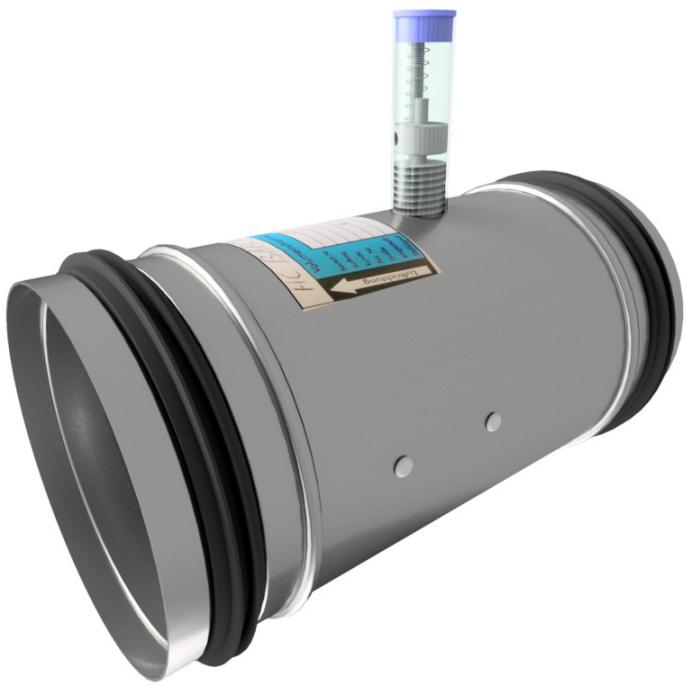




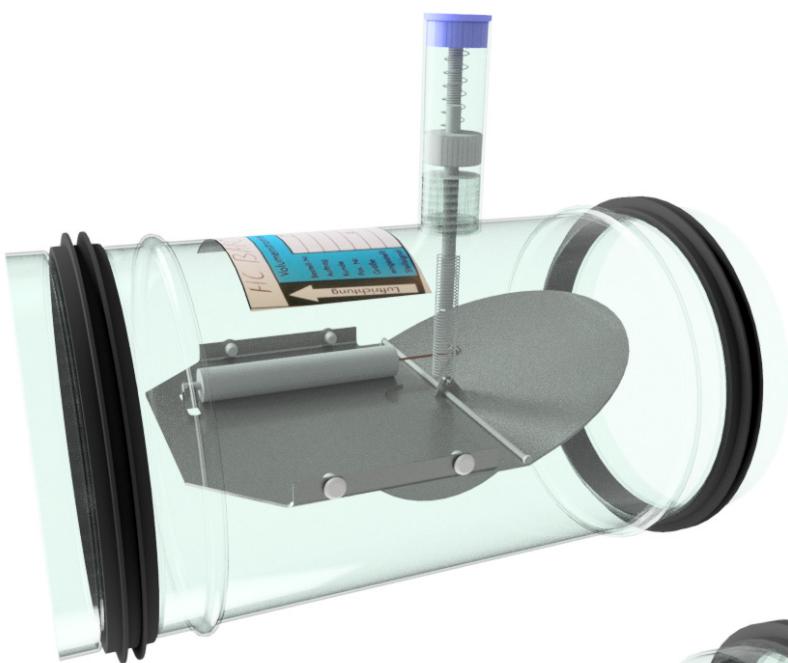
## CIRCULAR CAV AIR VOLUME CONTROL TERMINALS SYSTEM POWERED MECHANICAL REGULATOR

NR | NT TYPE





*type NROBOVO*



*Transparent renders of the NROBOVO*

# Circular CAV air volume control terminals

## type designation

Type      NR  
          NT

### Composition type designation:

**N - R - O - B - O - V - O**

#### **N** Position 1: Product group

N = constant air volume terminal

#### **R** Position 2: Function

O = not applicable

R = single wall, circular CAV terminals with system powered mechanical regulator

T = double wall, circular CAV terminals with system powered mechanical regulator

1 = non standard, specify separately

#### Ordering example:

**N R O B O V O**

See above

**0 2 0 0**

Model

**Q 6 5 0**

Air volume (m<sup>3</sup>/h)

