SIEMENS

ACVATIX™

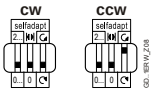
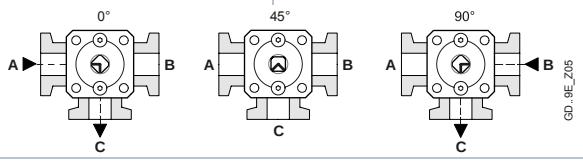
Rotary actuators for ball valves

GDB..9E

Electromotoric rotary actuators for open-close, three-position or modulating control. Used in heating, ventilation and air conditioning plants.

- For 2-port and 3-port control ball valves, internally threaded connections (VAI61.. and VBI61..) or externally threaded connections (VAG61.. and VBG61..), DN15 to DN25
- For 6-port control ball valves VWG41.. with externally threaded connections, DN10 to DN20
- Nominal torque 5 Nm
- Operating voltage AC 24 V ~ / DC 24…48 V ⎓ or AC 100…240 V ~
- Positioning signal DC 0/2…10 V ⎓
- Pre-wired with 0.9 m long connection cables

- Brushless, robust DC motors ensure reliable operation regardless of load.
- The rotary actuators do not require an end position switch, are overload proof, and remain in place upon reaching the end stop.
- The gears are maintenance free and low noise.
- Suitable for use with modulating controllers (DC 0/2...10 V), open-close or three-position controllers.
- We recommend a minimum pulse length of 500 ms on rotary actuators operated with 3-point control to ensure continuous and accurate operation.

GDB..	AC 24 V ~ / DC 24…48 V ⎓	**141.9E**	**161.9E**
	AC 100…240 V ~	**341.9E**	**–**
Control type		Open-close / three-position	Modulating control (0/2…10 V)
Rotary direction		Clockwise (cw) or counter-clockwise (ccw) direction depends … … on the type of control. With no power applied, the actuator remains in the respective position. … on the setting of the rotary direction DIL switch 	… on the setting of the rotary direction DIL switch  … on the positioning signal The actuator remains in the achieved position: … if the control signal is maintained at a constant value … for loss of operating voltage.
Combination with 2-port or 3-port control ball valves		NC (normally closed) ball valve	NC (normally closed) ball valve
		Basic setting: Y1: Opening Y2: Closing	DIL 3 set to “counter-clockwise” Flow = 0% at Y = 0 V Flow = 100% at Y = 10 V
		NO (normally open) ball valve	NO (normally open) ball valve
		Basic setting: Y1: Closing Y2: Opening	DIL 3 set to “clockwise” Flow = 100% at Y = 0 V Flow = 0% at Y = 10 V
Combination with 6-port control ball valves			Rotary direction “counter-clockwise” (ccw) Y = 0 V Flow A – C = 100% (0°) Y = 5 V closed (45°) Y = 10 V Flow B – C = 100% (90°) Rotary direction “clockwise” (cw) Y = 0 V Flow B – C = 100% (0°) Y = 5 V closed (45°) Y = 10 V Flow A – C = 100% (90°) 
Position indication: Mechanical		Rotary angle position indication by a position indicator/hand lever.	

Position indication: Electrical		Output voltage U = DC 0/2...10 V is generated proportional to the rotary angle. U depends on the rotary direction of the DIL switch setting.
Self-adaptation of linear span		When self-adaptation is active, the actuator automatically determines the mechanical end positions of the linear span.
Manual adjustment	The rotary actuator can be manually adjusted by pressing the gear train disengagement button.	
Rotary angle limitation	The rotary angle of the shaft adapter can be limited mechanically with a set screw.	

Housing

The housing consists essentially of flame retardant, non brominated, non chlorinated glass fibre reinforced plastic.

