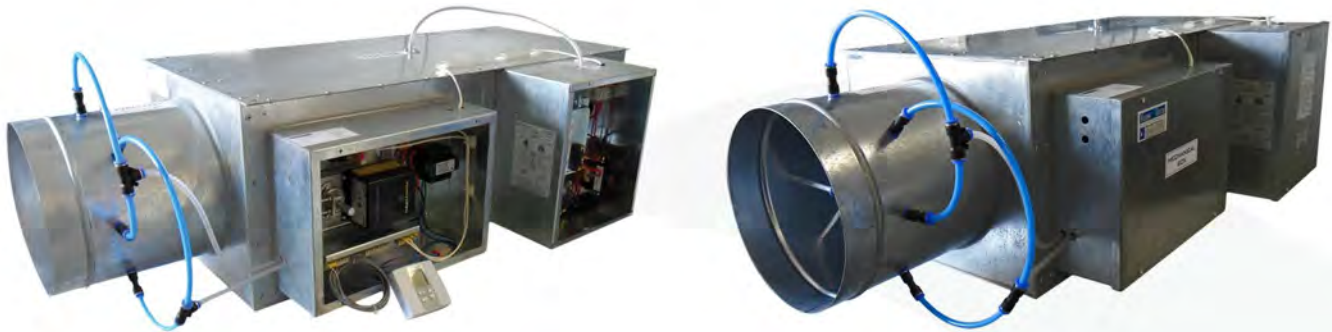




AIR DISTRIBUTION SPECIALIST



PRESSURE INDEPENDENT TERMINAL UNITS WITH ELECTRIC HEATER



PRESSURE INDEPENDENT TERMINAL UNIT WITH ELECTRIC HEATER



Model PITU-EH

Flow Tech pressure independent terminal units are designed to control air volume flow rate for supply air on variable volume system. These units are designed to supply the air flow rate of conditioned air into an occupied zone in response to control signal from a thermostat or building management system. These could also be used as stand alone system.

Flow Tech Terminal units consist of a casing with circular inlet spigot, rectangular outlet connection with integral 400 mm long attenuator lined with acoustic mineral insulation with black tissue facing. Circular damper blade and cross flow differential pressure sensor for measuring air volume. The casing design and optimized silencer geometry reduce self-generated noise and minimize pressure drop.

Terminal units also incorporate control components (VAV actuator, transformer) which are factory fitted and calibrated in our in house calibration rig to ensure all PITU-EH meet the design criteria of our customer. This enable the terminal to monitor desired air flow rate as dictated by the thermostat or input signal of 0-10V and compensate instantly for any changes in supply air pressure that might tend to alter the supply air volume. Net resultant is a pressure independent variable air volume system.

The complete VAV terminal/silencer assembly has been tested in accordance to ARI 880.

Features:

- Circular damper blade for better flow management
- EDPM gasket on damper blade for low leakage.
- Multi-point averaging inlet differential pressure sensor
- Acoustic lining of mineral wool with glass fiber facing suitable for air velocity up to 20m/s.
- Shaft indicator for damper position.
- Rectangular discharge outlet with clip and drive cleat duct connection.
- Control components encased in control panel (optional).

MATERIAL SPECIFICATIONS

- Casing 0.9mm (21 gauge) galvanized steel sheet.
- Damper blade 0.9mm (21 gauge) galvanized steel sheet.
- Acoustic insulation of 25mm thick, 24kg/m³ with black tissue facing meeting UL 181 standard
- Bearing - Brass Bush 12mm Round
- Aluminum Flow Grid.



Model PITU-EH



FIG. 1: VAV TERMINAL UNITS MODEL - PITU

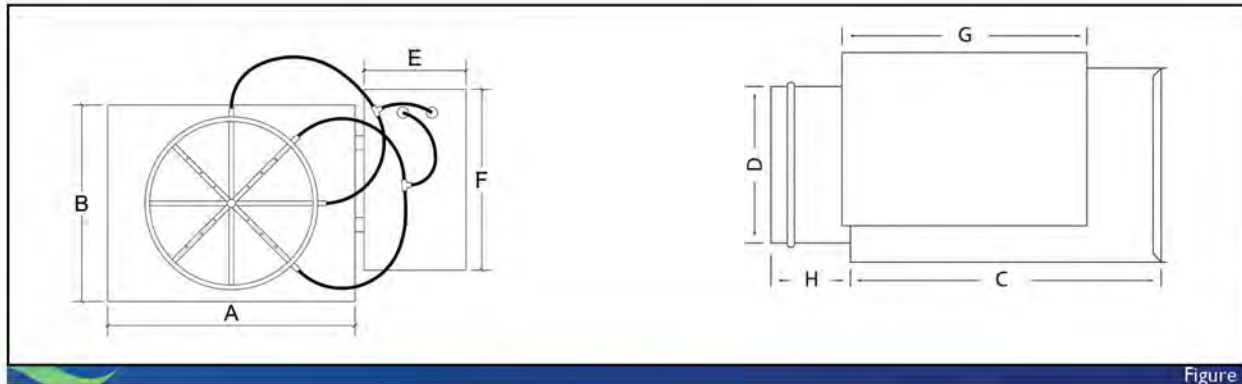


Figure 1

FIG. 2: VAV TERMINAL UNITS WITH SOUND ATTENUATOR - PITU-SA

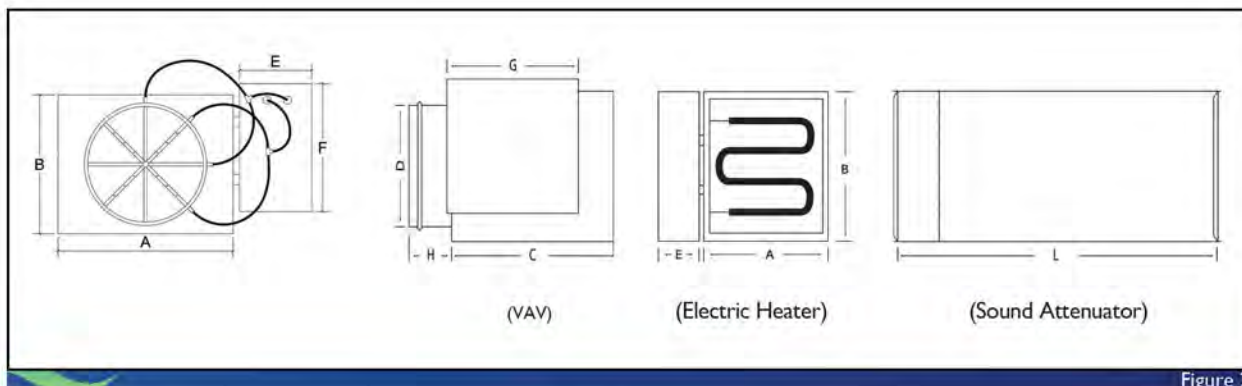


Figure 2

DIMENSIONS

MODEL	D	A	B	C	L	H	F	G	E
PITU-EH 15	150	275	225	800	900	150	200	300	100
PITU-EH 20	200	325	275	850	900	200	200	300	100
PITU-EH 25	250	375	325	900	900	250	250	300	100
PITU-EH 30	300	425	375	950	900	300	250	300	100
PITU-EH 35	350	475	425	1000	900	350	300	300	100
PITU-EH 40	400	525	475	1050	900	400	300	300	100
PITU-EH 60	600x400	600	400	1050	900	0	300	300	100

Left hand control panel as standard, Right hand control panel available as optional.



