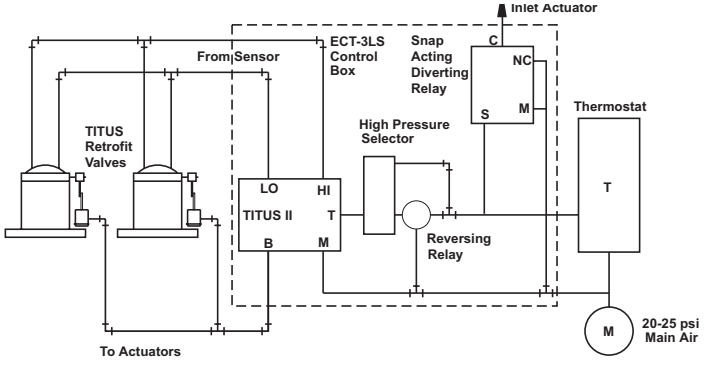
Compressed Air Consumption = 1.7 SCFH + Thermostat Loss



See the topic, ECT Series Applications in this section for Airflow Control Sequence

ECT-4LD

Compressed Air Consumption = 1.7 SCFH + Thermostat Loss



See the topic, ECT Series Applications in this section for Airflow Control Sequence

Notice

NOTICE:

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Anemostat® is a registered trademark of Anemostat Products Division, a Mestek Company.

Buensod and Barber-Colman terminal units are trademarks of Hart & Cooley, Inc.

Connor® is a registered trademark of Connor Incorporated, of Tek-Air Systems, Inc.

HSCE, HSCM, HSCW, HSCT, HDCE, HDCM, HDCD are model numbers of products manufactured by Barber-Colman.

HVEC, HVDC, HVOC, and VRC are model numbers of products manufactured by Anemostat®.

MPMC - MVC, MPM-MVC, MPMD-MVC, MPM-4-MVC are model numbers of products manufactured by Tuttle & Bailey®.

H Series - Design 14 & 16 are model numbers of products manufactured by Buensod.

Notes