

## TECHNICAL INFORMATION

<b>APPLICATION</b>	Airflow type	Variable, supply and extraction
<b>CONSTRUCTION</b>	Shape	Round
	Air flow control	non-polluting aluminium differential pressure sensor
	Min. diameter	100 mm
	Max. diameter	400 mm
	Length <math>\leq \varnothing 200\text{ mm}</math>	400 mm
	Length <math>> \varnothing 200\text{ mm}</math>	600 mm
<b>MATERIAL</b>	Standard material	Galvanised steel (275 g/m <sup>2</sup> )
	Damper	Galvanised steel damper with EPDM seal
	Insulation (BRD)	Mineral wool 50 mm
	Product finishing options	Painted RAL
<b>PERFORMANCE</b>	Certification	Housing: Class C (EN12237) Damper: Class 2 (EN1751)
	Min. air velocity	Defined @ 0,8 m/s
	Max. air velocity	Defined @ 12 m/s
<b>ACTUATOR</b>	Standard actuator	Grada G1: 227VM compact volume flow controller with display and integrated control
	Input signal	2-10V (standard), 0-10V In proportion to $V_{\min}$ and $V_{\max}$
	Output signal	2-10V (standard), 0-10V In proportion to $V_{\text{nom}}$
	Operating voltage	24 VAC/VDC +/-20%
	Operating conditions	0...+50°C - IP 42

## BR ROUND VAV UNIT

Variations **BRS** **BRD**



Galvanised round VAV unit with low resistance damper blade, supplied with an electronic actuator and aluminium differential pressure sensor. This VAV unit can be applied for regulating constant or variable air volumes based on air quality and/or temperature. The damper blade is equipped with an air tight seal and maintenance free bearings. The laser welded housing meets Class C following EN 12237, damper blade meets Class 2 following EN 1751. Available without (BSS) and with (BSD) insulation, and external sound attenuators.

Aluminium extruded differential pressure sensor with an operating range between 0,8 -12 m/s.

Class C housing following EN 12237

Air volume controlled actuator with integrated display and controls (no external equipment required)



