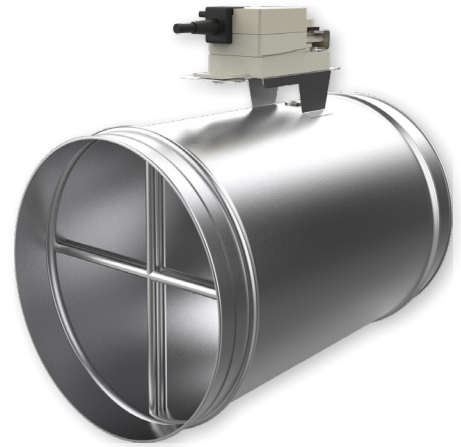


# CIRCULAR VARIABLE AIR VOLUME DAMPER

## RCVS / RCVS-I

The RCVS / RCVS-I damper is a circular variable air volume (VAV) damper. It regulates the airflows in a building for both supply and exhaust air. It is possible to control the airflow renewal according to a setpoint: temperature, air quality, external signal, and BMS...

The RCVS / RCVS-I are essential for fresh air management in commercial buildings (offices, meeting rooms) and schools. Customizable and available with specific options (special coatings, insulation, etc.), it will meet all your needs.



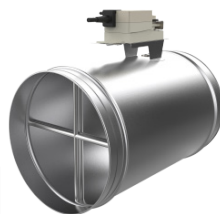
### CODIFICATION

- RC** —> RC range - Circular damper
- X** —> V - Variable air volume damper
- Y** —> S - Airtight
- Z** —> I - Insulated

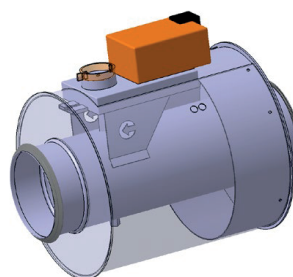
### CONSTRUCTION

Blades
Galvanized steel EPDM gaskets

Actuators
Belimo LMV D3 MF Option : MP, Modbus or BACnet protocol Specialized actuator manufacturers



Casing
Galvanized steel EPDM gasket



Option
Acoustic enclosure Mineral wool, thickness 25 mm Protection

### AVANTAGES

- **Flexibility** : factory set products or configured on site
- **Reliability** : Belimo actuator In standard  
Measurement range from 1 to 12 m/s
- **Adaptability** : Several functions available : VAV, CAV, ON/OFF, ...  
analogic signal, Modbus RTU or Bacnet MS/TP

# CIRCULAR VARIABLE AIR VOLUME DAMPER

## RCVS / RCVS-I

### TECHNICAL CHARACTERISTICS

	RCVS / RCVS-I
Upstream/downstream airtightness (EN1751)	Class 3
Frame airtightness (EN 1751)	Class C
Sizes	Ø100 to Ø400
Operating range	air velocity from 1 to 12 m/s Pressure : from 5 to 1000 Pa
Operating temperature	From -20°C to +80°C
Actuator	LMV D3 – NMV D3 – Belimo standard On request : specific manufacturers
Analogic control signal	Signal 0-10V or 2-10V DC
Communication	MPbus, Modbus RTU, Bacnet MS/TP
Option	Acoustic enclosure (mineral wool, thickness 25 mm) and protection plate

### ACCESSORIES



SON0008

Room CO<sub>2</sub> sensor  
configurable via NFC  
with display



SON0010

Room CO<sub>2</sub> sensor  
configurable via NFC  
without display



SON0004

Duct CO<sub>2</sub> sensor  
configurable in duct  
*Remote control BOI0021  
necessary for configuration*



SON0003

Presence sensor



BOI0022

Room controller with  
temperature  
*possible pairing with CO<sub>2</sub> sensor  
(room or duct)*



TEL0001

Remote control for actuator  
configuration - ZTH

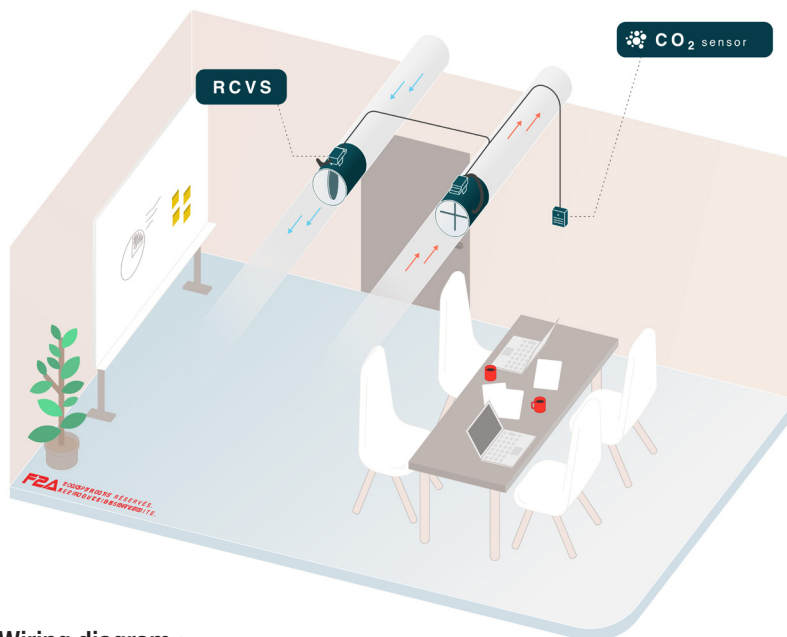
# CIRCULAR VARIABLE AIR VOLUME DAMPER

## RCVS / RCVS-I

### OPERATING PRINCIPLES

#### Supply and exhaust air controlled by an room CO<sub>2</sub> sensor

Both RCVS are controlled by an external 0-10V signal from an room CO<sub>2</sub> sensor.



#### At supply and return:

The CO<sub>2</sub> sensor sends a 0-10V signal based on the measured CO<sub>2</sub> level in the room. The dampers regulate the airflow between minimum and maximum setpoint according to the control signal sent by the CO<sub>2</sub> sensor. Linear regulation between minimum and maximum setpoints.

