MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

SIEMENS

GCA126.1E

SPRING-RETURN ROTARY DAMPER ACTUATOR

Used with the applicable OpenAir GCA12..1 Rotary Actuators configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Siemens OpenAir GCA12..1/GCA32..1 Data Sheet CM2N4613E, February 1999; GCA126.1E variant.

OpenAir™

Air damper actuators

GCA12...1
GCA32...1

Rotary version, two-position control,
with spring return, AC 24 V or AC 230 V



Electromotive rotary actuators for two-position control, nominal torque 16 Nm, spring return to fail-safe position, operating voltage AC 24 V or AC 230 V, for two-position control, span mechanically adjustable between 0...90°, pre-wired with 0.9 m long connection cables.
Type-specific variations with adjustable auxiliary switches for supplementary functions.

Use

To control air dampers in ventilating and air conditioning plants

- using a nominal torque of 16 Nm for damper surfaces up to 3 m^2, friction-dependent.
- requiring fail-safe position (zero position) when there is a power failure.

Functions

Basic functions

Rotational movement

- Direction of rotation (right or left) determined by the actuator's mounting on the damper shaft.
- As soon as an operating voltage of either AC 24 V or AC 230 V is applied, the actuator turns to " 90°".

Fail-safe function

In the event of power failure or when the operating voltage is shut off, the actuator spring returns to the fail-safe position “0” .

Position indication

The position indicator located on the shaft adapter displays the rotational angle position of the damper blade.

Manual override

The actuator can be turned to any position using a hex wrench and locked using a screwdriver. After mechanically releasing the lock or after briefly applying operating voltage, the actuator returns to the “0” position.

Mechanical limitation of rotational angle

The rotational angle of the shaft adapter can be limited to 5° increments between 0° and 90°.

Type-specific functions

Adjustable auxiliary switches

Auxiliary switches provide supplementary functions. The switching points for switches A and B (one changeover switch each) can be set independently in increments of 5° within the 0°...90° rotational angle.
Refer to "Technical design", "Commissioning notes" and "Internal diagram".

Summary of types

Operating voltage			
AC 24 V		AC 230 V	
Standard application	With 2 auxiliary switches	Standard application	With 2 auxiliary switches
GCA121.1E	**GCA126.1E**	**GCA321.1E**	**GCA326.1E**

Ordering

The auxiliary switches **cannot** be integrated retroactively. For that reason, order the respective type that contains the desired option.

Delivery

Due to various mounting options depending on the direction of rotation and shaft length, separate parts such as the shaft adapter with position indicator and other mounting parts are shipped separately with the actuator.

Connection cables

The actuator comes with 0.9 m long pre-wired connection cables.

Accessories and spare parts

The following accessories and spare parts are available for function upgrades of the actuators; see data sheet N4699:

Accessories

- Rotary/linear set for duct mounting **ASK71.1**
- Rotary/linear set for wall mounting **ASK71.2**
- Rotary/linear set with lever **ASK71.3**
- Rotary/linear set with lever and mounting plate **ASK71.4**
- Bracket for Powerpack **ASK73.1**
- Weather shield **ASK75.1**

Spare parts and ordering information as per data sheet **N4699**

Equipment combination

These actuators can be connected to all regulating and controlling devices with a two-position output supplying a switching voltage of AC 24 V or AC 230 V.

Technical design

Motor technology

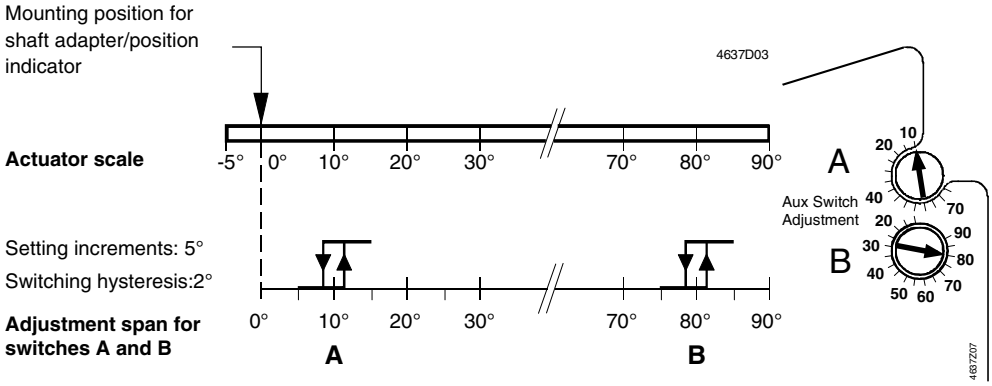
The brushless DC motor provides accurate speed control, torque monitoring to protect the actuator and dampers as well as a reliable fail-safe function.