ROUND  
EXECUTION



AIR  
BEHAVIOUR  
SYSTEMS



SOUND FRIENDLY



VAV

## ACCESSORIES

### UR SIL

circular duct silencers

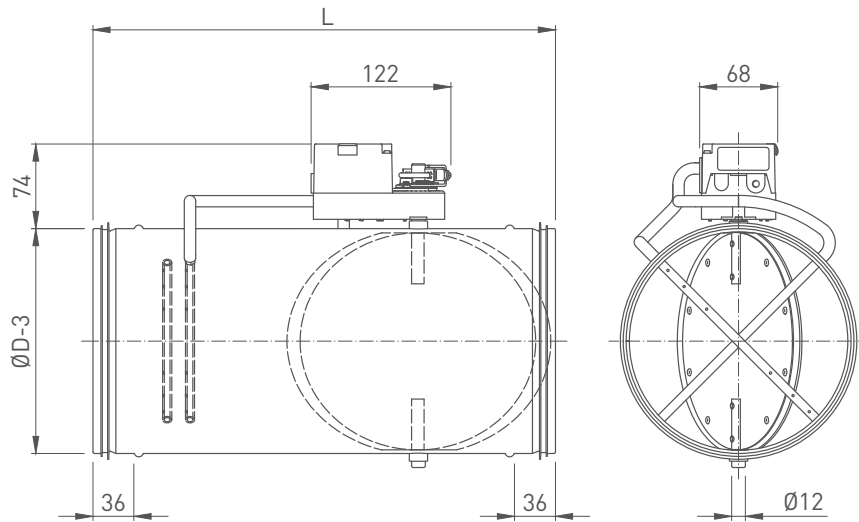


# ROUND VAV UNIT

BRS BRD

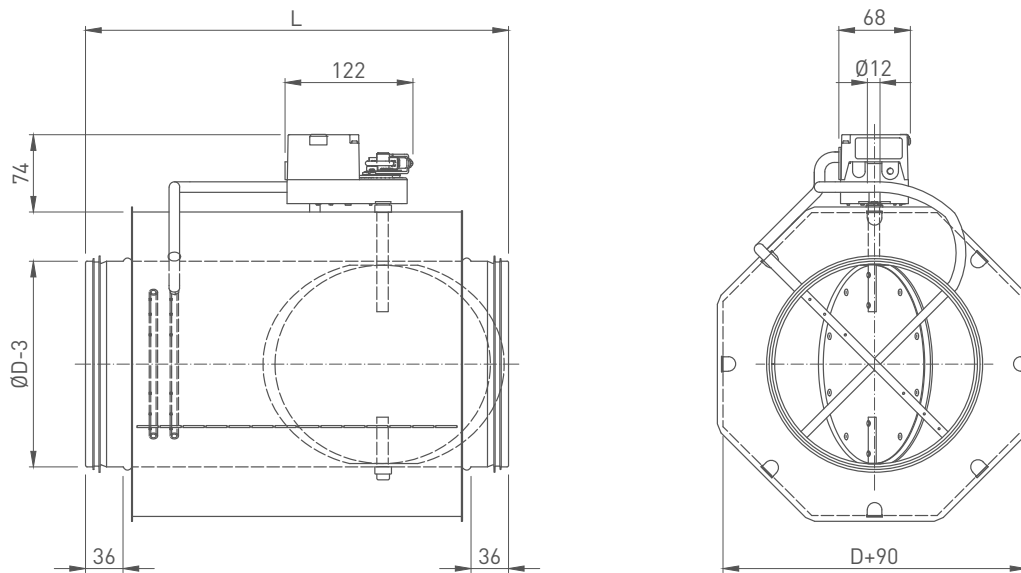
## DRAWING

BRS

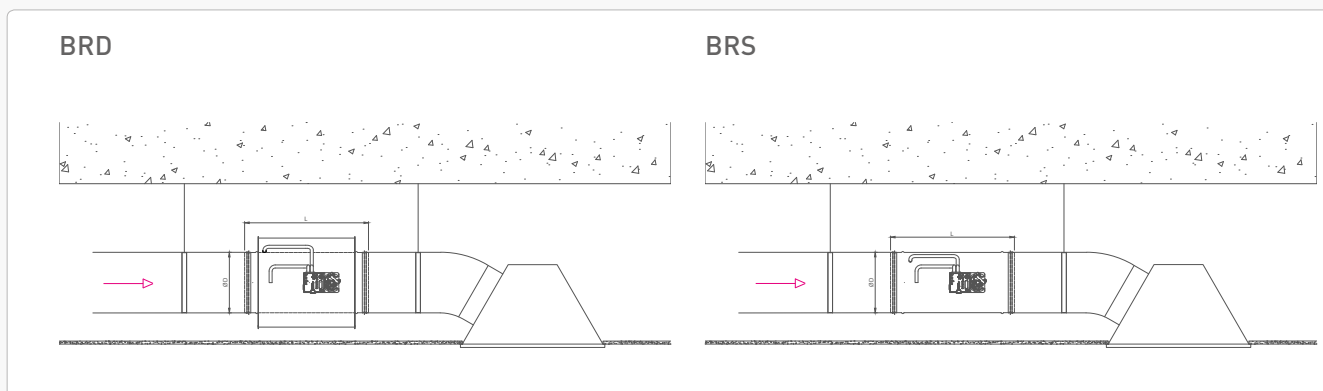


ØD [mm]	L [mm]
100	400
125	400
160	400
200	400
250	600
315	600
355	600
400	600

BRD



MOUNTING



MEASUREMENT OF THE VOLUMETRIC AIR FLOW RATE - GRADA G1 ACTUATOR

- the setpoint value signal  $Y$  depends on the chosen mode, i.e. 0-10 V DC or 2-10 V DC. The lower and upper limit correspond to  $V_{min}$  and  $V_{max}$  respectively. Speciality of input mode 2-10 V DC: in the range of  $Y = 0-0.8$  V DC the override command **Close** will be detected.

