HVAC CONTROL PRODUCTS

The Rotary Actuators Catalogue 2010

Johnson Controls

Company profile

Johnson Controls has expanded remarkably since Professor Warren Johnson founded the company to manufacture his invention, the electric room thermostat. Since its start in 1885, Johnson Controls has grown into a global leader in automotive experience, building efficiency and power solutions.
The company provides innovative automotive interiors that help make driving more comfortable, safe and enjoyable. For buildings, it offers products and services that optimize energy use and improve comfort and security. Johnson Controls also provides batteries for automobiles and hybrid electric vehicles, along with systems engineering and service expertise.

Our vision

A more comfortable,
safe and sustainable world.

Our values

Integrity
Honesty, fairness, respect, and safety are of the utmost importance.

Customer Satisfaction
Our future depends on us helping to make our customers successful. We are proactive and easy to do business with. We offer expert knowledge and practical solutions, and we deliver on our promises.

Employee Engagement
We foster a culture that promotes excellent performance, teamwork, inclusion, leadership and growth.

Innovation
We believe there is always a better way. We encourage change and seek the opportunity it brings.

Sustainability
Through our products, services, operations and community involvement, we promote the efficient use of resources to benefit all people and the world.

ROTARY ACTUATORS

M910x-AGA-xS / M910x-IGA-xS - *1/3 pages*

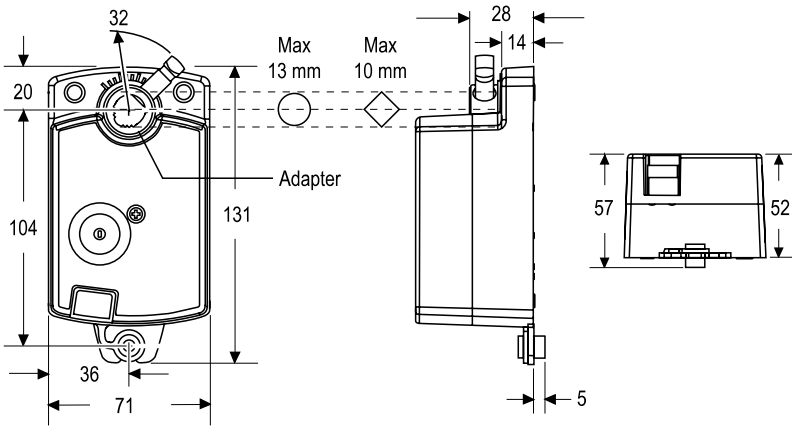
ON/OFF and Floating Actuators

The small electric damper actuator series have been developed to operate small and medium air damper in ventilation and air conditioning systems.

The compact design make this actuator highly versatile.

Features

- Floating and ON/OFF control
- Load-independent running time
- Up to 5 actuators in parallel operation possible
- Simple direct-mounting with universal adapter for fitting to 8...13 mm Ø round axis or with 8...10 mm square shaft
- Manual release button



Dimensions in mm

ROTARY ACTUATORS

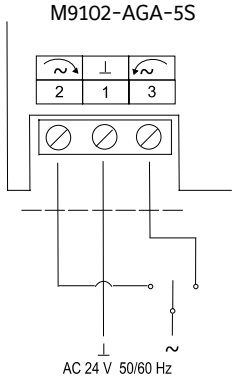
Johnson Controls

M910x-AGA-xS / M910x-IGA-xS *- 2/3 pages*

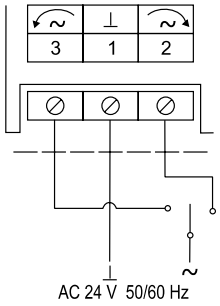
ON/OFF and Floating Actuators

Control Wiring Diagrams

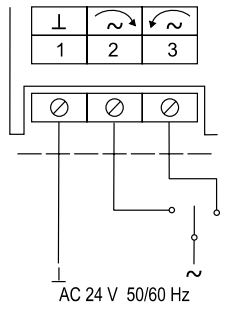
M9102-AGA-5S



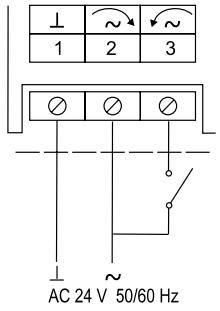
M9104-AGA-5S



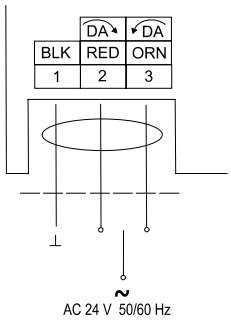
M9102-IGA-5S / M9104-IGA-5S
Floating



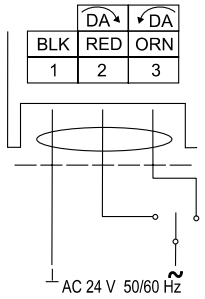
M9102-IGA-5S / M9104-IGA-5S
ON/OFF



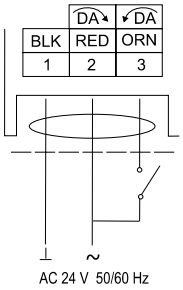
M9102-AGA-1S / M9104-AGA-1S



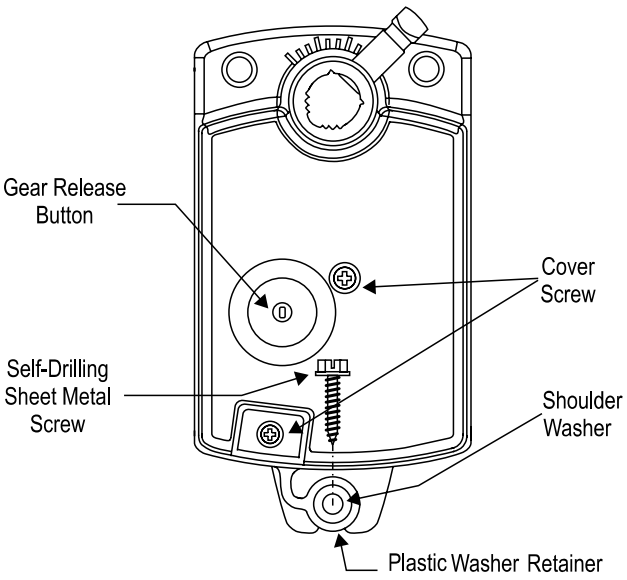
M9102-IGA-1S / M9104-IGA-1S
Floating



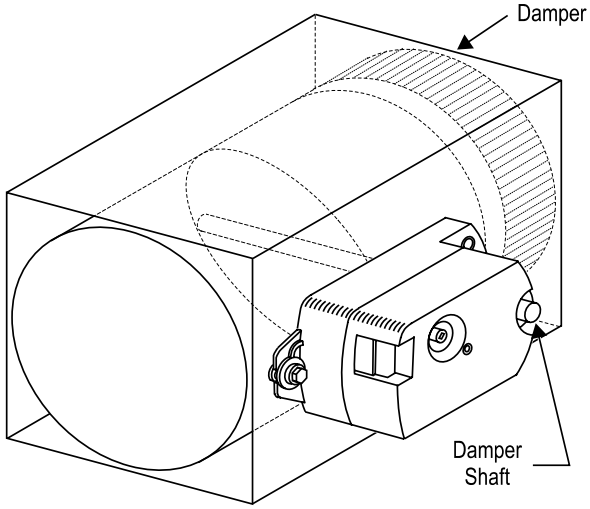
M9102-IGA-1S / M9104-IGA-1S
ON/OFF



Inserting the Screw into the Shoulder Washer



Positioning the Actuator



M910x-AGA-xS / M910x-IGA-xS - *3/3 pages*

ON/OFF and Floating Actuators

Technical Specifications

Actuator	M9102-AGA-1S	M9102-AGA-5S	M9102-IGA-1S	M9102-IGA-5S	M9104-AGA-1S	M9104-AGA-5S	M9104-IGA-1S	M9104-IGA-5S
Torque	2 Nm				4 Nm			
Damper area*	0.4 m²				0.8 m²			
Connection								
- PVC Cable	1.2 m	---	1.2 m	---	1.2 m	---	1.2 m	---
- Plug-in terminal block	---	3-Pole	---	3-Pole	---	3-Pole	---	3-Pole
Running Time OPEN	36 s (@ 50 Hz)				72 s (@ 50 Hz)			
Supply Voltage	AC 24 V +25% -20%							
Frequency	50-60 Hz							
Power Requirement	2.1 VA		2.5 VA		2.1 VA		3.0 VA	
Control signal	Floating without Timeout		ON/OFF and Floating with Timeout		Floating without Timeout		ON/OFF and Floating with Timeout	
Position signal	None							
Angle of rotation/ working range	93° < ± 3°							
Service Lifetime ca.	100.000							
Auxiliary Switches	None							
Noise Level	35 dB (A)							
Protection Class	II							
Degree of Protection	IP 42	IP 40	IP 42	IP 40	IP 42	IP 40	IP 42	IP 40
Ambient conditions								
- Operating temperature	0...+52 °C / IEC 721-3-3							
- Storage temperature	-30...+65 °C / IEC 721-3-2							
- Humidity	5...95% r.F. no condensed							
Weight	0.5 Kg							
Service	Maintenance-free							
Standards								
- Mechanics	EN 60 529 / EN 60 730-2-14							
- Electronics	EN 60 730-2-14							
- EMC Emissions	EN 50 081-1:92 / IEC 61000-6-3:96							
- EMC Immunity	EN 50 082-2:95 / IEC 61000-6-2:99							

***Caution:** Please note damper manufacturer's information concerning the open/close torque.

Ordering Codes

Codes	Descriptions
M9102-AGA-1S	2 Nm, AC 24 V with 1,2 PVC cable, Floating without Timeout
M9102-AGA-5S	2 Nm, AC 24 V with terminal block, Floating without Timeout
M9102-IGA-1S	2 Nm, AC 24 V with 1,2 PVC cable, ON/OFF and Floating with Timeout
M9102-IGA-5S	2 Nm, AC 24 V with terminal block, ON/OFF and Floating with Timeout
M9104-AGA-1S	4 Nm, AC 24 V with 1,2 PVC cable, Floating without Timeout
M9104-AGA-5S	4 Nm, AC 24 V with terminal block, Floating without Timeout
M9104-IGA-1S	4 Nm, AC 24 V with 1,2 PVC cable, ON/OFF and Floating with Timeout
M9104-IGA-5S	4 Nm, AC 24 V with terminal block, ON/OFF and Floating with Timeout

M9104-GGA-xS - *1/3 pages*

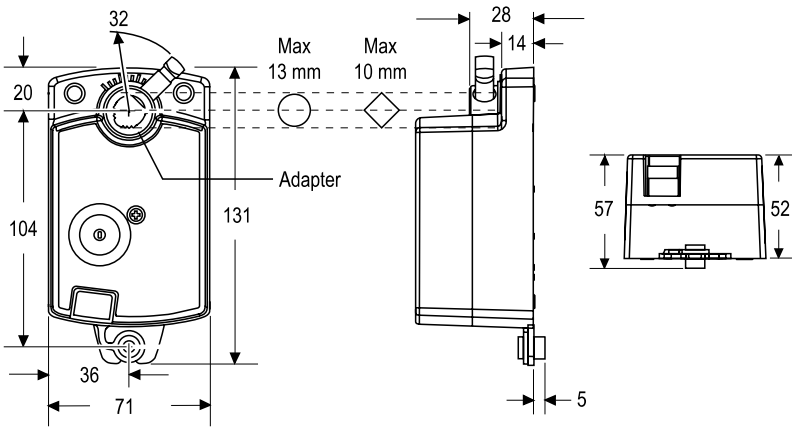
Proportional Actuators

The small electric damper actuator series have been developed to operate small and medium air damper in ventilation and air conditioning systems.

The compact design make this actuator highly versatile.

Features

- DC 0(2)...10 V or 0(4)...20 mA with field furnished 500 Ω resistor
- Load-independent running time
- Up to 5 actuators in parallel operation possible
- 1.2 M PVC Cable or Terminal block
- Simple direct-mounting with universal adapter for fitting to 8...13 mm Ø round axis or with 8...10 mm square shaft
- Selectable direction of rotation
- Manual release button
- Automatic shut-off at end position



Dimensions in mm

M9104-GGA-xS - *2/3 pages*

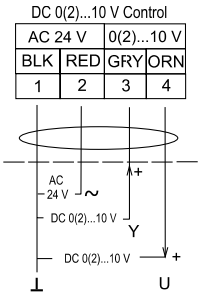
Proportional Actuators

Wiring Diagrams

M9104-GGA-1S

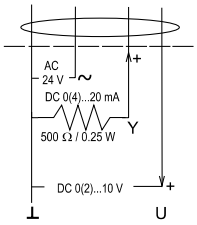
DC 0(2)...10 V Control

AC 24 V			0(2)...10 V
BLK	RED	GRY	ORN
1	2	3	4



DC 0(4)...20 mA Control with External Resistor

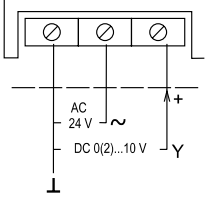
AC 24 V			0(2)...10 V
BLK	RED	GRY	ORN
1	2	3	4



M9104-GGA-5S

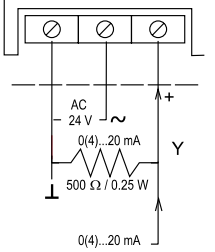
DC 0(2)...10 V Control

⊥	~	0(2)...10 V
1	2	3

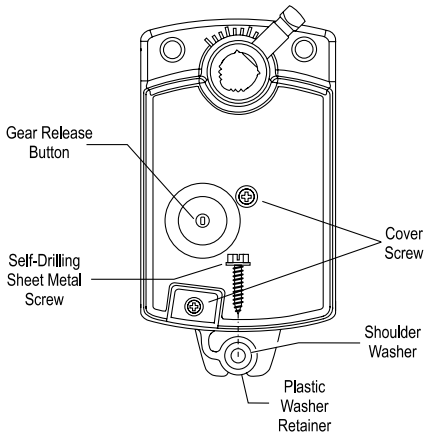


0(4)...20 mA Control with External Resistor

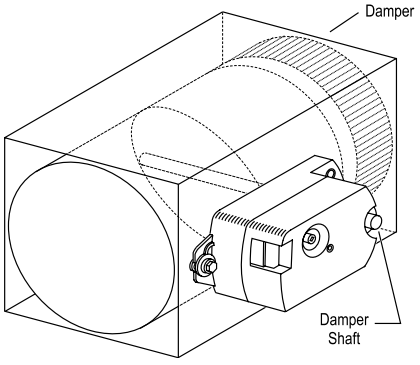
⊥	~	0(2)...10 V
1	2	3



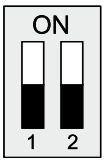
Inserting the Screw into the Shoulder Washer



Mounting the Actuator onto the Damper Shaft

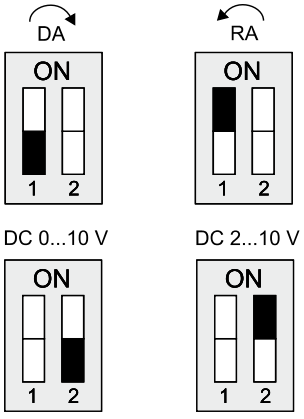


Factory setting



To change the factory setting, remove the actuator cover and adjust the switches on the circuit boards as figure.

Changing the Factory Settings



M9104-GGA-xS - *3/3 pages*

Proportional Actuators

Technical Specifications

Actuator	M9104-GGA-1S	M9104-GGA-5S
Torque	4 Nm	
Damper area*	0.8 m²	
Running Time	72 s (@ 50 Hz)	
Supply Voltage	AC 24 V +25% -20%	
Frequency	50-60 Hz	
Power Requirement	3.6 VA	
Control signal	DC 0(2)...10 V OR 0(4)...20 mA with field furnished 500 Ω resistor	
Position signal	DC 0(2)... 10 V	---
Angle of rotation/working range	90° (93° mech)	
Cable	1.2 m PVC	Terminal block
Service Lifetime ca.	100.000	
Auxiliary Switches	None	
Noise Level	35 dB (A)	
Protection Class	II	
Degree of Protection	IP 42	IP 40
Ambient conditions		
- Operating temperature	-20...+60 °C / IEC 721-3-3	
- Storage temperature	-30...+65 °C / IEC 721-3-2	
- Humidity	5...95% r.F. no condensed	
Weight	0.5 Kg	
Service	Maintenance-free	
Standards		
- Mechanics	EN 60 529 / EN 60 730-2-14	
- Electronics	EN 60 730-2-14	
- EMC Emissions	EN 50 081-1:92 / IEC 61000-6-3:96	
- EMC Immunity	EN 50 082-2:95 / IEC 61000-6-2:99	

***Caution:** Please note damper manufacturer's information concerning the open/close torque

Ordering Codes

Codes	Descriptions
M9104-GGA-1S	4 Nm, AC 24 V with 1,2 m PVC cable
M9104-GGA-5S	4 Nm, AC 24 V with Terminal block

M9304-Axx-1N - *1/3 pages*

ON/OFF and Floating Actuators

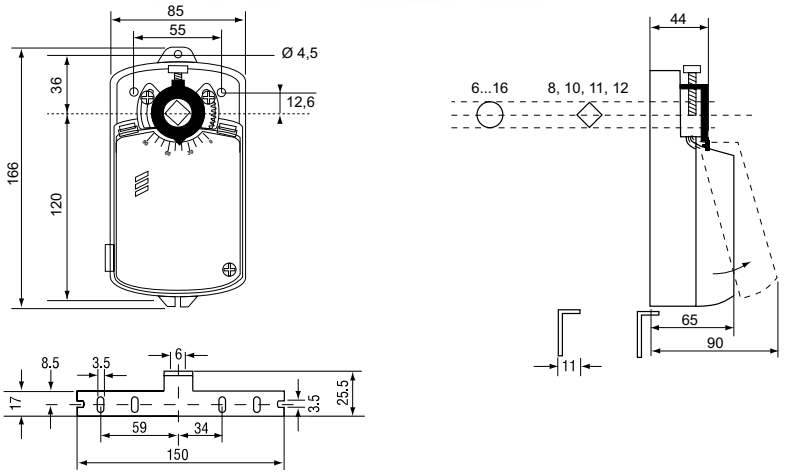
The silence electric actuators have been specially developed for use with small air dampers in ventilation and air conditioning systems.

Thanks to their very small size and clever construction they are also ideal for applications where space is limited.

A key feature of the design is the stem adapter which also incorporates angle-of-rotation limiting and position indication.

Features

- ON/OFF and Floating control
- Load-independent running time
- Up to 5 actuators in parallel operation possible
- Plug-in terminal block connection
- Simple direct-mounting with universal adapter for fitting to 6...16 mm Ø round axis or with Z01DN adapter kit for 8,10,11 and 12 mm square shaft
- Selectable direction of rotation
- Limitation of rotation angle
- Manual release button
- 2 adjustable auxiliary switches *(See next page for settings)*
- Automatic shut-off at end position (overload switch)
- Energy saving at end positions
- Actuators available with 1 m halogen-free cable
- Customized versions available



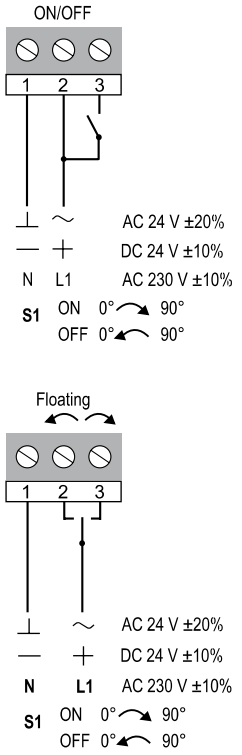
Dimensions in mm

Johnson Controls

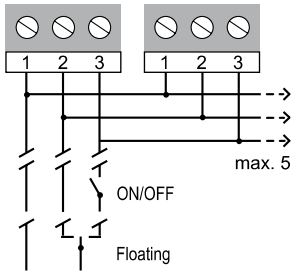
M9304-Axx-1N - *2/3 pages*

ON/OFF and Floating Actuators

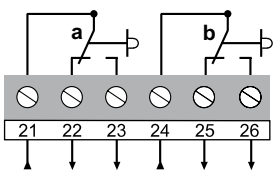
Wiring Diagrams



Parallel Connections



Auxiliary Switches (S)

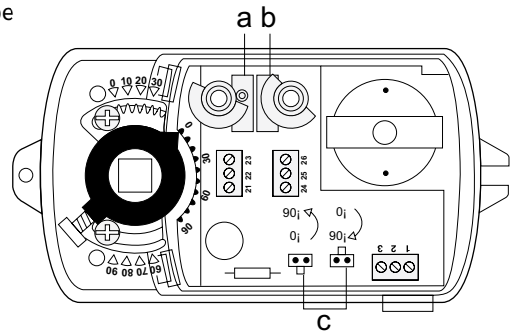


3(1.5) A, AC 230 V
Actuator at 0° position (CW)

Changing the direction of rotation

The direction of rotation can be changed by reversing plug **c**

Factory setting:
Clockwise rotation.

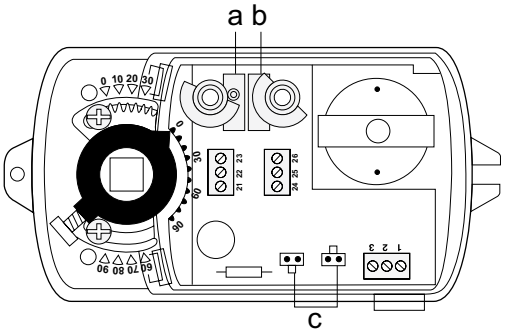


Setting the auxiliary switches

Factory setting:

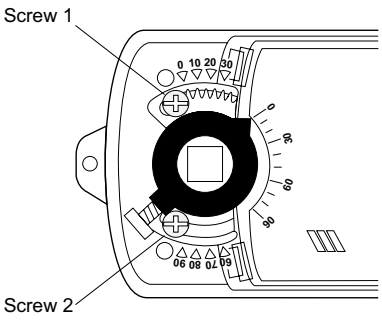
Switch **a** at 10°
Switch **b** at 80°

The switching position can be manually changed to any required position by turning the ratchet.



Limitation of rotation angle

The angle of rotation working range of 90° can be reduced by up to 30° from each end position by means of screw 1 and 2.



M9304-Axx-1N - *3/3 pages*

ON/OFF and Floating Actuators

Technical Specifications

Actuator	M9304-AGA-1N	M9304-AGC-1N	M9304-ADA-1N	M9304-ADC-1N
Torque	4 Nm			
Damper area*	0.8 m²			
Running Time	35 s			
Supply Voltage	AC/DC 24 V		AC 230 V	
Frequency	50-60 Hz			
Power Consumption				
- Running	2.5 W		4.0 W	
- At end position	0.75 W		3.0 W	
Dimensioning	4.1 VA / 3.4 A @ 2 ms		5.0 VA / 0.5 A @ 2 ms	
Control Signal	ON/OFF or Floating			
Position Signal	None			
Angle of rotation/Working range	90° (93°mech.)			
Angle of rotation/Limitation	0°...30° and 90°...60°			
Service life time	60,000 rotations			
Auxiliary Switches	None	3(1.5) A, AC 230 V	None	3(1.5) A, AC 230 V
- S1 setting range	None	5°...85° < adjustable	None	5°...85° < adjustable
Noise level	40 dB (A)			
Protection Class	II			
Degree of Protection	IP 42			
Cable aperture connection	M16 x 1.5			
Mode of Action	Type 1			
Ambient conditions				
- Operating temperature	-20...+50 °C / IEC 721-3-3			
- Storage temperature	-30...+60°C / IEC 721-3-2			
- Humidity	5...95% r.F. no condensed			
Weight	0.9 Kg			
Service	Maintenance-free			
Standards				
- Mechanics	EN 60 529 / EN 60 730-2-14			
- Electronics	EN 60 730-2-14			
- EMC Emissions	EN 50 081-1:92 / IEC 61000-6-3:96			
- EMC Immunity	EN 50 082-2:95 / IEC 61000-6-2:99			

***Caution:** Please note damper manufacturer's information concerning the open/close torque.

Ordering Codes

Codes	Descriptions
M9304-AGA-1N	AC/DC 24 V
M9304-AGC-1N	AC/DC 24 V, with 2 auxiliary switches
M9304-ADA-1N	AC 230 V
M9304-ADC-1N	AC 230 V, with 2 auxiliary switches

M9304-BDx-1N - *1/3 pages*

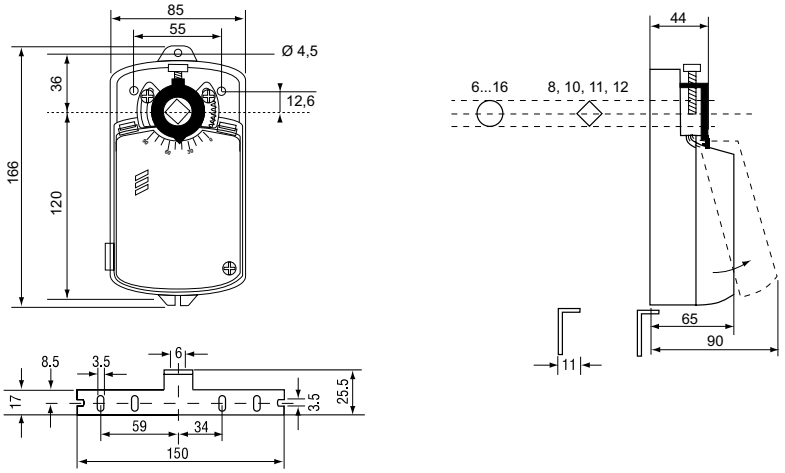
ON/OFF Actuators

The silence electric damper actuator series have been developed to operate small and medium air damper in ventilation and airconditioning systems.

