

CONTROL MODULE

TECHNICAL DOCUMENTATION



MR Mono - MR Modulo

THE CONSTANT AIRFLOW
SOLUTION, EASY TO INSTALL
AND ADJUST WITHOUT TOOLS

#HealthyLiving



MR Mono - MR Modulo



INTRODUCTION

- Aerodynamic disturbances within HVAC systems generate airflow variations.
- Managing to set real airflows as per those calculated in design stage, will ensure hygiene (ventilation) and thermal comfort (air conditioning) while limiting noise and optimizing fan or AHU operating costs.

RANGE

2 models:

- MR Mono - 1 code = 1 factory-set airflow,
- MR Modulo - 1 code = several airflow set point (8 references). 7 diameters (mm): 80, 100, 125, 150, 160, 200 and 250.

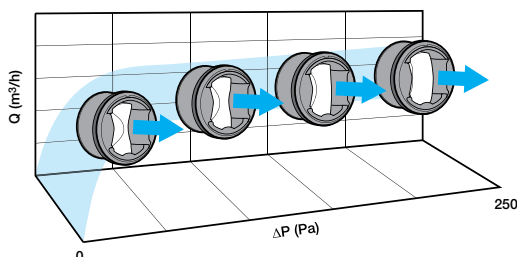
3 Pressure ranges:

- between 50 and 250 Pa for the standard MR Mono and the MR Modulo (except D80, D100 et D125 : 50-200 Pa),
- between 150 and 650 Pa for the MR High Pressure,
- between 80 and 250 Pa for the MR Modulo VMT (compliant with VMT technical approval).

PRINCIPLE OF OPERATION

- CARs (MR) purpose is airflow balancing in HVAC ductwork.
- It can be easily inserted into a portion of a circular duct network in order to regulate an accurate and constant airflow within a large differential pressure range.
- The membrane inflates or deflates depending on the pressure drop on both sides of the CAR, changing consequently the free air passage (see illustration below).

> This principle guarantees a constant airflow when the upstream/downstream differential pressure varies.



CONSTRUCTION AND MATERIAL

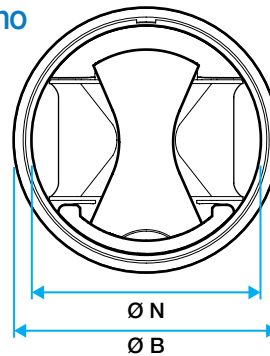
- ① Removable clips in PC / ABS plastic,
- ② Regulating silicon membrane,
- ③ Double-lip airtightness seal in elastomer,
- ④ Housing in PC / ABS plastic,
- ⑤ Rotating adjustment ring in PC / ABS plastic for airflow setting.

The following information is directly indicated on the product:

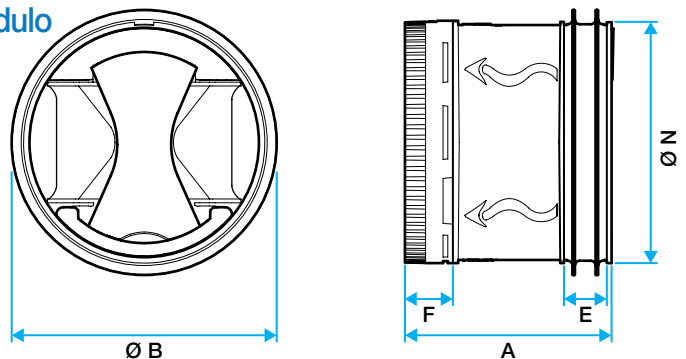
- Flow direction, diameter in mm and inch, operating differential pressure range, code, production traceability,
- MR Mono: factory airflow calibration (both in m³/h and cfm),
- MR Modulo: airflow setting range correlation table (both in m³/h and cfm).

DIMENSIONS - WEIGHT

MR Mono

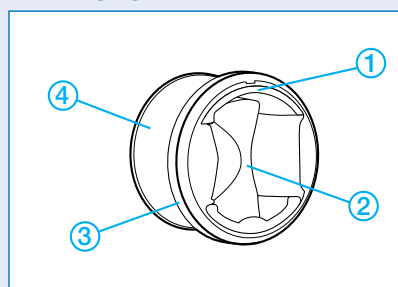


MR Modulo

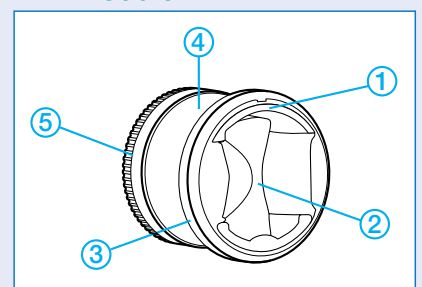


in mm				MR Mono			MR Modulo		
Duct Ø	ØN	ØB	E	F	A	Weight (kg)	F	A	Weight (kg)
80	76	85	14	3	53	0,06	15	65	0,08
100	92	105	14	4	61	0,10	13	70	0,12
125 15-90 m³/h	116	132	14	4	61	0,14	13	70	0,15
125 100-190 m³/h	116	132	14	4	97	0,20	17	110	0,17
150	147	153	14	4	103	0,30	19	118	0,37
160	153	167	14	4	103	0,30	19	118	0,37
200	190	210	20	7	128	0,60	23	144	0,59
250	238	262	20	5	159	1,06	26	180	1,02

