

## STR Circular VAV Terminal Units

### ■ Introduction

ASLI Circular Variable Air Volume (STR) terminal units are volume flow rate controller for supply air on variable air volume system. These units are designed to control the airflow rate of conditioned air into an occupied space in response to a control signal from thermostat or Building Automation System (BAS). They could be used in stand alone system or interfaced with LONWORKS.

ASLI RVAV terminal units also incorporate control components, (VAV controller actuator, and transformer) which are factory fitted. ASLI in-house testing facility ensured that all boxes that come out from the factory are calibrated and tested to match the controller of individual size. This allow the terminals to monitor the desired flow rate, as dictated by the thermostat or BAS, and compensate instantly for any changes in supply air pressure that might tend to alter the supply air volume. Hence, the net result is a pressure independent variable air volume system.

Two models are available, STR (basic unit) and STRC (basic unit with external cladding to reduce case radiated noise).



### ■ Materials

- Casing: 0.7mm galvanized steel.
- Damper blade: Double layer 0.7mm thickness galvanized steel with a sandwiched peripheral gasket
- Bearing: Engineering plastic.
- Square Shaft: 10mmX10mm galvanized steel.
- Differential pressure sensor: Aluminum.
- Cladding (Optional): 0.7mm galvanized steel packed with fiberglass.

### ■ Features

- Oval shape damper for better flow management.
- Neoprene peripheral gasket to prevent leakage.
- Multi-point averaging inlet differential pressure sensor.
- Round inlet and outlet with beading for good connection.
- Square damper shaft for better grip mounting of actuator.
- Shaft indicator indicating damper position.
- Double layer heavy gauge damper blade.
- Protective metal shroud for control components mounting.
- Can be used for Constant Air volume (CAV) application.
- Optional external cladding to reduce case radiated noise (STRC).

### ■ Air Volume Control Type

- Variable Air Volume (VAV) Pressure Dependent Control
  - Without differential pressure sensor
  - Pressure dependent
  - No monitoring of air volume
- Variable Air Volume (VAV) Pressure Independent Control
  - With differential pressure sensor
  - Pressure independent
  - Air volume varies depending on design flow and signal by controller
  - Air volume could be monitored
- Constant Air Volume (CAV) Pressure Independent Control
  - With differential pressure sensor
  - Pressure independent
  - Air volume is constant (design flow) provided that the minimum static pressure is achieved
  - Air volume could be monitored

