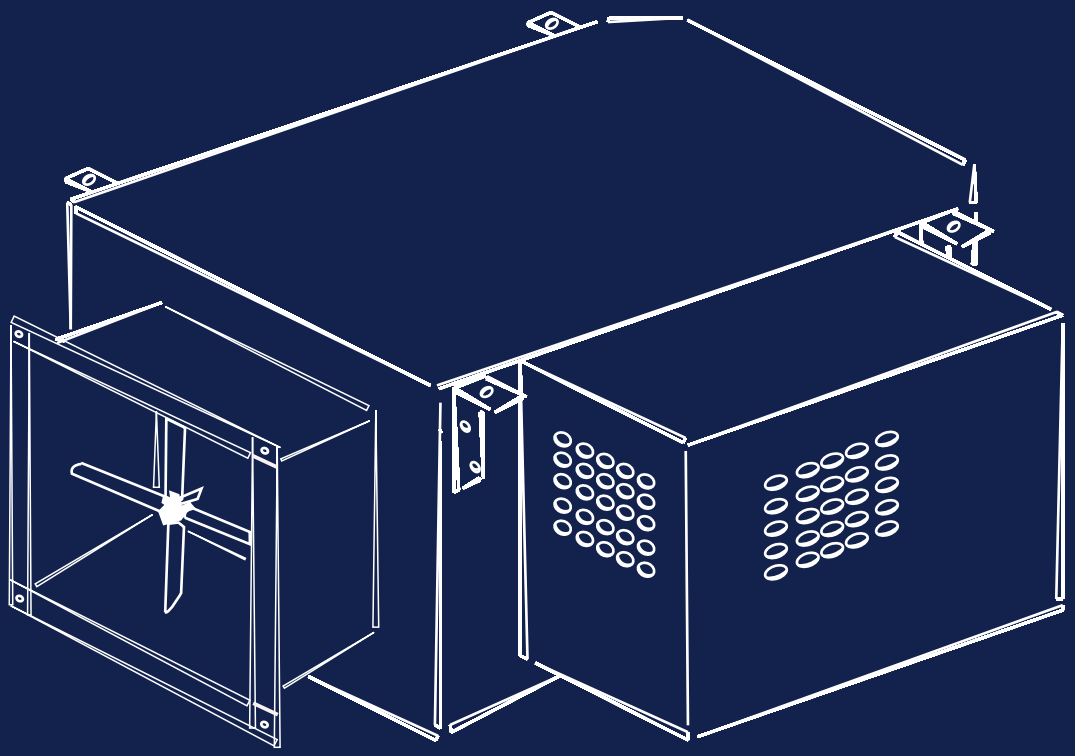


NDR series

Low height rectangular inlet compact VAV and CAV air volume control terminals

BARCOL-AIR

Compact VAV and CAV air volume control terminals

Table of contents

Compact VAV and CAV air volume control terminals

Type designation NDR.....

Composition type designation:

N – DR – O – N – E – O – B

N Position 1: **Product group**

N = air volume control terminals

Ordering example:

N	DR	O	N	E	O	B		1	5	0		R		1	0	0	0
See above								Model 100-400 &Heater				Handing controls		Heater capacity(w)			

DR Position 2: **Function**

A = single wall, circular volume control terminal
B = double wall, circular volume control terminal
C = compact type, circular volume control terminal
DR = compact type with low height and rectangular inlet connection
1 = non standard, specify separately

O Position 3: **Controls (manufacturer)**

O = without controls
For controls, contact our sales staff

N Position 4: **Outlet**

A = rectangular outlet
B = circular outlet
C = 4 circular outlets ('Octopus')
G = rectangular outlet and provision for integral hot water reheat coil
J = 4 circular outlets and provision for integral hot water reheat coil
N = rectangular outlet and provision for integral electric reheat coil
Q = 4 circular outlets and provision for integral electric reheat coil
1 = non standard, specify separately

E Position 5: **Reheat coil**

O = without reheat coil
A = 1-row hot water reheat
B = 2-row hot water reheat
D = 4-row hot water reheat
E = 1-stage 230VAC/1-phase electric reheat coil
F = 2-stage 230VAC/1-phase electric reheat coil
G = 3-stage 230VAC/1-phase electric reheat coil
H = 1-stage 400VAC/3-phase electric reheat coil
J = 2-stage 400VAC/3-phase electric reheat coil
1 = non standard, specify separately

B Positon 6: **Sensor**

O = not applicable
B = Flo-cross, 2 x 12 point averaging and signal amplifying air flow sensor (standard)
1 = non standard, specify separately

Ordering information:

Standard terminals:

- quantity of terminals
- complete 7 digit code
- terminal size or model
- air volume setting (V_{max}, V_{min} etc)
- control handing (standard right side)
- if applicable, electric reheat coil capacity
- supply or return air

Non standard terminals:

- for non standard terminals a full description and / or drawing are requested.

Compact VAV and CAV
air volume control terminals

Technical data
Type (NDR.....)

Application

Types NDR are compact pressure independent, low height VAV and CAV air volume control terminals with rectangular inlet . The terminals are designed for the accurate measurement and control of air volumes and pressure independent operation courtesy of the patented Flo-Cross airflow sensor.
In CAV application, the terminals maintain the required constant airflow independent of the inlet static pressure.
In VAV application, the terminals control the air volume to the room, depending on the cooling load required and independent of the inlet static pressure saving energy in both cooling and heating applications.
The VAV or CAV terminals can be used either for supply or return air applications in new or refurbishment projects. The terminals can be delivered with a distribution plenum and a built-in hot water or electric reheat coil.

Features:
- Pressure independent control functions.
- Volume control range 100% to 10%.
- Low pressure loss over the terminal.
- Galvanized steel casing for strength and durability with low height design
- Factory fitted distribution plenum with built-in hot water or electric reheat coil.
- Rectangular shaped damper blade for linear control characteristics.
- Low leakage damper, less than 1% of Vnom at 750 Pa.
- Low noise level.
- Suitable for all control functions (VAV, CAV, shut-off, etc.) to maximise system energy savings.
- Flo-Cross, 2 x 12 points averaging and signal amplifying airflow sensor, better than 2.5% accuracy even with irregular duct approach.
- Maintenance free.

Technical information

Casing:
Air-tight construction made of galvanized sheet steel with low casing leakage rate.

Insulation:
The rectangular discharge section is internally insulated.

Damper:
Damper blade: made of galvanized steel,sandwich construction with twin blades and a neoprene gasket with low leakage.
Damper shaft: aluminium,Φ12mm with self lubricating nylon bearings.

Flo-Cross: .
Extruded aluminum construction with nylon core and feet.

Distribution plenum:
Made of galvanized sheet steel with internal isolation. Plenum with standard rectangular outlet construction or with 1 to 7 circular outlets.Outlet spigots are made of galvanized steel and optionally can be provided with volume control dampers.

Reheat coil:
Choice of 1, 2 or 4-row hot water reheat coil or electric reheat coil (240VAC/1-phase or 415VAC/3-phase).

Controls:
Suitable for use with pneumatic, analogue, electronic or DDC controllers. Controls can be factory fitted, wired and calibrated. Controls enclosure（galvanized sheet steel）can be provided optionally.

Delivery format:

Delivery format:
- The VAV or CAV terminal will be supplied as a single mounting assembly.
  Optional ordered distribution plenum, reheat coil and/or controls are factory fitted, wired and calibrated. The terminal can be directly installed and commissioned when delivered to site.
- Controls location and hot water or electric connections are as standard fitted on the right hand side of the terminal when looking in the direction of the airflow.
  On request, the terminal can be delivered with connections on the left hand side.
- When terminals are ordered with controls, these will be factory fitted, wired and calibrated upon request.

Compact VAV and CAV
air volume control terminals

Technical data
Type (NDR.....)

Specify as:

Example:
Supply and install, variable air volume terminals with distribution plenum and 4 circular outlets, constructed from galvanized sheet steel. The casing leakage rate shall be classified according to class II, VDI3803/DIN24194. The VAV terminals shall have rectangular shaped damper blade with neoprene gasket and an aluminium damper shaft with self lubricating nylon bearings.

A centre averaging airflow sensor with at least 2 x 12 test points and amplified signal, type Flo-Cross shall control the airflow with an accuracy better than 2.5%. The terminals shall be supplied with 1-row hot water reheat coil.

The controller shall be I/A Series, DDC controller: LonMark compatible, type MNL-V2RVx or BACnet, type MNB-V2.

