SERIES DL

Drum Louvres

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Features

- High Capacity.
- Long Throw Air Distribution.
- Full Horizontal & Vertical Adjustment.
- Wide Size Range.
- Full Range of Volume Control Accessories.
- Extruded Aluminium Construction.

GILBERTS

SERIES DL

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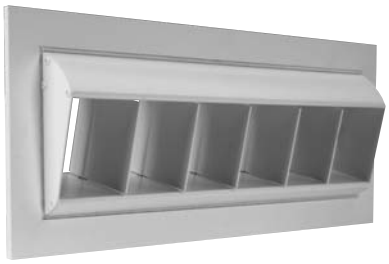
Introduction

Gilberts Drum Louvre Series DL is a highly flexible and versatile unit that has been specifically developed to meet the requirements of the long throw application in the air distribution field. Capable of handling high air volumes the Drum Louvre can deliver a powerful stream of air with a wide variety of horizontal and vertical fields of coverage and velocities. This makes the unit ideal for spot cooling or heating applications such as in factories and process areas or for other difficult applications such as large theatres or auditoria.
Manufactured throughout from extruded aluminium the unit consists of a rotating Drum Assembly which rotates through + or - 30° for coverage in the vertical plane. This angular correction allows the rise and fall in the airstream, caused by temperature differentials between supply and room air, to be offset as well as permitting both horizontal or vertical positioning. Individual blades housed in the drum can be adjusted independently to provide a jet or diffused airflow, reducing the length of throw with a corresponding equal terminal velocity.
Attractively designed and styled the unit is available in 8 different sizes catering for volumes up to 2.0 m^3/s. Standard accessories include separate volume controllers, which also act as deflectrols /airturns or opposed blade dampers fixed directly to the rear of the drum. Units can also be supplied with 24v, or 240V Motors providing the facility to remotely rotate the drum for upward or downward distribution in accordance with a cooling or heating cycle.

TYPE DL: Standard Drum Louvre available in sizes 1 to 8
TYPE DL/DO: Drum Louvre complete with rear mounted, screwdriver operated opposed blade damper.
TYPE DL/VCC: Drum Louvre complete with volume controller suitable for concealed ductwork.
TYPE DL/VCE: Drum Louvre complete with volume controller suitable for exposed ductwork.

Standard finish for the Drum Louvre is a polyester powder white with other colours and finish types available on request.



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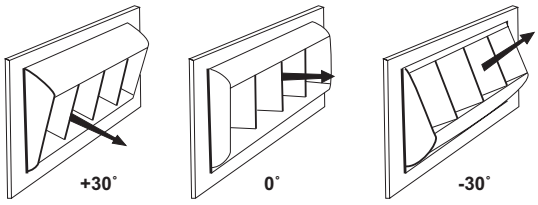


Performance Data

The performance tables listed in this brochure relate to isothermal heating and cooling applications. Performance figures for throw, pressure drop and also sound data under isothermal conditions can be found in the performance tables on pages 6, 7, 8, and 9. Corresponding figures showing the rise and fall of the jet stream under heating and cooling conditions can be found in the rise and fall charts on pages 10, 11, 12, and 13, with angular corrections indicated on page 14. Vertical performance under heating conditions are given on page 15, with angular variances calculated from figures given on page 16.
Vertical vane adjustment figures indicating percentage reduction in throws are also given on page 14.
References Used
PRESSURE: All pressure are in Pa (N/m^2)
THROW: All terminal velocity figures in (m/s) as indicated in the performance charts
SOUND: All figures given in (dbA)

SELECTION PROCEDURE

Dependant upon the Drum Louvres positions worked examples on pages 2 and 16 will guide the designer in the use and selection procedures for either horizontal or vertical applications.

Selection Procedure

HORIZONTAL THROW EXAMPLE (ISOTHERMAL CONDITIONS)

Air volume is 0.425m³/s and a throw of 18m is required with a terminal velocity of 0.5m/s. Initially refer to the sizing charts on pages 6, 7, 8 and 9. Using air volume as your primary factor search for the closest air volume to your requirements in the left hand columns of the sizing chart tables. Each table refers to a specific Drum Louvre size (1 to 8) and you may find that more than one size can accommodate your air volume. Throw requirements can then be read off on the horizontal axis to reveal the unit with the closest terminal velocity to your needs.

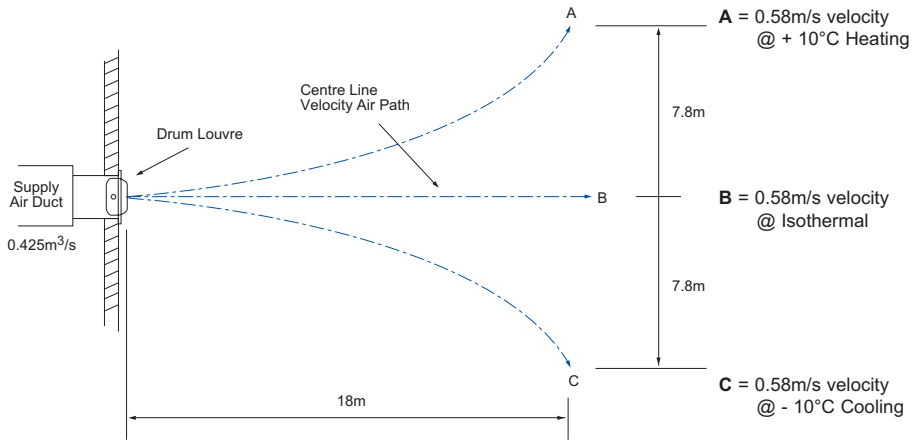
In this example size 4 Drum Louvre gives the closest match. At 0.425m³/s and an 18m throw the terminal velocity is 0.58m/s. The table also indicates that at this volume the pressure drop will be 50 Pa and the noise level 33 dbA.

HEATING AND COOLING ALLOWANCES

When a temperature difference between supply air and room air exists we can calculate the rise and fall of any airstream.

Using the initial data from our horizontal throw example we can add a temperature differential and determine the effect on performance. For example the effect of a temperature differential of 10°C heating or cooling can be calculated using our rise and fall charts on pages 10, 11, 12 and 13, (other temp. differentials are also listed).

Reviewing our example size 4 Drum Louvre we can see from the Size 4 Rise and Fall chart on page 11 that for an air volume of 0.425m3/s at 18m throw and10°C temp. differential the airstream will rise or fall by 7.8m (see diagram below).



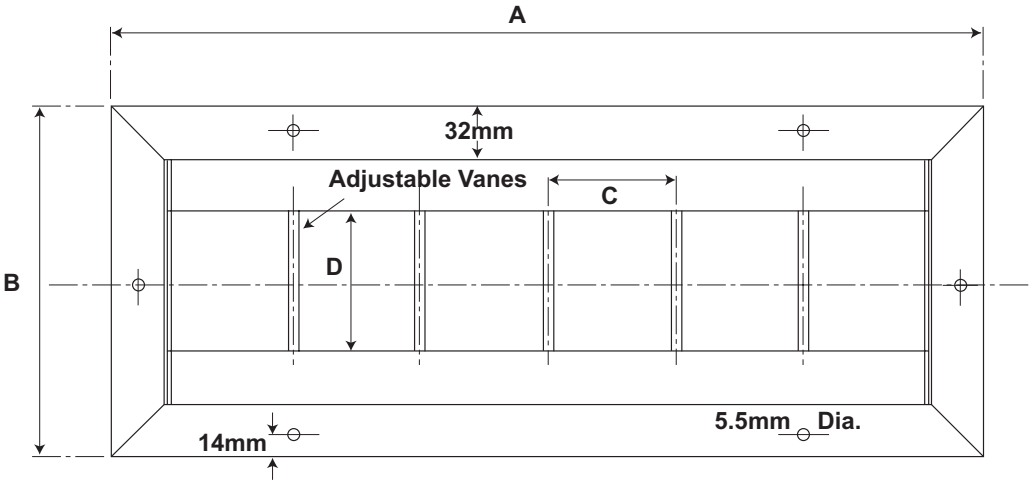
ANGULAR SETTING OF DRUM LOUVRES

Once the throw is established we can use the angular discharge correction chart on page 14 to determine the vertical angular correction required on the drum position to achieve a horizontal throw. In our example at 18m throw we have a rise/fall effect of 7.8m. The nearest factor available on the chart indicates that a 23° adjustment would correct a 7.2 rise/fall at 18m. From this we can estimate that a 24° angular adjustment would correct to near horizontal throw desired at 18m

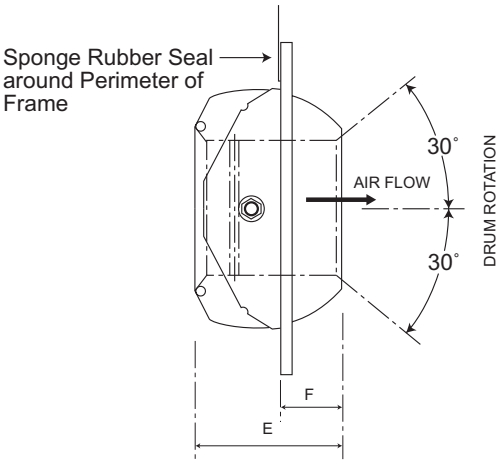
VANE SETTING (REDUCTION IN THROW)

If the throw on the unit size selected is greater than that required, or if a wider jet/spread of air is required we can use the vertical vanes in the Drum Louvre to alter the airstream. The vane adjustment graph on page 16 indicates the percentage decrease in throw for any given angle of vane deflection setting. Again using our example, if we required a 10% reduction in throw down to 16m we would adjust the angle of all vanes by 5°.

