

OpenAir™

## Air damper actuators with spring return for railway vehicles

GPC2..1A/RW (DC 110 V)



### Electromotoric rotary actuators for open-close and modulating control

- Nominal torque 4 Nm
- Operating voltage DC 110 V =
- Connection cables railway specific
- Emergency function with spring return
- Position indication
- Auxiliary switches for auxiliary functions
- Degree of protection IP54
- Printed circuit board with protective coating

## Features

Air damper actuators in difficult operational conditions; they meet the main requirements for:

- EN 50155 (Railway applications - Electronic equipment used on rolling stock)
- EN 45545 (Railway applications - Fire protection on railway vehicles)
- EN 61373 (Railway applications - Rolling stock equipment - Shock and vibration tests)

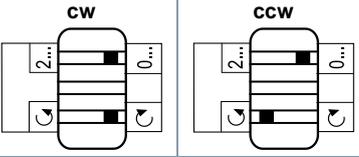
The spring return actuator drives the damper to the desired operating position after connecting the operating voltage. At the same time, the spring return, integrated in the actuator, is tensioned. In the event of a loss of operational voltage, the spring return automatically drives the damper to the defined emergency position.

## Use

These damper actuators are expressly suitable for air conditioning units and air distribution systems for railway vehicles. Typically, used to operate air dampers that must be driven to a defined emergency position in the event of a loss of voltage.

- For damper areas of ca. 0.6 m<sup>2</sup>
- Suitable for use with 2-position, as well as modulating controllers (DC 0/2...10 V)

## Functions

Type	DC 110 V =	GPC221.1A/RW GPC226.1A/RW	GPC261.1A/RW
Control type		Open-Close	Modulating control
Direction of rotation		Clockwise or counter-clockwise direction depends on the mounting position on the damper shaft; and	
		-	<ul style="list-style-type: none"> <li>• ...on the type of control</li> <li>• ...on the setting of the rotary direction DIL switch (clockwise [cw] / counter-clockwise [ccw])</li> </ul>
			
Emergency function		In the event of a power outage or switching off of the operating voltage, the spring return drives the actuator and the damper, connected by the damper shaft, to the defined emergency position.	
Position indication	Mechanical	Angle of rotation position indication by a position indicator	
	Electrical		<ul style="list-style-type: none"> <li>• Output voltage <math>U = DC\ 0/2...10\ V</math> is generated proportionally to the angle of rotation.</li> <li>• The direction of action (inverted or non-inverted) for output voltage <math>U</math> is based on the DIL switch position.</li> </ul>
Auxiliary switch		Fixed position 5° / 85°	

## Technical design

### Housing

The housing consists essentially of glass fibre reinforced plastic:

- Flame retardant
- Non brominated
- Non chlorinated

### Actuator motor / gears

- 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.

The actuator is shipped with a factory-set preload of 5°.

## Type summary

Type	Stock number	Control	Operating voltage	Position indicator U = DC 0/2...10 V	Auxiliary switch	Rotary direction switch
GPC221.1A/RW	S55499-D726	2-position	DC 110 V =	-	-	-
GPC226.1A/RW	S55499-D727				2	
GPC261.1A/RW	S55499-D728	Modulating		Yes	-	Yes

## Product documentation

Topic	Title	Dokument-ID
Data sheet	Air damper actuators with spring return for railway vehicles, GPC2..1A/RW (DC 110 V)	A6V12575999
Mounting instructions	Damper actuators for railway vehicles GPC..1A/RW	A6V12576004

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

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

## Safety

	<b>⚠ CAUTION</b>
	<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>• Mounting, commissioning, and service by properly trained personnel only.</li> </ul>

## Engineering

### Auxiliary switches

Auxiliary switches **cannot** be added in the field.

