Publication	PART E
DIFFUSERS section 2	SEPT 2005

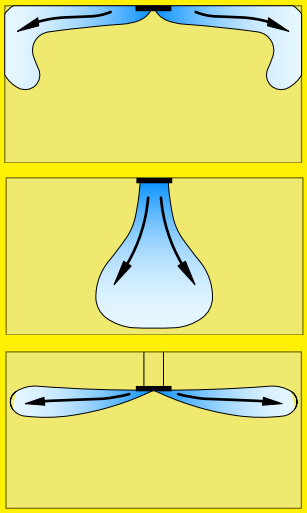
Air Diffusers

supply and exhaust ventilation systems

circular diffusers

Brooke Air®

introduction



The MRA range of circular diffusers are high air capacity terminals specifically designed to suit applications such as atria, auditoria or industrial premises.
The core position is adjustable on a central screw thread giving conventional horizontal diffusion with exposed duct or ceiling mounted installations, or a progressively adjustable vertical projection setting for spot cooling and heating applications.

The diffuser frames and cores are manufactured from aluminium spinnings and incorporate steel adjustment mechanisms and core retainers.

type

MRA

control

louvre dampers fitted to the diffuser neck LD.

NOTE: Louvre Dampers are not available for size 30 diffusers

finish

The standard diffuser finish is stove enamelled (SE) silver with matt black louvre dampers, but a wide range of paint finishes are also available in either BS or RAL colours. See **Part I** for details.

sizes

MRA diffusers are manufactured in ten standard duct sizes ranging from 150mm to 760mm.

installation

For ceiling mounted applications, the cores are easily removed to allow the diffuser neck to be rivetted or screw fixed to the stub duct.
When MRA/LD's are installed with flexible ducting, it is advisable to fit a suitable length of sleeve to prevent the damper blades catching the duct reinforcing wire.
Otherwise, ensure that there is adequate clearance throughout the blade travel. For ease of commissioning, the damper adjuster can be accessed through the centre cone of the diffuser.

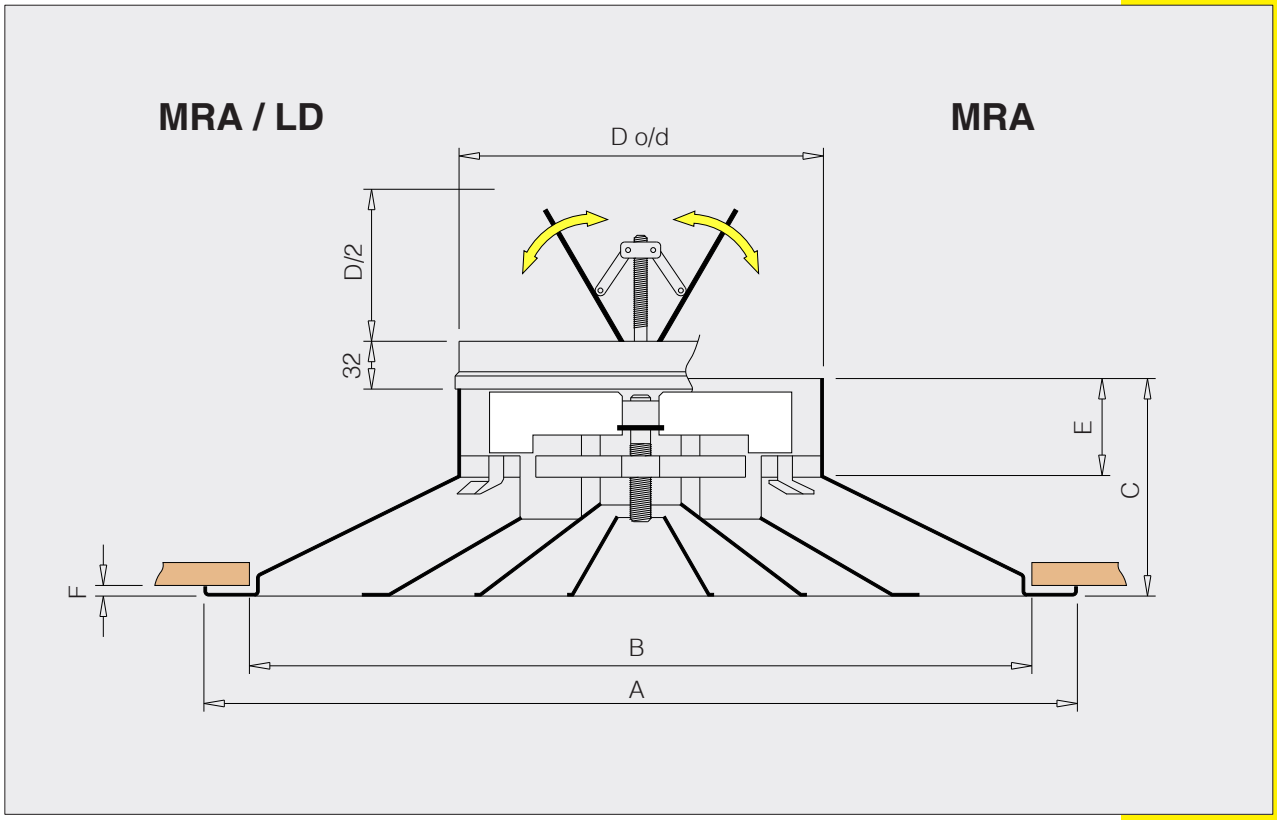
ordering details

EXAMPLE :