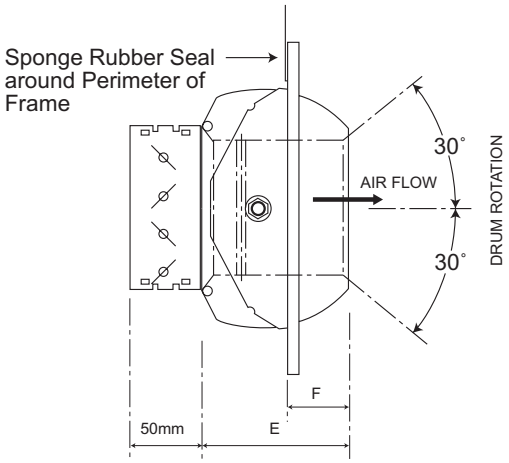
Drum Louvre Dimensions



DRUM LOUVRE



DRUM LOUVRE C/W O.B.D.

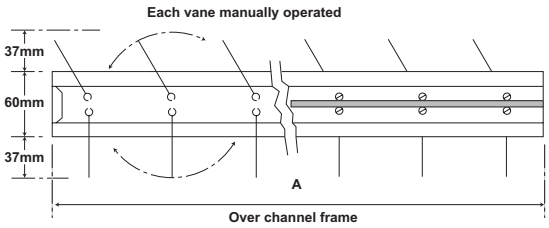


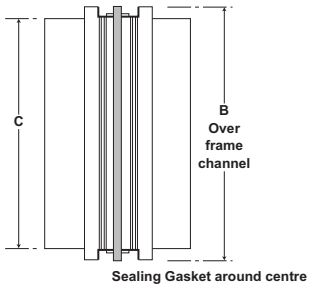
DIMENSIONS (mm)

LIST SIZE	A	B	C	D	E	F	DUCT OPENING	No of Vanes	No of Screws	APPROX WEIGHT kg
1	297	208	76	85	90	35	246 x 157	2	6	1.25
2	373	208	76	85	90	35	322 x 157	3	6	1.59
3	525	208	76	85	90	35	475 x 157	5	10	2.13
4	678	208	76	85	90	35	627 x 157	7	10	2.73
5	576	303	127	150	150	59	525 x 259	3	10	3.89
6	703	303	127	150	150	59	652 x 259	4	10	4.68
7	830	303	127	150	150	59	779 x 259	5	14	5.44
8	957	303	127	150	150	59	906 x 259	6	14	6.44

Drum Louvre Dimensions

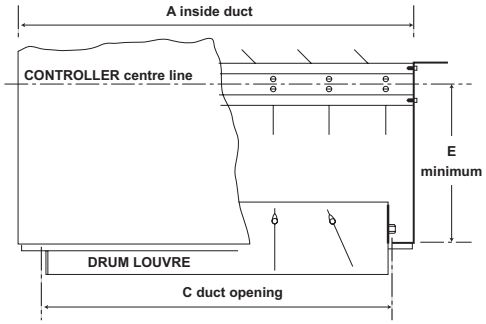
Volume Controller

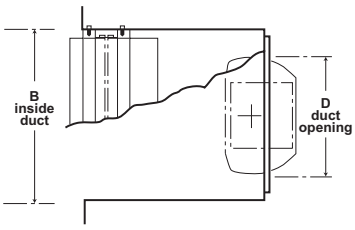




Size	VC/E A	VC/C A	VC/E B	VC/C B	VC/E C	VC/C C	No. of Vanes
1	308	244	219	155	199	135	6
2	384	320	219	155	199	135	8
3	536	473	219	155	199	135	12
4	689	625	219	155	199	135	16
5	587	523	314	257	294	237	14
6	714	650	314	257	294	237	18
7	841	777	314	257	294	237	20
8	968	904	314	257	294	237	24

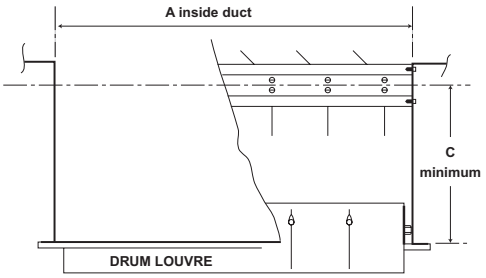
Volume Controller for Exposed Ductwork ...Ref VCE

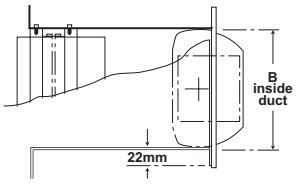




Size	A	B	C	D	E	Drum Size
1	310	221	246	157	159	1
2	386	221	322	157	159	2
3	538	221	475	157	159	3
4	691	221	627	157	159	4
5	589	316	525	259	210	5
6	716	316	652	259	210	6
7	843	316	779	259	210	7
8	970	316	906	259	210	8

Volume Controller for Concealed Ductwork ...Ref VCC





Size	A	B	C	Drum Size
1	246	157	159	1
2	322	157	159	2
3	475	157	159	3
4	627	157	159	4
5	525	259	210	5
6	652	259	210	6
7	779	259	210	7
8	906	259	210	8

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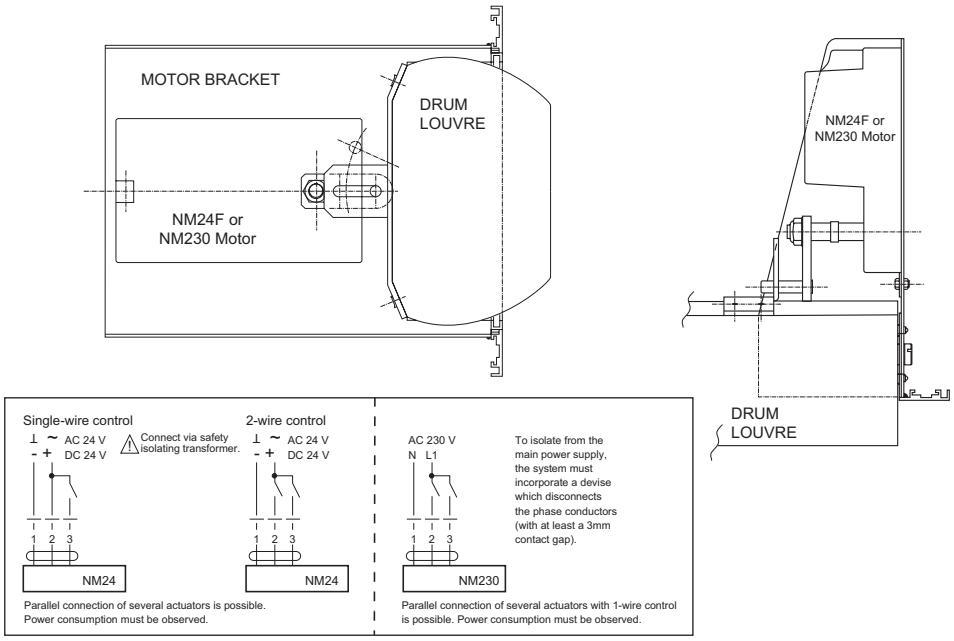
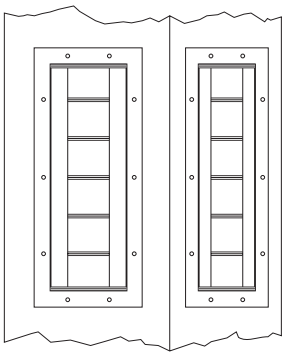
Drum Louvre Motorised



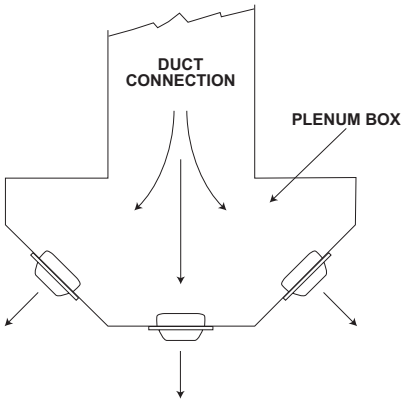
Typical Applications and Installation Guidelines

TYPICAL APPLICATIONS



VERTICAL MOUNTING

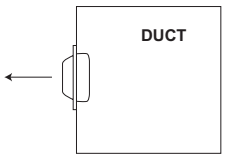
The drum louvre can be adapted to a vertical installation such as a combined decorative pillar and plenum around a structural column.