The compact design and universal adapter fitted with limitation of rotation angle make this actuator highly versatile.

Features

- ON/OFF
- Load-independent running time
- Up to 5 actuators in parallel operation possible
- Plug-in terminal block connection
- Simple direct-mounting with universal adapter for fitting to 6...16 mm Ø round axis or with Z01DN adapter kit for 8,10,11 and 12 mm square shaft
- Selectable direction of rotation
- Limitation of rotation angle
- Manual release button
- 2 adjustable auxiliary switches *(See next page for settings)*
- Automatic shut-off at end position (overload switch)
- Energy saving at end positions
- Actuators available with 1 m halogen-free cable
- Customized versions available



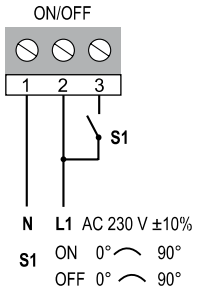
Dimensions in mm

Johnson Controls

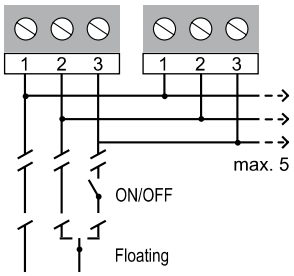
M9304-BDx-1N - *2/3 pages*

ON/OFF Actuators

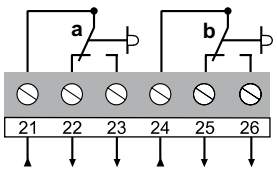
Wiring Diagram



Parallel Connections



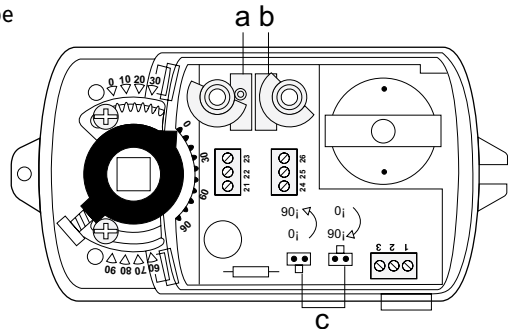
Auxiliary Switches (S)



Changing the direction of rotation

The direction of rotation can be changed by reversing plug **c**

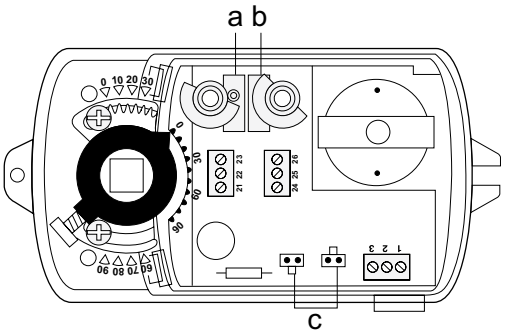
Factory setting:
Clockwise rotation.



Setting the auxiliary switches

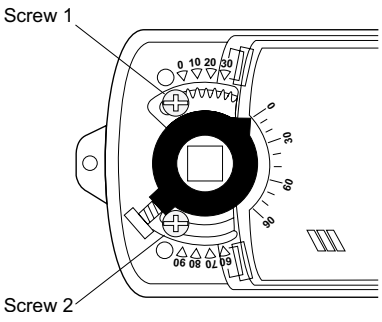
Factory setting:
Switch **a** at 10°
Switch **b** at 80°

The switching position can be manually changed to any required position by turning the ratchet.



Limitation of rotation angle

The angle of rotation working range of 90° can be reduced by up to 30° from each end position by means of screw 1 and 2.



M9304-BDx-1N - *3/3 pages*

ON/OFF Actuators

Technical Specifications

Actuator	M9304-BDx-1N
Torque	4 Nm
Damper area*	0.8 m²
Running Time	35 s
Supply Voltage	AC 230 V
Frequency	50-60 Hz
Power Consumption	
- Running	2.8 W
- At end position	1.7 W
Dimensioning	3.6 VA / 0.1 A @ 2 ms
Control Signal	ON/OFF
Position Signal	None
Angle of rotation/Working range	90° (93°mech.)
Angle of rotation/Limitation	0°...30° and 90°...60°
Service life time	60,000 rotations
Auxiliary Switches	3(1.5) A, AC 230 V
- S1 setting range	5°...85° < adjustable
Noise level	40 dB (A)
Protection Class	II
Degree of Protection	IP 42
Cable aperture connection	M16 x 1.5
Mode of Action	Type 1
Ambient conditions	
- Operating temperature	-20...+50 °C / IEC 721-3-3
- Storage temperature	-30...+60°C / IEC 721-3-2
- Humidity	5...95% r.F. no condensed
Weight	0.950 Kg
Service	Maintenance-free
Standards	
- Mechanics	EN 60 529 / EN 60 730-2-14
- Electronics	EN 60 730-2-14
- EMC Emissions	EN 50 081-1:92 / IEC 61000-6-3:96
- EMC Immunity	EN 50 082-2:95 / IEC 61000-6-2:99

***Caution:** Please note damper manufacturer's information concerning the open/close torque.

Ordering Codes

Codes	Descriptions
M9304-BDA-1N	AC 230 V
M9304-BDC-1N	AC 230 V, with 2 auxiliary switches

M9304-GGA-1N- *1/3 pages*

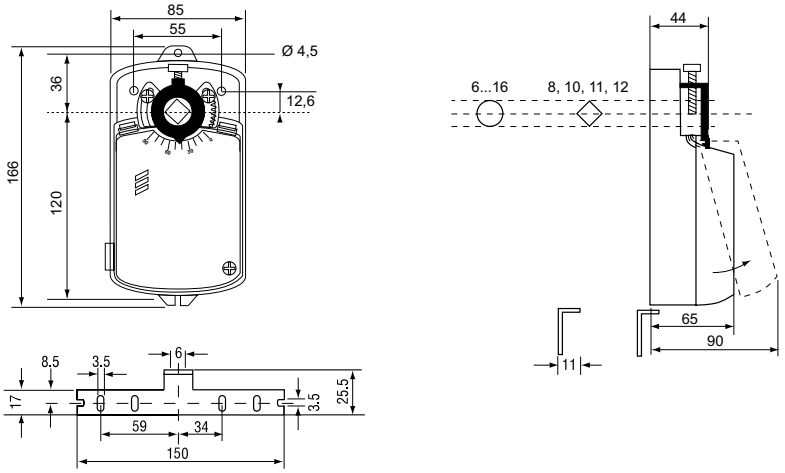
Proportional Actuators

The silence electric damper actuator series have been developed to operate small and medium air damper in ventilation and air conditioning systems.

The compact design and universal adapter fitted with limitation of rotation angle make this actuator highly versatile.

Features

- DC 0...10 V
- Up to 5 actuators in parallel operation possible
- Plug-in terminal block connection
- Simple direct-mounting with universal adapter for fitting to 6...16 mm Ø round axis or with Z01DN adapter kit for 8,10,11 and 12 mm square shaft. 45-min shaft lenght
- Selectable direction of rotation
- Limitation of rotation angle
- Manual release button
- Automatic shut-off at end position (overload switch)
- Energy saving at end positions
- Actuators available with 1 m halogen-free cable

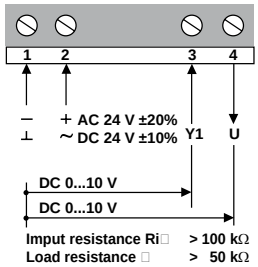


Dimensions in mm

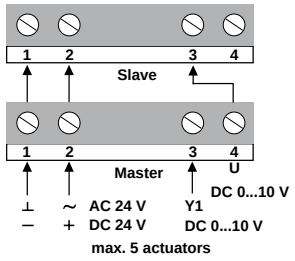
M9304-GGA-1N- *2/3 pages*

Proportional Actuators

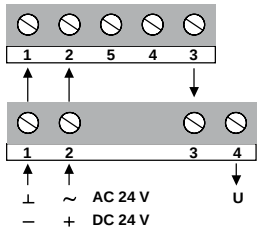
Wiring Diagram



Parallel Connections



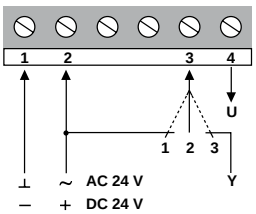
Positioner



The actuator M9304-GGA-1N can also be controlled using the Positioner (M9000-PA and M9000-PF) with a control signal of DC 0...10V.

For further information concerning the PA and PF positioner please refer to data sheet 6.20

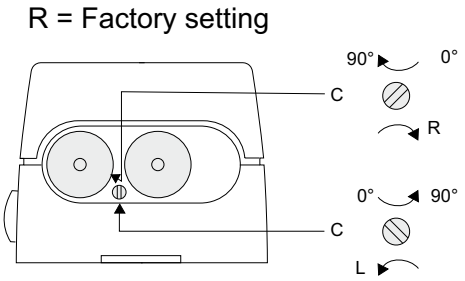
Override Control



The actuator M9304-GGA-1N can be forced to override control when wired in accordance with the diagram.

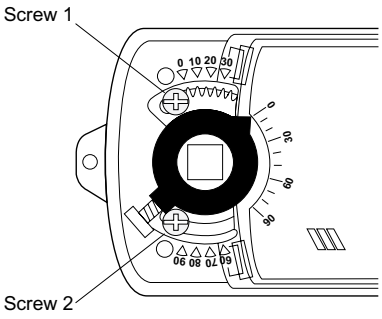
Switch position:
1= Actuator runs at 10 V
2= Actuator runs at 0 V
3= Automatic control operation

Changing the direction of rotation



Limitation of rotation angle

The angle of rotation/working range of 90° can be reduced by up to 30° from each end position by means of screw 1 and 2.



M9304-GGA-1N- *3/3 pages*

Proportional Actuators

Technical Specifications

Actuator	M9304-GGA-1N
Torque	4 Nm
Damper area*	0.8 m²
Running Time	35 s
Supply Voltage	AC/DC 24 V
Frequency	50-60 Hz
Power Consumption	
- Running	2.5 W
- At end position	0.75 W
Dimensioning	3.5 VA / 2.5 A @ 2 ms
Control Signal	DC 0...10 V
Position Signal	DC 0...10 V
Angle of rotation/Working range	90° (93°mech.)
Angle of rotation/Limitation	0°...30° and 90°...60°
Service life time	60,000 rotations
Noise level	40 dB (A)
Protection Class	II
Degree of Protection	IP 42
Cable aperture connection	M16 x 1.5
Mode of Action	Type 1
Ambient conditions	
- Operating temperature	−20...+50 °C / IEC 721-3-3
- Storage temperature	−30...+60°C / IEC 721-3-2
- Humidity	5...95% r.F. no condensed
Weight	0.9 Kg
Service	Maintenance-free
Standards	
- Mechanics	EN 60 529 / EN 60 730-2-14
- Electronics	EN 60 730-2-14
- EMC Emissions	EN 50 081-1:92 / IEC 61000-6-3:96
- EMC Immunity	EN 50 082-2:95 / IEC 61000-6-2:99

***Caution:** Please note damper manufacturer's information concerning the open/close torque.

Ordering Codes

Codes	Descriptions
M9304-GGA-1N	AC/DC 24 V

M91xx-Axx-1N - *1/3 pages*

Page 16

ON/OFF and Floating Actuators

The standard electric damper actuator series is designed to operate air dampers in ventilation and air conditioning systems.

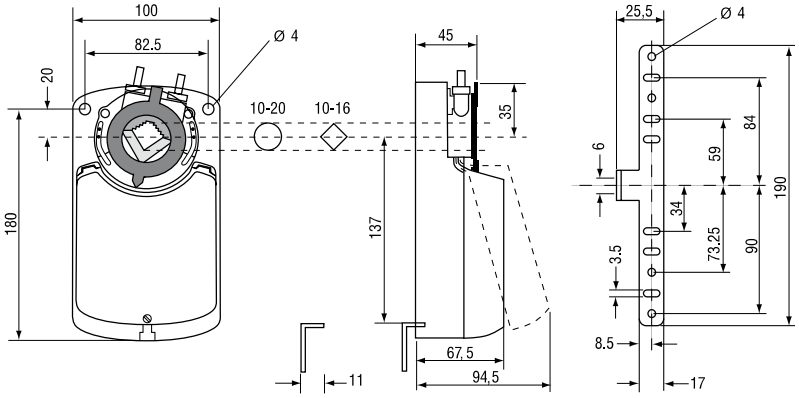
The compact design and universal adapter fitted with limitation of rotation angle make this actuator highly versatile.

Features

- ON/OFF and Floating control
- Up to 5 actuators in parallel operation possible
- Plug-in terminal block connection
- Simple direct-mount with universal adapter on Ø 10 mm to 20 mm shaft or square shaft from 10 mm to 16 mm 48 mm minimum damper shaft length
- Selectable direction of rotation
- Limitation of rotation angle
- Manual release button
- 2 adjustable auxiliary switches *(See next page for settings)*
- Automatic shut-off at end position (overload switch)
- Energy saving at end positions
- Actuators available with 1 m halogen-free cable
- Customized versions available

Accessories

- M9000- ZK damper linkage selection
- M9000- ZKG ball joints



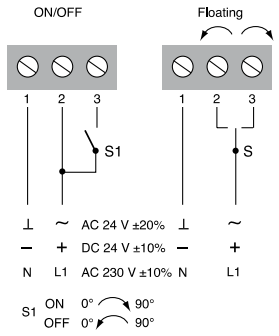
Dimensions in mm

Johnson Controls

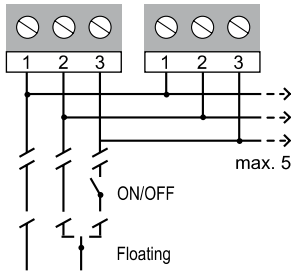
M91xx-Axx-1N - *2/3 pages*

ON/OFF and Floating Actuators

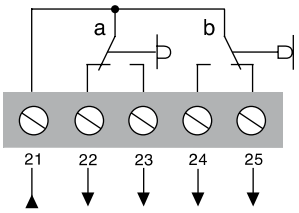
Wiring Diagrams



Parallel Connections

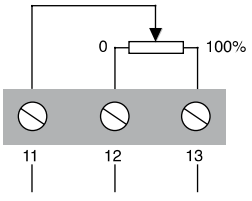


Auxiliary Switches (S)



3(1.5)A, AC 230 V
Actuator at 0° position

Potentiometer (P)

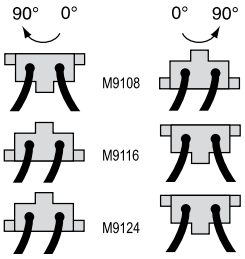


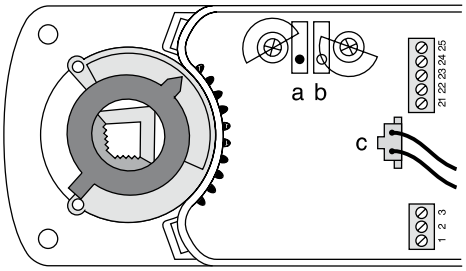
P1 = 1K Ω/0,5 W/±10%
P2 = 140 Ω/0,5 W/±10%
P4 = 2K Ω/0,5 W/±10%

Changing the direction of rotation

The direction of rotation can be changed by reversing plug **c**

Factory setting:

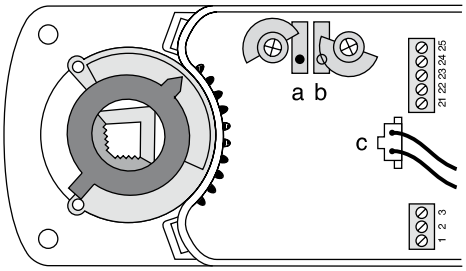




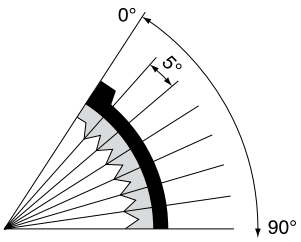
Setting the auxiliary switches

Factory setting:
Switch **a** at 10°
Switch **b** at 80°

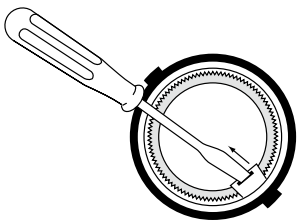
The switching position can be manually changed to any required position by turning the ratchet.



Limitation of Rotation angle



Adapter release



Johnson Controls

M91xx-Axx-1N - *3/3 pages*

ON/OFF and Floating Actuators

Technical Specifications

Actuator	M9108-AGx-1N	M9116-AGx-1N	M9124-AGx-1N	M9108-ADx-1N	M9116-ADx-1N	M9124-ADx-1N
Torque	8 Nm	16 Nm	24 Nm	8 Nm	16 Nm	24 Nm
Damper area*	1.5 m^2	3.0 m^2	4.5 m^2	1.5 m^2	3.0 m^2	4.5 m^2
Running Time OPEN	30 s	80 s	125 s	30 s	80 s	125 s
Running Time CLOSE	30 s	80 s	125 s	30 s	80 s	125 s
Supply Voltage	AC/DC 24 V			AC 230 V		
Frequency	50-60 Hz			50-60 Hz		
Power Consumption						
- Running	2.5 W			3.0 W		
- At end position	0.5 W			0.5 W		
Dimensioning	5.0 VA / 3.4 A @ 2 ms			3.6 VA / 0.5 A @ 2 ms		
Control Signal	ON/OFF or Floating					
Position Signal	Potentiometer 0.5 W / ±10%					
Angle of rotation/ Working range	90° (93°mech.)					
Angle of rotation/Limitation	5°...85° in 5° < steps					
Auxiliary Switches	3(1.5) A, AC 230 V					
- S1 setting range	5°...85° < adjustable					
- S2 setting range						
Cable	1.0 m halogen-free					
- Motor	3-Wire 1-2-3					
- Switches	5-Wire 21-22-23-24-25					
- Potentiometer	3-Wire 11-12-13					
Life time	60.000 rotations					
Noise level	45 dB (A)					
Protection Class	II					
Degree of Protection	IP 54					
Mode of Action	Type 1					
Ambient conditions						
- Operating temperature	-20...+50 °C / IEC 721-3-3					
- Storage temperature	-30...+60°C / IEC 721-3-2					
- Humidity	5...95% r.F. no condensed					
Weight	1.1 Kg			1.2 Kg		
Service	Maintenance-free					
Standards						
- Mechanics	EN 60 529 / EN 60 730-2-14					
- Electronics	EN 60 730-2-14					
- EMC Emissions	EN 50 081-1:92 / IEC 61000-6-3:96					
- EMC Immunity	EN 50 082-2:95 / IEC 61000-6-2:99					

***Caution:** Please note damper manufacturer's information concerning the open/close torque.

Ordering Codes

Codes	Descriptions
M91xx-AGA-1N	AC/DC 24 V
M91xx-AGC-1N	AC/DC 24 V, with 2 auxiliary switches
M91xx-AGE-1N	AC/DC 24 V, with 1000 Ω feedback potentiometer
M91xx-AGD-1N	AC/DC 24 V, with 140 Ω feedback potentiometer
M91xx-AGF-1N	AC/DC 24 V, with 2000 Ω feedback potentiometer
M91xx-ADA-1N	AC 230 V
M91xx-ADC-1N	AC 230 V, with 2 auxiliary switches
M91xx-ADE-1N	AC 230 V, with 1000 Ω feedback potentiometer
M91xx-ADD-1N	AC 230 V, with 140 Ω feedback potentiometer
M91xx-ADF-1N	AC 230 V, with 2000 Ω feedback potentiometer

M91xx-GDx-1N *- 1/4 pages*

Proportional Actuators AC 230 V

The standard electric damper actuator series is designed to operate air dampers in ventilation and air conditioning systems.

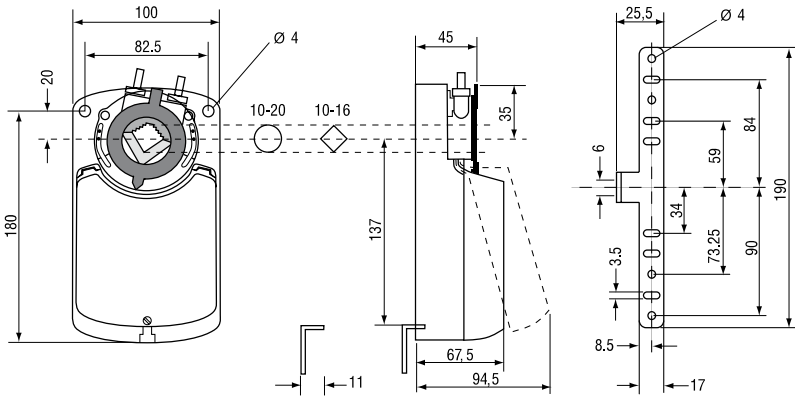
The compact design and universal adapter fitted with limitation of rotation angle make this actuator highly versatile.

Features

- DC 0(2)...10 V control signal
- Load independent
- Working area adjustable
- Up to 5 actuators in parallel operation possible
- Plug-in terminal block connection
- Simple direct-mount with universal adapter on 10...20 mm Ø round-axis or 10...16 mm square shaft 48 mm minimum damper shaft lenght
- Selectable direction of rotation
- Limitation of rotation angle
- Manual release button
- 2 adjustable auxiliary switches
- Automatic shut-off at end position (overload switch)
- Actuators available with 1 m cable
- Customized versions available

Accessories

- M9000- ZK Damper linkage selection
- M9000- ZKG Ball joints

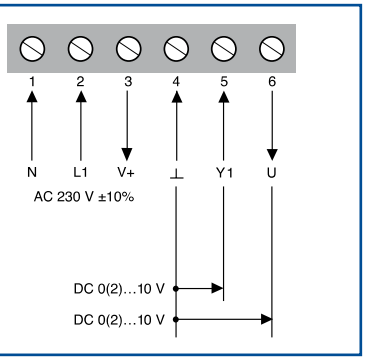


Dimensions in mm

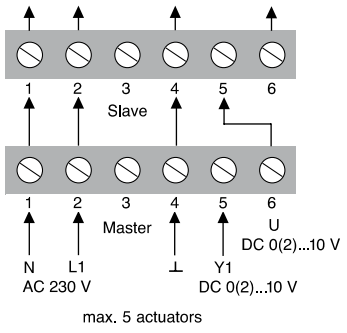
M91xx-GDx-1N - *2/4 pages*

Proportional Actuators AC 230 V

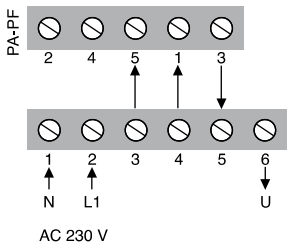
Wiring Diagram



Parallel Connections



Position transmitter



The M91...-GD.-1N can also be controlled using the JOHNSON CONTROLS Positioner (PA/PF) with control signal of DC 0(2)...10 V.

