

ACVATIX™

## Rotary actuators for ball valves

GLD161.9E..



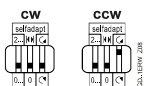
**Electromotive rotary actuators for modulating control.  
Used in heating, ventilation and air conditioning plants.**

- For 2-port and 3-port control ball valves, internally threaded connections (VAI61.. and VBI61..) or externally threaded connections (VAG61.. and VBG61..), DN15...50
- Nominal torque 8 Nm
- Operating voltage GLD161.9E AC 24 V ~ / DC 24...48 V =
- Operating voltage GLD161.9E/MO AC 24 V ~ / DC 24 V =
- GLD161.9E/MO: RS-485 for Modbus RTU communication
- Pre-wired with 0.9 m long connection cables

## Features

- 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).

## Functions

Function	161.9E	161.9E/MO
Control type	Modulating control (0/2...10 V)	Modbus RTU
Rotary direction	<p>Clockwise or counter-clockwise 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>	-
	NC (normally closed) ball valve	-
	DIL 3 set to "counter-clockwise" (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	-
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.	
Modbus RTU (RS-485), not galvanically isolated		Setpoint 0...100 % valve position Actual value 0...100 % for valve position Override control Open / Close / Min / Max / Stop Setpoint monitoring and backup mode

### Housing

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

### Type summary

Type	Stock no.	Control	Operating voltage	Position indicator U = DC 0...10 V –	Self-adaption of rotational angle range	Aux. switches	Rotary direction switch
GLD161.9E	S55499-D278	Modulating DC 0/2...10 V $\square$	AC 24 V ~ / DC 24...48 V $\square$	yes	yes	–	yes
GLD161.9E/MO	S55499-D695	Modbus RTU	AC 24 V ~ / DC 24 V $\square$				

### Accessories / Spare parts

#### Spare parts

Individual spare parts are not available. Components of the accessory kit ASK77.3<sup>1)</sup>, available as an accessory, can however be used for spare parts.

Description	Components
ASK77.3 Accessory Kit BV for GxBxx1.9E	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 G..B.1E.

#### Accessories

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

### Equipment combinations

#### GLD161.9E.. and VA..61.. 2-port control ball valves

Control ball valves with:						GLD161.9E..		
internal threads <sup>1)</sup>	Rp	external threads <sup>2)</sup>	G..B	k <sub>vs</sub> [m <sup>3</sup> /h]	DN	$\Delta p_{max}$	$\Delta p_s$	
–	–	<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>VAI61.32..</b>	Rp 1¼"	<b>VAG61.32..</b>	G 2 B	10...25	32			1000
<b>VAI61.40..</b>	Rp 1½"	<b>VAG61.40..</b>	G 2 ¼ B	16...40	40			800
<b>VAI61.50..</b>	Rp 2"	<b>VAG61.50..</b>	G 2 ¾ B	25...63	50			600

## GLD161.9E.. and VB..61.. 3-port control ball valves

Control ball valves with:						GLD161.9E..	
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>
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		
VBI61.32-16	Rp 1¼"	VBG61.32-16	G 2 B	16	32		
VBI61.40-25	Rp 1½"	VBG61.40-25	G 2 ¼ B	25	40		
-	-	VBG61.50-40	G 2 ¾ B	40	50		
VBI61.50..	Rp 2"	-	-	40...63	50		

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

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


### Product documentation

Topic	Title	Document ID
Data sheet	Rotary actuators for ball valves	A6V11171770
Mounting instructions	GLD..9E..	A6V11171776
Mounting instructions	VAI61.. / VBI61..	M4211
Mounting instructions	VAG61.. / VBG61..	M4212