TYPICAL SELECTION GUIDE

Model	Airflow		Basic Unit				w/ Attenuator				Minimum ΔPs Across Assembly				Minimum ΔPt		Discharge NC Basic Assembly ΔPs Across Unit			Discharge NC c/w 36" Attenuator ΔPs Across Unit			Radiated NC Basic Assembly ΔPs Across Unit		
											1Row Coil		2Row Coil		Basic Unit		0.5"	1.5"	3"	0.5"	1.5"	3"	0.5"	1.5"	3"
											in.wg	Pa	in.wg	Pa	in.wg	Pa	in.wg	Pa	W.G	W.G	W.G	W.G	W.G	W.G	W.G
PITU-EH 15	CFM	L/S	in.wg	Pa	in.wg	Pa	in.wg	Pa	in.wg	Pa	in.wg	Pa	in.wg	Pa	125Pa	375Pa	750Pa	125Pa	375Pa	750Pa	125Pa	375Pa	750Pa		
	75	35	0.01	2	0.01	2	0.02	5	0.03	7	0.05	12	--	--	--	--	--	--	--	--	--	--	--		
	175	83	0.01	2	0.01	2	0.04	10	0.08	20	0.25	62	--	--	22	--	--	20	--	--	20	--	24	27	
	275	130	0.01	2	0.01	2	0.07	17	0.15	37	0.25	62	--	--	24	--	--	--	--	20	24	27	27	27	
	375	177	0.13	31	0.13	31	0.24	60	0.36	90	0.33	82	--	--	24	27	--	--	22	--	23	27	27	27	
475	224	0.18	45	0.18	45	0.33	82	0.50	124	0.46	114	--	--	24	30	--	--	25	--	25	29	29	29		
PITU-EH 20	150	71	0.02	5	0.02	5	0.04	10	0.07	17	0.05	12	--	--	--	--	--	--	--	--	--	--	--	--	
	250	118	0.02	4	0.02	4	0.05	12	0.09	22	0.07	17	--	--	23	--	--	--	--	--	--	--	--	--	
	450	212	0.05	12	0.05	12	0.14	35	0.24	60	0.20	50	--	23	29	--	--	21	--	22	--	22	26	26	
	650	306	0.01	2	0.01	2	0.16	40	0.33	82	0.15	37	--	23	30	--	--	22	--	26	30	30	30	30	
	850	400	0.01	2	0.01	2	0.25	62	0.52	129	0.25	62	--	25	32	--	--	24	22	29	33	33	33	33	
PITU-EH 25	250	118	0.02	4	0.02	4	0.05	12	0.09	22	0.07	17	--	--	23	--	--	--	--	--	--	--	--	--	
	450	212	0.01	2	0.01	2	0.06	15	0.11	27	0.06	15	--	22	31	--	--	22	--	25	--	25	--	25	
	750	353	0.01	2	0.01	2	0.15	37	0.31	77	0.20	50	--	25	35	--	--	26	--	22	31	31	31	31	
	1050	496	0.01	2	0.01	2	0.21	52	0.44	109	0.30	75	--	27	36	--	21	27	--	24	33	33	33	33	
	1350	637	0.01	2	0.01	2	0.32	80	0.66	164	0.29	72	--	25	33	--	20	27	--	25	32	32	32	32	
PITU-EH 30	900	425	0.01	2	0.01	2	0.01	25	0.20	50	0.07	17	--	23	31	--	--	23	--	21	28	28	28	28	
	1200	566	0.01	2	0.01	2	0.16	40	0.33	82	0.11	27	--	25	32	--	--	26	--	23	30	30	30	30	
	1500	708	0.01	2	0.01	2	0.23	57	0.47	117	0.17	42	--	26	34	--	21	28	--	25	31	31	31	31	
	1800	850	0.01	2	0.01	2	0.31	77	0.63	157	0.24	60	--	27	35	--	23	30	--	26	33	33	33	33	
	2100	991	0.01	2	0.01	2	0.04	100	0.82	204	0.33	82	--	28	35	--	25	31	--	28	34	34	34	34	
PITU-EH 35	1000	472	0.01	2	0.01	2	0.07	17	0.13	32	0.05	12	--	22	31	--	21	29	--	21	28	28	28	28	
	1500	708	0.01	2	0.01	2	0.12	30	0.25	62	0.10	25	--	25	34	--	23	31	--	25	32	32	32	32	
	2000	944	0.01	2	0.01	2	0.20	50	0.40	100	0.18	45	--	27	36	--	24	32	21	29	35	35	35	35	
	2500	1180	0.01	2	0.01	2	0.28	70	0.58	144	0.27	67	--	29	38	--	25	34	24	32	37	37	37	37	
	3000	1416	0.01	2	0.01	2	0.38	95	0.79	197	0.38	95	--	30	39	--	26	35	27	35	40	40	40	40	
PITU-EH 40	1500	708	0.01	2	0.01	2	0.09	22	0.19	47	0.06	15	--	22	30	--	20	28	--	23	30	30	30	30	
	2000	944	0.01	2	0.01	2	0.15	37	0.30	75	0.10	25	--	25	33	--	22	30	--	26	33	33	33	33	
	2500	1180	0.01	2	0.01	2	0.21	52	0.43	107	0.16	40	--	27	35	--	24	32	22	30	35	35	35	35	
	3000	1416	0.01	2	0.01	2	0.28	70	0.58	144	0.22	55	--	29	37	--	26	34	25	33	38	38	38	38	
	3500	1652	0.01	2	0.01	2	0.37	92	0.75	187	0.30	75	--	31	40	--	27	35	28	36	41	41	41	41	
4000	1888	0.01	2	0.01	2	0.46	114	0.94	234	0.39	97	20	33	41	--	28	36	31	39	44	44	44	44		
PITU-EH 60 (60x40cm)	3000	1416	0.01	2	0.01	2	0.13	32	0.28	70	0.06	15	21	29	34	20	29	34	23	31	36	36	36	36	
	4000	1888	0.01	2	0.01	2	0.21	52	0.44	109	0.10	25	26	33	38	25	33	38	27	35	40	40	40	40	
	5000	2360	0.01	2	0.01	2	0.31	77	0.64	159	0.15	37	29	37	42	28	36	41	30	38	43	43	43	43	
	6000	2832	0.01	2	0.01	2	0.42	105	0.86	214	0.21	52	32	40	45	30	39	44	33	41	46	46	46	46	
	4000	3304	0.01	2	0.01	2	0.54	134	1.11	276	0.28	70	35	42	47	33	41	46	35	43	48	48	48	48	
8000	3776	0.01	2	0.01	2	0.68	169	1.39	346	0.36	90	37	44	49	34	43	48	37	45	50	50	50	50		

PERFORMANCE NOTES

- NC's are derived from sound power levels, which are obtained in accordance with ARI Standard 880-98 and ASHRAE Standard 130-1996.
- Airflow is given in Litres/Second, L/S and Cubic Feet/minute, CFM.
- Blank spaces indicate NC's less than 20
- ΔPs is the difference in static pressure from inlet to discharge of the unit.
- ΔPt is the difference in total pressure from inlet to discharge of the unit.
- Pressure is given in Pascals, Pa and Inches of Water Gauge, in.wg.
- NC values are calculated based on typical attenuation values in Appendix E, ARI Standard 885-98, "A Procedure for Estimating Occupied Space Sound Levels in the Application of Air Terminals and Air Outlets". The following chart shows the attenuation deductions that have been used for NC calculations.
- ΔPs for terminal units with electric coil is equal to basic unit. Resistance of the coil elements is negligible.