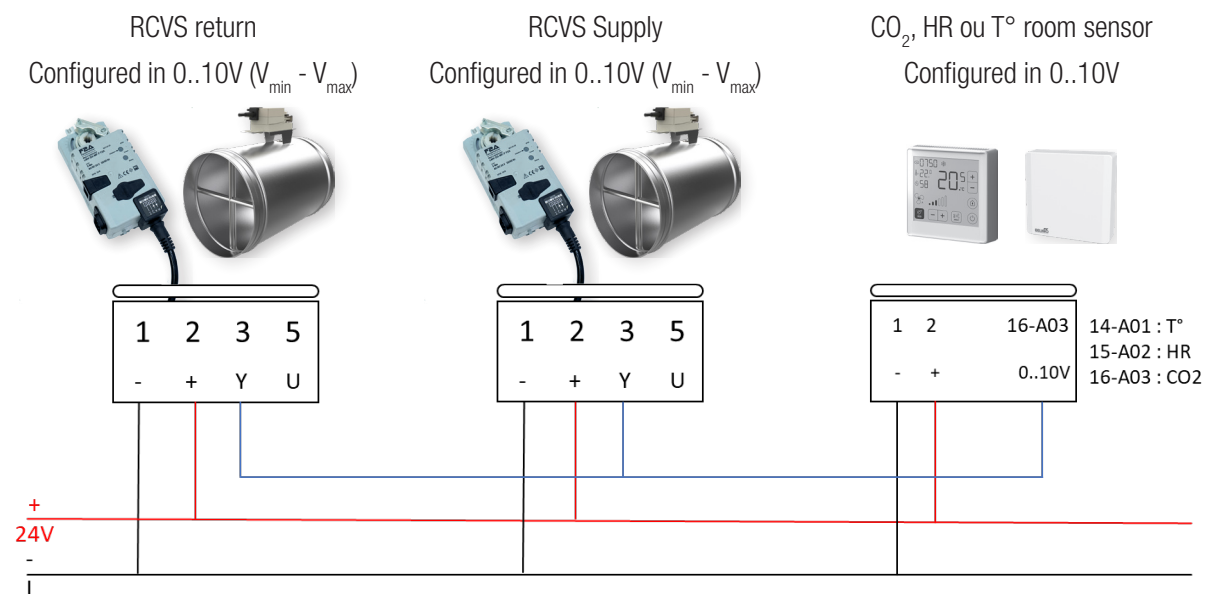
#### Wiring diagram :

CO<sub>2</sub> sensor configured at 0-10V over the 500-1200 ppm range.

RCVS configured with a 0-10V signal and an airflow range of 30-300 m<sup>3</sup>/h.

The CO<sub>2</sub> sensor records a level of 800 ppm and transmits it as a 5V signal to the dampers.

The dampers interpret 5V as a setpoint of 165 m<sup>3</sup>/h.



**Note :** for modulating operation with tight closure, the damper should be set to 2-10V. The damper will close tightly if the signal received at 3-Y is 0V.

The parameters are factory set and can be modified on site with the TEL0001 remote control

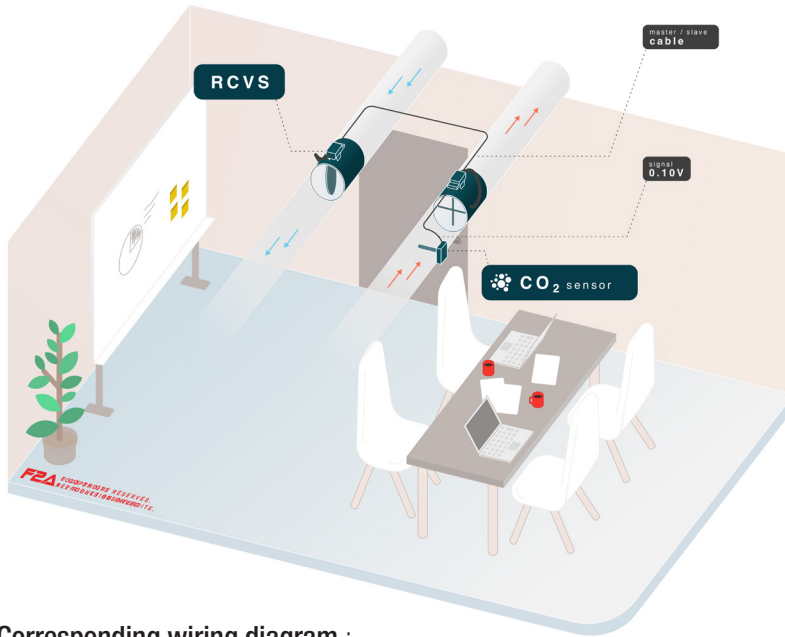
# CIRCULAR VARIABLE AIR VOLUME DAMPER

## RCVS / RCVS-I

### OPERATING PRINCIPLES

#### Supply and Exhaust air controlled by a duct CO<sub>2</sub> sensor

Both RCVS are controlled by an external 0-10V signal from a duct CO<sub>2</sub> sensor



#### For supply and exhaust :

The CO<sub>2</sub> sensor sends a 0-10V signal based on the measured CO<sub>2</sub> level in the room. The dampers regulate the airflow between minimum and maximum setpoint according to the control signal sent by the CO<sub>2</sub> sensor. Linear regulation between minimum and maximum setpoints.

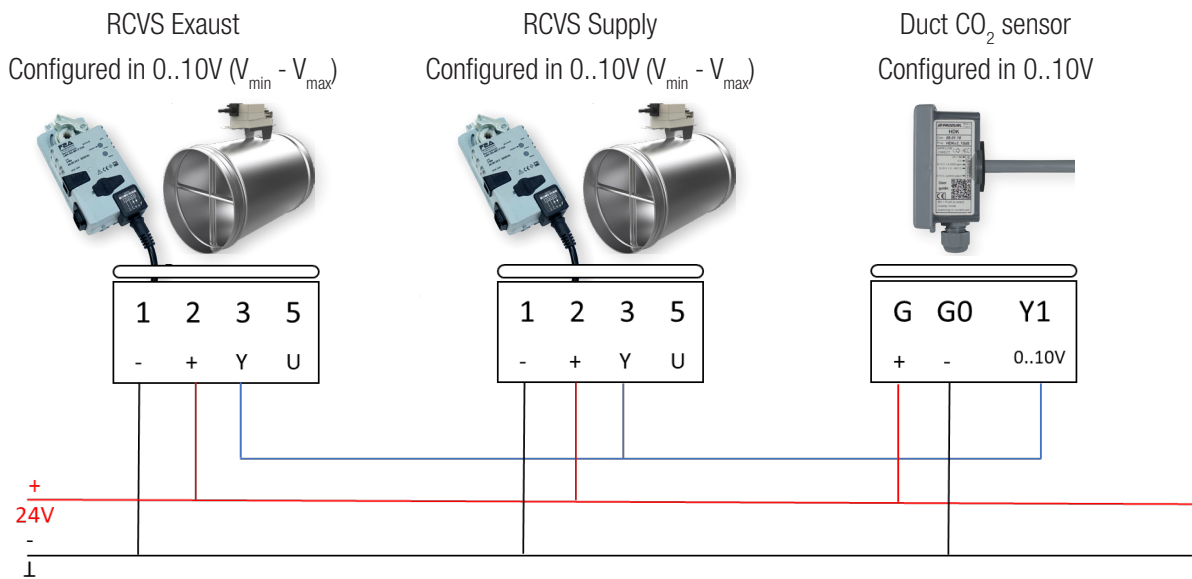
#### Corresponding wiring diagram :

CO<sub>2</sub> sensor configured in 0-10V over the range 500-1200 ppm.