Controls must be factory fitted, wired and calibrated according to the following requirements:

Maximum air volume 250l/s
Minimum air volume 60l/s
Minimum air volume 120l/s(in case of reheat)
Terminal size 200 mm
Max. pressure loss 15 Pa
Max. discharge sound index < NC30 (@250Pa Δp)
Max. radiated sound index < NC30 (@250Pa Δp)

Ordering example: type-model-handing=NDROJAOB-200R

Manufacturer: Barcol-Air

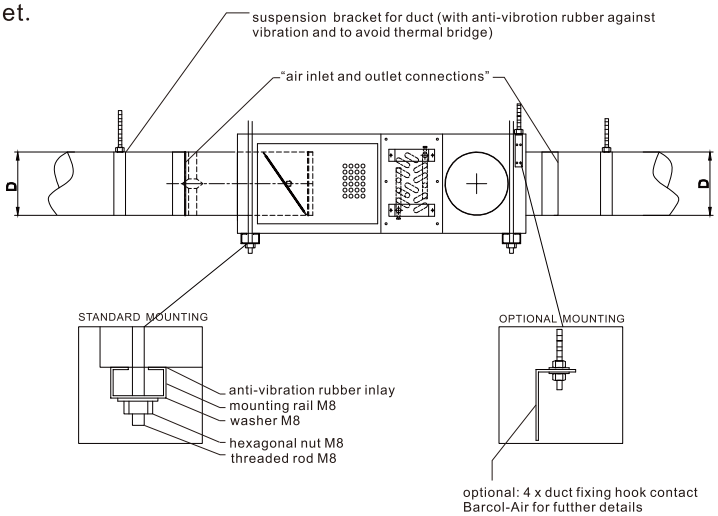
Installation Instructions

The Barcol-Air VAV terminals shall be installed using at least two support channels, with anti-vibration rubber under the terminal (as shown in the drawing below). Each of these channels shall be fixed with two threaded rods to the ceiling slab above. Alternatively 4 duct fixing hooks can be provided for suspending the units.

The installation method:

1. Shall prevent the body of the VAV terminal from high mechanical tension, which could damage the construction and performance of the terminal.
2. Shall prevent torsion on the VAV terminals, which could cause malfunction of the damper blades.
3. Provides some flexibility to the final location of the VAV terminals.
4. Use at least one diameter straight duct length before the VAV inlet.
5. Additional manual volume control dampers (VCD's) should not be installed before the unit inlet.
6. All connections shall be thermally isolated.
7. Pressure sensing tubes for the FloCross airflow sensor not be "kinked" or otherwise obstructed by the external duct insulation.

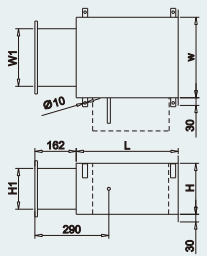
See drawing below.



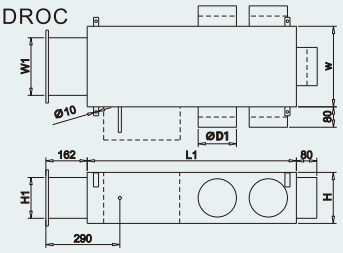
BARCOL-AIR

NDR series base unit

NDROA

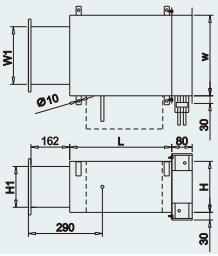


NDROC

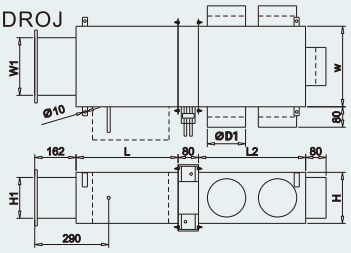


NDR series with Hot Water Reheat

NDROG

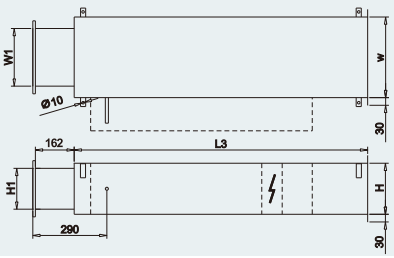


NDROJ

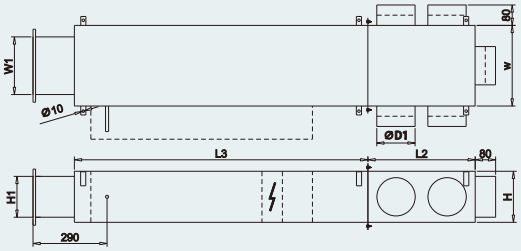


NDR series with Electric Reheat

NDRON



NDROQ



Dimensions NDR terminals

Model	050	075	100	150	200	250	315	355	400
W1	100	100	100	150	200	300	450	600	850
H1	100	150	200	200	200	200	200	200	200
W	250	250	250	250	250	350	500	650	900
H	250	250	250	250	250	250	250	250	250
W*	300	300	300	300	400	550	650	800	1050
H*	300	300	300	300	300	300	400	400	400
L	425	425	425	425	425	425	425	425	425
ΦD1	148	148	148	148	148	198	198	198	198
L1	845	845	845	845	845	945	945	945	945
L2	420	420	420	420	420	520	520	520	520
L3	770	770	770	770	770	770	770	770	770

All dimensions in mm.

W*,H* are the VAV dimension with hot water reheat section.

Length 80mm for not more than 2rows, 125mm for 4rows.

Other dimensions are avaliable upon request.

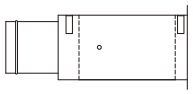
Kv values

Model	050	075	100	150	200	250	315	355	400
KV(l/s*Pa$^{-1/2}$)	5.6	9	14	23	29	44	66	86	105

Flow = Kv x √ΔPfc
ΔPfc = Flo-Cross signal
IfΔPfc = 30 Pa and VAV size =150
Flow = 23 x √30 = 126 l/s

Compact VAV and CAV
air volume control terminals

Type NDROA



Sound data Δp = 125 Pa

Model	data refering to inlet spigot				min. ΔPs	discharge sound									radiated sound								
						Lw in dB/Oct.(re 1pW)						Lp values			Lw in dB/Oct.(re 1pW)						Lp values		
	Velocity	air volume				125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	dB(A)	NC	NR	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	dB(A)	NC	NR
	m/s	l/s	CFM	M3/H	Pa	dB									dB								
050	2	20	42	72	2	40	41	37	36	31	21	--	--	--	--	--	--	--	--	--	--	--	--
	4	40	85	144	8	44	47	45	43	38	26	27	20	20	20	--	--	--	--	--	--	--	--
	6	60	127	216	18	50	49	49	47	42	32	30	24	26	23	--	--	--	--	--	--	--	--
	8	80	169	288	32	54	54	50	50	50	38	35	29	31	27	--	--	--	--	--	--	--	--
	10	100	212	360	50	55	56	54	52	51	41	36	31	33	29	21	--	--	--	--	--	--	--
075	2	30	64	108	2	42	43	39	38	32	22	--	--	--	--	--	--	--	--	--	--	--	--
	4	60	127	216	8	47	48	46	44	39	28	25	--	20	21	--	--	--	--	--	--	--	--
	6	90	191	324	17	51	51	50	48	43	33	29	23	25	25	--	--	--	--	--	--	--	--
	8	120	254	432	31	55	56	52	52	50	38	34	28	30	28	21	--	--	--	--	20	--	--
	10	150	318	540	48	57	57	56	54	51	42	35	30	32	30	24	20	--	--	--	21	--	--
100	2	40	85	144	2	43	44	40	38	34	22	--	--	--	--	--	--	--	--	--	--	--	--
	4	80	169	288	8	49	50	46	44	40	29	24	--	20	22	--	--	--	--	--	--	--	--
	6	120	254	432	17	53	54	51	48	44	34	28	22	24	26	20	--	--	--	--	18	--	--
	8	160	339	576	30	57	58	54	52	49	39	31	26	28	29	23	19	19	19	21	--	--	--
	10	200	424	720	47	59	61	58	55	52	43	34	29	31	32	26	22	21	21	23	--	--	--
150	2	60	127	216	2	39	41	40	38	37	32	--	--	--	18	--	--	--	--	--	--	--	--
	4	120	254	432	7	47	48	46	44	41	36	22	--	--	25	20	19	--	--	--	--	--	--
	6	180	381	648	15	52	52	50	49	44	39	26	--	22	29	24	23	20	18	20	--	--	--
	8	240	508	864	26	56	56	54	52	48	42	30	24	26	32	27	26	23	21	23	--	--	--
	10	300	636	1080	41	60	60	58	56	51	45	34	28	30	34	29	28	25	23	25	--	--	--
200	2	80	169	288	2	39	34	37	34	30	23	--	--	--	19	--	--	--	--	--	--	--	--
	4	160	339	576	6	48	44	46	42	37	31	20	--	--	26	22	21	18	--	--	--	--	--
	6	240	508	864	14	54	51	52	47	42	36	26	--	20	30	26	25	22	20	21	--	--	--
	8	320	678	1152	25	58	55	56	51	46	40	31	23	25	33	29	28	25	22	24	--	--	--
	10	400	847	1440	39	61	59	60	54	50	43	34	27	30	35	31	30	27	25	26	--	--	--
250	2	120	254	432	1	41	43	42	39	34	30	--	--	--	19	--	--	--	--	--	--	--	--
	4	240	508	864	6	50	51	50	45	40	35	25	--	20	26	21	21	18	--	--	--	--	--
	6	360	763	1296	13	56	56	55	50	44	39	30	23	26	30	25	25	22	20	21	--	--	--
	8	480	1017	1728	23	60	60	59	53	47	43	34	28	30	33	28	28	25	23	24	--	--	--
	10	600	1271	2160	36	63	63	63	56	50	45	37	32	34	35	31	31	27	25	26	--	--	--
315	2	180	381	648	1	42	45	41	41	38	33	--	--	--	21	18	18	--	--	--	--	--	--
	4	360	763	1296	5	52	52	48	47	43	38	26	--	21	28	25	25	22	18	19	--	--	--
	6	540	1144	1944	12	58	57	54	52	48	42	31	24	27	32	29	29	26	22	23	--	--	--
	8	720	1525	2592	22	63	61	58	56	52	46	35	29	31	35	32	32	29	25	26	--	--	--
	10	900	1907	3240	34	67	64	62	59	55	50	39	34	35	38	34	34	31	27	28	--	--	--
355	2	240	508	864	1	42	52	45	45	40	38	24	--	21	22	19	19	--	--	--	--	--	--
	4	480	1017	1728	5	53	56	51	50	43	42	29	24	26	29	26	26	23	18	20	--	--	--
	6	720	1525	2592	12	59	60	56	54	46	45	33	28	30	33	30	30	27	23	24	--	--	--
	8	960	2034	3456	21	64	63	60	57	50	48	37	32	33	36	33	33	30	25	27	--	--	--
	10	1200	2542	4320	33	68	66	64	61	53	52	41	36	37	38	35	35	32	28	29	--	--	--
400	2	340	720	1224	1	43	54	46	46	42	36	26	21	24	22	19	19	--	--	--	--	--	--
	4	680	1441	2448	5	54	58	52	51	45	40	31	26	28	29	26	26	24	19	20	--	--	--
	6	1020	2161	3672	11	60	62	57	55	48	43	35	30	32	33	30	30	28	23	24	--	--	--
	8	1360	2881	4896	20	65	65	61	58	52	46	39	34	36	36	33	33	31	26	27	--	--	--
	10	1700	3602	6120	32	69	68	65	62	55	50	42	37	39	39	36	36	33	28	29	--	--	--