Radiated Sound is based on a 5/8" mineral fiber tile ceiling per ARI 885-1998 typical attenuation values:

Total Deductions	Octave Band Mid Frequency, HZ.					
	125	250	500	1000	2000	4000
All Sizes	18	19	20	26	31	36

Discharge Sound is based on environmental effect, end reflection, flex duct effect, space effect, sound power division and lined duct. effect.

Total Deductions	Octave Band Mid Frequency, HZ.					
	125	250	500	1000	2000	4000
<400 CFM	24	28	39	53	59	40
400-800 CFM	27	29	40	51	53	39
>800 CFM	29	30	41	51	52	39



TYPICAL SELECTION GUIDE

NC levels presented in the Typical Selection Guide are based on typical attenuation values as outlined in ARI standard 885-98, Appendix E. ARI Standard 885-98, Appendix E provides typical sound attenuation values for air terminal discharge sound and air terminal radiated sound. The typical attenuation values are recommended for use by manufacturers to estimate application sound levels.

In product catalogs the end use environments are not known and the factors presented in ARI Standard 885-98 are provided as typical attenuation values. Use of these values will allow better comparison between manufacturers and give the end user a value which will be expected to be applicable for many types of spaces.

Following is a detailed description of the typical attenuation values used to determine NC levels.

Radiated Sound

The typical radiated sound attenuation values for three types of ceilings: TYPE 1 - Glass Fiber; TYPE 2 - Mineral Fiber; TYPE 3 - Solid Gypsum Board.

Since Mineral Fiber tile ceilings are the most common construction used in commercial buildings, the attenuation values in the Typical Selection Guide are based on Type 2 - Mineral Fiber.

The table on the right provides the calculation method for the radiated sound total attenuation values based on ARI Standard 885-98.

	Octave Band Mid Frequency, HZ.					
	125	250	500	1000	2000	4000
Environmental Effect	2	1	0	0	0	0
Ceiling/Space Effect	16	18	20	26	31	36
Total Attenuation Deduction	18	19	20	26	31	36

- The ceiling/space effect assumes the following conditions:
1. 5/8" tile, 20lb/ft³ density
 2. The plenum is at least 3 feet deep
 3. The plenum space is either wide (over 25ft) or lined with insulation
 4. The ceiling has no significant penetration directly under the unit.

Discharge Sound

The typical discharge sound attenuation values for three sizes of terminal units.

1. Small Box - Defined as a unit with discharge duct of approximately 20 x 20 cm and capacity less than 400 cfm.
2. Medium Box - Defined as a unit with discharge duct of approximately 30 x 30 cm and capacity between 400 - 800 cfm
3. Large Box - Defined as a unit with discharge duct of approximately 40 x 40 cm and capacity of greater than 800 cfm.

For a complete explanation of the attenuation factors and the procedures for calculating room NC levels, please refer to ARI Standard 885-98.

Small Box (< 400 CFM)	Octave Band Mid Frequency, HZ.					
	125	250	500	1000	2000	4000
Environmental Effect	2	1	0	0	0	0
5 Ft (1.5m) Duct Lining	2	6	12	25	28	18
End Reflection	8	5	2	0	0	0
5 Ft (1.5m), 8in (200mm) Flex Duct	5	10	18	20	21	12
Space Effect	4	6	7	8	9	10
Sound Power Division	0	0	0	0	0	0
Total Attenuation Deduction	24	28	39	53	58	40

Medium Box (400-800 CFM)	Octave Band Mid Frequency, HZ.					
	125	250	500	1000	2000	4000
Environmental Effect	2	1	0	0	0	0
5 Ft (1.5m) Duct Lining	2	4	10	20	20	14
End Reflection	9	5	2	0	0	0
5 Ft (1.5m), 8in (200mm) Flex Duct	6	10	18	20	21	12
Space Effect	5	6	7	8	9	10
Sound Power Division	3	3	3	3	3	3
Total Attenuation Deduction	27	29	40	51	53	39

Large Box (> 800 CFM)	Octave Band Mid Frequency, HZ.					
	125	250	500	1000	2000	4000
Environmental Effect	2	1	0	0	0	0
5 Ft (1.5m) Duct Lining	2	3	9	18	17	12
End Reflection	9	5	2	0	0	0
5 Ft (1.5m), 8in (200mm) Flex Duct	6	10	18	20	21	12
Space Effect	5	6	7	8	9	10
Sound Power Division	5	5	5	5	5	5
Total Attenuation Deduction	29	30	41	51	52	39