RCVS configured with a 0.10V signal and an airflow range of 30-300 m<sup>3</sup>/h.

The CO<sub>2</sub> sensor records a rate of 800 ppm and transmits it as a 5V signal to the dampers.

The dampers interpret 5V as a setpoint of 165 m<sup>3</sup>/h to maintain.



Note: for modulating operation with tight closure, the damper must be configured in 2-10V. The damper will be tightly closed if the signal received on 3-Y is 0V. The parameters are factory set and can be modified on site with the TEL0001 remote control

# CIRCULAR VARIABLE AIR VOLUME DAMPER

## RCVS / RCVS-I

### OPERATING PRINCIPLES

#### Supply and Exhaust air controlled by a presence detector

Both RCVS are controlled by an external signal from a detector. The presence detector acts as a shunt of the control signal to control the VAV damper. It allows the damper to switch from a minimum to a maximum airflow setpoint.

Two possible scenarios depending on the damper configuration :

Mini or max : the damper is at its minimum or maximum airflow.

on/off : the damper is tightly closed or at its maximum airflow..

#### For supply and exhaust:

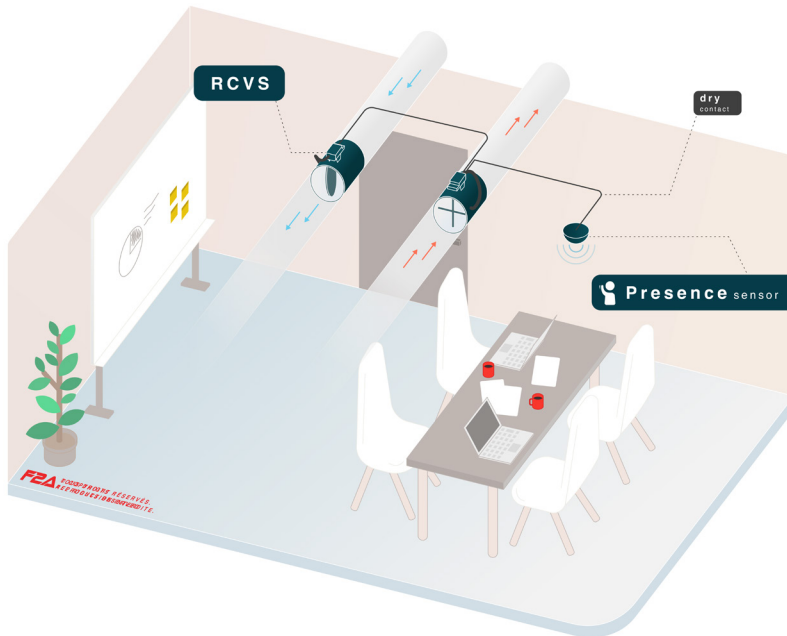
In unoccupied mode, the required airflow is minimum, in high occupancy the required airflow is maximum.

#### Wiring diagram:

Presence detector configured to be opened in unoccupied mode

RCVS configured in 0-10V over the range 30-300 m<sup>3</sup>/h.

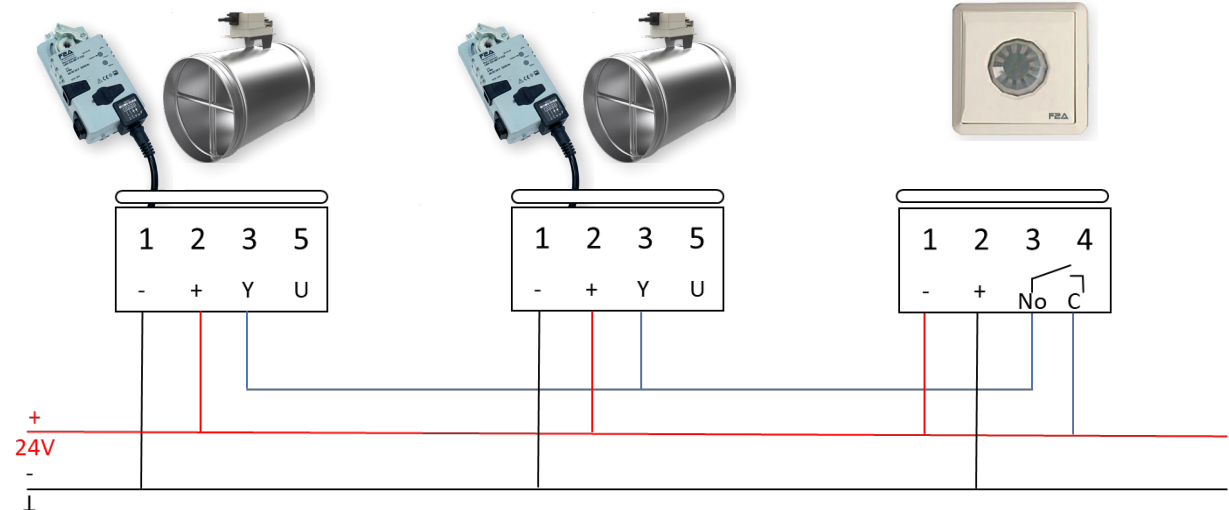
In unoccupied mode, the detector is in the "open" position, the damper receives 0V and interprets the signal as a setpoint of 30 m<sup>3</sup>/h. In occupied mode, the detector switches to the "closed" position, the damper receives 24V and interprets this signal as a setpoint of 300 m<sup>3</sup>/h.



RCVS exhaust  
Configured in 0..10V (V<sub>min</sub> - V<sub>max</sub>)

RCVS Supply  
Configured in 0..10V (V<sub>min</sub> - V<sub>max</sub>)

Presence detector normally open  
NO to configure on-site



**NB :** for modulating operation with tight closure. The damper setting has to be 2-10V. The register will be closed tight if the signal received on 3-Y is 0V.

The parameters are factory configured and can be modified on site using the TEL0001

FT\_RCVS / RCVS-I\_11/2024\_EN The information provided in this data sheet cannot be considered as contractual. F2A reserves the right to change the data given in this document without notice, as part of its product improvement process.

