

ACVATIX™

## Rotary actuators for ball valves

GSD161.9A



### **Electromotoric rotary actuators for 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
- Nominal torque 2 Nm
- Operating voltage AC 24 V ~ / DC 24...48 V =
- Pre-wired with 0.9 m long connection cables
- Gear train disengagement button for manual adjustment
- Position indication

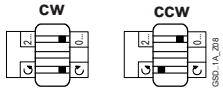
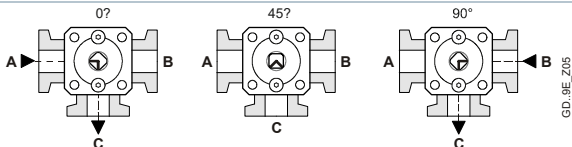
## Features

- The rotary actuator drives the control ball valve to the desired operating position after connecting the operating voltage.
- 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.

## Use

Suitable for use with modulating controllers (DC 0/2...10 V).

## Functions

<b>GSD161.9A</b>	
Control type	Modulating control (0/2...10 V)
Rotary direction	<p>Clockwise (cw) or counter-clockwise (ccw) direction depends ...</p> <p>... on the setting of the rotary direction DIL switch</p>  <p>... on the positioning signal</p> <p>The actuator remains in the achieved position:</p> <p>... if the control signal is maintained at a constant value</p> <p>... for loss of operating voltage.</p>
Combination with 2-port or 3-port control ball valves	<p><b>NC (normally closed) ball valve</b></p> <p>DIL 3 set to "counterclockwise" (ccw)</p> <p>Flow = 0% at Y = 0 V</p> <p>Flow = 100% at Y = 10 V</p>
	<p><b>NO (normally open) ball valve</b></p> <p>DIL 3 set to "clockwise" (cw)</p> <p>Flow = 100% at Y = 0 V</p> <p>Flow = 0% at Y = 10 V</p>
Combination with 6-port control ball valves	<p><b>Rotary direction "counter-clockwise" (ccw)</b></p> <p>Y = 0 V Flow A – C = 100% (0°)</p> <p>Y = 5 V closed (45°)</p> <p>Y = 10 V Flow B – C = 100% (90°)</p>
	<p><b>Rotary direction "clockwise" (cw)</b></p> <p>Y = 0 V Flow B – C = 100% (0°)</p> <p>Y = 5 V closed (45°)</p> <p>Y = 10 V Flow A – C = 100% (90°)</p> 
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.
Manual adjustment	The rotary actuator can be manually adjusted by pressing the gear train disengagement button.

### Housing

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

### Type summary

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
GSD161.9A	S55499-D232	Modulating	AC 24 V ~ / DC 24...48 V =	DC 0/2...10 V =	yes	–	–	yes

### Accessories / Spare parts

#### Spare parts

Individual spare parts are not available. Components of the accessory kit ASK77.5 <sup>1)</sup>, available <sup>2)</sup> as an accessory, can however be used for spare parts.

Description	Components
ASK77.5 Accessory Kit for BV GSD-GQD	Mounting bracket (base plate) Axle with sleeve and spring Manual lever with locking clip

<sup>1)</sup> Can also be used as rotary actuator for ball valves together with the actuator for air dampers GSD.1A.

<sup>2)</sup> As of August 2017.

#### Accessories

Type	Stock no.	Description
ALJ100	S55846-Z115	Temperature adapter for ball valves