MR Mono



MR Modulo



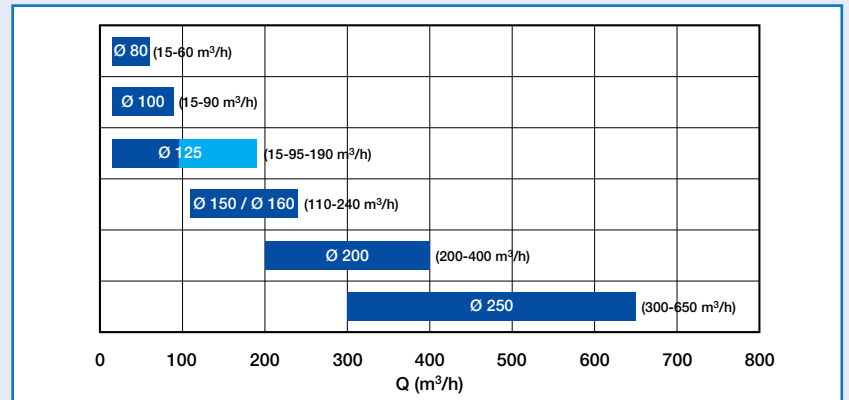
MR Mono - MR Modulo



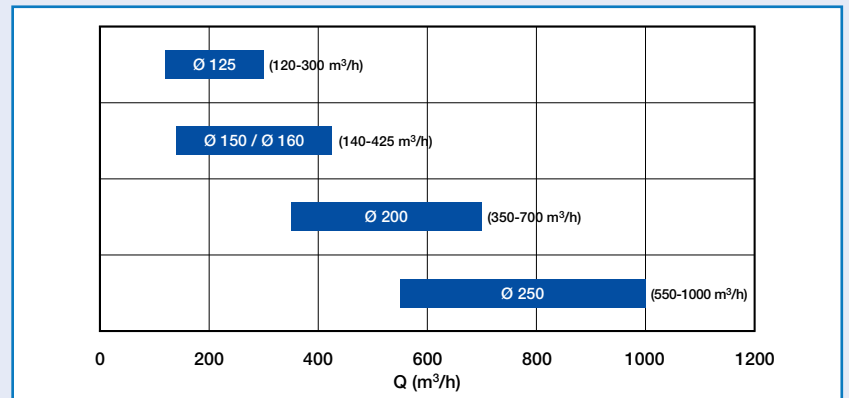
FIELD OF APPLICATION

- Maintaining airflows in ventilation or air conditioning ductworks.
- Use in air supply and air exhaust.
- Operating airflow range (see diagrams).
- Tolerance in airflow over operating range:
 - +/- 5 m³/h for an airflow ≤ 50 m³/h except VMT MR,
 - +/- 10 % for an airflow > 50 m³/h except MR Mono D80, D100 and D125 (+/-15%), MR Modulo D80, D100 and D125 (+/-10% maximum airflow) and MR VMT, 0 %/ +30 % for MR VMT D125 and -5 %/+20 % for the others MR VMT (to ensure compliance with technical approval).
- Pressions différentielles fonctionnelles :
 - MR Modulo and standard MR: range between 50 and 250 Pa, (except D80, D100 et D125: 50-200 Pa).
 - MR Mono High Pressure: range between 150 and 650 Pa,
 - MR Modulo VMT: range between 80 and 250 Pa.
- Temperature range of use: -10 to 60° C.
- Compliant with DIN EN 1506 (dimensions).

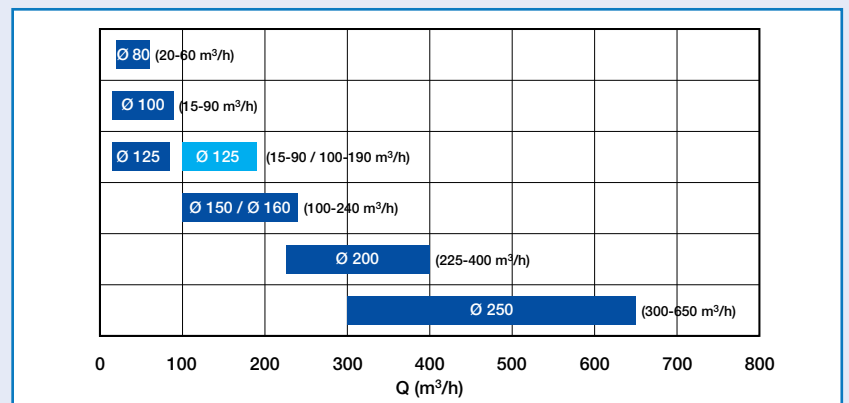
MR Mono Standard



MR Mono HP



MR Modulo Standard



MR Mono Standard

ACOUSTIC FEATURES

Sound power levels of noise (Lw) at duct output:

The following tables give the sound power levels of noise (Lw) expressed in decibels per octave (dB/oct) as well as the global sound power levels in dB(A) according to the pressure drop.

These sound power levels are results of tests carried out by a Dutch independent laboratory (PEUTZ) and are given at the duct outlet.

Measures were carried out in accordance with NF EN ISO 3741 and NF EN ISO 5135 norms, with a CAR fitted into a duct with an upstream and downstream straight length equal to 3 diameters.

Ø 80		Differential Pressure ΔP (Pa)																															
		50 Pa							100 Pa							150 Pa							200 Pa										
Airflow (m ³ /h)		125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))
		15		25	21	21	15	14	9	6	23	25	30	30	27	28	23	19	34	25	32	34	34	34	31	25	40	26	34	38	40	40	37
20		25	22	22	16	15	9	6	24	26	31	31	28	28	24	19	34	26	34	35	34	35	31	26	40	27	36	38	40	40	38	32	46
25		25	23	23	17	15	10	7	24	26	32	31	28	29	24	19	35	27	35	35	34	35	32	26	41	28	37	39	40	41	38	33	46
30		25	24	23	18	16	10	7	25	27	32	32	29	29	25	19	36	28	36	36	35	36	32	27	41	29	39	40	40	41	38	33	46
35		25	25	24	18	17	11	7	25	27	33	32	29	30	25	20	36	28	37	37	35	36	32	27	42	30	41	40	40	42	39	34	47
40		25	25	24	19	18	11	8	26	28	34	33	30	30	26	20	37	29	38	37	35	37	33	28	42	31	42	41	40	42	39	35	47
45		25	26	25	20	18	12	8	27	28	35	33	30	31	26	20	37	30	39	38	36	37	33	28	43	32	44	42	40	43	39	36	48
50		25	27	26	21	19	12	8	27	29	35	33	31	32	27	20	37	31	41	38	36	38	34	29	43	33	45	43	40	43	40	36	48
60		25	29	27	23	20	13	9	29	30	37	34	32	33	28	21	39	33	43	40	36	39	35	30	44	36	49	44	41	44	41	38	49

Ø100		Differential Pressure ΔP (Pa)																															
		50 Pa							100 Pa							150 Pa							200 Pa										
Airflow (m ³ /h)		125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))
		15		30	27	25	19	15	7	7	26	29	28	31	30	28	22	20	35	29	32	34	36	37	33	32	42	31	36	37	41	45	44
20		29	27	25	19	15	7	7	26	29	28	31	30	28	23	20	35	29	33	34	36	37	33	32	42	31	37	38	41	45	43	44	50
25		28	27	25	19	16	8	7	26	28	29	32	30	28	23	20	35	29	33	35	36	37	33	31	42	32	37	38	41	45	43	43	50
30		27	27	25	19	16	8	7	27	28	30	32	30	29	24	20	35	30	34	35	36	37	33	31	42	32	37	39	41	44	42	41	49
35		26	27	25	20	16	8	7	27	28	30	32	30	29	24	20	36	30	34	36	36	37	33	30	42	32	38	39	41	44	42	40	49
40		25	27	25	20	17	8	7	27	28	31	33	30	30	25	20	36	30	35	36	36	37	33	30	42	33	38	40	41	44	41	39	49
50		22	27	26	20	18	9	7	27	28	33	34	30	31	26	21	37	31	36	38	36	37	34	28	43	34	40	42	41	43	41	35	48
55		23	27	26	20	17	9	7	27	28	32	33	30	31	26	20	37	31	36	37	36	37	34	29	43	34	39	41	41	43	41	36	48
60		22	27	26	20	18	9	7	27	28	34	34	30	32	27	21	38	31	37	39	36	37	34	28	43	34	40	43	41	43	41	34	48
65		23	28	26	21	19	10	8	28	29	34	34	31	32	27	21	38	32	38	39	36	38	34	28	43	35	41	43	42	43	41	34	48
70		25	28	26	21	19	10	9	28	29	35	35	31	32	27	20	38	33	39	39	37	38	35	27	43	36	42	43	42	43	41	34	49
75		26	29	26	22	20	11	10	28	30	36	35	31	33	28	20	38	34	40	40	37	38	35	27	44	37	43	44	42	43	41	34	49
85		29	30	27	23	22	13	13	30	32	38	35	32	33	29	20	39	36	42	40	37	39	35	27	44	39	46	45	42	44	41	34	49
90		31	30	27	24	22	13	14	30	33	39	36	32	34	29	19	40	37	43	41	37	39	36	27	45	40	47	45	42	44	41	34	50