MULTI-POINT SITUATIONS

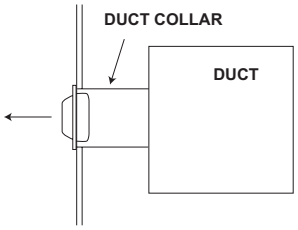
Purpose made plenum boxes can be constructed to accommodate multi-directional requirements.

INSTALLATION GUIDELINES



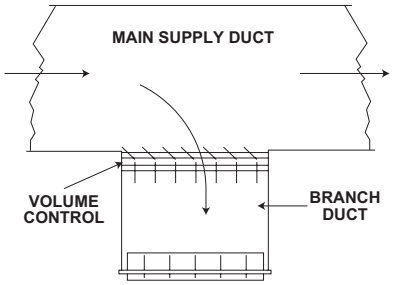
VELOCITIES UP TO 5m/s

The drum louvre can be fixed directly to the ducting using self-tapping screws.



VELOCITIES EXCEEDING 5m/s

In this situation it is recommended that an extension duct collar be fitted to the main ducting.



POSITION REQUIRING VOLUME CONTROL

In many installations it is necessary to use a Volume Controller. This also acts as a Deflectrol, controlling air flow into the branch ducting. Details of our Volume controller can be found on page 4.

Drum Louvre Size 1

Vol in m3/s	Throw in metres 3	6	9	12	15	18	21	24	P.S. (Pa)	Sound (dBA)
	Residual Velocity (m/s)									
0.025	0.32	0.18	0.12	-	-	-	-	-	2	-
0.05	0.63	0.35	0.25	0.19	0.14	0.11	-	-	7	-
0.075	0.95	0.53	0.37	0.28	0.22	0.17	0.13	-	14	-
0.1	1.27	0.71	0.49	0.37	0.29	0.23	0.17	0.11	25	22
0.125	1.58	0.88	0.61	0.46	0.36	0.28	0.21	0.13	35	24
0.15	1.89	1.06	0.74	0.55	0.43	0.34	0.25	0.16	45	27
0.175	2.21	1.23	0.86	0.65	0.50	0.40	0.29	0.19	63	31
0.2	2.52	1.41	0.98	0.74	0.57	0.45	0.33	0.22	83	33
0.225	2.84	1.59	1.10	0.83	0.64	0.51	0.37	0.24	100	36
0.25	3.15	1.76	1.23	0.92	0.72	0.56	0.41	0.27	125	38
0.275	3.47	1.94	1.35	1.02	0.79	0.62	0.46	0.30	150	40

Drum Louvre Size 2

Vol in m3/s	Throw in metres 3	6	9	12	15	18	21	24	P.S. (Pa)	Sound (dBA)
	Residual Velocity (m/s)									
0.025	0.29	0.16	0.10	-	-	-	-	-	1	-
0.05	0.54	0.30	0.21	0.16	0.12	0.10	-	-	3	-
0.075	0.81	0.46	0.32	0.24	0.19	0.15	0.11	-	5	-
0.1	1.08	0.61	0.42	0.32	0.25	0.20	0.14	-	11	-
0.125	1.35	0.76	0.53	0.40	0.31	0.24	0.18	0.12	18	21
0.15	1.62	0.91	0.64	0.48	0.37	0.29	0.21	0.14	24	23
0.175	1.89	1.06	0.74	0.56	0.43	0.34	0.25	0.16	30	24
0.2	2.16	1.22	0.85	0.64	0.49	0.39	0.29	0.18	40	28
0.225	2.42	1.37	0.95	0.72	0.56	0.44	0.32	0.21	50	30
0.25	2.69	1.52	1.06	0.80	0.62	0.49	0.36	0.23	63	32
0.275	2.96	1.67	1.16	0.88	0.68	0.53	0.39	0.25	75	34
0.3	3.23	1.82	1.27	0.95	0.74	0.58	0.43	0.27	90	36
0.325	3.50	1.98	1.38	1.03	0.80	0.63	0.46	0.30	100	37
0.35	3.77	2.13	1.48	1.11	0.86	0.68	0.50	0.32	120	39
0.375	4.04	2.28	1.59	1.19	0.93	0.73	0.53	0.34	150	42

Drum Louvre Size 3

Vol in m3/s	Throw in metres 3	6	9	12	15	18	21	24	P.S. (Pa)	Sound (dBA)
	Residual Velocity (m/s)									
0.075	0.65	0.37	0.26	0.20	0.15	0.12	-	-	3	-
0.1	0.86	0.50	0.35	0.26	0.20	0.16	0.12	-	5	-
0.125	1.08	0.62	0.43	0.33	0.25	0.20	0.15	-	8	-
0.15	1.29	0.75	0.52	0.39	0.30	0.24	0.18	0.11	11	-
0.175	1.51	0.87	0.61	0.46	0.35	0.28	0.20	0.13	15	21
0.2	1.72	1.00	0.69	0.52	0.40	0.32	0.23	0.15	20	23
0.225	1.94	1.12	0.78	0.59	0.45	0.36	0.26	0.17	25	24
0.25	2.15	1.24	0.87	0.65	0.50	0.40	0.29	0.19	30	26
0.275	2.37	1.37	0.95	0.72	0.55	0.44	0.32	0.21	38	29
0.3	2.59	1.49	1.04	0.78	0.60	0.48	0.35	0.22	43	30
0.325	2.80	1.62	1.13	0.84	0.66	0.52	0.38	0.24	50	32
0.35	3.02	1.74	1.21	0.91	0.71	0.55	0.41	0.26	60	33
0.375	3.23	1.87	1.30	0.97	0.76	0.59	0.44	0.28	75	36
0.4	3.45	1.99	1.39	1.04	0.81	0.63	0.47	0.30	79	37
0.425	3.66	2.11	1.47	1.10	0.86	0.67	0.49	0.32	93	38
0.45	3.88	2.24	1.56	1.17	0.91	0.71	0.52	0.34	101	39
0.475	4.09	2.36	1.64	1.23	0.96	0.75	0.55	0.35	112	40
0.5	4.31	2.49	1.73	1.30	1.01	0.79	0.58	0.37	138	42
0.525	4.52	2.61	1.82	1.36	1.06	0.83	0.61	0.39	150	43
0.55	4.74	2.74	1.90	1.43	1.11	0.87	0.64	0.41	163	44

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Drum Louvre Size 4

Vol	Throw in metres								S.P.	Sound
in	3	6	9	12	15	18	21	24		
m3/s	Residual Velocity (m/s)								(Pa)	(dBA)
0.075	0.55	0.32	0.23	0.17	0.13	0.10	-	-	1	-
0.1	0.73	0.43	0.30	0.23	0.17	0.14	0.10	-	2	-
0.125	0.91	0.54	0.38	0.28	0.22	0.17	0.13	-	4	-
0.15	1.09	0.65	0.45	0.34	0.26	0.21	0.15	0.10	5	-
0.175	1.28	0.76	0.53	0.39	0.31	0.24	0.18	0.11	7	-
0.2	1.46	0.87	0.60	0.45	0.35	0.27	0.20	0.13	10	-
0.225	1.64	0.97	0.68	0.51	0.39	0.31	0.28	0.15	13	20
0.25	1.82	1.08	0.75	0.56	0.44	0.34	0.25	0.16	16	21
0.275	2.00	1.19	0.83	0.62	0.48	0.38	0.28	0.18	19	23
0.3	2.19	1.30	0.90	0.68	0.52	0.41	0.30	0.20	23	24
0.325	2.37	1.41	0.98	0.73	0.57	0.45	0.33	0.21	25	27
0.35	2.55	1.51	1.05	0.79	0.61	0.48	0.35	0.23	35	29
0.375	2.73	1.62	1.13	0.85	0.65	0.51	0.38	0.24	40	31
0.4	2.91	1.73	1.20	0.90	0.70	0.55	0.40	0.26	44	32
0.425	3.10	1.84	1.28	0.96	0.74	0.58	0.43	0.28	50	33
0.45	3.28	1.95	1.35	1.01	0.78	0.62	0.45	0.29	55	34
0.475	3.46	2.06	1.43	1.07	0.83	0.65	0.48	0.31	61	35
0.5	3.64	2.16	1.51	1.13	0.87	0.69	0.50	0.32	70	38
0.525	3.82	2.27	1.58	1.18	0.92	0.72	0.53	0.34	78	38
0.55	4.01	2.38	1.66	1.24	0.96	0.75	0.55	0.36	84	39
0.575	4.18	2.49	1.73	1.30	1.00	0.79	0.58	0.37	90	41

