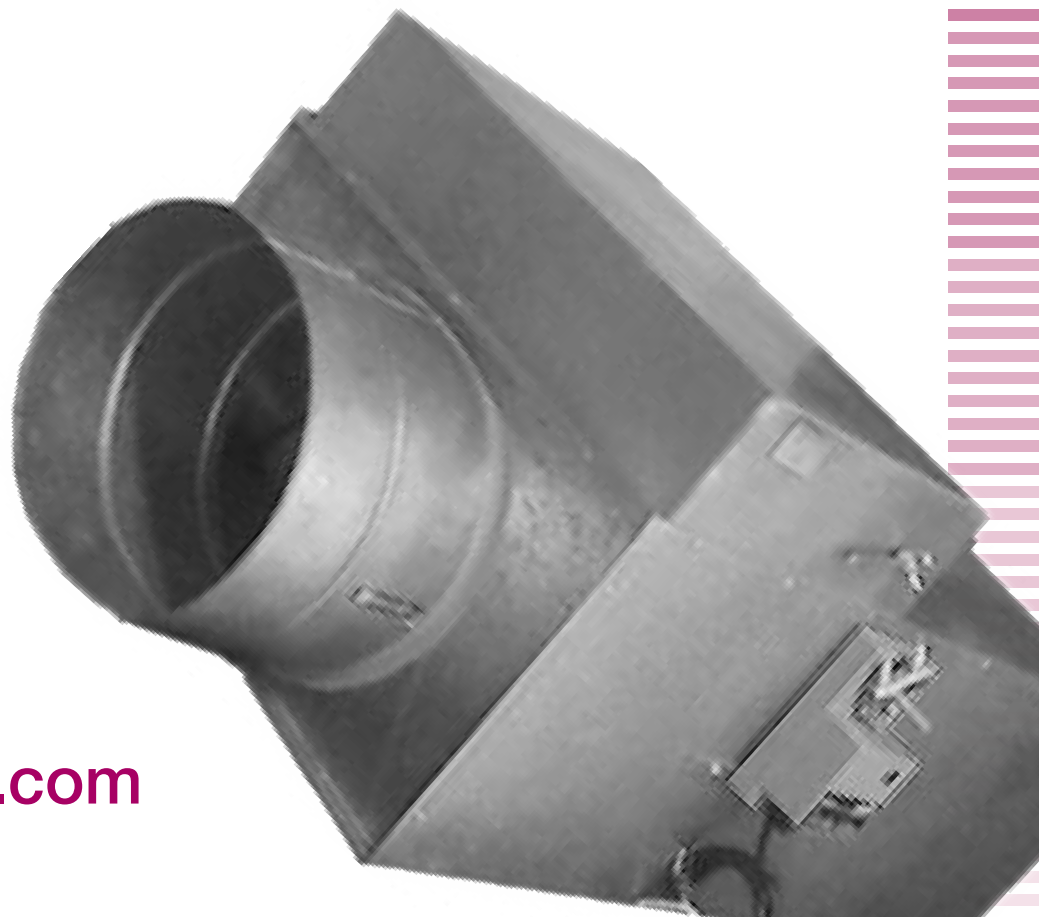


KOOLAIR

series

KMSR

Bypass terminal units



ISO 9001

BUREAU VERITAS
Certification

Sistema de Gestión



www.koolair.com

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KMSR bypass terminal units

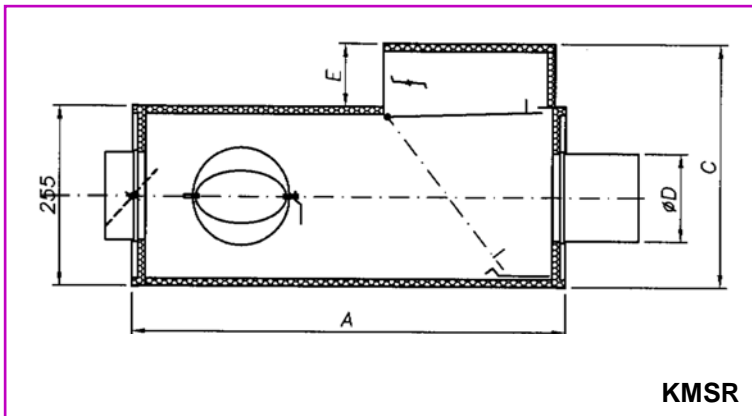


Description

The Koolair KMSR boxes are bypass terminal units used in single-duct, low-velocity systems where a volume control damper cannot or should not be used in the fan.

The KMSR receives constant air flow, supplies a part of this air to the room to be conditioned and reroutes the rest to the return duct. As a result, the equipment acts as a constant-volume unit, but the room to be conditioned receives variable flow air as needed.

A typical application consists of using the KMSR with standalone equipment where, for system economics and to avoid frost in the evaporator, a reduction in the air flow rate is not advisable. (For further information, refer to our manual "Variable volume system for stand-alone air handling units").