For further information concerning the PA and PF positioner please refer to sheet 6.20.

Caution: A maximum of 5 actuators can be controlled in parallel operation.

Setting the control Signal

Control signal Y1 DC 0...10 V
Input resistance Ri 100 kΩ

Position signal U DC 0...10 V
Load resistance > 50 kΩ

By switching microswitch **d** to ON position, the control signal Y1 or Y2 will be adapted to the chosen angle of rotation.

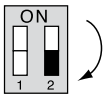
By switching microswitch **c** the direction of rotation can be changed

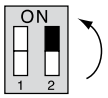
Microswitch **d**
Self-adapting

Dectivated

Activated

Microswitch **c**





Setting Span and OFFSET

The potentiometers **O** and **S** help to match control signals Y1 to any make of controller.

Example 1

Control signal Y1 working between DC 2...10 V

Setting: Starting point O = 2
working range S = 8

Example 2

Control signal Y2 working between 6...18 mA

Setting: Starting point O = 3
Working range S = 6

Start point O

Scale O	0	1	2	3	4	5	6	7	8
for Y1 (VDC)	0	1	2	3	4	5	6	7	8

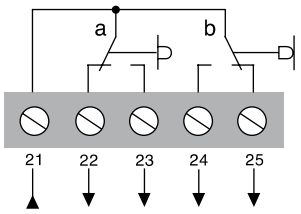
Working range S

Scale S	2	3	4	5	6	7	8	9	10
for Y1 (VDC)	2	3	4	5	6	7	8	9	10

M91xx-GDx-1N - *3/4 pages*

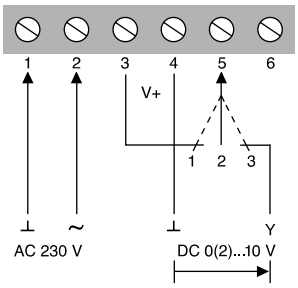
Proportional Actuators AC 230 V

Auxiliary Switches (S)



3(1.5)A, AC 230 V
Actuator at 0° position

Override Control



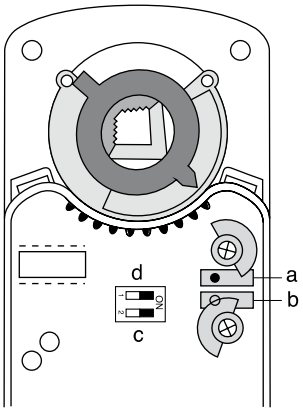
The actuator M91..-GD.-1N can be forced to override control when wired in accordance with the diagram.

Switch position:
1 = Actuator runs at 10 V
2 = Actuator runs at 0(2) V
3 = Automatic control

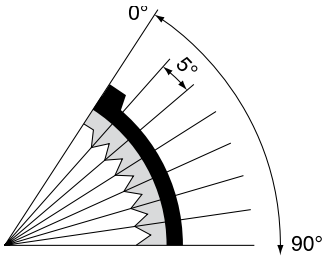
Settings the auxiliary switches

Factory setting:
Switch **a** at 10°
Switch **b** at 80°

The switching position can be manually changed to any required position by turning the ratchet.

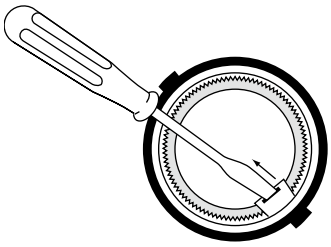


Limitation of Rotation Angle



The limitation or rotation angle can be set in 5° steps by moving the adapter.

Adapter release



The adapter can be remove simply by pressing the adapter clip on the underside of the actuator.

M91xx-GDx-1N - *4/4 pages*

Modulating Actuators AC 230 V

Technical Specifications

Actuator	M9108-GDx-1N	M9116-GDx-1N	M9124-GDx-1N
Torque	8 Nm	16 Nm	24 Nm
Damper area*	1.5 m²	3.0 m²	4.5 m²
Running Time OPEN	30 s	80 s	125 s
Running Time CLOSE	30 s	80 s	125 s
Supply Voltage	AC 230 V		
Frequency	50-60 Hz		
Power Consumption			
- Running	5.5 W		
- At end position	0.6 W		
Dimensioning	6.0 VA / 0.1 A @ 2 ms		
Working area	Adjustable		
Control Signal Y1	DC 0(2)... 10 V		
Imput resistance Y1	Ri 100 Ω		
Position signal U	DC 0...10 V		
Load resistance	> 50 kΩ		
Angle of rotation/Working range	90° (93°mech.)		
Angle of rotation/Limitation	5°...85° in 5° < steps		
Auxiliary Switches	3(1.5) A, AC 230 V		
- S1 setting range	5°...85° < adjustable		
- S2 setting range			
Cable	1.0 m halogen-free		
- Motor	6-Wire 1-2-3-4-5-6		
- Switches	5-Wire 21-22-23-24-25		
Life time	60.000 rotations		
Noise level	45 dB (A)		
Protection Class	II		
Degree of Protection	IP 54		
Mode of Action	Type 1		
Ambient conditions			
- Operating temperature	-20...+50 °C / IEC 721-3-3		
- Storage temperature	-30...+60°C / IEC 721-3-2		
- Humidity	5...95% r.F. no condensed		
Weight	1.2 Kg		
Service	Maintenance-free		
Standards			
- Mechanics	EN 60 529 / EN 60 730-2-14		
- Electronics	EN 60 730-2-14		
- EMC Emissions	EN 50 081-1:92 / IEC 61000-6-3:96		
- EMC Immunity	EN 50 082-2:95 / IEC 61000-6-2:99		

***Caution:** Please note damper manufacturer's information concerning the open/close torque.

Ordering Codes

Codes	Descriptions
M91xx-GDA-1N	AC 230 V
M91xx-GDC-1N	AC 230 V, with 2 auxiliary switches

M91xx-GDx-1N1 - *1/3 pages*

Proportional Actuators AC 230 V

The standard electric damper actuator series is designed to operate air dampers in ventilation and air conditioning systems.

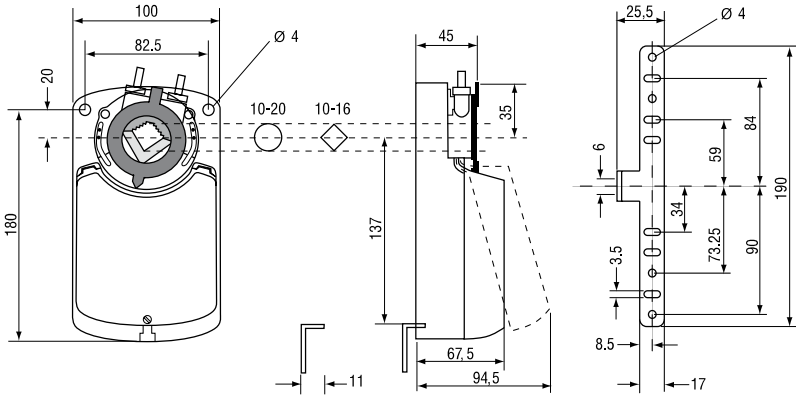
The compact design and universal adapter fitted with limitation of rotation angle make this actuator highly versatile.

Features

- 0(4)...20 mA control signal
- Up to 5 actuators in parallel operation possible
- Plug-in terminal block connection
- Simple direct-mount with universal adapter
  on 10...20 mm Ø round-axis
  or 10...16 mm square shaft
  48 mm minimum damper shaft lenght
- Selectable direction of rotation
- Limitation of rotation angle
- Manual release button
- 2 adjustable auxiliary switches
- Automatic shut-off at end position (overload switch)
- Actuators available with 1 m cable
- Customized versions available

Accessories

- M9000- ZK Damper linkage selection
- M9000- ZKG Ball joints

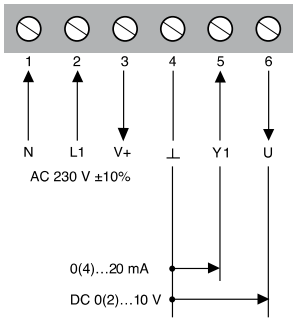


Dimensions in mm

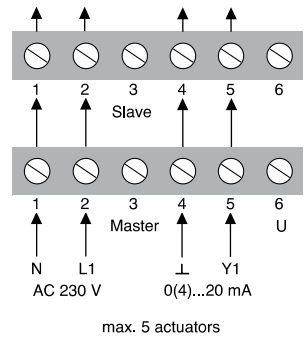
M91xx-GDx-1N1 - *2/3 pages*

Proportional Actuators AC 230 V

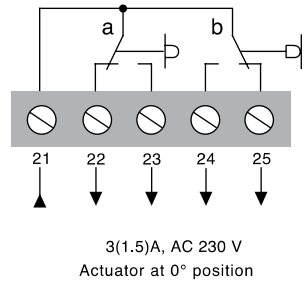
Wiring Diagram



Parallel Connections



Auxiliary Switches (S)



Angle of rotation

The limitation or rotation angle can be set in 5° steps by moving the adapter.

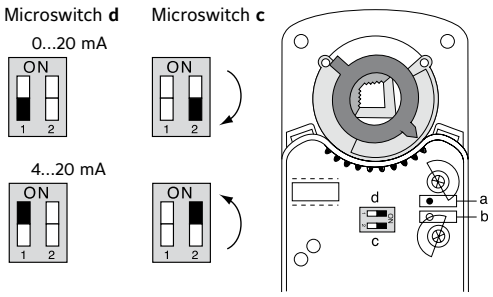
The adapter can be removed simply by pressing the adapter clip on the underside of the actuator.

Setting the control Signal

Control signal Y1	0(4)...20 mA
Input resistance	Ri 100 kΩ
Position signal U	DC 0...2...10 V
Load resistance	> 50 kΩ

Switching microswitch d1 to the ON position, will change the control signal to 4...20 mA.

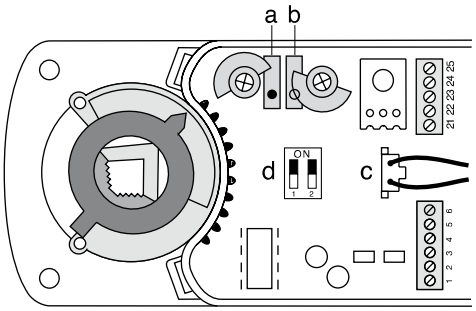
Changing the direction of rotation



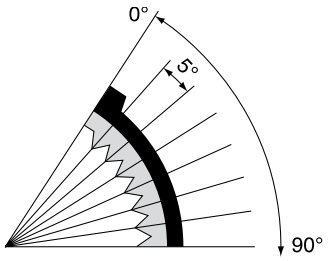
Setting the auxiliary switches

Factory setting:
Switch a at 10°
Switch b at 80°

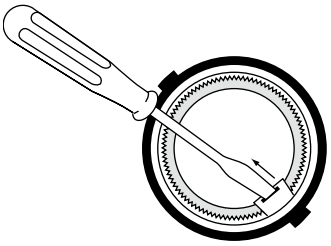
The switching position can be manually changed to any required position by turning the ratchet.



Limitation of rotation Angle



Adapter release



Johnson Controls

M91xx-GDx-1N1 - *3/3 pages*

Proportional Actuators AC 230 V

Technical Specifications

Actuator	M9108-GDx-1N1	M9116-GDx-1N1	M9124-GDx-1N1
Torque	8 Nm	16 Nm	24 Nm
Damper area*	1.5 m²	3.0 m²	4.5 m²
Running Time OPEN	30 s	80 s	125 s
Running Time CLOSE	30 s	80 s	125 s
Supply Voltage	AC 230 V		
Frequency	50-60 Hz		
Power Consumption			
- Running	5.5 W		
- At end position	0.6 W		
Dimensioning	6.0 VA / 0.1 A @ 2 ms		
Control Signal Y1	0(4)...20 mA		
Imput resistance Y1	Ri 100 Ω		
Position signal U	DC 0...10 V		
Load resistance	> 50 kΩ		
Angle of rotation/Working range	90° (93°mech.)		
Angle of rotation/Limitation	5°...85° in 5° < steps		
Auxiliary Switches	3(1.5) A, AC 230 V		
- S1 setting range	5°...85° < adjustable		
- S2 setting range			
Cable	1.0 m halogen-free		
- Motor	6-Wire 1-2-3-4-5-6		
- Switches	5-Wire 21-22-23-24-25		
Life time	60.000 rotations		
Noise level	45 dB (A)		
Protection Class	II		
Degree of Protection	IP 54		
Mode of Action	Type 1		
Ambient conditions			
- Operating temperature	−20...+50 °C / IEC 721-3-3		
- Storage temperature	−30...+60°C / IEC 721-3-2		
- Humidity	5...95% r.F. no condensed		
Weight	1.2 Kg		
Service	Maintenance-free		
Standards			
- Mechanics	EN 60 529 / EN 60 730-2-14		
- Electronics	EN 60 730-2-14		
- EMC Emissions	EN 50 081-1:92 / IEC 61000-6-3:96		
- EMC Immunity	EN 50 082-2:95 / IEC 61000-6-2:99		

***Caution:** Please note damper manufacturer's information concerning the open/close torque.

Ordering Codes

Codes	Descriptions
M91xx-GDA-1N1	AC 230 V
M91xx-GDC-1N1	AC 230 V, with 2 auxiliary switches

M91xx-GGx-1N - *1/4 pages*

Page 26

Proportional Actuators AC/DC 24 V

The standard electric damper actuator series is designed to operate air dampers in ventilation and air conditioning systems.

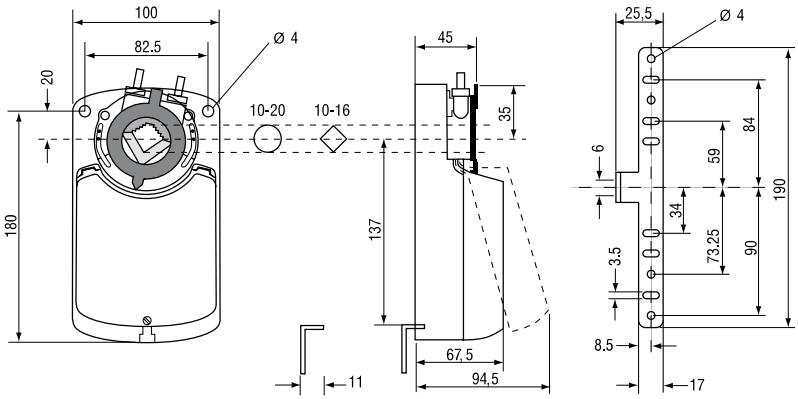
The compact design and universal adapter fitted with limitation of rotation angle make this actuator highly versatile.

Features

- DC 0(2)...10 V or 0(4)...20 mA control signal
- Working area adjustable
- Load-independent running time
- Up to 5 actuators in parallel operation possible
- Plug-in terminal block connection
- Simple direct-mount with universal adapter
  on 10...20 mm Ø round-axis
  or 10...16 mm square shaft
  48 mm minimum damper shaft lenght
- Selectable direction of rotation
- Limitation of rotation angle
- Manual release button
- 2 adjustable auxiliary switches
- Automatic shut-off at end position (overload switch)
- Actuators available with 1 m cable
- Customized versions available

Accessories

- M9000- ZK Damper linkage selection
- M9000- ZKG Ball joints

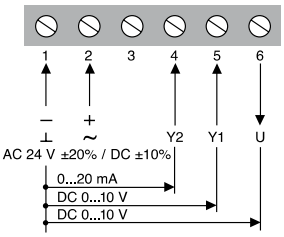


Dimensions in mm

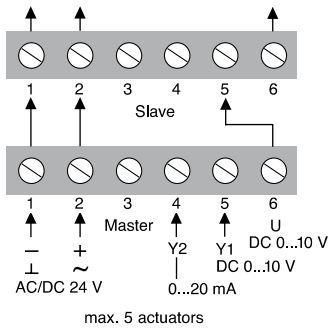
M91xx-GGx-1N - *2/4 pages*

Proportional Actuators AC/DC 24 V

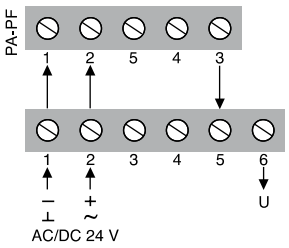
Wiring Diagram



Parallel Connections



Position transmitter



The M91xx-GGx-1N can also be controlled using the JOHNSON CONTROL Positioner (PA/PF) with control signal of DC 0...10 V.

For further information concerning the PA and PF positioner please refer to sheet 6.20.

Caution: A maximum of 5 actuators can be controlled in parallel operation.

Setting the control Signal

Control signal Y1 DC 0...10 V
Input resistance Ri 250 kΩ

Control signal Y2 0...20 mA
Input resistance Ri 388 Ω

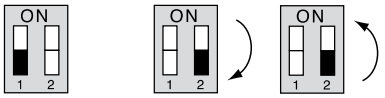
Position signal U DC 0...10 V
Load resistance > 50 kΩ

By switching microswitch d to ON position, the control signal Y1 or Y2 will be adapted to the chosen angle of rotation.

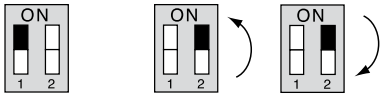
By switching microswitch **c** the direction of rotation can be changed.

Microswitch **d** Self-adapting — Microswitch **c**

Dectivated



Activated



M9116
M9124

M9108

Setting Span and OFFSET

The potentiometers **O** and **S** help to match control signals Y1 and Y2 to any make of controller.

Example 1

Control signal Y1 working between DC 2...10 V

Setting: Starting point O = 2
working range S = 8

Example 2

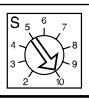
Control signal Y2 working between 6...18 mA

Setting: Starting point O = 3
Working range S = 6

Start point O

Scale O	0	1	2	3	4	5	6	7	8
for Y1 (VDC)	0	1	2	3	4	5	6	7	8
for Y2 (mA)	0	2	4	6	8	10	12	14	16

Working range S

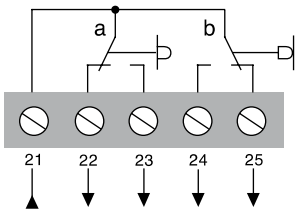


Scale S	2	3	4	5	6	7	8	9	10
for Y1 (VDC)	2	3	4	5	6	7	8	9	10
for Y2 (mA)	4	6	8	10	12	14	16	18	20

M91xx-GGx-1N - *3/4pages*

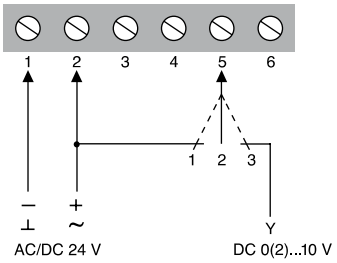
Proportional Actuators AC/DC 24 V

Auxiliary Switches (S)



3(1.5)A, AC 230 V
Actuator at 0° position

Override Control



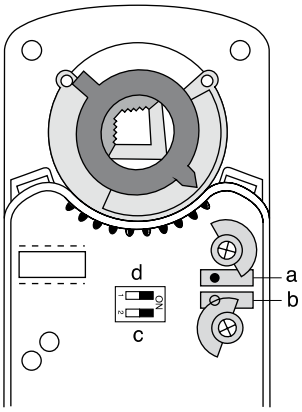
The actuator M91xx-GGx-1N can be forced to override control when wired in accordance with the diagram.

Switch position:
1 = Actuator runs at 10 V
2 = Actuator runs at 0(2) V
3 = Automatic control

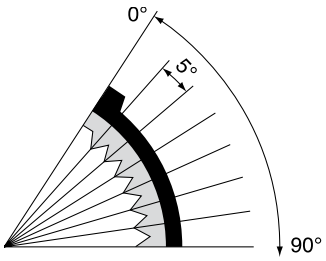
Settings the auxiliary switches

Factory setting:
Switch **a** at 10°
Switch **b** at 80°

The switching position can be manually changed to any required position by turning the ratchet.

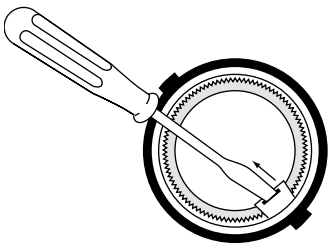


Limitation of Rotation Angle



The limitation or rotation angle can be set in 5° steps by moving the adapter.

Adapter release



The adapter can be remove simply by pressing the adapter clip on the underside of the actuator.

M91xx-GGx-1N - *4/4 pages*

Proportional Actuators AC/DC 24 V

Technical Specifications

Actuator	M9108-GGx-1N	M9116-GGx-1N	M9124-GGx-1N
Torque	8 Nm	16 Nm	24 Nm
Damper area*	1.5 m²	3.0 m²	4.5 m²
Running Time OPEN	30 s	80 s	125 s
Running Time CLOSE	30 s	80 s	125 s
Supply Voltage	AC/DC 24 V		
Frequency	50-60 Hz		
Power Consumption			
- Running	2.5 W		
- At end position	0.3 W		
Dimensioning	6.0 VA / 3.6 A @ 2 ms		
Working area Y	not adjustable		
Control Signal Y1	DC 0... 10 V		
Imput resistance Y1	Ri 250 Ω		
Control signal Y2	0...20 mA		
Imput resistance Y2	Ri 388 Ω		
Position signal U	DC 0...10 V		
Load resistance	> 50 k Ω		
Angle of rotation/Working range	90° (93°mech.)		
Angle of rotation/Limitation	5°...85° in 5° < steps		
Auxiliary Switches	3(1.5) A, AC 230 V		
- S1 setting range	5°...85° < adjustable		
- S2 setting range			
Cable	1.0 m halogen-free		
- Motor	5-Wire 1-2-4-5-6		
- Switches	5-Wire 21-22-23-24-25		
Life time	60.000 rotations		
Noise level	45 dB (A)		
Protection Class	II		
Degree of Protection	IP 54		
Mode of Action	Type 1		
Ambient conditions			
- Operating temperature	-20...+50 °C / IEC 721-3-3		
- Storage temperature	-30...+60°C / IEC 721-3-2		
- Humidity	5...95% r.F. no condensed		
Weight	1.1 Kg		
Service	Maintenance-free		
Standards			
- Mechanics	EN 60 529 / EN 60 730-2-14		
- Electronics	EN 60 730-2-14		
- EMC Emissions	EN 50 081-1:92 / IEC 61000-6-3:96		
- EMC Immunity	EN 50 082-2:95 / IEC 61000-6-2:99		

***Caution:** Please note damper manufacturer's information concerning the open/close torque.

Ordering Codes

Codes	Descriptions
M91xx-GGA-1N	AC/DC 24 V
M91xx-GGC-1N	AC/DC 24 V, with 2 auxiliary switches

M9132-Axx-1N - *1/3 pages*

Page 30

ON/OFF and Floating Actuators

The standard electric damper actuator series is designed to operate air dampers in ventilation and air conditioning systems.

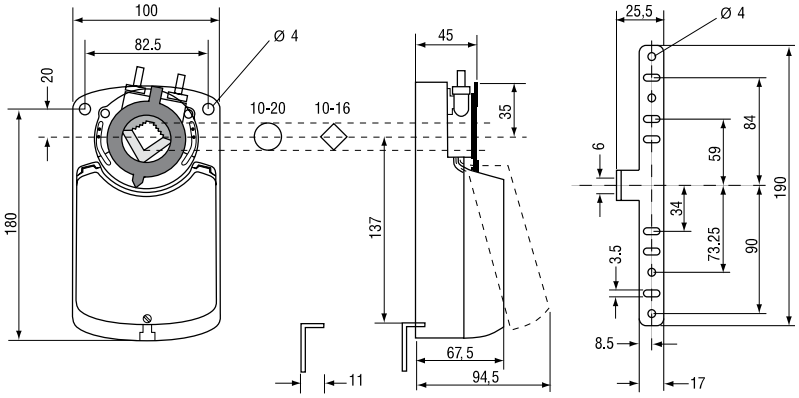
The compact design and universal adapterfitted with limitation of rotation angle make this actuator highly versatile.