#### **O** Position 3: Control

O = system powered, mechanical regulator (standard)

1 = non standard, specify separately

#### **B** Position 4: Outlet

O = not applicable

B = circular outlet

C = 4 circular outlets ('Octopus')

G = rectangular outlet and provision for integral hot water reheat coil

H = Circular 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

P = circular outlet and provision for integral electric reheat coil

Q = 4 circular outlets and provision for integral electric reheat coil

1 = non standard, specify separately

#### **O** Position 5: Reheat coil

O = without reheat coil

A = 1-row hot water reheat coil

B = 2-row hot water reheat coil

D = 4-row hot water reheat coil

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

T = 230VAC-1Ph Modulating control (Thyristor)

V = 400VAC-3Ph Modulating control (Thyristor)

1 = non standard, specify separately

#### Ordering information:

##### Standard terminals:

- quantity of terminals
- complete 7 digit code
- terminal size or model
- air volume setting (Q) in m<sup>3</sup>/h
- control handing (standard right side)
- if applicable, electric reheat coil capacity

##### Non standard terminals:

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

#### Ordering codes "Specials"

N..1... - 3010	=	4 balancing dampers in 'Octopus' outlet
N..1... - 3006	=	'Octopus' with 6 outlets instead of 4
N..1... - 3016	=	'Octopus' with 6 outlets incl. balancing dampers
N..1... - FL	=	Flange connection 30 mm for rectangular outlet

#### **V** Position 6: Controls (type & function)

O = not applicable

V = factory pre-set with provision for site adjustment across the full volume range

1 = non standard, specify separately

#### **O** Position 7: Finish

O = standard finish (galvanized steel)

E = epoxy coating

1 = non standard, specify separately

**Technical data****Type N(R/T).....****Application**

N(R/T) series circular, constant volume terminals with system powered mechanical regulator are designed to keep a constant air flow, independent of the inlet static pressure without the use of a DDC CAV/VAV controller/actuator. These terminals save commissioning time on site and are suitable either for supply or return air in new or refurbishment projects.

**Features:**

- Single wall or double wall.
- Pressure independent from 50 – 1000 Pa.
- Compact design.
- Low pressure loss over the terminal.
- Control accuracy  $\pm 10\%$  (in the recommended flow range).
- Control accuracy for air volumes below 100 m<sup>3</sup>/h will be  $\pm 10\text{m}^3/\text{h}$ .
- Temperature insensitive (-30°C to +100°C).
- Can be mounted in any position.
- Factory pre-set, saves commissioning time on site.
- Provision for on-site adjustment across the full volume range.
- Maintenance free.
- Factory fitted discharge plenum with built-in hot water or electric reheat coil.
- Low noise production.
- Casing air leakage complying to NEN-EN 1751 class C.

**Technical information****Casing:**

- Terminal casing made of galvanized sheet steel (non spiral) with sleeve connection with rubber gasket.
- Optional: finish with epoxy/RAL coating is available upon request.
- Casing air leakage complying to NEN-EN 1751 class C, Class II VDI 3803 or DIN 24 194.
- Duct-sleeve connections at the in- and outlet are suitable for DIN 24 145 or DIN 24 146 connections.
- In case of double wall construction 25 mm insulation material is used completely enclosed by the double wall construction.
- Type NROB is optionally available in SS 304 or SS 316 (add. cost)

**Damper:**

- The damper blade is mounted in a smooth and maintenance-free PTFE bushing.
- A pneumatic piston damper prevents overshoots and oscillation of the control plate and ensures an accurate response and control behaviour.
- Damper blade: aluminium.
- Damper shaft: stainless steel with self lubricating Nylon bearings.

**Discharge plenum:**

- Made of galvanized sheet steel with 13 mm internal insulation (30 kg/m<sup>3</sup>).
- Plenum with standard rectangular or multiple outlet (4 x circular) outlet construction. Optional single, double, triple or six circular outlets possible.
- Outlet spigots are made of flame retardant polymer and optionally can be provided with volume control balancing dampers made of galvanized sheet steel.