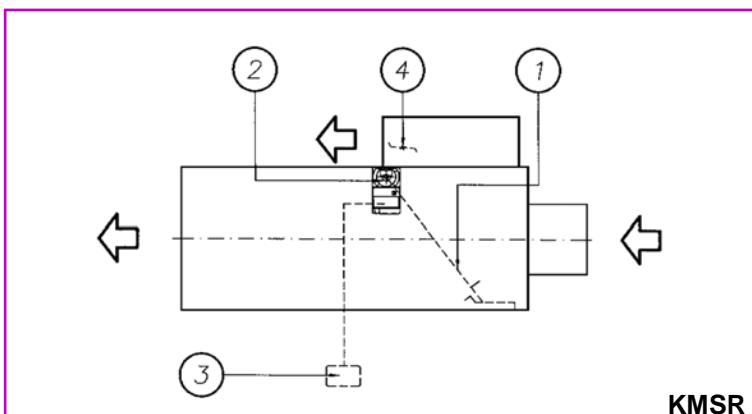
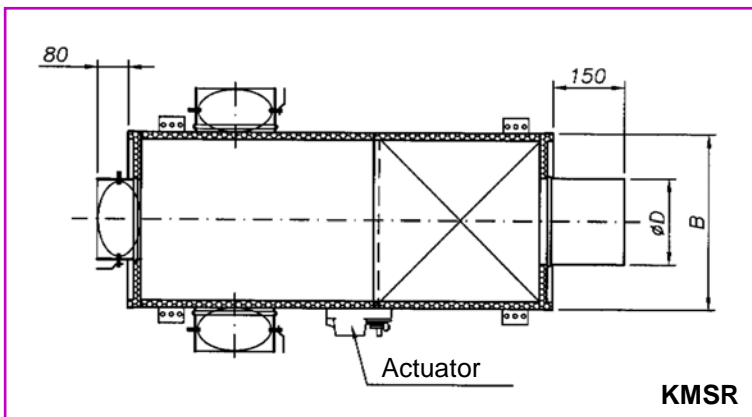


Control

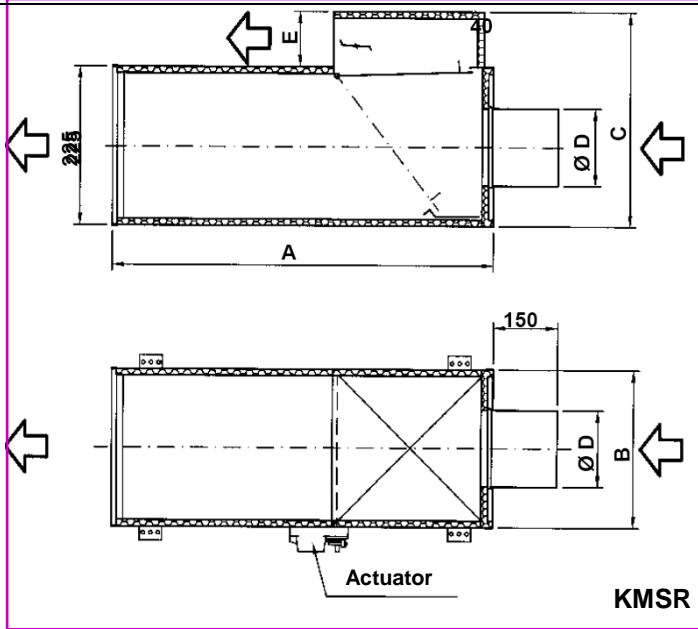
Air volume control consists of the following components:

- 1- Bypass damper
- 2- Proportional actuator (24V)
- 3- Ambient thermostat, proportional action
- 4- Manual damper.

Note: The outlet discharging to the return duct (4) has a manual damper to balance the pressure loss from both circuits: one for discharge to the room and one for air return.



Dimensions



DIMENSIONS in mm						
MODELS	A	B	C	ØD	E	WEIGHT (kg)
150	610	305	355	160	100	13
300	610	305	355	200	100	14
500	610	305	355	225	100	15
750	760	430	355	250*	100	20
1000	760	430	355	315*	100	23
1500	915	685	370	355*	115	25
2000	915	865	370	400*	115	30

(*) OVAL (circumference equivalent to round section)

Identification:

Example:

KMSR-500-1 Bypass supply unit.
Size 500 with rectangular discharge outlet.

If necessary, the side where the actuator should be mounted should be defined, as viewed from the air inlet side.

- KMSR** Bypass terminal unit.
- SIZES** Indicate size from 150 to 2000.
- DISCHARGE OUTLET LAYOUT** Indicate according to table below

Multiple discharge configurations.

	1	2	3	4	5	6	7	8	9	10	11
150	225	225	225	225	225	225	225	125*	125*	125*	225
300	225	225	225	225	225	225	225	125*	125*	125*	225
500	225	250*	250*	225	225	225	225	125*	125*	125*	225
750	315*	315*	315*	315*	315*	315*	315*	180	180	180	225
1000	315*	315*	315*	315*	315*	315*	315*	180	180	180	225
1500	355*	355*	355*	355*	355*	355*	355*	250*	250*	250*	355*
2000	355*	355*	355*	355*	355*	355*	355*	315*	315*	315*	315*

* OVAL CROSS-SECTION (circumference equivalent to round section)

If there is more than one discharge outlet, each discharge has a manual damper to balance the pressure loss of each of the supply circuits.

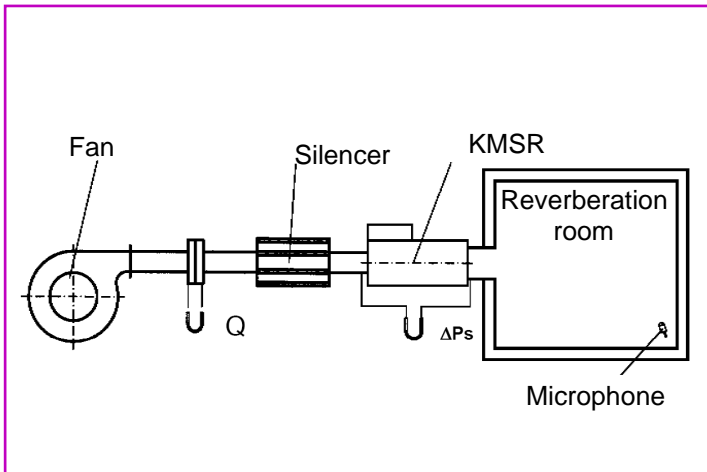
Selection tables

The following tables (1 to 8) contain all the data necessary for correctly selecting the KMSR terminal units.