Ø 125		Differential Pressure ΔP (Pa)																															
		50 Pa							100 Pa							150 Pa							200 Pa										
Airflow (m ³ /h)		125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))
		15		24	30	27	20	15	6	13	28	27	33	36	33	31	24	21	38	29	34	38	37	35	30	29	42	31	34	40	40	39	36
25		25	30	28	21	16	7	14	28	28	33	35	33	31	24	21	38	30	34	38	37	35	30	28	42	31	35	40	40	39	37	35	46
30		25	30	28	21	16	8	14	28	28	33	35	33	31	24	21	38	30	34	38	37	35	31	28	42	32	35	40	40	39	37	34	46
45		26	31	28	23	17	9	14	29	29	33	35	33	32	23	20	38	31	35	38	37	36	31	27	42	33	37	41	40	39	38	33	46
50		27	31	28	23	18	10	14	29	29	34	35	34	32	23	19	38	31	35	38	37	36	31	26	42	33	37	41	40	40	38	33	46
60		28	31	28	24	19	11	14	30	30	34	35	34	33	23	19	39	32	36	38	37	36	32	25	42	34	38	41	40	40	39	32	46
65		29	31	28	25	19	11	14	30	30	34	34	34	33	23	19	39	32	36	38	37	37	32	25	42	34	39	41	40	40	39	31	46
70		29	31	28	25	20	12	14	30	31	34	34	34	33	23	18	39	33	37	38	37	37	32	25	42	35	39	41	40	41	40	31	47
75		30	31	28	26	20	12	14	30	31	34	34	34	34	23	18	39	33	37	38	37	37	32	24	43	35	39	41	40	41	40	31	47
80		31	31	28	26	20	13	14	31	31	34	34	34	34	23	18	39	33	37	38	37	37	32	24	43	35	40	41	41	42	41	30	47
85		31	31	28	26	21	13	15	31	32	34	34	34	34	23	18	39	34	37	38	37	38	33	24	43	36	40	41	41	43	41	30	48
90		32	31	29	27	21	14	15	31	32	34	34	34	35	23	17	39	34	38	38	38	38	33	23	43	36	41	41	41	43	42	29	48
95		32	32	29	28	22	14	15	32	32	34	34	34	35	23	17	40	35	38	38	38	38	33	23	43	37	41	41	41	44	42	29	49

Ø 125		Differential Pressure ΔP (Pa)																															
		50 Pa								100 Pa								150 Pa								200 Pa							
		125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))
100	31	33	30	25	15	11	15	31	36	39	40	37	29	25	19	41	39	41	44	43	35	32	26	47	42	43	48	49	41	38	32	51	
110	32	33	30	26	16	12	15	31	38	40	40	37	30	26	20	41	41	43	45	43	36	33	27	47	45	45	49	49	42	39	33	52	
120	33	33	30	26	17	13	15	31	40	41	40	38	32	27	21	42	44	44	45	44	38	34	28	47	48	47	50	49	43	40	35	53	
130	34	33	30	27	18	14	16	32	42	41	40	38	33	28	22	42	47	46	45	44	39	35	29	48	51	49	50	50	44	41	36	53	
140	36	33	30	27	20	15	16	32	44	42	40	39	34	29	23	43	49	47	46	45	40	36	30	49	54	52	51	50	45	43	37	54	
150	37	33	30	28	21	16	17	32	47	43	40	40	36	30	24	44	52	49	46	45	41	37	32	50	57	54	51	51	47	44	39	55	
160	38	33	30	28	22	16	17	33	49	43	40	40	37	31	24	45	55	50	47	46	43	38	33	51	60	56	52	51	48	45	40	56	
190	42	34	31	29	25	19	19	35	56	46	40	43	41	33	27	48	63	55	48	49	46	41	36	54	69	63	54	54	51	48	44	61	

Ø 160		Differential Pressure ΔP (Pa)																															
		50 Pa								100 Pa								150 Pa								200 Pa							
		125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))
110	28	31	32	28	27	19	14	34	34	36	38	41	39	32	23	45	38	42	44	46	45	39	31	50	41	46	49	51	49	45	38	57	
120	29	30	31	28	26	18	14	34	35	37	39	40	38	31	22	44	39	42	44	46	44	38	30	50	43	47	49	50	49	44	38	56	
130	29	30	31	27	25	17	13	33	36	37	39	39	38	30	22	43	40	43	44	45	43	37	30	49	44	47	49	50	48	44	38	56	
140	29	30	30	26	23	15	13	32	36	38	39	38	37	30	22	43	41	43	45	44	42	37	30	49	46	48	50	49	47	43	38	56	
150	29	30	30	26	22	14	13	32	37	38	39	38	36	29	21	42	43	44	45	44	41	36	30	48	47	49	50	49	46	43	38	56	
160	29	30	29	25	21	12	13	31	38	39	39	37	35	28	21	42	44	44	45	43	41	35	30	48	49	49	50	49	46	42	38	57	
170	30	29	29	25	20	11	13	31	39	39	39	37	34	27	21	42	45	45	45	43	40	35	30	48	50	50	50	49	45	42	38	57	
180	30	29	28	24	19	10	13	31	39	40	39	36	33	26	20	41	46	46	45	43	39	34	30	48	52	50	51	49	44	41	39	58	
190	30	29	29	24	19	10	13	30	40	40	39	36	33	26	21	41	46	46	45	43	39	34	30	47	52	51	51	48	44	41	38	58	
200	30	30	29	24	19	10	13	30	40	40	40	36	33	26	21	41	47	46	46	43	39	34	29	48	52	51	51	48	44	41	37	58	
210	30	30	29	24	19	10	13	30	41	40	40	36	33	26	21	42	47	46	46	43	39	34	29	48	52	51	51	48	45	41	36	58	
240	30	31	29	24	18	10	14	30	42	41	40	37	33	26	21	42	48	46	46	42	40	34	28	48	53	51	51	47	45	41	35	59	

Ø 200		Differential Pressure ΔP (Pa)																															
		50 Pa								100 Pa								150 Pa								200 Pa							
		125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))
225	27	26	23	19	13	8	14	25	36	35	34	30	27	21	15	36	41	41	40	36	34	29	20	42	45	46	45	42	39	35	26	47	
250	29	28	25	21	16	10	15	27	38	37	35	33	29	23	16	37	42	42	41	38	36	30	22	43	47	47	46	43	41	37	27	48	
275	30	29	26	23	18	12	16	28	39	38	36	35	31	24	17	39	44	43	41	40	38	32	23	45	48	47	46	44	44	39	28	50	
300	32	31	27	25	20	14	16	30	41	40	37	38	32	26	18	41	46	44	42	42	40	33	24	46	51	48	47	46	46	40	30	51	
325	33	33	29	27	21	15	16	32	42	41	38	39	34	28	20	42	46	46	44	43	41	35	26	48	50	50	49	47	47	41	31	53	
350	35	34	30	29	23	17	17	33	44	43	39	40	35	29	23	44	47	47	45	44	42	36	27	49	50	51	51	48	48	42	32	54	
400	38	37	33	33	27	20	17	37	46	46	42	43	38	33	27	47	48	50	48	47	44	38	31	52	50	55	54	51	49	43	34	56	

