

## GA-T70-024

Direct coupled, non-spring return actuators, 70 in-lb

## User Manual

July, 2003

  
ISO 9001

  
LISTED



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## Direct coupled, non-spring return actuators, 70 in-lb

### 1 Application

Actuators to be easily installed by direct shaft mounting on air dampers, shutters and butterfly valves in ventilation and air conditioning systems. Can be controlled by any compatible electric or electronic analog controller DDC/PLC control or automation system. The actuators should be mounted indoors in a dry environment, relatively free from corrosive fumes.

### 2 Safety remarks

**The actuators are not suitable for use in explosive atmospheric applications!**

All service to the actuators (mounting, electrical connection, retrofitting and repair) must be carried out with the power supply disconnected. The electrical connection must be done by a trained and competent person considering the wiring diagrams, local and national regulations. Use copper twisted conductors only. Provide disconnect and overload protection if necessary.

**This actuator may only be operated by 24 VAC/VDC!**

The transformer **must** be sized according to technical data of the actuator (see section 10).

**Always read the controller installation instructions before making any connection!**

### 3 Installation

Direct mounting with V-bolt clamp to the damper shaft (diagr. 1) and fixing with enclosed anti-rotation mounting bracket (diagr. 2).

Shaft: Ø 5/16" to 5/8" (Ø 8 - 16 mm)

□ 5/16" to 15/32" (□ 8 - 12 mm)

- Turn the damper until the blades are closed
- Disengage the gears by pressing the red button and rotate the clamp until the switching position indication shows 90°
- Tighten the nuts on the clamp (4 - 6 ft-lb)

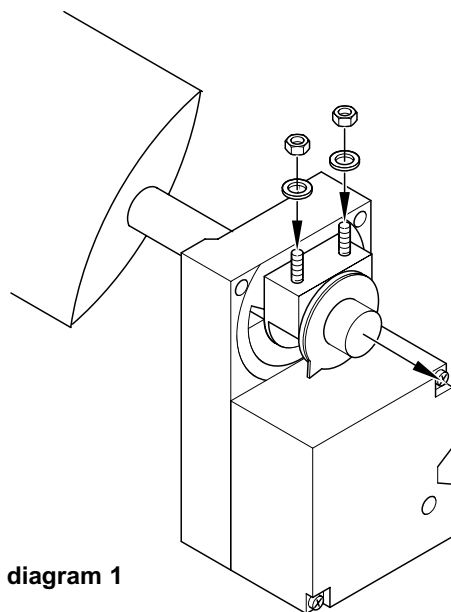


diagram 1

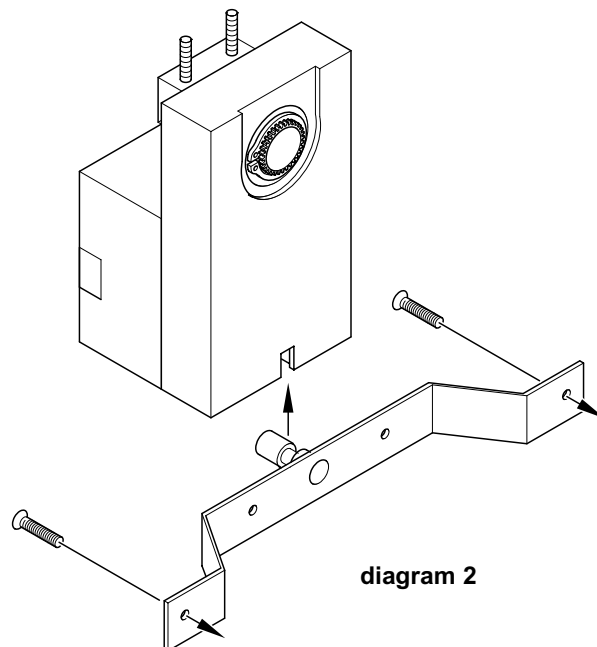
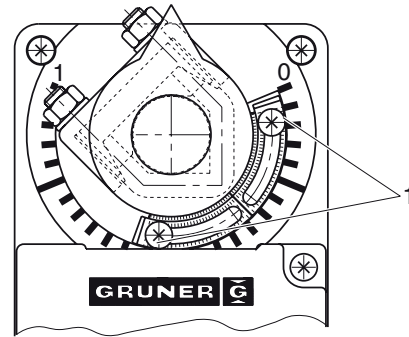


diagram 2

#### 4 Adjustment of the angle of rotation

Both end stops are adjusted to 0° and 90°. For smaller rotation angles, loosen the screws (1) at the metal end stop, adjust the end stops as required, and fasten the screws again.