Type	Stock no.	Control	Operating voltage	Positioning signal Y	Position indicator U = DC 0...10 V ⎓	Self-adaption of rotational angle range	Aux. switches	Rotary direction switch
GDB141.9E	S55499-D200	Open-close or three-position	AC 24 V ~ / DC 24…48 V ⎓	–	–	–	–	yes
GDB341.9E	S55499-D201		AC 100…240 V ~					
GDB161.9E	S55499-D275	Modulating	AC 24 V ~ / DC 24…48 V ⎓	DC 0/2...10 V ⎓	yes	yes	–	

Accessories / Spare parts

Individual spare parts are not available. Components of the accessory kit ASK77.3 [1], available as an accessory, can however be used for spare parts.

Description	Components
ASK77.3 Accessory Kit BV for GLBxx1.9E	Mounting bracket (base plate) Axle with sleeve and spring Manual lever with locking clip

[1] Can also be used as rotary actuator for ball valves together with the actuator for air dampers G..B.1E.

Equipment combinations

GDB..9E and VA..61.. 2-port control ball valves

Control ball valves with:				k_{vs} [m^3/h]	DN	GDB..9E	
internal threads [1]	Rp	external threads [2]	G..B			Δp_{max}	Δp_s
–	–	**VAG61.15..**	G 1 B	1…6.3	15	350	1400
VAI61.15..	Rp ½“	–	–	1…10	15		
VAI61.20..	Rp ¾”	**VAG61.20..**	G 1 ¼ B	4…10	20		
VAI61.25..	Rp 1”	**VAG61.25..**	G 1 ½ B	6.3…16	25		

GDB.. 9E and VB..61.. 3-port control ball valves

Control ball valves with:				k_{vs} [m^3/h]	DN	GDB..9E	
internal threads [1]	Rp	external threads [2]	G..B			Δp_{max}	Δp_s
VBI61.15..	Rp ½“	**VBG61.15..**	G 1 B	1.6…6.3	15	350	–
VBI61.20..	Rp ¾”	**VBG61.20..**	G 1 ¼ B	4…6.3	20		
VBI61.25-10	Rp 1”	**VBG61.25-10**	G 1 ½ B	10	25		

[1] Data sheet N4211
[2] Data sheet N4212

GDB.. 9E and VWG41.. control ball valves

Typ		DN	Used as toggle key	Used as control ball valve	Δp_{max} [kpa]
GDB341.9E	**and VWG41.10..**	10	yes	–	200
	and VWG41.20..	20			
GDB161.9E	**and VWG41.10..**	10	–	yes	
	and VWG41.20..	20			
Δp_{max} = Maximum permissible differential pressure over the ball valve control path, valid for the entire positioning range of the ball valve rotary actuator unit.					

Topic	Title	Document ID
Data sheet	Rotary actuators for ball valves GDB..9E	A6V10636150_en--
Mounting instructions	Rotary-type actuator GDB..9E	A6V10636144_----
Mounting instructions	Ball valve VAI61.. / VBI61..	M4211
Mounting instructions	Ball valve VAG61.. / VBG61..	M4212
Mounting instructions	6-port control ball valve VWG41..	A6V10564501

Related documents such as environmental declarations, CE declarations, etc., can be downloaded at the following Internet address:
http://siemens.com/bt/download

Safety

Caution

National safety regulations

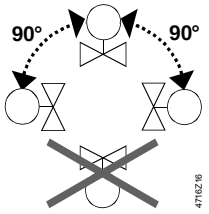
Failure to comply with national safety regulations may result in personal injury and property damage.

- Observe national provisions and comply with the appropriate safety regulations.
- Use only properly trained technicians for mounting, commissioning, and servicing.

Mounting

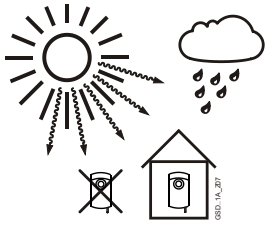
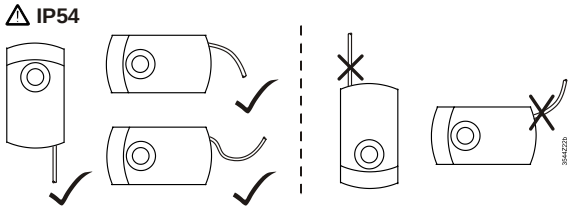
Both ball valve and rotary actuator can easily be assembled at the mounting location. Neither special tools nor adjustments are required.