Ø 250		Differential Pressure ΔP (Pa)																															
		50 Pa								100 Pa								150 Pa								200 Pa							
		125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))
300	34	30	24	17	19	12	13	28	47	41	36	36	32	26	20	41	53	47	42	33	37	34	27	45	60	51	48	32	41	40	34	50	
350	35	31	26	21	20	13	13	29	48	42	38	38	33	27	21	42	52	47	43	37	38	34	28	46	57	51	49	37	43	40	34	51	
400	36	32	28	25	21	13	13	31	48	43	39	40	34	28	21	43	51	47	45	41	40	35	28	48	54	52	50	43	45	41	34	52	
450	36	33	31	29	21	14	13	33	49	43	41	42	35	28	21	45	50	48	47	45	41	35	28	50	52	52	52	49	47	42	34	54	
500	37	34	33	35	22	14	13	37	49	44	43	44	35	29	22	47	49	48	49	50	43	36	28	53	49	53	55	55	50	42	34	58	
550	38	35	34	35	23	16	14	37	49	45	44	45	37	30	22	48	50	49	49	50	44	36	29	53	51	53	54	54	49	42	35	57	
650	40	36	36	36	26	18	14	39	48	46	46	47	40	32	22	50	50	50	50	50	44	37	30	53	53	53	54	53	48	41	36	57	

MR Modulo

ACOUSTIC FEATURES

Sound power levels of noise (Lw) at duct output:

The following tables give the sound power levels of noise (Lw) expressed in decibels per octave (dB/oct) as well as the global sound power levels in dB(A) according to the pressure drop.

These sound power levels are results of tests carried out by a Dutch independent laboratory (PEUTZ) and are given at the duct outlet.

Measures were carried out in accordance with NF EN ISO 3741 and NF EN ISO 5135 norms, with a CAR fitted into a duct with an upstream and downstream straight length equal to 3 diameters.

Ø 80		PDifferential Pressure ΔP (Pa)																															
		50 Pa								100 Pa								150 Pa								200 Pa							
Airflow (m³/h)		125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))
		15		19	25	24	18	21	7	6	26	19	29	30	28	32	22	18	36	25	35	36	36	43	34	22	45	31	40	42	43	53	48
20		19	25	24	19	21	8	7	26	20	30	31	29	32	23	18	36	26	35	36	36	42	34	23	45	31	41	42	43	52	47	27	55
25		20	25	24	19	21	8	7	27	21	30	31	29	32	23	19	36	27	36	37	36	42	34	24	45	32	41	42	43	51	46	29	54
30		20	25	24	20	21	8	8	27	22	31	31	29	32	24	19	37	28	37	37	36	42	34	25	45	33	42	42	42	50	45	31	53
35		20	25	24	20	21	9	8	27	23	32	32	30	33	25	19	37	29	37	37	36	41	35	26	44	33	42	42	42	49	45	33	52
40		20	26	24	21	21	9	8	27	24	32	32	30	33	25	20	37	30	38	37	36	41	35	27	44	34	43	42	42	48	44	34	51
45		20	26	24	21	21	10	9	27	26	33	32	30	33	26	20	37	30	38	37	36	40	35	28	44	35	44	42	42	47	44	36	51
50		21	26	24	21	21	10	9	27	27	33	33	31	33	27	20	38	31	39	38	36	40	35	30	44	36	44	42	41	46	43	38	50
60		21	26	25	22	21	12	10	28	29	34	34	31	33	29	21	39	33	40	38	36	39	36	32	44	37	45	42	41	44	43	41	50

Ø 100		Differential Pressure ΔP (Pa)																															
		50 Pa								100 Pa								150 Pa								200 Pa							
Airflow (m³/h)		125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))
		15		20	26	22	14	15	8	3	23	24	32	31	29	25	18	17	34	31	32	35	34	34	31	29	40	38	32	38	38	43	43
20		21	27	22	15	14	8	4	24	25	32	32	30	25	19	17	34	31	33	35	34	34	31	28	40	37	33	39	39	42	42	39	48
25		22	27	23	16	14	8	6	24	25	33	33	30	26	19	17	35	31	34	36	35	34	31	28	41	36	34	39	40	42	42	38	48
30		23	27	24	17	14	8	7	25	26	33	33	31	27	20	17	35	31	35	37	36	35	31	27	41	35	36	40	41	42	41	37	48
35		23	28	24	18	15	8	8	25	27	34	34	31	27	21	17	36	31	35	38	37	35	31	27	42	34	37	41	41	42	41	36	48
40		24	28	25	19	15	7	9	26	27	34	35	32	28	21	17	37	31	36	39	37	35	31	26	42	34	38	42	42	42	40	35	48
45		27	30	28	21	15	7	13	28	29	36	37	34	30	23	17	39	31	39	41	40	36	31	25	44	32	42	45	45	42	39	32	49
50		26	29	27	20	15	7	11	27	29	35	36	34	29	22	17	38	31	38	40	39	36	31	25	43	32	40	44	44	42	40	33	49
60		28	31	28	22	15	7	14	29	30	36	38	35	30	24	18	40	31	40	42	41	37	32	24	45	31	43	46	46	42	39	31	50
65		27	30	27	22	16	7	14	29	30	36	37	34	31	24	18	39	31	40	42	40	37	32	25	44	32	43	46	45	43	39	32	50
70		26	29	27	22	16	8	14	28	30	36	37	34	31	24	18	39	32	40	41	39	38	33	25	44	33	44	45	44	43	40	32	49
75		26	28	26	21	17	8	14	28	30	36	36	33	32	25	18	39	32	41	41	39	38	33	26	44	34	45	45	44	44	41	33	50
80		24	27	24	21	18	9	14	27	30	37	35	32	33	26	18	38	33	42	40	38	40	34	27	45	36	46	44	42	46	42	35	50
90		23	26	24	20	18	10	14	27	31	37	34	32	34	26	18	39	34	42	39	37	40	35	27	45	37	47	44	42	47	42	35	51

Ø 125		Differential Pressure ΔP (Pa)																															
		50 Pa								100 Pa								150 Pa								200 Pa							
Airflow (m³/h)		125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))
		15		32	23	22	19	16	4	2	24	29	29	28	28	33	15	15	36	31	31	32	31	36	26	24	39	33	32	35	34	47	37
25		32	25	23	20	17	5	5	26	31	31	30	29	33	17	15	36	33	33	34	33	36	28	24	40	35	35	38	37	45	37	32	47
30		32	26	24	21	17	6	6	26	32	32	31	30	32	18	15	37	34	34	36	34	36	28	24	41	35	36	39	38	43	37	32	47
35		33	29	26	22	19	8	10	28	34	35	35	32	32	21	16	38	36	38	39	37	37	30	24	43	37	41	44	42	42	37	31	48
40		33	30	27	23	19	9	12	29	35	36	36	33	32	22	17	38	36	39	41	38	37	30	24	44	38	42	45	44	42	38	31	49
50		34	32	28	24	20	11	15	30	36	38	38	34	32	24	17	40	38	42	43	40	38	32	24	46	39	45	49	46	43	38	30	51
60		34	33	29	24	20	12	16	31	37	39	39	35	32	25	17	40	39	43	45	41	38	32	24	46	40	46	50	48	44	38	30	52
65		34	34	30	25	21	13	18	32	38	40	40	35	32	26	18	41	39	44	46	42	39	33	24	47	41	48	52	49	45	38	30	53
70		34	35	31	25	21	14	19	32	39	42	41	36	32	27	18	42	40	46	47	44	39	33	24	48	42	49	53	50	46	39	29	54
75		35	36	31	26	22	14	20	33	39	43	43	37	32	29	18	43	41	47	49	45	39	34	24	49	42	51	55	52	47	39	29	56
80		35	37	32	27	22	15	22	34	40	44	44	37	32	30	19	44	42	48	50	46	40	34	24	50	43	52	56	53	48	39	29	57
85		35	38	33	27	23	16	23	35	41	45	45	38	32	31	19	45	42	49	51	47	40	35	24	51	44	54	58	54	48	39	29	59
90		36	39	34	28	23	17	25	36	42	46	46	39	33	32	19	46	43	51	53	48	40	36	24	53	45	55	60	56	49	39	28	60