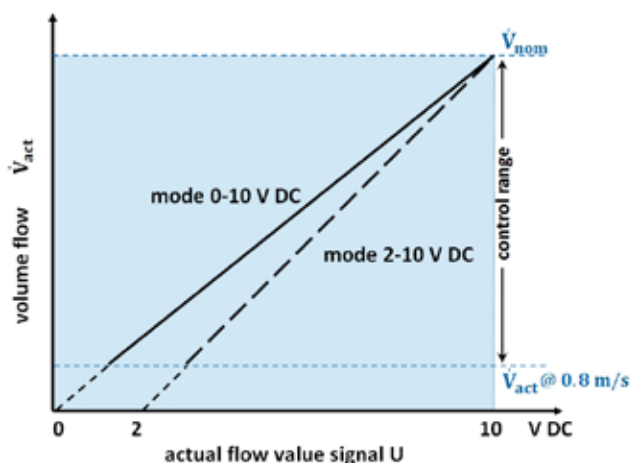
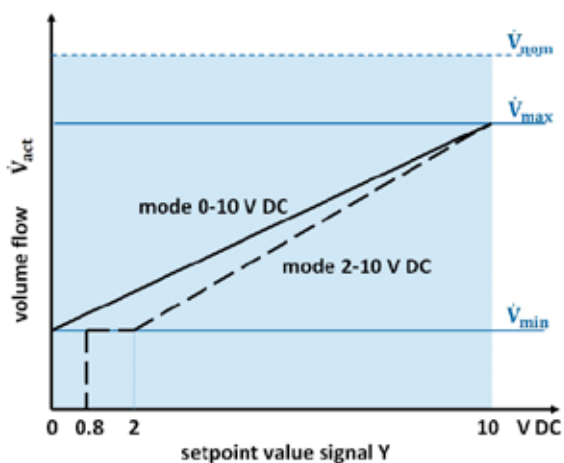


- the output/feedback signal  $U$  represents the actual flow and follows the selected mode of operation (0-10 V DC or 2-10 V DC). The signal  $U$  is proportional to the selected  $V_{nom}$  value.

- $V_{nom}$ : nominal volume flow rate ([m<sup>3</sup>/h] or [l/s]) corresponding at a sensor pressure difference of 250 Pa. Upper limit of the flow setting range and the maximum volume flow rate setpoint value for the VAV unit.

- $V_{min}$ : lower limit of the operating range for the VAV unit that can be set by the installer. It is smaller than or equal to  $V_{max}$ ; it may equal zero. It corresponds to the setpoint signal minimum, i.e. 0 or 2 V DC.

- $V_{max}$ : upper limit of the operating range for the VAV unit that can be set by the installer. It is smaller than or equal to  $V_{nom}$ . It corresponds to the setpoint signal maximum, i.e. 10 V DC.



## ROUND VAV UNIT

BRS BRD

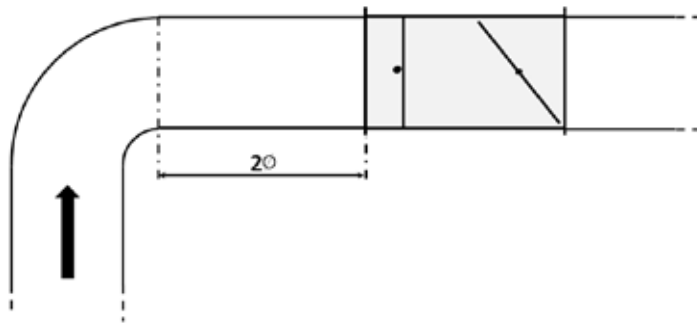
### MEASUREMENT ACCURACY

- Duct velocities larger than 1.2 m/s are recommended, and should not go below 0,8 m/s. At lower air velocities measurement accuracies cannot be guaranteed.

VELOCITY [m/s]	MEASUREMENT ERROR [%]
≥ 0.8	< 10
≥ 1.2	< 5

- The above volume flow rate accuracy applies only to situations with a straight upstream section of the duct according to ISO 5219 / EN 1751, and measured according ISO 3966. The actuators show a measurement error of <5% with respect to ISO 3966 in the recommended working range. Direct upstream mounting of a 90° bend on the VAV results in a measurement error of <5%.

