

ACVATIX™

## Rotary actuators for ball valves

GQD..9A



**Electromotive rotary actuators with spring return for fail-safe function on 2-position, 3-position, and modulating control. Used on 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 shutoff ball valves 2-port and changeover ball valves 3-port, internally threaded connections (VAI60.. and VBI60..) or externally threaded connections (VAG60.. and VBG60..), DN15 to DN25.
- 2 Nm nominal torque
- GQD121.9A, GQD131.9A, GQD161.9A: Operating voltage AC 24 V ~ / DC 24...48 V =
- GQD321.9A: Operating voltage AC 230 V ~
- Positioning signal DC 0/2...10 V=
- Prewired with 0.9 m connecting cable

## Features

- Brushless, robust DC motors ensure reliable operation regardless of load.
- The valve 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 (DC 0...10 V), 2-position or 3-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.
- On plants where the rotary actuator must move to the zero position (emergency position) during power failure.

## Functions

Type	GQD..21.9A	GQD131.9A	GQD161.9A
Control type	2-position	3-position	Modulating
Rotary direction as per mounting on ball valve	<b>NC (normally closed) ball valve</b>	<b>NC (normally closed) ball valve</b>	<b>NC (normally closed) ball valve</b>
	Switch on operating voltage: <ul style="list-style-type: none"> <li>• Actuator opens (counter-clockwise)</li> </ul> Switch off operating voltage: <ul style="list-style-type: none"> <li>• Actuator closes with spring return (clockwise)</li> </ul>	Positioning signal on Y1 <ul style="list-style-type: none"> <li>• – rotation counter-clockwise</li> </ul> Positioning signal on Y2 <ul style="list-style-type: none"> <li>• – rotation clockwise</li> <li>• – ball valve closes</li> </ul>	0...10 V "counter-clockwise" Flow = 0% at Y = 0 V Flow = 100% at Y = 0 V
<b>See mounting instructions M4659 for other switchings.</b>			
Emergency position (Spring return)	On power failure or when the operating voltage is switched off, the spring moves the rotary actuator to its mechanical zero position.		
Position indication: Mechanical	Rotary angle position indication as position indicator. <sup>1)</sup>		

<sup>1)</sup> Using the position indicator as a manual lever can lead to damage to the gear.

## Design

### Housing


The housing is made of fiberglass reinforced plastic:

- Flame retardant
- Non-brominated
- Non-chlorinated

## Type summary

Type	Item NO.	Positioning signal	Operating voltage	Positioning signal U= DC 0...10 V	Self-adaption Rotation angle ranges	Auxiliary switch	Rotary direction switch
GQD121.9A	BPZ:GQD121.9A	2-position	AC 24 V ~ / DC 24...48 V =	–	–	–	Yes
GQD321.9A	BPZ:GQD321.9A		AC 230 V ~	–	–	–	
GQD131.9A	BPZ:GQD131.9A	3-position	AC 24 V ~ / DC 24...48 V =	–	–	–	
GQD161.9A	BPZ:GQD161.9A	DC 0...10 V =	AC 24 V ~ / DC 24...48 V =	Yes	Yes	–	

Accessories

	<b>⚠ DANGER</b>
	<p><b>Hazard to life caused by a lack of ground for the combination ALJ100 with GQD321.9A!</b></p> <p>Combining rotary actuator GQD321.9A operated at AC 230 V ~ with temperature adapter ALJ100 results in life-threatening shocks due to a lack of ground.</p> <ul style="list-style-type: none"> <li>• Never combine rotary actuator GQD321.9A with temperature adapter ALJ100.</li> </ul>

Type	Stock number	Description
ALJ100	S55846-Z115	Temperature adapter for ball valves

Equipment combinations

Rotary actuators are suitable for operating following Siemens ball valves:

**VA..61..**  
**2-port control ball valves**

Control ball valves with:				k <sub>vs</sub> [m <sup>3</sup> /h]	DN	GQD..9A	
Internal threads <sup>1)</sup>	Rp	External threads <sup>2)</sup>	G..B			Δp <sub>max</sub>	Δp <sub>s</sub>
–	–	VAG61.15..	G 1 B	1...6.3	15	350	1400
VAI61.15..	Rp ½"	–	–	0.25...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		

**VB..61..**  
**3-Port control ball valves**

Control ball valves with:				k <sub>vs</sub> [m <sup>3</sup> /h]	DN	GQD..9A	
Internal threads <sup>1)</sup>	Rp	External threads <sup>2)</sup>	G..B			Δp <sub>max</sub>	Δp <sub>s</sub>
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		
VBG61.25-10	Rp 1"	VBG61.25-10	G 1 ½ B	10	25		

<sup>1)</sup> Data sheet N4211

<sup>2)</sup> Data sheet N4212

**VA..60.. / VB..60..**  
**2-port shut-off valves and 3-port changeover ball valves**

Control ball valves with:				k <sub>vs</sub> [m <sup>3</sup> /h]	DN	GQD..21.9A	
Internal threads <sup>3)</sup>	Rp	External threads <sup>4)</sup>	G..B			Δp <sub>max</sub>	Δp <sub>s</sub>
–	–	VAG60.15-9	G 1 B	9	15	350	1400

Control ball valves with:				k <sub>vs</sub> [m <sup>3</sup> /h]	DN	GQD..21.9A	
Internal threads <sup>3)</sup>	Rp	External threads <sup>4)</sup>	G..B			Δp <sub>max</sub>	Δp <sub>s</sub>
VAl60.15-15	Rp ½"	–	–	15	15		
–	–	VAG60.20-17	G 1 ¼ B	17	20		
VAl60.20-22	Rp 1"	–	–	22	20		
VAl60.25-22	Rp 1"	VAG60.25-22	G 1 ½ B	22	25		

VBI60.15-5L	Rp ½"	VBG60.15-5L	G 1 B	5	15	350	–
–	–	VBG60.20-8L	G 1 ¼ B	8	20		
VBI60.20-9L	Rp 1"	–	–	9	20		
VBI60.25-9L	Rp 1"	VBG60.25-9L	G 1 ½ B	9	25		

–	–	VBG60.15-8T	G 1 B	8	15	350	–
VBI60.15-12T	Rp ½"	–	–	12	15		
–	–	VBG60.20-13T	G 1 ¼ B	13	20		
VBI60.20-16T	Rp 1"	–	–	16	20		
–	–	VBG60.25-13T	G 1 ½ B	13	25		
VBI60.25-16T	Rp 1"	–	–	16	25		

<sup>3)</sup> Data sheet N4213

<sup>4)</sup> Data sheet N4214

## Product documentation

Topic	Title	Document ID
Data sheet	Rotary actuators for ball valves	N4659
Mounting instructions	GQD..9A..	M4659
Mounting instructions	VAI61 / VBI61..	M4211
Mounting instructions	VAG61 / VBG61..	M4212
Mounting instructions	VAI60.. / VBI60..	M4213
Mounting instructions	VAG60.. / VBG60..	M4214


Related documents such as the environmental declarations, CE declarations, etc., can be downloaded from the following Internet address:

<https://siemens.com/bt/download>

## Notes

Additional information on rotary actuators is available in document Z4614.

## Safety

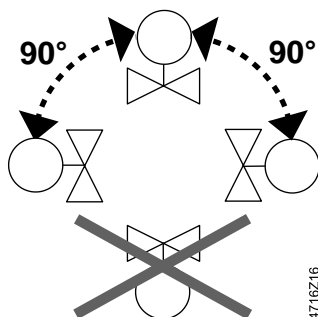
	<b>⚠ CAUTION</b>
	<b>National safety regulations</b> Failure to comply with national safety regulations may result in personal injury and property damage. <ul style="list-style-type: none"><li>• Observe national provisions and comply with the appropriate safety regulations.</li><li>• Mounting, commissioning, and service by properly trained personnel only.</li></ul>

## Mounting


Additional information on rotary actuators is available in document M4659.