Spring return mechanism in the event of power failure

Springs supply the fail-safe function. The problems caused by conventional frictional grip for multi-stage gearing are solved using a second, synchronously turning spring in the motor which eliminates the motor's frictional grip.

Adjustable auxiliary switch (type-specific)

The illustration below shows the adjustable switching values for auxiliary switches A and B in relation to the rotational angle.



Note

The setting shafts for the auxiliary switches turn together with the actuator. The scales are valid only for the zero position of the actuator.

Mechanical design

Basic components

Housing

Robust, lightweight all metal housing made from aluminum diecast which guarantees a long actuator life even under extreme ambient conditions.

Gear train

Maintenance-free and noise-free gear train with stall and overload protection for the life of the actuator.

Spring preload

The spring has a factory set preload of 5° which ensures tight close-off for the air dampers.

Manual adjustment

A wrench lock in the center of the actuator allows the manual setting of the gears. A hex wrench is supplied.

Self-centering shaft adapter

The actuator can be fastened to shafts with various diameters and in various shapes (square, round) using just one screw due to the L&G patented mounting.
Insert the shaft adapter from either side into the opening for the shaft adapter depending on the damper shaft length. For short shafts, the shaft adapter is on the duct side.
The shaft adapter coupling and the shaft holding are coupled via double-sided gearing.

Mechanical limitation of the rotational angle

The limitation of the rotational angle can be adjusted in the span of 0...90° in increments of 5°.

Mounting bracket

A metal strip with bolt serves to fasten the actuator on the opposite side of the shaft holding.

Electrical connection

All actuators come with pre-wired 0.9 m long connection cables.

Note

You can mount the actuator on either side depending on the required rotation direction. All setting and operating elements are available on both sides of the actuator.

Type-specific elements

Auxiliary switches

For supplementary functions, the auxiliary switches A and B can be adjusted on the actuator front, below the opening for the shaft adapter.

Factory settings for auxiliary switches A and B (see "Technical design")

The auxiliary switches are factory set:
Switch A: Switching point at 5°
Switch B: Switching point at 85°

To change the settings of A and B, use a flat blade screwdriver to turn the switch adjustment dials to the desired setting.

Important

The angle values are valid only for the actuator position "0°". (The switch adjustment dials turn together with the actuator).

Technical data

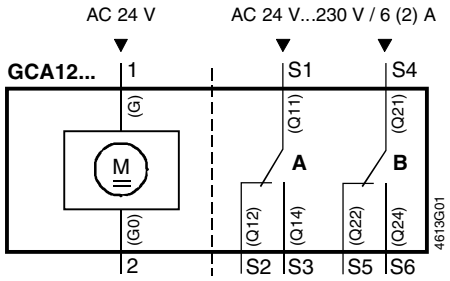
⚠ **Power supply AC 24V** for GCA121.1E GCA126.1E	Operating voltage	AC 24 V ± 20 %
	Safety extra-low voltage (SELV) or protection by extra-low voltage (PELV) as per	HD 384
	Protection class	III as per EN 60 730
	Requirements for external safety insulating transformer (100% duty) to	EN 60 742
	Feeder protection external	max. 10 A
	Frequency	50/60 Hz
	Power consumption: running	8 VA/6 W
	holding	3 VA/1.5 W
⚠ **Power supply AC 230V** for GCA321.1E GCA326.1E	Operating voltage	AC 230 V ± 10 %
	Protection class	II as per EN 60 730
	Feeder protection extern	max. 10 A
	Frequency	50/60 Hz
	Power consumption: running	9 VA/6 W
	holding	9 VA/2.3 W
⚠ **Auxiliary switches** for GCA126.1E GCA326.1E	Contact rating	6 A resistive, 2 A inductive
	Life: 6 A resistive, 2 A inductive	10^4 switchings
	5 A resistive, 1 A inductive	5×10^4 switchings
	no load	10^6 switchings
	Voltage	AC 24...230 V
	Protection class	II as per EN 60 730
	Voltage proof auxiliary switch to housing	AC 4 kV
	Setting range for switchover contacts	5°...85°
	Setting increments	5°
	Switching hysteresis	2°
	Factory setting:	
	Switch A	5°
	Switch B	85°
Connection cables	Power supply line AC 24 V (wires 1-2) / AC 230 V (wires 3-4)	2 x 0.75 mm^2
	Auxiliary switch cables (wires S1...S6)	6 x 0.75 mm^2
Mechanical data	Nominal torque	16 Nm
	Restoring torque (for power failure)	16 Nm
	Min. holding torque	> 16 Nm
	Max. torque	< 50 Nm
	Nominal angle of rotation (with position indication)	90°
	Max. angle of rotation (mechanically limited)	95°± 2°
	Runtime for nominal angle of rotation 90° (motor operation)	90 s
	Closing (on power loss) with spring return	15 s
	Direction of rotation (determined by type of mounting)	clockwise/counter clockwise
	Mechanical life	10^5 cycles
	Dimensions for the damper shaft	
	Round	8...25.6 mm
	Square	6...18 mm
	Min. length	20 MONOGYR
	Max. shaft hardness	< 400 HV
	Actuator dimensions	see "Dimensions"
	Weight	
	GCA121.1E, GCA126.1E	2 kg
	GCA321.1E, GCA326.1E	2.1 kg
Environmental conditions	Transport	IEC 721-3-2
	Climatic conditions	Class 2K2
	Temperature	–32...+70 °C
	Humidity (non-condensing)	< 95% r.h.
	Mechanical conditions	Class 2M3