# CIRCULAR VARIABLE AIR VOLUME DAMPER

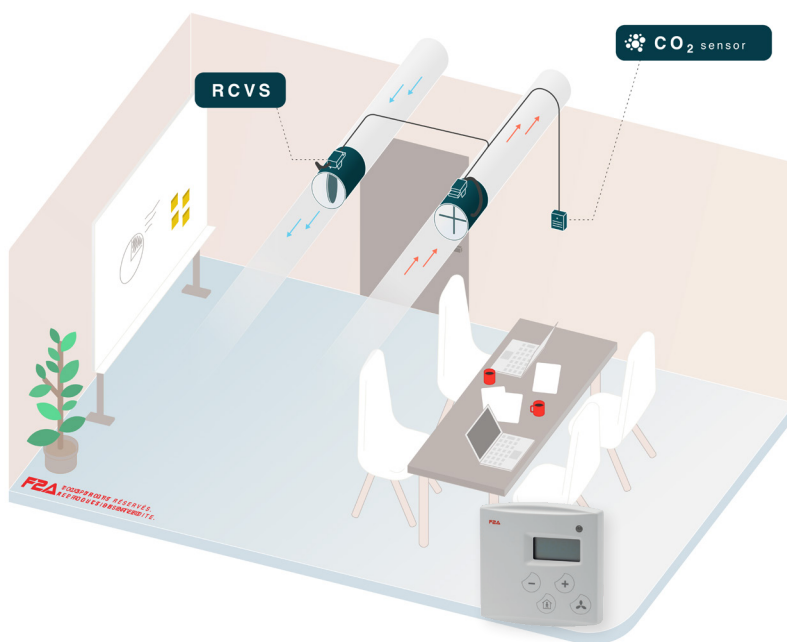
## RCVS / RCVS-I

### OPERATING PRINCIPLES

#### Supply and exhaust air controlled by a room controller paired and a CO<sub>2</sub> sensor

The two RCVS dampers are controlled by an external signal from the room controller. It can regulate the temperature according to a setpoint but also in a boost mode or a schedule time.

The room CO<sub>2</sub> sensor wired to the room controller will enable to control the CO<sub>2</sub> level within the room.



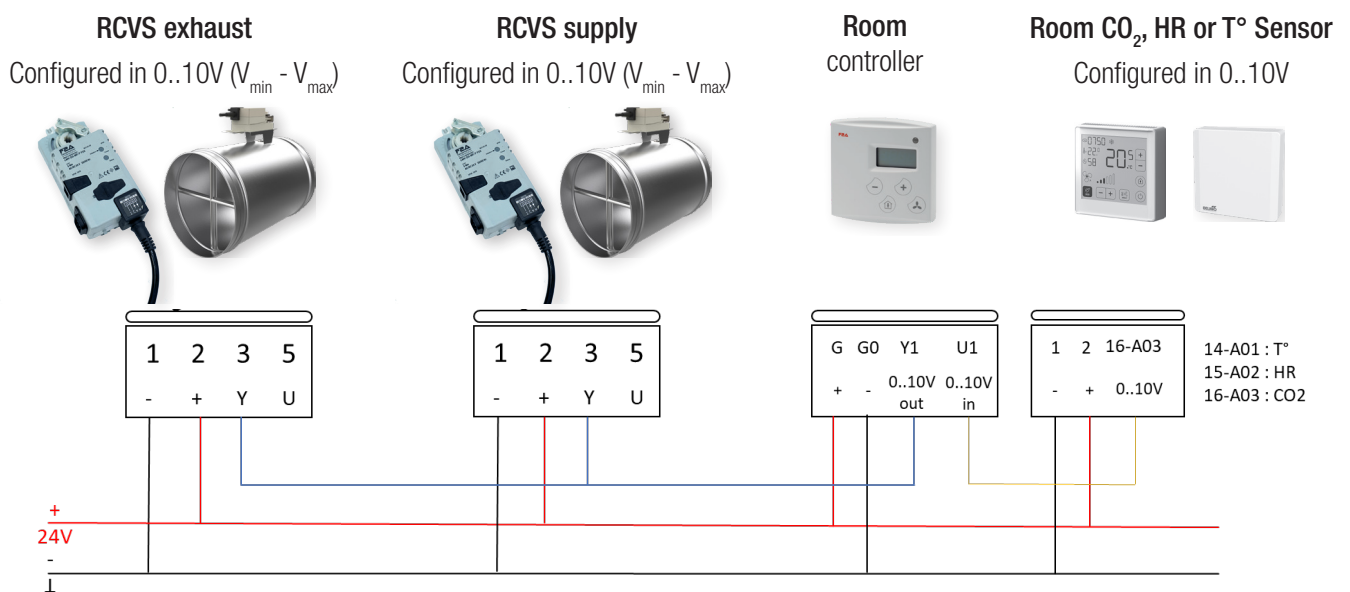
#### Supply and exhaust:

The CO<sub>2</sub> sensor sends a 0-10V signal according to the CO<sub>2</sub> level measured in the room to the room controller.

The room controller measures the temperature, compared with signal from the CO<sub>2</sub> sensor, and defines the right setpoint to send to the dampers.

The damper controls the airflow according to the setpoint.

Linear regulation between the set minimum and maximum airflow parameters.



**Note :** for temperature control, only the room controller is needed.

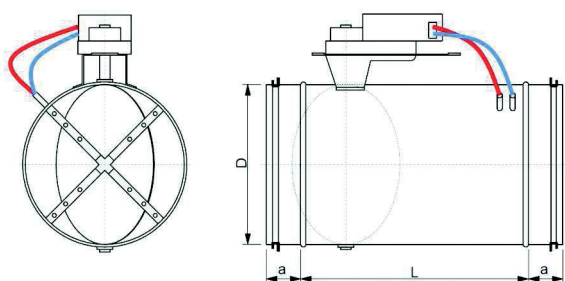
For temperature and CO<sub>2</sub> control, an additional CO<sub>2</sub> sensor is needed.

The room controller must be configured to send the signals to the VAV dampers.

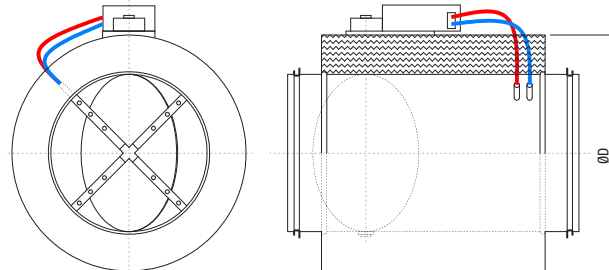
# CIRCULAR VARIABLE AIR VOLUME DAMPER

## RCVS / RCVS-I

### DIMENSIONS AND WEIGHTS (KG)



RCVS : standard damper



RCVS-I : standard damper with external insulation

	All versions			Standard version	Insulated version (I)	
	Ø D (mm)	a (mm)	L (mm)	Weight (kg)	Ø Dy (mm)	Weight (kg)
RCV 100	99	35	300	1,4	200	2,8
RCV 125	124	35	300	1,7	225	4,0
RCV 160	159	35	340	2,2	260	3,3
RCV 200	199	35	370	2,7	300	4,1
RCV 250	249	40	390	4,1	350	5,8
RCV 315	314	40	450	5,4	415	10,2
RCV 400	399	60	490	9,3	500	17,5

### QUICK SELECTION

We recommend an operating range for RCVS/RCVS-I from 1 m/s to 5 m/s.