DISCHARGE SOUND POWER LEVELS

Model	Sound Power Levels, Lw dB, re 10 ⁻¹² Watts																															
	Airflow		125 Pa (0.5" W.G)							250 Pa (1.0" W.G)							500 Pa (2.0" W.G)							750 Pa (3.0" W.G)								
			Octave Band							Octave Band							Octave Band							Octave Band								
	CFM	L/S	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7
PITU-EH 15	75	35	48	44	40	37	35	29	50	47	45	41	41	37	51	49	49	46	47	44	52	50	52	49	51	49						
	175	83	61	57	50	46	42	36	62	59	54	51	48	43	64	62	59	56	54	51	64	63	62	58	58	55						
	275	130	59	54	50	46	42	37	61	58	55	51	49	45	64	62	60	56	55	52	66	64	63	59	59	56						
	375	177	57	56	48	46	41	33	61	60	54	52	47	41	65	65	59	57	54	49	67	68	63	61	57	53						
	475	224	59	57	51	48	42	35	63	62	56	54	49	42	67	67	62	59	55	50	69	70	65	62	59	54						
PITU-EH 20	150	71	47	43	36	37	34	27	51	48	41	42	41	35	55	53	47	48	47	43	57	56	50	51	51	47						
	250	118	51	49	41	41	38	34	55	55	48	47	44	41	59	60	55	52	51	48	61	63	59	56	55	52						
	450	212	57	55	48	46	41	37	60	61	55	51	48	45	64	66	61	57	54	52	66	70	65	61	58	56						
	650	306	57	54	48	46	41	34	61	61	55	51	47	44	65	67	62	57	54	52	67	70	66	61	58	56						
	850	400	60	57	51	48	42	39	64	63	58	54	49	46	68	69	65	60	55	53	70	73	70	63	59	58						
PITU-EH 25	250	118	51	49	41	41	38	34	55	55	48	47	44	41	59	60	55	52	51	48	61	63	59	56	55	52						
	450	212	56	52	45	44	40	37	60	59	54	51	48	45	64	67	62	58	56	53	67	71	67	65	60	57						
	750	353	60	55	49	48	43	40	64	63	57	55	51	48	69	71	66	62	58	56	71	75	71	67	63	60						
	1050	496	62	56	50	49	44	41	66	64	59	57	51	49	70	72	67	64	59	57	73	76	72	68	64	61						
	1350	637	62	57	54	54	47	44	66	64	61	58	54	51	71	70	67	63	60	47	73	74	71	66	64	63						
PITU-EH 30	900	425	56	55	52	48	44	40	61	62	58	54	51	47	66	68	64	60	57	53	69	72	68	64	61	57						
	1200	566	59	57	53	50	46	42	64	63	60	56	52	48	69	70	66	62	59	55	72	73	70	66	63	59						
	1500	708	61	57	55	51	47	43	67	64	61	57	54	50	72	71	68	64	61	57	75	74	71	67	65	60						
	1800	850	63	58	56	53	48	45	68	65	62	59	55	51	74	71	69	65	62	58	77	75	72	69	66	62						
	2100	991	65	59	57	54	50	46	70	65	63	60	56	52	75	72	70	66	63	59	78	76	73	70	67	63						
PITU-EH 35	1000	472	55	53	48	46	42	38	62	60	54	53	49	45	68	67	60	59	56	51	72	72	63	63	59	55						
	1500	708	59	55	52	49	45	41	65	63	58	55	52	48	69	70	66	62	59	55	72	73	70	66	63	59						
	2000	944	62	57	56	50	48	43	68	65	62	57	54	50	74	72	68	64	61	57	78	76	71	68	65	61						
	2500	1180	64	59	58	52	49	45	70	66	64	59	56	52	76	73	70	66	62	59	78	76	73	70	67	63						
	3000	1416	65	60	60	53	51	47	71	67	66	60	57	53	78	75	72	67	64	60	82	79	76	71	68	64						
PITU-EH 40	1500	708	59	53	51	48	45	40	65	60	57	55	52	47	71	67	62	62	59	54	75	71	66	66	63	58						
	2000	944	62	56	55	50	47	42	68	63	60	57	54	49	75	70	66	64	59	55	75	74	68	66	62	58						
	2500	1180	64	58	58	51	49	44	71	65	63	58	56	51	77	72	69	65	62	58	81	76	72	69	66	62						
	3000	1416	66	59	60	53	50	46	73	66	66	60	57	53	79	73	71	67	64	59	83	77	75	71	68	64						
	3500	1652	68	61	62	54	51	47	74	67	68	61	58	54	81	74	73	68	65	61	84	78	77	72	69	65						
PITU-EH 60 (60x40cm)	4000	1888	70	62	64	55	52	48	76	69	69	62	59	55	82	75	75	69	66	62	86	79	78	73	70	66						
	3000	1416	66	64	61	59	57	50	69	68	66	64	61	56	73	72	70	69	66	62	75	74	73	72	69	65						
	4000	1888	70	68	65	62	60	53	73	72	69	67	65	59	77	76	74	72	70	65	79	78	76	75	73	68						
	5000	2360	73	71	68	64	62	56	76	75	72	69	6	61	80	79	76	74	72	67	82	81	79	77	75	71						
	6000	2832	75	73	70	66	64	58	79	77	74	71	69	63	82	81	79	76	74	69	84	84	81	79	77	73						
PITU-EH 60 (60x40cm)	4000	3304	77	75	72	68	66	59	81	79	76	73	71	65	84	83	80	78	76	71	86	86	83	81	79	74						
	8000	3776	79	77	73	69	68	61	83	81	78	74	73	66	86	85	82	79	78	72	88	88	85	82	80	76						

Performance Notes:

1. Data obtained in accordance with ARI Standard 880-98 and ASHRAE Standard 130-1996.
2. Airflow is given in litres per second, L/S; and cubic feet per minute, CFM.
3. Pressure is given in Pascals, Pa; and inches of water gauge, in.wg.
4. Blank spaces indicate sound power levels less than 20.



RADIATED SOUND POWER LEVELS

Model	Airflow		Sound Power Levels, Lw dB, re 10 ⁻¹² Watts																																																																																																																																		
			125 Pa (0.5" W.G)							250 Pa (1.0" W.G)							500 Pa (2.0" W.G)							750 Pa (3.0" W.G)																																																																																																													
			Octave Band							Octave Band							Octave Band							Octave Band																																																																																																													
CFM	L/S	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7																																																																																																						
PITU-EH 15	75	35	44	34	27	22	-	-	45	36	31	26	24	22	47	38	34	30	29	26	48	39	36	32	32	29	175	83	51	45	38	31	25	21	52	47	42	35	30	26	54	49	45	40	35	30	56	50	47	42	37	33	275	130	58	46	38	31	25	-	60	49	42	36	31	26	62	51	46	40	37	33	63	53	48	43	40	37	375	177	55	45	42	34	28	22	58	49	45	39	34	28	62	53	49	43	40	34	64	56	51	46	43	38	475	224	57	48	44	36	29	23	60	51	47	41	35	29	64	55	51	45	42	35	65	58	53	48	45	39			
	PITU-EH 20	150	71	47	35	31	25	20	-	50	39	35	29	26	22	53	43	38	34	32	28	55	45	40	37	36	32	250	118	50	37	31	28	22	-	52	42	37	32	26	20	54	47	42	36	30	26	56	50	46	38	33	29	450	212	56	43	36	34	28	21	58	48	42	37	32	26	60	53	48	41	36	31	62	56	51	44	39	34	650	306	57	46	38	33	27	25	60	51	43	38	33	33	64	56	49	43	40	41	66	58	53	47	43	46	850	400	60	49	40	35	29	26	63	54	46	41	35	34	67	59	52	46	41	42	69	62	55	49	45	46		
		PITU-EH 25	250	118	50	37	31	28	22	-	52	42	37	32	26	20	54	47	42	36	30	26	56	50	43	378	35	29	450	212	50	37	32	27	21	-	54	45	39	33	28	26	57	52	46	40	34	33	59	56	50	44	38	37	750	353	53	42	36	32	25	21	57	49	43	38	32	28	61	57	50	45	38	35	63	61	55	48	42	39	1050	496	55	44	38	33	27	22	58	51	45	40	33	29	62	58	52	46	39	36	64	63	56	50	43	39	1350	637	56	46	40	34	30	26	59	52	47	40	35	32	63	59	53	45	40	37	65	62	57	48	42	40	
			PITU-EH 30	900	425	49	44	37	31	24	20	53	49	43	37	29	25	58	55	50	42	34	30	60	58	53	45	37	33	1200	566	52	45	39	34	27	22	56	51	45	40	32	27	61	57	52	45	37	32	63	60	55	48	40	35	1500	708	54	47	41	36	30	24	59	52	47	42	35	29	63	58	53	47	40	34	65	61	57	50	43	37	1800	850	56	48	42	38	32	26	61	53	48	43	37	31	65	59	54	49	42	36	67	62	58	52	45	39	2100	991	58	49	43	40	34	27	62	54	49	45	39	32	66	60	55	50	44	37	69	63	59	53	47	40
				PITU-EH 35	1000	472	52	44	35	30	22	-	56	50	40	35	28	22	59	55	45	40	33	28	62	59	48	43	36	31	1500	708	56	47	41	34	28	22	60	53	46	40	33	28	64	59	51	45	38	33	66	62	55	48	41	36	2000	944	59	49	45	38	32	26	63	55	51	43	37	31	66	61	56	48	42	37	69	64	59	51	45	40	2500	1180	61	51	49	40	35	29	65	57	54	46	40	34	69	63	59	51	45	40	71	66	62	54	48	43	3000	1416	63	52	51	42	38	31	67	58	57	48	43	36	71	64	62	53	48	42	73	68	65	56	51
PITU-EH 40					1500	708	54	46	39	34	29	25	58	52	44	39	34	30	61	57	48	44	39	35	64	60	51	47	41	37	2000	944	57	48	44	38	33	28	61	54	49	43	38	33	64	60	53	47	43	38	67	63	56	50	45	41	2500	1180	59	50	48	41	37	31	63	56	53	45	41	36	67	61	57	50	46	41	69	65	60	53	48	44	3000	1416	61	52	51	43	39	33	65	57	56	47	44	38	69	63	60	52	48	43	71	66	63	55	51	46	3500	1652	63	53	54	45	41	35	67	59	58	49	46	40	70	64	63	54	50	45	73	68	66	57	53
	PITU-EH 60 (60x40cm)				4000	1888	64	54	56	46	43	37	68	60	61	51	48	42	72	65	65	56	52	47	74	69	68	58	55	50	3000	1416	60	54	49	41	33	23	64	59	54	46	39	31	67	63	59	51	44	40	69	66	61	54	48	45	4000	1888	64	58	52	43	36	25	67	62	57	48	41	34	71	66	62	54	47	42	73	69	64	57	50	47	5000	2360	66	60	54	45	38	27	70	65	59	50	43	36	73	69	64	56	49	44	75	72	67	59	52	49	6000	2832	68	63	56	47	39	29	72	67	61	52	45	37	75	71	66	57	50	45	77	76	69	60	53
		4000			3304	70	64	59	48	40	30	73	69	63	53	56	38	77	73	68	59	51	47	79	76	70	62	55	52	8000	3776	71	66	59	49	41	31	75	70	64	55	47	40	78	75	69	60	52	48	80	77	72	63	56	53																																																																														