### Equipment combinations

#### GSD161.9A and VA..61.. (2-port) / VB..61.. (3-port) control ball valves

Control ball valves with:						GSD161.9A	
internal threads <sup>1)</sup>	Rp	external threads <sup>2)</sup>	G..B	k <sub>vs</sub> [m <sup>3</sup> /h]	DN	Δp <sub>max</sub>	Δp <sub>s</sub>
–	–	<b>VAG61.15..</b>	G 1 B	1...6.3	15	350	1400
<b>VAI61.15..</b>	Rp ½"	–	–	0,25...10	15		
<b>VAI61.20..</b>	Rp ¾"	<b>VAG61.20..</b>	G 1 ¼ B	4...10	20		
<b>VAI61.25..</b>	Rp 1"	<b>VAG61.25..</b>	G 1 ½ B	6.3...16	25		
<b>VBI61.15..</b>	Rp ½"	<b>VBG61.15..</b>	G 1 B	1.6...6.3	15		–
<b>VBI61.20..</b>	Rp ¾"	<b>VBG61.20..</b>	G 1 ¼ B	4...6.3	20		
<b>VBI61.25-10</b>	Rp 1"	<b>VBG61.25-10</b>	G 1 ½ B	10	25		

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

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

## GSD161.9A and 6-port control ball valves VWG41..

VWG41..	$k_{vs}$ left [m <sup>3</sup> /h]	$k_{vs}$ right [m <sup>3</sup> /h]	DN	GSD161.9A $\Delta p_{max}$
VWG41.10-0.25..	0.25	0.4...1	10	200
VWG41.10-0.4..	0.4	0.65...1.6		
VWG41.10-0.65..	0.65	1...1.6		
VWG41.10-1.0..	1	1.3...1.9		
VWG41.10-1.3..	1.3	1.6...1.9		
VWG41.10-1.6-1.9	1.6	1.9		
VWG41.10-1.9-1.9	1.9	1.9		

## Product documentation


Topic	Title	Document ID
Data sheet	Rotary actuators for ball valves GSD161.9A	A6V10636056_en--
Mounting instructions	Rotary-type actuator GSD161.9A	A6V10636061_----
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>

## Notes

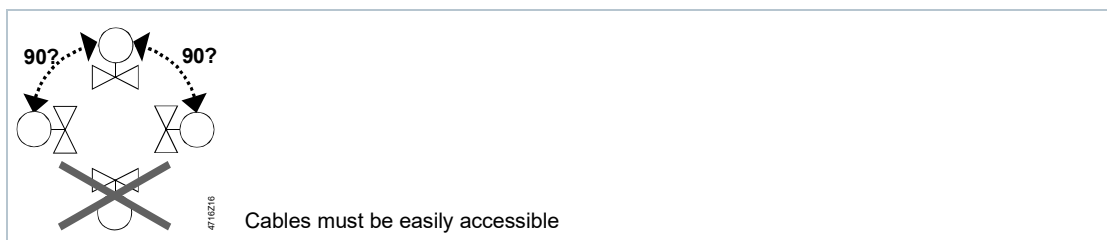
## Safety

	<p><b>⚠ Caution</b></p>
	<p><b>National safety regulations</b></p> <p>Failure to comply with national safety regulations may result in personal injury and property damage.</p> <ul style="list-style-type: none"> <li>● Observe national provisions and comply with the appropriate safety regulations.</li> <li>● Use only properly trained technicians for mounting, commissioning, and servicing.</li> </ul>