However, these dampers can regulate up to 10 m/s. The use of a circular silencer to reduce noise beyond 5 m/s is highly recommended.

	Minimum airflow		Lp* at 100 Pa	Maximum recommended airflow		Lp* à 100 Pa	Maximum airflow	
	m <sup>3</sup> /h	l/s	dB(A)	m <sup>3</sup> /h	l/s	dB(A)	m <sup>3</sup> /h	l/s
RCVS 100	43	13	46	170	47	54	340	94
RCVS 125	70	19	43	265	74	53	540	150
RCVS 160	115	32	40	430	119	50	900	350
RCVS 200	180	50	42	680	189	50	1450	403
RCVS 250	280	78	40	1060	294	50	2200	611
RCVS 315	450	125	36	1680	467	45	3700	1028
RCVS 400	730	203	39	2700	750	49	6000	1667

\* Lp(A) : acoustic pressure level at a pressure drop of 100 Pa. With room attenuation.

**Example** : required airflow 400 m<sup>3</sup>/h.

- Selection of RCVS D125: V > 5 m/s. The selection works but may create noise. Silencer is recommended

- Selection of RCVS D160: V < 5 m/s. The selection is optimized..

# CIRCULAR VARIABLE AIR VOLUME DAMPER

## RCVS / RCVS-I

### RCVS Ø100 ACOUSTIC PERFORMANCE

Pressure drop Pa	Noise regenerated by frequency band according to the pressure drop											Global Lw (dB)	Global LwA (dBA)
	Air velocity m/s	Airflow m³/h	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz			
			Lw acoustic power										
50	2	57	58	57	51	46	39	30	23	24	61	48	
50	5	141	60	60	56	52	45	42	35	29	64	53	
50	8	226	63	62	61	59	52	48	41	36	68	59	
50	12	339	62	64	65	64	59	52	47	42	70	64	
100	2	57	61	62	57	52	46	38	31	27	66	54	
100	5	141	70	68	64	59	53	49	43	40	73	61	
100	8	226	69	70	66	63	57	53	48	44	74	64	
100	12	339	66	66	66	65	60	55	50	46	72	66	
250	2	57	63	64	62	59	56	49	45	42	69	61	
250	5	141	71	73	70	65	60	55	50	47	77	67	
250	8	226	74	77	73	68	64	59	55	51	80	70	
250	12	339	74	77	75	71	67	63	58	55	81	73	

### RCVS Ø125 ACOUSTIC PERFORMANCE

Pressure drop Pa	Noise regenerated by frequency band according to the pressure drop											Global Lw (dB)	Global LwA (dBA)
	Air velocity m/s	Airflow m³/h	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz			
			Lw acoustic power										
50	2	88	56	49	50	42	36	27	21	24	57	45	
50	5	221	62	57	56	51	46	39	34	27	64	53	
50	8	353	66	62	62	59	53	48	43	37	69	60	
50	12	530	64	64	64	64	58	54	48	41	70	64	
100	2	88	59	53	56	49	43	36	31	26	62	51	
100	5	221	70	63	63	57	52	46	41	35	72	59	
100	8	353	74	66	67	63	58	52	48	44	76	64	
100	12	530	74	67	69	67	62	57	53	48	76	68	
250	2	88	61	58	62	57	53	49	46	43	67	60	
250	5	221	71	69	72	63	58	54	50	46	76	67	
250	8	353	76	74	76	68	63	58	54	50	81	71	
250	12	530	79	77	78	72	67	62	58	54	83	74	



# CIRCULAR VARIABLE AIR VOLUME DAMPER

## RCVS / RCVS-I

### RCVS Ø160 ACOUSTIC PERFORMANCE

Pressure drop Pa	Noise regenerated by frequency band according to the pressure drop											Global Lw (dB)	Global LwA (dBA)
	Air velocity m/s	Airflow m³/h	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz			
			Lw acoustic power										
50	2	145	58	50	43	39	33	27	24	24	59	41	
50	5	362	66	57	54	49	46	36	33	27	66	51	
50	8	579	61	58	57	56	53	43	41	35	65	57	
50	12	869	60	61	62	61	56	49	48	40	68	62	
100	2	145	63	56	50	45	41	36	36	28	64	48	
100	5	362	71	63	61	53	50	42	42	34	72	57	
100	8	579	75	69	63	59	57	48	47	41	76	62	
100	12	869	71	67	65	63	62	54	53	47	74	66	
250	2	145	63	60	58	53	50	48	51	45	66	58	
250	5	362	76	70	70	59	55	51	54	49	78	65	
250	8	579	81	76	71	66	61	55	57	52	82	69	
250	12	869	85	79	75	70	66	59	59	53	86	72	

### RCVS Ø 200 ACOUSTIC PERFORMANCE

Pressure drop Pa	Noise regenerated by frequency band according to the pressure drop											Global Lw (dB)	Global LwA (dBA)
	Air velocity m/s	Airflow m³/h	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz			
			Lw acoustic power										
50	2	226	56	51	44	40	37	31	25	25	57	43	
50	5	565	65	58	54	49	48	41	37	29	66	53	
50	8	905	67	63	59	56	55	45	43	36	70	59	
50	12	1357	64	62	62	60	60	52	50	44	69	63	
100	2	226	62	57	50	46	43	41	38	33	63	50	
100	5	565	69	64	59	53	50	47	47	40	71	57	
100	8	905	73	69	64	59	57	50	49	43	75	62	
100	12	1357	73	71	68	65	63	55	54	49	76	67	
250	2	226	63	62	58	54	53	51	53	50	67	60	
250	5	565	75	70	65	58	55	54	55	53	77	64	
250	8	905	79	73	69	63	59	56	57	55	81	67	
250	12	1357	82	78	73	70	66	60	60	57	84	72	

# CIRCULAR VARIABLE AIR VOLUME DAMPER

## RCVS / RCVS-I

### RCVS Ø250 ACOUSTIC PERFORMANCE

Pressure drop Pa	Noise regenerated by frequency band according to the pressure drop											Global Lw (dB)	Global LwA (dBA)
	Air velocity m/s	Airflow m³/h	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz			
			Lw acoustic power										
50	2	353	54	51	46	40	34	27	24	25	56	42	
50	5	884	62	59	55	50	42	39	34	28	65	52	
50	8	1414	64	61	58	55	48	46	42	34	67	56	
50	12	2121	61	61	60	57	56	51	48	42	67	60	
100	2	353	60	56	51	46	41	38	36	33	62	49	
100	5	884	68	63	60	55	47	44	42	38	70	57	
100	8	1414	71	67	64	60	52	50	48	42	73	61	
100	12	2121	71	70	67	65	59	56	54	48	75	66	
250	2	353	63	62	58	53	51	50	52	49	67	59	
250	5	884	74	72	66	61	55	53	53	51	77	64	
250	8	1414	78	76	71	66	58	57	56	54	81	68	
250	12	2121	79	77	74	71	63	61	60	57	82	72	

