SIEMENS

OpenAir™

Actuator for Fire and Smoke Protection Dampers

GNA166.1E/T12

Electronic rotary actuator for modulating control of fire and smoke protection dampers.

- Nominal torque 9 Nm; spring return 7 Nm
- Operating voltage AC 24 V /DC 24…48 V
- Spring return for failsafe position
- Mechanically adjustable span between 0…90°
- Prewired with 0.9 m long connection cables
- Temperature monitoring unit with 2 thermal cutouts (72 °C) and test button
- Rigid connection between actuator and damper shaft

Features

The brushless DC motor ensures accurate speed control, torque monitoring for protecting the actuator and the damper, and provides a reliable failsafe function.

In the case of a power failure, the mechanical spring ensures the failsafe function.

Use

For the control of fire and smoke protection dampers.

- Nominal torque of 9 Nm for damper surfaces up to about 1.0 m^2 (friction dependent)
- In fire protection sections of plants where, in the event that the thermal fuse cuts out at a duct or ambient temperature of 72 °C, or in the case of a power failure, the actuator must travel travel to the failsafe position (zero position)

Functions

Control type	Modulating control
Positioning signal, with adjustable characteristic function	DC 0…35 V at • Offset: Uo = DC 0...5 V • Span: ΔU = 2…30 V
Direction of rotation	Clockwise or counter-clockwise movement depends on the mounting position of the damper shaft.
Spring return	On power failure or when the operating voltage is switched off, the spring return moves the actuator to its mechanical zero position.
Position indication: Mechanical	Rotation angle position indication by using a position indicator.
Auxiliary switches	The switching points for auxiliary switches A and B can be set independent of each other in increments of 5…90°
Powerpack (2 actuators, tandem mounted)	**Not permitted.**
Rotation angle limitation	The rotation angle of the shaft adapter can be limited mechanically at increments of 5°.

Technical design

Basic components

Housing	Robust, lightweight all metal housing made from die-cast aluminium which guarantees a long service life even under extreme environmental conditions.
Gear train	Maintenance- 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° to ensure tight shutoff fort he fire and smoke protection dampers.
Manual adjustment	A hole with a screw in the center of the actuator allows manual setting of the gears. A hex wrench is supplied.
Mounting bracket	A perforated bracket with pin available, depending on the way the actuator is fixed.
Electrical connection	The actuator comes with prewired 0.9 long connecting cables.

The actuators can be mounted on either side depending on the required direction of rotation. All setting and operating elements are available on both sides of the actuator.

Temperature monitoring unit

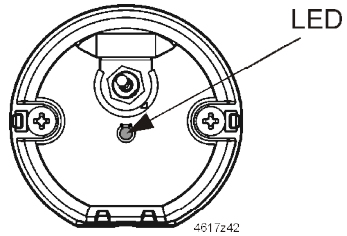
Use

The temperature monitoring unit is ready connected to the actuator and is used for forced control of motorized fire and smoke protection dampers, should excessive temperatures occur.

Mode of operation

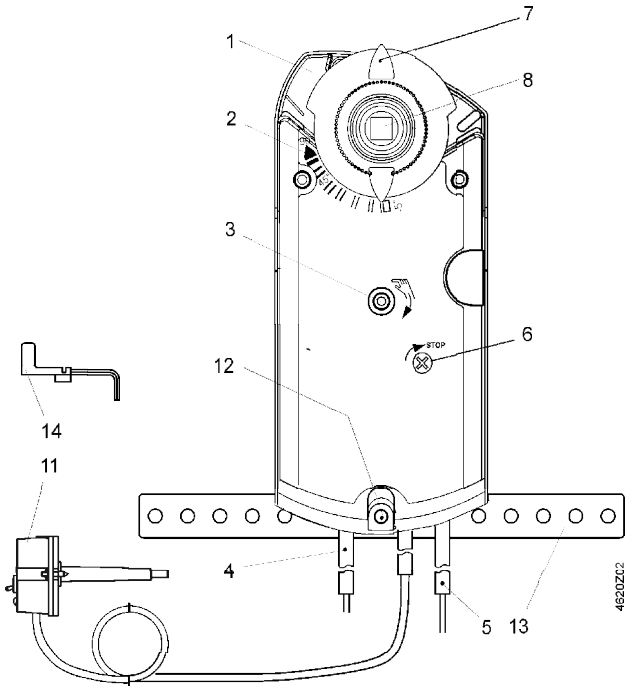
The temperature monitoring unit contains 2 thermal fuses, 1 for monitoring the duct temperature and 1 for the ambient temperature. If the temperature at any of these fuses exceeds the level of 72 °C (optionally: 95 °C), the power supply will be irreversibly cut. AS a result, the return spring will drive the actuator to the failsafe position. A test button is integrated for making functional checks. When pressed, the current path will be cut.