**Reheat coil:**

- Choice of 1-, 2- or 4-row hot water reheat coil or electric reheat coil (230VAC/1-phase or 400VAC/3-phase).
- More detailed technical information can be found in the separate NO...- type documentation.

**Controls:**

- The factory setpoint is indicated on the pre-calibrated terminal.
- If the CAV terminal is equipped with a electric or hot water reheat coil, separate temperature control is required.

**Finish:**

- Standard finish galvanized steel.
- Optional: finish with epoxy/RAL coating is available upon request.
- Type NROB is optionally available in SS 304 or SS 316 (add. cost)

**Delivery format:**

- The constant air volume (\*Q in increments of 5 m<sup>3</sup>/h) and other necessary calibration data must be provided together with the purchase order.

**Specify as****Example:**

Supply and install, circular, pressure independent constant air volume terminals with system powered mechanical regulator; control accuracy  $\pm 10\%$  of CAV. The construction shall be galvanized steel with a casing leakage rate classified according to class II, VDI 3803/DIN 24 194.

The CAV terminals shall have an aluminium damper blade with stainless steel shaft rotating in self lubricating Nylon bearings.

The damper blade is mounted in a smooth and maintenance-free PTFE bushing. A pneumatic piston damper prevents overshoots and oscillation of the control plate and ensures an accurate response and control behaviour.

Air volume 161 l/s

Terminal size 200 mm

Max. pressure loss 60 Pa

Max. discharge sound index < NC35 (@250Pa Δ p)

Max. radiated sound index < NC28 (@250Pa Δ p)

Barcol-Air control type "V", factory set with provision for site adjustment across the full volume range.

Ordering example : type – model – airflow (m<sup>3</sup>/h) = NROBOVO - 0200 - Q580 (= 161 l/s)

Barcol-Air type NROBOVO.

Type N(R/T).....



### Installation instructions:

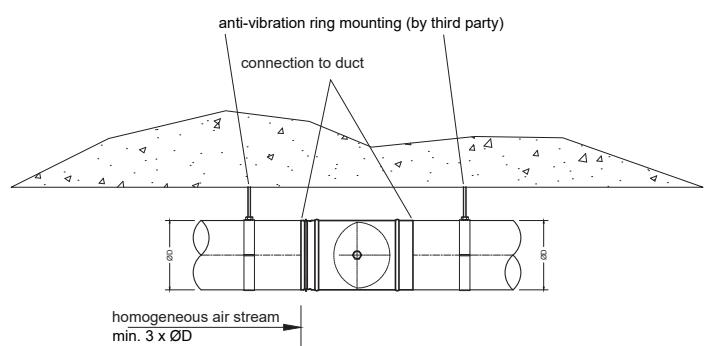
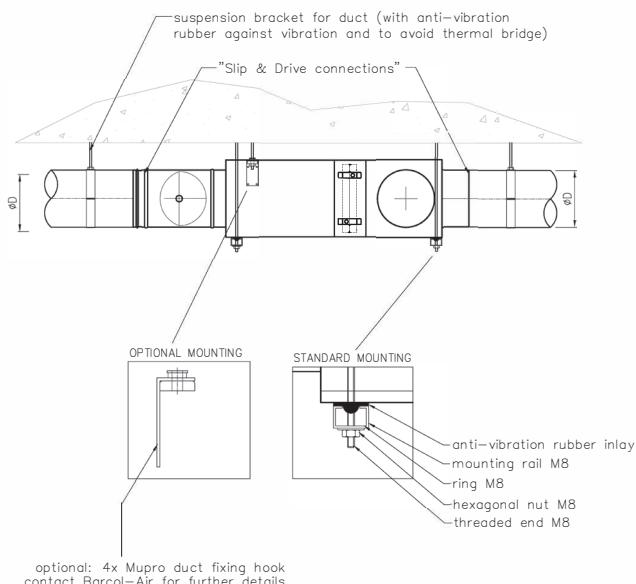
The Barcol-Air CAV terminals shall be installed using at least two support brackets (DIN-rail or L-profile), with anti-vibration rubber under the terminal. Each of these brackets shall be fixed with two threaded rods to the ceiling slab above.