### RCVS Ø315 ACOUSTIC PERFORMANCE

Pressure drop Pa	Noise regenerated by frequency band according to the pressure drop											Global Lw (dB)	Global LwA (dBA)
	Air velocity m/s	Airflow m³/h	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz			
			Lw acoustic power										
50	2	561	51	45	39	35	30	26	23	25	52	37	
50	5	1403	59	55	48	44	41	41	33	28	61	48	
50	8	2244	65	61	54	51	45	42	37	33	67	53	
50	12	3367	70	66	61	58	50	47	43	38	72	59	
100	2	561	54	50	45	41	38	34	31	29	56	44	
100	5	1403	63	58	52	47	43	44	40	35	64	52	
100	8	2244	69	64	58	53	48	48	45	40	71	57	
100	12	3367	75	69	64	60	54	52	49	45	76	62	
250	2	561	57	56	54	52	50	50	49	48	62	57	
250	5	1403	68	64	59	54	50	49	49	46	70	58	
250	8	2244	74	69	64	59	54	53	53	50	76	62	
250	12	3367	79	74	68	63	57	56	56	53	81	66	

# CIRCULAR VARIABLE AIR VOLUME DAMPER

## RCVS / RCVS-I

### RCVS Ø 400 ACOUSTIC PERFORMANCE

Pressure drop Pa	Noise regenerated by frequency band according to the pressure drop											Global Lw (dB)	Global LwA (dBA)
	Air velocity m/s	Airflow m³/h	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz			
			Lw acoustic power										
50	2	905	53	46	42	38	35	28	21	23	54	40	
50	5	2262	61	53	50	48	44	39	32	26	62	50	
50	8	3619	68	61	59	58	54	50	45	38	70	60	
50	12	5429	72	65	64	69	63	60	55	50	75	69	
100	2	905	59	52	48	44	42	38	32	28	60	47	
100	5	2262	68	60	56	52	49	46	42	36	69	55	
100	8	3619	72	64	62	59	55	51	47	41	73	61	
100	12	5429	75	67	67	68	62	59	55	49	77	69	
250	2	905	66	60	56	52	51	49	47	44	68	57	
250	5	2262	76	67	63	58	56	54	52	48	77	62	
250	8	3619	81	71	67	63	59	57	55	55	82	66	
250	12	5429	84	74	72	69	64	61	58	55	85	71	

### ACOUSTIC PERFORMANCES

Radiated noise at a pressure drop of 100 Pa

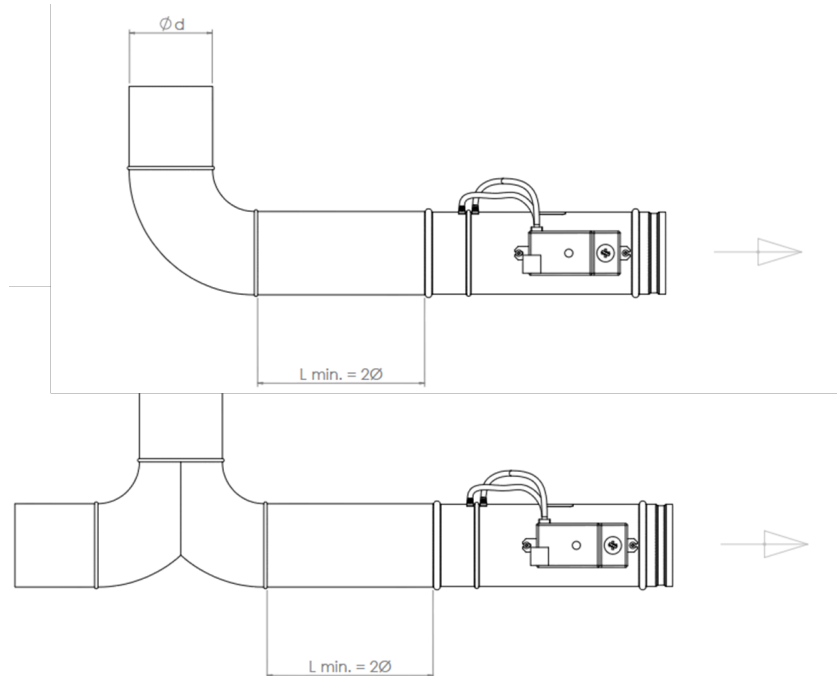
Size	Air velocity m/s	Airflow m³/h	Standard version	Insulated version	Size	Air velocity m/s	Airflow m³/h	Standard version	Insulated version
			Global LwA (dBA)	Global LwA (dBA)				Global LwA (dBA)	Global LwA (dBA)
D100	2	57	26	25	D250	2	353	27	26
	5	141	31	29		5	884	32	30
	8	226	35	34		8	1414	37	36
	12	339	39	38		12	2121	44	41
D125	2	88	28	27	D315	2	561	27	26
	5	221	37	34		5	1403	34	33
	8	353	37	37		8	2244	39	38
	12	530	42	42		12	3367	47	47
D160	2	145	27	26	D400	2	905	44	41
	5	362	37	35		5	2262	41	40
	8	579	42	41		8	3619	48	47
	12	869	46	46		12	5429	56	57
D200	2	226	28	27					
	5	565	34	32					
	8	905	37	36					
	12	1357	43	40					

# CIRCULAR VARIABLE AIR VOLUME DAMPER

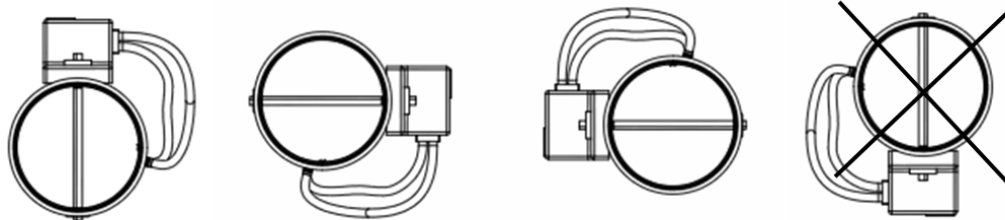
## RCVS / RCVS-I

### INSTALLATION REQUIREMENTS

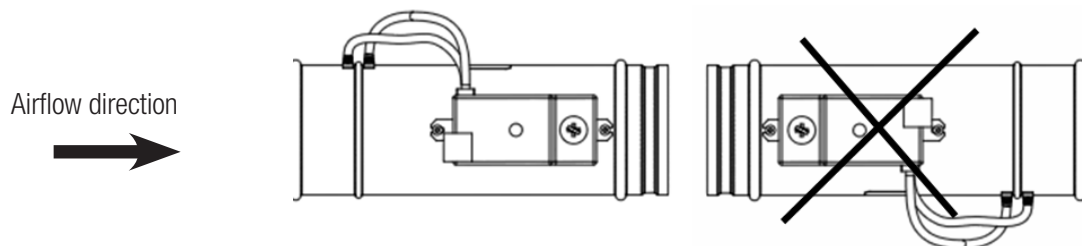
Ensure a minimum safety distance of 2 to 3 x  $\varnothing$  between the damper and the nearest network singularity.