Data common to all tables:

- Ø (mm): Diameter of standard round inlet connection to box.
- Min. P (Pa): Minimum inlet pressure to KMSR equivalent to pressure loss of box with the damper completely open.
- Q(m³/h) (l/s): Air flow rate for which the unit is to be selected.

Determination of the sound power regenerated by the KMSR.



Determination of the sound power radiated by the KMSR.

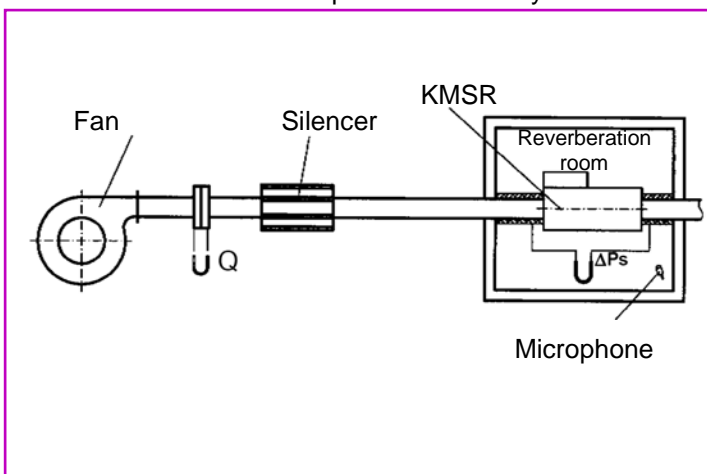


Table 1

This table lists the sound pressure level in the room, due to the noise regenerated by the KMSR unit, in dB(A) for various air flow rates. To obtain these values a 10 dB/octave attenuation in the discharge duct and in the diffuser, and the inherent attenuation of the room, has been assumed. These values are given for four bypass damper settings: 0%, 25%, 50% and 75% of the air flow rate for return.

Table 2

This table lists the sound pressure level in the room expressed in NC (value of the NC curve corresponding to the sound spectrum) for the same conditions as Table 1.

Table 3

This table expresses the sound pressure level in the room as NR (value of the NR curve corresponding to the sound spectrum) for the same conditions as Table 1.

Table 4

This table lists the sound power levels for noise (dB) regenerated by the KMSR unit at the various octave band frequencies.

Table 5

This table lists the sound pressure levels in the room, due to radiated noise in the KMSR unit, in dB(A) for various air flow rates and inlet pressures. To obtain these values a 10 dB/octave attenuation has been assumed for the drop ceiling.

Table 6

Sound pressure levels in NC.

Table 7

Sound pressure levels in NR.

Table 8

Sound pressure levels in dB, by octave band.

ISO standards

All acoustic data published in this catalogue were obtained by tests conducted at our TESTING (R&D) LABORATORY in a single reverberation room, constructed according to ISO 3741.

All tests have been carried out according to ISO 5135 and 5220.

Selection tables

- Terminal units, KMSR type (sound pressure levels in dB(A))

KMSR Size	REGENERATED NOISE			dB(A) at Q _{BYPASS} =				P _{min.} [Pa] at Q _{BYPASS} =			
	Ø (mm)	Q [m ³ /h]	Q (l/s)	0%	25%	50%	75%	0%	25%	50%	75%
150	160	150	41.7	<	<	<	<	< 2	< 2	< 2	2
		200	55.6	<	<	<	<	< 2	< 2	2	4
		250	69.4	<	<	<	<	< 2	< 2	3	6
		300	83.3	<	<	21	22	< 2	2	5	9
		350	97.2	<	21	24	26	< 2	3	7	12
300	200	300	83.3	<	<	<	<	< 2	< 2	3	6
		375	104.2	<	<	<	<	< 2	3	5	9
		450	125.0	<	<	20	22	< 2	4	7	14
		525	145.8	<	21	23	25	< 2	5	10	19
		600	166.7	<	24	26	28	< 2	7	13	24
500	225	500	138.9	<	<	<	<	< 2	4	7	13
		630	175.0	<	21	23	25	< 2	6	11	21
		760	211.1	<	25	27	29	< 2	9	17	31
		890	247.2	<	29	31	33	< 2	13	23	43
		1020	283.3	<	32	34	36	< 2	17	30	56
750	250	1000	277.8	<	28	30	32	< 2	13	23	44
		1125	312.5	<	31	33	35	< 2	17	30	55
		1250	347.2	<	34	36	37	< 2	21	37	68
		1375	381.9	21	36	38	40	< 2	25	44	82
		1500	416.7	23	38	40	42	< 2	30	53	98
1000	315	1350	375.0	<	29	32	33	< 2	15	26	45
		1500	416.7	18	32	34	36	< 2	19	32	56
		1650	458.3	21	35	37	38	< 2	23	39	67
		1800	500.0	23	37	39	40	< 2	27	46	80
		1950	541.7	25	39	41	42	< 2	32	54	94
1500	355	1900	527.8	22	36	38	39	< 2	22	37	57
		2175	604.2	26	39	41	43	< 2	28	49	74
		2450	680.6	29	43	45	46	< 2	36	62	94
		2725	756.9	32	45	47	49	< 2	45	77	117
		3000	833.3	34	48	50	51	< 2	54	93	141
2000	400	2700	750.0	30	43	45	46	< 2	26	48	49
		3025	840.3	33	46	48	49	< 2	33	61	62
		3350	930.6	36	49	51	52	< 2	41	75	76
		3675	1020.8	38	51	53	55	< 2	49	90	91
		4000	1111.1	41	54	56	57	< 2	58	106	108