## 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>

## Maintenance

The rotary actuators with spring return GPC..1A/RW 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, which can cause flying parts and injuries.</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 the European Guidelines 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		DC 110 V = + 25 % / - 30 % (77...137,5 V =)	
Power consumption	Running	GPC22..1A/RW	2.3 W
		GPC26..1A/RW	2.3 W
	Holding	GPC22..1A/RW	1.5 W
		GPC26..1A/RW	1.5 W

Functional data		
Nominal torque		4 Nm
Holding torque		4 Nm
Angle of rotation	Nominal angle of rotation	90°
	Max. angle of rotation (mechanically limited)	95° ± 2°
Runtimes	Runtime at nominal angle of rotation 90°	60 s
	Closing time with spring return (in case of power failure) 90°	15 s (@ -20...+55 °C) > 20 s (@ -20...-32 °C)
Duty cycle		100 %
Direction of rotation		Clockwise / counter-clockwise
Mechanical life		100 000 cycles
Sound power level	Actuator	40 dB(A)
	Spring return	55 dB(A)

Inputs			
Positioning signal for GPC22..1A/RW			
	Operating voltage DC 110 V = / 0 V	(wires 3-4/L+-N)	Open / close
Positioning signal for GPC26..1A/RW			
	Operating voltage DC 110 V = / 0 V	(wires 3-4/L+-N)	
	Input voltage	(wires 8-2/Y-G-)	DC 0/2...10 V =
	Current consumption		0.1 mA
	input resistance		>100 kΩ
	Max. permissible input voltage		DC 35 V

Outputs			
Position indicator			
Output signal for GPC26..1A			
	Output voltage U	(wires 9-2/U-G-)	DC 0...10 V =
	Max. output current		DC ± 1 mA
	Protected against faulty wiring		Max. DC 110 V =
	Auxiliary power supply	(wires 1-2/G+-G-)	DC 24 V = ± 20 %, max. 10 mA

Auxiliary switch (GPC226.1A/RW)			
Switching voltage		DC 110 V =	
Contact rating		0.2 A resistive, 0.1 A inductive, min. 10 mA @ DC 110 V =	
Electric strength auxiliary switch against housing		AC 4 kV	
Switch setting	A / B	Factory setting	5° / 85° (fixed position)
	No mixed operation AC 24 V ~ / DC 24...48 V = and AC 100...240 V ~		

Connection cable (specific to railway vehicles)	
Cable length	0.9 m
Wire cross-section	0.75 mm <sup>2</sup>

Degree of protection	
Protection class	To EN 60730 II
Housing protection	IP54 as per EN 60529

Environmental conditions		
Temperature	-32...55 °C	
Humidity	<95 % r.h.	
Overtemperature	Max. 10 min / 15 °C	...70 °C
Condensation	Permissible	

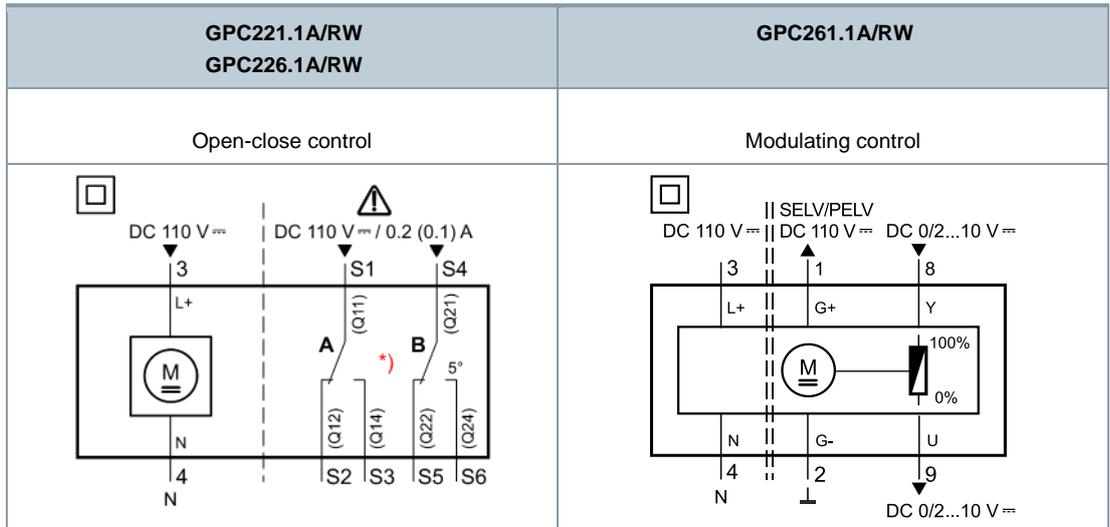
Standards, directives and approvals	
Product standard	EN 60730 Part 2-14: Particular requirements for electric actuators
Railway application	EN 50155 Railway applications - Electronic equipment used on rolling stock
	EN 61373 Shock und vibration
	EN 45545-2 Fire protection on railway vehicles
Electromagnetic compatibility (application area)	For railway applications Residential, commercial, and industrial environments
EU Conformity (CE)	A5W00029693 <sup>1)</sup>
RCM Conformity	A5W00029694 <sup>1)</sup>
EAC Conformity	Eurasian conformity