## STR Circular VAV Terminal Units

### ■ Nomenclature and Dimensions

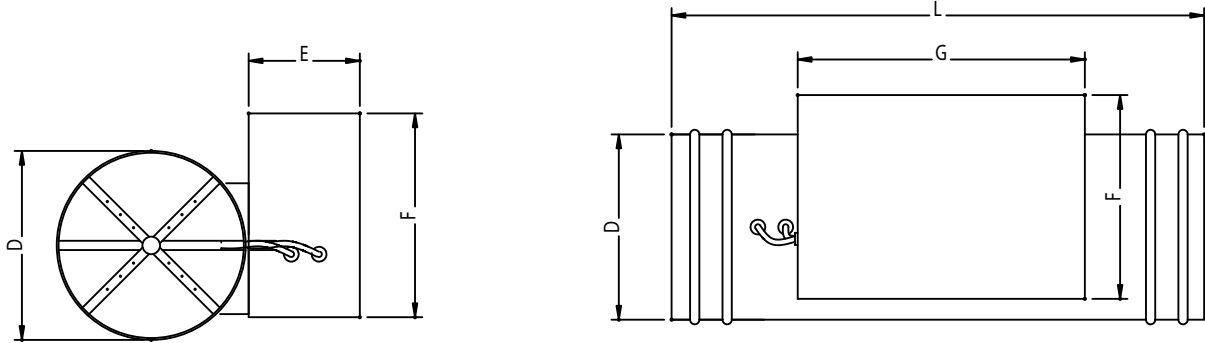


Figure 1: Basic STR Terminal Unit

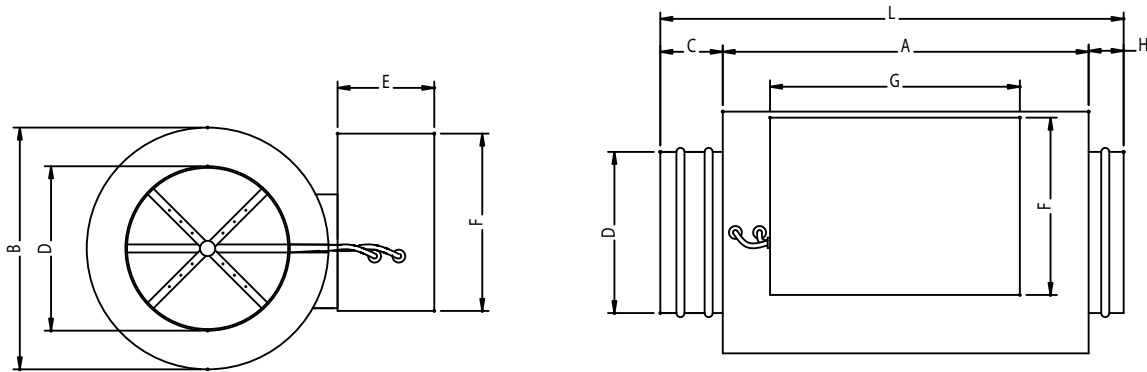


Figure 2: STRC Terminal Unit (with cladding)

H -Unit Size	D	E	F	G	L	B	A	H	C
100	95	120	220	310	494	195	344	50	100
150	145	120	220	310	494	245	344	50	100
200	195	120	220	310	494	295	344	50	100
250	245	120	220	310	494	345	344	50	100
300	295	120	220	310	494	395	344	50	100
350	345	120	220	310	596	445	446	50	100
400	395	120	220	310	596	495	446	50	100

General notes:

- Galvanized steel housing
- Mechanically seal leak resistant construction
- Right hand control location standard, as shown above
- Turbulence flow approaching the terminal will create additional noise, pressure drop and greater air flow variation. It is therefore recommended for optimum performance, there should be a minimum of 4 duct diameters of straight duct, same size as inlet, between the inlet and any transition, take off or lifting.

### ■ STR Round Variable Air Volume Terminal Selection Guide

STR	C=with cladding	-	5	4 = 4" dia.
				6 = 6" dia.
				8 = 8" dia.
				10 = 10" dia.
				12 = 12" dia.
				14 = 14" dia.
				16 = 16" dia.
				24X16 = 24"X16" inlet

Example: STR-512.



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## STR Circular VAV Terminal Units

### ■ Air Volume Ranges

Unit Size, mm (inch)	Air Volume Range (Min - Max)	
	liter/s	CFM
100 (4)	31 - 106	65 - 225
150 (6)	50 - 212	105 - 450
200 (8)	99 - 378	210 - 800
250 (10)	160 - 637	340 - 1350
300 (12)	245 - 991	520 - 2100
350 (14)	363 - 1510	770 - 3200
400 (16)	472 - 1888	1000 - 4000