Both ball valve and rotary actuator can be easily and directly assembled at the mounting location. No special tools or adjustments required.

### Alignment



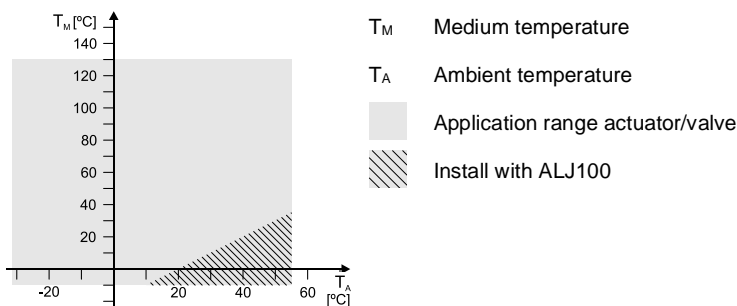
## Installation

	<b>⚠ WARNING</b>
	<p><b>No internal line protection for supply lines to external consumers</b></p> <p>Risk of fire and injury due to short-circuits!</p> <ul style="list-style-type: none"> <li>Adapt the wire cross sections as per local regulations to the rated value of the installed fuse.</li> </ul>

## Engineering

Only use GQD..9A actuators at medium temperatures of  $> 0^{\circ}\text{C}$ .

We recommend using temperature adapter ALJ100 in locations exposed to condensation to protect the actuator.




## Commissioning

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

## Maintenance

GQD..9A actuators are maintenance-free.

## Disposal

	<b>⚠ WARNING</b>
	<p><b>Tensioned return spring</b></p> <p>Opening the drive housing can release the highly tensioned return spring, possibly resulting in injury due to flying parts.</p> <ul style="list-style-type: none"> <li>Do not open the drive housing.</li> </ul>



The device is considered an electronic device for disposal in accordance with European guidelines and may not be disposed of as domestic waste.

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

Technical data on specific applications are valid only together with Siemens products listed under "Equipment combinations". Siemens rejects any and all warranties in the event that third-party products are used.

Supply voltage GQD1..9A			
Operating voltage AC		AC 24 V ~ ± 20 % (19.2...28.8 V ~)	
Frequency		50/60 Hz	
Operating voltage DC		DC 24...48 V = ± 15 % (20.4...55.2 V =)	
Power consumption	Operation	GQD121.9A	6.5 VA / 4.5 W
		GQD131.9A	4 VA / 2.5 W
		GQD161.9A	4.5 VA / 3 W
	Hold	GQD121.9A	6.5 VA / 2.5 W
		GQD131.9A	3 VA / 1.5 W
		GQD161.9A	3.5 VA / 2 W

Supply voltage GQD321.9A			
Operating voltage AC		AC 230 V ~ ± 10 % (207...253 V ~)	
Frequency		50/60 Hz	
Power consumption	Operation	10 VA / 4.5 W	
	Hold	7 VA / 3 W	

Function data			
Nominal torque		2 Nm	
	Maximum torque (when blocked)	6 Nm	
	Minimum holding torque	2 Nm	
Nominal rotation angle (with position indication)		90°	
	Maximum rotation angle (mechanically limited)	95° ± 2°	
Runtime at a nominal rotational angle of 90° (motorized)		30 s	
Closing time with spring return (on power failure)		15 s	
Permissible medium temperature in valve in combination with GQD..9A actuators		0...120 °C	

Inputs GQD131.9A and GQD161.9A			
Positioning signal			
	Switching current (at AC 24 V / DC 24...48 V =) for "Open"/"Close"		> AC / DC 8 mA
	Input voltage Y	(wires 8-2)	DC 0...10 V =
	Max. permissible input voltage		DC 35 V



Outputs GQD16.9A		
Output signal		
Output voltage U	(Wires 9-2)	DC 0...10 V =
Max. output current		DC ± 1 mA