Bend



### NOMINAL AIR FLOW ( $V_{NOM}$ @ 250 Pa)

∅	100	125	160	200	250	315	355	400
$V_{nom}$ (m <sup>3</sup> /h)	351	574	990	1564	2549	3936	5067	6230

SELECTION

SOUND PRESSURE LEVEL AT DIFFERENTIAL PRESSURE OF 100 Pa

∅	duct velocity	flow rate		dP <sub>s,min</sub>	air discharge noise [L <sub>p</sub> ]	case-radiated noise [L <sub>p</sub> ]	
					BRS/BRD	BRS	BRD
[mm]	[m/s]	[m³/h]	[l/s]	[Pa]	[dB(A)]	[dB(A)]	[dB(A)]
100	0,8	23	6	<1	20	<20	<20
	1	28	8	<1	22	<20	<20
	1,5	42	12	1	24	<20	<20
	4	113	31	10	32	<20	<20
	6	170	47	22	36	<20	<20
	8	226	63	40	39	<20	<20
	10	283	79	62	42	<20	<20
	12	339	94	90	45	21	<20
125	0,8	35	10	<1	22	<20	<20
	1	44	12	<1	23	<20	<20
	1,5	66	18	1	26	<20	<20
	4	177	49	7	33	<20	<20
	6	265	74	16	37	<20	<20
	8	353	98	29	40	<20	<20
	10	442	123	46	43	<20	<20
	12	530	147	66	46	<20	<20
160	0,8	58	16	<1	21	<20	<20
	1	72	20	<1	23	<20	<20
	1,5	109	30	<1	25	<20	<20
	4	290	80	5	32	<20	<20
	6	434	121	12	35	<20	<20
	8	579	161	21	38	<20	<20
	10	724	201	32	41	<20	<20
	12	869	241	47	44	<20	<20
200	0,8	90	25	<1	21	<20	<20
	1	113	31	<1	22	<20	<20
	1,5	170	47	<1	24	<20	<20
	4	452	126	4	31	<20	<20
	6	679	188	9	34	<20	<20
	8	905	251	15	37	<20	<20
	10	1131	314	24	40	<20	<20
	12	1357	377	34	43	<20	<20

SOUND PRESSURE INCLUDING TYPICAL CEILING ATTENUATION AND ROOM ABSORPTION

## ROUND VAV UNIT

BRS BRD

### SOUND PRESSURE LEVEL AT DIFFERENTIAL PRESSURE OF 100 Pa

Ø	duct velocity	flow rate		dP <sub>s,min</sub>	air discharge noise [L <sub>p</sub> ]	case-radiated noise (L <sub>p</sub> )	
					BRS/BRD	BRS	BRD
[mm]	[m/s]	[m³/h]	[l/s]	[Pa]	[dB(A)]	[dB(A)]	[dB(A)]
250	0,8	141	39	<1	<20	<20	<20
	1	177	49	<1	20	<20	<20
	1,5	265	74	<1	22	<20	<20
	4	707	196	3	28	<20	<20
	6	1060	295	6	32	<20	<20
	8	1414	393	11	35	<20	<20
	10	1767	491	17	37	<20	<20
	12	2121	589	25	40	<20	<20
315	0,8	224	62	<1	<20	<20	z
	1	281	78	<1	<20	<20	<20
	1,5	421	117	<1	<20	<20	<20
	4	1122	312	2	24	<20	<20
	6	1683	468	5	27	<20	<20
	8	2244	623	8	30	<20	<20
	10	2806	779	13	33	<20	<20
	12	3367	935	18	36	20	20
355	0,8	285	79	<1	<20	<20	<20
	1	356	99	<1	<20	<20	<20
	1,5	534	148	<1	<20	<20	<20
	4	1425	396	2	22	<20	<20
	6	2138	594	4	25	<20	<20
	8	2851	792	7	28	<20	<20
	10	3563	990	11	31	21	<20
	12	4276	1188	15	34	24	21
400	0,8	362	101	<1	<20	<20	<20
	1	452	126	<1	<20	<20	<20
	1,5	679	188	<1	<20	<20	<20
	4	1810	503	1	<20	<20	<20
	6	2714	754	3	23	21	<20
	8	3619	1005	6	26	24	21
	10	4524	1257	9	29	27	24
	12	5429	1508	13	32	30	26