### ■ Performance Data (Selection Guide)

Unit Size	Sound Power Level, Lw dB, re 10 <sup>-12</sup> watts																						
	Air Flow		ΔPs 125 Pa (0.5" W.G.)						ΔPs 250 Pa (1.0 W.G.)					ΔPs 500 Pa (2.0 W.G.)					ΔPs 750 Pa (3.0 W.G.)				
			Octave Band			Octave Band			Octave Band			Octave Band			Octave Band			Octave Band					
CFM	L/s	W.G.	Pa	W.G.	Pa	W.G.	Pa	Min	125 Pa	250 Pa	500 Pa	750 Pa	Min	125 Pa	250 Pa	500 Pa	750 Pa	Min	125 Pa	250 Pa	500 Pa	750 Pa	
4	79	37	0.01	2	0.01	2	0.06	14	-	-	-	25	-	-	-	-	21	-	-	-	-	-	
	128	60	0.01	2	0.01	2	0.14	35	-	-	-	22	28	-	-	-	20	24	-	-	-	-	
	176	83	0.02	5	0.02	5	0.27	67	-	-	22	28	34	-	-	22	25	29	-	-	-	21	24
	225	106	0.04	10	0.04	10	0.45	112	-	23	27	31	35	-	23	25	28	31	-	-	22	24	28
6	158	74	0.01	2	0.01	2	0.04	11	-	-	-	21	28	-	-	-	20	24	-	-	-	-	-
	255	120	0.03	7	0.03	7	0.12	31	-	-	-	25	31	-	-	-	23	28	-	-	-	20	22
	353	166	0.10	25	0.10	25	0.28	71	-	-	24	30	37	-	20	24	28	32	-	-	20	23	28
	450	213	0.21	53	0.21	53	0.51	128	-	24	28	33	38	-	24	28	31	34	-	20	23	28	32
8	280	132	0.01	2	0.01	2	0.04	10	-	-	-	26	32	-	-	-	23	28	-	-	-	20	22
	453	214	0.01	2	0.01	2	0.09	24	-	-	21	28	35	-	20	22	26	31	-	-	20	23	25
	627	296	0.02	6	0.02	6	0.19	47	-	-	26	32	40	-	23	28	31	35	-	-	23	27	32
	800	378	0.06	16	0.06	16	0.33	83	-	25	30	35	41	-	28	31	34	37	-	23	27	32	35
10	473	223	0.01	2	0.01	2	0.05	11	-	-	22	29	36	-	23	25	30	34	-	21	23	27	30
	765	361	0.01	2	0.01	2	0.11	26	-	-	25	31	38	21	26	31	34	38	-	22	27	31	35
	1058	499	0.02	6	0.02	6	0.21	53	-	21	27	32	39	26	31	34	37	40	22	27	31	35	38
	1350	638	0.06	16	0.06	16	0.37	92	22	27	31	35	40	30	35	37	38	42	25	30	32	36	39
12	735	347	0.01	2	0.01	2	0.05	13	-	-	22	27	36	-	22	24	29	33	-	20	22	25	28
	1076	508	0.01	2	0.01	2	0.10	25	-	-	24	28	38	-	25	28	32	36	-	23	25	30	32
	1418	669	0.01	2	0.01	2	0.17	41	-	20	26	30	40	24	29	33	36	40	-	24	30	33	37
	1759	831	0.02	4	0.02	4	0.26	65	-	22	28	32	41	28	33	36	39	43	25	30	33	37	40
	2100	992	0.04	10	0.04	10	0.39	96	23	28	32	35	42	32	37	39	40	45	27	32	34	38	42
14	1120	529	0.01	2	0.01	2	0.06	16	-	-	21	28	35	-	23	25	30	34	-	21	23	27	30
	1640	774	0.01	2	0.01	2	0.13	32	-	-	23	29	37	23	28	31	34	38	-	25	28	32	34
	2160	1020	0.01	2	0.01	2	0.21	53	-	20	25	32	39	27	32	34	37	41	25	30	32	35	38
	2680	1266	0.02	6	0.02	6	0.34	85	-	22	28	33	40	30	35	38	42	46	27	32	35	39	43
	3200	1511	0.06	16	0.06	16	0.52	128	23	28	32	36	41	34	39	41	43	47	29	34	36	40	45
16	1400	661	0.01	2	0.01	2	0.06	14	-	-	23	30	38	-	21	23	28	32	-	-	21	24	27
	1920	907	0.01	2	0.01	2	0.10	25	-	-	25	32	41	-	24	27	31	35	-	22	24	28	31
	2440	1152	0.01	2	0.01	2	0.16	39	-	21	27	34	42	25	30	32	35	39	22	27	30	33	35
	2960	1398	0.01	2	0.01	2	0.23	57	-	22	28	33	38	28	33	35	38	43	26	31	33	36	39
	3480	1643	0.02	5	0.02	5	0.32	81	-	23	30	35	40	31	36	39	43	47	28	33	36	40	45
	4000	1889	0.05	12	0.05	12	0.45	112	25	30	33	37	41	35	40	43	45	48	3	35	37	42	46

• ΔPs is the difference in static pressure from inlet to discharge of the unit.