LED-Functions



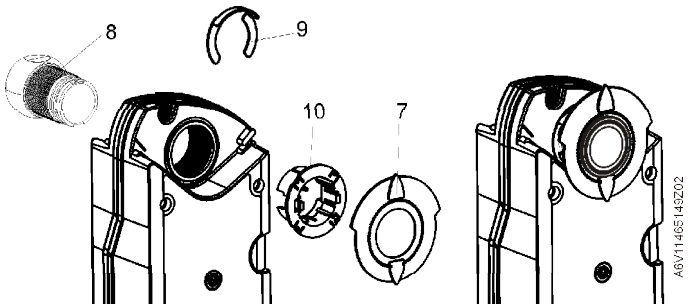
Red	=	Operating voltage OK Thermo sensor defect
Green	=	Operating voltage OK Thermo sensor OK
Dark	=	No operating voltage

Setting and operating elements



1	Housing
2	Rotation angle scale 0…90°
3	Hexagon socket for manual override
4	Connecting cable for power supply
5	Connecting cable for auxiliary switches
6	Stop shaft for gear train
7	Position indicator
8	Shaft adapter
9	Locking ring for shaft adapter
10	Adapter for position indicator
11	Temperature monitoring unit
12	Pin
13	Mounting bracket
14	Hex wrench for manual override

Arrangement for shaft adapter



Type summary

Type	Stock number	Operating voltage	Positioning signal Y	Auxiliary switches
GNA166.1E/T12	S55499-D496	AC 24 V / DC 24…48 V	DC 0…35 V	2

Delivery

Due to the mounting choices depending on the direction of rotation and the shaft length, shaft adapter with position indicator and other mounting accessories are shipped unassembled with the actuator.

Connecting cables

The actuator comes with 0.9 m long prewired connecting cables.
The cable length of the read fitted temperature monitoring unit is 0.9 m.

Accessories

Type / Stock number	Description
ASK79.4	Duct tip to temperature monitoring unit **72 °C**
ASK79.5	Duct tip to temperature monitoring unit **95 °C**

Equipment combinations

The actuator GNA166.1E/T12 can be used with all types of modulating controllers with DC 0…10 V or DC 0…35 V input that deliver a switching voltage of AC 24 V / DC 24…48 V.

Product documentation

Content	Title	Document-ID
Data sheet	Actuator for Fire and Smoke Protection Dampers GNA166.1E/T12	A6V11465149
Technical principles	OpenAir™ GMA..1 actuators with spring return	Z4614
Mounting instructions	Rotary actuator with spring return GNA166.1E/T12	A6V11465152
Mounting instructions	Duct tip for temperature monitoring unit ASK79.4, ASK79.5	M4610

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. • Mounting, commissioning, and service by properly trained personnel only.

Engineering

	⚠ WARNING
	Power supply The actuator must be used with safety extra low voltage (SELV) or protection by extra low voltage (PELV) in accordance with HD384. • Unearthed = **S**afety **E**xtra **L**ow **V**oltage **SELV** • Grounded = **P**rotection by **E**xtra **L**ow **V**oltage **PELV**

Parallel connection of actuators

Electric parallel connection of the same type of actuator is permitted provided operating voltage is within the required tolerance. Voltage drops on the supply lines must be taken into consideration.