Drum Louvre Size 5

Vol	Throw in metres										S.P.	Sound
in	3	6	9	12	15	18	21	24	30	36		
m3/s	Residual Velocity (m/s)										(Pa)	(dBA)
0.1	0.62	0.35	0.24	0.18	0.14	0.11	-	-	-	-	2	-
0.15	0.92	0.52	0.36	0.27	0.21	0.17	0.12	-	-	-	4	-
0.2	1.23	0.70	0.49	0.37	0.28	0.22	0.16	0.11	-	-	7	22
0.25	1.54	0.87	0.61	0.46	0.35	0.28	0.20	0.13	-	-	10	24
0.3	1.85	1.04	0.73	0.55	0.43	0.33	0.24	0.16	-	-	14	26
0.35	2.15	1.22	0.85	0.64	0.50	0.39	0.29	0.18	-	-	18	28
0.4	2.46	1.39	0.97	0.73	0.57	0.45	0.33	0.21	-	-	23	29
0.45	2.77	1.57	1.09	0.82	0.64	0.50	0.37	0.23	-	-	29	31
0.5	3.08	1.74	1.21	0.91	0.71	0.56	0.41	0.26	-	-	35	32
0.55	3.38	1.91	1.33	1.00	0.78	0.61	0.45	0.29	-	-	43	34
0.6	3.69	2.09	1.45	1.09	0.85	0.67	0.49	0.31	-	-	50	35
0.65	3.99	2.26	1.58	1.19	0.92	0.72	0.53	0.34	-	-	56	37
0.7	4.31	2.44	1.70	1.28	0.99	0.78	0.57	0.37	-	-	64	38
0.75	4.62	2.61	1.82	1.37	1.06	0.83	0.61	0.39	0.10	-	73	39
0.8	4.92	2.79	1.94	1.46	1.13	0.89	0.65	0.42	0.10	-	81	40
0.85	5.23	2.96	2.06	1.55	1.20	0.95	0.69	0.44	0.11	-	90	41
0.9	5.54	3.13	2.18	1.64	1.28	1.00	0.73	0.47	0.11	-	100	42
0.95	5.85	3.31	2.31	1.74	1.35	1.06	0.77	0.49	0.12	-	112	43
1	6.15	3.48	2.43	1.83	1.42	1.11	0.81	0.52	0.13	-	120	44

Drum Louvre Size 6

Vol in m3/s	Throw in metres 3	6	9	12	15	18	21	24	30	36	S.P. (Pa)	Sound (dBA)
	Residual Velocity (m/s)											
0.15	0.80	0.47	0.33	0.25	0.19	0.15	0.11	-	-	-	3	-
0.2	1.07	0.63	0.44	0.33	0.26	0.20	0.15	0.10	-	-	5	-
0.25	1.34	0.78	0.55	0.41	0.32	0.25	0.18	0.12	-	-	7	-
0.3	1.61	0.94	0.66	0.49	0.38	0.30	0.22	0.14	-	-	10	20
0.35	1.88	1.10	0.77	0.58	0.45	0.35	0.26	0.17	-	-	13	23
0.4	2.14	1.25	0.87	0.66	0.51	0.40	0.29	0.19	-	-	16	25
0.45	2.41	1.41	0.98	0.74	0.57	0.45	0.33	0.21	-	-	20	27
0.5	2.68	1.57	1.09	0.82	0.64	0.50	0.37	0.24	-	-	25	28
0.55	2.95	1.72	1.20	0.90	0.70	0.55	0.40	0.26	-	-	29	31
0.6	3.21	1.88	1.31	0.98	0.76	0.60	0.44	0.28	-	-	33	32
0.65	3.48	2.03	1.42	1.07	0.83	0.65	0.48	0.31	-	-	38	33
0.7	3.75	2.19	1.53	1.15	0.89	0.70	0.51	0.33	-	-	44	34
0.75	4.02	2.35	1.64	1.23	0.96	0.75	0.55	0.35	-	-	50	36
0.8	4.29	2.51	1.75	1.31	1.02	0.80	0.59	0.38	-	-	56	37
0.85	4.55	2.66	1.86	1.40	1.08	0.85	0.62	0.40	0.10	-	63	38
0.9	4.82	2.82	1.97	1.48	1.15	0.90	0.66	0.42	0.11	-	70	39
0.95	5.09	2.98	2.08	1.56	1.21	0.95	0.69	0.45	0.11	-	75	39
1	5.36	3.13	2.19	1.64	1.27	1.00	0.73	0.47	0.12	-	84	43
1.05	5.63	3.29	2.30	1.72	1.34	1.05	0.77	0.49	0.12	-	92	45
1.1	5.89	3.45	2.40	1.81	1.40	1.10	0.80	0.52	0.13	-	100	47
1.15	6.16	3.60	2.51	1.89	1.46	1.15	0.84	0.54	0.13	-	110	48
1.2	6.43	3.76	2.62	1.97	1.53	1.20	0.88	0.56	0.14	-	121	49
1.25	6.70	3.91	2.73	2.05	1.59	1.25	0.91	0.58	0.14	-	130	50
1.3	6.96	4.07	2.84	2.13	1.65	1.30	0.95	0.61	0.15	-	141	51

Drum Louvre Size 7

Vol in m3/s	Throw in metres 3	6	9	12	15	18	21	24	30	36	S.P. (Pa)	Sound (dBA)
	Residual Velocity (m/s)											
0.15	0.70	0.43	0.30	0.23	0.18	0.14	0.10	-	-	-	2	-
0.2	0.94	0.58	0.40	0.30	0.23	0.18	0.14	-	-	-	3	-
0.25	1.17	0.72	0.50	0.38	0.29	0.23	0.17	0.11	-	-	5	-
0.3	1.41	0.86	0.60	0.45	0.35	0.28	0.20	0.13	-	-	7	21
0.35	1.64	1.00	0.70	0.53	0.41	0.32	0.24	0.15	-	-	9	22
0.4	1.87	1.15	0.80	0.60	0.47	0.37	0.27	0.18	-	-	11	24
0.45	2.11	1.29	0.90	0.68	0.53	0.41	0.30	0.20	-	-	14	26
0.5	2.34	1.44	1.00	0.75	0.58	0.46	0.34	0.22	-	-	18	27
0.55	2.58	1.58	1.11	0.83	0.64	0.51	0.37	0.24	-	-	21	28
0.6	2.81	1.72	1.21	0.91	0.70	0.55	0.41	0.26	-	-	25	29
0.65	3.04	1.87	1.31	0.98	0.76	0.60	0.44	0.28	-	-	28	31
0.7	3.28	2.01	1.41	1.06	0.82	0.64	0.47	0.31	-	-	33	32
0.75	3.51	2.15	1.51	1.13	0.88	0.69	0.51	0.33	-	-	38	34
0.8	3.75	2.30	1.61	1.21	0.94	0.74	0.54	0.35	-	-	42	35
0.85	3.98	2.44	1.71	1.28	0.99	0.78	0.57	0.37	-	-	47	36
0.9	4.22	2.59	1.81	1.36	1.05	0.83	0.61	0.39	0.10	-	52	37
0.95	4.45	2.73	1.91	1.43	1.11	0.87	0.64	0.41	0.11	-	58	38
1	4.69	2.87	2.01	1.51	1.17	0.92	0.67	0.43	0.11	-	63	38
1.05	4.92	3.02	2.11	1.58	1.23	0.96	0.71	0.46	0.12	-	69	39
1.1	5.15	3.16	2.21	1.66	1.29	1.01	0.74	0.48	0.12	-	75	40
1.15	5.39	3.30	2.31	1.74	1.34	1.06	0.77	0.50	0.13	-	72	41
1.2	5.62	3.45	2.41	1.81	1.40	1.10	0.81	0.52	0.13	-	80	42
1.25	5.86	3.59	2.51	1.89	1.46	1.15	0.84	0.54	0.14	-	85	43
1.3	6.09	3.73	2.61	1.96	1.52	1.19	0.87	0.56	0.14	-	93	44
1.35	6.32	3.88	2.71	2.04	1.58	1.24	0.91	0.58	0.15	-	105	45
1.4	6.56	4.02	2.81	2.11	1.64	1.28	0.94	0.61	0.15	-	117	46
1.45	6.79	4.16	2.91	2.19	1.69	1.33	0.97	0.63	0.16	-	120	47
1.5	7.03	4.31	3.01	2.26	1.75	1.38	1.01	0.65	0.16	-	130	47
1.55	7.26	4.45	3.12	2.34	1.81	1.42	1.04	0.67	0.17	-	135	48
1.6	7.5	4.59	3.22	2.41	1.87	1.47	1.08	0.69	0.17	-	150	49
1.65	7.73	4.74	3.32	2.49	1.93	1.51	1.11	0.71	0.18	-	160	49