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

### Notes

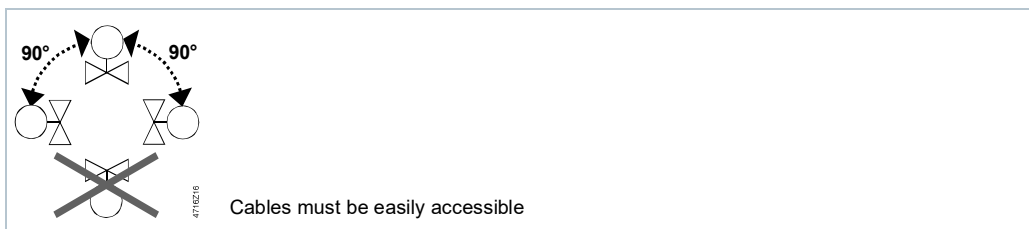
#### Safety

	<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

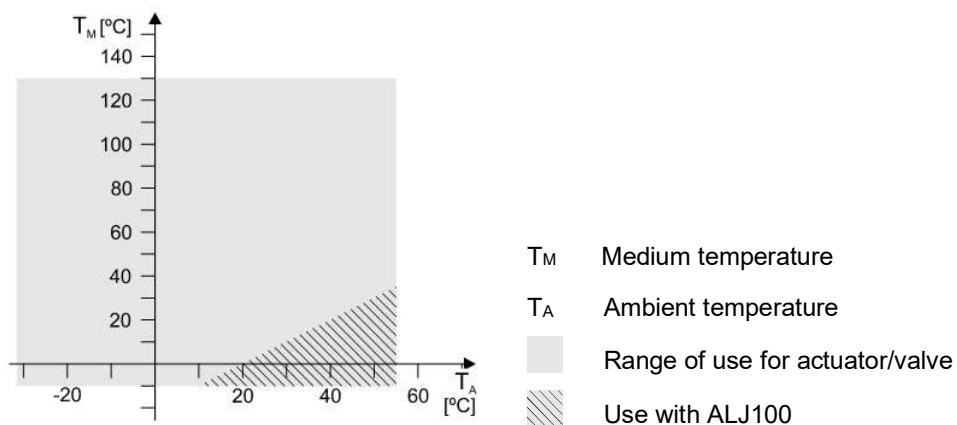
Protection against direct sunlight and rain	Correct mounting position and cable connection	Protection only with closed cover!

## Installation

	<p><b>⚠ WARNING</b></p> <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 line diameters as per local regulations to the rated value of the installed fuse.</li> </ul>
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## Engineering

If condensation occurs at the mounting site, the use of the temperature adapter ALJ100 is recommended in order to protect the actuator. If the medium temperature is  $\leq 0^\circ\text{C}$ , the adapter shaft must be greased with silicon grease.



## GLD161.9E/MO

The Modbus converter is designed for analog control at 0...10 V.

## Commissioning

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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

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The actuators GLD161.9E.. 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.

Power supply		
Operating voltage (SELV/PELV) / Frequency	GLD161.9E	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>
	GLD161.9E/MO	AC 24 V ~ ±20 % (19,2...28,8 V ~) / 50/60 Hz DC 24 V = ±20 % (19,2...28,8 V =)
Power consumption	running	4.9 VA / 1.8 W
	holding	0.5 W

Function data	
Nominal torque	8 Nm
Maximum torque (blocked)	16 Nm
Nominal rotary angle (with position indication)	90°
Maximum rotary angle (mechanic limitation)	95° ± 2°
Runtime for 90° rotary angle	30 s
Actuator sound power level	32 dB(A)

Inputs		
Positioning signal		
Input voltage	(wires 8-2/Y-G0)	DC 0/2... 10 V =
Current consumption		0.1 mA
Input resistance		>100 kΩ
Max. permissible input voltage		DC 35 V = limited to DC 10 V =
Protected against faulty wiring		max. AC 24 V ~
Hysteresis		60 mV

Communication GLD161.9E/MO		
Communication protocol		
Modbus RTU		RS-485, not galvanically isolated
Number of nodes		Max. 32
Address range		1...245 / 255
	Factory setting	255
Transmission formats		1-8-E-1 / 1-8-O-1 / 1-8-N-1 / 1-8-N-2
	Factory setting	1-8-E-1
Baud rates (kbaud)		Auto / 9.6 / 19.2 / 38.4 / 57.6 / 76.8 / 115.2
	Factory setting	Auto
Bus termination		120 Ω electronically switchable
	Factory setting	Off

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

Connection cables	
Cable length	0.9 m
Cross section of prewired connection cables	0.75 mm <sup>2</sup>
Permissible length for signal lines	300 m

Degree of protection	
Insulation class	III as per EN 60730
Housing protection	IP54 as per EN 60529