Performance Notes:

1. Data obtained in accordance with ARI Standard 880-98 and ASHRAE Standard 130-1996.
2. Airflow is given in litres per second, L/S; and cubic feet per minute, CFM.
3. Pressure is given in Pascals, Pa; and inches of water gauge, in.wg.
4. Blank spaces indicate sound power levels less than 20.



DISCHARGE SOUND POWER LEVELS WITH SOUND ATTENUATOR

Model		Sound Power Levels, Lw dB, re 10 ⁻¹² Watts																													
		Airflow		125 Pa (0.5" W.G)							250 Pa (1.0" W.G)							500 Pa (2.0" W.G)							750 Pa (3.0" W.G)						
				Octave Band							Octave Band							Octave Band							Octave Band						
CFM	L/S	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7						
PITU SA-EH 15	75	35	48	43	36	28	-	-	49	45	40	32	23	-	51	47	44	37	29	20	52	48	47	39	32	25					
	175	83	59	56	45	37	24	-	60	58	50	42	30	-	62	60	54	46	36	26	63	61	56	49	39	31					
	275	130	57	51	46	37	26	-	59	55	50	42	31	21	62	58	55	47	36	26	64	60	57	49	39	30					
	375	177	56	52	47	37	23	-	59	56	52	42	30	20	62	61	57	47	36	28	64	63	60	50	40	33					
	475	224	58	54	49	39	25	-	61	59	54	44	31	22	64	63	59	49	37	29	66	66	62	52	41	34					
PITU SA-EH 20	150	71	47	40	37	28	-	-	50	45	42	33	25	-	53	49	47	38	31	23	55	52	50	41	35	27					
	250	118	48	44	37	31	20	-	52	48	43	36	27	25	55	53	50	41	33	32	57	55	54	44	37	37					
	450	212	55	52	44	38	25	20	58	56	51	43	31	27	62	60	57	48	38	35	64	63	61	51	41	39					
	650	306	60	56	49	42	27	21	63	61	55	48	34	29	66	65	62	53	40	36	68	68	65	56	44	40					
	850	400	58	55	47	42	30	23	62	59	54	47	36	30	66	64	60	52	43	37	68	66	64	65	46	41					
PITU SA-EH 25	250	118	48	44	37	31	20	-	52	48	43	36	27	25	55	53	50	41	33	32	57	55	54	44	37	37					
	450	212	54	49	45	38	29	25	58	54	51	43	36	32	61	60	58	48	42	40	64	64	62	51	46	44					
	750	353	59	53	48	44	33	28	62	59	55	49	39	36	66	64	62	54	46	43	68	68	66	57	49	47					
	1050	496	60	54	50	46	34	29	64	60	56	51	40	37	67	66	63	56	47	44	70	69	67	58	51	49					
	1350	637	61	54	50	45	35	35	65	60	57	51	42	38	69	66	63	56	48	41	72	69	67	59	52	42					
PITU SA-EH 30	900	425	54	51	49	42	36	31	58	57	55	48	41	38	62	62	62	53	47	45	65	65	66	57	51	49					
	1200	566	57	53	51	44	37	33	61	59	57	50	43	40	66	64	64	55	49	47	68	68	68	59	53	51					
	1500	708	59	55	52	46	39	35	64	61	59	51	45	41	68	66	65	57	51	48	71	70	69	60	54	52					
	1800	850	61	57	53	47	40	36	65	62	60	53	46	43	70	68	67	58	52	50	72	71	70	62	55	54					
	2100	991	63	58	54	48	41	37	67	63	61	54	47	44	72	69	68	60	53	51	74	72	71	63	56	55					
PITU SA-EH 35	1000	472	58	53	46	42	37	33	64	59	53	48	43	40	69	66	59	53	49	46	73	70	62	57	52	50					
	1500	708	61	54	50	45	40	36	66	61	56	50	46	42	72	68	62	56	52	49	75	72	66	59	55	53					
	2000	944	62	56	52	46	42	37	68	62	58	52	47	44	73	69	64	58	53	50	76	73	68	61	57	54					
	2500	1180	63	57	54	48	43	39	69	63	60	53	49	45	74	70	66	59	55	52	77	74	70	62	58	56					
	3000	1416	64	57	56	49	44	40	70	64	62	54	50	46	75	71	68	60	56	53	78	75	71	63	59	57					
PITU SA-EH 40	1500	708	58	52	49	45	41	34	63	59	55	51	47	42	69	66	60	56	53	49	73	70	64	60	57	53					
	2000	944	60	54	52	47	43	36	66	61	58	53	49	45	71	68	63	58	55	51	75	72	66	61	59	55					
	2500	1180	62	56	54	48	44	38	67	62	60	54	50	45	73	69	65	60	56	52	77	73	68	63	60	57					
	3000	1416	63	57	56	50	45	39	69	64	61	55	51	46	75	70	67	61	57	54	78	74	70	64	61	58					
	3500	1652	64	58	57	51	46	40	70	65	63	56	52	47	76	71	68	62	58	55	79	75	71	65	62	59					
PITU SA-EH 60 (60x40cm)	4000	1888	65	59	59	51	47	41	71	65	64	57	53	48	77	72	70	63	59	56	80	76	73	66	63	60					
	3000	1416	65	63	59	54	49	43	69	68	64	59	54	48	72	72	69	64	59	53	74	75	72	67	61	56					
	4000	1888	69	67	63	57	52	46	72	71	67	62	57	51	76	76	72	67	62	57	78	78	75	70	64	60					
	5000	2360	72	69	65	59	55	49	75	74	70	64	59	54	79	78	75	69	64	59	81	81	77	72	67	63					
	6000	2832	74	72	67	61	57	51	78	76	72	66	61	56	81	81	77	71	66	62	83	83	79	74	69	65					
4000	3304	76	73	69	62	58	53	80	78	74	67	63	58	83	82	78	72	68	64	85	85	81	75	70	67						
8000	3776	78	75	71	64	60	55	82	80	75	69	64	60	85	84	80	74	69	65	87	87	83	77	72	68						

Performance Notes:

1. Data obtained in accordance with ARI Standard 880-98 and ASHRAE Standard 130-1996.
2. Airflow is given in litres per second, L/S; and cubic feet per minute, CFM.
3. Pressure is given in Pascals, Pa; and inches of water gauge, in.wg.
4. Blank spaces indicate sound power levels less than 20.