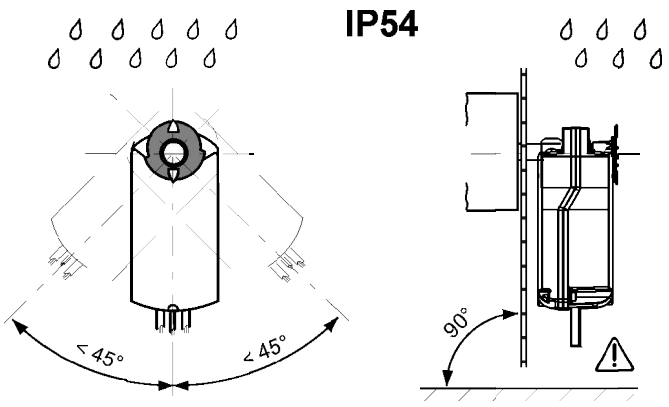
Sizing transformers

- Use safety isolating transformers with double isolation conforming to EN60742. The transformers must be suited for 100% duty.
- Observe all local safety rules and regulations relating to the sizing and protection of transformers.
- Determine the transformer's size by adding up the power consumption in VA of all actuators used.

Mounting

See Mounting instructions A6V11465152. The actuator must be fitted to the fire and smoke protection dampers as specified by the OEM.

Housing protection



Mounting bracket / pin

If the actuator is mounted directly on the damper shaft, the mounting bracket/pin must be used. The insertion depth for the shaft into the housing must be sufficient.

Temperature monitoring unit

The temperature monitoring unit is to be fitted to the duct wall or the damper housing using 2 self-tapping screws of 3.5 mm diameter.

The enclosed drilling template facilitates mounting. When mounting, it must be ensured that the thermal fuse is fully exposed to the airflow.

Maintenance

⚠ Caution

The actuator is maintenance free.

- Do not open the actuator.
- Maintenance work may only be carried out by the manufacturer.

Disposal

⚠ WARNING

Tensioned return spring

Opening the actuator housing can release the highly tensioned return spring, which can cause flying parts and injuries.

- Do not open the actuator housing.

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.

Technical Data

Power supply		
Operating voltage		AC 24 V ± 20 % DC 24…48 V ± 20 %
Frequency		50/60 Hz
Power consumption		
When running	AC	5 VA / 3.5 W
	DC	3.5 W
When holding	AC/DC	2 W

Function data		
Nominal torque		
Motor		9 Nm
Spring return		7 Nm
Maximum torque (blocked)		21 Nm
Nominal rotation angle		90°
Maximum rotation angle		95°± 2°
Running time for nominal rotation angle 90° (motor operation)		90 s
Closing with spring return (on power failure)		15 s

Inputs / Outputs		
Positioning signal		
Input voltage Y	(wires 8-2)	DC 0…10 V
Maximum permissible input voltage		DC 35 V
Characteristic functions		
Input voltage Y	(wires 8-2)	DC 0…35 V
Non-adjustable characteristic function		DC 0…10V
Adjustable characteristic function	Offset Uo	DC 0…5 V
	Span ΔU	DC 2…30 V
Auxiliary switches		
AC power supply		
Switching voltage		AC 24…230 V
Nominal current res./ind.		6 A / 2 A
DC power supply		
Switching voltage		DC 12…30 V
Nominal current		DC 2 A
Switching range for auxiliary switches		5…90°
Setting increments		5°

Connecting cables (halogen free)		
Cross-section	(wires 1-2)	2 x 0.75 mm^2
Standard length		0.9 m

Degree of protection and safety class	
Degree of protection of housing (actuator only)	IP54 to EN60529
Insulation protection class	III to EN60730

Environmental conditions		
Operation		IEC 721-3-3
	Temperature	-32…55 °C
	Humidity (non-condensing)	<95% r.h.
Transport		IEC 721-3-2
	Temperature	-32…70 °C
	Humidity (non-condensing)	<95 % r.h.