# VAV TERMINAL UNITS

## STR Circular VAV Terminal Units

### ■ Performance Data (Discharge Sound Power Levels, Basic Assembly Unit - STR)

Unit Size	Sound Power Level, Lw dB, re 10 <sup>-12</sup> watts																									
	Air Flow		ΔPs 125 Pa (0.5" W.G.)						ΔPs 250 Pa (1.0 W.G.)						ΔPs 500 Pa (2.0 W.G.)						ΔPs 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
4	79	37	45	44	42	39	38	33	48	49	47	46	45	40	52	53	51	52	51	46	55	58	56	59	58	53
	128	60	49	48	46	43	42	37	52	53	51	50	49	44	56	57	55	56	55	50	59	62	60	63	62	57
	176	83	53	53	54	53	49	44	57	58	59	58	55	50	61	62	63	64	62	57	65	67	68	69	68	63
	225	106	57	58	60	58	53	51	61	61	64	63	59	55	65	64	67	67	65	60	69	67	71	72	71	64
6	158	74	49	48	43	40	40	34	52	53	48	47	46	41	56	57	52	53	53	49	59	62	57	60	59	56
	255	120	53	52	47	44	44	38	56	57	52	51	50	45	60	61	56	57	57	53	63	66	61	64	63	60
	353	166	57	57	55	54	51	45	61	62	60	59	57	52	65	66	64	65	63	59	69	71	69	70	69	66
	450	213	61	62	61	59	55	52	65	65	65	64	61	57	69	68	68	68	66	62	73	71	72	73	72	67
8	280	132	54	53	48	45	45	39	57	58	53	52	51	46	61	62	57	58	58	54	64	67	62	65	64	61
	453	214	57	56	51	48	48	42	60	61	56	55	54	49	64	65	60	61	61	57	67	70	65	68	67	64
	627	296	60	60	56	55	52	46	64	65	61	60	58	54	68	69	65	66	64	61	72	74	70	71	70	69
	800	378	64	65	62	60	56	53	68	68	66	65	62	59	72	71	69	69	67	64	76	74	73	74	73	70
10	473	223	60	59	54	51	51	45	63	64	59	58	57	52	67	68	63	64	64	60	70	73	68	71	70	67
	765	361	61	61	56	55	53	48	65	66	61	61	59	55	68	70	65	66	65	62	72	75	70	72	71	69
	1058	499	63	63	57	56	54	49	67	68	62	61	60	56	71	72	66	67	65	63	75	77	71	72	71	70
	1350	638	67	68	63	61	58	56	71	71	67	66	63	61	75	74	70	70	69	66	79	77	74	75	74	71
12	735	347	60	58	54	51	51	44	64	63	59	58	58	52	66	66	62	63	62	57	71	72	69	72	71	67
	1076	508	62	60	56	53	53	46	66	65	61	60	60	54	68	68	64	65	64	59	73	74	71	74	73	69
	1418	669	63	62	58	57	55	49	67	67	63	63	61	56	70	70	66	67	66	61	75	76	73	75	74	71
	1759	831	65	64	59	58	56	50	69	69	64	64	62	57	72	72	67	67	66	62	78	78	74	75	74	72
2100	992	69	69	65	63	60	57	73	72	69	68	66	62	76	74	72	71	69	66	82	78	77	78	77	73	
14	1120	529	62	59	56	53	53	46	66	64	61	60	60	53	69	68	66	67	66	61	73	73	71	74	73	68
	1640	774	64	61	58	55	55	47	68	66	63	62	62	55	71	70	68	69	68	62	75	75	73	76	75	70
	2160	1020	65	63	60	59	57	50	69	68	65	65	63	57	73	72	70	71	70	65	77	77	75	77	76	72
	2680	1266	67	65	61	60	58	51	71	70	66	66	64	58	76	74	71	71	70	66	80	79	76	77	76	73
	3200	1511	71	70	67	65	62	58	75	73	71	70	68	63	80	76	75	75	73	69	84	79	79	80	79	74
16	1400	661	64	61	58	55	55	47	67	65	62	61	61	55	69	68	66	67	67	63	72	72	70	73	73	71
	1920	907	66	62	60	57	57	48	69	66	64	63	63	57	72	71	69	70	70	65	75	75	73	76	76	74
	2440	1152	67	64	62	61	59	51	70	68	66	67	66	59	74	73	71	72	72	67	77	77	75	78	79	75
	2960	1398	68	65	63	62	60	52	72	70	67	67	65	58	75	74	72	73	70	64	79	79	77	79	75	70
	3480	1643	69	66	63	62	60	52	73	71	68	68	66	59	78	76	73	73	71	65	82	81	78	79	77	72
4000	1889	73	71	69	67	64	59	77	74	73	72	69	64	82	78	77	77	73	69	86	81	81	82	78	74	

• ΔPs is the difference in static pressure from inlet to discharge of the unit.