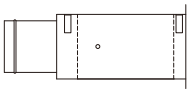
1. *Sound data is determined in a reverberation room at an independent sound laboratory, according to ISO3741 and ISO 5135 standards.*
2. *Lw in dB/Oct.(re 1pW) are sound power levels for discharge sound and case radiated sound. Figures less than 17 dB are indicated by "-".*
3. *The discharge sound pressure levels are determined with the assumptions as mentioned in table 1 for downstream ductwork including a diffuser with insulated plenum box.*
4. *The radiated sound pressure levels are determined with the assumptions as mentioned in table 1 for ceiling plenum and suspended ceiling absorption.*
5. *Lp values are including a room absorption of 10 dB/Oct.*
6. *dB(A),NC and NR index figures are sound pressure levels. Figures less than 20 are indicated by "- -".*
7. *ΔPs is static pressure drop across VAV air volume control terminal with damper fully open.*
8. *For non standard applications and/or selections, please contact our technical staff.*

Table 1 : Assumptions for additional attenuation

Hz	125	250	500	1K	2K	4K
Discharge (dB)	5	10	20	30	30	25
Radiated (dB)	2	5	10	15	15	20

Compact VAV and CAV
air volume control terminals

Type NDROA



Sound data Δp = 250 Pa

Model	data refering to inlet spigot				min. ΔPs	discharge sound									radiated sound								
						Lw in dB/Oct.(re 1pW)						Lp values			Lw in dB/Oct.(re 1pW)						Lp values		
	Velocity	air volume				125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	dB(A)	NC	NR	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	dB(A)	NC	NR
	m/s	l/s	CFM	M3/H	Pa	dB									dB								
050	2	20	42	72	2	43	47	44	41	39	31	20	--	--	20	--	--	--	--	--	--	--	--
	4	40	85	144	8	50	50	49	47	43	35	24	--	20	26	--	--	--	--	--	--	--	--
	6	60	127	216	18	55	51	52	50	46	41	28	22	25	30	25	--	--	--	--	--	--	--
	8	80	169	288	32	57	55	54	53	52	42	31	26	28	32	26	23	21	21	22	--	--	--
	10	100	212	360	50	58	62	56	55	58	48	35	30	32	36	29	26	23	23	24	--	--	--
075	2	30	64	108	2	44	48	45	42	40	31	--	--	--	20	--	--	--	--	--	--	--	--
	4	60	127	216	8	50	51	50	48	43	35	21	--	--	27	--	--	--	--	--	--	--	--
	6	90	191	324	17	55	52	53	51	47	41	29	23	25	31	25	20	--	--	20	--	--	--
	8	120	254	432	31	58	56	55	53	52	43	31	26	28	34	28	25	22	21	23	--	--	--
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100	2	40	85	144	2	45	48	45	43	40	29	21	--	--	21	--	--	--	--	--	--	--	--
	4	80	169	288	8	51	53	51	48	45	35	27	20	23	28	22	18	--	--	18	--	--	--
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200	2	80	169	288	2	43	38	41	39	36	30	--	--	--	25	21	20	--	--	--	--	--	--
	4	160	339	576	6	52	49	50	47	43	37	24	--	--	32	28	27	22	19	21	--	--	--
	6	240	508	864	14	57	55	56	51	47	42	30	22	24	36	32	31	26	23	25	--	--	--
	8	320	678	1152	25	61	59	60	55	51	45	34	27	29	39	35	34	29	26	28	--	--	--
	10	400	847	1440	39	64	63	63	58	54	48	38	31	33	41	37	36	31	29	30	--	--	--
250	2	120	254	432	1	44	47	46	44	41	37	21	--	--	25	20	20	--	--	--	--	--	--
	4	240	508	864	6	53	55	54	50	46	42	29	23	25	32	27	27	22	20	21	--	--	--
	6	360	763	1296	13	59	60	59	54	50	46	34	28	31	36	31	31	26	24	25	--	--	--
	8	480	1017	1728	23	63	64	62	57	53	48	38	33	35	39	34	34	29	27	28	--	--	--
	10	600	1271	2160	36	66	67	65	60	55	51	41	36	38	41	37	37	31	29	30	--	--	--
315	2	180	381	648	1	45	50	45	46	45	40	23	--	20	27	24	24	19	--	--	--	--	--
	4	360	763	1296	5	54	56	52	52	50	44	30	24	26	34	31	31	26	22	23	--	--	--
	6	540	1144	1944	12	60	60	57	56	53	48	34	28	31	38	35	35	30	26	27	--	--	--
	8	720	1525	2592	22	65	64	61	59	56	51	38	33	34	41	38	38	33	29	30	--	--	--
	10	900	1907	3240	34	69	67	64	62	59	54	41	36	37	44	40	40	35	31	32	22	--	--
355	2	240	508	864	1	45	57	50	51	47	47	29	24	7	28	25	25	20	--	--	--	--	--
	4	480	1017	1728	5	55	61	56	55	50	49	33	29	31	35	32	32	27	22	24	--	--	--
	6	720	1525	2592	12	61	64	60	58	52	51	37	32	34	39	36	36	31	26	28	--	--	--
	8	960	2034	3456	21	66	66	63	61	55	54	40	35	37	42	39	39	34	29	31	20	--	--
	10	1200	2542	4320	33	70	69	66	64	57	56	43	38	39	44	41	41	36	32	33	23	--	--
400	2	340	720	1224	1	46	59	51	52	49	45	31	27	29	28	25	25	21	--	17	--	--	--
	4	680	1441	2448	5	56	63	57	56	52	47	35	31	33	35	32	32	28	23	24	--	--	--
	6	1020	2161	3672	11	62	66	61	59	54	49	39	35	36	39	36	36	32	27	28	--	--	--
	8	1360	2881	4896	20	67	68	64	62	57	52	42	38	39	42	39	39	35	30	31	21	--	--
	10	1700	3602	6120	32	71	71	67	65	59	54	45	41	42	45	42	42	37	32	33	23	--	--