Connection	
Cable length	0.9 m
Cable cross-section	0.75 mm <sup>2</sup>

Ambient conditions and protection classification	
Device IP class per EN 60730	
AC 24 V ~ / DC 24 V =	III
AC 230 V ~	II
Degree of protection of housing to EN 60529 (see M4659)	IP40
Operation	As per IEC 60721-3-3
Climatic conditions	Class 2K3
Temperature (extended)	-32...55 °C
Humidity (non-condensing)	<95 % r.h.
Transportation	Transport per IEC 60721-3-2
Climatic conditions	Class 3K5 / Class 2K3
Temperature (extended)	-32...70 °C
Humidity (non-condensing)	<95 % r.h.
Storage	Per IEC 60721-3-1
Climatic conditions	Class 1K3
Temperature (extended)	-32...50 °C
Humidity (non-condensing)	<95 % r.h.
Mechanical ambient conditions	Class 2M2

Standards, directives and approvals	
Product standards	EN 60730 Part 2-14: Special requirements for electric actuators
Electromagnetic compatibility (field of use)	For residential, commercial, and industrial environments
EU conformity (CE)	A5W00004364 <sup>1)</sup>
RCM conformity	A5W00004365 <sup>1)</sup>

### Environmental compatibility

The product environmental declaration CM2E4604E <sup>1)</sup> contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

### Dimensions

See Dimensions

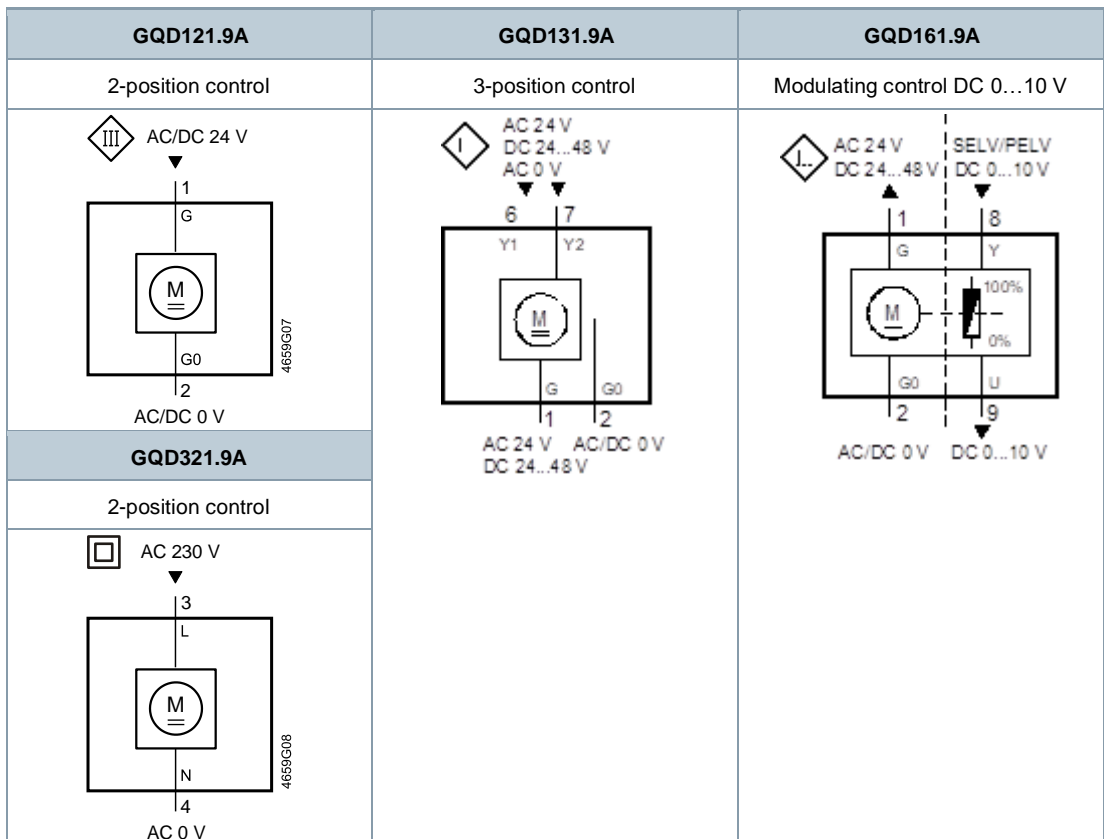
### Weight

Without packaging	GSD121.9A	0.66 kg
	GSD321.9A	0.67 kg
	GSD131.9A	0.67 kg
	GSD161.9A	0.68 kg