#### 5 Adjustment of the rotation direction and of the auxiliary switch

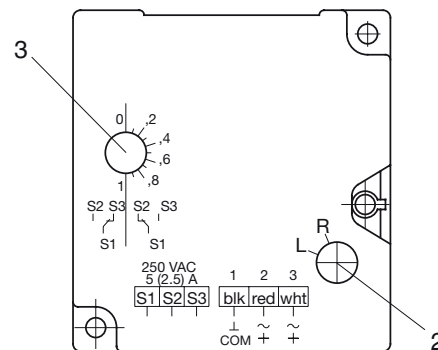
##### Rotation direction

The actuator is adjusted to clockwise direction by the factory --> "R". To change the direction of rotation, turn the adjustment knob (2) to "L".

Types with terminals have no knob. In this case change (+) and (-).

##### Auxiliary switch

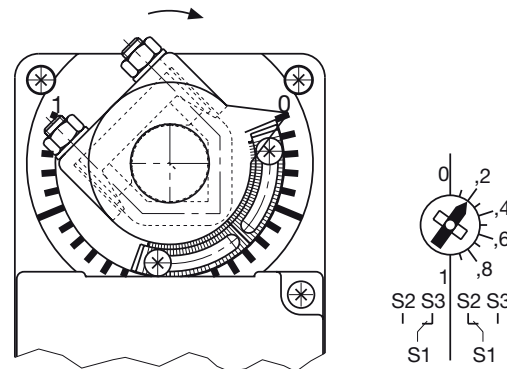
The scale at the adjustment knob (3) corresponds to a percentage graduation, related to 0° to 90°.



##### Drive is placed at 0° on the end stop

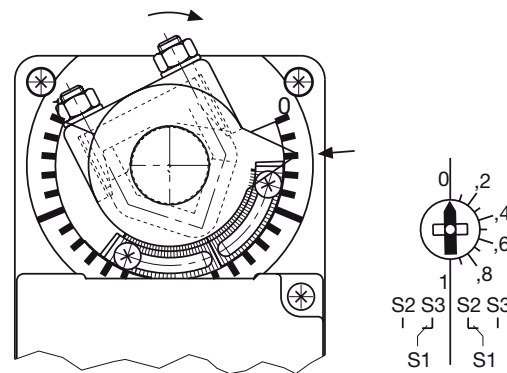
Turn the adjustment knob from 0 to the right until the tip indicates the required switching position.

For example, 2 = 20% of the angle of rotation. Drive turns to the right and the switch switches at 20% of the angle of rotation (operating position S1-S3).



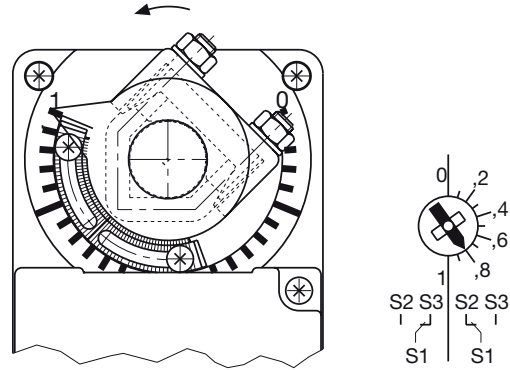
##### Drive at operating position

Press the override button and turn the drive to the required operating position, for example, 20% of the angle of rotation. Turn the adjustment knob to 0 and pass with the tip slightly. As a result, 20% of the angle of rotation is adjusted (operating position S1-S3).

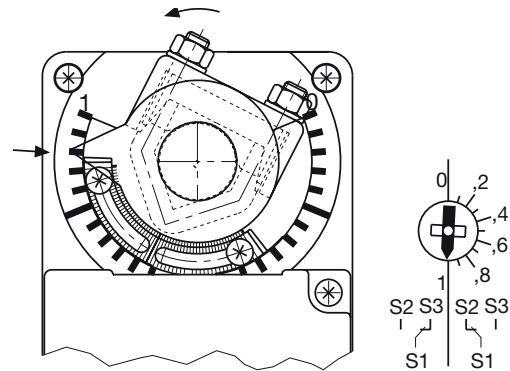


**Drive is placed at "1" on the end stop**

Turn the adjustment knob from 1 to the left until the tip indicates the required switching position. For example, 8 = 20% of the angle of rotation. Drive turns to the left and the switch switches at 20% of the angle of rotation (operating position S1-S3).