Table 1

< : Sound pressure level < 20 dB(A)

Selection tables

-Terminal units, KMSR type (sound pressure levels in NC)

KMSR Size	REGENERATED NOISE			NC at Q _{BYPASS} =				P _{min.} [Pa] at Q _{BYPASS} =			
	Ø (mm)	Q [m ³ /h]	Q (l/s)	0%	25%	50%	75%	0%	25%	50%	75%
150	160	150	41.7	<	<	<	<	< 2	< 2	< 2	2
		200	55.6	<	<	<	<	< 2	< 2	2	4
		250	69.4	<	<	<	<	< 2	< 2	3	6
		300	83.3	<	<	<	<	< 2	2	5	9
		350	97.2	<	<	20	22	< 2	3	7	12
300	200	300	83.3	<	<	<	<	< 2	< 2	3	6
		375	104.2	<	<	<	<	< 2	3	5	9
		450	125.0	<	<	<	<	< 2	4	7	14
		525	145.8	<	<	<	21	< 2	5	10	19
		600	166.7	<	20	22	24	< 2	7	13	24
500	225	500	138.9	<	<	<	<	< 2	4	7	13
		630	175.0	<	<	<	21	< 2	6	11	21
		760	211.1	<	21	23	25	< 2	9	17	31
		890	247.2	<	25	27	29	< 2	13	23	43
		1020	283.3	<	28	30	32	< 2	17	30	56
750	250	1000	277.8	<	24	26	28	< 2	13	23	44
		1125	312.5	<	27	29	31	< 2	17	30	55
		1250	347.2	<	30	32	33	< 2	21	37	68
		1375	381.9	<	32	34	36	< 2	25	44	82
		1500	416.7	<	34	36	38	< 2	30	53	98
1000	315	1350	375.0	<	25	28	29	< 2	15	26	45
		1500	416.7	<	28	30	32	< 2	19	32	56
		1650	458.3	<	31	33	34	< 2	23	39	67
		1800	500.0	<	33	35	36	< 2	27	46	80
		1950	541.7	21	35	37	38	< 2	32	54	94
1500	355	1900	527.8	<	32	34	35	< 2	22	37	57
		2175	604.2	22	35	37	39	< 2	28	49	74
		2450	680.6	25	39	41	42	< 2	36	62	94
		2725	756.9	28	41	43	45	< 2	45	77	117
		3000	833.3	30	44	46	47	< 2	54	93	141
2000	400	2700	750.0	26	39	41	42	< 2	26	48	49
		3025	840.3	29	42	44	45	< 2	33	61	62
		3350	930.6	32	45	47	48	< 2	41	75	76
		3675	1020.8	34	47	49	51	< 2	49	90	91
		4000	1111.1	37	50	52	53	< 2	58	106	108

Table 2

< : Sound pressure level < NC 20

Selection tables

- Terminal units, KMSR type (sound pressure levels in NR)

KMSR		REGENERATED NOISE		NR at Q _{BYPASS} =				P _{min.} [Pa] at Q _{BYPASS} =			
Size	Ø (mm)	Q [m ³ /h]	Q (l/s)	0%	25%	50%	75%	0%	25%	50%	75%
150	160	150	41.7	<	<	<	<	< 2	< 2	< 2	2
		200	55.6	<	<	<	<	< 2	< 2	2	4
		250	69.4	<	<	<	<	< 2	< 2	3	6
		300	83.3	<	<	<	<	< 2	2	5	9
		350	97.2	<	<	21	23	< 2	3	7	12
300	200	300	83.3	<	<	<	<	< 2	< 2	3	6
		375	104.2	<	<	<	<	< 2	3	5	9
		450	125.0	<	<	<	<	< 2	4	7	14
		525	145.8	<	<	20	22	< 2	5	10	19
		600	166.7	<	21	23	25	< 2	7	13	24
500	225	500	138.9	<	<	<	<	< 2	4	7	13
		630	175.0	<	<	20	22	< 2	6	11	21
		760	211.1	<	22	24	26	< 2	9	17	31
		890	247.2	<	26	28	30	< 2	13	23	43
		1020	283.3	<	29	31	33	< 2	17	30	56
750	250	1000	277.8	<	25	27	29	< 2	13	23	44
		1125	312.5	<	28	30	32	< 2	17	30	55
		1250	347.2	<	31	33	34	< 2	21	37	68
		1375	381.9	<	33	35	37	< 2	25	44	82
		1500	416.7	20	35	37	39	< 2	30	53	98
1000	315	1350	375.0	<	26	29	30	< 2	15	26	45
		1500	416.7	<	29	31	33	< 2	19	32	56
		1650	458.3	<	32	34	35	< 2	23	39	67
		1800	500.0	20	34	36	37	< 2	27	46	80
		1950	541.7	22	36	38	39	< 2	32	54	94
1500	355	1900	527.8	<	33	35	36	< 2	22	37	57
		2175	604.2	23	36	38	40	< 2	28	49	74
		2450	680.6	26	40	42	43	< 2	36	62	94
		2725	756.9	29	42	44	46	< 2	45	77	117
		3000	833.3	31	45	47	48	< 2	54	93	141
2000	400	2700	750.0	27	40	42	43	< 2	26	48	49
		3025	840.3	30	43	45	46	< 2	33	61	62
		3350	930.6	33	46	48	49	< 2	41	75	76
		3675	1020.8	35	48	50	52	< 2	49	90	91
		4000	1111.1	38	51	53	54	< 2	58	106	108