type	control	finish	size	quantity
MRA	/ LD	/ SE SILVER	/ 10	/ 5

SPECIFICATIONS

dimensions



	DIMENSIONS (mm)					
SIZE	**A**	**B**	**C**	**D**	**E**	**F**
6	340	325	110	152	60	5
8	457	427	127	203	60	5
10	569	528	146	254	60	5
12	680	630	155	305	60	6
15	851	782	172	381	60	6
18	1041	934	248	457	60	20
21	1148	1100	280	533	60	20
24	1170	1100	280	610	60	20
30	1420	1300	280	760	100	20

Circular diffusers

PERFORMANCE DATA

SIZE	SELECTION PARAMETER	NECK AIR VELOCITY (m/s)									
		3.0	3.5	4.0	4.5	5	5.5	6	7	8	10
6	AIRFLOW RATE (l/s)	54	63	73	81	91	100	109	127	145	181
	THROW (m) MIN - MAX	0.6 - 1.2	0.7 - 1.5	0.8 - 1.7	0.9 - 1.9	1.0 - 1.2	1.1 - 2.3	1.25 - 2.5	1.4 - 2.9	1.6 - 3.3	2.0 - 4.1
	PROJECTION (m)	3.6	4.0	4.3	4.5	4.7	5.0	5.2	5.7	6.1	6.7
	PRESSURE LOSS (Pa)	13	18	24	30	37	44	53	72	94	140
	NR LEVEL		16	21	24	28	31	34	40	44	51
8	AIRFLOW RATE (l/s)	97	114	130	146	162	179	202	224	256	320
	THROW (m) MIN - MAX	0.8 - 1.7	0.9 - 1.9	1.1 - 2.2	1.2 - 2.5	1.4 - 2.8	1.5 - 3.0	1.6 - 3.3	1.9 - 3.9	2.2 - 4.4	2.7 - 5.5
	PROJECTION (m)	4.7	5.2	5.5	6.0	6.2	6.5	6.7	7.3	7.9	8.8
	PRESSURE LOSS (Pa)	11	16	21	26	32	41	50	64	84	130
	NR LEVEL	17	21	25	28	31	35	37	41	44	51
10	AIRFLOW RATE (l/s)	152	177	203	228	252	279	304	355	405	507
	THROW (m) MIN - MAX	1.0 - 2.1	1.2 - 2.4	1.4 - 2.8	1.5 - 3.1	1.7 - 3.5	1.9 - 3.8	2.1 - 4.2	2.4 - 4.9	2.7 - 5.5	3.5 - 6.9
	PROJECTION (m)	5.8	6.4	6.8	7.3	7.7	8.1	8.5	9.2	10.4	11.4
	PRESSURE LOSS (Pa)	9	13	17	21	25	33	39	52	68	110
	NR LEVEL	16	22	26	30	33	36	39	44	48	55
12	AIRFLOW RATE (l/s)	219	255	292	328	366	401	438	511	585	731
	THROW (m) MIN - MAX	1.2 - 2.5	1.4 - 2.9	1.6 - 3.3	1.8 - 3.7	2.1 - 4.6	2.3 - 4.6	2.5 - 5.0	2.9 - 5.8	3.3 - 6.7	4.1 - 8.3
	PROJECTION (m)	6.9	7.6	8.2	8.8	9.5	10.4	11.4	12.1	12.8	14.2
	PRESSURE LOSS (Pa)	9	12	16	21	25	30	37	51	66	102
	NR LEVEL	18	23	27	31	35	38	41	46	50	57
15	AIRFLOW RATE (l/s)	342	399	456	513	570	627	680	798	912	1140
	THROW (m) MIN - MAX	1.2 - 2.5	1.8 - 3.6	2.1 - 4.2	2.3 - 4.7	2.6 - 5.2	2.8 - 5.7	3.1 - 6.2	3.6 - 7.3	4.1 - 8.3	5.2 - 10.4
	PROJECTION (m)	6.9	9.5	10.9	11.8	12.3	12.8	13.3	14.2	15.2	17.1
	PRESSURE LOSS (Pa)	9	10	13	16	20	24	28	39	51	80
	NR LEVEL	18	25	29	32	35	38	41	44	50	56
18	AIRFLOW RATE (l/s)	492	574	656	738	820	902	984	1148	1312	1640
	THROW (m) MIN - MAX	1.8 - 3.7	2.2 - 4.4	2.5 - 5.0	2.8 - 5.6	3.1 - 6.2	3.4 - 6.8	3.7 - 7.5	4.3 - 8.7	5.0 - 10.0	6.2 - 12.5
	PROJECTION (m)	10.9	11.9	12.8	13.3	14.2	14.7	15.7	17.1	18.0	20.4
	PRESSURE LOSS (Pa)	6	8	10	13	15	19	22	31	40	64
	NR LEVEL	20	25	29	33	36	39	42	47	51	58
21	AIRFLOW RATE (l/s)	672	784	896	1008	1120	1232	1344	1568	1792	2240
	THROW (m) MIN - MAX	2.2 - 4.4	2.5 - 5.1	2.9 - 5.8	3.2 - 6.5	3.6 - 7.3	4.0 - 8.0	4.3 - 8.7	5.2 - 10.2	5.8 - 11.6	7.3 - 14.6
	PROJECTION (m)	12.3	13.3	14.2	15.2	16.1	17.1	18.0	20.0	22.0	24.0
	PRESSURE LOSS (Pa)	4	6	7	9	11	14	16	23	30	46
	NR LEVEL	25	30	34	38	41	44	47	51	55	62
24	AIRFLOW RATE (l/s)	876	1022	1168	1314	1460	1606	1750	2045	2340	2920
	THROW (m) MIN - MAX	2.5 - 5.0	2.9 - 5.8	3.3 - 6.7	3.7 - 7.5	4.1 - 8.3	4.6 - 9.2	5.0 - 10.0	5.8 - 11.6	6.6 - 13.3	8.3 - 16.6
	PROJECTION (m)	13.3	14.7	15.7	17.1	18.0	19.0	20.4	22.0	24.0	28.0
	PRESSURE LOSS (Pa)	6	9	10	13	15	19	22	30	40	62
	NR LEVEL	28	32	36	39	43	45	48	52	56	63
30	AIRFLOW RATE (l/s)	1360	1588	1814	2041	2268	2495	2722	3175	3629	4536
	THROW (m) MIN - MAX	3.1 - 6.2	3.6 - 7.2	4.2 - 8.3	4.7 - 9.2	5.2 - 10.2	5.8 - 11.5	6.4 - 12.3	7.2 - 14.1	8.2 - 16.5	10.5 - 20.0
	PROJECTION (m)	16.7	18.5	20.0	21.0	22.5	24.0	26.0	28.0	31.0	34.0
	PRESSURE LOSS (Pa)	10	14	17	23	27	33	40	54	68	110
	NR LEVEL	30	35	38	42	45	48	51	55	59	65