Environmental conditions	
Operation	IEC 60721-3-3
Climatic conditions	Class 3K5
Mounting location	interior, weather-protected
Temperature extended	-32...+55 °C
Humidity (non-condensing)	<95 % r.F.
Transport	IEC 60721-3-2
Climatic conditions	Class 3K5 / Class 2K3
Temperature extended	-32...+70 °C
Humidity (non-condensing)	<95 % r.F.
Storage	IEC 60721-3-1
Climatic conditions	Class 1K3
Temperature extended	-32...+50 °C
Humidity (non-condensing)	<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)	A5W00026944 <sup>2)</sup>
UK Conformity (UKCA)	A5W00219360A <sup>2)</sup>
RCM Conformity	A5W00026948 <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 A5W00026068 <sup>2)</sup> contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

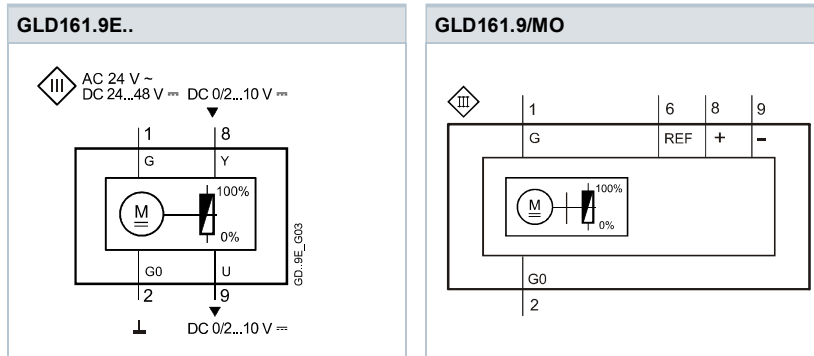
Dimensions	
Actuator W x H x D	see „Dimensions“, p. 11

Weight		
Without packaging		0.69 kg
	External Modbus converter	0.15 kg

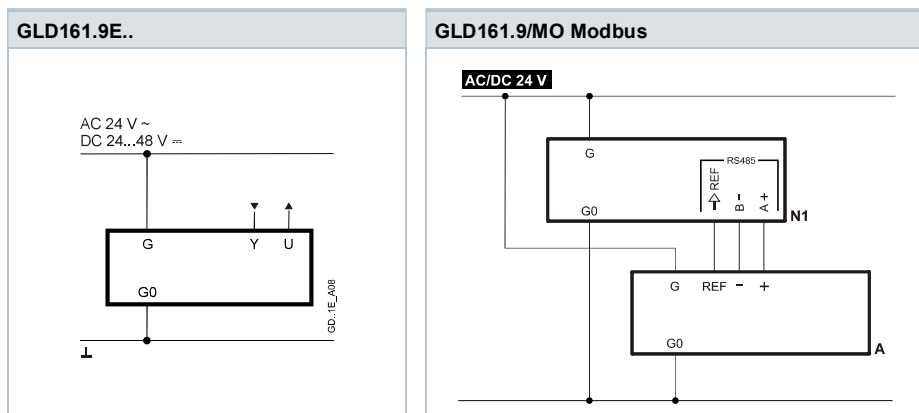
<sup>1)</sup> Permitted only to DC 30 V –