### SOUND PRESSURE INCLUDING TYPICAL CEILING ATTENUATION AND ROOM ABSORPTION

SOUND PRESSURE LEVEL AT DIFFERENTIAL PRESSURE OF 150 Pa

Ø	duct velocity	flow rate		dP <sub>s,min</sub>	air discharge noise [L <sub>p</sub> ]	case-radiated noise [L <sub>p</sub> ]	
					BRS/BRD	BRS	BRD
[mm]	[m/s]	[m³/h]	[l/s]	[Pa]	[dB(A)]	[dB(A)]	[dB(A)]
100	0,8	23	6	<1	25	<20	<20
	1	28	8	<1	26	<20	<20
	1,5	42	12	1	29	<20	<20
	4	113	31	10	36	<20	<20
	6	170	47	22	40	<20	<20
	8	226	63	40	43	<20	<20
	10	283	79	62	46	21	<20
	12	339	94	90	48	23	22
125	0,8	35	10	<1	27	<20	<20
	1	44	12	<1	28	<20	<20
	1,5	66	18	1	31	<20	<20
	4	177	49	7	37	<20	<20
	6	265	74	16	41	<20	<20
	8	353	98	29	43	<20	<20
	10	442	123	46	46	<20	<20
	12	530	147	66	49	21	<20
160	0,8	58	16	<1	26	<20	<20
	1	72	20	<1	27	<20	<20
	1,5	109	30	<1	30	<20	<20
	4	290	80	5	36	<20	<20
	6	434	121	12	39	<20	<20
	8	579	161	21	42	<20	<20
	10	724	201	32	44	<20	<20
	12	869	241	47	47	<20	<20
200	0,8	90	25	<1	25	<20	<20
	1	113	31	<1	27	<20	<20
	1,5	170	47	<1	29	<20	<20
	4	452	126	4	35	<20	<20
	6	679	188	9	38	<20	<20
	8	905	251	15	41	<20	<20
	10	1131	314	24	43	<20	<20
	12	1357	377	34	45	<20	<20

SOUND PRESSURE INCLUDING TYPICAL CEILING ATTENUATION AND ROOM ABSORPTION

## ROUND VAV UNIT

BRS BRD

### SOUND PRESSURE LEVEL AT DIFFERENTIAL PRESSURE OF 150 Pa

Ø	duct velocity	flow rate		dP <sub>s,min</sub>	air discharge noise [L <sub>p</sub> ]	case-radiated noise (L <sub>p</sub> )	
					BRS/BRD	BRS	BRD
[mm]	[m/s]	[m³/h]	[l/s]	[Pa]	[dB(A)]	[dB(A)]	[dB(A)]
250	0,8	141	39	<1	24	<20	<20
	1	177	49	<1	25	<20	<20
	1,5	265	74	<1	27	<20	<20
	4	707	196	3	33	<20	<20
	6	1060	295	6	36	<20	<20
	8	1414	393	11	38	<20	<20
	10	1767	491	17	40	<20	<20
	12	2121	589	25	43	<20	<20
315	0,8	224	62	<1	<20	<20	<20
	1	281	78	<1	20	<20	<20
	1,5	421	117	<1	23	<20	<20
	4	1122	312	2	28	<20	<20
	6	1683	468	5	31	<20	<20
	8	2244	623	8	34	<20	<20
	10	2806	779	13	36	21	<20
	12	3367	935	18	39	23	21
355	0,8	285	79	<1	<20	<20	<20
	1	356	99	<1	<20	<20	<20
	1,5	534	148	<1	20	<20	<20
	4	1425	396	2	26	<20	<20
	6	2138	594	4	29	<20	<20
	8	2851	792	7	32	22	<20
	10	3563	990	11	34	24	21
	12	4276	1188	15	36	27	24
400	0,8	362	101	<1	<20	<20	<20
	1	452	126	<1	<20	<20	<20
	1,5	679	188	<1	<20	<20	<20
	4	1810	503	1	24	22	<20
	6	2714	754	3	27	25	22
	8	3619	1005	6	29	28	24
	10	4524	1257	9	32	30	27
	12	5429	1508	13	34	32	29

