BYPASS VARIABLE AIR VOLUME TERMINAL UNIT

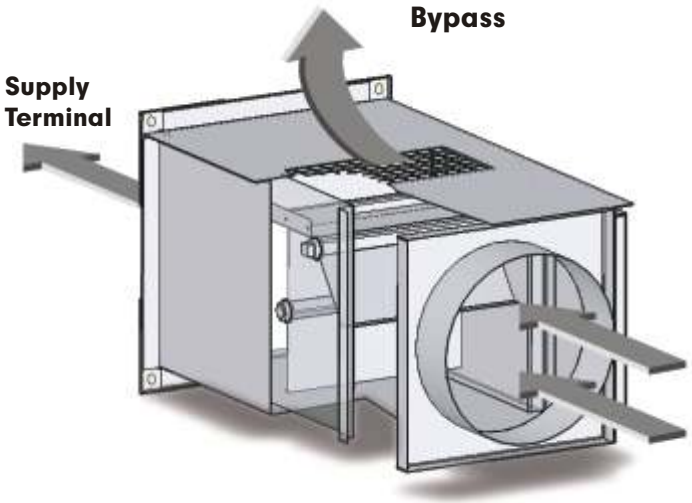
Bypass VAVs combine the advantages of proven air handling concepts to give complete zoning flexibility from a single zone source. The VAVs complement by providing excellent temperature control and central air distribution with unlimited zoning. The added advantage of multi-zone systems are by supplying centralized air distribution from unwanted zones to demand related zones.

Bypass Variable Volume Terminal Unit
Model: VAV - BP

SYSTEMS PRINCIPLE OF OPERATION

Cosmos Bypass Terminal Unit is a single duct pressure dependent air terminal unit, designed for use with popular constant volume low and medium pressure packaged air handling systems or roof top air conditioning units at low prime cost. Temperature control is achieved by supplying only enough conditioned air to the space to satisfy room thermostat demand. Excess air is diverted (bypassed) directly to the return air ceiling plenum for free or ducted return. Airflow to each occupied zone will vary on thermostat demand, from full flow to shut-off or to a set minimum air volume.

Bypass terminals can be added to a single-zone constant volume system to provide zoning without the energy penalty of a conventional reheat system, providing low first cost with minimum fan controls. The Combination of efficient pressure independent VAV & VFD driven AHU is more energy efficient compared to these system. Its most frequent application is on small systems.



STANDARD FEATURES

- Casing 22 gauge galvanized sheet with round inlets. Outlets are square with four side flange. Damper well design for reliable long term operation. The internal linkage is smooth due to frictionless double nylon bushings.
- 12 x 12 mm plated steel drive shaft.
- Internally lined casing utilizing opencell elestometric nitrile foam rubber, fiberfree, supersilent & microban resistant.
- Size range from 150 mm to 400 mm with capacities from 400 CFM to 2800 CFM
- Compact low profile design is ideally suited for installation in tight space
- Electronics control factory supply & mounted.
- Variety of control options available, based on applications.
- Electronic thermostat & actuator provide accurate mounting control.

UNIQUE DAMPER DESIGN

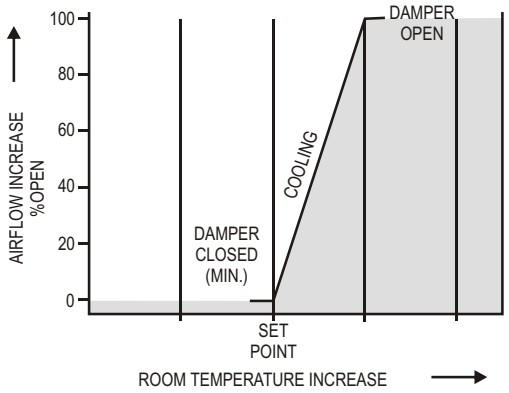
COSMOS Bypass terminal units utilize a unique damper for superior control and performance. A common problem with standard pivoted single blade damper designs is objectionable noise and loss of modulation due to pulsating and / or a snap-closing action of the valve. This is caused by a poor valve design, which struggle to modulate turbulent airflow arid require excessive torque.