SERIES DL

Drum Louvres

Drum Louvre Size 8

Vol in m3/s	Throw in metres: 3	6	9	12	15	18	21	24	30	36	S.P. (Pa)	Sound (dBA)
	Residual Velocity (m/s)											
0.200	0.82	0.53	0.38	0.28	0.22	0.17	0.13	-	-	-	2	-
0.250	1.03	0.66	0.47	0.35	0.27	0.22	0.16	0.10	-	-	3	-
0.300	1.23	0.80	0.56	0.42	0.33	0.26	0.19	0.12	-	-	4	20
0.350	1.44	0.93	0.66	0.49	0.38	0.30	0.22	0.14	-	-	5	22
0.400	1.64	1.06	0.75	0.56	0.44	0.34	0.25	0.16	-	-	7	23
0.450	1.85	1.20	0.84	0.63	0.49	0.39	0.28	0.18	0.10	-	9	25
0.500	2.05	1.33	0.94	0.70	0.54	0.43	0.32	0.21	0.11	-	11	26
0.550	2.26	1.46	1.03	0.77	0.60	0.47	0.35	0.23	0.12	-	13	26
0.600	2.47	1.59	1.12	0.84	0.65	0.51	0.38	0.25	0.13	-	16	27
0.650	2.67	1.73	1.22	0.91	0.71	0.56	0.41	0.27	0.15	-	19	29
0.700	2.88	1.86	1.31	0.98	0.76	0.60	0.44	0.29	0.16	-	22	30
0.750	3.08	1.99	1.41	1.06	0.82	0.64	0.47	0.31	0.17	-	25	31
0.800	3.29	2.13	1.50	1.13	0.87	0.69	0.50	0.33	0.18	-	28	32
0.850	3.49	2.26	1.59	1.20	0.93	0.73	0.54	0.35	0.19	-	33	33
0.900	3.69	2.39	1.69	1.27	0.98	0.77	0.57	0.37	0.20	0.10	36	34
0.950	3.90	2.52	1.78	1.34	1.03	0.81	0.60	0.39	0.21	0.10	38	35
1.000	4.11	2.66	1.87	1.41	1.09	0.86	0.63	0.41	0.22	0.11	44	36
1.050	4.31	2.79	1.96	1.48	1.14	0.90	0.66	0.43	0.23	0.11	48	36
1.100	4.52	2.92	2.06	1.55	1.20	0.94	0.69	0.45	0.25	0.12	53	37
1.150	4.73	3.05	2.15	1.62	1.25	0.98	0.72	0.47	0.26	0.12	59	38
1.200	4.93	3.19	2.25	1.69	1.31	1.03	0.75	0.49	0.27	0.13	62	39
1.250	5.14	3.32	2.34	1.76	1.36	1.07	0.79	0.51	0.28	0.13	68	40
1.300	5.34	3.45	2.44	1.83	1.41	1.11	0.82	0.53	0.29	0.13	73	41
1.350	5.55	3.59	2.53	1.90	1.47	1.15	0.85	0.55	0.30	0.14	79	42
1.400	5.75	3.72	2.62	1.97	1.52	1.20	0.88	0.57	0.31	0.14	86	43
1.450	5.96	3.85	2.72	2.04	1.58	1.24	0.91	0.59	0.32	0.15	92	43
1.500	6.16	3.98	2.81	2.11	1.63	1.28	0.94	0.61	0.33	0.15	98	44
1.550	6.37	4.12	2.90	2.18	1.69	1.32	0.97	0.63	0.34	0.16	104	45
1.600	6.57	4.25	3.00	2.25	1.74	1.37	1.00	0.65	0.35	0.16	108	45
1.650	6.78	4.38	3.09	2.32	1.79	1.41	1.04	0.67	0.36	0.17	115	46
1.700	6.98	4.51	3.18	2.39	1.85	1.45	1.07	0.69	0.38	0.17	125	47
1.750	7.19	4.64	3.28	2.46	1.90	1.50	1.10	0.71	0.39	0.18	132	48
1.800	7.40	4.78	3.37	2.53	1.96	1.54	1.13	0.73	0.40	0.18	140	49
1.850	7.60	4.91	3.46	2.60	2.01	1.58	1.16	0.75	0.41	0.19	145	50
1.900	7.80	5.04	3.56	2.67	2.07	1.62	1.19	0.77	0.42	0.19	155	51
1.950	8.01	5.18	3.65	2.74	2.12	1.66	1.22	0.79	0.43	0.20	165	52
2.000	8.22	5.31	3.74	2.81	2.17	1.71	1.26	0.81	0.44	0.20	172	52

Drum Louvre Rise & Fall Charts

UNIT SIZE 1

VOLUME m^3/s	TEMP DIFF °C	THROW METRES	3	6	9	12	15	18	21
0.025	5 10 15 20	RISE OR FALL mm	2360 5680 8800						
0.05	5 10 15 20	RISE OR FALL mm	320 840 1550 2500	2970 7650					
0.075	5 10 15 20	RISE OR FALL mm	130 340 540 810	1100 2620 4500 6800	3980 8300	8260			
0.1	5 10 15 20	RISE OR FALL mm	90 150 310 400	540 1410 2220 3080	1920 4540 7690	4560	7720		
0.125	5 10 15 20	RISE OR FALL mm	60 120 120 180	390 570 1200 1500	1200 2400 3900 5100	3000 5400	5400	9000	
0.15	5 10 15 20	RISE OR FALL mm	30 90 120 150	300 600 900 1200	900 1800 3000 4200	2400 4200 6600	4500 6900	6900	
0.175	5 10 15 20	RISE OR FALL mm	30 60 90 120	210 450 600 900	750 1200 2700 3000	1800 3000 5100 6300	3300 5400	5700 8100	8700
0.2	5 10 15 20	RISE OR FALL mm	30 60 60 90	150 300 450 600	510 750 1800 2100	1200 2250 3600 5100	2400 3900 6600	4200 6600	5700 9300
0.225	5 10 15 20	RISE OR FALL mm	0 30 60 60	120 270 300 540	420 810 1410 1710	1050 1800 3000 3900	1950 3300 5400 7200	3600 5700 9300	5400 7800
0.25	5 10 15 20	RISE OR FALL mm	0 30 30 60	90 210 300 450	330 690 1050 1350	810 1500 2550 3300	1560 2700 4800 5700	2700 5400 7500 9200	4500 6600
0.275	5 10 15 20	RISE OR FALL mm	0 30 30 30	90 150 180 300	270 540 810 1080	660 1200 2100 2550	1260 2250 3900 5100	2160 3900 6000 8100	3600 5400 9300

UNIT SIZE 2

VOLUME m^3/s	TEMP Diff °C	THROW METRES	3	6	9	12	15	18	21
0.075	5 10 15 20	RISE OR FALL mm	300 550 1050 1560	1950 5130 8030	7050				
0.1	5 10 15 20	RISE OR FALL mm	130 320 540 770	1000 2450 4000 6420	3250 7800	7550			
0.125	5 10 15 20	RISE OR FALL mm	110 210 300 420	530 1300 2200 3070	1870 4770 7710	4700	7850		
0.15	5 10 15 20	RISE OR FALL mm	90 180 220 320	330 800 1300 2100	580 2790 4880 7050	2870 7050	5600	8300	
0.175	5 10 15 20	RISE OR FALL mm	110 170 210	300 550 1050 1300	850 1960 3100 4900	1800 4600 7650	3450 8470	6050	
0.2	5 10 15 20	RISE OR FALL mm	30 90 120 150	300 600 900 1200	990 1890 3000 3900	2400 4500 6300	4500	7200	
0.225	5 10 15 20	RISE OR FALL mm	30 60 90 120	210 450 750 900	780 1560 2340 3000	1800 3600 5400 6600	3600 6300	5700	8700
0.25	5 10 15 20	RISE OR FALL mm	30 60 60 90	180 450 600 750	630 1200 1920 2520	1500 3000 4200 5400	2850 5400 7500	4800 8400	7200
0.275	5 10 15 20	RISE OR FALL mm	0 30 60 90	150 300 450 600	510 1050 1500 2100	1200 2400 3600 4800	2400 4800 6300	3900 7500	6000
0.3	5 10 15 20	RISE OR FALL mm	0 30 60 60	120 270 450 600	600 900 1290 1650	990 1650 2760 3900	1920 3900 5400 6900	3300 6000 8700	5400 6300
0.325	5 10 15 20	RISE OR FALL mm	0 30 30 60	120 210 330 420	360 750 1110 1410	840 1800 2550 3600	1650 3300 4800 6000	3000 5700 7800	4500 8400
0.35	5 10 15 20	RISE OR FALL mm	0 30 30 30	90 180 270 330	330 510 960 1260	750 1500 2220 2940	1440 3000 4200 5700	2250 5100 6600 9000	3900 7500 9900
0.375	5 10 15 20	RISE OR FALL mm	0 0 30 30	60 150 210 300	240 510 750 990	570 1200 1710 2250	1110 2250 3300 4500	1950 3900 5700 7500	3000 6000 8400