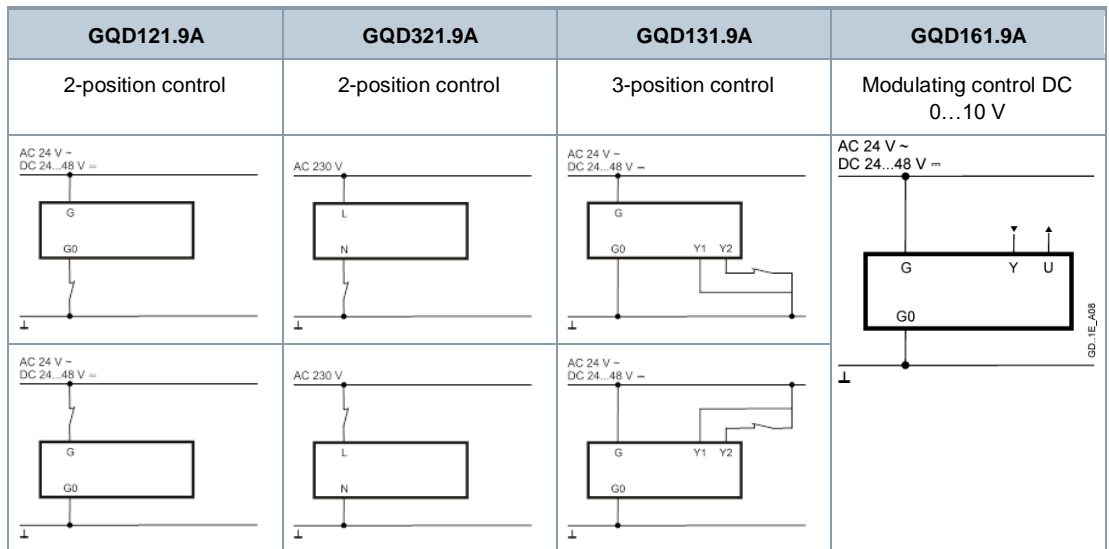
<sup>1)</sup> Documents can be downloaded at <http://www.siemens.com/bt/download>