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

Internal Diagram



Connection diagram

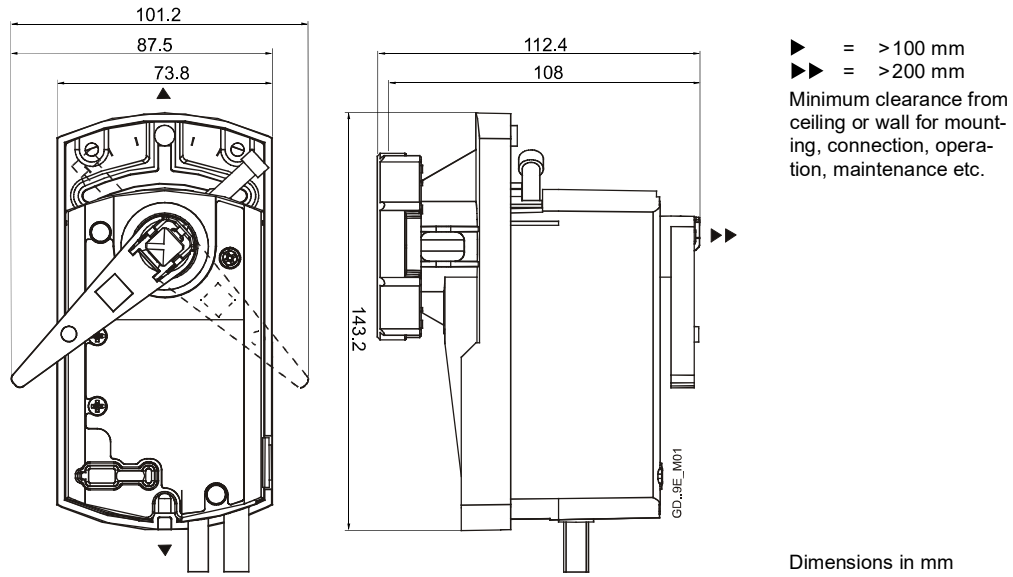


Cable labeling

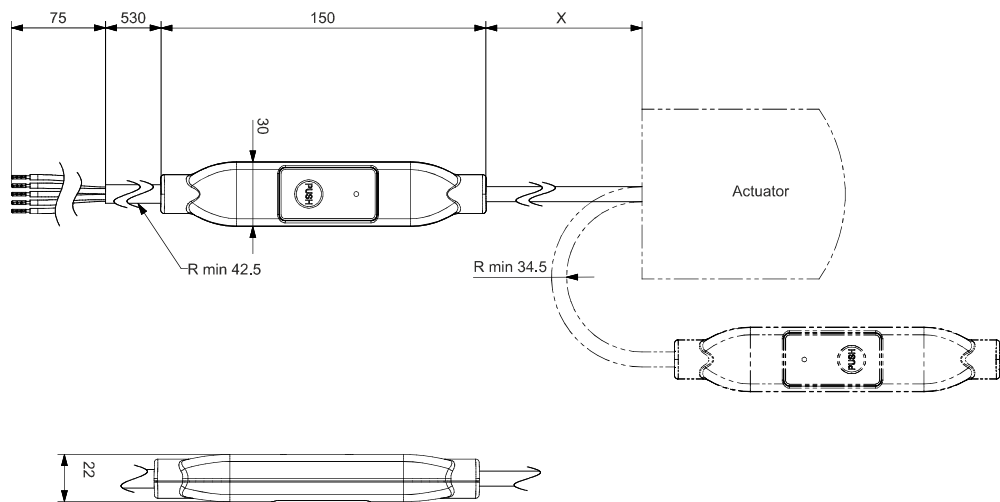
Pin	Code	No.	Color	Abbreviation	Meaning
Actuators	G	1	red	RD	System potential AC 24 V ~ / DC 24...48 V ~
AC 24 V ~	G0	2	black	BK	System neutral
DC 24...48 V ~	Y	8	grey	GY	Signal-in
	U	9	pink	PK	Signal-out
Modbus	REF	6	purple	VT	Reference (Modbus RTU)
AC 24 V ~	+	8	gray	GY	Bus + (Modbus RTU)
DC 24 V ~	-	9	pink	PK	Bus - (Modbus RTU)

## Dimensions

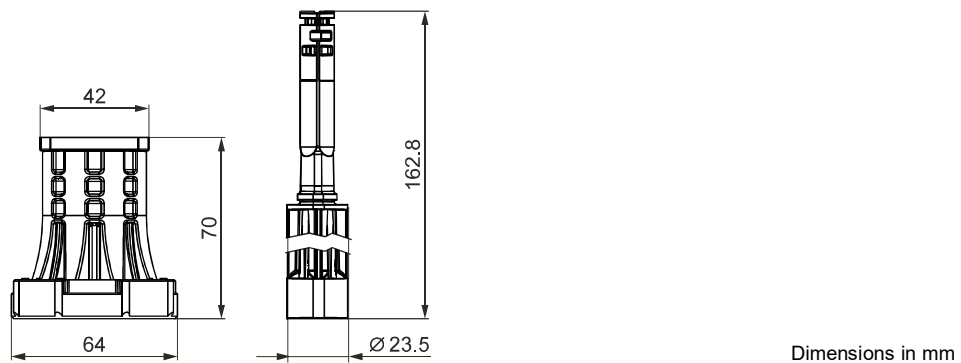
### Actuator



### External Modbus converter



### Temperature adapter (optional)



## Revision numbers

Type	Valid from rev. no.
GLD161.9E	..F
GLD161.9E/MO	..F

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