Environmental compatibility
The product environmental declaration A5W00030347 <sup>1)</sup> contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

Dimensions and weight			
Actuator B x H x T		See Dimensions [▶ 10]	
Damper shaft	Round	8...15 mm	
	Square	6...11 mm	
	Min. shaft length	20 mm	
	Max. shaft hardness	<300 HV	
Weight	Without packaging	Without switch	Max. 0.65 kg
		With switch	Max. 0.8 kg

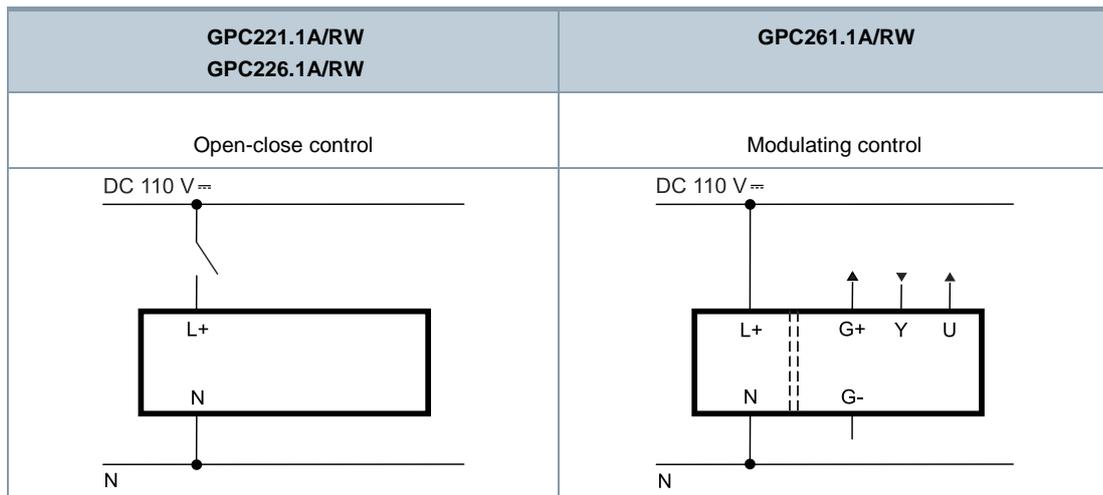
<sup>1)</sup> The documents can be downloaded from <http://siemens.com/bt/download>.

Internal diagrams



*) Auxiliary switch GPC226.1A/RW				
		Actuator Position	Switch A Common S1 connected to	Switch B Common S4 connected to
0°... 5°	5°... 90°	85°... 90°	0°...5°	S3
5°... 90°	85°... 90°	85°... 90°	5°...85°	S6
85°... 90°	85°... 90°	85°... 90°	85°...90°	S2
		N.O.	Normally open	
		N.C.	Normally closed	