Ø 125		Differiencial Pressure ΔP (Pa)																															
		50 Pa							100 Pa							150 Pa							200 Pa										
Airflow (m³/h)		125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))
		100		36	35	32	30	25	16	14	34	43	43	42	39	36	31	23	44	46	45	47	45	41	38	32	50	48	48	51	50	46	44
110		36	35	31	30	25	17	15	34	43	43	42	39	36	31	24	44	47	46	47	45	42	38	32	50	50	48	51	50	47	45	40	55
120		36	34	31	30	25	18	15	34	44	43	42	40	36	31	24	44	48	46	47	46	43	39	33	50	52	49	52	51	48	45	40	55
130		37	34	31	29	25	18	16	34	44	42	41	40	37	32	25	44	50	47	47	46	43	40	33	51	54	50	52	51	49	46	41	56
140		37	34	31	29	25	19	17	34	45	42	41	40	37	32	25	45	51	47	47	47	44	40	34	51	56	51	52	52	50	47	42	57
150		37	34	31	29	24	20	17	34	45	42	41	41	37	33	26	45	52	47	47	47	45	41	34	52	58	52	53	53	51	48	42	58
160		38	34	31	29	24	20	18	34	46	42	41	41	38	33	26	46	54	48	47	48	46	42	35	53	61	53	53	54	53	49	43	59
190		39	33	31	29	24	22	20	34	47	41	41	43	39	35	28	46	58	49	48	50	48	44	37	54	67	57	54	56	56	51	46	62

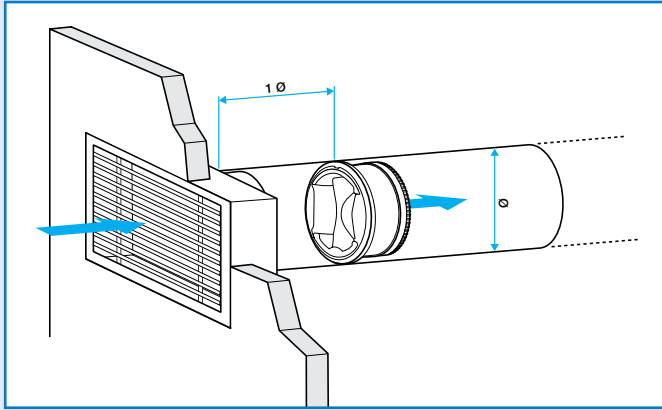
Ø 160		Differiencial Pressure ΔP (Pa)																															
		50 Pa							100 Pa							150 Pa							200 Pa										
Airflow (m³/h)		125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))
		110		31	31	30	24	19	10	12	33	36	37	40	34	31	25	17	40	38	40	44	39	37	32	26	45	39	43	48	44	43	38
120		31	31	30	24	19	11	13	32	37	38	40	34	31	25	17	41	39	41	44	40	37	32	26	46	41	44	48	44	43	39	33	53
130		31	31	30	24	19	11	13	31	38	38	40	35	32	26	18	41	41	42	44	40	38	33	26	46	42	45	49	44	43	39	33	53
140		31	31	30	25	20	11	13	31	39	39	40	36	32	26	18	41	42	43	45	40	38	33	26	46	44	47	49	45	44	39	33	54
150		31	31	30	25	20	11	13	31	40	40	40	36	33	26	18	41	43	44	45	41	39	33	26	46	46	48	49	45	44	39	33	55
160		31	31	30	26	20	11	13	31	42	41	39	37	33	27	19	42	44	45	45	41	39	33	26	47	47	49	50	45	44	40	33	56
170		31	31	30	26	21	12	14	31	43	41	39	38	34	27	19	42	46	46	45	42	40	34	27	47	49	51	50	45	45	40	33	56
180		32	31	30	27	21	12	14	32	44	42	39	39	34	27	20	43	47	47	45	42	40	34	27	48	50	52	50	45	45	40	33	57
190		31	31	30	27	22	13	14	32	43	42	39	39	35	28	21	43	47	47	45	42	40	34	27	48	50	51	50	45	45	40	33	57
200		31	31	30	27	22	13	14	32	43	42	39	39	35	29	21	43	47	46	45	42	40	35	28	47	50	51	49	45	44	40	33	56
210		30	31	31	28	22	14	14	32	43	41	39	39	36	30	22	43	47	46	45	42	40	35	28	47	50	50	49	45	44	40	34	56
240		29	31	31	28	23	17	13	33	42	40	40	40	37	32	25	44	46	44	44	42	40	37	30	48	50	48	48	44	43	40	34	55

Ø 200		Differiencial Pressure ΔP (Pa)																															
		50 Pa							100 Pa							150 Pa							200 Pa										
Airflow (m³/h)		125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))
		225		29	27	24	23	18	11	13	27	39	39	36	33	31	26	18	39	43	42	41	39	37	32	24	44	46	45	46	44	42	38
250		30	28	26	24	19	12	13	29	41	40	37	35	33	26	19	40	44	43	42	40	38	32	24	45	47	47	45	44	42	37	28	49
275		31	30	27	26	20	13	13	30	42	41	38	38	34	27	20	42	46	45	42	41	38	32	24	45	49	48	45	44	42	36	27	49
300		32	32	29	27	21	14	14	31	44	41	39	40	36	28	21	44	47	46	42	42	39	32	23	46	50	50	45	44	42	35	26	49
325		34	33	30	29	23	16	14	33	45	42	40	41	37	30	23	44	48	47	44	43	40	34	26	48	51	51	48	45	44	38	28	51
350		36	34	31	31	25	18	15	35	46	43	40	42	37	31	25	45	49	48	46	44	42	36	28	49	52	53	52	47	46	40	31	53
400		39	37	34	35	28	21	17	38	48	45	42	43	39	34	28	47	51	51	50	47	45	40	32	53	55	57	59	50	50	44	36	58