Features

- ON/OFF and Floating control
- Load-independent running time
- Up to 5 actuators in parallel operation possible
- Plug-in terminal block connection
- Simple direct-mount with universal adapter on Ø 10 mm to 20 mm shaft or square shaft from 10 mm to 16 mm 48 mm minimum damper shaft length
- Selectable direction of rotation
- Limitation of rotation angle
- Manual release button
- 2 adjustable auxiliary switches *(See next page for settings)*
- Automatic shut-off at end position (overload switch)
- Energy saving at end positions
- Actuators available with 1 m halogen-free cable
- Customized versions available

Accessories

- M9000- ZK damper linkage selection
- M9000- ZKG ball joints



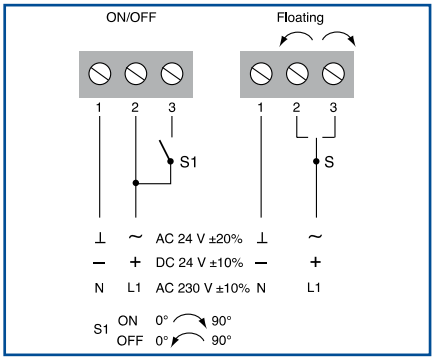
Dimensions in mm

Johnson Controls

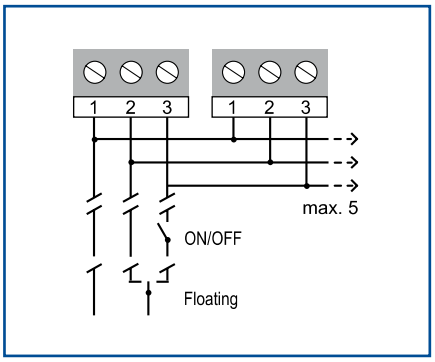
M9132-Axx-1N - *2/3 pages*

ON/OFF and Floating Actuators

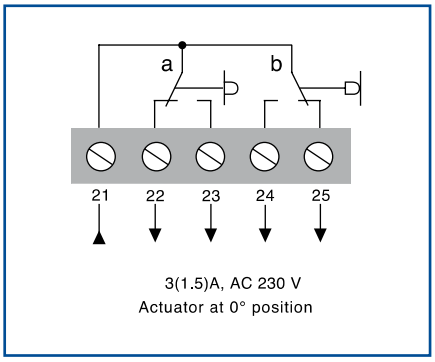
Wiring Diagrams



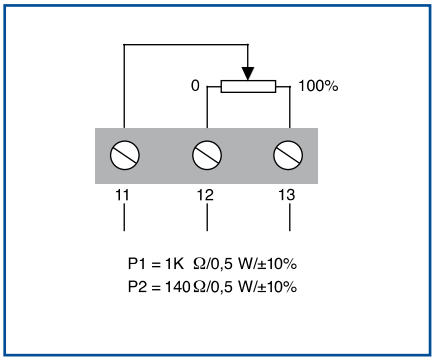
Parallel Connections



Auxiliary Switches (S)



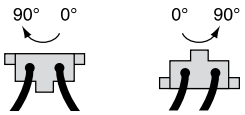
Potentiometer (P)

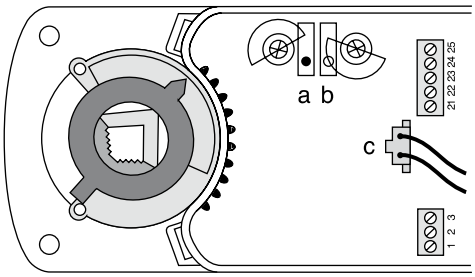


Changing the direction of rotation

The direction of rotation can be changed by reversing plug **c.**

Factory setting:

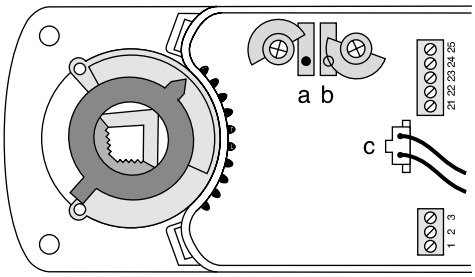




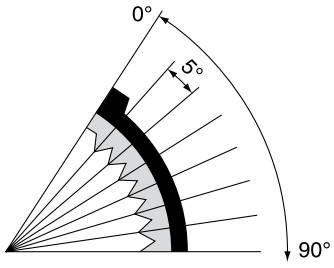
Setting the auxiliary switches

Factory setting:
Switch **a** at 10°
Switch **b** at 80°

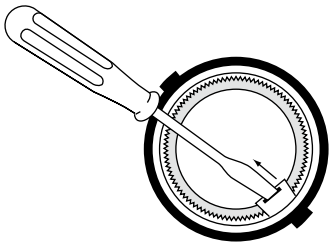
The switching position can be manually changed to any required position by turning the ratchet.



Limitation of rotation angle



Adapter release



M9132-Axx-1N - *3/3 pages*

ON/OFF and Floating Actuators

Technical Specifications

Actuator	M9132-AGx-1N	M9132-ADx-1N
Torque	32 Nm	
Damper area*	6.0 m²	
Running Time OPEN	140 s	
Running Time CLOSE	140 s	
Supply Voltage	AC/DC 24 V	AC 230 V
Frequency	50-60 Hz	
Power Consumption		
- Running	4.0 W	5.5 W
- At end position	0.5 W	1.0 W
Dimensioning	3.0 VA / 3.4 A @ 2 ms	4.5 VA / 0.25 A @ 2 ms
Control Signal	ON/OFF or Floating	
Position Signal	Potentiometer 0.5 W / ±10%	
Angle of rotation/Working range	90° (93°mech.)	
Angle of rotation/Limitation	5°...85° in 5° < steps	
Auxiliary Switches	3(1.5) A, AC 230 V	
- S1 setting range	5°...85° < adjustable	
- S2 setting range		
Cable	1.0 m halogen-free	
- Motor	3-Wire 1-2-3	
- Switches	5-Wire 21-22-23-24-25	
- Potentiometer	3-Wire 11-12-13	
Life time	60.000 rotations	
Noise level	45 dB (A)	
Protection Class	II	
Degree of Protection	IP 54	
Mode of Action	Type 1	
Ambient conditions		
- Operating temperature	-20...+50 °C / IEC 721-3-3	
- Storage temperature	-30...+60°C / IEC 721-3-2	
- Humidity	5...95% r.F. no condensed	
Weight	1.1 Kg	1.2 Kg
Service	Maintenance-free	
Standards		
- Mechanics	EN 60 529 / EN 60 730-2-14	
- Electronics	EN 60 730-2-14	
- EMC Emissions	EN 50 081-1:92 / IEC 61000-6-3:96	
- EMC Immunity	EN 50 082-2:95 / IEC 61000-6-2:99	

***Caution:** Please note damper manufacturer's information concerning the open/close torque.

Ordering Codes

Codes	Descriptions
M9132-AGA-1N	AC/DC 24 V
M9132-AGC-1N	AC/DC 24 V, with 2 auxiliary switches
M9132-AGE-1N	AC/DC 24 V, with 1000 Ω feedback potentiometer
M9132-AGD-1N	AC/DC 24 V, with 140 Ω feedback potentiometer
M9132-AGF-1N	AC/DC 24 V, with 2000 Ω feedback potentiometer
M9132-ADA-1N	AC/DC 24 V
M9132-ADC-1N	AC/DC 24 V, with 2 auxiliary switches
M9132-ADE-1N	AC/DC 24 V, with 1000 Ω feedback potentiometer
M9132-ADD-1N	AC/DC 24 V, with 140 Ω feedback potentiometer
M9132-ADF-1N	AC/DC 24 V, with 2000 Ω feedback potentiometer

M9132-GGx-1N - *1/4 pages*

Page 33

Proportional Actuators AC/DC 24 V

The standard electric damper actuator series is designed to operate air dampers in ventilation and air conditioning systems.

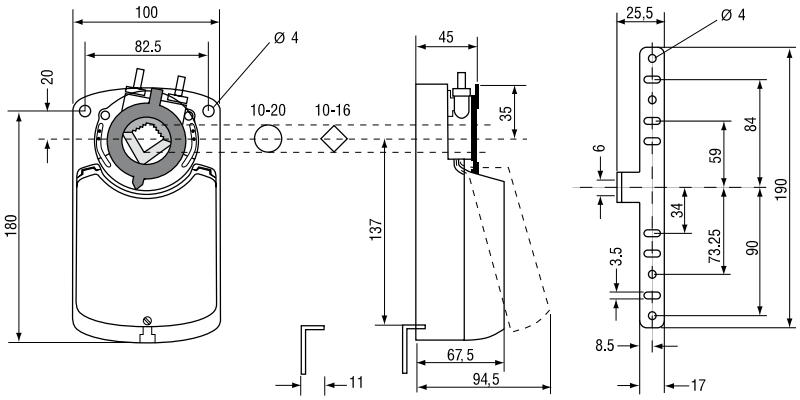
The compact design and universal adapter fitted with limitation of rotation angle make this actuator highly versatile.

Features

- DC 0...10 V or 0...20 mA control signal
- Working area adjustable
- Load-independent running time
- Up to 5 actuators in parallel operation possible
- Plug-in terminal block connection
- Simple direct-mount with universal adapter
  on 10...20 mm Ø round-axis
  or 10...16 mm square shaft
  48 mm minimum damper shaft lenght
- Selectable direction of rotation
- Limitation of rotation angle
- Manual release button
- 2 adjustable auxiliary switches
- Automatic shut-off at end position (overload switch)
- Actuators available with 1 m cable
- Customized versions available

Accessories

- M9000- ZK Damper linkage selection
- M9000- ZKG Ball joints



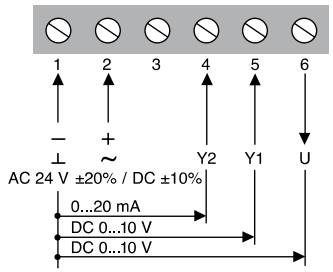
Dimensions in mm

Johnson Controls

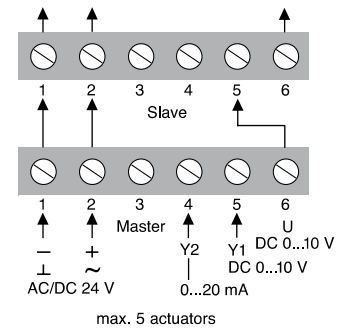
M9132-GGx-1N - *2/4 pages*

Proportional Actuators AC/DC 24 V

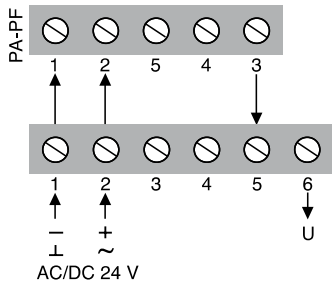
Wiring Diagram



Parallel Connections



Position transmitter



The M9132-...-1N can also be controlled using the JOHNSON CONTROLS Positioner (PA/PF) with control signal of DC 0...10 V.

For further information concerning the PA and PF positioner please refer to sheet 6.20.

Caution: A maximum of 5 actuators can be controlled in parallel operation.

Setting the control Signal

Control signal Y1	DC 0...10 V
Input resistance	Ri 250 kΩ
Control signal Y2	0...20 mA
Input resistance	Ri 388 Ω
Position signal U	DC 0...10 V
Load resistance	> 50 kΩ

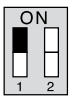
By switching microswitch **d1** to ON position, the control signal Y1 or Y2 will be adapted to the chosen angle of rotation.

By switching microswitch **c** the direction of rotation can be changed.

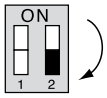
Microswitch **d**
Self-adapting

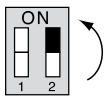
Dectivated

Activated



Microswitch **c**





Setting Span and OFFSET

The potentiometers **O** and **S** help to match control signals Y1 and Y2 to any make of controller.

Example 1

Control signal Y1 working between DC 2...10 V

Setting: Starting point O = 2
working range S = 8

Example 2

Control signal Y2 working between 6...18 mA

Setting: Starting point O = 3
Working range S = 6

Start point O

Scale O	0	1	2	3	4	5	6	7	8
for Y1 (VDC)	0	1	2	3	4	5	6	7	8
for Y2 (mA)	0	2	4	6	8	10	12	14	16

Working range S

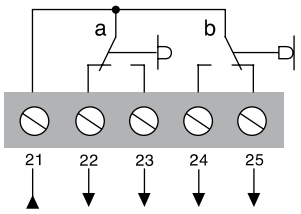
Scale S	2	3	4	5	6	7	8	9	10
for Y1 (VDC)	2	3	4	5	6	7	8	9	10
for Y2 (mA)	4	6	8	10	12	14	16	18	20

Johnson Controls

M9132-GGx-1N - *3/4 pages*

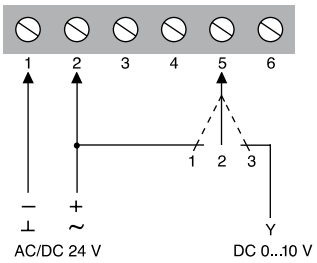
Proportional Actuators AC/DC 24 V

Auxiliary Switches (S)



3(1.5)A, AC 230 V
Actuator at 0° position

Override Control



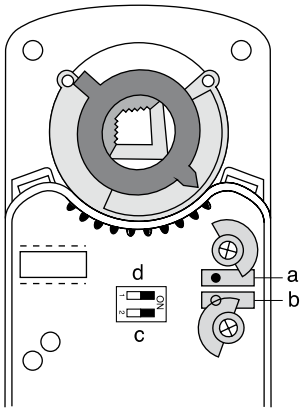
The actuator M9132-...-1N can be forced to override control when wired in accordance with the diagram.

Switch position:
1 = Actuator runs at 10 V
2 = Actuator runs at 0(2) V
3 = Automatic control

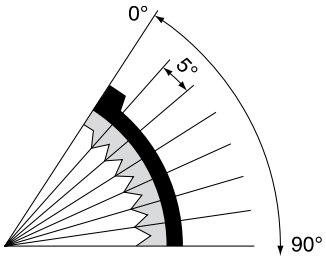
Settings the auxiliary switches

Factory setting:
Switch **a** at 10°
Switch **b** at 80°

The switching position can be manually changed to any required position by turning the ratchet.

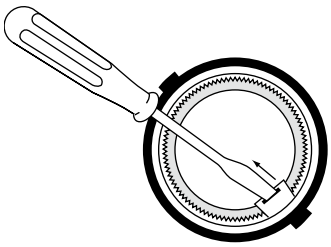


Limitation of Rotation Angle



The limitation or rotation angle can be set in 5° steps by moving the adapter.

Adapter release



The adapter can be remove simply by pressing the adapter clip on the underside of the actuator.

M9132-GGx-1N - *4/4 pages*

Proportional Actuators AC/DC 24 V

Technical Specifications

Actuator	M9132-GGx-1N
Torque	32 Nm
Damper area*	6.0 m^2
Running Time OPEN	200 s
Running Time CLOSE	200 s
Supply Voltage	AC/DC 24 V
Frequency	50-60 Hz
Power Consumption	
- Running	2.5 W
- At end position	0.3 W
Dimensioning	4.5 VA / 3.6 A @ 2 ms
Working area Y	not adjustable
Control Signal Y1	DC 0... 10 V
Imput resistance Y1	Ri 250 Ω
Control Signal Y2	0...20 mA
Imput resistance Y2	Ri 388 Ω
Position signal U	DC 0...10 V
Load resistance	> 50 kΩ
Angle of rotation/Working range	90° (93°mech.)
Angle of rotation/Limitation	5°...85° in 5° < steps
Auxiliary Switches	3(1.5) A, AC 230 V
- S1 setting range	5°...85° < adjustable
- S2 setting range	
Cable	1.0 m halogen-free
- Motor	5-Wire 1-2-4-5-6
- Switches	5-Wire 21-22-23-24-25
Life time	60.000 rotations
Noise level	45 dB (A)
Protection Class	II
Degree of Protection	IP 54
Mode of Action	Type 1
Ambient conditions	
- Operating temperature	-20...+50 °C / IEC 721-3-3
- Storage temperature	-30...+60°C / IEC 721-3-2
- Humidity	5...95% r.F. no condensed
Weight	1.1 Kg
Service	Maintenance-free
Standards	
- Mechanics	EN 60 529 / EN 60 730-2-14
- Electronics	EN 60 730-2-14
- EMC Emissions	EN 50 081-1:92 / IEC 61000-6-3:96
- EMC Immunity	EN 50 082-2:95 / IEC 61000-6-2:99

***Caution:** Please note damper manufacturer's information concerning the open/close torque.

Ordering Codes

Codes	Descriptions
M9132-GGA-1N	AC/DC 24 V
M9132-GGC-1N	AC/DC 24 V, with 2 auxiliary switches

M9206-AGx-1S - *1/3 pages*

Page 37

ON/OFF and Floating Actuators

The electric, spring return damper-actuator series has been specially developed for the motorized operation of safety air dampers (anti-icing) in air conditioning systems, smoke evacuation dampers and sealing dampers.

When the control signal is applied the actuator drives the damper to the operational position, while evenly tensioning the integrated spring.

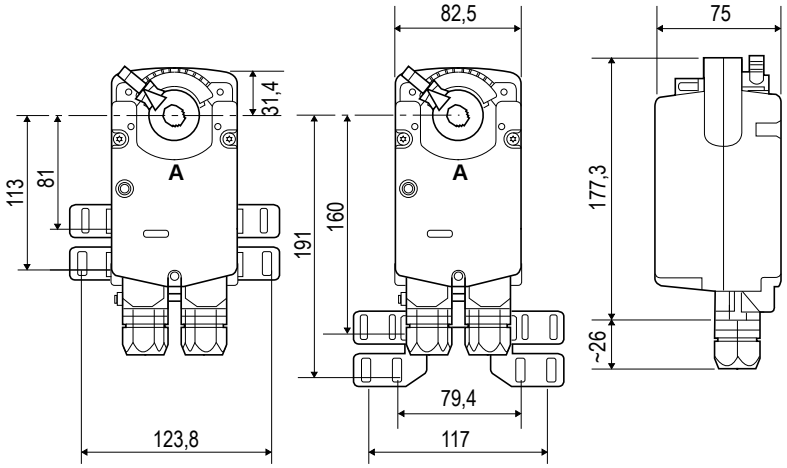
After a power failure the stored energy in the spring immediately brings the damper to the safety position.

Manual operation is automatically cancelled when the actuator is in electrical operation.

The compact design and universal adapter fitted with limitation of rotation angle make this actuator highly versatile.

Features

- ON/OFF and Floating control
- Electrical connections with halogen-free cable
- Up to 5 actuators in parallel operation possible
- Simple direct mounting with universal adapter on Ø 10 mm to 16 mm shaft or 10 mm to 14 mm square shaft 45 mm min shaft length
- Selectable direction of rotation
- Limitation of rotation angle
- 1 adjustable auxiliary switches *(See next page for settings)*
- Automatic shut-off at end position (overload switch)
- Energy saving at end positions
- Customized versions available



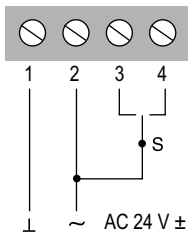
Dimensions in mm

M9206-AGx-1S - *2/3 pages*

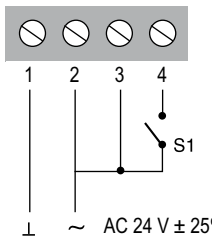
ON/OFF and Floating Actuators

Wiring Diagram

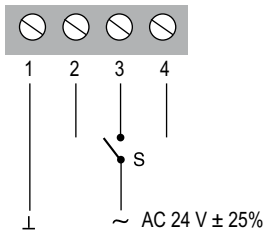
3-point



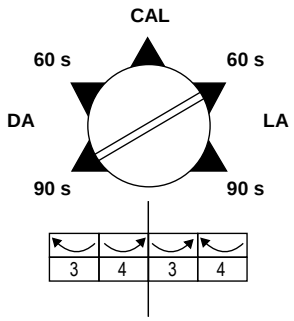
2-point



OPEN/CLOSE

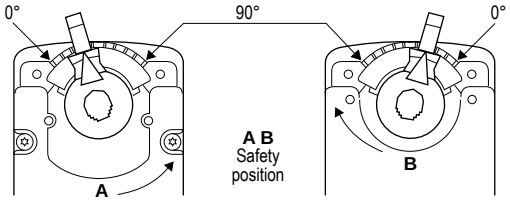


Mode selection on running time switch

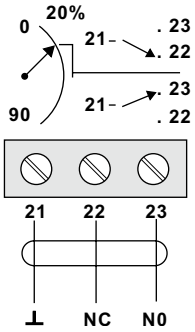


Changing the direction of rotation

The direction of rotation can be changed by simply turning the actuator and reversing the shaft adapter.

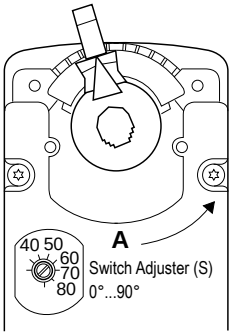


Auxiliary switch adjustment



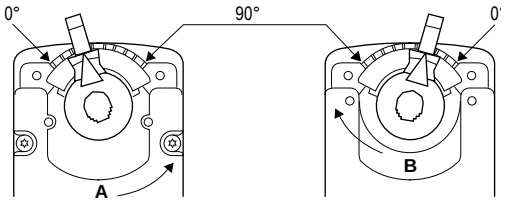
The switch point is adjustable from 0°...90°.

Factory setting 20°



Limitation of rotation Angle

The angle of rotation/ working range can be adjusted mechanically by repositioning the adapter in 5° steps.
The minimum rotation range is 34.5°



M9206-AGx-1S - *3/3 pages*

ON/OFF and Floating Actuators

Technical Specifications

Actuator	M9206-AGx-1S
Torque	6 Nm
Damper area*	1.1 m^2
Electrical connections	
- Motor control	4-Polig, 1.2 m, halogen-free
- Auxiliary switches	3-Polig, 1.2 m, halogen-free
Running time	
- Motor OPEN	60 or 90 s adjustable
- Spring return CLOSE	35...90 s
Supply voltage	AC 24 V ±25 %
Frequency	50-60 Hz
Power consumption	
- Operating	AC 24 V = 8.0 VA
- At end position	AC 24 V = 6.0 VA
Control Signal	ON/OFF and Floating
Position Signal	None
Angle of rotation/Working range	90° (93°mech.)
Angle of rotation/Limitation	34.5°...90°
Service lifetime ca.	60.000 rotations
Auxiliary Switches	5(2.9) A, AC 230 V
- Setting range	0°...90° adjustable
Noise level	51 dB (A)
Protection Class	II
Degree of Protection	IP42
Ambient conditions	
- Operating temperature	−32...+60 °C / IEC 721-3-3
- Storage temperature	−40...+85°C / IEC 721-3-2
- Humidity	5...95% r.F. non condensed
Weight	1.6 Kg
Dimensioning	14.0 VA
Service	Maintenance-free
Standards	
- Mechanics	EN 60 529 / EN 60 730-2-14
- Electronics	EN 60 730-2-14
- EMC Emissions	EN 50 081-1:92 / IEC 61000-6-3:96
- EMC Immunity	EN 50 082-2:95 / IEC 61000-6-2:99

***Caution:** Please note damper manufacturer's information concerning the open/close torque.

Ordering Codes

Codes	Descriptions
M9206-AGA-1S	AC 24 V, with Halogen-free cable
M9206-AGB-1S	AC 24 V, with Halogen-free cable and 1 auxiliary switches

M9206-Bxx-1S - *1/3 pages*

Page 40

ON/OFF Actuators

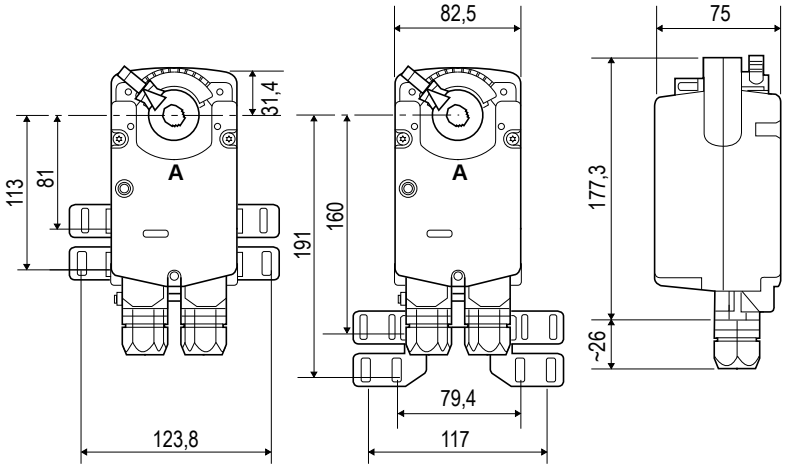
The electric, spring return damper-actuator series has been specially developed for the motorized operation of safety airdampers (anti-icing) in air conditioning systems, smoke evacuation dampers and sealing dampers.