Orientation



Cables must be easily accessible

Protection against weather, humidity and dirt

		
Protection against direct sunlight and rain	Correct mounting position and cable connection	Protection only with closed cover!

Installation

WARNING

No internal line protection for supply lines to external consumers

Risk of fire and injury due to short-circuits

- Adapt the line diameters as per local regulations to the rated value of the installed fuse.

Commissioning

When commissioning the system, check wiring and the functions of the rotary actuator.

Manual adjustment

The rotary actuator can be manually adjusted into any position between 0° and 90° by pushing the gear train disengagement slider.

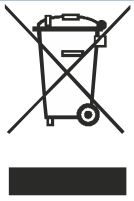
If a control signal from the controller is present, this will take priority in determining the position after the slider is released.

For manual adjustment: Power off!

Maintenance

The actuators GDB..9E are maintenance-free.

Disposal



The device is considered electrical and electronic equipment for disposal in terms of the applicable European Directive and may not be disposed of as domestic garbage.

- Dispose of the device through channels provided for this purpose.
- Comply with all local and currently applicable laws and regulations.

Power supply GDB1..9E		
Operating voltage (SELV/PELV) / Frequency		AC 24 V ~ ±20 % (19,2…28,8 V ~) / 50/60 Hz DC 24…48 V ⎓ ±20 % (19,2…57,6 V ⎓) [1)]
Power consumption running	GDB141.9E GDB161.9E	2 VA / 1 W 2.1 VA / 1.2 W
Power consumption holding	GDB141.9E GDB161.9E	0.5 W 0.7 W

Power supply GDB341.9E	
Operating voltage / Frequency	AC 100…240 V ~ ±10 % (90…264 V ~) / 50/60 Hz
Power consumption running	5 VA / 1.6 W
Power consumption holding	0.9 W

Function data	
Nominal torque Maximum torque (blocked) Minimum holding torque	5 Nm 10 Nm 5 Nm
Nominal rotary angle (with position indication) Maximum rotary angle (mechanic limitation)	90° 95° ± 2°
Runtime for 90° rotary angle	150 s
Actuator sound power level	28 dB(A)

Inputs		
Positioning signal for GDB141.9E Operating voltage AC 24 V ~ / DC 24…48 V ⎓	 (wires 1-6/G-Y1) (wires 1-7/G-Y2)	 clockwise counterclockwise
Positioning signal for GDB341.9E Operating voltage AC 100…240 V ~	 (wires 4-6/N-Y1) (wires 4-7/N-Y2)	 clockwise counterclockwise
Positioning signal for GDB161.9E Input voltage Current consumption Input resistance	 (wires 8-2/Y-G0)	 DC 0/2…10 V ⎓ 0.1 mA >100 kΩ
Max. permissible input voltage Protected against faulty wiring Hysteresis		DC 35 V ⎓ limited to DC 10 V ⎓ max. AC 24 V ~ / DC 24…48 V ⎓ 60 mV

Outputs		
Position indicator (GDB161.9E) Output signal Output voltage U Max. output current Protected against faulty wiring	 (wires 9-2/U-G0)	 DC 0...10 V ⎓ DC ±1 mA max. AC 24 V ~ / DC 24…48 V ⎓

Connection cables	
Cable length	0.9 m
Cross section of prewired connection cables	0.75 mm^2
Permissible length for signal lines	300 m

Degree of protection	
Insulation class AC 24 V ~ / DC 24…48 V ⎓, feedback potentiometer AC 100…240 V ~, auxiliary switches	As per EN 60730 III II
Housing protection	IP 54 as per EN 60529