Optional 4 x Mupro fixing hooks can be used (see drawing).

This installation method:

- 1 Shall prevent the body of the CAV terminal from high mechanical tension, which could damage the construction and performance of the terminal.
- 2 Shall prevent torsion on the CAV terminals, which could cause malfunction of the damper blades.
- 3 Provides some flexibility to the final location of the CAV terminals.
- 4 Use at least 3x diagonal straight duct length before the CAV inlet.
- 5 Additional manual volume control dampers (VCD's) before the inlet are not required / recommended!!
6. All connections shall be thermally isolated.

Installation of circular CAV terminals can be done in a similar way, with the only assumption that two circular support brackets with anti-vibration rubber (installation clamps) instead of DIN-rail or L-profile shall be used. To prevent the VAV terminal from rotation, we recommend to use a complete clamp (support + top bracket), so that the terminal is 'clamped' in between.



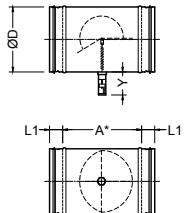
Mounting drawing type NROJ...

Mounting drawing type NROB...

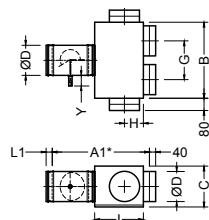
Type NR  
NT

# Circular CAV air volume control terminals

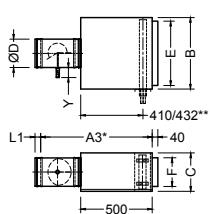
## Dimensions NR units



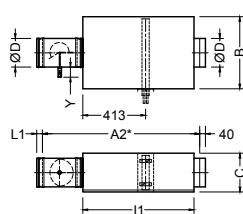
Type NROBOVO



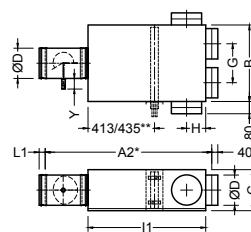
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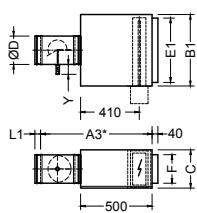
Type NROG.VO



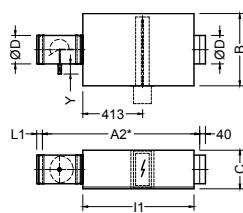
Type NROH.VO



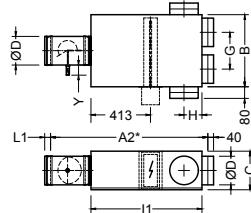
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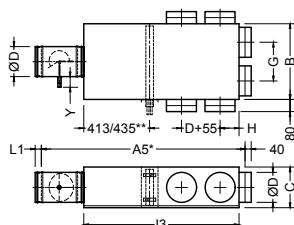
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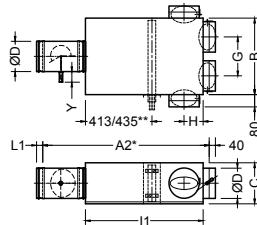
Type NROP.VO