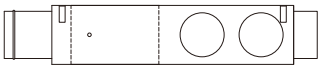
1. *Sound data is determined in a reverberation room at an independent sound laboratory, according to ISO3741 and ISO 5135 standards.*
2. *Lw in dB/Oct.(re 1pW) are sound power levels for discharge sound and case radiated sound. Figures less than 17 dB are indicated by "-".*
3. *The discharge sound pressure levels are determined with the assumptions as mentioned in table 1 for downstream ductwork including a diffuser with insulated plenum box.*
4. *The radiated sound pressure levels are determined with the assumptions as mentioned in table 1 for ceiling plenum and suspended ceiling absorption.*
5. *Lp values are including a room absorption of 10 dB/Oct.*
6. *dB(A),NC and NR index figures are sound pressure levels. Figures less than 20 are indicated by "- -".*
7. *ΔPs is static pressure drop across VAV air volume control terminal with damper fully open.*
8. *For non standard applications and/or selections, please contact our technical staff.*

Table 1 : Assumptions for additional attenuation

Hz	125	250	500	1K	2K	4K
Discharge (dB)	5	10	20	30	30	25
Radiated (dB)	2	5	10	15	15	20

Compact VAV and CAV
air volume control terminals

Type NDROC



Sound data Δp = 125 Pa

Model	data refering to inlet spigot				min. ΔPs	Δp = 125 Pa																	
						discharge sound									radiated sound								
						L_w in dB/Oct. (re 1pW)						Lp values			L_w in dB/Oct. (re 1pW)						Lp values		
	Velocity	air volume				125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	dB(A)	NC	NR	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	dB(A)	NC	NR
	m/s	l/s	CFM	m^3/h	Pa	dB									dB								
100	2	40	85	144	2	34	32	22	18	-	-	--	--	--	-	-	-	-	-	-	--	--	--
	4	80	169	288	10	40	38	28	24	18	-	--	--	--	22	-	-	-	-	-	--	--	--
	6	120	254	432	22	44	43	33	28	22	-	--	--	--	26	20	-	-	-	18	--	--	--
	8	160	339	576	38	48	46	36	32	27	-	20	--	--	29	23	19	19	19	21	--	--	--
	10	200	424	720	60	50	49	40	35	30	19	23	--	--	32	26	22	21	21	23	--	--	--
150	2	60	127	216	2	30	29	22	18	-	-	--	--	--	18	-	-	-	-	-	--	--	--
	4	120	254	432	7	38	36	28	24	19	-	--	--	--	25	20	19	-	-	-	--	--	--
	6	180	381	648	15	43	40	32	29	22	-	--	--	--	29	24	23	20	18	20	--	--	--
	8	240	508	864	26	47	44	36	32	26	18	--	--	--	32	27	26	23	21	23	--	--	--
	10	300	636	1080	41	51	48	40	36	29	21	23	--	--	34	29	28	25	23	25	--	--	--
200	2	80	169	288	1	30	22	19	-	-	-	--	--	--	19	-	-	-	-	-	--	--	--
	4	160	339	576	6	39	32	28	22	-	-	--	--	--	26	22	21	18	-	-	--	--	--
	6	240	508	864	13	45	39	34	27	20	-	--	--	--	30	26	25	22	20	21	--	--	--
	8	320	678	1152	23	49	43	38	31	24	-	20	--	--	33	29	28	25	22	24	--	--	--
	10	400	847	1440	36	52	47	42	34	28	19	23	--	--	35	31	30	27	25	26	--	--	--
250	2	120	254	432	1	32	31	24	19	-	-	--	--	--	19	-	-	-	-	-	--	--	--
	4	240	508	864	5	41	39	32	25	18	-	--	--	--	26	21	21	18	-	-	--	--	--
	6	360	763	1296	11	47	44	37	30	22	-	--	--	--	30	25	25	22	20	21	--	--	--
	8	480	1017	1728	19	51	48	41	33	25	19	23	--	--	33	28	28	25	23	24	--	--	--
	10	600	1271	2160	30	54	51	44	36	28	21	26	--	21	35	31	31	27	25	26	--	--	--
315	2	180	381	648	1	36	37	23	21	-	-	--	--	--	21	18	18	-	-	-	--	--	--
	4	360	763	1296	5	46	44	30	27	21	-	--	--	--	28	25	25	22	18	19	--	--	--
	6	540	1144	1944	11	52	49	36	32	26	18	24	--	--	32	29	29	26	22	23	--	--	--
	8	720	1525	2592	19	57	53	40	36	30	22	28	21	23	35	32	32	29	25	26	--	--	--
	10	900	1907	3240	29	61	56	44	39	33	26	32	26	28	38	34	34	31	27	28	--	--	--
355	2	240	508	864	1	36	44	27	25	18	-	--	--	--	22	19	19	-	-	-	--	--	--
	4	480	1017	1728	4	47	48	33	30	21	18	21	--	--	29	26	26	23	18	20	--	--	--
	6	720	1525	2592	10	53	52	38	34	24	21	26	--	21	33	30	30	27	23	24	--	--	--
	8	960	2034	3456	18	58	55	42	37	28	24	30	22	25	36	33	33	30	25	27	--	--	--
	10	1200	2542	4320	28	62	58	46	41	31	28	33	28	29	38	35	35	32	28	29	--	--	--
400	2	340	720	1224	1	37	46	28	26	20	-	--	--	--	22	19	19	-	-	-	--	--	--
	4	680	1441	2448	4	48	50	34	31	23	-	23	--	20	29	26	26	24	19	20	--	--	--
	6	1020	2161	3672	9	54	54	39	35	26	19	27	21	24	33	30	30	28	23	24	--	--	--
	8	1360	2881	4896	17	59	57	43	38	30	22	31	24	27	36	33	33	31	26	27	--	--	--
	10	1700	3602	6120	26	63	60	47	42	33	26	35	29	30	39	36	36	33	28	29	--	--	--

1. *Sound data is determined in a reverberation room at an independent sound laboratory, according to ISO3741 and ISO 5135 standards.*
2. *Lw in dB/Oct.(re 1pW) are sound power levels for discharge sound and case radiated sound. Figures less than 17 dB are indicated by "-".*
3. *The discharge sound pressure levels are determined with the assumptions as mentioned in table 1 for downstream ductwork including a diffuser with insulated plenum box.*
4. *The radiated sound pressure levels are determined with the assumptions as mentioned in table 1 for ceiling plenum and suspended ceiling absorption.*
5. *Lp values are including a room absorption of 10 dB/Oct.*
6. *dB(A), NC and NR index figures are sound pressure levels. Figures less than 20 are indicated by "- -".*
7. *ΔPs is static pressure drop across VAV air volume control terminal with damper fully open.*
8. *For non standard applications and/or selections, please contact our technical staff.*

Table 1 : Assumptions for additional attenuation

Hz	125	250	500	1K	2K	4K
Discharge (dB)	5	10	20	30	30	25
Radiated (dB)	2	5	10	15	15	20

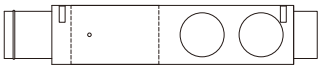
Table 2: Insertion Loss

Model	125	250	500	1K	2K	4K	Hz
100	9	10	11	13	15	15	dB
150	8	9	10	12	14	14	dB
200	8	8	9	11	13	13	dB
250	7	8	9	11	13	13	dB
315	7	8	9	11	13	13	dB
355	7	8	9	11	13	13	dB
400	7	8	9	11	13	13	dB