### SOUND PRESSURE INCLUDING TYPICAL CEILING ATTENUATION AND ROOM ABSORPTION



SOUND PRESSURE LEVEL AT DIFFERENTIAL PRESSURE OF 500 Pa

Ø	duct velocity	flow rate		dP <sub>s,min</sub>	air discharge noise [L <sub>p</sub> ]	case-radiated noise [L <sub>p</sub> ]	
					BRS/BRD	BRS	BRD
[mm]	[m/s]	[m³/h]	[l/s]	[Pa]	[dB(A)]	[dB(A)]	[dB(A)]
100	0,8	23	6	<1	40	<20	<20
	1	28	8	<1	41	<20	<20
	1,5	42	12	1	44	<20	<20
	4	113	31	10	50	26	24
	6	170	47	22	53	28	27
	8	226	63	40	56	31	29
	10	283	79	62	57	32	31
	12	339	94	90	59	34	32
125	0,8	35	10	<1	41	<20	<20
	1	44	12	<1	42	<20	<20
	1,5	66	18	1	45	<20	<20
	4	177	49	7	51	24	22
	6	265	74	16	54	26	25
	8	353	98	29	56	28	27
	10	442	123	46	58	30	28
	12	530	147	66	59	32	30
160	0,8	58	16	<1	40	<20	<20
	1	72	20	<1	41	<20	<20
	1,5	109	30	<1	44	<20	<20
	4	290	80	5	49	22	20
	6	434	121	12	52	24	23
	8	579	161	21	54	26	24
	10	724	201	32	56	28	26
	12	869	241	47	57	29	28
200	0,8	90	25	<1	39	<20	<20
	1	113	31	<1	40	<20	<20
	1,5	170	47	<1	42	<20	<20
	4	452	126	4	48	21	<20
	6	679	188	9	50	23	21
	8	905	251	15	52	25	23
	10	1131	314	24	54	27	25
	12	1357	377	34	55	28	26

SOUND PRESSURE INCLUDING TYPICAL CEILING ATTENUATION AND ROOM ABSORPTION

## ROUND VAV UNIT

BRS BRD

### SOUND PRESSURE LEVEL AT DIFFERENTIAL PRESSURE OF 500 Pa

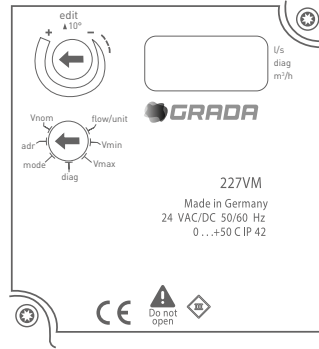
Ø	duct velocity	flow rate		dP <sub>s,min</sub>	air discharge noise [L <sub>p</sub> ]	case-radiated noise [L <sub>p</sub> ]	
					BRS/BRD	BRS	BRD
[mm]	[m/s]	[m³/h]	[l/s]	[Pa]	[dB(A)]	[dB(A)]	[dB(A)]
250	0,8	141	39	<1	37	<20	<20
	1	177	49	<1	38	<20	<20
	1,5	265	74	<1	40	<20	<20
	4	707	196	3	46	23	21
	6	1060	295	6	48	25	23
	8	1414	393	11	50	27	25
	10	1767	491	17	51	28	26
	12	2121	589	25	53	30	28
315	0,8	224	62	<1	33	<20	<20
	1	281	78	<1	34	<20	<20
	1,5	421	117	<1	36	20	<20
	4	1122	312	2	41	26	23
	6	1683	468	5	44	28	26
	8	2244	623	8	46	30	27
	10	2806	779	13	47	31	29
	12	3367	935	18	49	33	30
355	0,8	285	79	<1	30	21	<20
	1	356	99	<1	31	22	<20
	1,5	534	148	<1	34	24	21
	4	1425	396	2	39	29	26
	6	2138	594	4	42	32	29
	8	2851	792	7	43	34	31
	10	3563	990	11	45	35	32
	12	4276	1188	15	47	37	34
400	0,8	362	101	<1	28	26	22
	1	452	126	<1	29	27	24
	1,5	679	188	<1	31	29	26
	4	1810	503	1	37	35	32
	6	2714	754	3	39	38	34
	8	3619	1005	6	41	40	36
	10	4524	1257	9	43	41	38
	12	5429	1508	13	45	43	39

