SIEMENS

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

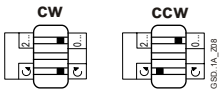
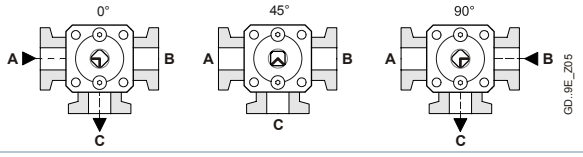
Features

- 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

GSD161.9A	
Control type	Modulating control (0/2…10 V)
Rotary direction	Clockwise (cw) or counter-clockwise (ccw) direction depends …
	… 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
	DIL 3 set to “counterclockwise” (ccw) Flow = 0% at Y = 0 V Flow = 100% at Y = 10 V
	NO (normally open) ball valve
	DIL 3 set to “clockwise” (cw) 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.
Manual adjustment	The rotary actuator can be manually adjusted by pressing the gear train disengagement button.

Technical design/mechanical design

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

Individual spare parts are not available. Components of the accessory kit ASK77.5 [1], available [2] 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

[1] Can also be used as rotary actuator for ball valves together with the actuator for air dampers GSD.1A.
[2] As of August 2017.

Equipment combinations

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

Control ball valves with:				k_{vs} [m³/h]	DN	GSD161.9A	
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		
VBI61.15..	Rp ½“	**VBG61.15..**	G 1 B	1.6…6.3	15		–
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

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

VWG41..	k_{vs} left [m³/h]	k_{vs} right [m³/h]	DN	GSD161.9A Δp_{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

⚠ Caution

National safety regulations

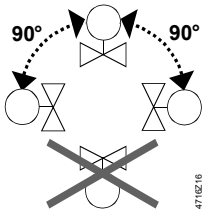
Failure to comply with national safety regulations may result in personal injury and property damage.

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

Mounting

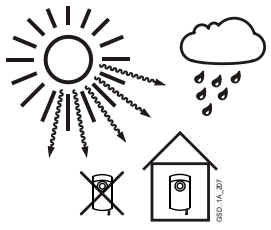
Both ball valve and rotary actuator can easily be assembled at the mounting location. Neither special tools nor adjustments are required.

Orientation

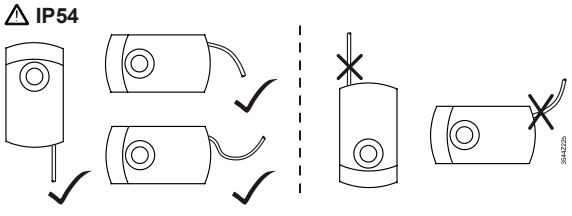


Cables must be easily accessible

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 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!

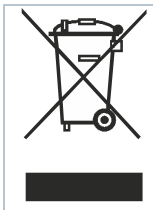
Electric, parallel connection of actuators

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

Maintenance

The actuators GSD161.9A 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.

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 ⎓) [1]
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

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^2

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 [2]
RCM Conformity	A5W00004363 [2]

Standards, directives and approvals	
EAC Conformity	Eurasian conformity
UL	UL as per UL 60730 http://ul.com/database cUL [1] as per CSA-C22.2 No. 24-93

Environmental compatibility
The product environmental declaration A5W00030346-A [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. 8

Weight	
Without packaging	0.65 kg

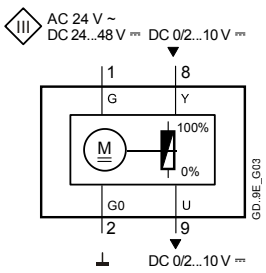
[1] Permitted only to DC 30 V ⎓

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

Diagrams

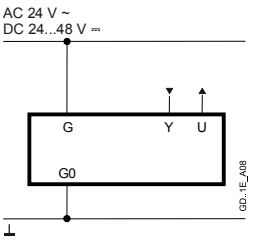
Internal Diagram

GSD161.9A



Connection diagram

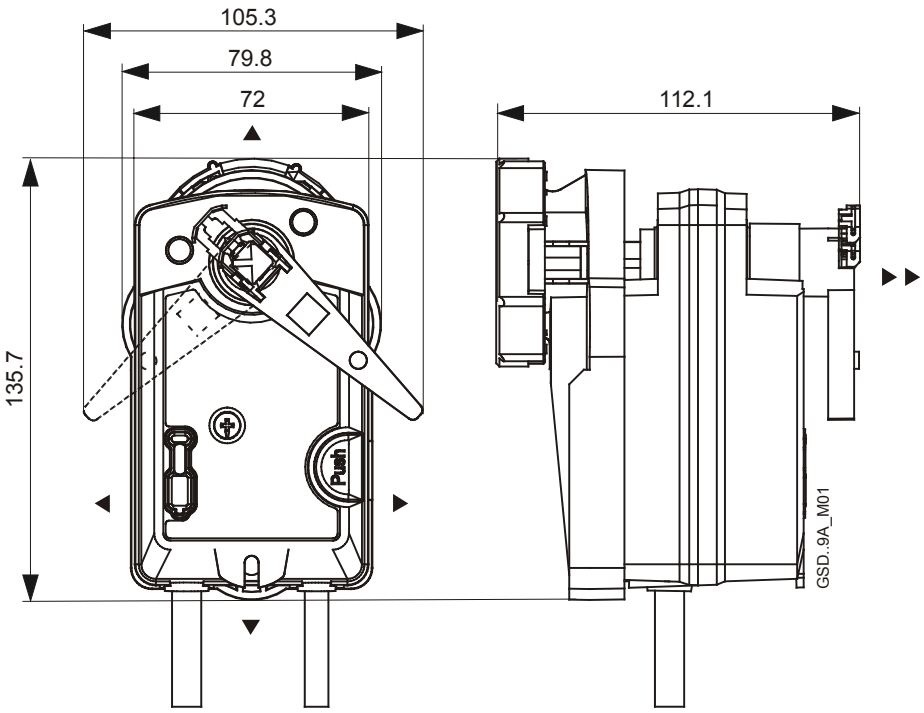
GSD161.9A



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 ~	G0	2	black	BK	System neutral
DC 24…48 V ⎓	Y	8	grey	GY	Signal in
	U	9	pink	PK	Signal out

Dimensions



Dimensions in mm

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

Revision numbers

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

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