BARCOL-AIR

Compact VAV and CAV
air volume control terminals

Type NDROC



Sound data Δp = 250 Pa

Model	data refering to inlet spigot				min. ΔPs	Δp = 250 Pa																	
						discharge sound									radiated sound								
						L_w in dB/Oct. (re 1pW)						Lp values			L_w in dB/Oct. (re 1pW)						Lp values		
	Velocity	air volume				125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	dB(A)	NC	NR	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	dB(A)	NC	NR
	m/s	l/s	CFM	m^3/h	Pa	dB									dB								
100	2	40	85	144	2	36	36	27	23	18	-	--	--	--	21	-	-	-	-	-	--	--	--
	4	80	169	288	10	42	41	33	28	23	-	--	--	--	28	22	18	-	-	18	--	--	--
	6	120	254	432	22	46	45	36	32	27	-	--	--	--	32	26	22	20	20	22	--	--	--
	8	160	339	576	38	49	48	39	35	31	20	22	--	--	35	29	25	23	23	25	--	--	--
	10	200	424	720	60	51	51	42	37	34	23	25	--	21	38	32	28	25	25	27	--	--	--
150	2	60	127	216	2	33	35	28	24	21	-	--	--	--	24	19	18	-	-	-	--	--	--
	4	120	254	432	7	41	41	34	30	25	19	--	--	--	31	26	25	20	18	20	--	--	--
	6	180	381	648	15	46	45	37	34	28	22	--	--	--	35	30	29	24	22	24	--	--	--
	8	240	508	864	26	50	48	41	37	31	24	22	--	--	38	33	32	27	25	27	--	--	--
	10	300	636	1080	41	53	51	43	39	33	26	25	--	21	40	35	34	29	27	29	--	--	--
200	2	80	169	288	1	34	26	23	19	-	-	--	--	--	25	21	20	-	-	-	--	--	--
	4	160	339	576	6	43	37	32	27	21	-	--	--	--	32	28	27	22	19	21	--	--	--
	6	240	508	864	13	48	43	38	31	25	18	--	--	--	36	32	31	26	23	25	--	--	--
	8	320	678	1152	23	52	47	42	35	29	21	23	--	--	39	35	34	29	26	28	--	--	--
	10	400	847	1440	36	55	51	45	38	32	24	27	--	21	41	37	36	31	29	30	--	--	--
250	2	120	254	432	1	35	35	28	24	19	-	--	--	--	25	20	20	-	-	-	--	--	--
	4	240	508	864	5	44	43	36	30	24	18	--	--	--	32	27	27	22	20	21	--	--	--
	6	360	763	1296	11	50	48	41	34	28	22	22	--	--	36	31	31	26	24	25	--	--	--
	8	480	1017	1728	19	54	52	44	37	31	24	26	--	22	39	34	34	29	27	28	--	--	--
	10	600	1271	2160	30	57	55	47	40	33	27	29	22	25	41	37	37	31	29	30	--	--	--
315	2	180	381	648	1	39	42	27	26	23	-	--	--	--	27	24	24	19	-	-	--	--	--
	4	360	763	1296	5	48	48	34	32	28	20	22	--	--	34	31	31	26	22	23	--	--	--
	6	540	1144	1944	11	54	52	39	36	31	24	27	--	22	38	35	35	30	26	27	--	--	--
	8	720	1525	2592	19	59	56	43	39	34	27	31	23	26	41	38	38	33	29	30	--	--	--
	10	900	1907	3240	29	63	59	46	42	37	30	34	28	29	44	40	40	35	31	32	22	--	--
355	2	240	508	864	1	39	49	32	31	25	23	21	--	--	28	25	25	20	-	-	--	--	--
	4	480	1017	1728	4	49	53	38	35	28	25	25	20	23	35	32	32	27	22	24	--	--	--
	6	720	1525	2592	10	55	56	42	38	30	27	29	23	26	39	36	36	31	26	28	--	--	--
	8	960	2034	3456	18	60	58	45	41	33	30	32	26	28	42	39	39	34	29	31	20	--	--
	10	1200	2542	4320	28	64	61	48	44	35	32	35	30	31	44	41	41	36	32	33	23	--	--
400	2	340	720	1224	1	40	51	33	32	27	21	23	--	21	28	25	25	21	-	17	--	--	--
	4	680	1441	2448	4	50	55	39	36	30	23	27	22	25	35	32	32	28	23	24	--	--	--
	6	1020	2161	3672	9	56	58	43	39	32	25	31	25	28	39	36	36	32	27	28	--	--	--
	8	1360	2881	4896	17	61	60	46	42	35	28	34	28	31	42	39	39	35	30	31	21	--	--
	10	1700	3602	6120	26	65	63	49	45	37	30	37	31	33	45	42	42	37	32	33	23	--	--

1. *Sound data is determined in a reverberation room at an independent sound laboratory, according to ISO3741 and ISO 5135 standards.*
2. *Lw in dB/Oct.(re 1pW) are sound power levels for discharge sound and case radiated sound. Figures less than 17 dB are indicated by "-".*
3. *The discharge sound pressure levels are determined with the assumptions as mentioned in table 1 for downstream ductwork including a diffuser with insulated plenum box.*
4. *The radiated sound pressure levels are determined with the assumptions as mentioned in table 1 for ceiling plenum and suspended ceiling absorption.*
5. *Lp values are including a room absorption of 10 dB/Oct.*
6. *dB(A), NC and NR index figures are sound pressure levels. Figures less than 20 are indicated by "- -".*
7. *ΔPs is static pressure drop across VAV air volume control terminal with damper fully open.*
8. *For non standard applications and/or selections, please contact our technical staff.*

Table 1 : Assumptions for additional attenuation

Hz	125	250	500	1K	2K	4K
Discharge (dB)	5	10	20	30	30	25
Radiated (dB)	2	5	10	15	15	20

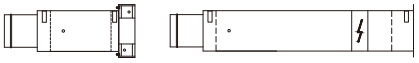
Table 2: Insertion Loss

Model	125	250	500	1K	2K	4K	Hz
100	9	10	11	13	15	15	dB
150	8	9	10	12	14	14	dB
200	8	8	9	11	13	13	dB
250	7	8	9	11	13	13	dB
315	7	8	9	11	13	13	dB
355	7	8	9	11	13	13	dB
400	7	8	9	11	13	13	dB

BARCOL-AIR

Compact VAV and CAV
air volume control terminals

Type NDROG NDRON



Sound data Δp = 125 Pa

Model	data refering to inlet spigot				min. ΔPs	discharge sound									radiated sound								
						Lw in dB/Oct.(re 1pW)						Lp values			Lw in dB/Oct.(re 1pW)						Lp values		
	Velocity	air volume				125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	dB(A)	NC	NR	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	dB(A)	NC	NR
	m/s	l/s	CFM	M3/H	Pa	dB									dB								
050	2	20	42	72	2	35	34	25	24	18	--	--	--	--	--	--	--	--	--	--	--	--	--
	4	40	85	144	8	39	40	33	30	25	--	--	--	--	20	--	--	--	--	--	--	--	--
	6	60	127	216	18	45	42	36	34	30	--	23	--	--	23	--	--	--	--	--	--	--	--
	8	80	169	288	32	48	46	37	36	36	23	28	--	--	27	--	--	--	--	--	--	--	--
	10	100	212	360	50	49	48	40	39	38	26	28	--	24	29	21	--	--	--	--	--	--	--
075	2	30	64	108	2	37	36	27	26	19	--	--	--	--	--	--	--	--	--	--	--	--	--
	4	60	127	216	8	41	40	33	32	26	--	--	--	--	21	--	--	--	--	--	--	--	--
	6	90	191	324	17	45	44	37	35	31	18	--	--	--	25	--	--	--	--	--	--	--	--
	8	120	254	432	31	49	48	39	39	37	23	26	--	--	28	21	--	--	--	20	--	--	--
	10	150	318	540	48	50	48	42	40	37	27	27	--	23	30	24	20	--	--	21	--	--	--
100	2	40	85	144	2	38	37	28	26	21	--	--	--	--	--	--	--	--	--	--	--	--	--
	4	80	169	288	8	44	43	34	31	27	--	--	--	--	22	--	--	--	--	--	--	--	--
	6	120	254	432	17	48	47	38	35	32	20	21	--	--	26	20	--	--	--	18	--	--	--
	8	160	339	576	30	51	50	41	38	35	24	24	--	--	29	23	19	19	19	21	--	--	--
	10	200	424	720	47	53	53	44	42	39	28	26	--	22	32	26	22	21	21	23	--	--	--
150	2	60	127	216	2	34	34	28	26	24	--	--	--	--	18	--	--	--	--	--	--	--	--
	4	120	254	432	7	41	40	33	32	28	21	--	--	--	25	20	19	--	--	--	--	--	--
	6	180	381	648	15	46	45	37	36	32	24	--	--	--	29	24	23	20	18	20	--	--	--
	8	240	508	864	26	50	48	41	39	35	27	22	--	--	32	27	26	23	21	23	--	--	--
	10	300	636	1080	41	53	51	44	42	37	30	26	--	21	34	29	28	25	23	25	--	--	--
200	2	80	169	288	2	24	27	25	22	18	--	--	--	--	19	--	--	--	--	--	--	--	--
	4	160	339	576	6	43	37	34	30	25	--	--	--	--	26	22	21	18	--	--	--	--	--
	6	240	508	864	14	48	43	39	34	29	21	--	--	--	30	26	25	22	20	21	--	--	--
	8	320	678	1152	25	52	47	43	38	33	24	23	--	--	33	29	28	25	22	24	--	--	--
	10	400	847	1440	39	55	51	46	40	36	27	26	--	20	35	31	30	27	25	26	--	--	--
250	2	120	254	432	1	36	36	29	27	22	--	--	--	--	19	--	--	--	--	--	--	--	--
	4	240	508	864	6	44	43	37	33	28	21	--	--	--	26	21	21	18	--	--	--	--	--
	6	360	763	1296	13	50	48	42	37	31	24	22	--	--	30	25	25	22	20	21	--	--	--
	8	480	1017	1728	23	53	52	45	40	34	27	26	--	21	33	28	28	25	23	24	--	--	--
	10	600	1271	2160	36	57	55	48	42	37	30	29	22	25	35	31	31	27	25	26	--	--	--
315	2	180	381	648	1	40	42	29	29	26	18	--	--	--	21	18	18	--	--	--	--	--	--
	4	360	763	1296	5	49	48	36	34	31	23	22	--	--	28	25	25	22	18	19	--	--	--
	6	540	1144	1944	12	55	53	41	39	35	27	27	--	22	32	29	29	26	22	23	--	--	--
	8	720	1525	2592	22	60	57	45	43	39	31	31	25	27	35	32	32	29	25	26	--	--	--
	10	900	1907	3240	34	64	60	48	46	42	34	35	30	31	38	34	34	31	27	28	--	--	--
355	2	240	508	864	1	40	49	33	33	27	24	20	--	--	22	19	19	--	--	--	--	--	--
	4	480	1017	1728	5	50	53	39	37	31	27	25	--	22	29	26	26	23	18	20	--	--	--
	6	720	1525	2592	12	56	56	43	41	34	30	29	23	26	33	30	30	27	23	24	--	--	--
	8	960	2034	3456	21	61	59	47	44	37	33	33	27	29	36	33	33	30	25	27	--	--	--
	10	1200	2542	4320	33	65	62	50	47	40	36	37	31	32	38	35	35	32	28	29	--	--	--
400	2	340	720	1224	1	41	51	34	34	29	22	22	--	20	22	19	19	--	--	--	--	--	--
	4	680	1441	2448	5	51	55	40	38	33	25	27	22	25	29	26	26	24	19	20	--	--	--
	6	1020	2161	3672	11	57	58	44	42	36	28	31	26	28	33	30	30	28	23	24	--	--	--
	8	1360	2881	4896	20	62	61	48	45	39	31	35	29	31	36	33	33	31	26	27	--	--	--
	10	1700	3602	6120	32	66	64	51	48	42	34	38	33	34	39	36	36	33	28	29	--	--	--