VAV ELECTRIC HEATER (PITU-EH)

Electric heater is factory installed, wired and tested to ensure proper function. Electric heater comes as a modular construction with flange to be connected to existing VAV units. The heating elements are low-watt density and designed to minimize hot spots and thermal cutouts. Solid state relay, Neptronic EVC which is a combination of an actuator and controller.

The EVC's are available in the stand-alone version (EVC) or in a BTL listed BACnet application specific version (EVCB).

They are designed to control pressure dependant or pressure independent single duct VAV with terminal heater.

The controller incorporates flow sensor, electronics and firmware of the VAV package. The EVC mounts directly to the damper jackshaft on the side of the VAV box.

The attractive thermostat has a large LCD display with four push buttons for set point, occupancy override and programming.

EVC SERIES FEATURES

- Main Supply 24V AC
- Integrated actuator and control module
- Field configured VAV algorithms
- True differential pressure sensor
- Quick connect RJ45 available
- BACnet® MS/TP communications (EVCB)
- Micro-processor based backlit LCD thermostat
- BACnet® service port on the thermostat (EVCB)
- Simple air balancing and commissioning with the thermostat keypad

APPLICATIONS

The EVC is suitable for networked or stand-alone VAV boxes and is fully programmable.

Change-over, heating and/or cooling with 4 stages ON/OFF or TPM or 2 stages floating and 2 outputs 0-10 Vdc

Performances

Model	Air flow Range LPS	Stages	Allowable Maximum KW			
			220/50/1		400/50/3	
			kW Min	kW Max	kW Min	kW Max
PITU-EH 15	35-224	1, 2	1.0	3.0	2.5	7.5
PITU-EH 20	71-400	1, 2	1.0	5.0	5.5	9.5
PITU-EH 25	118-637	1, 2, 3	1.0	7.5	5.5	13.0
PITU-EH 30	425-991	1, 2, 3	1.0	9.0	3.0	21.0
PITU-EH 35	472-1416	1, 2, 3	1.0	11.0	3.0	30.0
PITU-EH 40	708-1888	1, 2, 3	1.0	11.0	4.5	36.0
PITU-EH 60	1416-3776	1, 2, 3	1.0	12.0	5.0	40.0

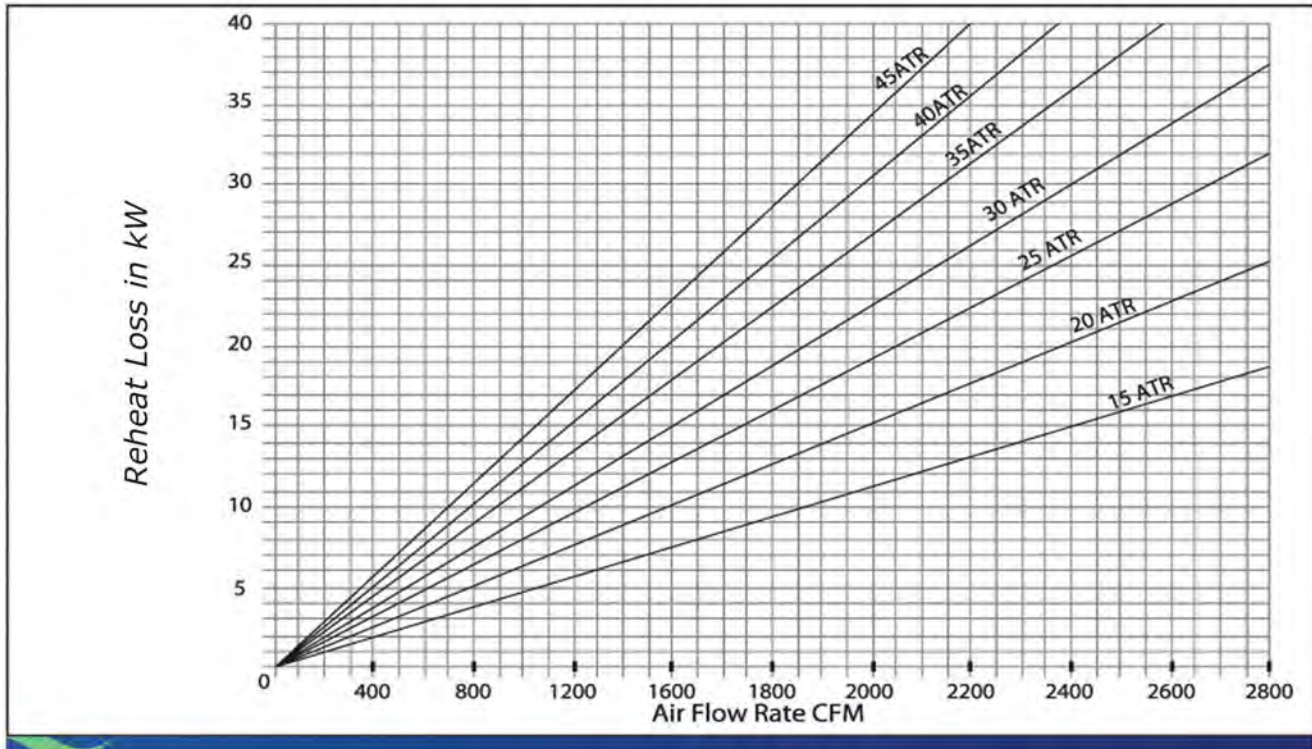
Minimum kW - Single Phase = 0.5 kW, Three Phase = 1.5 kW/Stage
 Minimum Air Velocity = 1 m/s
 Minimum Air Flow should be 33 LPS per kilowatt

Application Examples

- Single Duct, cooling only
- Single Duct cooling, 1-2 stage digital reheat
- Single Duct cooling and/or heating, 0-10 VDC reheat
- Single Duct cooling and/or heating, one stage time proportioned (TPM) reheat.

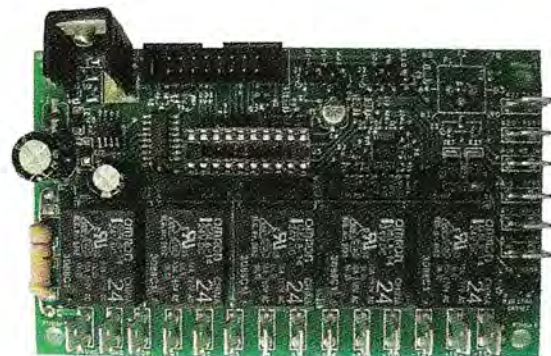


HEATER SELECTION CHART



**Modulating SCR "HEC" Controller
with Electronic Air Flow Sensors**

The Neptronic® Heater SCR controller accepts any control signal available in HVAC industry and converts it to a modulating and/or On-Off heat output through contactor(s) and solid state relay(s). This patented controller does include staging functions for up to 10 heating stages. Integrated electronic air-flow sensors provide an extra level of safety by constantly and accurately measuring air velocity and updating the heat output accordingly. This allows a safe and reliable operation whatever the condition of the air filters or if there is incidental obstruction in the air duct.