Never position the actuator at the bottom of the controller



Make sure pressure taps are located upstream of the blade



# CIRCULAR VARIABLE AIR VOLUME DAMPER

## RCVS / RCVS-I

### ACTUATORS

Actuators are factory fitted and set according to the required airflow range for the installation



The control signal is 2-10 V on RCVS (0-10V signal available on request or can be modified on-site with the optional ZTH-EU remote control (please contact us)).

Model	Actuator reference	Torque N.m
RCV 100	LMV-D3	5
RCV 125	LMV-D3	5
RCV 160	LMV-D3	5
RCV 200	LMV-D3	5
RCV 250	LMV-D3	5
RCV 315	LMV-D3	5
RCV 400	LMV-D3	5

### AIRFLOW CONTROL

The measured airflow rate can be calculated using the formula below and a K factor specific to each diameter. Connect to the pressure taps of the damper (+) and (-).

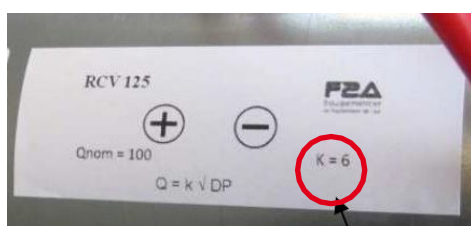
$$Q_v = K \sqrt{\Delta P}$$

Airflow (m<sup>3</sup>/h)

K factor

Δ (total pressure (+) - pressure (-))

Model	K factor
RCV 100	28
RCV 125	44
RCV 160	73
RCV 200	118
RCV 250	180
RCV 315	278
RCV 400	449



The flow rate adjustment accuracy relative to the setpoint is ±10% at minimum flow rate and ±5% at maximum flow rate

# CIRCULAR VARIABLE AIR VOLUME DAMPER

## RCVS / RCVS-I

### ELECTRICAL CONNECTION

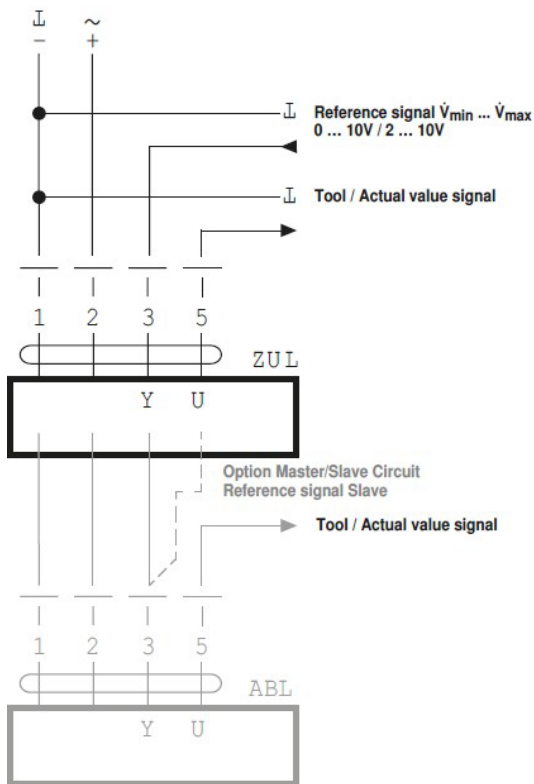
#### MF version actuator: non-communicating (standard)

The MF version does not allow communication. The variable air volume damper operates autonomously based on the set points. The use of the "U" output signal allows visualizing certain operating parameters (blade opening, setpoint value).

#### OPERATING PRINCIPLES

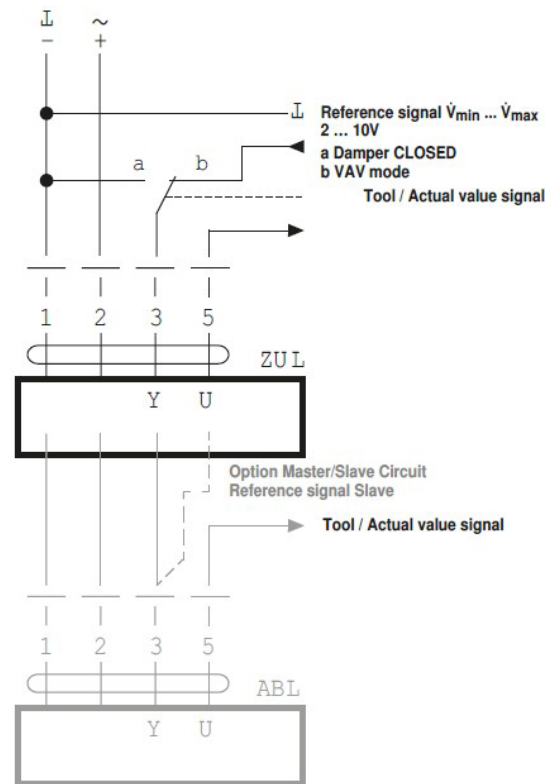
##### Example 1

VAV, analog signal



##### Example 2

VAV with closed mode (CLOSURE), 2...10V



#### Description :

Damper CLOSED with 0..10V control signal (Mode 2...10 V)

Parameter settings :

Mode 2...10V, closure threshold 0.1V ou 0.5V

If the required threshold of 0.1V is not reached, the value can be switched to 0.5V

With PC-Tool

Function	0.1V Stop level	0.5V Stop level
Damper CLOSED	<0.1V	<0.5V
$V_{min}$	>0.1V ...2V	>0.5V ...2V
$V_{min} \dots V_{max}$	2...10V	2...10V

The Y control signal is calculated based on the factory-set airflow range  $Q_v \text{ min}/Q_v \text{ max}$

The feedback signal U is calculated based on the nominal airflow of the damper diameter.

# CIRCULAR VARIABLE AIR VOLUME DAMPER

## RCVS / RCVS-I

### ELECTRICAL CONNECTION

The RCVS dampers can also be used in constant airflow operation.