Environmental conditions	
Operation Climatic conditions Mounting location Temperature extended Humidity (non-condensing)	IEC 60721-3-3 Class 3K5 interior, weather-protected -32…+55 °C <95 % r.F.
Transport Climatic conditions Temperature extended Humidity (non-condensing)	IEC 60721-3-2 Class 3K5 / Class 2K3 -32…+70 °C <95 % r.F.
Storage Climatic conditions Temperature extended Humidity (non-condensing)	IEC 60721-3-1 Class 1K3 -32…+50 °C <95 % r.F.
Mechanical conditions	Class 2M2

Standards, directives and approvals	
Product standard	EN 60730 Part 2-14 / Particular requirements for electric actuators
Electromagnetic compatibility (Applications)	For use in residential, commercial, light-industrial and industrial environments
EU Conformity (CE)	A5W00003842 [2)]
RCM Conformity	A5W00003843 [2)]
EAC Conformity	Eurasian conformity
UL	UL as per UL 60730 http://ul.com/database cUL as per CSA-C22.2 No. 24-93

Environmental compatibility
The product environmental declaration A5W00026068 [2)] contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

Dimensions	
Actuator W x H x D	see „Dimensions“, p. 9

Weight	
Without packaging	0.69 kg

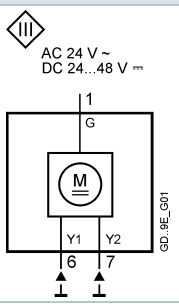
[1)] cUL: Permitted only to DC 30 V ⎓

[2)] The documents can be downloaded from http://siemens.com/bt/download.

Internal Diagrams

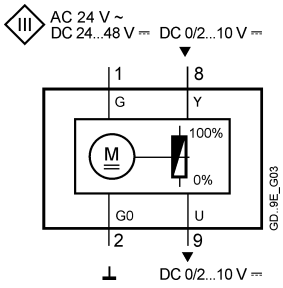
GDB141.9E (open-close, three-p.)

AC 24 V ~ / DC 24…48 V ⎓



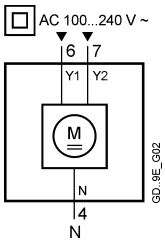
GDB161.9E (modulating)

AC 24 V ~ / DC 24…48 V ⎓



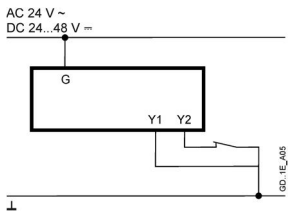
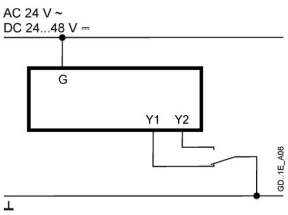
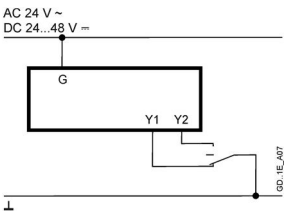
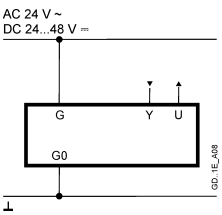
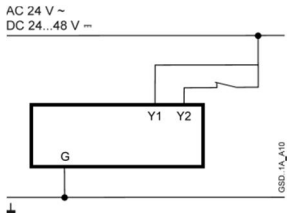
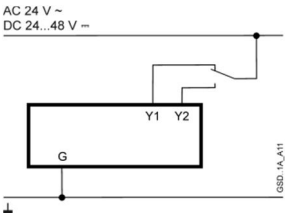
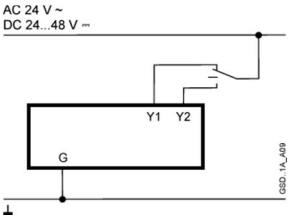
GDB341.9E (open-close, three-p.)