EVC SERIES

BACnet® or stand-alone VAV controller and actuator

SPECIFICATIONS

- Input
 - 2 thermistor input (10kΩ)
 - 1 digital input for night set back or occupancy
- Outputs
 - 2 analog outputs
 - Up to 4 binary triac outputs (supporting TPM, floating or ON/OFF) (2 standard)
- Controller Module - EVC Actuator
 - The EVC comes with a 8Nm (70 in.lb.) or 20Nm (180 in.lb.) actuator
- On Board Differential Pressure (Pressure Independent Models)
 - 0-1.0" WC
- Communication Ports (EVCB)
 - BACnet® MS/TP @ 9600, 19200, 38400, 76800 bps (maximum if 99 devices per BACnet® MS/TP segment)
- BACnet® Device Profile
 - BACnet® Application Specific Controller (B-ASC)
- Connection
 - Ethernet cable (RJ45) between the thermostat and the controller or 3 wire connection
- Wiring Class
 - Class 2
- Ambient
 - 0°C to 50°C (32°F to 122°F)
 - 5-95% RH (non-condensing)
- Dimensions & Weight
 - 17.2 x 11.0 x 7.9 cm (6.75 x 4.3 x 3.13 in)
 - 1.8kg (4lbs)

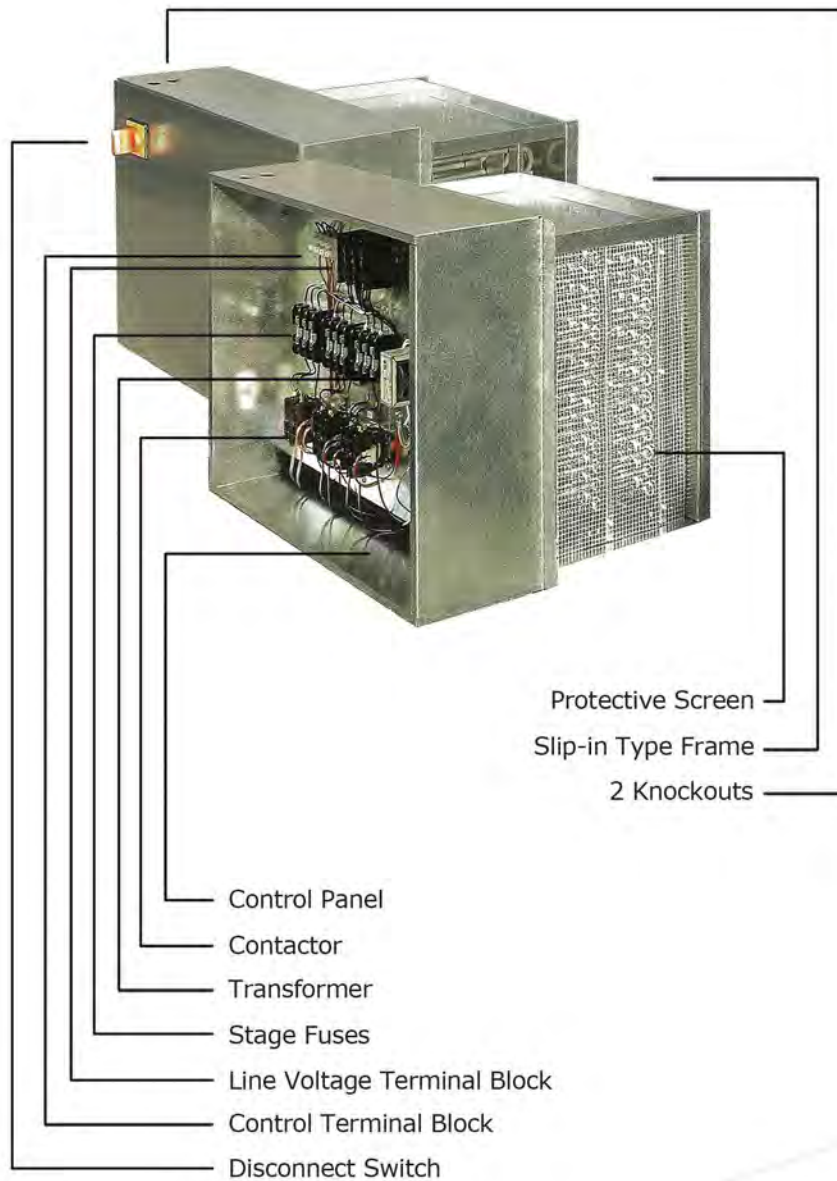


THERMOSTAT SPECIFICATIONS

- Thermostat
 - Attractive modern look with large backlit LCD
 - Icons driven information and 1 line of text information
 - Available in 2 series: TRL5x or TRL2x
- Push Buttons
 - 4 push buttons
- Temperature Sensor
 - Set point range 10°C to 40°C (50°F to 104°F)
 - Control accuracy ± 0.4°C (0.8°F)
 - Thermistor input 10kΩ at 25°C (77°F)
 - Temperature resolution ± 0.1°C (0.2°F)
- Service Port
 - Mini-USB connector giving access to the BACnet® network (if connected to EVCB)

DUCT HEATER OVERVIEW

- Modulating, ON/OFF or Staging
- Standard from 0.5 to 1000KW larger loads available
- Up to 40kW per sq. ft.



Disconnect Switch

Cuts the power supply to the heater in order to safely perform installation and maintenance tasks.

Standard when required by code, otherwise optional



Magnetic Contactor

Provides power to the individual stages of the heater.

Standard



Automatic Reset Thermal Cut-Out

An automatic reset, primary safety device. Removes power from elements if overheating occurs.

Standard



Manual Reset Thermal Cut-Out

A secondary safety device which removes power to the elements if overheating occurs.

Standard when required by code, otherwise optional



Transformer

Supplies power to the control circuit. Supplied with a fuse.

Standard



Fuses

Protect the total load and/or the individual heater stages.

Standard when required by code, otherwise optional



Pneumatic Electric Switch

Converts a pneumatic ON/OFF signal to an electric signal.

Standard for heaters with pneumatic ON/OFF signal



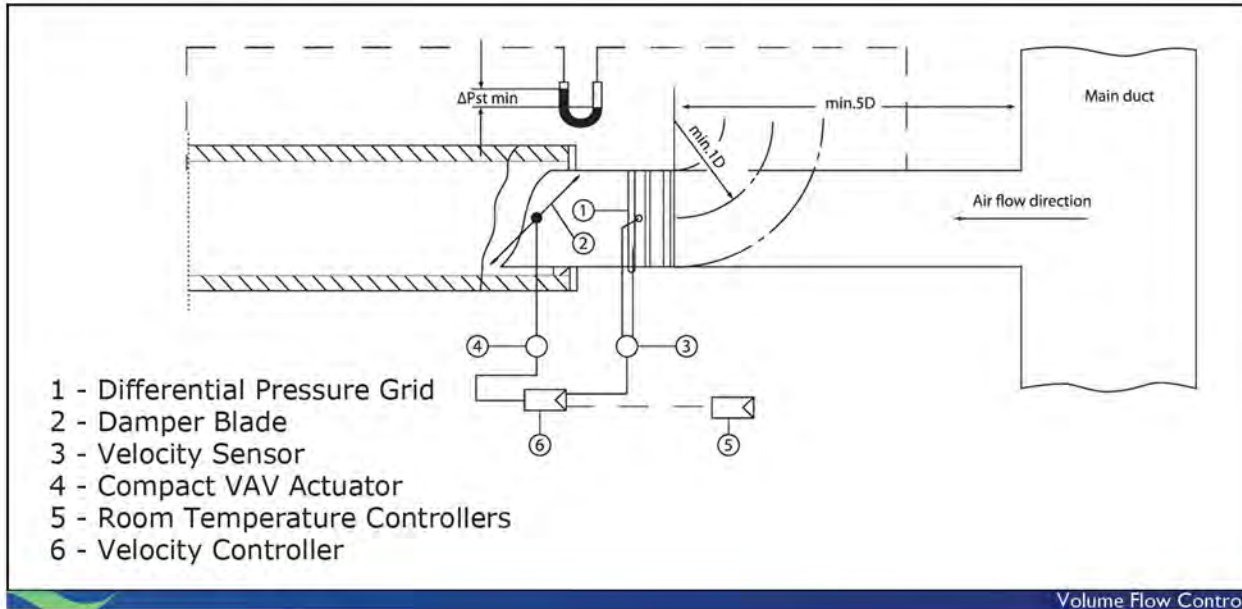
Airflow Switch

Safety component used to prevent a heater from operating if there is no airflow.