When the control signal is applied the actuator drives the damper to the operational position, while evenly tensioning the integrated spring. After a power failure the stored energy in the spring immediately brings the damper to the safety position.

Manual operation is automatically cancelled when the actuator is in electrical operation. The compact design and universal adapter fitted with limitation of rotation angle make this actuator highly versatile.

Features

- 2-point control
- Electrical connections with halogen-free cable
- Up to 5 actuators in parallel operation possible
- Plug-in terminal block connection
- Simple direct mounting with universal adapter on Ø 10 mm to 16 mm shaft or 10 mm to 14 mm square shaft 45 mm min shaft length
- Selectable direction of rotation
- Limitation of rotation angle
- 1 adjustable auxiliary switches *(See next page for settings)*
- Automatic shut-off at end position (overload switch)
- Energy saving at end positions
- Customized versions available

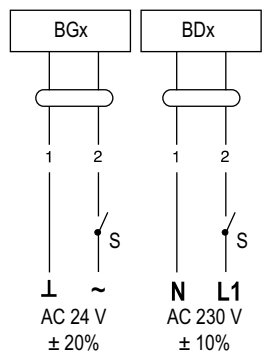


Dimensions in mm

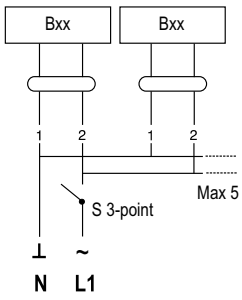
M9206-Bxx-1S - *2/3 pages*

ON/OFF Actuators

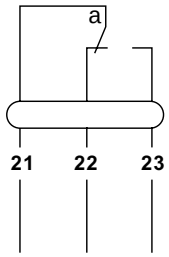
Wiring Diagram



Parallel Connections

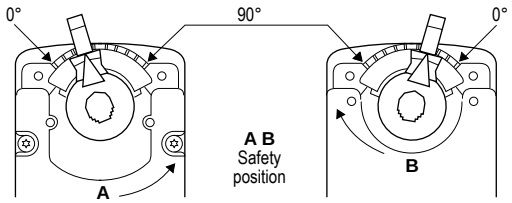


Auxiliary Switches (S)



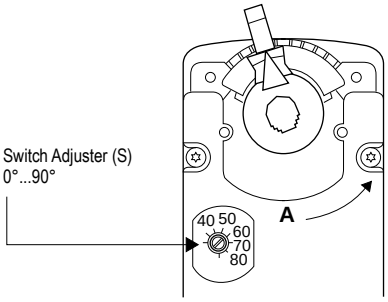
Changing the direction of rotation

The direction of rotation can be changed by simply turning the actuator and reversing the shaft adapter.



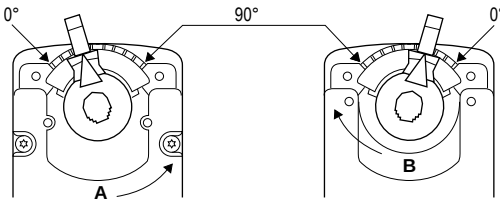
Setting the auxiliary switches

The switch point is adjustable from 0°...90°. The switching position can be manually changed to any required position by turning the ratchet.



Limitation of rotation Angle

The angle of rotation/ working range can be adjusted mechanically by repositioning the adapter in 5° steps.
The minimum rotation range is 34.5°



M9206-Bxx-1S - *3/3 pages*

ON/OFF Actuators

Technical Specifications

Actuator	M9206-BGx-1S	M9206-BDx-1S
Torque	6 Nm	
Damper area*	1.1 m²	
Running Time Motor	10...40 s	10...65 s
Running Time Spring Return	35...70 s	
Supply Voltage	AC 24 V	AC 230 V
Frequency	50-60 Hz	
Power Consumption		
- Running	6.9 W	10.7
- At end position	4.2 W	7.2 W
Dimensioning	9.8 VA / 3.5 A @ 2 ms	11.0 VA / 0.2 A @ 2 ms
Control Signal	2-Point ON/OFF	
Position Signal	None	
Angle of rotation/Working range	90° (93°mech.)	
Angle of rotation/Limitation	34.5°...90°	
Auxiliary Switches	3(1.5) A, AC 230 V	
- Setting range	0°...90°	
Cable	1.2 m halogen-free	
Life time	60.000 rotations	
Noise level	50 dB (A)	
Protection Class	II	
Degree of Protection	IP 42	
Mode of Action	Type 1	
Ambient conditions		
- Operating temperature	−32...+60 °C / IEC 721-3-3	
- Storage temperature	−40...+85°C / IEC 721-3-2	
- Humidity	5...95% r.F. non condensed	
Weight	1.6 Kg	
Service	Maintenance-free	
Standards		
- Mechanics	EN 60 529 / EN 60 730-2-14	
- Electronics	EN 60 730-2-14	
- EMC Emissions	EN 50 081-1:92 / IEC 61000-6-3:96	
- EMC Immunity	EN 50 082-2:95 / IEC 61000-6-2:99	

***Caution:** Please note damper manufacturer's information concerning the open/close torque.

Ordering Codes

Codes	Descriptions
M9206-BGA-1S	AC 24 V
M9206-BGB-1S	AC 24 V, with 1 auxiliary switch
M9206-BDA-1S	AC 230 V
M9206-BDB-1S	AC 230 V, with 1 auxiliary switch

M9206-GGx-1S - *1/4 pages*

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Proportional Actuators

The electric, Spring Return damper-actuator series has been specially developed for the motorized operation of safety air dampers (anti-icing) in air conditioning systems, smoke evacuation dampers and sealing dampers.

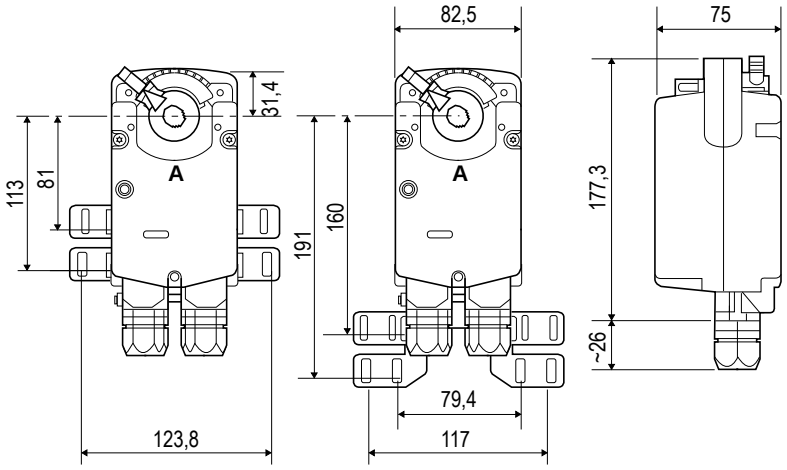
When the control signal is applied the actuator drives the damper to the operational position, while evenly tensioning the integrated spring. After a power failure the stored energy in the spring immediately brings the damper to the safety position.

Manual operation is automatically cancelled when the actuator is in electrical operation.

The compact design and universal adapter fitted with limitation of rotation angle make this actuator highly versatile.

Features

- DC (2)...10V or 0(4)...20 mA control
- Electrical connections with halogen-free cable
- Up to 5 actuators in parallel operation possible
- Simple direct mounting with universal adapter on Ø 10 mm to 16 mm shaft or 10 mm to 14 mm square shaft 45 mm min shaft length
- Selectable direction of rotation
- Limitation of rotation angle
- 1 adjustable auxiliary switches *(See next page for settings)*
- Automatic shut-off at end position (overload switch)
- Energy saving at end positions
- Customized versions available



Dimensions in mm

M9206-GGx-1S - *2/4 pages*

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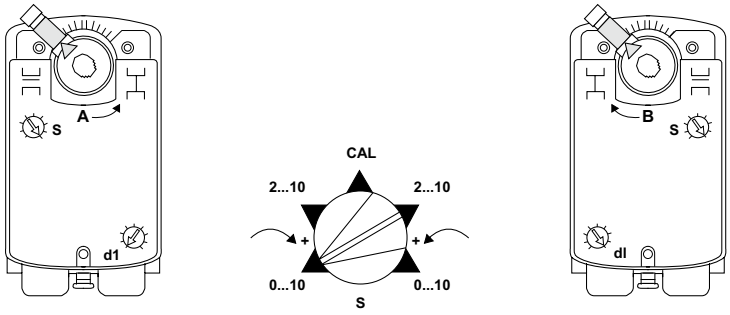
Proportional Actuators

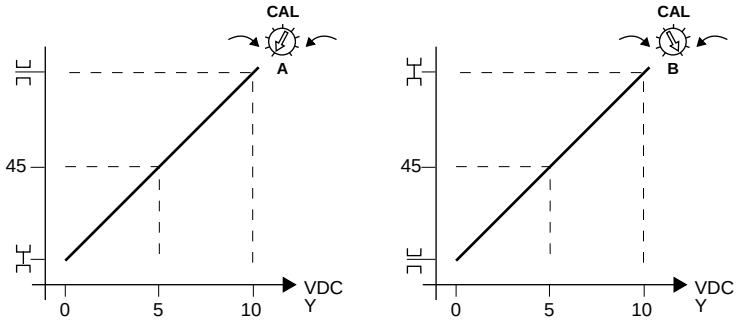
Signal adjust Position

- Choose working field and position of position signal Y by rotary swich d1.
- Processing sequence 1
  Increasing the signal position from 0(2) to 10 V the damper opens.
- Method of functioning 1
  «DW»
- Processing sequence 2
  Decreasing the position signal from 10V...2(0) the damper opens.
- Method of functioning 2
  «UW»
- Y-position signal
  Voltage: 0(2)...10VDC or
  Current: 0(4)...20 mA
  Attention: The 500Ω resistance is mounted Outside of the tool.
  (See the connection scheme)
- Factory-adjustment
  The tools are adjusted by factory to 0...10 V and Method of functioning «DW».
- Calibration
  If you set a rotation angle limit (e.g. 75°). The position signal Y can be adapted to the rotation angle by using the switch d1 on CAL position.
- CAL adjustement
  d1 on position 0...10 =
  Y-Input 0...10V for 90°
  d1 on position CAL =
  10V:90° = 0.11V x 75° = 8.33V
  d1 on position 2...10 =
  Y-Input 2...10V for 90° =
  d1 on position CAL =
  8V:90° =
  0.08V x 75° = 6.66V

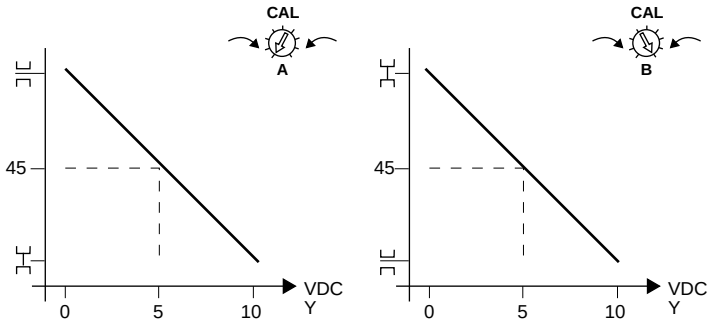
Control signal adjustment (Y)



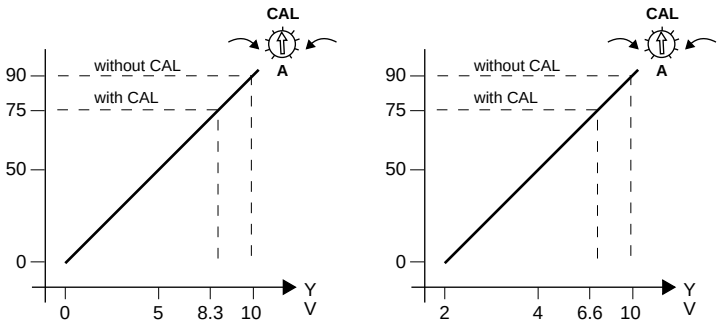
Direct acting (CW)



Reverse acting (CCW)



CAL-adjustment

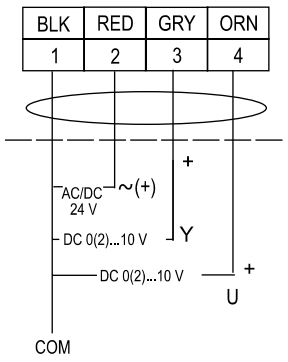


M9206-GGx-1S - *3/4 pages*

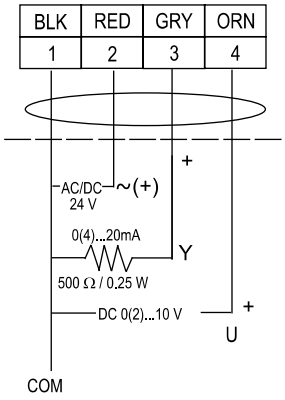
Proportional Actuators

Wiring Diagrams

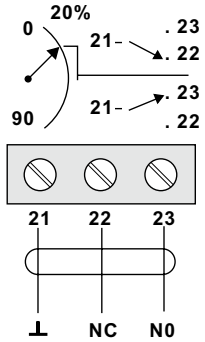
DC 0(2)...10V Control



0(4)...20mA Control with External Resistor



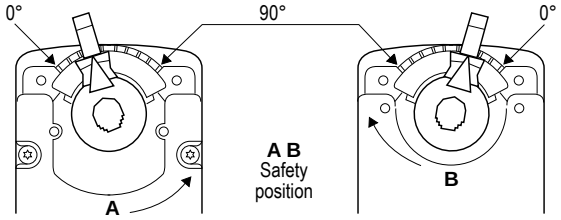
Auxiliary Switches (S)



1 = Black
2 = Red
3 = Gray
4 = Orange
21 = Gray/Black
22 = Gray/Blue
23 = Gray/Gray

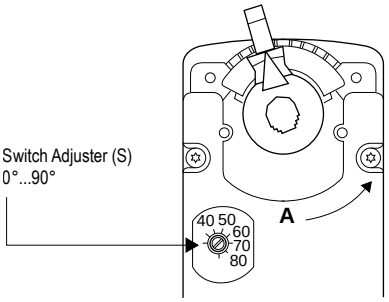
Changing the direction of rotation

The direction of rotation can be changed by simply turning the actuator and reversing the shaft adapter.



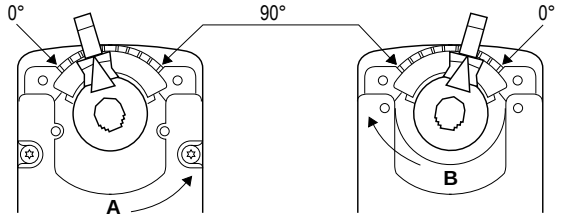
Setting the auxiliary switches

The switch point is adjustable from 0°...90°. The switching position can be manually changed to any required position by turning the ratchet.



Limitation of rotation Angle

The limitation or rotation/working range can, through segments 1 and 2, be reduced by up to 30°from both end positions.



M9206-GGx-1S - *4/4 pages*

Proportional Actuators

Technical Specifications

Actuator	M9206-GGx-1S
Torque	6 Nm
Damper area*	1.1 m²
Electrical connections	
- Motor control	4-Polig. 1.2 m halogen free
- Auxiliary switches	3-Polig. 1.2 m halogen free
Running time Motor OPEN	25...40 s
Running time Spring Return	35...90 s
Supply Voltage	AC 24V ± 25% DC 24 V ± 10%
Frequency	50-60 Hz
Power Consumption	
- Operating	AC 24 V = 12.0 VA
- Operating	DC 24 V = 5.6 VA
- At end position	AC 24 V = 5.0 VA
- At end position	DC 24 V = 2.2 VA
Dimensioning	12.0 VA
Weight	1.6 kg
Control signal	DC 0...10 V / DC 2...10 V adjustable
Position signal	DC 0...10 V / DC 2...10 V
Angle of rotation	
- Working range	93° mech.
- Limitation	34.5°...90
Auxiliary Switches	5(2.9) A, AC 230 V
- Setting range	0°...90°
Lifetime	60'000 Rotations
Noise level	51 dB (A)
Protection class	II
Degree of protection	IP 42
Mode of action	Type1
Ambient conditions	
- Operating temperature	-32...+60 °C / IEC 721-3-3
- Storage temperature	-40...+85 °C / IEC 721-3-2
- Humidity	5...95% r.F. no condensed
Service	Maintenance-free
Standards	
- Mechanics	EN 60 529 / EN 60 730-2-14
- Electronics	EN 60 730-2-14
- EMC Emissions	EN 50 081-1:92 / IEC 61000-6-3:96
- EMC Immunity	EN 50 082-2:95 / IEC 61000-6-2:99

***Caution:** Please note damper manufacturer's information concerning the open/close torque.

Ordering Codes

Codes	Descriptions
M9206-GGA-1S	AC/DC 24 V
M9206-GGB-1S	AC/DC 24 V, with 1 auxiliary switches

M9208-AGx-1 *- 1/4 pages*

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ON/OFF and Floating Actuators

The spring return electric damper-actuator series has been specially developed for the motorized operation of air dampers in air conditioning systems.

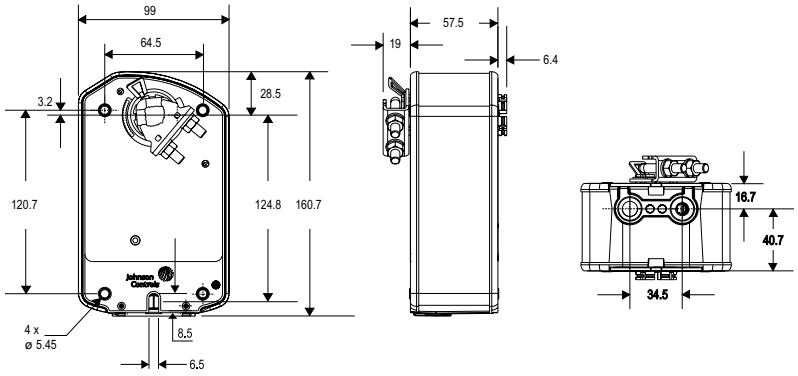
When the control signal is applied the actuator drives the damper to the operational position, while evenly tensioning the integrated spring. After a power failure the stored energy in the spring immediately brings the damper to the safety position.

Manual operation is automatically cancelled when the actuator is in electrical operation.

The compact design and universal adapter fitted with limitation of rotation angle make this actuator highly versatile.

Features

- ON/OFF and Floating control signal
- Up to 5 actuators in parallel operation possible
- Electrical connection with halogen-free cable
- Simple direct mounting with universal adapter on Ø 8 mm to 16 mm shaft or 6 mm to 12 mm square shaft. An optional M9208-600 Jackshaft Coupler Kit is available for 12 to 19 mm round shafts, or 10 mm to 14 mm square shafts
- Limitation of rotation angle
- Manual positioning with crank handle
- 2 auxiliary switches, 1 adjustable *(See next page for settings)*

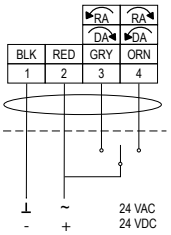


Dimensions in mm

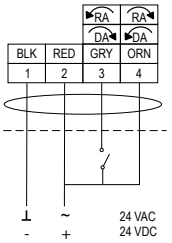
M9208-AGx-1 - *2/4 pages*

ON/OFF and Floating Actuators

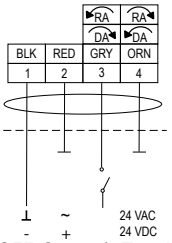
Wiring Diagrams



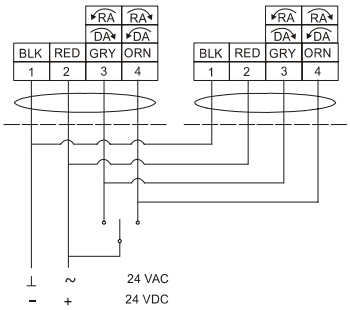
Floating Control, Four Wire



Open/Close, Single Wire Control

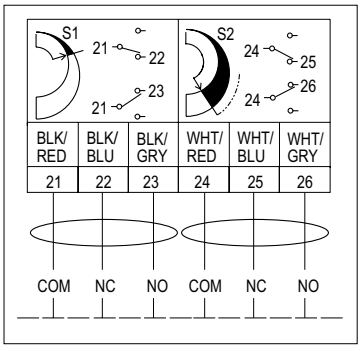


ON/OFF Control, Two Wire



Floating Control, Multiple Actuators with One Transformer

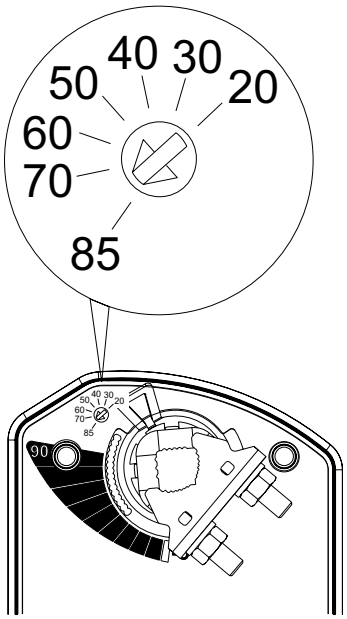
Auxiliary Switches (S)



Setting the auxiliary switches

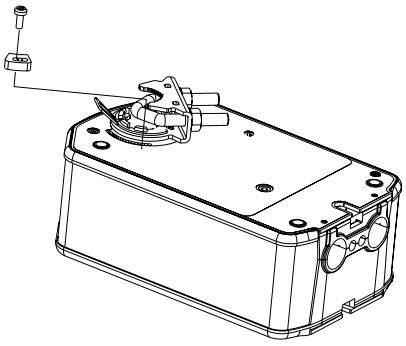
These models include two integral auxiliary switches, one fixed (S1) and one adjustable (S2), accessible on either face of the actuator. The nominal factory setting for S1 Auxiliary Switch is 11° closing, and the nominal factory setting for S2 Auxiliary Switch is 81° opening (relative to a 0 to 90° rotation range).
The switch point of S2 Auxiliary Switch is independently and continuously adjustable from 20° to 85° (relative to a 0 to 90° rotation range).
Use the method in the following example for the most accurate positioning of S2 Auxiliary Switch.

1. Move the actuator to the full spring return position.
2. Rotate the switch adjuster until it points to the desired switch point.
3. Connect S2 Auxiliary Switch to a power source or an ohmmeter, and apply power to the actuator. The actuator moves to the fully open position and holds while power is applied.
4. Observe the switch point. If required, repeat Steps 2 and 3.



Limitation of rotation angle

Using the M9208-603 the angle of rotation can be limited. The actuator is factory set for 95° rotation, and its range is limited in 5° increments to a minimum of 35°.
Attaching the stroke-limiting stop in the furthest mounting position reduces the rotation range of the actuator by 5°. Each progressive position reduces the rotation range on additional 5°.