# VAV TERMINAL UNITS

## STR Circular VAV Terminal Units

### ■ Performance Data (Radiated Sound Power Levels, Basic Assembly Unit - STR)

Unit Size	Sound Power Level, Lw dB, re 10 <sup>-12</sup> watts																									
	Air Flow		ΔPs 125 Pa (0.5" W.G.)						ΔPs 250 Pa (1.0 W.G.)						ΔPs 500 Pa (2.0 W.G.)						ΔPs 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
4	79	37	46	45	37	33	24	15	47	47	41	37	29	20	49	48	44	40	33	26	50	50	48	44	38	31
	128	60	49	48	40	36	27	18	50	50	44	40	32	23	52	51	47	43	36	29	53	53	51	47	41	34
	176	83	53	49	46	43	34	28	55	52	49	45	37	31	56	55	52	47	41	34	58	58	55	49	44	37
	225	106	56	53	50	48	40	33	58	56	52	49	42	35	59	58	54	50	44	37	61	61	56	51	46	39
6	158	74	47	46	38	34	25	16	49	48	42	38	30	22	51	51	47	43	36	28	53	53	51	47	41	34
	255	120	50	49	41	37	28	19	52	51	45	41	33	25	54	54	50	46	39	31	56	56	54	50	44	37
	353	166	54	50	47	44	35	29	56	54	51	47	39	33	59	57	54	49	43	36	61	61	58	52	47	40
	450	213	57	54	51	49	41	34	59	57	54	51	44	37	62	61	56	52	46	39	64	64	59	54	49	42
8	280	132	50	49	41	37	28	19	52	51	45	41	33	25	54	54	50	46	39	31	56	56	54	50	44	37
	453	214	53	52	44	40	31	22	55	54	48	44	36	28	57	57	53	49	42	34	59	59	57	53	47	40
	627	296	57	53	50	47	38	32	59	57	54	50	42	36	62	60	57	52	46	39	64	64	61	55	50	43
	800	378	60	57	54	52	44	37	62	60	57	54	47	40	65	64	59	55	49	42	67	67	62	57	52	45
10	473	223	56	55	47	43	34	25	58	57	51	47	39	31	60	60	56	52	45	37	62	62	60	56	50	43
	765	361	60	56	53	50	41	35	62	60	57	53	45	39	65	63	60	55	49	42	67	67	64	58	53	46
	1058	499	63	60	57	55	47	40	65	63	60	57	50	43	68	67	62	58	52	45	70	70	65	60	55	48
	1350	638	64	61	61	58	51	46	67	64	63	59	53	47	69	68	64	61	55	49	72	71	66	62	57	50
12	735	347	54	54	46	42	32	23	56	56	50	46	37	29	58	59	55	51	43	35	60	61	59	55	48	41
	1076	508	57	57	49	45	35	26	59	59	53	49	40	32	61	62	58	54	46	38	63	64	62	58	51	44
	1418	669	61	58	55	52	42	36	63	62	59	55	46	40	66	65	62	57	50	43	68	69	66	60	54	47
	1759	831	64	62	59	57	48	41	66	65	62	59	51	44	69	69	64	60	53	46	71	72	67	62	56	49
14	2100	992	65	63	63	60	52	47	68	66	65	61	54	48	70	70	66	63	56	50	73	73	68	64	58	51
	1120	529	55	55	47	43	33	24	57	57	51	47	38	30	59	60	56	52	44	36	61	62	60	56	49	42
	1640	774	59	59	51	47	37	28	61	61	55	51	42	34	63	64	60	56	48	40	65	66	64	60	53	46
	2160	1020	63	62	56	53	44	36	65	64	60	56	48	40	67	67	63	59	52	44	69	70	67	62	56	49
	2680	1266	66	64	61	59	50	43	68	67	64	61	53	46	71	71	66	62	55	48	73	74	69	64	58	51
16	3200	1511	67	65	65	62	54	49	70	68	67	63	56	50	72	72	68	65	58	52	75	75	70	66	60	53
	1400	661	53	53	45	43	33	24	55	55	49	47	38	30	57	58	54	52	44	36	59	60	58	56	49	42
	1920	907	56	56	48	46	36	27	58	58	52	50	41	33	60	61	57	55	47	39	62	63	61	59	52	45
	2440	1152	60	60	52	50	40	31	62	62	56	54	45	37	64	65	61	59	51	43	66	67	65	63	56	49
	2960	1398	64	63	57	56	47	39	66	65	61	59	51	43	68	68	64	62	55	47	70	71	68	65	59	52
	3480	1643	67	65	62	62	53	46	69	68	65	64	56	49	72	72	67	65	58	51	74	75	70	67	61	54
4000	1889	68	66	66	65	57	52	71	69	68	66	59	53	73	73	69	68	61	55	76	76	71	69	63	56	

• ΔPs is the difference in static pressure from inlet to discharge of the unit.