1. *Sound data is determined in a reverberation room at an independent sound laboratory, according to ISO3741 and ISO 5135 standards.*
2. *Lw in dB/Oct.(re 1pW) are sound power levels for discharge sound and case radiated sound. Figures less than 17 dB are indicated by "-".*
3. *The discharge sound pressure levels are determined with the assumptions as mentioned in table 1 for downstream ductwork including a diffuser with insulated plenum box.*
4. *The radiated sound pressure levels are determined with the assumptions as mentioned in table 1 for ceiling plenum and suspended ceiling absorption.*
5. *Lp values are including a room absorption of 10 dB/Oct.*
6. *dB(A), NC and NR index figures are sound pressure levels. Figures less than 20 are indicated by "- -".*
7. *ΔPs is static pressure drop across VAV air volume control terminal with damper fully open.*
8. *For non standard applications and/or selections, please contact our technical staff.*

Table 1 : Assumptions for additional attenuation

Hz	125	250	500	1K	2K	4K
Discharge (dB)	5	10	20	30	30	25
Radiated (dB)	2	5	10	15	15	20

Table 2: Insertion Loss

Model	125	250	500	1K	2K	4K	Hz
100	9	10	11	13	15	15	dB
150	8	9	10	12	14	14	dB
200	8	8	9	11	13	13	dB
250	7	8	9	11	13	13	dB
315	7	8	9	11	13	13	dB
355	7	8	9	11	13	13	dB
400	7	8	9	11	13	13	dB

9. *With reheat add the following to the ΔP above:*

Chart 1: Hot water reheat coil (470 fins per m).

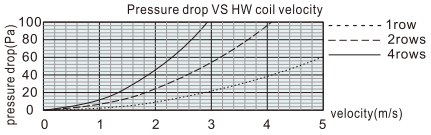
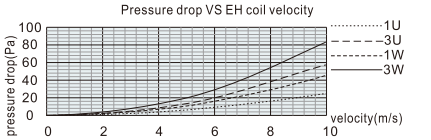


Chart 2: Electric heater finned tubular type.

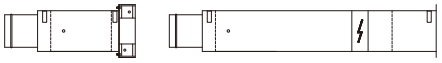


BARCOL-AIR

Changes w/o notice or obligation

Compact VAV and CAV
air volume control terminals

Type NDROG NDRON



Sound data Δp = 250 Pa

Model	data refering to inlet spigot				min. ΔPs	discharge sound									radiated sound								
						Lw in dB/Oct.(re 1pW)						Lp values			Lw in dB/Oct.(re 1pW)						Lp values		
	Velocity	air volume				125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	dB(A)	NC	NR	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	dB(A)	NC	NR
	m/s	l/s	CFM	M3/H	Pa	dB									dB								
050	2	20	42	72	2	38	40	33	29	27	--	--	--	--	20	--	--	--	--	--	--	--	--
	4	40	85	144	8	45	43	37	35	31	21	--	--	--	26	--	--	--	--	--	--	--	--
	6	60	127	216	18	50	44	40	37	34	26	20	--	--	30	25	--	--	--	--	--	--	--
	8	80	169	288	32	51	48	42	40	39	27	23	--	--	32	26	23	21	21	22	--	--	--
	10	100	212	360	50	52	54	43	42	45	33	27	20	24	36	29	26	23	23	24	--	--	--
075	2	30	64	108	2	40	41	33	30	29	17	--	--	--	20	--	--	--	--	--	--	--	--
	4	60	127	216	8	45	44	38	36	31	21	--	--	--	27	--	--	--	--	--	--	--	--
	6	90	191	324	17	50	44	41	38	35	26	21	--	--	31	25	20	--	--	20	--	--	--
	8	120	254	432	31	52	48	42	40	39	28	23	--	20	34	28	25	22	21	23	--	--	--
	10	150	318	540	48	53	55	45	43	44	33	27	20	24	37	30	26	23	23	25	--	--	--
100	2	40	85	144	2	40	41	34	31	28	--	--	--	--	21	--	--	--	--	--	--	--	--
	4	80	169	288	8	46	46	39	36	33	21	20	--	--	28	22	18	--	--	18	--	--	--
	6	120	254	432	17	50	50	42	39	37	25	23	--	--	32	26	22	20	20	22	--	--	--
	8	160	339	576	30	52	53	45	42	40	29	26	--	22	35	29	25	23	23	25	--	--	--
	10	200	424	720	47	54	55	47	44	43	32	28	22	25	38	32	28	25	25	27	--	--	--
150	2	60	127	216	2	38	40	34	32	32	26	--	--	--	24	19	18	--	--	--	--	--	--
	4	120	254	432	7	45	46	40	38	35	29	--	--	--	31	26	25	20	18	20	--	--	--
	6	180	381	648	15	50	49	43	41	38	31	23	--	--	35	30	29	24	22	24	--	--	--
	8	240	508	864	26	53	52	46	44	40	33	26	--	22	38	33	32	27	25	27	--	--	--
	10	300	636	1080	41	56	55	48	46	42	35	29	22	25	40	35	34	29	27	29	--	--	--
200	2	80	169	288	2	39	32	29	27	24	--	--	--	--	25	21	20	--	--	--	--	--	--
	4	160	339	576	6	47	41	38	35	31	23	--	--	--	32	28	27	22	19	21	--	--	--
	6	240	508	864	14	52	47	43	39	35	27	23	--	--	36	32	31	26	23	25	--	--	--
	8	320	678	1152	25	55	51	47	42	38	30	27	--	21	39	35	34	29	26	28	--	--	--
	10	400	847	1440	39	58	54	50	44	41	33	30	22	24	41	37	36	31	29	30	--	--	--
250	2	120	254	432	1	40	41	34	32	29	23	--	--	--	25	20	20	--	--	--	--	--	--
	4	240	508	864	6	48	48	42	38	34	28	22	--	--	32	27	27	22	20	21	--	--	--
	6	360	763	1296	13	53	53	46	42	37	31	27	20	23	36	31	31	26	24	25	--	--	--
	8	480	1017	1728	23	57	56	49	45	40	34	30	23	26	39	34	34	29	27	28	--	--	--
	10	600	1271	2160	36	60	59	52	47	42	36	33	27	29	41	37	37	31	29	30	--	--	--
315	2	180	381	648	1	43	47	34	35	33	26	20	--	--	27	24	24	19	--	--	--	--	--
	4	360	763	1296	5	52	53	40	40	37	30	26	20	23	34	31	31	26	22	23	--	--	--
	6	540	1144	1944	12	58	57	45	43	40	33	31	24	27	38	35	35	30	26	27	--	--	--
	8	720	1525	2592	22	62	60	48	46	43	36	34	28	30	41	38	38	33	29	30	--	--	--
	10	900	1907	3240	34	66	63	51	49	46	39	37	32	33	44	40	40	35	31	32	22	--	--
355	2	240	508	864	1	43	54	38	39	35	33	26	21	24	28	25	25	20	--	--	--	--	--
	4	480	1017	1728	5	53	58	44	43	38	35	30	25	28	35	32	32	27	22	24	--	--	--
	6	720	1525	2592	12	59	60	48	46	40	37	33	28	31	39	36	36	31	26	28	--	--	--
	8	960	2034	3456	21	63	63	51	48	42	39	36	31	33	42	39	39	34	29	31	20	--	--
	10	1200	2542	4320	33	67	65	53	51	44	41	39	34	35	44	41	41	36	32	33	23	--	--
400	2	340	720	1224	1	44	56	39	40	37	31	28	24	26	28	25	25	21	--	17	--	--	--
	4	680	1441	2448	5	54	60	45	44	40	33	32	28	30	35	32	32	28	23	24	--	--	--
	6	1020	2161	3672	11	60	62	49	47	42	35	35	31	33	39	36	36	32	27	28	--	--	--
	8	1360	2881	4896	20	64	65	52	49	44	37	38	33	35	42	39	39	35	30	31	21	--	--
	10	1700	3602	6120	32	68	67	54	52	46	39	41	36	37	45	42	42	37	32	33	23	--	--