Standard for ON/OFF heaters



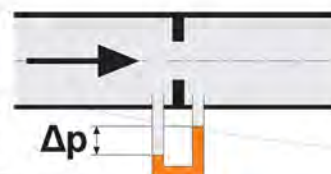
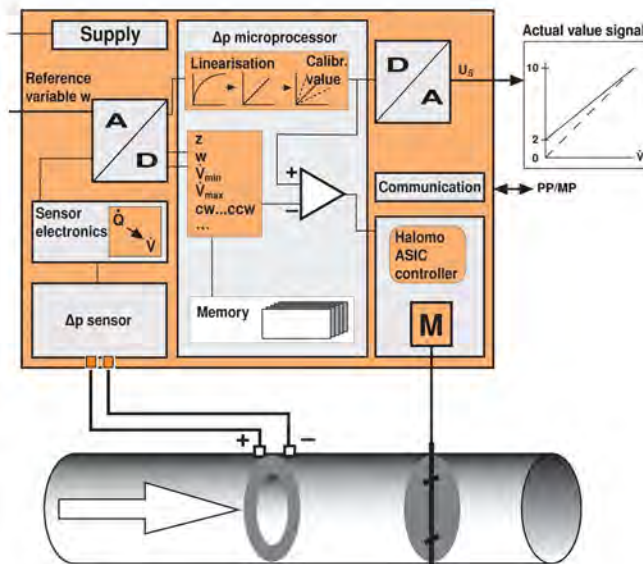
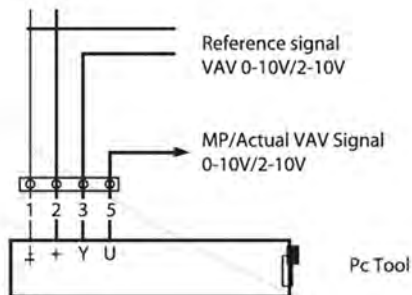
VOLUME FLOW CONTROL



CONTROL DIAGRAM

VAV with analogue reference signal

⊥- AC 24 V
 -+DC 24 V

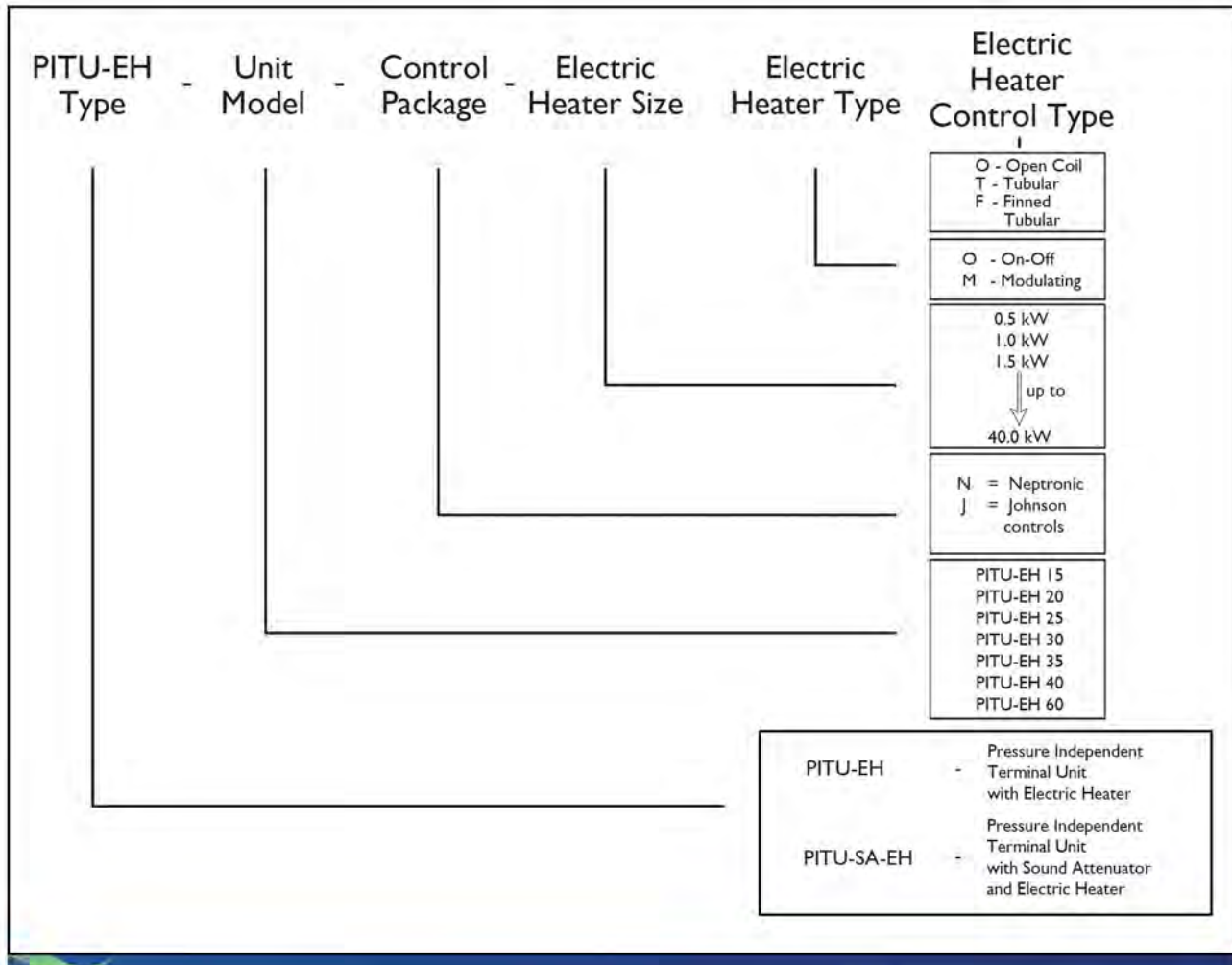


$$\dot{V} = c \cdot \sqrt{\Delta p / \rho}$$

Legend:
 \dot{V} = Volumetric flow
 c = Geometry-related constant of the baffle device
 Δp = Differential pressure
 ρ = Medium density



ORDERING SYSTEM



ORDERING EXAMPLE

PITU-EH-20N EH Size 1.0 KW EHM Type O

Refers to Pressure Independent Terminal Unit with Electric Heater,
Unit Model PITU-EH-20 with Nepronic Actuator, Electric Heater size 1.0kW,
Electric Heater Type Modulating, Open Coil