#### CONSTANT OPERATION CAV

##### CAV mode

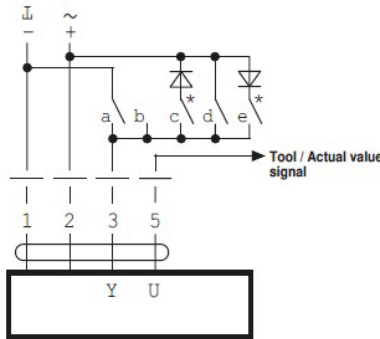
It is possible to configure the VAV-Compact in CAV mode when constant airflow control is required using the PC-Tool with the "CAV function":

- CLOSED damper -  $\dot{V}_{min}$  -  $\dot{V}_{max}$  - OPEN damper (standard)
- CLOSED damper -  $\dot{V}_{min}$  -  $\dot{V}_{max}$  -  $\dot{V}_{max}$  - damper (compatible with NMV-D2M)

#### Wiring diagram

##### Notes :

- Contacts switch in the same time
- DC power: \*c and e are not available in DC 24V
- CAV mode settings:  
Mode 2...10V, stop level 0.1V.
- In CAV applications, the closure level must not be set to 0.5V, otherwise, the open connection 3 is considered as a CLOSED damper



#### CAV function CLOSED - $\dot{V}_{min}$ - $\dot{V}_{max}$ - OPEN (standard)

	a	b	c	d	e
Signal	$\perp$		~	~	~
	-			+	
Switching terminal 3	$\frac{ }{3}$	$\frac{ }{3}$	$\frac{\text{N}}{3}$	$\frac{ }{3}$	$\frac{\text{N}}{3}$
Mode 2 ... 10 V	CLOSED	$\dot{V}_{min}$	CLOSED *	$\dot{V}_{max}$	OPEN *
Mode 0 ... 10 V	$\dot{V}_{min}$	$\dot{V}_{min}$	CLOSED *	$\dot{V}_{max}$	OPEN *

PC-Tool "CAV mode" settings :  
2...10V, threshold 0.1V

#### CAV function CLOSED - $\dot{V}_{min}$ - $\dot{V}_{mid}$ - $\dot{V}_{max}$ - OPEN

	a	b	c	d	e
Signal	$\perp$		~	~	~
	-			+	
Switching terminal 3	$\frac{ }{3}$	$\frac{ }{3}$	$\frac{\text{N}}{3}$	$\frac{ }{3}$	$\frac{\text{N}}{3}$
Mode 2 ... 10 V	CLOSED	$\dot{V}_{min}$	$\dot{V}_{mid}$ *	$\dot{V}_{max}$	OPEN *
Mode 0 ... 10 V	$\dot{V}_{min}$	$\dot{V}_{min}$	$\dot{V}_{mid}$ *	$\dot{V}_{max}$	OPEN *

PC-Tool "CAV mode" settings :  
Closed-  $\dot{V}_{min}$  -  $\dot{V}_{max}$  - Closure threshold: 0.1 V

PC-Tool "CAV mode" settings :  
Closed-  $\dot{V}_{min}$  -  $\dot{V}_{mid}$  -  $\dot{V}_{max}$

#### Actuators with communication (optional)

The version with communication allow to connect the VAV damper to the BMS system via different protocols. A communication protocol defines all the rules and specifies the operating modalities between several autonomous devices. The architecture of this type of controls is based on a supervisor managing a set of data and interpreting them according to a program by relaying orders to interfaces that synchronize the equipment.

Available communication protocols:

- MP Bus (Belimo protocol)
- MODBUS RTU
- BACnet MS/TP

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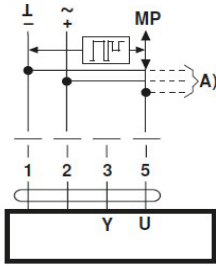
# CIRCULAR VARIABLE AIR VOLUME DAMPER

## RCVS / RCVS-I

### WIRING DIAGRAM

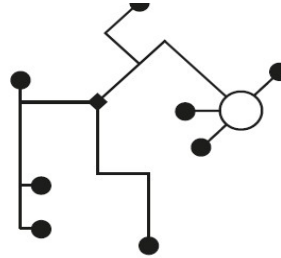
#### VARIABLE Airflow OPERATION WITH MP BUS (BELIMO protocol)

MP-Bus connection



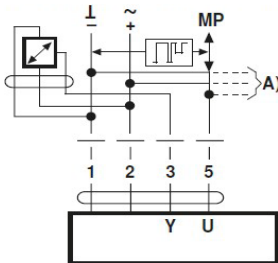
A) Additional actuators and sensors (max. 8)

Wiring topology



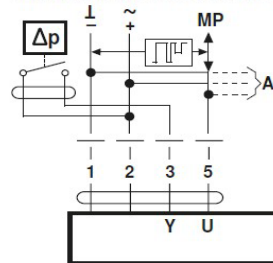
There are no restrictions regarding network topology. Star-ring, bus or hybrid forms are permissible. Communication and power supply can be carried in the same cable on the MP-Bus. Neither special cables nor terminating resistors are required.

Active sensors connection



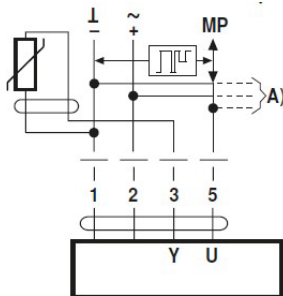
A) Additional actuators and sensors (max. 8)  
 - AC/DC 24V power supply  
 - Control signal DC 0...10V (max. DC 0...32V)  
 - Resolution 30 mV

Raccordement avec contact externe



A) Additional actuators and sensors (max. 8)  
 - Switching current 16 mA @ 24V  
 - Start point of the operating range must be parametrised on the MP actuator as  $\geq 0.5$  V

Passive sensor connection



Ni1000	-28...+98 °C	850...1600 Ω <sup>2)</sup>
PT1000	-35...+155 °C	850...1600 Ω <sup>2)</sup>
NTC	-10...+160 °C <sup>1)</sup>	200 Ω...60 kΩ <sup>2)</sup>

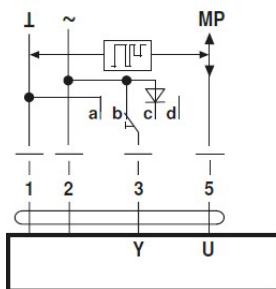
A) Additional actuators and sensors (max. 8)  
 1) Depending on the type  
 2) Resolution 1 Ohm Compensation of the measured value is recommended

#### Local override control

If no sensor is implemented, 3 (Y) connector is available for the safety circuit of local control.

Option: CLOSED - Vmax - OPEN

Comment: available only for 24DC!



a Closed damper  
 b Vmax  
 c Open damper  
 d Bus mode