Table 3

< : Sound pressure level < NR 20

Selection tables

- Terminal units, KMSR type (sound power levels in dB), regenerated noise

KMSR		REGENERATED NOISE		Q _{BYPASS} = 0%								Q _{BYPASS} = 25%								Q _{BYPASS} = 50%								Q _{BYPASS} = 75%							
Size	Ø (mm)	Q [m³/h]	Q [l/s]	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
150	160	150	41.7	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	20	<	<	<	<	<	21	20	22	<	<	<	<	<
		200	55.6	<	<	<	<	<	<	<	<	22	22	23	<	<	<	<	<	25	25	26	22	<	<	<	<	26	26	28	24	<	<	<	<
		250	69.4	<	<	<	<	<	<	<	<	27	27	28	24	<	<	<	<	29	29	31	26	<	<	<	<	31	31	32	28	21	<	<	<
		300	83.3	<	<	<	<	<	<	<	<	30	30	32	27	20	<	<	<	33	33	34	30	23	<	<	<	35	35	36	32	24	<	<	<
		350	97.2	<	<	<	<	<	<	<	<	34	33	35	31	23	<	<	<	36	36	38	33	26	<	<	<	38	38	39	35	28	<	<	<
300	200	300	83.3	<	<	<	<	<	<	<	<	21	21	22	<	<	<	<	<	23	23	25	20	<	<	<	<	25	25	26	22	<	<	<	<
		375	104.2	<	<	<	<	<	<	<	<	26	26	27	23	<	<	<	<	28	28	30	25	<	<	<	<	30	30	31	27	20	<	<	<
		450	125.0	<	<	<	<	<	<	<	<	30	30	31	27	20	<	<	<	32	32	34	29	22	<	<	<	34	34	35	31	24	<	<	<
		525	145.8	<	<	<	<	<	<	<	<	33	33	35	30	23	<	<	<	36	36	37	33	25	<	<	<	37	37	39	35	27	<	<	<
		600	166.7	20	20	22	<	<	<	<	<	36	36	38	33	26	<	<	<	39	39	40	36	28	<	<	<	40	40	42	37	30	21	<	<
500	225	500	138.9	<	<	<	<	<	<	<	<	28	28	29	25	<	<	<	<	30	30	31	27	20	<	<	<	32	31	33	29	21	<	<	<
		630	175.0	<	<	<	<	<	<	<	<	33	33	34	30	23	<	<	<	35	35	37	32	25	<	<	<	37	37	38	34	27	<	<	<
		760	211.1	22	22	23	<	<	<	<	<	37	37	39	35	27	<	<	<	40	40	41	37	29	20	<	<	41	41	43	38	31	22	<	<
		890	247.2	26	25	27	23	<	<	<	<	41	41	43	38	31	21	<	<	43	43	45	41	33	24	<	<	45	45	46	42	35	25	<	<
		1020	283.3	29	29	30	26	<	<	<	<	44	44	46	41	34	25	<	<	47	47	48	44	36	27	21	<	48	48	50	45	38	29	23	<
750	250	1000	277.8	26	25	27	23	<	<	<	<	41	40	42	38	30	21	<	<	43	43	44	40	32	23	<	<	44	44	46	41	34	25	<	<
		1125	312.5	28	28	30	25	<	<	<	<	43	43	45	40	33	24	<	<	46	46	47	43	35	26	20	<	47	47	49	44	37	27	22	<
		1250	347.2	31	31	32	28	21	<	<	<	46	46	47	43	36	26	20	<	48	48	50	45	38	28	23	<	50	50	51	47	39	30	24	20
		1375	381.9	33	33	35	30	23	<	<	<	48	48	50	45	38	29	23	<	50	50	52	48	40	31	25	21	52	52	53	49	42	32	26	23
		1500	416.7	35	35	37	32	25	<	<	<	50	50	52	47	40	31	25	21	53	52	54	50	42	33	27	23	54	54	56	51	44	34	29	25
1000	315	1350	375.0	28	28	29	25	<	<	<	<	42	42	43	39	32	22	<	<	44	44	45	41	34	24	<	<	45	45	47	43	35	26	20	<
		1500	416.7	31	31	32	28	20	<	<	<	45	45	46	42	34	25	<	<	47	47	48	44	36	27	21	<	48	48	50	45	38	28	23	<
		1650	458.3	33	33	35	30	23	<	<	<	47	47	48	44	37	27	21	<	49	49	51	46	39	29	24	20	51	50	52	48	40	31	25	21
		1800	500.0	35	35	37	32	25	<	<	<	49	49	51	46	39	30	24	20	51	51	53	48	41	32	26	22	53	53	54	50	43	33	27	24
		1950	541.7	37	37	39	35	27	<	<	<	51	51	53	48	41	32	26	22	53	53	55	51	43	34	28	24	55	55	56	52	45	35	29	26
1500	355	1900	527.8	35	35	36	32	24	<	<	<	48	48	50	45	38	29	23	<	50	50	52	47	40	31	25	21	52	51	53	49	41	32	26	22
		2175	604.2	38	38	40	35	28	<	<	<	52	52	53	49	41	32	26	23	54	54	55	51	43	34	28	25	55	55	57	52	45	35	30	26
		2450	680.6	42	41	43	39	31	22	<	<	55	55	56	52	45	35	29	26	57	57	58	54	47	37	31	28	58	58	60	55	48	39	33	29
		2725	756.9	44	44	46	41	34	25	<	<	58	58	59	55	47	38	32	29	60	60	61	57	49	40	34	31	61	61	63	58	51	41	36	32
		3000	833.3	47	47	48	44	37	27	21	<	60	60	62	57	50	41	35	31	62	62	64	59	52	43	37	33	64	64	65	61	53	44	38	34
2000	400	2700	750.0	42	42	44	40	32	23	<	<	55	55	57	53	45	36	30	26	57	57	59	54	47	38	32	28	59	59	60	56	48	39	33	29
		3025	840.3	46	45	47	43	35	26	20	<	59	58	60	56	48	39	33	29	60	60	62	58	50	41	35	31	62	62	63	59	51	42	36	33
		3350	930.6	48	48	50	45	38	29	23	<	61	61	63	58	51	42	36	32	63	63	65	60	53	44	38	34	65	64	66	62	54	45	39	35
		3675	1020.8	51	51	52	48	41	31	25	22	64	64	65	61	54	44	38	35	66	66	67	63	55	46	40	37	67	67	68	64	57	47	41	38
		4000	1111.1	53	53	55	50	43	33	28	24	66	66	68	63	56	46	41	37	68	68	69	65	58	48	42	39	69	69	71	66	59	50	44	40