# VAV TERMINAL UNITS

## STR Circular VAV Terminal Units

### ■ Performance Data (Radiated Sound Power Levels, Basic Assembly Unit With Cladding - STRC)

Unit Size	Sound Power Level, Lw dB, re 10 <sup>-12</sup> watts																									
	Air Flow		ΔPs 125 Pa (0.5" W.G.)						ΔPs 250 Pa (1.0 W.G.)						ΔPs 500 Pa (2.0 W.G.)						ΔPs 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
4	79	37	44	43	32	26	13	6	45	45	36	30	18	11	47	46	39	33	22	17	48	48	43	37	27	22
	128	60	47	46	35	29	16	9	48	48	39	33	21	14	50	49	42	36	25	20	51	51	46	40	30	25
	176	83	51	47	41	36	23	19	53	50	44	38	26	22	54	53	47	40	30	25	56	56	50	42	33	28
	225	106	54	51	45	41	29	24	56	54	47	42	31	26	57	56	49	43	33	28	59	59	51	44	35	30
6	158	74	45	44	33	27	14	7	47	46	37	31	19	13	49	49	42	36	25	19	51	51	46	40	30	25
	255	120	48	47	36	30	17	10	50	49	40	34	22	16	52	52	45	39	28	22	54	54	49	43	33	28
	353	166	52	48	42	37	24	20	54	52	46	40	28	24	57	55	49	42	32	27	59	59	53	45	36	31
	450	213	55	52	46	42	30	25	57	55	49	44	33	28	60	59	51	45	35	30	62	62	54	47	38	33
8	280	132	48	47	36	30	17	10	50	49	40	34	22	16	52	52	45	39	28	22	54	54	49	43	33	28
	453	214	51	50	39	33	20	13	53	52	43	37	25	19	55	55	48	42	31	25	57	57	52	46	36	31
	627	296	55	51	45	40	27	23	57	55	49	43	31	27	60	58	52	45	35	30	62	62	56	48	39	34
	800	378	58	55	49	45	33	28	60	58	52	47	36	31	63	62	54	48	38	33	65	65	57	50	41	36
10	473	223	54	53	42	36	23	16	56	55	46	40	28	22	58	58	51	45	34	28	60	60	55	49	39	34
	765	361	58	54	48	43	30	26	60	58	52	46	34	30	63	61	55	48	38	33	65	65	59	51	42	37
	1058	499	61	58	52	48	36	31	63	61	55	50	39	34	66	65	57	51	41	36	68	68	60	53	44	39
	1350	638	62	59	56	51	40	37	65	62	58	52	42	38	67	66	59	54	44	40	70	69	61	55	46	41
12	735	347	52	52	41	35	21	14	54	54	45	39	26	20	56	57	50	44	32	26	58	59	54	48	37	32
	1076	508	55	55	44	38	24	17	57	57	48	42	29	23	59	60	53	47	35	29	61	62	57	51	40	35
	1418	669	59	56	50	45	31	27	61	60	54	48	35	31	64	63	57	50	39	34	66	67	61	53	43	38
	1759	831	62	60	54	50	37	32	64	63	57	52	40	35	67	67	59	53	42	37	69	70	62	55	45	40
2100	992	63	61	58	53	41	38	66	64	60	54	43	39	68	68	61	56	45	41	71	71	63	57	47	42	
14	1120	529	53	53	42	36	22	15	55	55	46	40	27	21	57	58	51	45	33	27	59	60	55	49	38	33
	1640	774	57	57	46	40	26	19	59	59	50	44	31	25	61	62	55	49	37	31	63	64	59	53	42	37
	2160	1020	61	60	51	46	33	27	63	62	55	49	37	31	65	65	58	52	41	35	67	68	62	55	45	40
	2680	1266	64	62	56	52	39	34	66	65	59	54	42	37	69	69	61	55	44	39	71	72	64	57	47	42
	3200	1511	65	63	60	55	43	40	68	66	62	56	45	41	70	70	63	58	47	43	73	73	65	59	49	44
16	1400	661	51	51	40	36	22	15	53	53	44	40	27	21	55	56	49	45	33	27	57	58	53	49	38	33
	1920	907	54	54	43	39	25	18	56	56	47	43	30	24	58	59	52	48	36	30	60	61	56	52	41	36
	2440	1152	58	58	47	43	29	22	60	60	51	47	34	28	62	63	56	52	40	34	64	65	60	56	45	40
	2960	1398	62	61	52	49	36	30	64	63	56	52	40	34	66	66	59	55	44	38	68	69	63	58	48	43
	3480	1643	65	63	57	55	42	37	67	66	60	57	45	40	70	70	62	58	47	42	72	73	65	60	50	45
400	1889	66	64	61	58	46	43	69	67	63	59	48	44	71	71	64	61	50	46	74	74	66	62	52	47	