	Operation	IEC 721-3-3
	Climatic conditions	Class 3K5
	Mounting location	Inside, weather -protected
	Temperature	–32....+55 °C
	Humidity (non-condensing)	< 95% r.h.
IP-Code	Housing type according to EN 60 529	IP 54
CE- Conformity	In accordance with the directives set forth by the European Union	
	Electromagnetic compatibility (EMC)	89/336/EEC
	Low voltage directive	73/23/EEC
Product standards	Automatic electric regulating and controlling devices for residential use and other applications (Type 1)	EN 60 730-2-14
Electromagnetic compatibility	Emissions	EN 50 081-1
	Immunity	EN 50 082-2

Diagrams

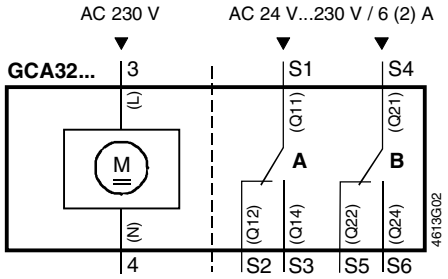
Internal diagrams

GCA121.1E
GCA126.1E



AC 24 V (SELV/PELV)

GCA321.1E
GCA326.1E



AC 230 V

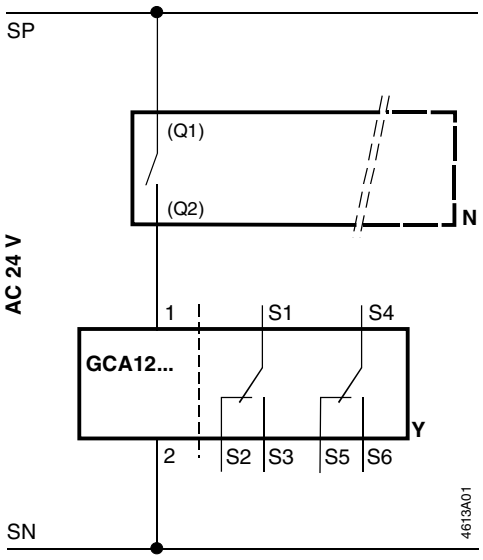
Cable labeling

All wires are color-coded and labeled.