Johnson Controls

M9208-AGx-1 - *3/4 pages*

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ON/OFF and Floating Actuators

Technical Specifications

Actuator	M9208-AGx-1
Power Requirements	24 V AC at 50/60 Hz (AC 19.2 to 28.8 V) - 24 V DC (DC 21.6 to 28.8 V)
- Running (AC)	7.9 VA
- Holding Position (AC)	5.5 VA
- Running (DC)	3.5 W
- Holding Position (DC)	1.9 W
Transformer Sizing Requirements	
- Minimum per Actuator	8 VA
Input Signal	AC 19.2 to 28.8 V at 50/60 Hz or DC 24 V +20% / -10%, Minimum Pulse Width: 500 msec 3,000 ohms control Inputs
Auxiliary Switch Rating (M9208-xxC-1)	Two Single-Pole, Double-Throw (SPDT), Double-Insulated Switches with Gold Flash Contacts: AC 24 V, 50 VA Pilot Duty; AC 240 V, 5.0 A Resistive, 1/4 hp, 275 VA Pilot Duty
Spring Return	Direction is Selectable with Mounting Position of Actuator: Side A, Actuator Face Away from Damper for CCW Spring Return; Side B, Actuator Face Away from Damper for CW Spring Return
Rated Torque	
- Power On (Running)	8 Nm at all operating temperatures
- Power Off (Spring Running)	8 Nm at all operating temperatures
Rotation Range	Maximum Full Stroke: 95° Adjustable Stop: 35° to 95° Maximum Position
Rotation Time for 90°	
- Power On (Running)	150 Seconds Constant for 0 to 8 Nm Load, at all Operating Conditions
- Power Off (Spring Returning)	17 to 25 Seconds for 0 to 8 Nm Load, at Room Temperature 22 Seconds Nominal at Full Rated Load 94 Seconds Maximum with 8 Nm Load, at -40 °C
Cycles	60,000 Full Stroke Cycles
Audible Noise Rating	
- Power On (Running)	<35 dBA at 8 Nm Load, at a Distance of 1 m
- Power On (Holding)	<20 dBA at a Distance of 1 m
- Power Off (Spring Returning)	<52 dBA at 8 Nm Load, at a Distance of 1 m
Electrical Connections	
- Actuators (all models)	1.2 m UL 758 Type AWM Halogen-Free Cable with 0.85 mm^2 (18 AWG) conductors and 6 mm ferrule ends
- Auxiliary Switches (-xxC Models)	1.2 m UL 758 Type AWM Halogen-Free Cable with 0.85 mm^2 (18 AWG) conductors and 6 mm ferrule ends
Mechanical Connections	8 to 16 mm Diameter Round Shafts, or 6 to 12 mm Square Shafts
Enclosure Rating	IP 54 for All Mounting Orientations
Ambient Conditions	
- Standard Operating	-40 to 60 °C; 90% RH Maximum, Non-condensing
- Storage	-40 to 85 °C; 95% RH Maximum, Non-condensing
Dimensions	See figure
Shipping Weight	1.7 Kg
CE Compliance	EMC Directive 2004/108/EC (Models: All) Low Voltage Directive 2006/95/EC (-AGC)

M9208-AGx-1 - *4/4 pages*

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ON/OFF and Floating Actuators

Ordering Codes

Codes	Descriptions
M9208-AGA-1	8 Nm, 24 V AC/DC, ON/OFF and Floating Point
M9208-AGC-1	8 Nm, 24 V AC/DC, ON/OFF and Floating Point, 2 auxiliary switches

Accessories and Replacement Parts *(Order Separately)*

Codes	Descriptions
M9000-604	Replacement Anti-Rotation Bracket Kit for M9208, M9210 and M9220 Series Electric Spring Return Actuators (quantity 1)
M9208-100	Remote Mounting Kit, including Mounting Bracket, M9208-150 Crankarm, Ball Joint and mounting fastener (quantity 1)
M9208-150	Crankarm (quantity 1)
M9208-600	Large Shaft Coupler Kit (with Locking Clip) for Mounting M9208-xxx-1 Series Electric Spring Return Actuators on dampers with round shafts from 12 to 19 mm or square shafts from 10 to 14 mm (quantity 1)
M9208-601	Replacement Standard Coupler Kit (with Locking Clip) for mounting M9208-xxx-1 Series Electric Spring Return Actuators on dampers with round shafts from 8 to 16 mm or square shafts from 6 to 12 mm (quantity 1)
M9208-602	Replacement Locking Clips for M9208-xxx-1 Series Electric Spring Return Actuators (quantity 5)
M9208-603	Adjustable Stop Kit for M9208-xxx-1 Series Electric Spring Return Actuators (quantity 1)
M9208-604	Replacement Manual Override Cranks for M9208 Series Electric Spring Return Actuators with long crank radius: 72 mm (quantity 5)
M9208-605	Replacement Manual Override Cranks for M9208 Series Electric Spring Return Actuators with short crank radius: 46.5 mm (quantity 5)

M9208-BGx-1 / M9208-BDx-1 - *1/4 pages*

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ON/OFF Actuators

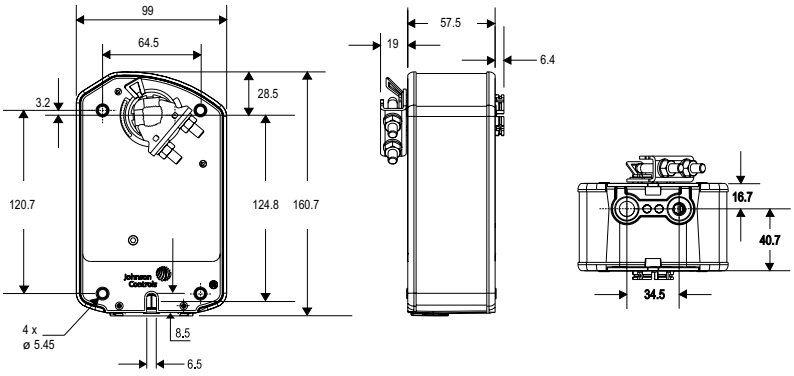
The spring return electric damper-actuator series has been specially developed for the motorized operation of air dampers in air conditioning systems.

When the control signal is applied the actuator drives the damper to the operational position, while evenly tensioning the integrated spring. After a power failure the stored energy in the spring immediately brings the damper to the safety position.

Manual operation is automatically cancelled when the actuator is in electrical operation.
The compact design and universal adapter fitted with limitation of rotation angle make this actuator highly versatile.

Features

- ON/OFF control
- Up to 5 actuators in parallel operation possible
- Electrical connection with halogen-free cable
- Simple direct mounting with universal adapter on Ø 8 mm to 16 mm shaft or 6 mm to 12 mm square shaft. An optional M9208-600 Jackshaft Coupler Kit is available for 12 to 19 mm round shafts, or 10 mm to 14 mm square shafts
- Limitation of rotation angle
- Manual positioning with crank handle
- 2 auxiliary switches, 1 adjustable *(See next page for settings)*

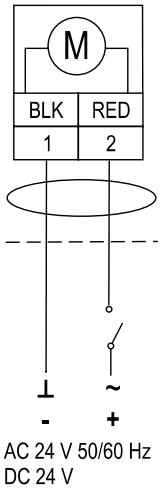


Dimensions in mm

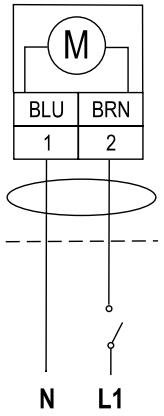
M9208-BGx-1 / M9208-BDx-1 - *2/4 pages*

ON/OFF Actuators

Wiring Diagrams

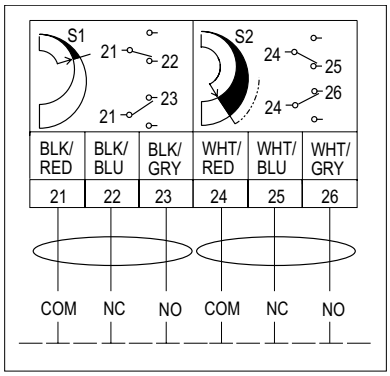


AC 24 V 50/60 Hz
DC 24 V



AC 230 V 50/60 Hz

Auxiliary Switches (S)



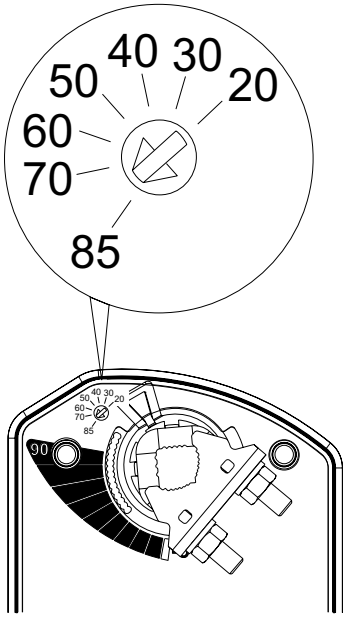
Setting the auxiliary switches

These models include two integral auxiliary switches, one fixed (S1) and one adjustable (S2), accessible on either face of the actuator. The nominal factory setting for S1 Auxiliary Switch is 11° closing, and the nominal factory setting for S2 Auxiliary Switch is 81° opening (relative to a 0 to 90° rotation range).

The switch point of S2 Auxiliary Switch is independently and continuously adjustable from 20° to 85° (relative to a 0 to 90° rotation range).

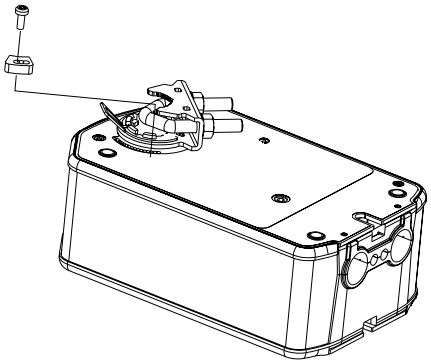
Use the method in the following example for the most accurate positioning of S2 Auxiliary Switch.

1. Move the actuator to the full spring return position.
2. Rotate the switch adjuster until it points to the desired switch point.
3. Connect S2 Auxiliary Switch to a power source or an ohmmeter, and apply power to the actuator. The actuator moves to the fully open position and holds while power is applied.
4. Observe the switch point. If required, repeat Steps 2 and 3.



Limitation of rotation angle

Using the M9208-603 the angle of rotation can be limited. The actuator is factory set for 95° rotation, and its range is limited in 5° increments to a minimum of 35°.
Attaching the stroke-limiting stop in the furthest mounting position reduces the rotation range of the actuator by 5°. Each progressive position reduces the rotation range on additional 5°.



Johnson Controls

M9208-BGx-1 / M9208-BDx-1 - *3/4 pages*

ON/OFF Actuators

Technical Specifications

Actuator	M9208-BGx-1	M9208-BDx-1
Power Requirements	24 V AC at 50/60 Hz (AC 18 to 30 V) 24 V DC (DC 21.6 to 28.8 V)	230 V AC at 50/60 Hz (AC 198 to 264 V)
- Running (AC)	6.1 VA	0.04 A
- Holding Position (AC)	1.2 VA	0.03 A
- Running (DC)	3.5 W	---
- Holding Position (DC)	0.5 W	---
Transformer Sizing Requirements		
- Minimum per Actuator	7 VA	---
Input Signal	---	---
Auxiliary Switch Rating (M9208-xxC-1)	Two Single-Pole, Double-Throw (SPDT), Double-Insulated Switches with Gold Flash Contacts: AC 24 V, 50 VA Pilot Duty; AC 240 V, 5.0 A Resistive, 1/4 hp, 275 VA Pilot Duty	
Spring Return	Direction is Selectable with Mounting Position of Actuator: Side A, Actuator Face Away from Damper for CCW Spring Return; Side B, Actuator Face Away from Damper for CW Spring Return	
Rated Torque		
- Power On (Running)	8 Nm at all operating temperatures	
- Power Off (Spring Running)	8 Nm at Standard operating temperatures 6 Nm at Extended operating temperatures	
Rotation Range	Maximum Full Stroke: 95° Adjustable Stop: 35° to 95° Maximum Position	
Rotation Time for 90°		
- Power On (Running)	55 to 71 Seconds for 0 to 8 Nm Load, at all Operating Conditions 60 Seconds Nominal at Full Rated Load (0.251 rpm)	
- Power Off (Spring Returning)	13 to 26 Seconds for 0 to 8 Nm Load, at Room Temperature 21 Seconds Nominal at Full Rated Load 39 Seconds Maximum with 8 Nm Load, at -20 °C 108 Seconds Maximum with 6 Nm load at -40 °C	
Cycles	60,000 Full Stroke Cycles	
Audible Noise Rating		
- Power On (Running)	<47 dBA at 8 Nm Load, at a Distance of 1 m	
- Power On (Holding)	<20 dBA at a Distance of 1 m	
- Power Off (Spring Returning)	<52 dBA at 8 Nm Load, at a Distance of 1 m	
Electrical Connections		
- Actuator (all models)	1.2 m UL 758 Type AWM Halogen-Free Cable with 0.85 mm^2 (18 AWG) conductors and 6 mm ferrule ends	
- Auxiliary Switches (-xxC models)	1.2 m UL 758 Type AWM Halogen-Free Cable with 0.85 mm^2 (18 AWG) conductors and 6 mm ferrule ends	
Mechanical Connections	8 to 16 mm Diameter Round Shafts, or 6 to 12 mm Square Shafts	
Enclosure Rating	IP 54 for All Mounting Orientations	
Ambient Conditions		
- Standard Operating	-20 to 60 °C; 90% RH Maximum, Non-condensing	
- Extended Operating	-40 to 20 °C; 90% RH Maximum, Non-condensing	
- Storage	-40 to 85 °C; 95% RH Maximum, Non-condensing	
Dimensions	See figure	
Shipping Weight	1.7 Kg	1.9 Kg
CE **Compliance**	EMC Directive 2004/108/EC (Models: All) Low Voltage Directive 2006/95/EC (-BDx and -BGC)	

M9208-BGx-1 / M9208-BDx-1 - *4/4 pages*

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ON/OFF Actuators

Ordering Codes

Codes	Descriptions
M9208-BGA-1	8 Nm, 24 V AC/DC, ON/OFF
M9208-BGC-1	8 Nm, 24 V AC/DC, ON/OFF, 2 auxiliary switches
M9208-BDA-1	8 Nm, 230 V AC, ON/OFF
M9208-BDC-1	8 Nm, 230 V AC, ON/OFF 2 auxiliary switches

Accessories and Replacement Parts *(Order Separately)*

Codes	Descriptions
M9000-604	Replacement Anti-Rotation Bracket Kit for M9208, M9210 and M9220 Series Electric Spring Return Actuators (quantity 1)
M9208-100	Remote Mounting Kit, including Mounting Bracket, M9208-150 Crankarm, Ball Joint and mounting fastener (quantity 1)
M9208-150	Crankarm (quantity 1)
M9208-600	Large Shaft Coupler Kit (with Locking Clip) for Mounting M9208-xxx-1 Series Electric Spring Return Actuators on dampers with round shafts from 12 to 19 mm or square shafts from 10 to 14 mm (quantity 1)
M9208-601	Replacement Standard Coupler Kit (with Locking Clip) for mounting M9208-xxx-1 Series Electric Spring Return Actuators on dampers with round shafts from 8 to 16 mm or square shafts from 6 to 12 mm (quantity 1)
M9208-602	Replacement Locking Clips for M9208-xxx-1 Series Electric Spring Return Actuators (quantity 5)
M9208-603	Adjustable Stop Kit for M9208-xxx-1 Series Electric Spring Return Actuators (quantity 1)
M9208-604	Replacement Manual Override Cranks for M9208 Series Electric Spring Return Actuators with long crank radius: 72 mm (quantity 5)
M9208-605	Replacement Manual Override Cranks for M9208 Series Electric Spring Return Actuators with short crank radius: 46.5 mm (quantity 5)

M9208-GGx-1 - *1/5 pages*

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Proportional Actuators

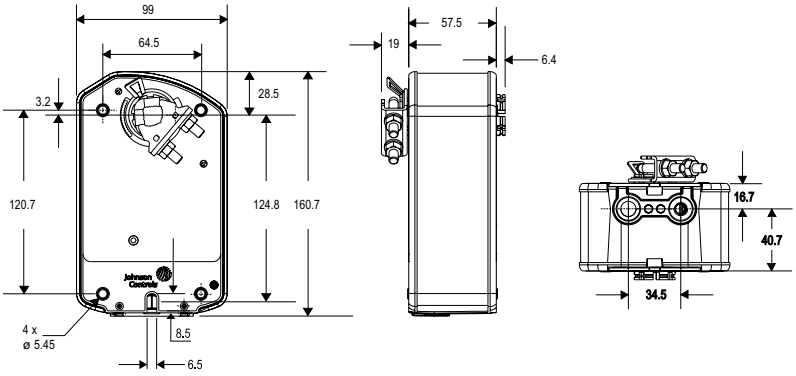
The spring return electric damper-actuator series has been specially developed for the motorized operation of air dampers in air conditioning systems.

When the control signal is applied the actuator drives the damper to the operational position, while evenly tensioning the integrated spring. After a power failure the stored energy in the spring immediately brings the damper to the safety position.

Manual operation is automatically cancelled when the actuator is in electrical operation. The compact design and universal adapter fitted with limitation of rotation angle make this actuator highly versatile.

Features

- 0(2)..10 V or 0(4)..mA control signal
- Up to 5 actuators in parallel operation possible
- Electrical connection with halogen-free cable
- Simple direct mounting with universal adapter on Ø 8 mm to 16 mm shaft or 6 mm to 12 mm square shaft. An optional M9208-600 Jackshaft Coupler Kit is available for 12 to 19 mm round shafts, or 10 mm to 14 mm square shafts
- Limitation of rotation angle
- Manual positioning with crank handle
- 2 auxiliary switches, 1 adjustable *(See next pages for settings)*



Dimensions in mm

M9208-GGx-1 - *2/5 pages*

Proportional Actuators

Direction of Action

The Proportional Electric Spring Return Actuators are factory set for Direct Acting (DA) operation.
In DA mode, applying an increasing input signal to the control input drives the actuator away from the spring return position. Reverse Acting (RA) operation is also available. In RA mode, applying an increasing input signal to the control input drives the actuator toward the spring return position. Figure aside indicates how to set the mode selection switch to change the behavior of the actuator.

Calibration (CAL) Function

The CAL function enables the actuator to redefine the selected input signal range proportionally across a reduced rotation range. The actuator maintains calibration when power is lost or removed.
Follow these steps to calibrate the input signal range:

1. With power applied to the actuator, move the mode selection switch to the CAL position and leave it in this position for approximately 5 seconds. The actuator begins rotating until the end-stops are found.
2. Move the mode selection switch to the desired input signal range. Selection can be made while the calibration process is in progress, or after it is complete. The selected input signal is proportionally reconfigured to the reduced rotation range.

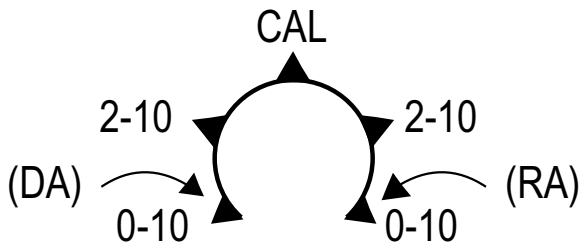
Note: During normal operation, if the actuator stroke increases due to seal or seat wear, input signal are automatically reconfigured to the increased rotation range in approximately 0.5° increments.

3. If the actuator mounting position is changed or if the linkage is adjusted, repeat Step 1 and Step 2 to repeat the CAL function.

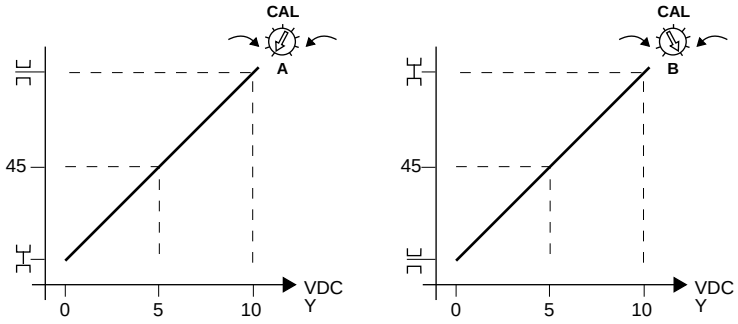
Note: The mode selection switch must remain out of the CAL position for at least 2 seconds before re-initiating the CAL function.

Note: If the mode selection switch is left in the CAL position, the actuator defaults to 0-10 V input signal range, DA.

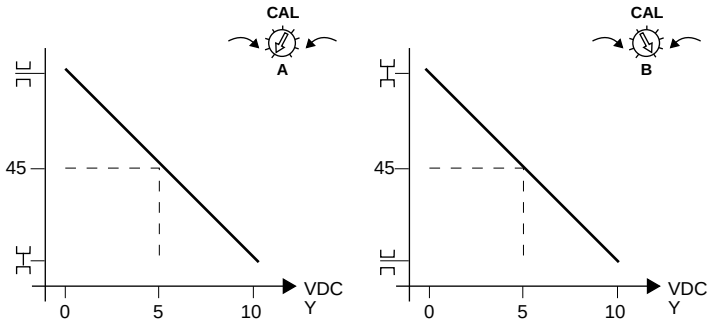
Control signal adjustment (Y)



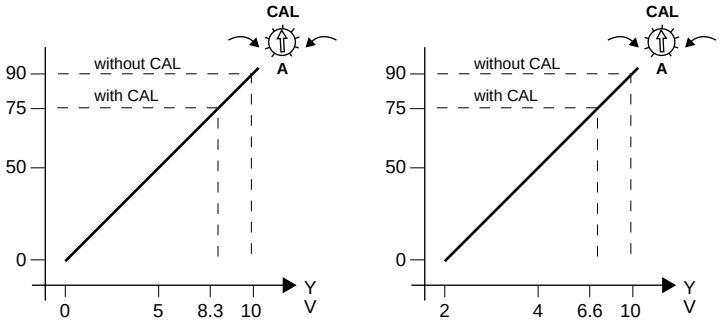
Direct acting (CW)



Reverse acting (CCW)



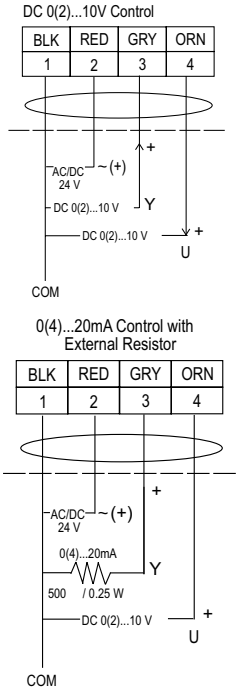
CAL-adjustment



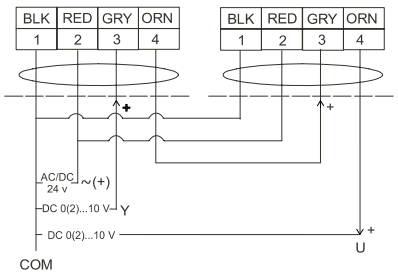
M9208-GGx-1 - *3/5 pages*

Proportional Actuators

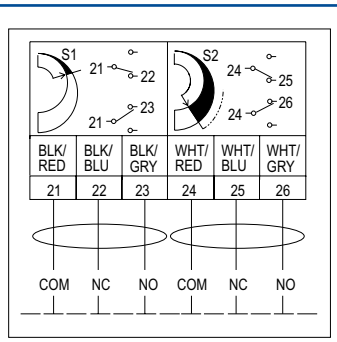
Wiring Diagrams



Master-Slave Application

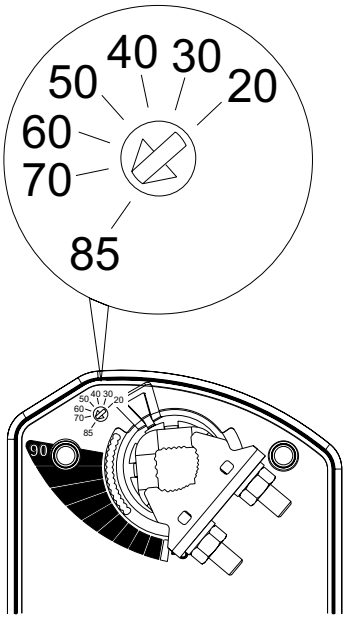


Auxiliary Switches (S)



Setting the auxiliary switches

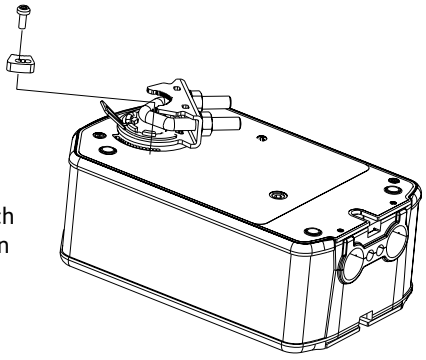
These models include two integral auxiliary switches, one fixed (S1) and one adjustable (S2), accessible on either face of the actuator. The nominal factory setting for S1 Auxiliary Switch is 11° closing, and the nominal factory setting for S2 Auxiliary Switch is 81° opening (relative to a 0 to 90° rotation range).
The switch point of S2 Auxiliary Switch is independently and continuously adjustable from 20° to 85° (relative to a 0 to 90° rotation range). .
Use the method in the following example for the most accurate positioning of S2 Auxiliary Switch.