• ΔPs is the difference in static pressure from inlet to discharge of the unit.

## STR Circular VAV Terminal Units

### Suggested Specification

#### General

Circular Variable Air Volume (VAV) units shall be fully/truly pressure independent with multi-point velocity sensor, detachable flow transmitter, 3 point floating electric actuator, room thermostat, and open protocol LonMark DDC (direct digital control) controller.

The unit including all the control components shall be supplied, installed and the complete unit tested at the factory by a qualified VAV manufacturer. A qualified VAV manufacturer shall have both good manufacturing facility and a pressure independent test laboratory for variable air volume testing.

The warranty of the complete unit including the controls shall be the sole responsibility of the supplier.

The calibration of the VAV units shall be conducted in accordance with Industry Standard for Air Terminals Standard ARI 880 published jointly by Air Diffusion Council (ADC) and Air conditioning and Refrigeration Institute (ARI).

The manufacturer shall maintain an air distribution laboratory capable of performing full testing of pressure independent boxes and airflow accuracy test.

#### Basic Assembly

The basic assembly shall be constructed of galvanized steel, not less than 0.7mm thickness. The inlet and outlet of the terminal unit shall be round type with beading.

The terminal unit shall come with external cladding with fiberglass internal insulation to reduce case radiated noise.

The damper shall be of heavy gauge metal, with peripheral tear resistant Neoprene lip seal to ensure a tight air seal at full shut off position. Damper shaft shall have damper position indicator and of square shape to ensure a fool proof grip between damper and electric actuator. Round shaft shall not be accepted.

All control components shall be mounted inside a protective metal shroud.

#### Pressure Requirement

- The static pressure drop across the terminal unit shall not be more than 53Pa (0.22 in. W.G.) at the selected design air flow.
- The pressure independence shall be achieved using a differential pressure type velocity sensor on a feed forward control loop.
- The velocity sensor shall be a differential pressure multi-point sensing type using the reliable pitot tube concept for air flow measurement.
- The high and low tubing connection shall be air tight to prevent leakage affecting the accuracy of the air flow measurement. Airflow measurement must be within +/- 5%.

#### Noise

Sound power level in each octave band 2 through 6 shall not exceed the following when operating at the rated air flow rate with 125Pa (0.5 in W.G.) static pressure across the terminal unit:

Frequency (Hz)	125	250	500	1000	2000	4000
Radiated Noise (dB)	68	66	66	65	57	52
Discharged Noise (dB)	73	71	69	67	64	59

#### Controls

- The VAV controller shall be Lon based microprocessor based direct digital control (DDC) with open system concept to ensure ease of interfacing on site with others.
- Each VAV unit shall have its own dedicated, stand-alone microprocessor-based, truly independent LonMark open system controller.
- Each VAV controller shall accept standard thermistor input for temperature sensing.

All the VAV units shall be capable of stand-alone or networking operation. In networking mode, the DDC controller shall be truly open to be freely integrated to existing LonWork BAS without any additional hardware or software.

As a minimum, the user shall have the capability of monitoring the following dynamics up-dated information through each of the operator interface devices :-

- zone temperature
- actual live airflow
- desired set-point airflow
- cooling set-point etc
- operating mode

The room thermostat shall have a LCD display for room temperature and set point adjustment capability.

The controller shall have an overriding function to occupied/unoccupied mode.

As a minimum the user shall have the ability to monitor and control the following set-points through each of the operator interface devices :-

- cooling set-point
- minimum and maximum air flows
- neutral zone
- occupied/unoccupied time schedule
- room temperature
- live actual air flow