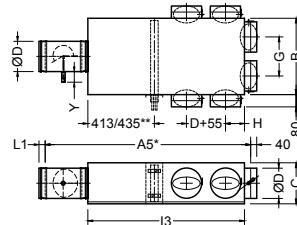
Type NROQ.VO



Type NROJ... - 3006



Type NROJ... - 3010



Type NROJ... - 3016

### Notes:

1. All dimensions in mm.
2. \*\* = Size varies with a 1-/2-row or 4-row hot water reheat coil.

# Circular CAV air volume control terminals

## Dimensions NR units

Type

NR  
NT



Type NROBOVO



Type NROCOVO



Type NROG/H.VO



Type NROJ.VO

### Dimensions

Model	80	100	125	140	160	200	250	315	400
A*	120	170	170	170	240	240	240	220	295
A1*	470	520	520	520	590	640	690	720	895
A2*	920	970	970	970	1040	1090	1140	1170	1345
A3*	660	710	710	710	780	780	780	760	835
A4*	625	675	700	735	805	895	995	1090	1350
A5*	1075	1125	1150	1185	1255	1345	1445	1540	1800
B	330	330	330	400	400	500	600	740	910
B1	330	330	330	400	400	400	600	600	600
C	228	228	228	248	248	268	318	408	458
ØD	78	98	123	138	158	198	248	313	398
E	275	275	275	350	350	450	550	690	850
E1	275	275	275	350	350	350	550	550	550
F	170	170	170	175	175	200	250	330	380
G	180	180	180	215	215	255	305	370	455
H	125	125	125	125	125	125	175	200	250
I	270	270	270	270	270	320	370	420	520
I1	720	720	720	720	720	770	820	870	970
I2	425	425	450	485	485	575	675	790	975
I3	875	875	900	935	935	1025	1125	1240	1425
L1	40	40	40	40	40	40	40	60	60
Y	70	70	70	70	70	70	70	110	110
Y1	85	85	85	85	85	85	85	125	125
J	155	155	155	155	155	155	155	155	230
K	105	105	105	105	105	105	105	105	160

### Notes:

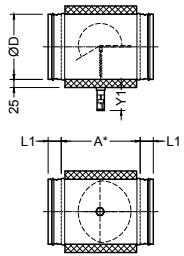
1. All dimensions in mm.
2. Other dimensions available on request
3. \* = Installed length.

Model Ø	CAV air volume range								
	I/s		CFM		m³/h				
	Min	Max	Min	Max	Min	Max			
80	11	-	35	24	-	74	40	-	125
100	19	-	61	41	-	129	70	-	220
125	28	-	78	59	-	165	100	-	280
140	42	-	111	88	-	235	150	-	400
160	50	-	139	106	-	294	180	-	500
200	69	-	250	147	-	529	250	-	900
250	139	-	417	294	-	882	500	-	1500
315	222	-	778	471	-	1647	800	-	2800
400	278	-	1111	588	-	2353	1000	-	4000

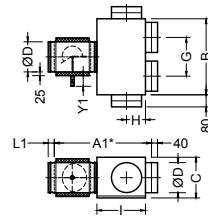
Type NR  
NT

## Circular CAV air volume control terminals

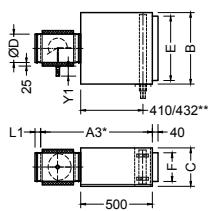
### Dimensions NT units



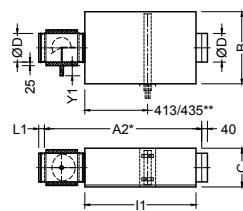
Type NTOBOVO



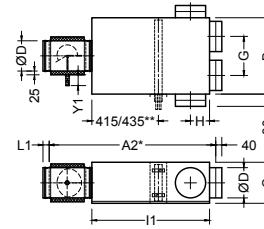
Type NTOCOVO



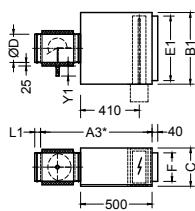
Type NTOG.VO



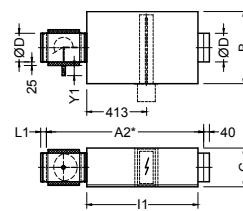
Type NTOH.VO



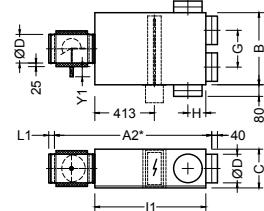
Type NTOJ.VO



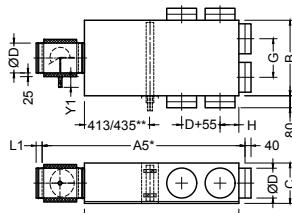
Type NTON.VO



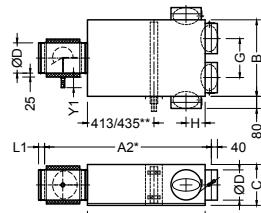
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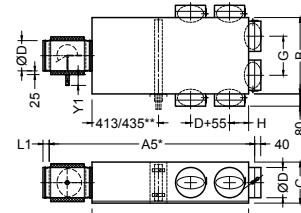
Type NTOQ.VO