1. Move the actuator to the full spring return position.
2. Rotate the switch adjuster until it points to the desired switch point.
3. Connect S2 Auxiliary Switch to a power source or an ohmmeter, and apply power to the actuator. The actuator moves to the fully open position and holds while power is applied.
4. Observe the switch point. If required, repeat Steps 2 and 3.

Limitation of rotation angle

Using the M9208-603 the angle of rotation can be limited.
The actuator is factory set for 95° rotation, and its range is limited in 5° increments to a minimum of 35°.
Attaching the stroke-limiting stop in the furthest mounting position reduces the rotation range of the actuator by 5°. Each progressive position reduces the rotation range on additional 5°.



Johnson Controls

M9208-GGx-1 - *4/5 pages*

Proportional Actuators

Technical Specifications

Actuator	M9208-GGx-1
Power Requirements	24 V AC/DC at 50/60 Hz (AC 19.2 to 28.8 V) - 24 V DC (DC 21.6 to 28.8 V)
- Running (AC)	7.9 VA
- Holding Position (AC)	5.5 VA
- Running (DC)	3.5 W
- Holding Position (DC)	1.9 W
Transformer Sizing Requirements	
- Minimum per Actuator	8 VA
Input Signal/Adjustments	Factory Set at DC 0 to 10 V, CW Rotation with Signal Increase; Selectable DC 0(2) to 10 V or 0(4) to 20 mA with Field-Furnished 500 ohm, 0.25 W Minimum Resistor; Switch Selectable Direct or Reverse Action with Signal Increase
Control Input Impedance	Voltage Input: 100,000 ohms; Current Input: 500 ohms with Field Furnished 500 ohm Resistor
Feedback Signal	DC 0(2) to 10 V for Desired Rotation Range up to 95° Corresponds to Rotation Limits, 0.5 mA at 10 V Maximum
Auxiliary Switch Rating	Two Single-Pole, Double-Throw (SPDT), Double-Insulated Switches with Gold Flash Contacts: AC 24 V, 50 VA Pilot Duty; AC 240 V, 5.0 A Resistive, 1/4 hp, 275 VA Pilot Duty
Spring Return	Direction is Selectable with Mounting Position of Actuator: Side A, Actuator Face Away from Damper for CCW Spring Return; Side B, Actuator Face Away from Damper for CW Spring Return
Running and Spring Return Torque	8 Nm at all operating temperature
Rotation Range	Maximum Full Stroke: 95° Adjustable Stop: 35° to 95° Maximum Position
Rotation Time for 90° of travel	
- Power On (Running)	150 Seconds Constant for 8 Nm Load, at all Operating Conditions
- Power Off (Spring Returning)	17 to 25 Seconds for 0 to 8 Nm Load, at Room Temperature 22 Seconds Nominal at Full Rated Load 94 Seconds Maximum with 8 Nm Load, at -40 °C
Cycles	60,000 Full Stroke Cycles; 1,500,000 repositions
Audible Noise Rating	
- Power On (Running)	<35 dBA at 8 Nm Load, at a Distance of 1 m
- Power On (Holding)	<20 dBA at a Distance of 1 m
- Power Off (Spring Returning)	<52 dBA at 8 Nm Load, at a Distance of 1 m
Electrical Connections	
- Actuators (all models)	1.2 m UL 758 Type AWM Halogen-Free Cable with 0.85 mm^2 (18 AWG) conductors and 6 mm ferrule ends
- Auxiliary Switches (-xxC Models)	1.2 m UL 758 Type AWM Halogen-Free Cable with 0.85 mm^2 (18 AWG) conductors and 6 mm ferrule ends
Mechanical Connections	
- Standard Shaft Clamp Included with Actuator	8 to 16 mm Diameter Round Shafts, or 6 to 12 mm Square Shafts
- Optional M9208-600 Jackshaft Coupler Kit	12 to 19 mm Diameter Round Shafts, or 10 to 14 mm Square Shafts
Aluminum Enclosure	IP54 for All Mounting Orientations
Ambient Conditions	
- Operating	-40 to 60 °C; 90% RH Maximum, Noncondensing
- Storage	-40 to 85 °C; 95% RH Maximum, Noncondensing
Dimensions	See Figure
Shipping Weight	Models: -GGA: 1.6 kg Models: -GGC: 1.7 Kg
CE Compliance	EMC Directive 2004/108/EC (Models: All) Low Voltage Directive 2006/95/EC (M9208-GGC-1 Model)

M9208-GGx-1 - *5/5 pages*

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Proportional Actuators

Ordering Codes

Codes	Descriptions
M9208-GGA-1	8 Nm, Proportional, 24 V AC/DC
M9208-GGC-1	8 Nm, Proportional, 2 auxiliary switches, 24 V AC/DC

Accessories and Replacement Parts *(Order Separately)*

Codes	Descriptions
M9000-604	Replacement Anti-Rotation Bracket Kit for M9208, M9210 and M9220 Series Electric Spring Return Actuators (quantity 1)
M9208-100	Remote Mounting Kit, including Mounting Bracket, M9208-150 Crankarm, Ball Joint and mounting fastener (quantity 1)
M9208-150	Crankarm (quantity 1)
M9208-600	Large Shaft Coupler Kit (with Locking Clip) for Mounting M9208-xxx-1 Series Electric Spring Return Actuators on dampers with round shafts from 12 to 19 mm or square shafts from 10 to 14 mm (quantity 1)
M9208-601	Replacement Standard Coupler Kit (with Locking Clip) for mounting M9208-xxx-1 Series Electric Spring Return Actuators on dampers with round shafts from 8 to 16 mm or square shafts from 6 to 12 mm (quantity 1)
M9208-602	Replacement Locking Clips for M9208-xxx-1 Series Electric Spring Return Actuators (quantity 5)
M9208-603	Adjustable Stop Kit for M9208-xxx-1 Series Electric Spring Return Actuators (quantity 1)
M9208-604	Replacement Manual Override Cranks for M9208 Series Electric Spring Return Actuators with long crank radius: 72 mm (quantity 5)
M9208-605	Replacement Manual Override Cranks for M9208 Series Electric Spring Return Actuators with short crank radius: 46.5 mm (quantity 5)

M9210-AGx-1 / M9220-AGx-1 - *1/3 pages*

ON/OFF and Floating Actuators

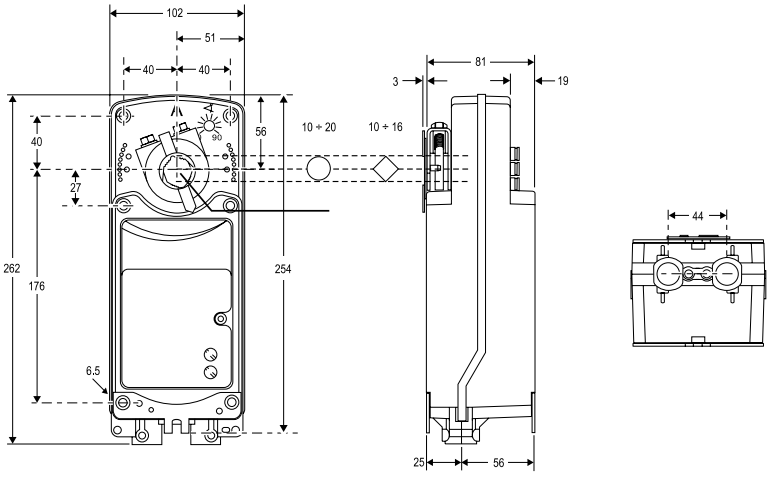
The spring return electric damper-actuator series has been specially developed for the motorized operation of safety air dampers, (anti-icing) in air conditioning systems,smoke evacuation dampers and sealingdampers.

When the control signal is applied, the actuator drives the damper to the operational position, while evenly tensioning the integrated spring. After a power failure the stored energy in the spring immediately brings the damper to the safety position.

Manual operation is automatically cancelled when the actuator is in electrical operation.
The compact design and universal adapter fitted with limitation of rotation angle make this actuator highly versatile.

Features

- ON/OFF and Floating control signal
- Up to 5 actuators in parallel operation possible
- Electrical connection with halogen-free cable
- Simple direct mounting with universal adapter on Ø 12 mm to 19 mm shaft or 10-12-14 mm square shaft. An optional M9220-600 Jackshaft Coupler Kit is available for 19 to 27 mm round shafts, or 16, 18, and 19 mm square shafts
- 80 mm min shaft length
- Tandem Operation possible
- Limitation of rotation angle
- Manual positioning with crank handle
- 2 auxiliary switches, 1 adjustable *(See next page for settings)*
- Automatic shut-off at end position (overload switch)
- Energy saving at end positions
- Actuators available with 1 m halogen-free cable

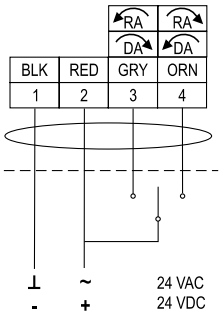


Dimensions in mm

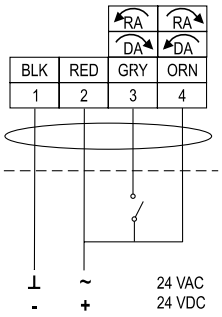
M9210-AGx-1 / M9220-AGx-1 - *2/3 pages*

ON/OFF and Floating Actuators

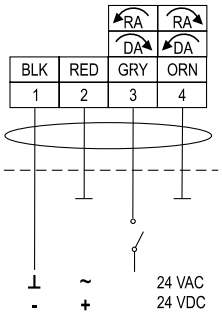
Wiring Diagrams



Floating Control, Four Wire

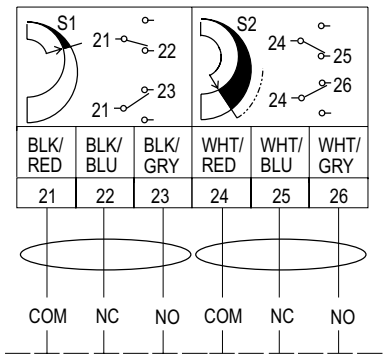


Open/Close, Single Wire Control



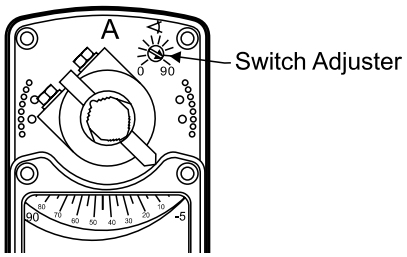
ON/OFF Control, Two Wire

Auxiliary Switches (S)



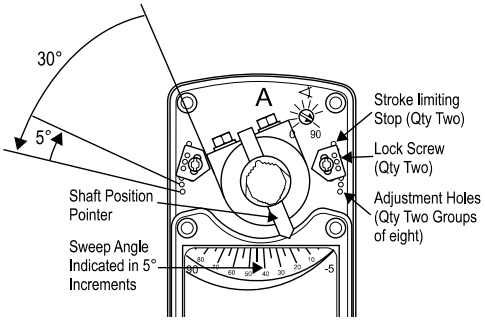
Setting the auxiliary switches

The 10S and 20S models include two integral auxiliary switches with a switch adjuster accessible on either face of the actuator.
The nominal factory setting for auxiliary switch S1 is 11° closing, and the nominal factory setting for auxiliary switch S2 is 81° opening.
The switch point of auxiliary switch S1 is fixed.
The switch point of auxiliary switch S2 is independently and continuously adjustable from 25° to 95°.
The switching position can be manually changed to any required position by turning the ratchet.



Limitation of rotation angle

Determine the desired rotation range.
If a 65° to 90° rotation range is desired, add one stroke limiting stop.
If a 35° to 60° rotation range is desired, add two stroke limiting stops.
Mount the stroke stop(s) in the desired position using the two M4 x10 mm selftapping screws provided. Tighten the screws to a torque of 4 Nm.
Manually reposition the coupler so that the coupler set screw aligns with the nodule guide that corresponds to the value determined in Step 2.
For a rotation range of 65°, mount one stroke limiting stops in the minimum stroke position.



M9210-AGx-1 / M9220-AGx-1 - *3/3 pages*

ON/OFF and Floating Actuators

Technical Specifications

Actuator	M9210-AGx-1	M9220-AGx-1
Torque	10 Nm	20 Nm
Damper area*	2.0 m^2	4.0 m^2
Running time Motor	150 s	
Running time Spring return	20 s	
Supply Voltage	AC/DC 24 V	
Frequency	50-60 Hz	
Power Consumption		
- Running AC	9.6 VA	15.5 VA
- Running DC	3.9 W	6.7 W
- At end position AC	6.0 VA	7.7 VA
- At end position DC	2.1 W	2.9 W
Dimensioning	15.0 VA	20.0 VA
Weight	2.9 kg	
Control signal	ON/OFF (2-Point) and Floating (3-Point)	
Position signal	None	
Angle of rotation		
- Working range	90°	
- Limitation	0°...30° and 90°...60°	
Auxiliary Switches	3(1.5)A, AC 230 V	
- S1 setting range	10° fix	
- S2 setting range	25°...90° adjustable	
Cable	1.2 m halogen-free	
- Motor	4-wire 1-2-3-4	
- Switches	6-wire 21-22-23-24-25-26	
Lifetime	60'000 Rotations	
Noise level	55 dB (A)	
Protection class	II	
Degree of protection	IP 54	
Mode of action	Type1	
Ambient conditions		
- Operating temperature	−40...+55 °C / IEC 721-3-3	
- Storage temperature	−65...+85 °C / IEC 721-3-2	
- Humidity	5...90% r.F. no condensed	
Service	Maintenance-free	
Standards		
- Mechanics	EN 60 529 / EN 60 730-2-14	
- Electronics	EN 60 730-2-14	
- EMC Emissions	EN 50 081-1:92 / IEC 61000-6-3:96	
- EMC Immunity	EN 50 082-2:95 / IEC 61000-6-2:99	

***Caution:** Please note damper manufacturer's information concerning the open/close torque.

Ordering Codes

Codes	Descriptions
M9210-AGA-1	10 Nm, AC/DC 24 V
M9210-AGC-1	10 Nm, AC/DC 24 V, with 2 auxiliary switches
M9220-AGA-1	20 Nm, AC/DC 24 V
M9220-AGC-1	20 Nm, AC/DC 24 V, with 2 auxiliary switches

Accessories and Replacement Parts *(Order Separately)*

Codes	Descriptions
DMPR-KC003	178 mm Blade Pin Extension (without Bracket) for Johnson Controls® Direct-Mount Damper Applications
M9000-158	Tandem Mounting Kit used to Mount Two Like Models of M9210/M9220 Series On/Off Electric Springback Actuators in Tandem to Deliver Twice the Torque
M9000-200	Commissioning Tool that Provides a Control Signal to Drive 24 V On/Off, Floating, Proportional, and/or Resistive Electric Actuators
M9000-604	Replacement Anti-Rotation Bracket Kit (with Screws) for M9210/M9220 Series On/Off Electric Springback Actuators
M9220-600	25 mm Jackshaft Coupler Kit (with Locking Clip) for Mounting M9210/M9220 Series On/Off Electric Springback Actuators on Dampers with 19 to 27 mm Round Shafts, or 16, 18, and 19 mm Square Shafts
M9220-601	Replacement Coupler Kit (with Locking Clip) for Mounting M9210/M9220 Series On/Off Electric Springback Actuators on Dampers with 12 to 19 mm Round Shafts or 10, 12, and 14 mm Square Shafts
M9220-602	Replacement Locking Clips for M9210/M9220 Series On/Off Electric Springback Actuators (Five per Bag)
M9220-603	Adjustable Stop Kit for M9210/M9220 Series On/Off Electric Springback Actuators
M9220-604	Replacement Manual Override Cranks for M9210/M9220 Series On/Off Electric Springback Actuators (Five per Bag)
M9220-610	Replacement Shaft Gripper, 10 mm Square Shaft with Locking Clip
M9220-612	Replacement Shaft Gripper, 12 mm Square Shaft with Locking Clip
M9220-614	Replacement Shaft Gripper, 14 mm Square Shaft with Locking Clip

M9210-Bxx-1 / M9220-Bxx-1 - *1/4 pages*

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ON/OFF Actuators

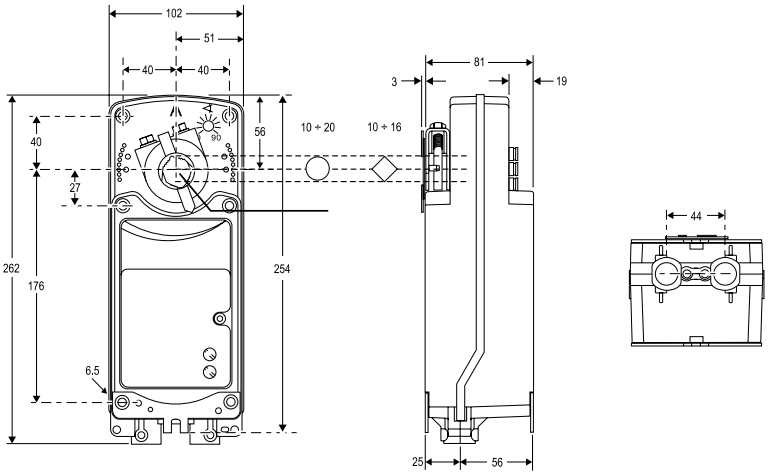
The spring return electric damper-actuator series has been specially developed for the motorized operation of safety air dampers, (anti-icing) in air conditioning systems, smoke evacuation dampers and sealing dampers.

When the control signal is applied, the actuator drives the damper to the operational position, while evenly tensioning the integrated spring. After a power failure the stored energy in the spring immediately brings the damper to the safety position.

Manual operation is automatically cancelled when the actuator is in electrical operation. The compact design and universal adapter fitted with limitation of rotation angle make this actuator highly versatile.

Features

- ON/OFF control
- Up to 5 actuators in parallel operation possible
- Electrical connection with halogen-free cable
- Simple direct mounting with universal adapter on Ø 12 mm to 19 mm shaft or 10-12-14 mm square shaft. An optional M9220-600 Jackshaft Coupler Kit is available for 19 to 27 mm round shafts, or 16, 18, and 19 mm square shafts
- 80 mm min shaft length
- Tandem Operation possible
- Limitation of rotation angle
- Manual positioning with crank handle
- 2 auxiliary switches, 1 adjustable *(See next page for settings)*
- Automatic shut-off at end position (overload switch)
- Energy saving at end positions
- Actuators available with 1 m halogen-free cable

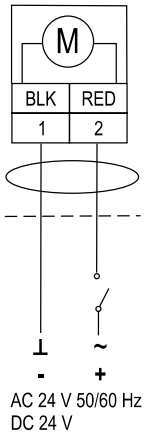


Dimensions in mm

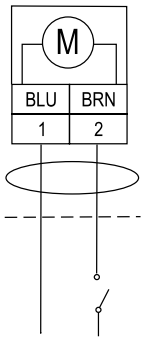
M9210-Bxx-1 / M9220-Bxx-1 - *2/4 pages*

ON/OFF Actuators

Wiring Diagrams

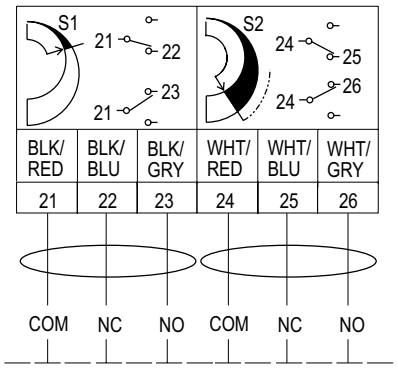


AC 24 V 50/60 Hz
DC 24 V



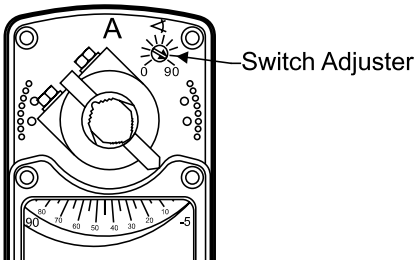
AC 230 V 50/60 Hz

Auxiliary Switches (S)



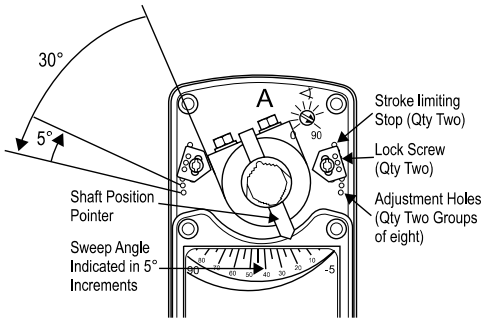
Setting the auxiliary switches

The 10S and 20S models include two integral auxiliary switches with a switch adjuster accessible on either face of the actuator.
The nominal factory setting for auxiliary switch S1 is 11° closing, and the nominal factory setting for auxiliary switch S2 is 81° opening.
The switch point of auxiliary switch S1 is fixed.
The switch point of auxiliary switch S2 is independently and continuously adjustable from 25° to 95°.
The switching position can be manually changed to any required position by turning the ratchet.



Limitation of rotation angle

Determine the desired rotation range.
If a 65° to 90° rotation range is desired, add one stroke limiting stop.
If a 35° to 60° rotation range is desired, add two stroke limiting stops.
Mount the stroke stop(s) in the desired position using the two M4 x10 mm selftapping screws provided. Tighten the screws to a torque of 4 Nm.
Manually reposition the coupler so that the coupler set screw aligns with the nodule guide that corresponds to the value determined in Step 2.
For a rotation range of 65°, mount one stroke limiting stops in the minimum stroke position.