Connection cable	Wire labeling	Designation	Color	L&G terminal code
Actuators AC 24 V	1	System potential AC 24 V	red	G
	2	System neutral	black	G0
Actuators AC 230V	3	Phase AC 230 V	brown	L
	4	Neutral conductor	blue	N
Auxiliary switches	S1	Switch A Input	gray/red	Q11
	S2	Switch A Normally closed contact	gray/blue	Q12
	S3	Switch A Normally open contact	gray/pink	Q14
	S4	Switch B Input	black/red	Q21
	S5	Switch B Normally closed contact	black/blue	Q22
	S6	Switch B Normally open contact	black/pink	Q24

Connection diagram

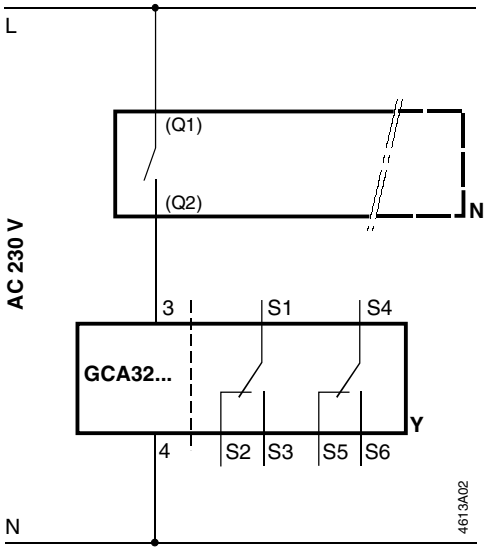
GCA121.1E
GCA126.1E



AC 24 V (SELV/PELV)

N Regulator or controller
Y Actuator GCA12..., two-position, AC 24 V
SP System potential AC 24 V
SN System neutral

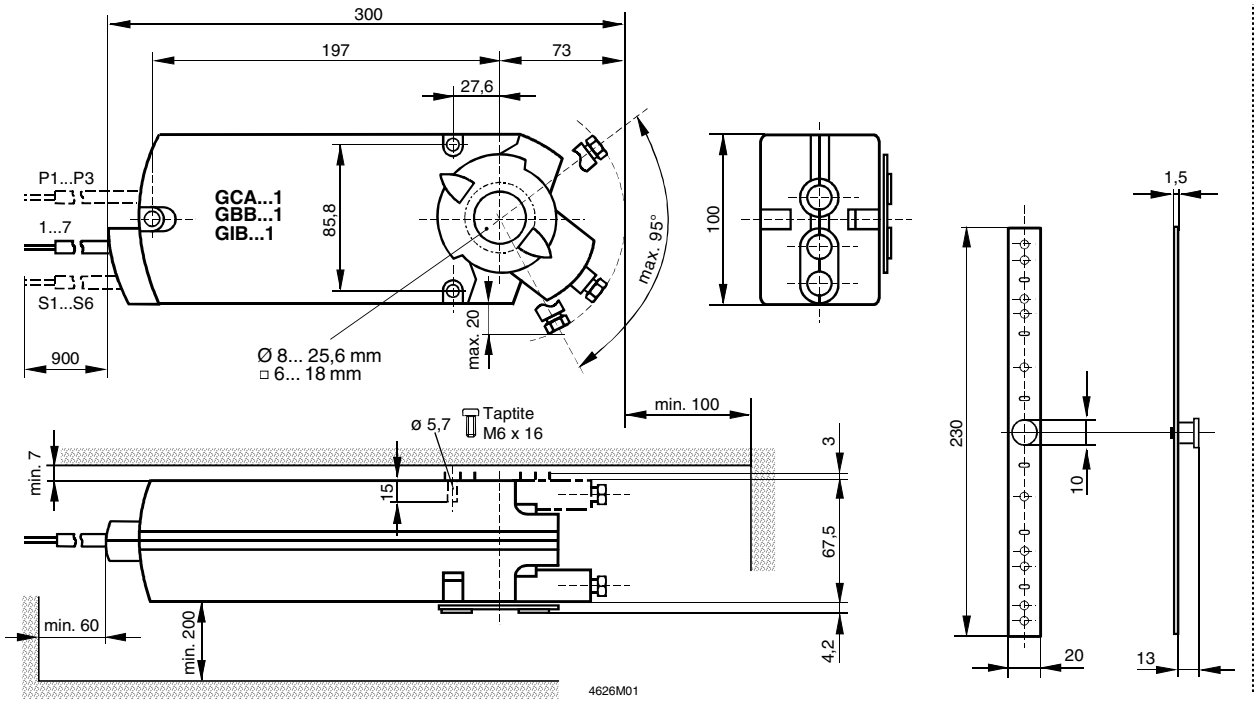
GCA321.1E
GCA326.1E



AC 230 V

N Regulator or controller
Y Actuator GCA32..., two-position, AC 24 V
L Phase conductor AC 230 V
N Neutral conductor

Dimensions



Dimensions in mm

© 1999 Siemens Building Technologies Ltd.