Type NTOJ... - 3006



Type NTOJ... - 3010



Type NTOJ... - 3016

#### Notes:

1. All dimensions in mm.
2. \*\* = Size varies with a 1-/2-row or 4-row hot water reheat coil.

## Dimensions

Model	<b>80</b>	<b>100</b>	<b>125</b>	<b>160</b>	<b>200</b>	<b>250</b>	<b>315</b>	<b>400</b>
<b>A*</b>	135	165	165	165	235	235	235	225
<b>A1*</b>	485	515	515	515	585	635	685	725
<b>A2*</b>	935	965	965	965	1035	1085	1135	1175
<b>A3*</b>	675	705	705	705	775	775	775	765
<b>A4*</b>	640	670	695	730	800	890	990	1095
<b>A5*</b>	1090	1120	1145	1180	1250	1340	1440	1545
<b>B</b>	330	330	330	400	400	500	600	740
<b>B1</b>	330	330	330	400	400	400	600	600
<b>C</b>	228	228	228	248	248	268	318	408
<b>ØD</b>	78	98	123	138	158	198	248	313
<b>E</b>	275	275	275	350	350	450	550	690
<b>E1</b>	275	275	275	350	350	350	550	550
<b>F</b>	170	170	170	175	175	200	250	330
<b>G</b>	180	180	180	215	215	255	305	370
<b>H</b>	125	125	125	125	125	125	175	200
<b>I</b>	270	270	270	270	270	320	370	420
<b>I1</b>	720	720	720	720	720	770	820	870
<b>I2</b>	425	425	450	485	485	575	675	790
<b>I3</b>	875	875	900	935	935	1025	1125	1240
<b>L1</b>	40	40	40	40	40	40	40	60
<b>Y</b>	70	70	70	70	70	70	70	110
<b>Y1</b>	85	85	85	85	85	85	85	125
<b>J</b>	155	155	155	155	155	155	155	155
<b>K</b>	105	105	105	105	105	105	105	105

## Notes:

1. All dimensions in mm.
2. Other dimensions available on request
3. \* = Installed length.

















### Adjusting the air volume of a constant-volume-terminal



The Barcol-Air constant-air-volume-terminals, type NR / NT are factory pre-set on the desired air volume. The air volume can be changed within the ranges of the unit and read on a scale. Adjustment goes manually by Allen key.

Model <b>Ø</b>	CAV air volume range								
	l/s		CFM		m <sup>3</sup> /h				
	Min	Max	Min	Max	Min	Max			
80	11	-	35	24	-	74	40	-	125
100	19	-	61	41	-	129	70	-	220
125	28	-	78	59	-	165	100	-	280
140	42	-	111	88	-	235	150	-	400
160	50	-	139	106	-	294	180	-	500
200	69	-	250	147	-	529	250	-	900
250	139	-	417	294	-	882	500	-	1500
315	222	-	778	471	-	1647	800	-	2800
400	278	-	1111	588	-	2353	1000	-	4000

### Adjusting the air volume

The image at the right shows a mechanical CAV terminal with the scale marking. At the upperside of the scale marking the air volume can be adjusted with an Allen key (2mm).

#### Accuracy

The volume flow controller is a mechanical self-powered unit and works without external power supply. A damper blade with low-friction bearings is adjusted by aerodynamic forces such that the set volume flow rate is maintained within the differential pressure range.

Over the entire pressure range, the flow rate deviation is  $\pm 10\%$  (less than 100 m<sup>3</sup> / h  $\pm 10$  m<sup>3</sup>/h).

For small air velocities below 4 m/s, the flow rate deviation can easily be larger than indicated above. Unfavourable flow conditions, pollution or minor bracing during installation can also cause larger deviations.





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