AC 100…240 V ~

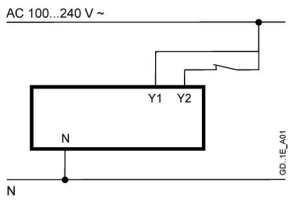
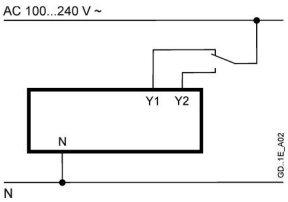
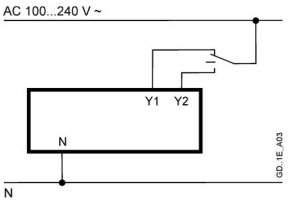


Connection diagrams

GDB1..9E (AC 24 V ~ / DC 24…48 V ⎓)

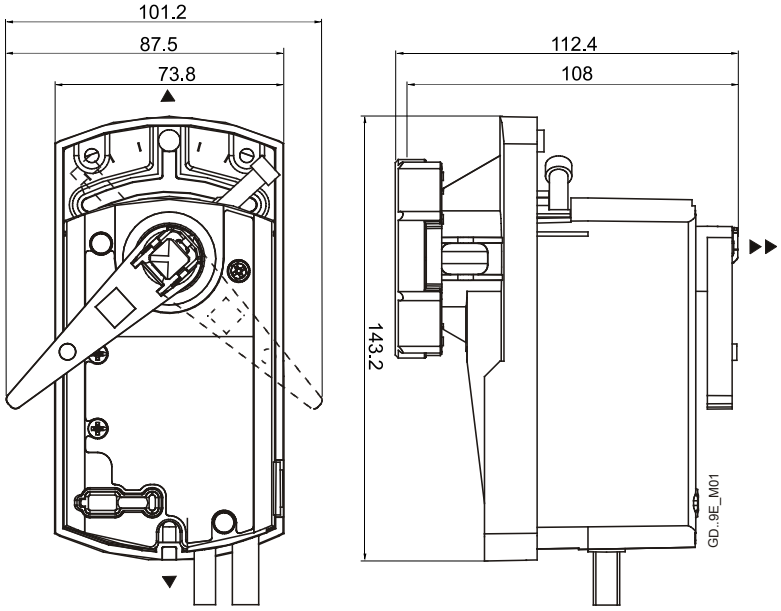
Open-close, single wire control Single Pole Single Throw (SPST)	**Open-close, two wire control** Single Pole Double Throw (SPDT)	**Three-position control**	**Modulating control**
			
			

GDB341.9E (AC 100…240 V ~)

Open-close, single wire control Single Pole Single Throw (SPST)	**Open-close, two wire control** Single Pole Double Throw (SPDT)	**Three-position control**
		

Cable labeling

Pin	Code	No	Color	Abbreviation	Meaning
Actuators	G	1	red	RD	System potential AC 24 V ~ / DC 24…48 V ⎓
AC 24 V ~	G0	2	black	BK	System neutral
DC 24…48 V ⎓	Y1	6	purple	VT	Positioning signal AC/DC 0 V, “clockwise” (GDB141.9E)
	Y2	7	orange	OG	Positioning signal AC/DC 0 V, “counter-clockwise” (GDB141.9E)
	Y	8	grey	GY	Signal in (GDB161.9E)
	U	9	pink	PK	Signal out (GDB161.9E)
Actuators	N	4	blue	BU	Neutral conductor
AC 100…240 V ~	Y1	6	black	BK	Positioning signal AC 100…240 V ~, “clockwise” (GDB341.9E)
	Y2	7	white	WH	Positioning signal AC 100…240 V ~, “counter-clockwise” (GDB341.9E)



Dimensions in mm

▶ = >100 mm
▶▶ = >200 mm

Minimum clearance from ceiling or wall for mounting, connection, operation, maintenance etc.

Type	Valid from rev. no.
GDB141.9E	..B
GDB341.9E	..B
GDB161.9E	..B

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Gtksnab
Оборудование для жизни

Мы ценим каждого клиента и предлагаем широкий ассортимент продукции. Оборудование соответствует всем директивам безопасности и имеет необходимые лицензии. Быстрая доставка по всей России и СНГ. Самовывоз со склада в Москве. Квалифицированные специалисты всегда готовы проконсультировать и помочь подобрать нужные запчасти. Доверьтесь нашему многолетнему опыту и надежности поставок! Интернет-магазин "Gtksnab".

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