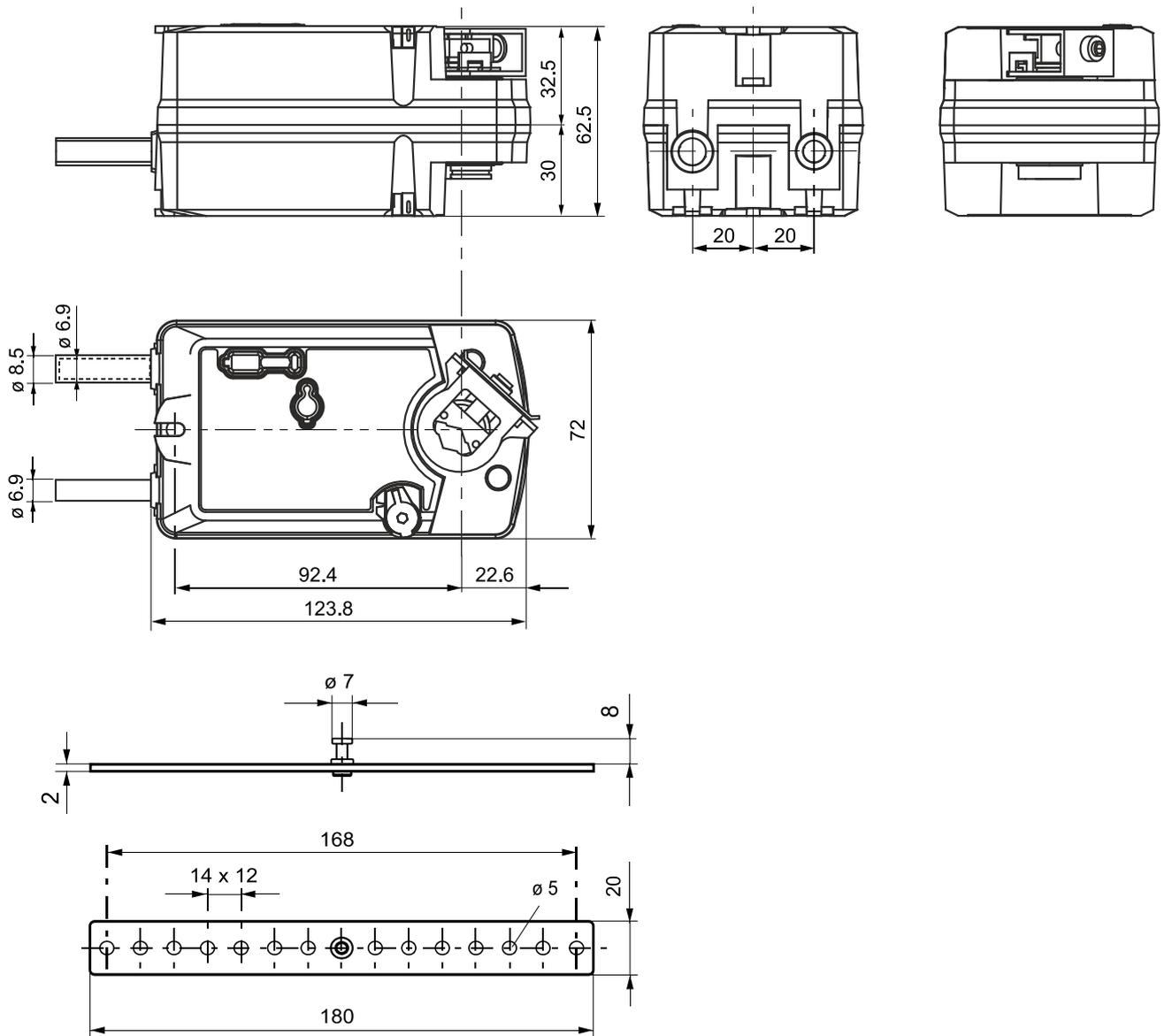
## Connection diagrams



## Cable designations

Connection	Cable				Meaning
	Code	No.	Color	Abbreviation	
Actuators DC 110 V =	G+	1	Brown	BN	System potential DC 24 V = (GPC261.1A/RW)
	G-	2	Light blue	BU	System neutral (GPC261.1A/RW)
	L+	3	Red	RD	System potential DC 110 V =
	N	4	Black	BK	Neutral conductor
	Y	8	Gray	GY	Signal in (GPC261.1A/RW)
	U	9	Pink	PK	Signal out (GPC261.1A/RW)
Auxiliary switch GPC226.1A/RW	Q11	S1	Gray/red	GY RD	Switch A input
	Q12	S2	Gray/blue	GY BU	Switch A normally open contact
	Q14	S3	Gray/pink	GY PK	Switch A normally closed contact
	Q21	S4	Black/red	BK RD	Switch B input
	Q22	S5	Black/blue	BK BU	Switch B normally open contact
	Q24	S6	Black/pink	BK PK	Switch B normally closed contact

## Dimensions



Dimensions in mm

## Revision numbers

Type	Valid from rev. no.
GPC221.1A/RW S55499-D726	..C
GPC226.1A/RW S55499-D727	..C
GPC261.1A/RW S55499-D728	..C