Standards and directives	
Product standards	EN60730 Part 2-14: Automatic electrical controls for household and similar use (mode of action type 1)
Electromagnetic compatibility	For residential, commercial and industrial environments
EU Conformity (CE)	A5W00004378 [1)]
RCM Conformity	A5W00004379 [1)]

Environmental compatibility
The product environmental declaration CE1E4620en [1)] contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

Dimensions and weight		
Dimensions		
Actuator W x H x D (see “Dimensions”)		81 x 178 x 63 mm
Damper shaft	Square	12x12 mm
	Minimum shaft length	20 mm
Weight	Without packaging	1.3 kg

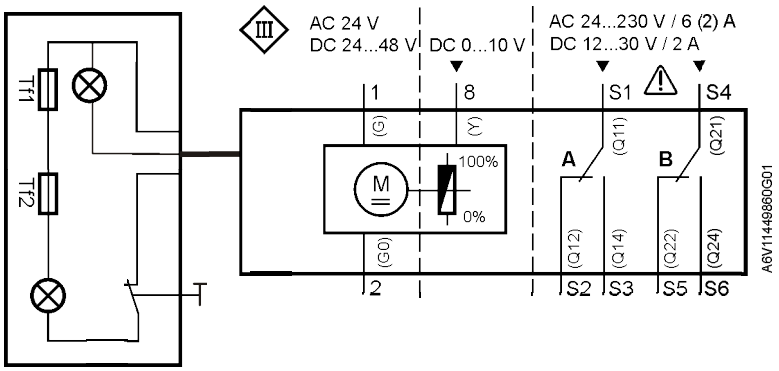
Temperature monitoring unit		
Connecting cable (halogen frei)	Cross-section	2 x 0.5 mm^2
	Length	0.9 m
Switching temperature for sizing (Tf)	Tf1	Outside the duct 72 °C
	Tf2	Inside the duct 72 °C
	Tf3	Inside the duct 72 °C
Temperature tolerance	Tf1, Tf2, Tf3	72 °C +0/-2 °C
Degree of protection of housing		IP54
Safety class		III (safety extra-low voltage)
Temperature	Ambient	-20…50 °C
	Storage	-20…50°C
Ambient humidity		KL D to DIN40040
Maintenance		Maintenance-free
Weight		0.1 kg

[1)] Documents can be downloaded at http://siemens.com/bt/download.