The **COSMOS** damper eliminates these problems. The special damper design smoothly modulates between supply and bypass conditions essentially self - balancing, requirement.

The precisely design damper operates with minimum torque.

Standard Control Sequences . Analog Electronic . Pressure Dependent

Sequence of Operation:
Central system supplies cool air. On a rise in room temperature above set point, the bypass damper will slowly modulate open, increasing the flow of air to the room, closing the bypass at the same time. On a fall in room temperature below set point, the bypass damper will modulate closed, reducing the flow of cool air into the room and opening the bypass at the same time. A mechanical air volume minimum stop is provided (field set).



COSMOS MODULATING CONTROLS

- **Hardware Specs**

- **Enclosures**
  Confirms to NEMA1

- **Mounting**
  Actuator - Direct mounting on VAV shaft/box
  Communicating Thermostat - On the wall in occupied area.

- **Power Supply**
  24 V ac for the controller 40 VA transformer 230 V to 24V

- **Power Consumption**
  15 VA peak

- **Ambient limit**
  Storage and operation -10 to 50 Deg C, Humidity-0 to 95 RH Non condensing

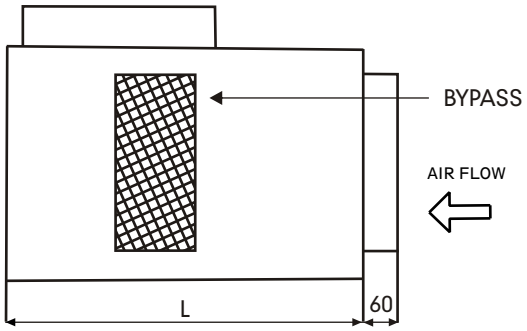
- **Actuator Specs**
  4 VA, 24 Vac/dc, 30 - 180 sec stroke Guaranteed for 60,000 operations minimum

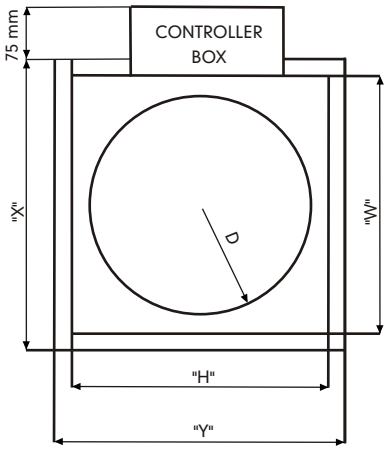
BYPASS TERMINAL UNIT ACCESSORIES DIMENSION

1. Single continuous length terminal construction minimizes casting leakage.

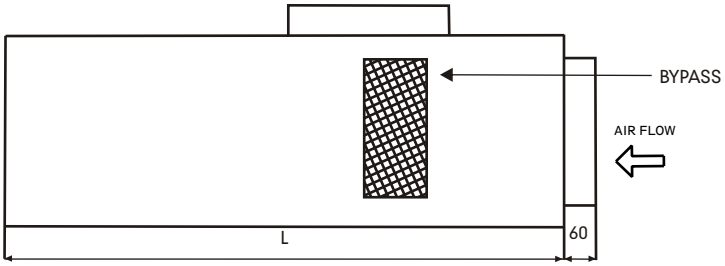
2. Continuous internal insulation reduces insulation seams and minimized airflow disturbance.