BASIS OF DATA

throws

Maximum and minimum throws are based on jet terminal velocities (Vt) of 0.25 and 0.75m/s respectively and correspond to average room air velocities (Vr) of 0.1 and 0.25m/s with a ceiling jet at a height of 3m and an 11°C cooling differential.
Where the application height differs from this throw selections should be adjusted accordingly; that is increasing the throw by 1m for every 1m increase in height. For exposed duct applications the throws should be reduced by a factor of 0.7.

noise levels

Noise data is based on a flush core setting and is expressed in terms of NR level with a room absorption factor of 8db. Data should be corrected for other core settings as shown in the table opposite.

pressure loss

Pressure losses are given as duct static pressures with a flush core setting. Data should be corrected for other core settings as shown in the table opposite.

exhaust correction factors

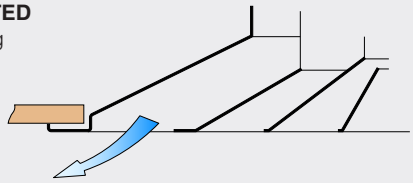
NR ADDITION	+3
PRESSURE LOSS FACTOR	1.2

projection

Projection data is based on a recessed core setting producing a vertical free jet at a heating differential of 10°C and a terminal velocity of 0.5m/s. Data should be corrected in accordance with the following table for other temperature differentials.

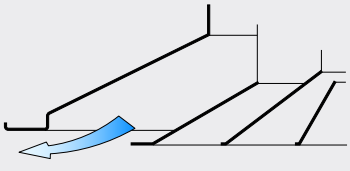
TEMPERATURE DIFFERENTIAL	-10	0	+10	+15	+20	+25
PROJECTION FACTOR	1.2	1.05	1.0	0.9	0.8	0.65

CEILING MOUNTED
Flush Core setting



Use Tabulated Data for Throws, Noise and Pressure Loss

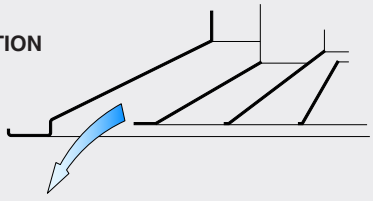
EXPOSED DUCT
Lowered Core setting



Correct Tabulated Data as follows:

Throw	x 0.7
Noise	- NR2
Pressure Loss	x 0.8

VERTICAL PROJECTION
Raised Core setting



Correct Tabulated Data as follows:

Noise	+ NR3
Pressure Loss	x 1.7

Diffuser programme literature

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