Internal diagram

Modulating control

DC 0…10 V / 0…35 V

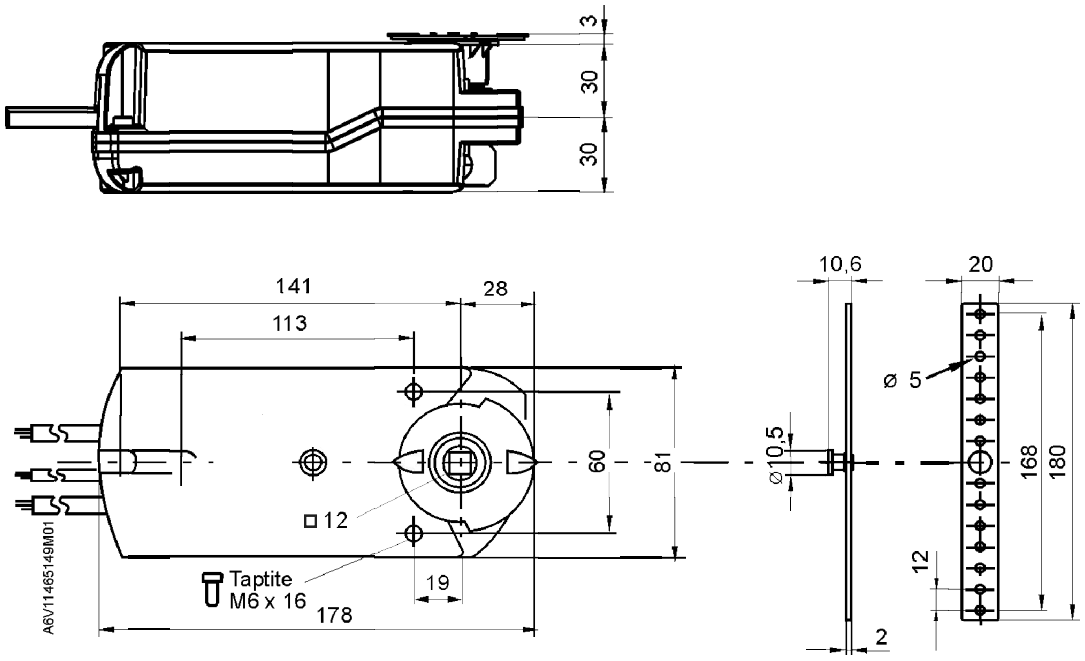


Wire designations

Connection	Kabel				Meaning
	Code	No.	Color	Abbreviation	
Actuator AC 24 V DC 24…48 V	G	1	red	RD	System potential AC 24 V / DC 24…48 V
	G0	2	black	BK	System neutral
	Y	8	gray	GY	Positioning signal DC 0…10 V, 0…35 V
Auxiliary switches	Q11	S1	gray/red	GY RD	Switch A input
	Q12	S2	gray/blue	GY BU	Switch A normally-closed contact
	Q14	S3	gray/pink	GY PK	Switch A normally-open contact
	Q21	S4	black/red	BK RD	Switch B input
	Q22	S5	black/blue	BK BU	Switch B normally-closed contact
	Q24	S6	black/pink	BK PK	Switch B normally-open contact

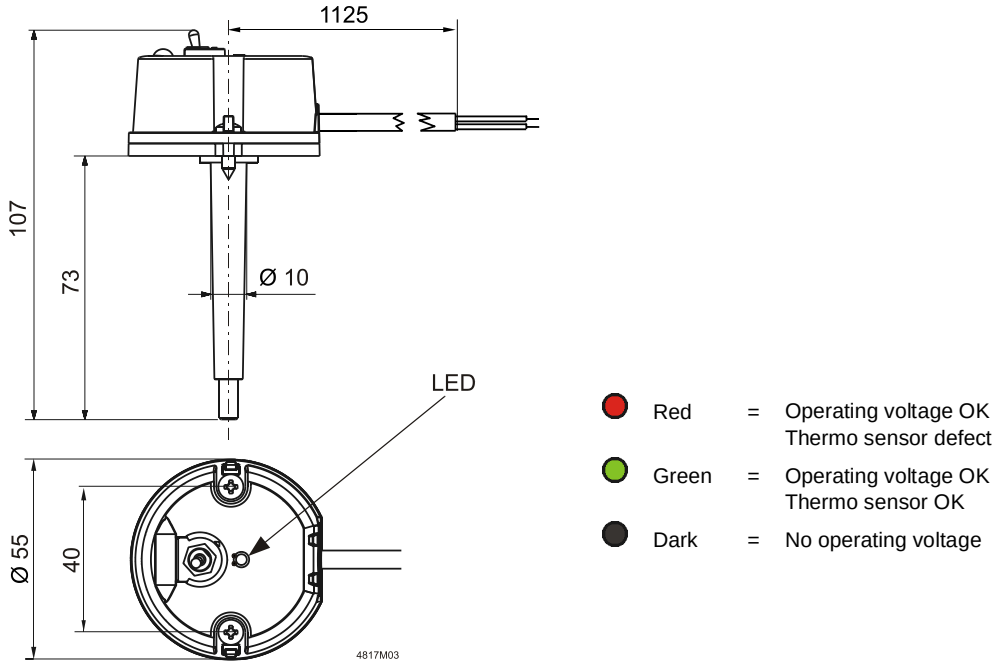
Dimensions

Actuator



Dimensions in mm

Temperature monitoring unit



Dimensions in mm

Revision numbers

Type	Valid from rev. no.
GNA166.1E/T12	..A

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