Table 4 < : Sound power level < 20 dB

	OCTAVE BAND							
	1	2	3	4	5	6	7	8
H	63	125	250	500	1000	2000	4000	8000

Selection tables

- Terminal units, KMSR type (sound pressure levels in dB(A))

KMSR	RADIATED NOISE			dB(A) at Q _{BYPASS} =				P _{min.} [Pa] at Q _{BYPASS} =			
	Size	∅ (mm)	Q [m ³ /h]	Q (l/s)	0%	25%	50%	75%	0%	25%	50%
150	160	150	41.7	<	<	<	<	< 2	< 2	< 2	2
		200	55.6	<	<	<	<	< 2	< 2	2	4
		250	69.4	<	<	<	<	< 2	< 2	3	6
		300	83.3	<	<	<	<	< 2	2	5	9
		350	97.2	<	<	20	22	< 2	3	7	12
300	200	300	83.3	<	<	<	<	< 2	< 2	3	6
		375	104.2	<	<	<	<	< 2	3	5	9
		450	125.0	<	<	<	20	< 2	4	7	14
		525	145.8	<	20	22	24	< 2	5	10	19
		600	166.7	<	23	26	27	< 2	7	13	24
500	225	500	138.9	<	<	<	<	< 2	4	7	13
		630	175.0	<	20	23	25	< 2	6	11	21
		760	211.1	<	25	27	29	< 2	9	17	31
		890	247.2	<	29	31	33	< 2	13	23	43
		1020	283.3	<	32	35	37	< 2	17	30	56
750	250	1000	277.8	<	28	31	33	< 2	13	23	44
		1125	312.5	<	31	34	36	< 2	17	30	55
		1250	347.2	<	34	37	38	< 2	21	37	68
		1375	381.9	<	36	39	41	< 2	25	44	82
		1500	416.7	21	38	41	43	< 2	30	53	98
1000	315	1350	375.0	<	30	32	34	< 2	15	26	45
		1500	416.7	<	32	35	37	< 2	19	32	56
		1650	458.3	<	35	37	39	< 2	23	39	67
		1800	500.0	<	37	40	41	< 2	27	46	80
		1950	541.7	21	39	42	43	< 2	32	54	94
1500	355	1900	527.8	<	35	38	40	< 2	22	37	57
		2175	604.2	21	39	42	43	< 2	28	49	74
		2450	680.6	24	42	45	46	< 2	36	62	94
		2725	756.9	26	45	47	49	< 2	45	77	117
		3000	833.3	29	47	50	52	< 2	54	93	141
2000	400	2700	750.0	23	42	44	46	< 2	26	48	49
		3025	840.3	26	45	47	49	< 2	33	61	62
		3350	930.6	29	47	50	52	< 2	41	75	76
		3675	1020.8	31	50	52	54	< 2	49	90	91
		4000	1111.1	34	52	55	56	< 2	58	106	108

Table 5

< : Sound pressure level < 20 dB(A)

Selection tables

- Terminal units, KMSR type (sound pressure levels in NC)