## Mounting

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

### Orientation



## Protection against weather, humidity and dirt

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

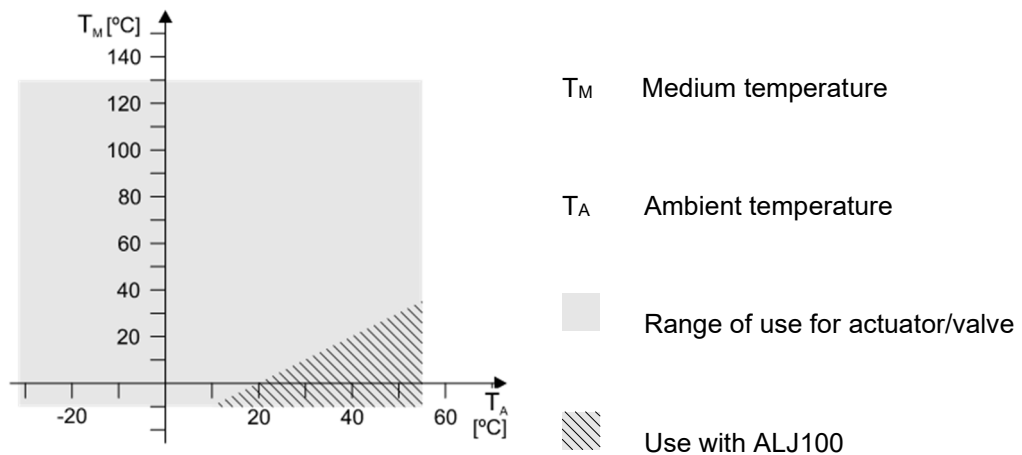
## Installation

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

GSD161.9A actuators may only be used at medium temperatures  $> 0\text{ }^{\circ}\text{C}$ .

If condensation occurs at the mounting site, the use of the temperature adapter ALJ100 is recommended in order to protect the actuator.



## 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  $0^{\circ}$  and  $90^{\circ}$  by pushing the gear train disengagement button.

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!

### Electric, parallel connection of actuators

Up to 10 actuators of the same type can be electrically wired in parallel; cable length and cable cross-sections must be observed.

### Maintenance

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The actuators GSD161.9A are maintenance-free.

### Disposal

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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.

## Technical data

Power supply		
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 =) <sup>1)</sup>
Power consumption	running	2.4 VA / 1.4 W
	holding	1.2 VA / 0.7 W
Functional data		
Nominal torque		2 Nm
Nominal rotational angle		90° / 95 ± 2°
Runtime at nominal rotational angle 90°		30 s
Duty cycle		100 %
Mechanical life		100 000 cycles
Permissible medium temperature in the valve in combination with GSD161.9A actuators		0...120 °C
Inputs		
Positioning signal Input voltage Current consumption Input resistance		(wires 8-2/Y-G0) DC 0/2...10 V = 0.1 mA >100 kΩ
Outputs		
Position indicator 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 <sup>2</sup>
Degree of protection		
Insulation class		III as per EN 60730
Housing protection		IP54 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.
Transportation – Climatic conditions – Temperature (extended) – Humidity, non-condensing		IEC 60721-3-2 Class 3K5 / 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		EN60730 Part 2-14 / Particular requirements for electric actuators
Electromagnetic compatibility (Applications)		For use in residential, commerce, light-industrial and industrial environments
EU Conformity (CE)		A5W00004362 <sup>2)</sup>

Standards, directives and approvals	
RCM Conformity	A5W00004363 <sup>2)</sup>
EAC Conformity	Eurasian conformity
UL	UL as per UL 60730 <a href="http://ul.com/database">http://ul.com/database</a> cUL <sup>1)</sup> as per CSA-C22.2 No. 24-93

#### Environmental compatibility

The product environmental declaration A5W00030346-A <sup>2)</sup> 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

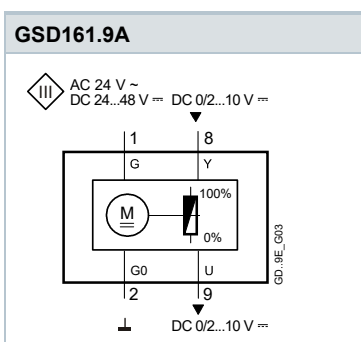
Without packaging 0.65 kg

<sup>1)</sup> Permitted only to DC 30 V =

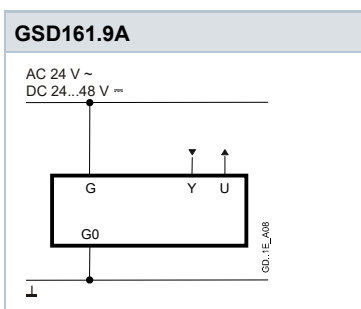
<sup>2)</sup> The documents can be downloaded from <http://siemens.com/bt/download>.