## Connection diagrams

### Internal diagrams



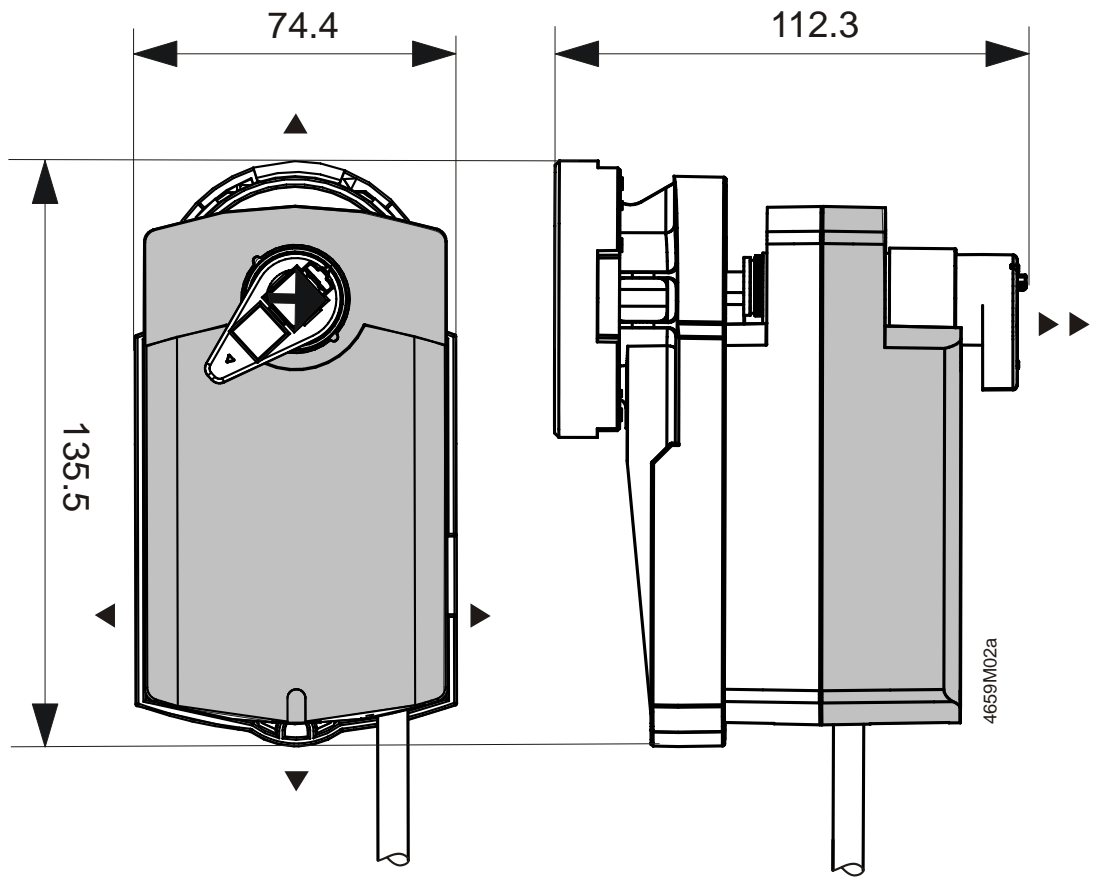
## Connection diagrams



## Cable designations

Connecting thread	Cable				Meaning
	Code	No.	Color	Abbreviation	
Rotary actuators AC 24 V ~ DC 24...48 V =	G	1	Red	RD	System potential AC 24 V ~ / DC 24 V...48 V =
	G0	2	Black	BK	System neutral
	Y1	6	Purple	VT	Positioning signal AC 0 V, AC 24 V ~ / DC 24...48 V = "Counter-clockwise" NC.
	Y2	7	Orange	OG	Positioning signal AC 0 V, AC 24 V ~ / DC 24...48 V = "Clockwise" NC.
	Y	8	Gray	GY	Positioning signal DC 0...10 V
	U	9	Pink	PK	Position indication 0...10 VDC
Rotary actuators AC 230 V ~	L	3	Brown	BN	Phase AC 230 V
	N	4	Blue	BU	Neutral conductor

Actuator

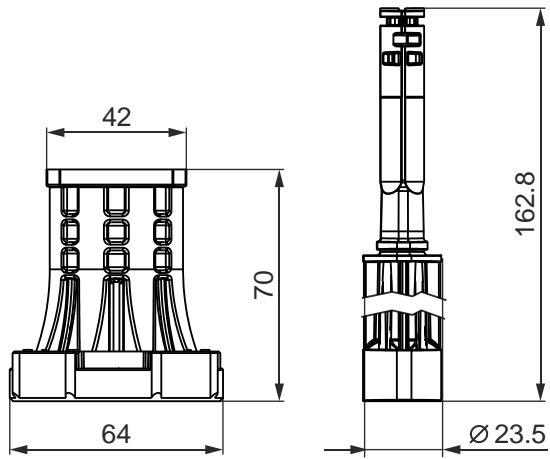


Dimensions in mm

- ▶ => 100 mm
- ▶ => 200 mm
- ▶

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

Temperature adapter (optional)



## Revision numbers

Type	Valid from rev. no.
GQD121.9A	..E
GQD321.9A	..D
GQD131.9A	..B
GQD161.9A	..B