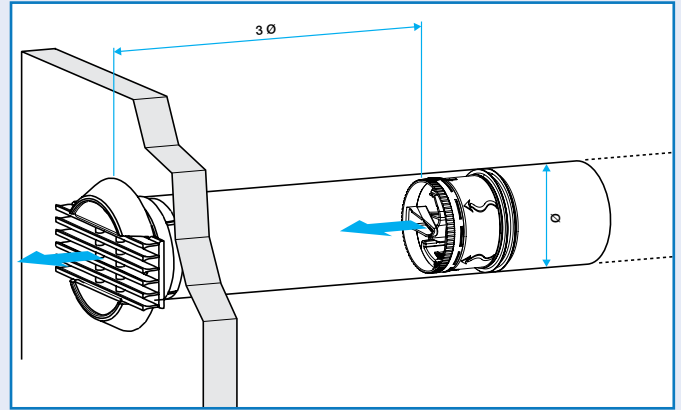
Ø 250		Differiencial Pressure ΔP (Pa)																															
		50 Pa							100 Pa							150 Pa							200 Pa										
Airflow (m³/h)		125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall Lw (dB(A))
		300		38	33	29	25	22	12	12	33	44	38	40	40	31	22	15	42	43	44	42	38	37	29	22	44	43	49	44	36	41	36
350		38	33	30	27	22	13	12	33	46	40	41	41	33	24	17	44	46	46	44	41	38	31	24	46	46	51	46	40	43	38	32	49
400		38	34	31	30	23	13	13	34	47	42	42	43	34	26	18	46	49	47	45	44	40	33	26	48	50	52	48	44	45	40	33	52
450		37	34	33	33	23	14	13	36	49	44	43	45	36	28	20	47	51	49	47	47	42	35	28	50	54	54	51	49	47	42	35	54
500		37	34	34	36	24	15	14	38	50	46	45	47	37	29	22	49	54	51	49	50	43	37	30	53	58	55	53	53	49	44	37	57
550		38	36	37	38	26	18	15	40	50	46	45	47	38	31	23	49	53	51	49	50	44	38	31	53	57	55	53	54	50	44	37	57
650		40	39	41	42	31	23	18	44	49	46	46	46	40	33	25	50	52	50	50	51	45	39	32	54	55	54	54	55	51	45	38	58

MR Mono - MR Modulo

- The MR will push-fit into circular ducts in close proximity to a take-off or a terminal.
- It is important to observe the MR orientation corresponding to the airflow direction indicated on the MR.
- Horizontal / vertical mounting possible.
- In order to avoid acoustic and aeraulic disturbance it is recommended to respect the following distance between the MR and the terminal (grille / diffuser / inlet):
 - in exhaust: $D = 1 \varnothing$,
 - in supply: $D = 3 \varnothing$.

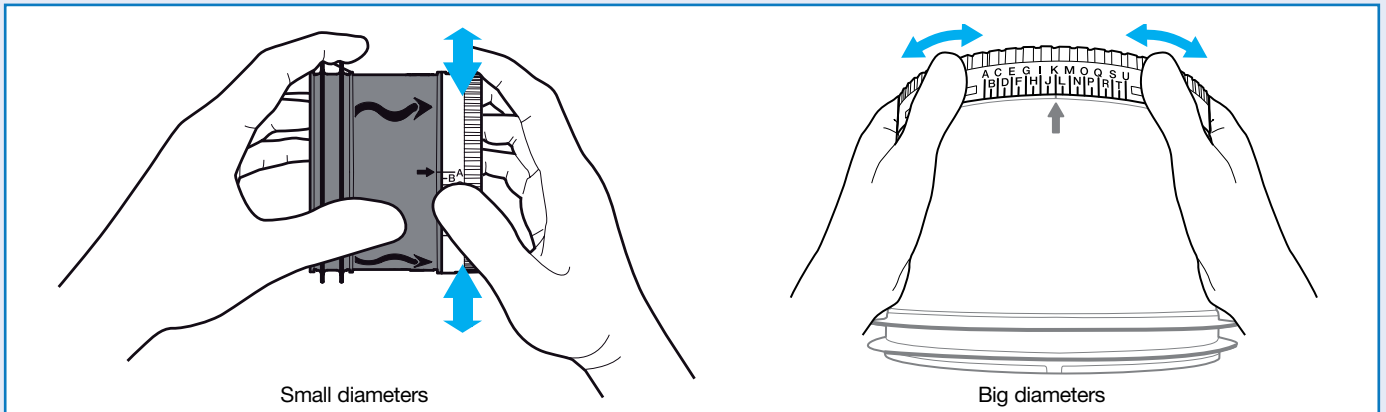


Air exhaust



Air supply

MR Modulo mounting and setting

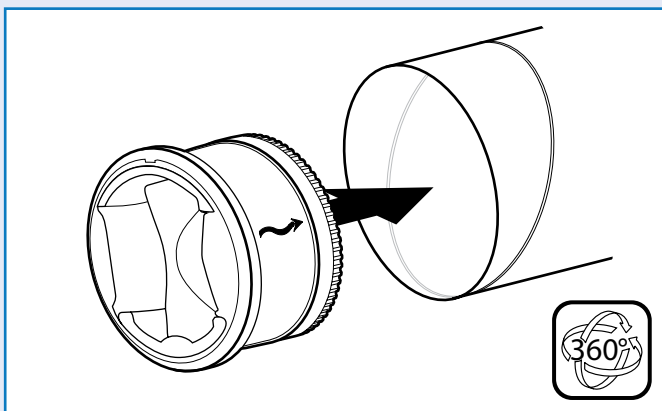


Small diameters

Big diameters

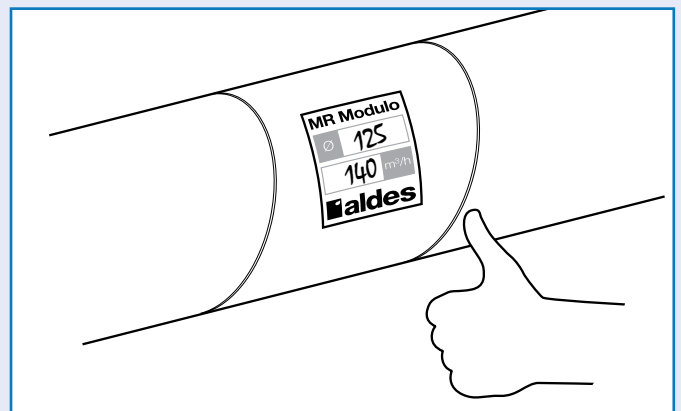
1. Adjust the airflow setting

Rotate the adjustment ring for a tool-free airflow setting until the desired airflow according to the correlation table p.9.



2. Position the MR Modulo

Introduce the MR in the duct according to the arrow which shows the airflow direction. Minimum straight upstream and downstream distances must be observed. There is no recommendation regarding the membrane positioning.











3. Product localization

MR Modulo is delivered with a sticker which will be needed to be manually filled on site (MR diameter and airflow setting) and placed directly onto the duct to show where the MR Modulo has been mounted.



MR Modulo

Correlation table

For certain diameters, the same letter on the ring may correspond to two airflow values. To enable this, the shim must be inserted  or removed .