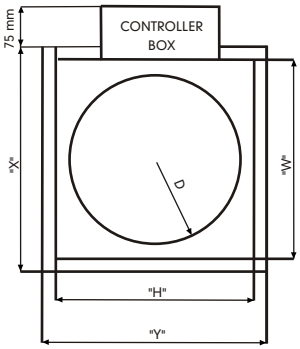
DIMENSIONAL DETAIL OF BYPASS VAV





MODEL	CAPACITY (CFM)	Ø D	"H"	"W"	"I"	X x Y	BYPASS
VAV-BP-150	0 - 400	Ø 150	200	200	500	246 x 246	146 x 86
VAV-BP-200	0 - 700	Ø 200	250	250	500	296 x 296	190 x 100
VAV-BP-250	0 - 1100	Ø 250	300	300	600	346 x 346	240 x 115
VAV-BP-300	0 - 1600	Ø 300	350	350	600	396 x 396	290 x 130
VAV-BP-350	0 - 2100	Ø 350	400	500	600	546 x 546	440 x 135
VAV-BP-400	0 - 2800	Ø 400	445	500	600	446 x 491	440 x 200





MODEL	CAPACITY (CFM)	Ø D	"H"	"W"	"I"	X x Y	BYPASS
VAV-BP-150	0 - 400	Ø 150	200	200	1150	246 x 246	146 x 86
VAV-BP-200	0 - 700	Ø 200	250	250	1150	296 x 296	190 x 100
VAV-BP-250	0 - 1100	Ø 250	300	300	1150	346 x 346	240 x 115
VAV-BP-300	0 - 1600	Ø 300	350	350	1150	396 x 396	290 x 130
VAV-BP-350	0 - 2100	Ø 350	400	500	1150	546 x 546	440 x 135
VAV-BP-400	0 - 2800	Ø 400	445	500	1150	446 x 491	440 x 200

ALL DIMENSIONS IN MM

Performance Data - Sound Power Level

Model : VAV - BP

Inlet size	Airflow Cfm	Airflow l/s	Min. Discharge Dps "w.g.	Min. Discharge Dps pa	Min. Discharge Dps "w.g.	Min. Discharge Dps pa	RADIATED												
							Bypass Closed Sound Power Level (dB)						NC Levels	Bypass Open Sound Power Level (dB)						NC Levels
							125	250	500	1000	2000	4000		125	250	500	1000	2000	4000	
150	400	189	0.01	2	0.14	35	42	37	33	24	-	-	-	54	55	52	52	51	37	25
	300	142	0.01	2	0.08	20	-	34	25	-	-	-	-	47	48	45	47	37	26	-
	200	94	0.01	2	0.04	10	-	-	-	-	-	-	-	-	38	34	32	-	-	-
	100	47	0.01	2	0.01	2	-	-	-	-	-	-	-	-	34	29	-	-	-	-
200	700	330	0.01	2	0.21	52	47	41	34	28	26	-	-	60	59	55	53	48	41	30
	500	236	0.01	2	0.11	27	43	34	27	-	-	-	-	52	50	46	43	3	28	20
	350	165	0.01	2	0.05	12	-	32	-	-	-	-	-	47	40	37	32	25	-	-
	200	94	0.01	2	0.02	5	-	-	-	-	-	-	-	43	30	-	-	-	-	-
250	1100	519	0.01	2	0.43	107	52	49	46	37	32	23	20	65	64	62	60	56	52	37
	800	378	0.01	2	0.23	57	49	43	39	28	26	-	-	56	55	52	50	46	41	25
	500	236	0.01	2	0.09	22	43	35	29	-	-	-	-	47	45	43	41	34	-	-
	250	118	0.01	2	0.02	5	-	-	-	-	-	-	-	42	28	-	-	-	-	-
300	1600	755	0.01	2	0.50	124	48	51	47	37	35	29	20	69	69	66	63	60	56	40
	1200	566	0.01	2	0.28	70	43	41	38	29	25	-	-	61	60	58	56	52	46	33
	800	378	0.01	2	0.13	32	40	33	29	-	-	-	-	50	49	49	46	39	31	22
	400	189	0.01	2	0.03	7	-	-	25	-	-	-	-	44	40	41	35	28	-	-
350	2100	991	0.05	12	0.50	124	54	58	56	49	49	41	31	69	69	67	65	61	57	43
	1600	755	0.03	7	0.29	70	48	50	49	42	40	29	24	62	62	60	57	53	48	35
	1050	495	0.01	2	0.12	30	44	40	38	29	-	-	-	51	50	50	45	40	31	23
	550	260	0.01	2	0.03	7	-	31	26	-	-	-	-	-	37	36	29	-	-	-
400	2750	1298	0.06	15	0.50	124	64	63	59	49	46	37	34	73	73	71	69	65	61	47
	2050	967	0.03	7	0.28	70	57	54	50	41	36	25	24	65	65	63	61	56	50	37
	1375	649	0.01	2	0.13	32	45	41	38	27	-	-	-	54	53	53	50	44	34	27
	700	330	0.01	2	0.03	7	-	-	-	-	-	-	-	40	35	33	25	-	-	-