### SOUND PRESSURE INCLUDING TYPICAL CEILING ATTENUATION AND ROOM ABSORPTION

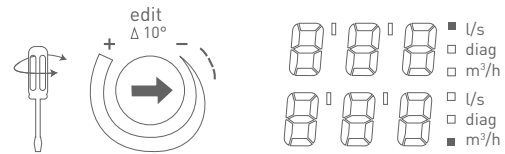
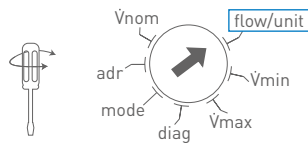
# ROUND VAV UNIT

BRS BRD

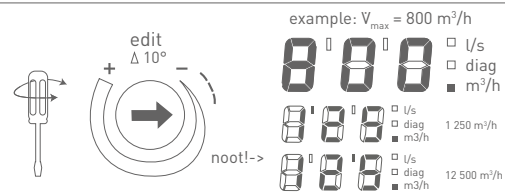
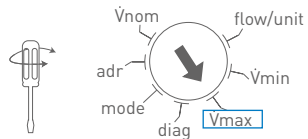
## BR ACTUATOR SETUP USE OF THE MOTOR G1



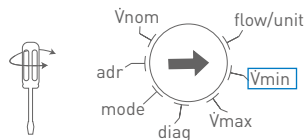
### 1. AIRFLOW/UNIT SECTION



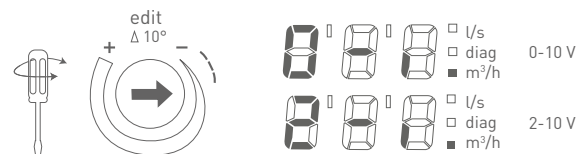
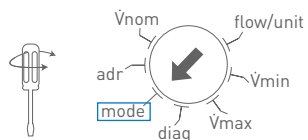
### 2. V<sub>MAX</sub> VALUE SETUP



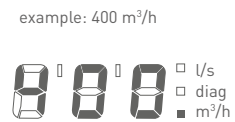
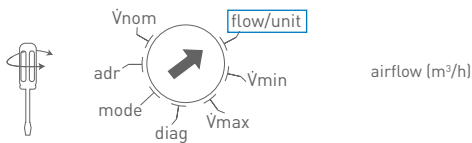
### 3. V<sub>MIN</sub> VALUE SETUP