Ø 80				Ø 100				Ø 125 (15 to 90 m³/h)				Ø 150 - Ø 160		Ø 200		Ø 250			
												m³/h	cfm	m³/h	cfm	m³/h	cfm		
m³/h	cfm	m³/h	cfm	m³/h	cfm	m³/h	cfm	m³/h	cfm	m³/h	cfm								
J	20	12	-	-	L	15	9	-	-	L	15	9	59	U	225	132	U	300	177
I	25	15	-	-	K	20	12	-	-	K	20	12	65	P	110	147	R	355	209
G	30	18	-	-	H	30	18	60	35	H	30	18	71	O	120	162	O	400	235
F	35	20	-	-	F	40	24	65	38	F	40	24	82	M	130	177	L	450	265
E	-	-	50	29	E	45	26	70	41	E	45	26	88	J	160	191	I	500	294
D	45	24	-	-	D	50	29	75	44	D	50	29	94	M	325	206	G	550	324
B	-	-	60	35	C	55	32	80	47	C	55	32	106	J	350	235	A	650	383
A	45	26	-	-	B	-	-	85	49	B	-	-	112	D	400				
					A	-	-	90	53	A	-	-	124						
													141						

Ø 125 (100 to 190 m³/h)	
m³/h	cfm
K	100
J	110
I	120
H	130
G	150
E	160
C	170
A	190

Ø 125 VMT (36 to 84 m³/h)		Ø 125 VMT (100 to 170 m³/h)	
			
m³/h		m³/h	
With wedge	Without wedge		
E	36	K	100
D	40	J	110
C	45	I	120
B	50	H	125
A	55	G	140
		E	145
		D	150
		B	155
		A	170

Ø 160 VMT		Ø 200 VMT		Ø 250 VMT	
m³/h		m³/h		m³/h	
P	120	U	230	W	260
O	125	T	255	V	270
N	130	S	270	U	280
M	140	R	280	T	295
L	145	Q	290	S	310
J	155	P	305	R	325
I	170	O	315	Q	345
H	185	M	325	O	365
F	195	L	340	M	380
E	200	K	350	L	400
		J	360	K	425
		I	370		
		H	380		
		F	390		
		D	400		
		C	410		
		A	420		

MAINTENANCE

- MR performances are not altered by clogging, therefore it requires practically no special maintenance.
- If used in an atmosphere where there is a lot of particles, sleeves with inspection window (see MAF page 14) are recommended to allow regular inspection.
- Clean with soapy water. When cleaning, plug the hole on the plastic body, at the base of the bulb, in order to avoid any blocking of this orifice and to prevent any liquid or foreign body from passing inside the bulb.

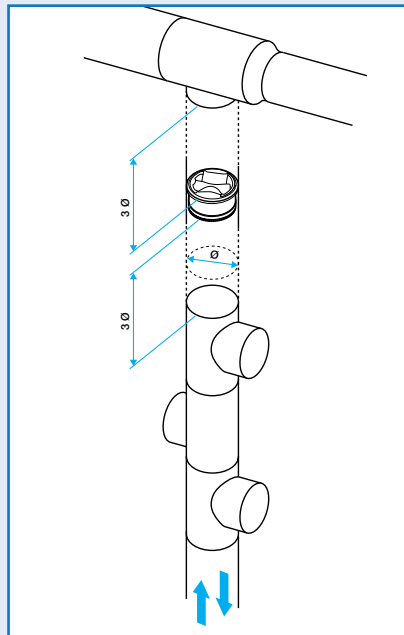
MODULO SPECIFICATION TEXT

- CARs will be manufactured from ABS plastic without chlorine. They will provide a constant airflow rate, for use in air conditioning and ventilation systems. They will include an airflow adjustment system and a regulation system as describe below:
 - regulation mechanism with a stainless steel spring and a silicone membrane,
 - airflow setting system thanks to an adjustment rotating ring (tool-free).
- They provide accuracy in airflow over a differential pressure range between 50 and 250 Pa, (except D80, D100 et D125 : 50-200 Pa) of:
 - +/- 5 m³/h for airflow ≤ 50 m³/h,
 - +/- 10% for airflow > 50 m³/h except MR Mono D80, D100 et D125 (+/-15%) and MR Modulo D80, D100 et D125 (+/-10% max airflow).
- Installation will be possible in duct and accessories as well independent of orientation.
- Positioning and sealing will be ensured by a double-lip seal in elastomer. Type MR Modulo, Aldes brand.

MR Mono - MR Modulo

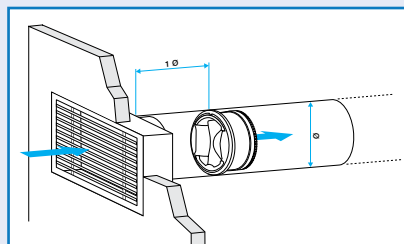
APPLICATION EXAMPLE

Airflow stabilization within an HVAC network portion

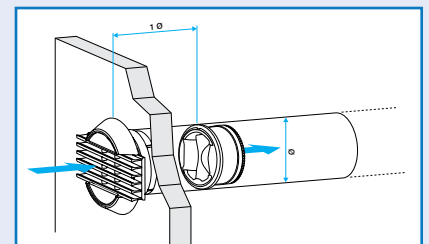


Exhausted airflow stabilization

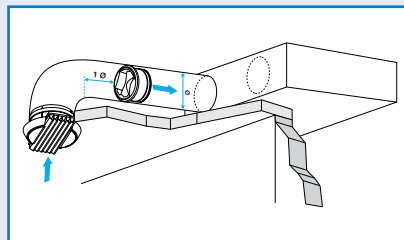
- In exhaust, a 1Ø -distance is recommended between the CAR and the terminal to insure air velocity harmonization in the duct to avoid aeraulic and acoustic disturbance.



1/ MR installed after a supply plenum box



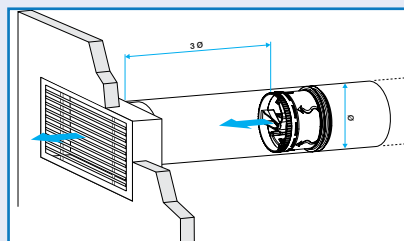
2/ MR installed after a BIM-type grille



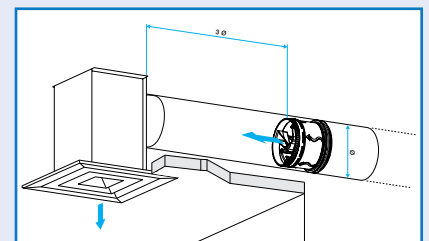
3/ MR installed before a fancoil

Supply airflow stabilization throughout a terminal

- In supply as well a 3Ø -distance is recommended between the CAR and the terminal to insure air velocity harmonization in the duct to avoid aeraulic and acoustic disturbance.



1/ MR installed before a supply plenum box



2/ MR installed before a BIM-type grille

MR Modulo

STANDARD RANGE CODES

• Ø 80 to 250 mm • Qnom from 15 to 650 m³/h.



Ø (mm)	Airflow (m ³ /h)	Code
80	20-60	11016307
100	15-90	11016308
125	15-90	11016309
125	100-190	11016310
150	100-240	11016311
160	100-240	11016312
200	225-400	11016313
250	300-650	11016314

MR Mono



STANDARD RANGE CODES

• Ø 80 to 250 mm • Qnom from 15 to 650 m³/h.

Ø (mm)	Airflow (m ³ /h)	Code
80	15	11016226
	20	11016227
	25	11016228
	30	11016229
	35	11016230
	40	11016231
	45	11016232
	50	11016233
	60	11016234
100	15	11016235
	20	11016236
	25	11016237
	30	11016238
	35	11016239
	40	11016240
	45	11016241
	50	11016242
	55	11016243
	60	11016244
	65	11016245
	70	11016246
	75	11016247
	80	11016248
	85	11016249
	90	11016250

Ø (mm)	Airflow (m ³ /h)	Code
125	15	11016251
	25	11016252
	30	11016253
	45	11016254
	50	11016255
	60	11016256
	65	11016257
	70	11016258
	75	11016259
	80	11016260
	85	11016261
	90	11016262
	95	11016263
	100	11016264
	105	11016265
	110	11016266
	115	11016267
	120	11016268
	150	110
130		11016276
150		11016277
170		11016278
210		11016279
240		11016280

MR Modulo VMT

STANDARD RANGE CODES

• Ø 80 to 250 mm • Qnom from 20 to 650 m³/h.