KMSR		RADIATED NOISE		NC at Q _{BYPASS} =				P _{min.} [Pa] at Q _{BYPASS} =			
Size	Ø (mm)	Q [m ³ /h]	Q (l/s)	0%	25%	50%	75%	0%	25%	50%	75%
150	160	150	41.7	<	<	<	<	< 2	< 2	< 2	2
		200	55.6	<	<	<	<	< 2	< 2	2	4
		250	69.4	<	<	<	<	< 2	< 2	3	6
		300	83.3	<	<	<	<	< 2	2	5	9
		350	97.2	<	<	<	<	< 2	3	7	12
300	200	300	83.3	<	<	<	<	< 2	< 2	3	6
		375	104.2	<	<	<	<	< 2	3	5	9
		450	125.0	<	<	<	<	< 2	4	7	14
		525	145.8	<	<	<	<	< 2	5	10	19
		600	166.7	<	<	20	22	< 2	7	13	24
500	225	500	138.9	<	<	<	<	< 2	4	7	13
		630	175.0	<	<	<	20	< 2	6	11	21
		760	211.1	<	20	22	24	< 2	9	17	31
		890	247.2	<	24	26	28	< 2	13	23	43
		1020	283.3	<	27	30	32	< 2	17	30	56
750	250	1000	277.8	<	23	26	28	< 2	13	23	44
		1125	312.5	<	26	29	31	< 2	17	30	55
		1250	347.2	<	29	31	33	< 2	21	37	68
		1375	381.9	<	31	34	36	< 2	25	44	82
		1500	416.7	<	33	36	38	< 2	30	53	98
1000	315	1350	375.0	<	24	27	29	< 2	15	26	45
		1500	416.7	<	27	30	32	< 2	19	32	56
		1650	458.3	<	30	32	34	< 2	23	39	67
		1800	500.0	<	32	34	36	< 2	27	46	80
		1950	541.7	<	34	36	38	< 2	32	54	94
1500	355	1900	527.8	<	30	33	35	< 2	22	37	57
		2175	604.2	<	34	36	38	< 2	28	49	74
		2450	680.6	<	37	39	41	< 2	36	62	94
		2725	756.9	21	39	42	44	< 2	45	77	117
		3000	833.3	24	42	45	47	< 2	54	93	141
2000	400	2700	750.0	<	37	39	41	< 2	26	48	49
		3025	840.3	21	40	42	44	< 2	33	61	62
		3350	930.6	24	42	45	47	< 2	41	75	76
		3675	1020.8	26	45	47	49	< 2	49	90	91
		4000	1111.1	28	47	49	51	< 2	58	106	108

Table 6

< : Sound pressure level < NC 20

Selection tables

- Terminal units, KMSR type (sound pressure levels in NR)

KMSR	RADIATED NOISE			dB(A) at Q _{BYPASS} =				P _{min.} [Pa] at Q _{BYPASS} =			
	Size	Ø (mm)	Q [m ³ /h]	Q (l/s)	0%	25%	50%	75%	0%	25%	50%
150	160	150	41.7	<	<	<	<	< 2	< 2	< 2	2
		200	55.6	<	<	<	<	< 2	< 2	2	4
		250	69.4	<	<	<	<	< 2	< 2	3	6
		300	83.3	<	<	<	<	< 2	2	5	9
		350	97.2	<	<	<	<	< 2	3	7	12
300	200	300	83.3	<	<	<	<	< 2	< 2	3	6
		375	104.2	<	<	<	<	< 2	3	5	9
		450	125.0	<	<	<	<	< 2	4	7	14
		525	145.8	<	<	<	20	< 2	5	10	19
		600	166.7	<	<	21	23	< 2	7	13	24
500	225	500	138.9	<	<	<	<	< 2	4	7	13
		630	175.0	<	<	<	21	< 2	6	11	21
		760	211.1	<	21	23	25	< 2	9	17	31
		890	247.2	<	25	27	29	< 2	13	23	43
		1020	283.3	<	28	31	33	< 2	17	30	56
750	250	1000	277.8	<	24	27	29	< 2	13	23	44
		1125	312.5	<	27	30	32	< 2	17	30	55
		1250	347.2	<	30	32	34	< 2	21	37	68
		1375	381.9	<	32	35	37	< 2	25	44	82
		1500	416.7	<	34	37	39	< 2	30	53	98
1000	315	1350	375.0	<	25	28	30	< 2	15	26	45
		1500	416.7	<	28	31	33	< 2	19	32	56
		1650	458.3	<	31	33	35	< 2	23	39	67
		1800	500.0	<	33	35	37	< 2	27	46	80
		1950	541.7	<	35	37	39	< 2	32	54	94
1500	355	1900	527.8	<	31	34	36	< 2	22	37	57
		2175	604.2	<	35	37	39	< 2	28	49	74
		2450	680.6	20	38	40	42	< 2	36	62	94
		2725	756.9	22	40	43	45	< 2	45	77	117
		3000	833.3	25	43	46	48	< 2	54	93	141
2000	400	2700	750.0	<	38	40	42	< 2	26	48	49
		3025	840.3	22	41	43	45	< 2	33	61	62
		3350	930.6	25	43	46	48	< 2	41	75	76
		3675	1020.8	27	46	48	50	< 2	49	90	91
		4000	1111.1	29	48	50	52	< 2	58	106	108