Drum Louvre Rise & Fall Charts

UNIT SIZE 3

VOLUME m^3/s	TEMP DIFF °C	THROW METRES	3	6	9	12	15	18	21	24
0.075	5 10 15 20	RISE OR FALL mm	550 3500 5950 7800	4700	8850					
0.1	5 10 15 20	RISE OR FALL mm	320 1600 2780 4540	2160 7940	7570					
0.125	5 10 15 20	RISE OR FALL mm	140 770 1590 2140	1250 5730 7900	4350	7900				
0.150	5 10 15 20	RISE OR FALL mm	110 540 1030 1310	870 3700 6100 7690	2520 8300	6450	8450			
0.175	5 10 15 20	RISE OR FALL mm	90 310 530 770	510 2450 3880 6500	1680 7920 8800	4280	7700			
0.2	5 10 15 20	RISE OR FALL mm	60 120 150 210	390 780 1200 1650	1350 2700 4200 5400	3300 5400	5400	9300		
0.225	5 10 15 20	RISE OR FALL mm	60 90 150 180	360 720 1110 1500	1200 2400 3600 4800	2940 5400	5400	8400		
0.25	5 10 15 20	RISE OR FALL mm	30 90 120 150	330 690 990 1350	1110 2100 3300 4500	2700 4800 6600	4800 8100	7200		
0.275	5 10 15 20	RISE OR FALL mm	30 60 90 120	240 480 750 990	810 1650 2400 3300	1950 3600 5400	3900 6600	6000	9300	
0.3	5 10 15 20	RISE OR FALL mm	30 60 90 90	210 420 660 840	690 1410 2220 3000	1800 3300 5100 6000	3600 6000	5400 6200	8100	
0.35	5 10 15 20	RISE OR FALL mm	0 30 60 90	150 300 450 600	510 1020 1500 2040	1200 2280 3600 4500	2400 4500 6300	3900 6900	6000	
0.4	5 10 15 20	RISE OR FALL mm	0 0 30 60	90 180 270 360	300 630 900 1200	720 1380 2160 2850	1410 2820 4200 5400	2460 4800 6900 8400	3900 6900	
0.45	5 10 15 20	RISE OR FALL mm	0 0 30 30	60 150 210 300	240 510 750 960	570 1200 1680 2280	1170 2280 3600 4800	1980 2900 5700 7500	3300 5700 8400	
0.55	5 10 15 20	RISE OR FALL mm		60 90 150 180	150 300 480 660	360 780 1200 1590	750 1530 2340 3060	1290 2700 4200 5100	2070 4200 6000 7800	3000 6000 8700

UNIT SIZE 4

VOLUME m^3/s	TEMP DIFF °C	THROW METRES	3	6	9	12	15	18	21	24
0.075	5 10 15 20	RISE OR FALL mm	1300 3440 5930 7880	8400						
0.125	5 10 15 20	RISE OR FALL mm	310 780 1600 2160	2150 5800 7950 8490	7450					
0.175	5 10 15 20	RISE OR FALL mm	130 320 520 780	1020 2170 4520 6280	3550 7500 8650	7400				
0.225	5 10 15 20	RISE OR FALL mm	110 200 320 540	520 1310 2100 3070	1850 4700 7650 8300	4100 7880	7460			
0.275	5 10 15 20	RISE OR FALL mm	80 120 200 310	280 760 1270 1850	930 2680 4320 6280	2440 6350 8150 8730	4800 8430	7600		
0.3	5 10 15 20	RISE OR FALL mm	60 90 150 180	390 750 1110 1500	1260 2400 3900 5100	3000 6000	5700	8400		
0.325	5 10 15 20	RISE OR FALL mm	60 90 120 180	330 660 1020 1380	1080 2160 3300 4200	2580 5100	5100	7500		
0.35	5 10 15 20	RISE OR FALL mm	30 60 90 120	270 450 750 1020	810 1650 2460 3300	1980 3900 6000	3900 6900	6000	9000	
0.375	5 10 15 20	RISE OR FALL mm	30 60 90 120	210 420 660 870	720 1410 2250 2790	1710 3300 5400 6300	3300 6000	5700 9600	8100	
0.425	5 10 15 20	RISE OR FALL mm	30 60 60 90	180 330 510 690	570 1110 1800 2400	1350 2700 3900 5400	2700 5100 7800 9600	4500 7800	6600	
0.475	5 10 15 20	RISE OR FALL mm	0 30 60 60	150 270 420 540	480 960 1410 1860	1110 2160 3300 4200	2250 4200 6300 7500	3600 6600	5700	
0.5	5 10 15 20	RISE OR FALL mm		120 210 330 420	360 720 1050 1410	840 930 1150 1470	1650 1680 2460 3300	2850 5700 8400	4500 7800	6000
0.55	5 10 15 20	RISE OR FALL mm		90 180 270 360	330 630 960 1260	750 1470 2250 3000	1440 2820 4500 5400	2520 4800 6900 8400	3600 6600	5900 9600
0.6	5 10 15 20	RISE OR FALL mm		90 180 240 330	270 540 840 1110	660 1290 1890 2460	1320 2160 3900 5100	2160 4200 6000 8100	3450 6000 9600	5100 8700

Drum Louvre Rise & Fall Charts

UNIT SIZE 5

VOLUME m^3/s	TEMP DIFF °C	THROW METRES	3	6	9	12	15	18	21	24	27
0.1	5	RISE	1310	7580							
	10	OR	3100								
	15	FALL	5100								
	20	mm	7600								
0.15	5	RISE	350	3080	8400						
	10	OR	1050	6980							
	15	FALL	1890	8290							
	20	mm	2620								
0.2	5	RISE	160	1300	4800	8300					
	10	OR	560	3560	8320						
	15	FALL	790	5920							
	20	mm	1300	7750							
0.25	5	RISE	120	810	2800	6750	8600				
	10	OR	340	2000	7100						
	15	FALL	450	3100	8310						
	20	mm	560	5100	8800						
0.3	5	RISE	80	550	1710	4080	7720	8800			
	10	OR	150	1330	4100	7800					
	15	FALL	290	1880	7210						
	20	mm	340	3100	7620						
0.35	5	RISE		340	1010	2600	5250	7930			
	10	OR	80	800	2750	6830	8480				
	15	FALL	170	1340	5000	8240					
	20	mm	350	1820	7200	8900					
0.4	5	RISE		280	840	1900	3800	6050			
	10	OR		550	1750	4650	8100				
	15	FALL	140	960	3410	7560					
	20	mm	220	1320	4650	8300					
0.475	5	RISE	30	220	720	1800	3300	6000	8700		
	10	OR	60	390	1380	3300	6300				
	15	FALL	60	600	2220	5400					
	20	mm	90	840	3000	6300					
0.55	5	RISE		150	510	1200	2400	4200	6300	9300	
	10	OR		270	960	2400	4800	8100			
	15	FALL		360	1470	3900	6900				
	20	mm		540	1950	4800	8700				
0.6	5	RISE		120	450	1080	2160	3600	5700	8400	
	10	OR		240	900	2190	4200	7200			
	15	FALL		450	1350	3300	6000				
	20	mm		510	1800	4200	8100				
0.65	5	RISE		120	360	900	1800	3300	5100	7200	
	10	OR		210	720	1800	3600	6000	9600		
	15	FALL		330	1110	2820	5400	9300			
	20	mm		450	1560	3300	6300				
0.75	5	RISE		90	300	720	1410	2400	3900	5700	
	10	OR		150	540	1410	2820	3600	7800		
	15	FALL		240	870	2100	4200	7200			
	20	mm		330	1200	2820	5700	8700			
0.85	5	RISE		60	240	570	1110	1920	3000	4500	
	10	OR		120	450	1110	2250	3900	6000	8700	
	15	FALL		180	690	1680	3300	5400	8400		
	20	mm		270	960	2220	4200	6900			
0.95	5	RISE			180	450	900	1530	2550	3600	5100
	10	OR			360	900	1800	3000	5100	6900	8700
	15	FALL			540	1350	2700	4800	7200		
	20	mm			750	1800	3300	6000	8700		