Ø (mm)	Airflow (m ³ /h)	Code
125	36-84	11016194
125	100-170	11016195
160	120-200	11016196
200	230-420	11016197
250	260-425	11016198

Ø (mm)	Airflow (m ³ /h)	Code
160	120	11016281
	130	11016282
	140	11016283
	150	11016284
	160	11016285
	170	11016286
	180	11016287
	190	11016288
	200	11016289
	210	11016290
	240	11016291
200	200	11016292
	225	11016293
	250	11016294
	275	11016295
	300	11016296
	325	11016297
	350	11016298
	400	11016299
250	300	11016300
	350	11016301
	400	11016302
	450	11016303
	500	11016304
	550	11016305
	650	11016306

HIGH PRESSURE RANGE CODES

• 125 to 250 mm • Qnom from 110 to 1 000 m³/h.

Ø (mm)	Airflow (m ³ /h)	Code
125	110	11016071
	150	11016072
	200	11016073
	240	11016074
	290	11016075
150	210	11016076
	260	11016077
	310	11016078
	380	11016079

Ø (mm)	Airflow (m ³ /h)	Code
160	210	11016081
	260	11016082
	310	11016083
	380	11016084
	350	11016086
200	440	11016087
	530	11016088
	620	11016089
	700	11016090

Ø (mm)	Airflow (m ³ /h)	Code
250	550	11016091
	600	11016092
	800	11016093
	950	11016094
	1 000	11016095

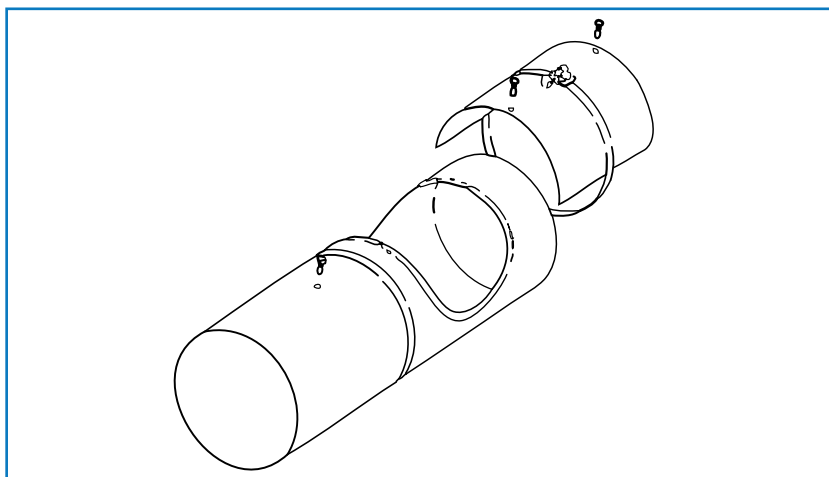
MR Mono - MR Modulo

MAF

MR performances are not altered by clogging, therefore it requires practically no special maintenance.

- If used in an atmosphere where there is a lot of particles, sleeves with inspection window are recommended to allow regular inspection.
- When cleaning, plug the hole on the plastic body, at the base of the bulb, in order to avoid any blocking of this orifice and to prevent any liquid or foreign body from passing inside the membrane.

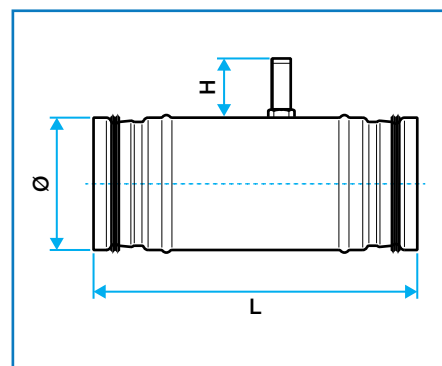
Description	Code
Window sleeve Ø 100	11013121
Window sleeve Ø 125	11013122
Window sleeve Ø 150	11013123
Window sleeve Ø 160	11013124
Window sleeve Ø 200	11013125
Window sleeve Ø 250	11013126



MR Max

- The MR Max is especially adapted for specific systems requiring big diameter (up to 400 mm), high pressure (up to 1 000 Pa) and high airflow (up to 4 000 m³/h).
- The MR Max is available from diameter 80 mm to 400 mm.
- The MR Max works with a free-moving control plate. The airflow can be set from outside.

Description	Code
MR Max Ø 80	11016389
MR Max Ø 100	11016390
MR Max Ø 125	11016391
MR Max Ø 160	11016392
MR Max Ø 200	11016393
MR Max Ø 250	11016394
MR Max Ø 315	11016395
MR Max Ø 400	11016396



Duct Ø (mm)	Airflow range (m ³ /h)	L (mm)	H (mm)
80	40 - 125	215	70
100	70 - 220	245	70
125	100 - 280	245	70
160	180 - 500	315	70
200	250 - 900	315	70
250	500 - 150	315	70
315	800 - 280	345	110
400	1 000 - 4 000	415	110

MR Mono - MR Modulo

REGULATION AND AIR-BALANCING OFFER FOR HVAC DUCWORKS

As a leader in ventilation and thermal comfort, Aldes offers a wide range of products for airflow balancing and control:

Passive range

Balancing dampers.



RG
Commissioning damper



CRGN
Rectangular balancing dampers



Iris
Iris damper

Automatic range

Constant airflow steadiness irrespective of pressure variations.



MR Mono
Constant Airflow Regulator single-airflow



MR Modulo
Constant Airflow Regulator multi-airflow



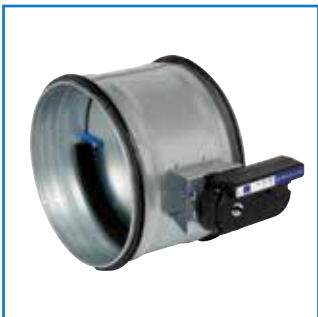
MR Max
Constant Airflow Regulator high pressure, high airflows



RMA
Motorized Constant Airflow Regulator motorized

Active range

Variable flow rate control according to instructions.



MDA Mod
Timed proportional regulation damper



VAV
Variable Air Volume

#HealthyLiving

Because air is not just for us to breathe but it also helps us live a healthier life, Aldes commits to taking care of the health of each building occupant.

Our skills in air management enables us to help design indoor living spaces that are smart and caring. Where we live, work and have fun, Aldes watches over our well-being through innovative solutions that improve indoor air quality.

High-performance solutions that respect the environment, enabling the renewal and purification of indoor air, heating it, cooling it, and providing domestic hot water.

More than just a movement, **#HealthyLiving** embodies our principles of being caring and responsible, as well as our pioneering spirit.



For more information about **MR Mono - MR Modulo**,
contact your Aldes advisor,
visit aldes.com or find us at:



Aldes headquarters - 20, boulevard Irène Joliot-Curie - 69694 Vénissieux Cedex - France
Tel. +33 (0)4 78 77 15 15 - Fax +33 (0)4 78 76 15 97