## Diagrams

### Internal Diagram



### Connection diagram

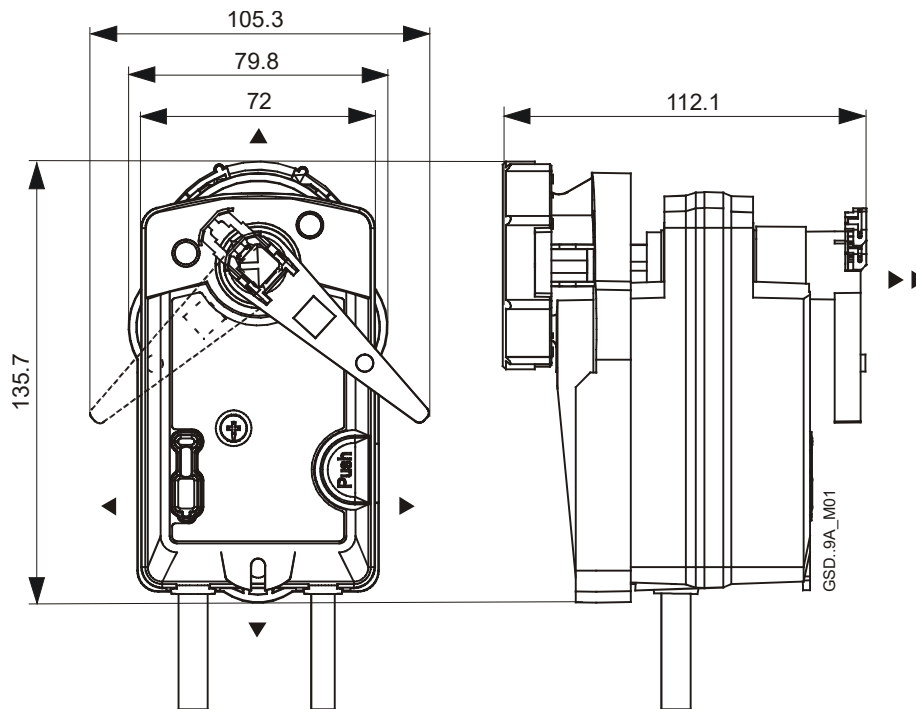


### Cable labeling

Connection	Code	No	Color	Abbreviation	Meaning
Actuators	G	1	red	RD	System potential AC 24 V ~ / DC 24...48 V =
AC 24 V ~ DC 24...48 V =	G0	2	black	BK	System neutral
	Y	8	grey	GY	Signal in
	U	9	pink	PK	Signal out



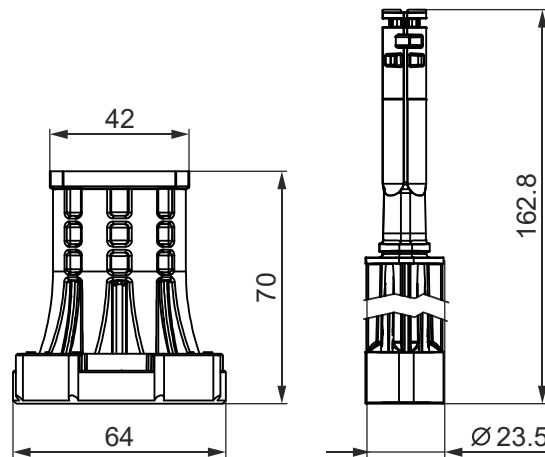
Actuator



Dimensions in mm

- ▶ = >100 mm Minimum clearance from ceiling or wall for mounting,
- ▶▶ = >200 mm connection, operation, maintenance etc.

Temperature adapter (optional)



## Revision numbers

Type	Valid from rev. no.
GSD161.9A	..A