Table 7

< : Sound pressure level < NR 20

Selection tables

- Terminal units, KMSR type (sound power levels in dB), radiated noise

KMSR Size	RADIATED NOISE		Q _{BYPASS} = 0%								Q _{BYPASS} = 25%								Q _{BYPASS} = 50%								Q _{BYPASS} = 75%								
	Ø (mm)	Q [m³/h]	Q [l/s]	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
150	160	150	41.7	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
		200	55.6	<	<	<	<	<	<	<	<	<	21	<	<	<	<	<	<	21	24	20	<	<	<	<	<	23	26	22	<	<	<	<	<
		250	69.4	<	<	<	<	<	<	<	<	24	27	23	<	<	<	<	<	27	29	26	20	<	<	<	<	28	31	28	22	<	<	<	<
		300	83.3	<	<	<	<	<	<	<	<	28	31	28	22	<	<	<	<	31	34	30	24	<	<	<	<	33	36	32	26	21	<	<	<
		350	97.2	<	<	<	<	<	<	<	<	32	35	31	25	20	<	<	<	35	37	34	28	23	<	<	<	37	39	36	30	24	<	<	<
300	200	300	83.3	<	<	<	<	<	<	<	<	21	23	20	<	<	<	<	<	23	26	22	<	<	<	<	<	25	28	24	<	<	<	<	<
		375	104.2	<	<	<	<	<	<	<	<	26	29	25	<	<	<	<	<	29	31	28	22	<	<	<	<	30	33	30	24	<	<	<	<
		450	125.0	<	<	<	<	<	<	<	<	31	33	30	24	<	<	<	<	33	36	32	26	21	<	<	<	35	38	34	28	23	<	<	<
		525	145.8	<	<	<	<	<	<	<	<	34	37	33	27	22	<	<	<	37	40	36	30	25	<	<	<	39	41	38	32	27	20	<	<
		600	166.7	20	23	<	<	<	<	<	<	38	40	37	31	25	<	<	<	40	43	39	33	28	22	<	<	42	45	41	35	30	23	<	<
500	225	500	138.9	<	<	<	<	<	<	<	<	29	32	28	22	<	<	<	<	32	34	31	25	20	<	<	<	34	36	33	27	21	<	<	<
		630	175.0	<	20	<	<	<	<	<	<	35	38	34	28	23	<	<	<	37	40	37	31	25	<	<	<	39	42	38	32	27	21	<	<
		760	211.1	22	24	21	<	<	<	<	<	39	42	39	33	27	21	<	<	42	45	41	35	30	23	<	<	44	47	43	37	32	25	20	<
		890	247.2	26	28	25	<	<	<	<	<	43	46	43	37	31	25	<	<	46	49	45	39	34	27	22	<	48	51	47	41	36	29	24	<
		1020	283.3	29	32	28	22	<	<	<	<	47	50	46	40	35	28	22	<	49	52	49	43	37	31	25	20	51	54	50	44	39	33	27	22
750	250	1000	277.8	25	28	24	<	<	<	<	<	43	46	42	36	31	24	<	<	46	48	45	39	33	27	21	<	48	50	47	41	35	29	23	<
		1125	312.5	28	31	27	21	<	<	<	<	46	49	45	39	34	27	22	<	49	51	48	42	36	30	24	<	50	53	50	44	38	32	26	21
		1250	347.2	31	33	30	24	<	<	<	<	49	51	48	42	36	30	24	<	51	54	50	44	39	33	27	22	53	56	52	46	41	34	29	23
		1375	381.9	33	36	32	26	21	<	<	<	51	54	50	44	39	32	27	21	54	56	53	47	41	35	29	24	56	58	55	49	43	37	31	26
		1500	416.7	35	38	34	28	23	<	<	<	53	56	52	46	41	34	29	23	56	59	55	49	44	37	31	26	58	60	57	51	45	39	33	28
1000	315	1350	375.0	26	29	25	<	<	<	<	<	44	47	43	37	32	26	20	<	47	50	46	40	35	28	23	<	49	51	48	42	37	30	24	<
		1500	416.7	29	31	28	22	<	<	<	<	47	50	46	40	35	28	22	<	50	52	49	43	37	31	25	20	51	54	51	45	39	33	27	22
		1650	458.3	31	34	30	24	<	<	<	<	49	52	48	42	37	31	25	20	52	55	51	45	40	33	28	22	54	57	53	47	42	35	29	24
		1800	500.0	33	36	33	27	21	<	<	<	52	54	51	45	39	33	27	22	54	57	53	47	42	36	30	25	56	59	55	49	44	37	32	26
		1950	541.7	35	38	35	29	23	<	<	<	54	56	53	47	41	35	29	24	56	59	55	49	44	38	32	27	58	61	57	51	46	39	34	28
1500	355	1900	527.8	32	35	31	25	20	<	<	<	50	53	49	43	38	31	26	20	53	55	52	46	41	34	28	23	55	57	54	48	42	36	30	25
		2175	604.2	35	38	34	28	23	<	<	<	53	56	53	47	41	35	29	24	56	59	55	49	44	38	32	27	58	61	57	51	46	39	34	28
		2450	680.6	38	41	37	31	26	20	<	<	57	59	56	50	44	38	32	27	59	62	58	52	47	41	35	30	61	64	60	54	49	42	37	31
		2725	756.9	41	44	40	34	29	22	<	<	59	62	58	52	47	41	35	30	62	65	61	55	50	43	38	32	64	67	63	57	52	45	39	34
		3000	833.3	44	46	43	37	31	25	<	<	62	64	61	55	50	43	37	32	64	67	64	58	52	46	40	35	66	69	65	59	54	48	42	37
2000	400	2700	750.0	38	41	37	31	26	<	<	<	56	59	55	49	44	38	32	27	59	62	58	52	47	40	35	29	61	64	60	54	49	42	37	31
		3025	840.3	41	44	40	34	29	22	<	<	59	62	58	52	47	41	35	30	62	65	61	55	50	43	38	32	64	67	63	57	52	45	40	34
		3350	930.6	44	46	43	37	31	25	<	<	62	65	61	55	50	43	38	32	65	67	64	58	52	46	40	35	67	69	66	60	54	48	42	37
		3675	1020.8	46	49	45	39	34	27	22	<	64	67	63	57	52	46	40	35	67	70	66	60	55	48	43	37	69	72	68	62	57	50	45	39
		4000	1111.1	48	51	47	41	36	30	24	<	67	69	66	60	54	48	42	37	69	72	68	62	57	51	45	40	71	74	70	64	59	52	47	41

Table 8 < : Sound power level < 20 dB

	OCTAVE BAND							
	1	2	3	4	5	6	7	8
H	63	125	250	500	1000	2000	4000	8000

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