1. *Sound data is determined in a reverberation room at an independent sound laboratory, according to ISO3741 and ISO 5135 standards.*
2. *Lw in dB/Oct.(re 1pW) are sound power levels for discharge sound and case radiated sound. Figures less than 17 dB are indicated by "-".*
3. *The discharge sound pressure levels are determined with the assumptions as mentioned in table 1 for downstream ductwork including a diffuser with insulated plenum box.*
4. *The radiated sound pressure levels are determined with the assumptions as mentioned in table 1 for ceiling plenum and suspended ceiling absorption.*
5. *Lp values are including a room absorption of 10 dB/Oct.*
6. *dB(A), NC and NR index figures are sound pressure levels. Figures less than 20 are indicated by "- -".*
7. *ΔPs is static pressure drop across VAV air volume control terminal with damper fully open.*
8. *For non standard applications and/or selections, please contact our technical staff.*

Table 1 : Assumptions for additional attenuation

Hz	125	250	500	1K	2K	4K
Discharge (dB)	5	10	20	30	30	25
Radiated (dB)	2	5	10	15	15	20

Table 2: Insertion Loss

Model	125	250	500	1K	2K	4K	Hz
100	9	10	11	13	15	15	dB
150	8	9	10	12	14	14	dB
200	8	8	9	11	13	13	dB
250	7	8	9	11	13	13	dB
315	7	8	9	11	13	13	dB
355	7	8	9	11	13	13	dB
400	7	8	9	11	13	13	dB

9. *With reheat add the following to the ΔP above:*

Chart 1: Hot water reheat coil (470 fins per m).

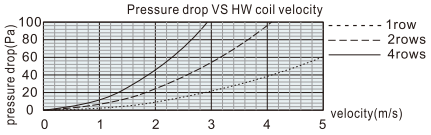
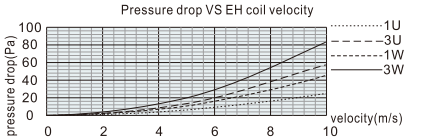
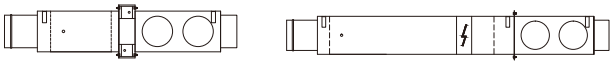


Chart 2: Electric heater finned tubular type.



Compact VAV and CAV
air volume control terminals

Type NDROJ NDROQ



Sound data Δp = 125 Pa

Model	data refering to inlet spigot				min. ΔPs	Δp = 125 Pa																	
						discharge sound									radiated sound								
						L_w in dB/Oct. (re 1pW)						Lp values			L_w in dB/Oct. (re 1pW)						Lp values		
	Velocity	air volume				125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	dB(A)	NC	NR	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	dB(A)	NC	NR
	m/s	l/s	CFM	m^3/h	Pa	dB									dB								
100	2	40	85	144	2	32	30	20	-	-	-	--	--	--	-	-	-	-	-	-	--	--	--
	4	80	169	288	10	38	36	26	21	-	-	--	--	--	22	-	-	-	-	-	--	--	--
	6	120	254	432	22	42	40	30	25	20	-	--	--	--	26	20	-	-	-	18	--	--	--
	8	160	339	576	38	45	43	33	28	23	-	--	--	--	29	23	19	19	19	21	--	--	--
	10	200	424	720	60	47	46	36	32	27	-	20	--	--	32	26	22	21	21	23	--	--	--
150	2	60	127	216	2	28	27	20	-	-	-	--	--	--	18	-	-	-	-	-	--	--	--
	4	120	254	432	7	35	33	25	22	-	-	--	--	--	25	20	19	-	-	-	--	--	--
	6	180	381	648	15	40	38	29	26	20	-	--	--	--	29	24	23	20	18	20	--	--	--
	8	240	508	864	26	44	41	33	29	23	-	--	--	--	32	27	26	23	21	23	--	--	--
	10	300	636	1080	41	47	44	36	32	25	18	--	--	--	34	29	28	25	23	25	--	--	--
200	2	80	169	288	1	28	20	-	-	-	-	--	--	--	19	-	-	-	-	-	--	--	--
	4	160	339	576	6	37	30	26	20	-	-	--	--	--	26	22	21	18	-	-	--	--	--
	6	240	508	864	13	42	36	31	24	17	-	--	--	--	30	26	25	22	20	21	--	--	--
	8	320	678	1152	23	46	40	35	28	21	-	--	--	--	33	29	28	25	22	24	--	--	--
	10	400	847	1440	36	49	44	38	30	24	-	20	--	--	35	31	30	27	25	26	--	--	--
250	2	120	254	432	1	30	29	21	-	-	-	--	--	--	19	-	-	-	-	-	--	--	--
	4	240	508	864	5	38	36	29	23	-	-	--	--	--	26	21	21	18	-	-	--	--	--
	6	360	763	1296	11	44	41	34	27	19	-	--	--	--	30	25	25	22	20	21	--	--	--
	8	480	1017	1728	19	47	45	37	30	22	-	--	--	--	33	28	28	25	23	24	--	--	--
	10	600	1271	2160	30	51	48	40	32	25	18	22	--	--	35	31	31	27	25	26	--	--	--
315	2	180	381	648	1	34	35	21	19	-	-	--	--	--	21	18	18	-	-	-	--	--	--
	4	360	763	1296	5	43	41	28	24	19	-	--	--	--	28	25	25	22	18	19	--	--	--
	6	540	1144	1944	11	49	46	33	29	23	-	21	--	--	32	29	29	26	22	23	--	--	--
	8	720	1525	2592	19	54	50	37	33	27	19	25	--	20	35	32	32	29	25	26	--	--	--
	10	900	1907	3240	29	58	53	40	36	30	22	29	22	24	38	34	34	31	27	28	--	--	--
355	2	240	508	864	1	34	42	25	23	-	-	--	--	--	22	19	19	-	-	-	--	--	--
	4	480	1017	1728	4	44	46	31	27	19	-	--	--	--	29	26	26	23	18	20	--	--	--
	6	720	1525	2592	10	50	49	35	31	22	18	23	--	--	33	30	30	27	23	24	--	--	--
	8	960	2034	3456	18	55	52	39	34	25	21	27	--	22	36	33	33	30	25	27	--	--	--
	10	1200	2542	4320	28	59	55	42	37	28	24	30	23	25	38	35	35	32	28	29	--	--	--
400	2	340	720	1224	1	35	44	26	24	17	-	--	--	--	22	19	19	-	-	-	--	--	--
	4	680	1441	2448	4	45	48	32	28	21	-	20	--	--	29	26	26	24	19	20	--	--	--
	6	1020	2161	3672	9	51	51	36	32	24	-	24	--	21	33	30	30	28	23	24	--	--	--
	8	1360	2881	4896	17	56	54	40	35	27	19	28	21	24	36	33	33	31	26	27	--	--	--
	10	1700	3602	6120	26	60	57	43	38	30	22	32	25	27	39	36	36	33	28	29	--	--	--

1. *Sound data is determined in a reverberation room at an independent sound laboratory, according to ISO3741 and ISO 5135 standards.*
2. *Lw in dB/Oct.(re 1pW) are sound power levels for discharge sound and case radiated sound. Figures less than 17 dB are indicated by "-".*
3. *The discharge sound pressure levels are determined with the assumptions as mentioned in table 1 for downstream ductwork including a diffuser with insulated plenum box.*
4. *The radiated sound pressure levels are determined with the assumptions as mentioned in table 1 for ceiling plenum and suspended ceiling absorption.*
5. *Lp values are including a room absorption of 10 dB/Oct.*
6. *dB(A), NC and NR index figures are sound pressure levels. Figures less than 20 are indicated by "- -".*
7. *ΔPs is static pressure drop across VAV air volume control terminal with damper fully open.*
8. *For non standard applications and/or selections, please contact our technical staff.*

Table 1 : Assumptions for additional attenuation

Hz	125	250	500	1K	2K	4K
Discharge (dB)	5	10	20	30	30	25
Radiated (dB)	2	5	10	15	15	20

Table 2: Insertion Loss

Model	125	250	500	1K	2K	4K	Hz
100	9	10	11	13	15	15	dB
150	8	9	10	12	14	14	dB
200	8	8	9	11	13	13	dB
250	7	8	9	11	13	13	dB
315	7	8	9	11	13	13	dB
355	7	8	9	11	13	13	dB
400	7	8	9	11	13	13	dB

9. *With reheat add the following to the ΔP above:*

Chart 1: Hot water reheat coil (470 fins per m).