Performance Notes:

1) Discharge sound power is the noise emitted from the unit discharge into the downstream duct.
2) Radiated sound power is the breakout noise transmitted through the unit casing walls.
3) Sound power levels are in decibels, dB re 10-12 watts.
4) All sound data listed by octave bands is raw data without any corrections for room absorption or duct attenuation.
   Dash (-) in space indicates sound power level is less than 20 or equal to background.
5) Minimum discharge DPs is the static pressure loss through the unit with 100% airflow through discharge outlet.
6) Minimum bypass DPs is the static pressure loss through the unit with 100% airflow through the bypass outlet.

Performance Data - Sound Power Level

Model : VAV - BP

Inlet size	Airflow Cfm	Airflow l/s	Min. Discharge DPs "w.g.	Min. Discharge DPs pa	Min Bypass DPs "w.g.	Min Bypass DPs Pa	Discharge Sound Power Level (dB) 125	250	500	1000	2000	4000	NC Levels Discharge
150	400	189	0.01	2	0.14	35	45	44	41	33	29	26	-
	300	142	0.01	2	0.08	20	43	38	34	25	-	-	-
	200	94	0.01	2	0.04	10	-	31	24	-	-	-	-
	100	47	0.01	2	0.01	2	-	-	-	-	-	-	-
200	700	330	0.01	2	0.21	52	52	51	47	39	36	33	-
	500	236	0.01	2	0.11	27	45	43	38	29	24	-	-
	350	165	0.01	2	0.05	12	-	34	28	-	-	-	-
	200	94	0.01	2	0.02	5	-	-	-	-	-	-	-
250	1100	519	0.01	2	0.43	107	50	50	46	43	37	34	-
	800	378	0.01	2	0.23	57	47	47	36	30	28	22	-
	500	236	0.01	2	0.09	22	44	40	34	28	-	-	-
	250	118	0.01	2	0.02	5	40	30	-	-	-	-	-
300	1600	755	0.01	2	0.50	124	49	47	45	43	44	40	-
	1200	566	0.01	2	0.28	70	44	40	38	36	36	29	-
	800	378	0.01	2	0.13	32	40	31	25	-	-	-	-
	400	189	0.01	2	0.03	7	-	-	26	-	-	-	-
350	2100	991	0.05	12	0.50	124	60	57	54	48	45	36	-
	1600	755	0.03	7	0.29	70	54	49	44	39	34	24	-
	1050	495	0.01	2	0.12	30	47	37	31	24	-	-	-
	550	260	0.01	2	0.03	7	-	31	-	-	-	-	-
400	2750	1298	0.06	15	0.50	124	66	64	61	56	52	46	21
	2050	967	0.03	7	0.28	70	58	56	51	46	42	34	-
	1375	649	0.01	2	0.13	32	50	45	39	33	27	-	-
	700	330	0.01	2	0.03	7	47	31	-	-	-	-	-

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