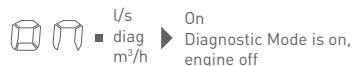
### 4. CONTROL



### READOUT

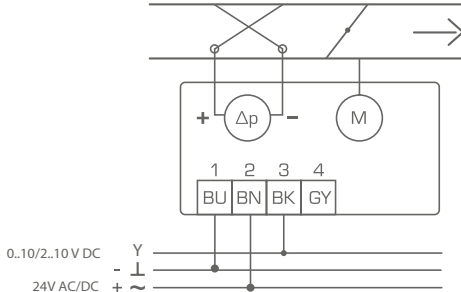


## DIAGNOSTICS

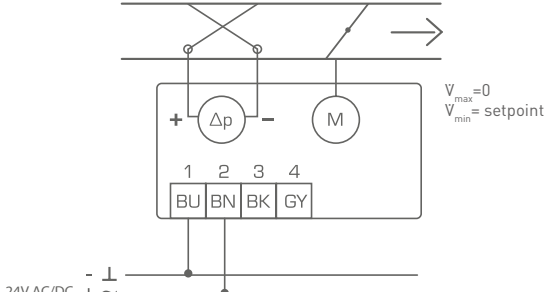


WIRING DIAGRAMS

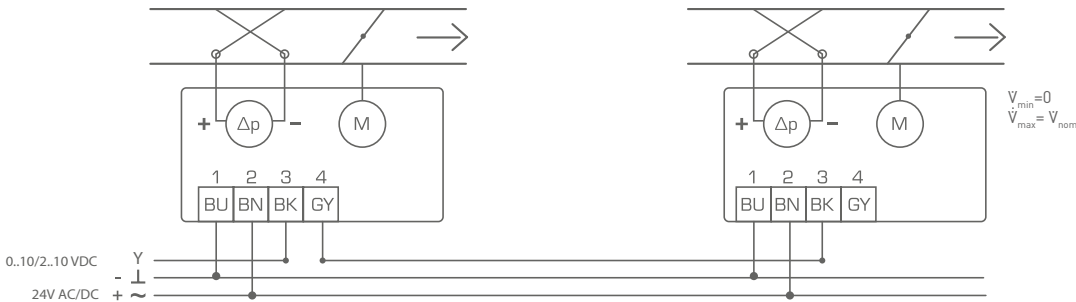
VAV OPERATION



CAV CONSTANT MIN VOLUME

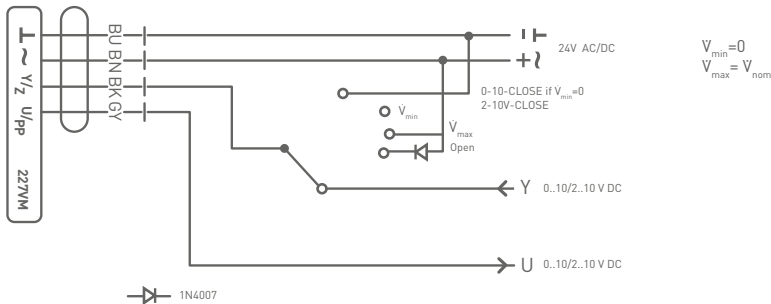


MASTER SLAVE CONTROL



FORCED CONTROL

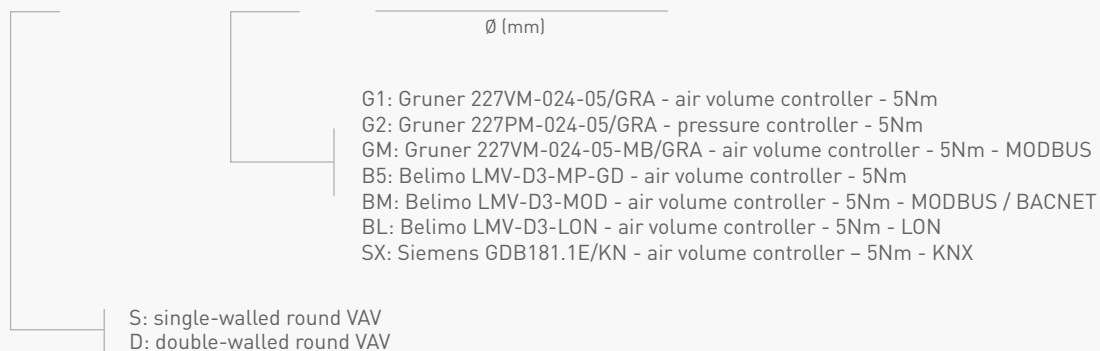
The controller can be force controlled to following positions via closing contacts.



- Close: Y = connected to ground conductor of 24 VAC supply (only with mode 2-10 V DC)
- $V_{min}$ : Y = disconnected
- $V_{max}$ : Y = full wave from 24 VAC supply
- Open: Y = pos. rectified half wave from 24 VAC supply

HOW TO ORDER ?

B	R	S	0	0	G1	0	1	2	5
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\* the lowest maximum airflow = 20%Vnom.

FACTORY SETTINGS - GRADA G1 ACTUATOR

- $V_{max}$  corresponds to the air flow rate at a duct air velocity of 10 m/s.
- $V_{min}$  corresponds to the air flow rate at a duct air velocity of 1.5 m/s.
- Mode 2 - 10 V DC