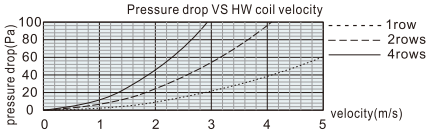
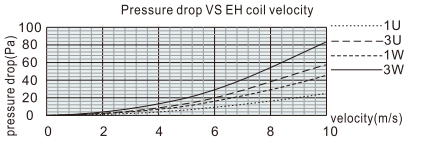


Chart 2: Electric heater finned tubular type.



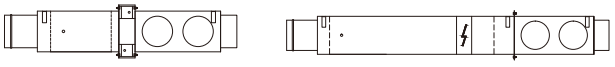
BARCOL-AIR

Changes w/o notice or obligation

Rev 240613

Compact VAV and CAV
air volume control terminals

Type NDROJ NDROQ



Sound data Δp = 250 Pa

Model	data refering to inlet spigot				min. ΔPs	Δp = 250 Pa																	
						discharge sound									radiated sound								
						L_w in dB/Oct. (re 1pW)						Lp values			L_w in dB/Oct. (re 1pW)						Lp values		
	Velocity	air volume				125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	dB(A)	NC	NR	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	dB(A)	NC	NR
	m/s	l/s	CFM	m^3/h	Pa	dB									dB								
100	2	40	85	144	2	34	34	26	21	-	-	--	--	--	21	-	-	-	-	-	--	--	--
	4	80	169	288	10	40	39	31	26	21	-	--	--	--	28	22	18	-	-	18	--	--	--
	6	120	254	432	22	44	43	34	29	25	-	--	--	--	32	26	22	20	20	22	--	--	--
	8	160	339	576	38	46	46	37	32	28	-	--	--	--	35	29	25	23	23	25	--	--	--
	10	200	424	720	60	48	48	39	34	31	20	22	--	--	38	32	28	25	25	27	--	--	--
150	2	60	127	216	2	32	33	26	22	20	-	--	--	--	24	19	18	-	-	-	--	--	--
	4	120	254	432	7	39	39	32	28	23	17	--	--	--	31	26	25	20	18	20	--	--	--
	6	180	381	648	15	44	42	35	31	26	19	--	--	--	35	30	29	24	22	24	--	--	--
	8	240	508	864	26	47	45	38	34	28	21	20	--	--	38	33	32	27	25	27	--	--	--
	10	300	636	1080	41	50	48	40	36	30	23	22	--	--	40	35	34	29	27	29	--	--	--
200	2	80	169	288	1	33	25	21	17	-	-	--	--	--	25	21	20	-	-	-	--	--	--
	4	160	339	576	6	41	34	30	25	19	-	--	--	--	32	28	27	22	19	21	--	--	--
	6	240	508	864	13	46	40	35	29	23	-	--	--	--	36	32	31	26	23	25	--	--	--
	8	320	678	1152	23	49	44	39	32	26	18	20	--	--	39	35	34	29	26	28	--	--	--
	10	400	847	1440	36	52	47	42	34	29	21	23	--	--	41	37	36	31	29	30	--	--	--
250	2	120	254	432	1	34	34	26	22	-	-	--	--	--	25	20	20	-	-	-	--	--	--
	4	240	508	864	5	42	41	34	28	22	-	--	--	--	32	27	27	22	20	21	--	--	--
	6	360	763	1296	11	47	46	38	32	25	19	20	--	--	36	31	31	26	24	25	--	--	--
	8	480	1017	1728	19	51	49	41	35	28	22	23	--	--	39	34	34	29	27	28	--	--	--
	10	600	1271	2160	30	54	52	44	37	30	24	26	--	21	41	37	37	31	29	30	--	--	--
315	2	180	381	648	1	37	40	26	25	21	-	--	--	--	27	24	24	19	-	-	--	--	--
	4	360	763	1296	5	46	46	32	30	25	18	20	--	--	34	31	31	26	22	23	--	--	--
	6	540	1144	1944	11	52	50	37	33	28	21	24	--	--	38	35	35	30	26	27	--	--	--
	8	720	1525	2592	19	56	53	40	36	31	24	28	20	23	41	38	38	33	29	30	--	--	--
	10	900	1907	3240	29	60	56	43	39	34	27	31	24	26	44	40	40	35	31	32	22	--	--
355	2	240	508	864	1	37	47	30	29	23	21	--	--	--	28	25	25	20	-	-	--	--	--
	4	480	1017	1728	4	47	51	36	33	26	23	23	--	20	35	32	32	27	22	24	--	--	--
	6	720	1525	2592	10	53	53	40	36	28	25	27	20	23	39	36	36	31	26	28	--	--	--
	8	960	2034	3456	18	57	56	43	38	30	27	30	23	26	42	39	39	34	29	31	20	--	--
	10	1200	2542	4320	28	61	58	45	41	32	29	33	26	28	44	41	41	36	32	33	23	--	--
400	2	340	720	1224	1	38	49	31	30	25	19	21	--	--	28	25	25	21	-	17	--	--	--
	4	680	1441	2448	4	48	53	37	34	28	21	25	--	23	35	32	32	28	23	24	--	--	--
	6	1020	2161	3672	9	54	55	41	37	30	23	28	--	25	39	36	36	32	27	28	--	--	--
	8	1360	2881	4896	17	58	58	44	39	32	25	31	21	28	42	39	39	35	30	31	21	--	--
	10	1700	3602	6120	26	62	60	46	42	34	27	34	25	30	45	42	42	37	32	33	23	--	--

1. Sound data is determined in a reverberation room at an independent sound laboratory, according to ISO3741 and ISO 5135 standards.
2. Lw in dB/Oct.(re 1pW) are sound power levels for discharge sound and case radiated sound. Figures less than 17 dB are indicated by "-".
3. The discharge sound pressure levels are determined with the assumptions as mentioned in table 1 for downstream ductwork including a diffuser with insulated plenum box.
4. The radiated sound pressure levels are determined with the assumptions as mentioned in table 1 for ceiling plenum and suspended ceiling absorption.
5. Lp values are including a room absorption of 10 dB/Oct.
6. dB(A), NC and NR index figures are sound pressure levels. Figures less than 20 are indicated by "- -".
7. ΔPs is static pressure drop across VAV air volume control terminal with damper fully open.
8. For non standard applications and/or selections, please contact our technical staff.

Table 1 : Assumptions for additional attenuation

Hz	125	250	500	1K	2K	4K
Discharge (dB)	5	10	20	30	30	25
Radiated (dB)	2	5	10	15	15	20

Table 2: Insertion Loss

Model	125	250	500	1K	2K	4K	Hz
100	9	10	11	13	15	15	dB
150	8	9	10	12	14	14	dB
200	8	8	9	11	13	13	dB
250	7	8	9	11	13	13	dB
315	7	8	9	11	13	13	dB
355	7	8	9	11	13	13	dB
400	7	8	9	11	13	13	dB

9. With reheat add the following to the ΔP above:

Chart 1: Hot water reheat coil (470 fins per m).

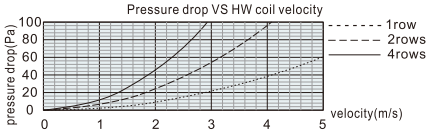
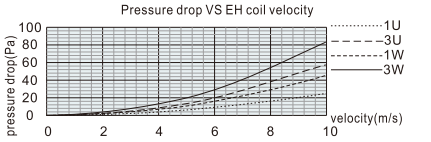


Chart 2: Electric heater finned tubular type.



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