UNIT SIZE 6

VOLUME m^3/s	TEMP DIFF °C	THROW METRES	6	9	12	15	18	21	24	27	30
0.15	5	RISE	4920								
	10	OR	8300								
	15	FALL									
	20	mm									
0.2	5	RISE	2220	6650							
	10	OR	6050								
	15	FALL	7850								
	20	mm									
0.25	5	RISE	1320	4390	8280						
	10	OR	3000	7700							
	15	FALL	3400	8000							
	20	mm	7550								
0.3	5	RISE	800	2750	6500	8450					
	10	OR	3150	7900							
	15	FALL	3800	8480							
	20	mm	4700								
0.35	5	RISE	580	1900	4350	7550	9500				
	10	OR	1900	6000	8850						
	15	FALL	2300	7300							
	20	mm	3450	7800							
0.4	5	RISE	380	1200	2950	6000	8350				
	10	OR	890	3300	7150	9100					
	15	FALL	1650	5750	8400						
	20	mm	2100	7560							
0.45	5	RISE	330	1050	2150	4250	6800				
	10	OR	800	2400	5550	8150					
	15	FALL	1100	4100	8000						
	20	mm	1920	6300	8470						
0.5	5	RISE	240	810	1950	3900	6300	9900			
	10	OR	450	1650	3900	7500					
	15	FALL	690	2400	6000						
	20	mm	900	3300							
0.55	5	RISE	210	750	1800	3600	5700	8400			
	10	OR	420	1500	3600	6000					
	15	FALL	600	2100	5100						
	20	mm	810	3000	6000						
0.65	5	RISE	150	540	1320	2700	4500	6900			
	10	OR	330	1080	2700	5400	8400				
	15	FALL	480	1650	3900	7500					
	20	mm	630	2190	5400	9300					
0.75	5	RISE	120	420	1050	2100	3600	5700	7800		
	10	OR	240	810	2100	4200	6600				
	15	FALL	360	1260	3000	6000					
	20	mm	510	1800	4200	7800					
0.95	5	RISE		270	660	1260	2130	3300	5400	7200	9300
	10	OR		510	1260	2460	4500	6600	9900		
	15	FALL		750	1800	3600	6000	9600			
	20	mm		1050	2550	4800	8100				
1.1	5	RISE		210	510	1050	2100	3000	4350	6000	8100
	10	OR		420	1080	2160	3600	5400	8100		
	15	FALL		690	1620	3000	5400	8100			
	20	mm		870	2100	4200	6900				
1.2	5	RISE		150	360	750	1260	2040	3000	4350	6000
	10	OR		300	750	1500	2550	4200	6000	8100	
	15	FALL		450	1080	2160	3900	6000	8400		
	20	mm		600	1410	2850	5100	6600			
1.3	5	RISE		120	330	630	1080	1800	2700	3900	5250
	10	OR		270	630	1230	2220	3600	5400	7200	
	15	FALL		390	930	1830	3300	5400	7500		
	20	mm		540	1260	2550	4500	6600	9600		

Drum Louvre Rise & Fall Charts

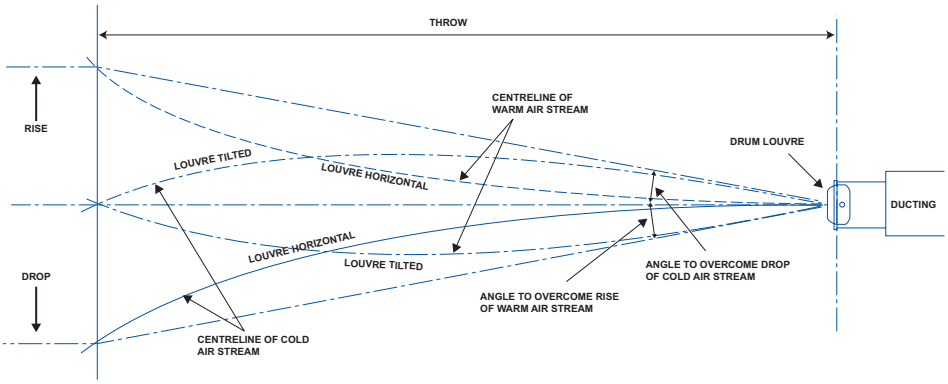
UNIT SIZE 7

VOLUME m³/s	TEMP DIFF °C	THROW METRES	6	9	12	15	18	21	24	27	30
0.15	5 10 15 20	RISE OR FALL mm	8600								
0.25	5 10 15 20	RISE OR FALL mm	2740 6700 8400	8040							
0.35	5 10 15 20	RISE OR FALL mm	1070 2700 4400 6000	3900 7850	7600						
0.45	5 10 15 20	RISE OR FALL mm	530 1550 2480 3750	1900 4700 7470 8200	4500	8000					
0.55	5 10 15 20	RISE OR FALL mm	300 800 1400 2050	1040 2800 4820 6800	2420 6320 8400	4800	7470				
0.65	5 10 15 20	RISE OR FALL mm	210 420 720 780	750 1470 2100 2880	1800 3600 5100 6000	3300 6300	5700	8100			
0.75	5 10 15 20	RISE OR FALL mm	150 300 420 570	480 1020 1500 2040	1200 2400 3600 4800	2400 4500 6900	4200 7500	6000	9000		
0.85	5 10 15 20	RISE OR FALL mm	120 240 360 480	420 840 1260 1710	1020 2040 3000 3900	1950 3900 5700 7500	3300 6300 9300	5400 9900	7500		
0.95	5 10 15 20	RISE OR FALL mm		330 660 990 1350	810 1560 2400 3300	1650 3000 4800 6000	2700 5400 7500	4500 8100	6000	8700	
1.1	5 10 15 20	RISE OR FALL mm		240 450 690 900	570 1080 1650 2220	1080 2160 3300 4200	2220 3900 5400 6900	3000 5700 8400	4500 8400	6000	8100
1.2	5 10 15 20	RISE OR FALL mm		210 390 600 780	480 960 1470 1920	960 1950 2940 3600	1650 3300 4800 6000	2640 5100 7500 9600	3900 7200	5700	7200
1.3	5 10 15 20	RISE OR FALL mm		150 330 480 660	420 780 1200 1560	810 1560 2400 3300	1350 2760 4200 5700	2160 4500 6300 8100	3300 6300 9300	4800 9000	6000
1.4	5 10 15 20	RISE OR FALL mm		150 300 450 600	360 720 1050 1410	690 1410 2100 3000	1260 2520 3600 5100	1980 3900 6000 7500	3000 5700 8100	4500 8100	5700
1.6	5 10 15 20	RISE OR FALL mm		90 180 300 390	240 480 750 990	480 960 1500 1920	840 1650 2580 3300	1350 2700 3900 5100	2040 4200 6000 7200	2850 5700 8100	4050 7500

UNIT SIZE 8

VOLUME m³/s	TEMP DIFF C	THROW METRES	6	9	12	15	18	21	24	27	30
0.25	5 10 15 20	RISE OR FALL mm	2600 6470 8480	7700							
0.35	5 10 15 20	RISE OR FALL mm	1050 2800 4850 7040	3700 7920	7750						
0.45	5 10 15 20	RISE OR FALL mm	570 1350 2590 3620	1900 4670 7600 8310	4400	7600					
0.55	5 10 15 20	RISE OR FALL mm	390 780 1350 2020	1150 2800 4720 6800	2450 6550 8350	5150	7600				
0.65	5 10 15 20	RISE OR FALL mm	235 560 1020 1350	895 1740 3210 3980	1720 4050 6670 8100	3560 7500 8620	5930				
0.75	5 10 15 20	RISE OR FALL mm	210 390 660 840	720 1410 2100 2850	1650 3300 5100 6300	3300 6300	5700	8400			
0.85	5 10 15 20	RISE OR FALL mm	180 300 450 600	540 1080 1590 2100	1350 2640 3900 5400	2550 5100 7200	4200 8100	6300	9600		
0.95	5 10 15 20	RISE OR FALL mm		450 900 1410 1800	1110 2250 3300 4500	2220 4500 6300 8100	3900 7200	6000	8400		
1.1	5 10 15 20	RISE OR FALL mm		300 600 900 1200	750 1500 2100 2700	1500 3000 4500 6000	2550 5400 7200 9300	4200 7800	6000	8100	
1.2	5 10 15 20	RISE OR FALL mm		240 510 660 1050	600 1260 1980 2550	1200 2460 3600 5100	2100 4500 6000 8100	3300 6600 9300	5100 9600	6900	9300
1.3	5 10 15 20	RISE OR FALL mm		240 450 690 900	540 1080 1650 2100	1050 2100 3300 4200	1800 3900 5700 6900	3000 6000 8400	4500 8700	6000	8100
1.4	5 10 15 20	RISE OR FALL mm		210 390 630 810	480 990 1500 2010	990 1980 3000 3900	1740 3300 5100 6000	2700 5100 7500 9300	3900 7200	5400	7200
1.6	5 10 15 20	RISE OR FALL mm		150 270 330 600	360 660 1050 1440	690 1350 2100 2880	1200 2400 3600 4500	1920 3900 5700 6900	2850 5700 8100 9900	3900 7800	5400
1.9	5 10 15 20	RISE OR FALL mm		120 210 330 450	270 480 810 1080	510 990 1650 2160	870 1710 2700 3300	1500 2820 4500 5700	2250 4500 6000 8100	3300 6000 8700	4200 8100

Angular Discharge Correction Chart

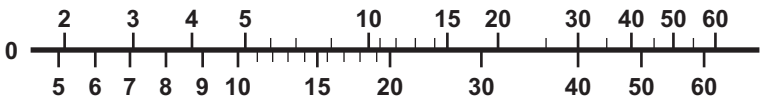


THROW (METRES)

RISE OR DROP (METRES)	3	6	9	12	15	18	21	24	27	30	36
0.03	1	1	1								
0.15	3	2	1	1							
0.30	6	3	2	1	1	1					
0.60	11	6	4	3	2	2	2				
1.20		11	8	6	5	4	3	3			
1.80		17	11	9	7	6	5	4	4		
2.40		22	15	11	9	8	7	6	5	5	
3.00		27	18	14	11	10	8	7	6	6	
4.50			27	21	17	14	12	11	9	9	7
6.00				27	22	18	16	15	12	12	10
7.20					27	23	20	17	16	14	12
9.15						27	23	21	18	17	14
10.66							27	24	21	19	16
12.20								27	24	22	18
13.72									27	25	21
15.24				CORRECTION IN DEGREES							23
16.77											25
18.30											27