**Drive at operating position**

Press the override button and turn the drive in the required operating position, for example, 20% of the angle of rotation. Turn the adjustment knob to 1 and pass with the tip slightly. As a result, 20% of the angle of rotation is adjusted (operating position S1-S3).



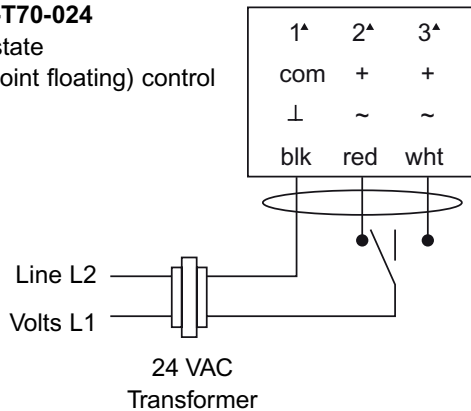
## 6 Wiring configuration

### Notes:

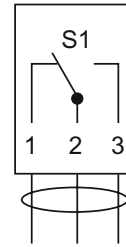
- Actuators are provided with color coded wires. Wires for optional switches and feedback pot are number coded.
- Observe polarity on secondary of transformers. Incorrect polarity can cause controller damage or operation error.
- Provide overload protection for line voltage and disconnect as required.

### GA-T70-024

Tri-state  
(3-point floating) control



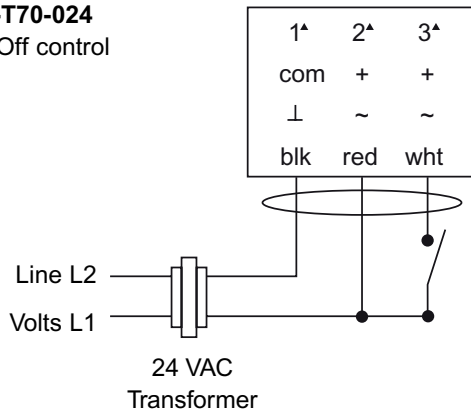
### Option S1



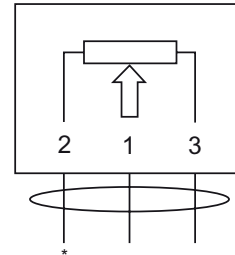
(1) Auxiliary switch, SPDT, 24 VAC, 5 (2.5) A, w/ adjustable cam for any position setting

### GA-T70-024

On/Off control



### Option P1



(1) Feedback pot, 1 kΩ,  
\* = 0 Ω at 0° angle of rotation

▲ Terminal version wiring connection:

1 = com    2 = + (CW/0-90°)    3 = + (CCW/90-0°)

Multiple actuators (maximum quantities)	GA-T70-024 Tri-state or On/Off
Stacking (torque is additive)	4
Parallel connection	20

### L/R selector (built-in actuator cover)

Select	Angle of rotation
R	CW/0-90° w/red connect
R	CCW/90-0° w/white connect
L	CW/0-90° w/white connect
L	CCW/90-0° w/red connect

## 7 Parallel control of two or more actuators

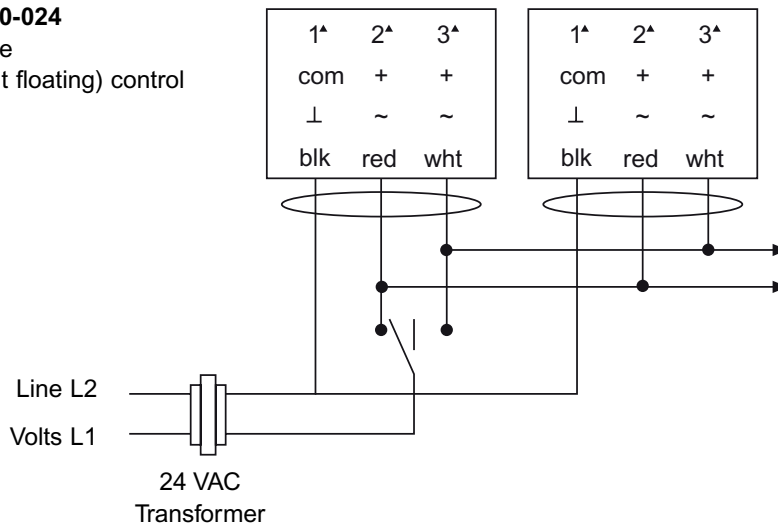
### Notes:

- Provide overload protection and disconnect as required.
- Actuator and controller must have separate transformers.
- Set reversing switch L/R as required.