Vane Adjustment

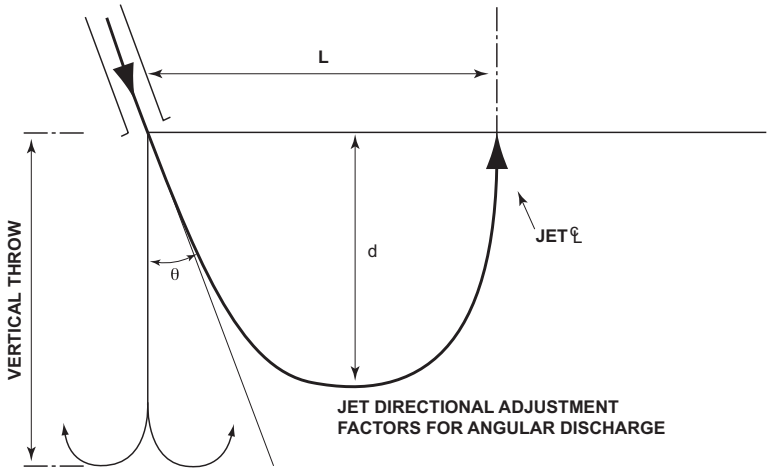
VERTICAL VANE ANGLE SETTING (DEGREES)



PERCENTAGE DECREASE IN THROW (%)

EXAMPLE: A 5˚ DEGREE CHANGE OF BLADE ANGLE CAUSES A 10% DECREASE IN THROW.

Correctional Figures for Angular Variance to Vertical Performance



Take Maximum Throw (T_M) from Tables

Hence, $d = K_1 T_M$

$L = K_2 T_M$

θ°	K_1	K_2
0 -10	1.00	0.00
11 -20	0.98	0.45
21 -30	0.91	0.86
31 -40	0.81	1.21
41 -50	0.67	1.28
51 -60	0.52	1.60
61 -70	0.35	1.59
71 -80	0.20	1.43
81 -90	0.07	1.07

VERTICAL THROW EXAMPLE (ISOTHERMAL CONDITIONS)

Select and size Drum Louvre from sizing charts on pages 6, 7, 8 and 9 in accordance with the first part of the selection procedure on page 2.

VERTICAL THROW (HEATING)

A requirement for 10°C heating is required at a volume of 0.4 M^3/s to throw vertically to floor level 10m away.
To select a Drum Louvre size we simply view our table on page 15.
Reviewing Δt = 10°C chart with a volume of 0.4 m^3/s gives a size 4 drum louvre selection to give a 10m throw to 0.1m/s terminal velocity. Therefore a size DL/4 unit should be selected.

VERTICAL THROW ANGULAR ADJUSTMENT (HEATING)

All previous data has assumed a direct vertical discharge, although we can calculate a throw pattern for an angular discharge using our table above.
Using the previous data of +10°C Δt and 0.4m^3/s we can calculate the new air path by using the listed formulas, assuming a 30° angle, by using the formula stated.

Discharge at 30° off set from vertical

$d = K_1 \times T_M$, d = 0.91 x 10m, d = 9.1m vertical

$L = K_2 \times T_M$, L = 0.86 x 10m, L = 8.6m horizontal

Drum Louvre

Vertical Performance Under Heating Conditions

(this data is for reference only with throws shown to 0.1m/s terminal velocity)

ΔT = 5°C

Q (m^3/s)	Maximum Throw (m) 2.5	5	7.5	10	15	20	25	30
0.05	3							
0.10	5	3	2	1				
0.15	8	4	3	2	1			
0.20		5	6	4	2	1		
0.30		8	7	5	4	2	1	
0.40			8	7	6	4	3	2
0.60				8	7	6	4	3
0.80					8	7	6	5
1.00						8	7	6
1.50	**DRUM LOUVRE SIZE**							8
2.00								
3.00								
4.00								

ΔT = 10°C

Q (m^3/s)	Maximum Throw (m) 2.5	5	7.5	10	15	20	25	30
0.05								
0.10	4							
0.15	6	3	2					
0.20	7	4	3	2				
0.30		6	5	3	2			
0.40		8	6	4	3	2		
0.60			8	6	5	4	3	2
0.80				8	6	5	4	3
1.00					8	6	5	4
1.50	**DRUM LOUVRE SIZE**					8	6	5
2.00							8	7
3.00								
4.00								

ΔT = 15°C

Q (m^3/s)	Maximum Throw (m) 2.5	5	7.5	10	15	20	25	30
0.05	1							
0.10	3	1						
0.15	5	2	1					
0.20	6	4	2	1				
0.30		5	4	3	1			
0.40		7	5	4	2	1		
0.60			7	5	4	3	2	1
0.80				7	5	4	3	2
1.00					7	5	4	3
1.50	**DRUM LOUVRE SIZE**					7	5	4
2.00							8	6
3.00								
4.00								

ΔT = 20°C

Q (m^3/s)	Maximum Throw (m) 2.5	5	7.5	10	15	20	25	30
0.05								
0.10	3							
0.15	4	1						
0.20	5	3	2	1				
0.30	8	4	3	2				
0.40		5	4	3	1			
0.60			6	4	3	2		
0.80			8	6	4	3	2	1
1.00				8	5	4	3	2
1.50	**DRUM LOUVRE SIZE**				8	6	5	4
2.00						8	6	5
3.00								
4.00								

ΔT = 30°C

Q (m^3/s)	Maximum Throw (m) 2.5	5	7.5	10	15	20	25	30
0.05								
0.10	2							
0.15	3	1						
0.20	4	2	1					
0.30	7	4	3	1				
0.40		5	4	3	1			
0.60		7	5	3	2			
0.80			7	5	4	3	2	1
1.00			8	6	5	4	3	2
1.50	**DRUM LOUVRE SIZE**				6	5	4	3
2.00					8	6	5	4
3.00							8	7
4.00								

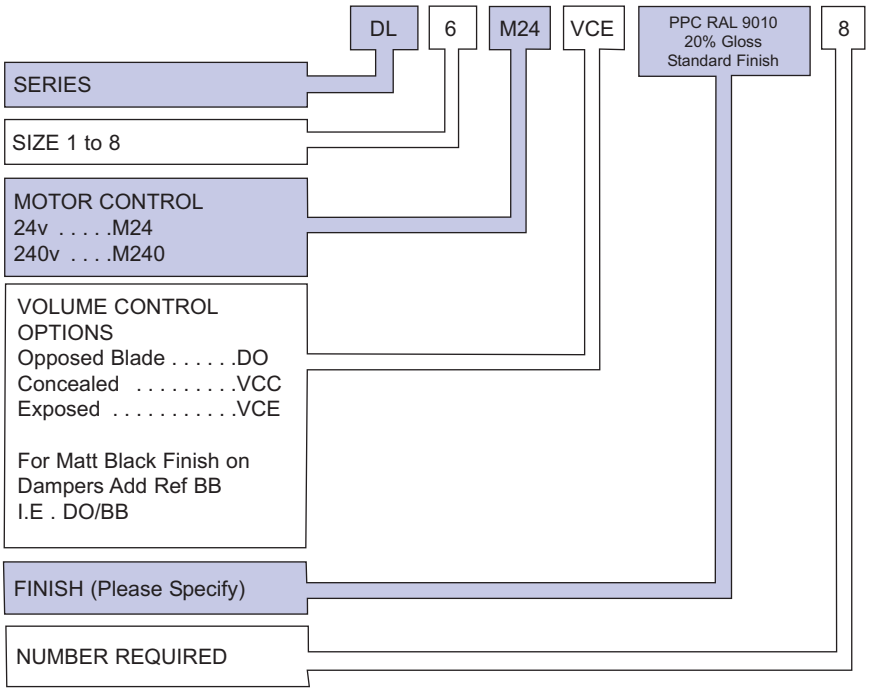
ΔT = 40°C

Q (m^3/s)	Maximum Throw (m) 2.5	5	7.5	10	15	20	25	30
0.05								
0.10	1							
0.15	2	1						
0.20	4	2						
0.30	5	3	2	1				
0.40		4	3	2				
0.60		6	4	3	2	1		
0.80		8	6	4	3	2		
1.00			7	5	4	3	2	1
1.50	**DRUM LOUVRE SIZE**			8	5	4	3	2
2.00					8	5	4	3
3.00						8	7	5
4.00								7

SERIES DL

Drum Louvres

Ordering Specification



Example : DL1 / M24 / DO / BB PPC RAL 9010 20% Gloss

Finish

Standard Finish: Polyester Powder Coat White RAL 9010 20% Gloss.
Special Finishes: PPC to Stock BS or RAL colour.

Fixing

Standard flange screw fixing using self tapping screws.

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