### GA-T70-024

Tri-state

(3-point floating) control



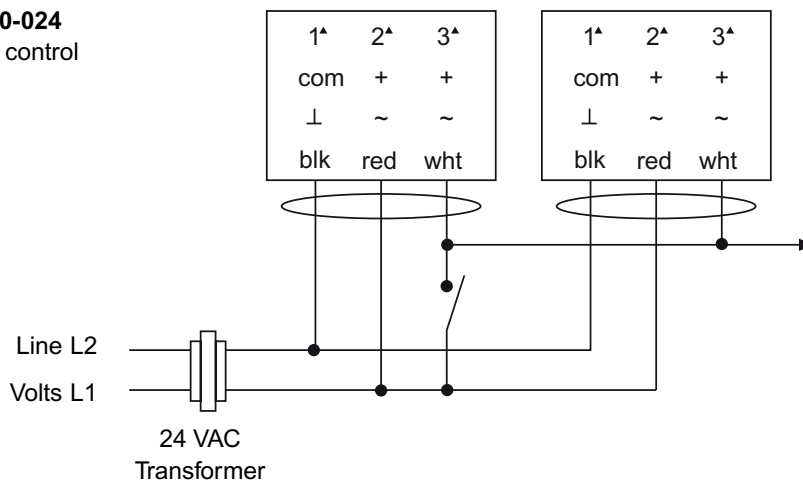
### Attention:

- Observe polarity on secondary of transformers.
- Connect all actuator blk-wires (1) to line of transformer and all red (2)- and wht (3)-wires of parallel controlled actuators together via switch to the other leg of the transformer.

**Before starting the operation, all electrical and mechanical functions have to be checked!**

### GA-T70-024

On/Off control



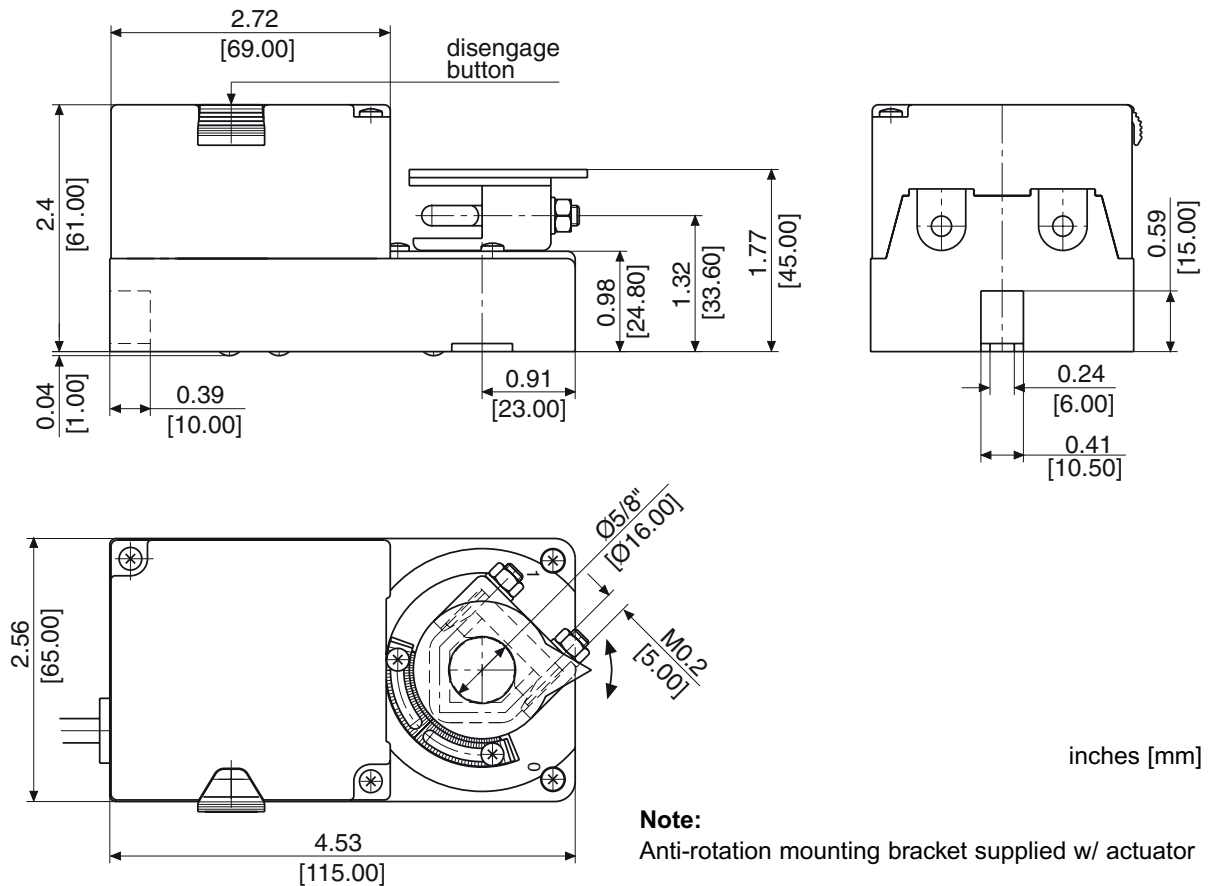
### Attention:

- Observe polarity on secondary of transformers.
- Connect all actuator blk (1)-wires to line of transformer and all red (2)-wire to the other leg of the transformer.
- White (3) lines of parallel controlled actuators are connected together via switch to the volts line.

**Before starting the operation, all electrical and mechanical functions have to be checked!**



## 8 Dimensions



## 9 Ordering information

<b>GA-T70-024</b>	w/ Plenum rated cable
<b>GA-T70-024-S1</b>	w/ Plenum rated cable, and (1) aux. switch
<b>GA-T70-024-P1</b>	w/ Plenum rated cable, and (1) 1 kΩ Pot
<b>GA-T70-024T</b>	w/ Terminal block
<b>GA-T70-024T-P1</b>	w/ Terminal block, and (1) 1 kΩ Pot

**Note:**

Terminal version actuator comes without L/R selector and adj. visual position indicator.

## 10 Specifications

### Control

Input signal      Tri-state (3-pt. floating) or  
On/Off, 24 VAC/DC

### Electrical

Power supply      24 VAC/VDC  $\pm$  20%,  
50/60 Hz  
Over voltage      Up to 40 V, max. 5 sec.  
Power consumption      2.0 W (3.0 VA)

### Performance

Torque      70 in-lb (8 Nm)  
Damper size      Up to 18 sq. ft. (1.6 m<sup>2</sup>)  
Angle of rotation      0-95°/95-0°, selectable, adj.  
angle with integral stops  
· CCW(L) and CW(R)      L/R selector, built-in

actuator cover (Terminal  
version is w/o L/R selector)

Rotation time      60 to 120 sec/0-90°  
Power failure      Stays in last position of  
operation

Position indicator      0-10 divisions and adj.  
visual indicator (Terminal  
version is w/o visual  
indicator)

Synchronization       $\pm$  1%  
Overload protection      Electronic throughout  
rotation

Manual override      Built-in disengage button  
Motor type      DC motor  
Noise level      Max. 35 dB(A)

### Environmental

Permissible ambient  
· working temperature      -22°F to 122°F  
(-30°C to 50°C)  
· storage temperature      -40°F to 176°F  
(-40°C to 80°C)  
· humidity      5-95% RH, non-condensing

### Physical

Enclosure  
· cover      ABS, UL 94-5V  
· base      PA 6.6  
· color      Gray and black  
· protection      NEMA 2, NEMA 1 for  
Terminal version

Mounting position      Any position  
Anti-rotation bracket      Included w/actuator  
Stacking/paralleling      Refer to table  
"Multiple Actuators"

Clamp connection to  
· round shaft       $\varnothing$  5/16" to 5/8"  
(8 to 16 mm)  
· square shaft       $\square$  5/16" to 15/32"  
(8 to 12 mm)

Wire connection      3 ft. (0.9 m) cable, color  
coded, plenum rated  
Wire size      18 AWG (0.75 mm<sup>2</sup>)

Terminal version  
· wire connection      Terminal block, outside of  
cover, screw type for lead  
wire,  
min. 26 AWG (0.14 mm<sup>2</sup>)  
max. 14 AWG (2.5 mm<sup>2</sup>)

Dimensions      4.53 x 2.56 x 2.40 in.  
(115 x 65 x 61 mm)

Weight      1.2 lbs. (0.53 kg)

**Manufacturing**  
**Listings/Approvals**      ISO 9001 certified  
CE

UL and CSA  
**Warranty**      Five-year material and  
workmanship  
(Two-year standard,  
three-year conditional)

### Options

· S1 (1) Aux. switch      SPDT 24 VAC, 5 (2.5) A,  
built-in      adj. at any position,  
incl. 3 ft. (0.9 m) cable,  
number coded, plenum  
rated, or terminal block  
· P1 (1) Feedback pot      1 k $\Omega$  pot, incl. 3 ft. (0.9 m)  
cable, number coded,  
plenum rated, or terminal  
block