M9210-Bxx-1 / M9220-Bxx-1 - *3/4 pages*

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ON/OFF Actuators

Technical Specifications

Actuator	M9210-BGx-1	M9210-BDx-1	M9220-BGx-1	M9220-BDx-1
Torque	10 Nm	10 Nm	20 Nm	20 Nm
Damper area*	2.0 m²	2.0 m²	4.0 m²	4.0 m²
Running time Motor	24...57 s			
Running time Spring return	11...15 s			
Supply Voltage	AC/DC 24V	AC 230 V	AC/DC 24V	AC 230 V
Frequency	50-60 Hz			
Power Consumption				
- Running AC	26 VA	0.12 VA	24.6 VA	0.15 A
- Running DC	15.6 W	---	17.6 W	---
- At end position AC	9.3 VA	0.09 A	5.4 VA	0.09 A
- At end position DC	2.6 W	---	2.8 W	---
Dimensioning	20.0 VA		14.0 VA	
Control signal	ON/OFF (2-Point)			
Position signal	None			
Angle of rotation				
- Working range	90°			
- Limitation	0°...30° and 90°...60°			
Auxiliary Switches	3(1.5)A, AC 230 V			
- S1 setting range	10° fix			
- S2 setting range	25°...90° adjustable			
Cable	1.2 m halogen-free			
- Motor	2-wire 1-2			
- Switches	6-wire 21-22-23-24-25-26			
Lifetime	60'000 Rotations			
Noise level	66 dB (A)			
Protection class	II			
Degree of protection	IP 54			
Mode of action	Type1			
Ambient conditions				
- Operating temperature	-40...+55 °C / IEC 721-3-3			
- Storage temperature	-65...+85 °C / IEC 721-3-2			
- Humidity	5...95% r.F. no condensed			
Service	Maintenance-free			
Weight	2.9 kg	3.5 Kg	2.9 kg	3.5 Kg
Standards				
- Mechanics	EN 60 529 / EN 60 730-2-14			
- Electronics	EN 60 730-2-14			
- EMC Emissions	EN 50 081-1:92 / IEC 61000-6-3:96			
- EMC Immunity	EN 50 082-2:95 / IEC 61000-6-2:99			

***Caution:** Please note damper manufacturer's information concerning the open/close torque.

M9210-Bxx-1 / M9220-Bxx-1 - *4/4 pages*

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ON/OFF Actuators

Ordering Codes

Codes	Descriptions
M9210-BGA-1	10 Nm, AC/DC 24 V
M9210-BGC-1	10 Nm, AC/DC 24 V, with 2 auxiliary switches
M9210-BDA-1	10 Nm, AC 230 V
M9210-BDC-1	10 Nm, AC 230 V, with 2 auxiliary switches
M9220-BGA-1	20 Nm, AC/DC 24 V
M9220-BGC-1	20 Nm, AC/DC 24 V, with 2 auxiliary switches
M9220-BDA-1	20 Nm, AC 230 V
M9220-BDC-1	20 Nm, AC 230 V, with 2 auxiliary switches

Accessories and Replacement Parts *(Order Separately)*

Codes	Descriptions
DMPR-KC003	178 mm Blade Pin Extension (without Bracket) for Johnson Controls® Direct-Mount Damper Applications
M9000-158	Tandem Mounting Kit used to Mount Two Like Models of M9210/M9220 Series On/Off Electric Springback Actuators in Tandem to Deliver Twice the Torque
M9000-200	Commissioning Tool that Provides a Control Signal to Drive 24 V On/Off, Floating, Proportional, and/or Resistive Electric Actuators
M9000-604	Replacement Anti-Rotation Bracket Kit (with Screws) for M9210/M9220 Series On/Off Electric Springback Actuators
M9220-600	25 mm Jackshaft Coupler Kit (with Locking Clip) for Mounting M9210/M9220 Series On/Off Electric Springback Actuators on Dampers with 19 to 27 mm Round Shafts, or 16, 18, and 19 mm Square Shafts
M9220-601	Replacement Coupler Kit (with Locking Clip) for Mounting M9210/M9220 Series On/Off Electric Springback Actuators on Dampers with 12 to 19 mm Round Shafts or 10, 12, and 14 mm Square Shafts
M9220-602	Replacement Locking Clips for M9210/M9220 Series On/Off Electric Springback Actuators (Five per Bag)
M9220-603	Adjustable Stop Kit for M9210/M9220 Series On/Off Electric Springback Actuators
M9220-604	Replacement Manual Override Cranks for M9210/M9220 Series On/Off Electric Springback Actuators (Five per Bag)
M9220-610	Replacement Shaft Gripper, 10 mm Square Shaft with Locking Clip
M9220-612	Replacement Shaft Gripper, 12 mm Square Shaft with Locking Clip
M9220-614	Replacement Shaft Gripper, 14 mm Square Shaft with Locking Clip

For further information and additional models see Product Installation Guide

Johnson Controls

M9210-xGx-1 / M9220-xGx-1 - *1/5 pages*

Proportional Actuators

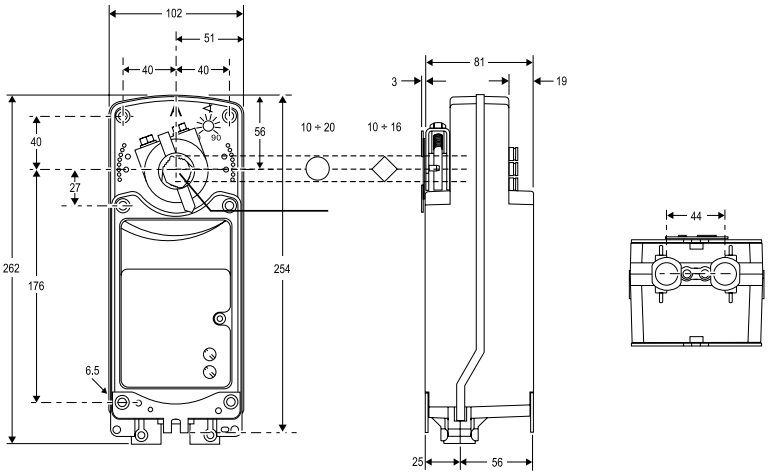
The spring return electric damper-actuator series has been specially developed for the motorized operation of safety air dampers (anti-icing) in air conditioning systems, smoke evacuation dampers and sealing dampers.

When the control signal is applied the actuator drives the damper to the operational position, while evenly tensioning the integrated spring. After a power failure the stored energy in the spring immediately brings the damper to the safety position.

Manual operation is automatically cancelled when the actuator is in electrical operation. The compact design and universal adapter fitted with limitation of rotation angle make this actuator highly versatile.

Features

- 0(2)..10 V or 0(4)..mA control signal
- Up to 5 actuators in parallel operation possible
- Electrical connection with halogen-free cable
- Simple direct mounting with universal adapter on Ø 12 mm to 19 mm shaft or 10-12-14 mm square shaft. An optional M9220-600 Jackshaft Coupler Kit is available for 19 to 27 mm round shafts, or 16, 18, and 19 mm square shafts
- 80 mm min shaft length
- Tandem Operation possible
- Limitation of rotation angle
- Manual positioning with crank handle
- 2 auxiliary switches, 1 adjustable *(See next page for settings)*
- Automatic shut-off at end position (overload switch)
- Energy saving at end positions
- Actuators available with 1 m halogen-free cable



Dimensions in mm

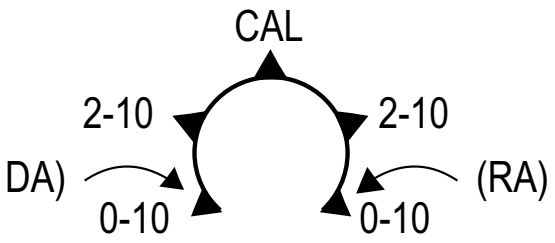
M9210-xGx-1 / M9220-xGx-1 - *2/5 pages*

Proportional Actuators

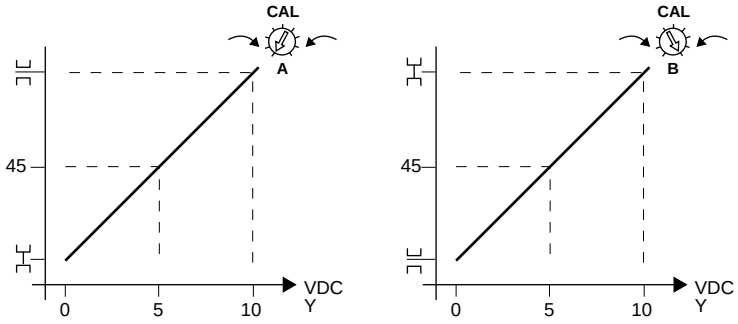
Signal adjust Position

- Choose working field and position of position signal Y by rotary swich d1.
- Processing sequence 1
  Increasing the signal position from 0(2) to 10 V the damper opens.
- Method of functioning 1
  «DW»
- Processing sequence 2
  Decreasing the position signal from 10V...2(0) the damper opens.
- Method of functioning 2
  «UW»
- Y-position signal
  Voltage: 0(2)...10VDC or
  Current: 0(4)...20 mA
  Attention: The 500Ω resistance is mounted Outside of the tool.
  (See the connection scheme)
- Factory-adjustment
  The tools are adjusted by factory to 0...10 V and Method of functioning «DW».
- Calibration
  If you set a rotation angle limit (e.g. 75°). The position signal Y can be adapted to the rotation angle by using the switch d1 on CAL position.
- CAL adjustement
  d1 on position 0...10 =
  Y-Input 0...10V for 90°
  d1 on position CAL =
  10V:90° = 0.11V x 75° =
  8.33V
  d1 on position 2...10 =
  Y-Input 2...10V for 90° =
  d1 on position CAL =
  8V:90° =
  0.08V x 75° = 6.66V

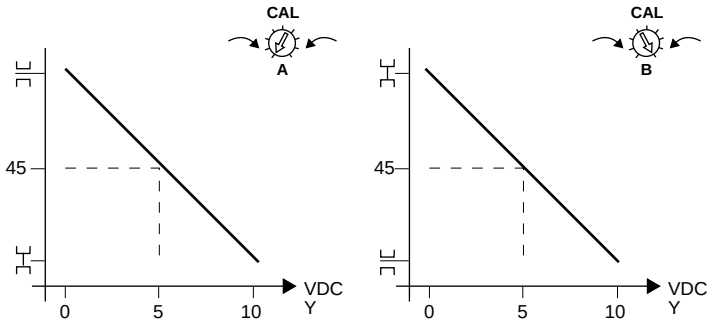
Control signal adjustment (Y)



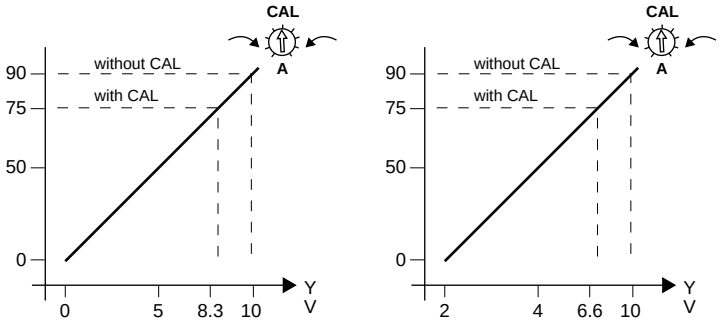
Direct acting (CW)



Reverse acting (CCW)



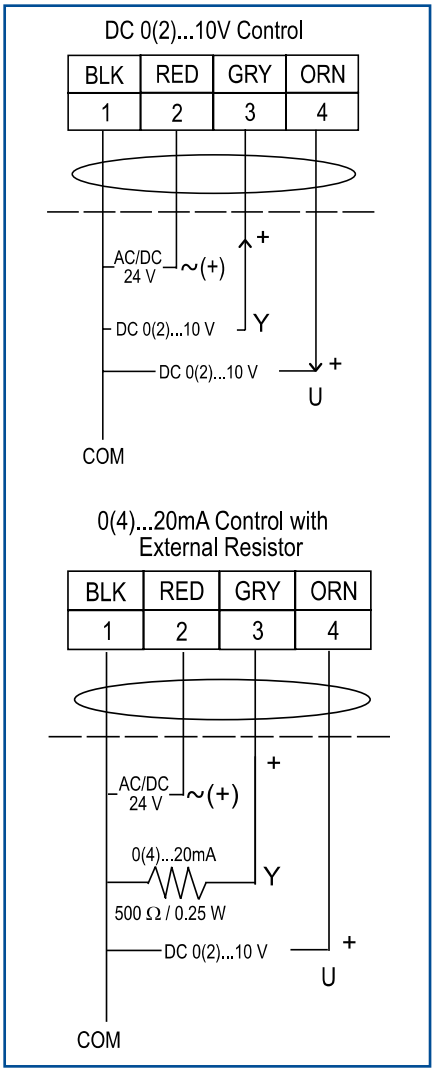
CAL-adjustment



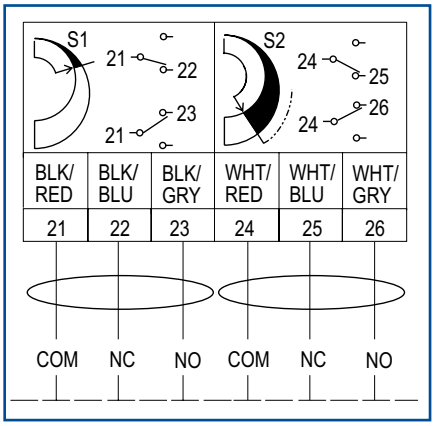
M9210-xGx-1 / M9220-xGx-1 - *3/5 pages*

Proportional Actuators

Wiring Diagrams

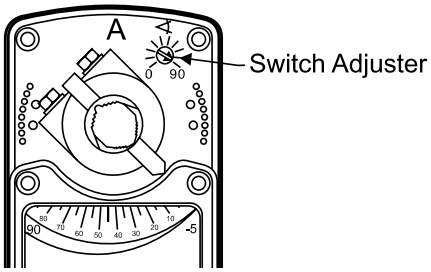


Auxiliary Switches (S)



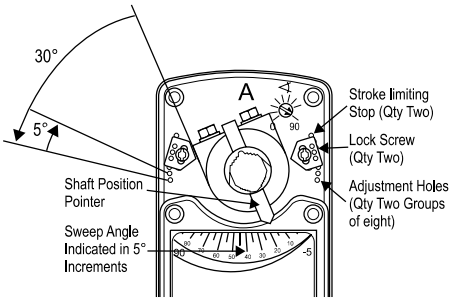
Setting the auxiliary switches

The 10S and 20S models include two integral auxiliary switches with a switch adjuster accessible on either face of the actuator.
The nominal factory setting for auxiliary switch S1 is 11° closing, and the nominal factory setting for auxiliary switch S2 is 81° opening.
The switch point of auxiliary switch S1 is fixed.
The switch point of auxiliary switch S2 is independently and continuously adjustable from 25° to 95°.
The switching position can be manually changed to any required position by turning the ratchet.



Limitation of rotation angle

Determine the desired rotation range.
If a 65° to 90° rotation range is desired, add one stroke limiting stop.
If a 35° to 60° rotation range is desired, add two stroke limiting stops.
Mount the stroke stop(s) in the desired position using the two M4 x10 mm selftapping screws provided. Tighten the screws to a torque of 4 Nm.
Manually reposition the coupler so that the coupler set screw aligns with the nodule guide that corresponds to the value determined in Step 2.
For a rotation range of 65°, mount one stroke limiting stops in the minimum stroke position.



M9210-xGx-1 / M9220-xGx-1 - *4/5 pages*

Proportional Actuators

Technical Specifications

Actuator	M9210-GGx-1	M9210-HGx-1	M9220-GGx-1	M9220-HGx-1
Torque	10 Nm	10 Nm	20 Nm	20 Nm
Damper area*	2.0 m²	2.0 m²	4.0 m²	4.0 m²
Running time Motor	150 s			
Running time Spring return	26 s			
Supply Voltage	AC/DC 24V			
Frequency	50-60 Hz			
Power Consumption				
- Running AC	9.6 VA		15.5 VA	
- Running DC	3.9 W		6.7 W	
- At end position AC	6.0 VA		7.7 VA	
- At end position DC	2.1 W		2.9 W	
Dimensioning	15.0 VA			
Weight	2.9 kg			
Control signal	DC 0(2)...10 V or 0(4)...20 mA			
Working area Y	Not adjustable	Adjustable	Not adjustable	Adjustable
Position signal	DC 0(2)...10 V			
Angle of rotation				
- Working range	90°			
- Limitation	0°...30° and 90°...60°			
Auxiliary Switches	3(1.5) A, AC 230 V			
- S1 setting range	10° fix			
- S2 setting range	25°...90° adjustable			
Cable	1.2 m halogen-free			
- Motor	4-wire 1-2-3-4			
- Switches	6-wire 21-22-23-24-25-26			
Lifetime	60'000 Rotations			
Noise level	55 dB (A)			
Protection class	II			
Degree of protection	IP 54			
Mode of action	Type1			
Ambient conditions				
- Operating temperature	-40...+55 °C / IEC 721-3-3			
- Storage temperature	-65...+85 °C / IEC 721-3-2			
- Humidity	5...95% r.F. no condensed			
Service	Maintenance-free			
Standards				
- Mechanics	EN 60 529 / EN 60 730-2-14			
- Electronics	EN 60 730-2-14			
- EMC Emissions	EN 50 081-1:92 / IEC 61000-6-3:96			
- EMC Immunity	EN 50 082-2:95 / IEC 61000-6-2:99			

***Caution:** Please note damper manufacturer's information concerning the open/close torque.

M9210-xGx-1 / M9220-xGx-1 - *5/5 pages*

Proportional Actuators

Ordering Codes

Codes	Descriptions
M9210-GGA-1	10 Nm, AC/DC 24 V
M9210-GGC-1	10 Nm, AC/DC 24 V, with 2 auxiliary switches
M9210-HGA-1	10 Nm, AC/DC 24 V, adjustable span and offset
M9210-HGC-1	10 Nm, AC/DC 24 V, with 2 auxiliary switches, adjustable span and offset
M9220-GGA-1	20 Nm, AC/DC 24 V
M9220-GGC-1	20 Nm, AC/DC 24 V, with 2 auxiliary switches
M9220-HGA-1	20 Nm, AC/DC 24 V, adjustable span and offset
M9220-HGC-1	20 Nm, AC/DC 24 V, with 2 auxiliary switches, adjustable span and offset

Accessories and Replacement Parts *(Order Separately)*

Codes	Descriptions
DMPR-KC003	178 mm Blade Pin Extension (without Bracket) for Johnson Controls® Direct-Mount Damper Applications
M9000-158	Tandem Mounting Kit used to Mount Two Like Models of M9210/M9220 Series On/Off Electric Springback Actuators in Tandem to Deliver Twice the Torque
M9000-200	Commissioning Tool that Provides a Control Signal to Drive 24 V On/Off, Floating, Proportional, and/or Resistive Electric Actuators
M9000-604	Replacement Anti-Rotation Bracket Kit (with Screws) for M9210/M9220 Series On/Off Electric Springback Actuators
M9220-600	25 mm Jackshaft Coupler Kit (with Locking Clip) for Mounting M9210/M9220 Series On/Off Electric Springback Actuators on Dampers with 19 to 27 mm Round Shafts, or 16, 18, and 19 mm Square Shafts
M9220-601	Replacement Coupler Kit (with Locking Clip) for Mounting M9210/M9220 Series On/Off Electric Springback Actuators on Dampers with 12 to 19 mm Round Shafts or 10, 12, and 14 mm Square Shafts
M9220-602	Replacement Locking Clips for M9210/M9220 Series On/Off Electric Springback Actuators (Five per Bag)
M9220-603	Adjustable Stop Kit for M9210/M9220 Series On/Off Electric Springback Actuators
M9220-604	Replacement Manual Override Cranks for M9210/M9220 Series On/Off Electric Springback Actuators (Five per Bag)
M9220-610	Replacement Shaft Gripper, 10 mm Square Shaft with Locking Clip
M9220-612	Replacement Shaft Gripper, 12 mm Square Shaft with Locking Clip
M9220-614	Replacement Shaft Gripper, 14 mm Square Shaft with Locking Clip

M9216-AGx-1- *1/3 pages*

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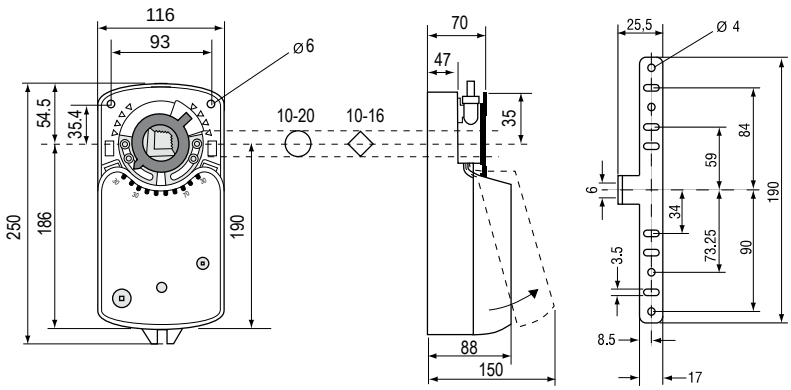
Floating Actuators

The spring return electric damper-actuator series, has been specially developed for the motorized operation of safety air dampers (anti-icing) in air conditioning systems, smoke evacuation dampers and sealing dampers.

When the control signal is applied the actuator drives the damper to the operational position, while evenly tensioning the integrated spring. After a power failure the stored energy in the spring immediately brings the damper to the safety position.

Manual operation is automatically cancelled when the actuator is in electrical operation. The compact design and universal adapter fitted with limitation of rotation angle make this actuator highly versatile.



Dimensions in mm

Features

- Floating control
- Up to 5 actuators in parallel operation possible
- Plug-in terminal block connection
- Simple direct mounting with universal adapter on Ø 10 mm to 20 mm shaft or 10 mm to 16 mm square shaft 77 mm min shaft length
- Selectable direction of rotation
- Limitation of rotation angle
- Manual positioning with crank handle
- 2 adjustable auxiliary switches *(See next page for settings)*
- Automatic shut-off at end position (overload switch)
- Feedback potentiometer
- Energy saving at end positions
- Actuators available with 1 m halogen-free cable
- Customized versions available

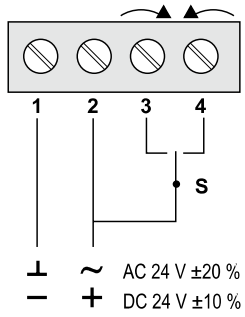
Accessories

- ZK Damper linkage selection
- ZKG Ball joints *(see data sheet 6.10)*

M9216-AGx-1 - *2/3 pages*

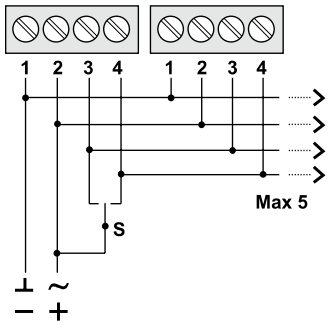
Floating Actuators

Wiring Diagram

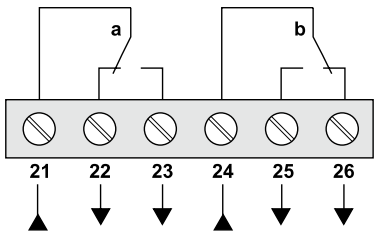


When changing the directions of rotations several times in quick succession, allow a delay of 1 sec. after each change.

Parallel Connections

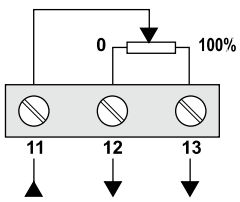


Auxiliary Switches (S)



3(1.5)A, AC 230 V
Actuator at 0° position

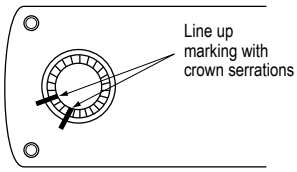
Potentiometer



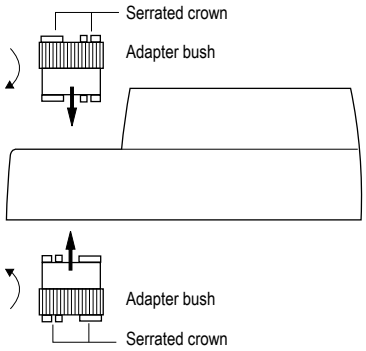
P1= 1 K Ω / 0,5 W ±10 %
P2= 140 K Ω / 0,5 W ±10%

Changing the direction of rotation

The change in rotation direction is archieved by removing the adapter bush from one side and replacing it on the other side.



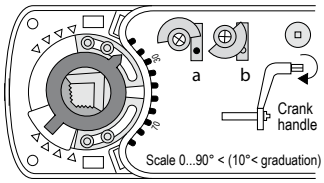
Factory setting:
Clockwise rotation.



Setting the auxiliary switches

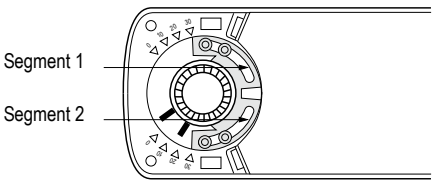
Factory setting:
Switch **a** at 10°
Switch **b** at 80°

The switching position can be manually changed to any required position by turning the ratchet.



Limitation of rotation Angle

The limitation or rotation/ working range can, through segments 1 and 2, be reduced by up to 30° from both end positions.



Johnson Controls

M9216-AGx-1 - *3/3 pages*

Floating Actuators

Technical Specifications

Actuator	M9216-AGx-1
Torque	16 Nm
Damper area*	3.0 m²
Running Time Motor	90...120 s
Running Time Spring Return	10 s
Supply Voltage	AC/DC 24 V
Frequency	50-60 Hz
Power Consumption	
- Running	10.0 W
- At end position	4.0 W
Dimensioning	18.0 VA / 4 A @ 2 ms
Control Signal	3-Point Floating
Position Signal	Potentiometer
Angle of rotation/Working range	90° (93°mech.)
Angle of rotation/Limitation	0°...30° and 90...60°
Auxiliary Switches	3(1.5) A, AC 230 V
- Setting range	5°...85° < adjustable
Potentiometer load	0.5 W
Tolerance	±10%
Cable aperture connection	PG11
Life time	60.000 rotations
Noise level	50 dB (A)
Protection Class	II
Degree of Protection	IP 54
Mode of Action	Type 1
Ambient conditions	
- Operating temperature	-20...+50 °C / IEC 721-3-3
- Storage temperature	-30...+60°C / IEC 721-3-2
- Humidity	5...95% r.F. no condensed
Weight	2.7 Kg
Service	Maintenance-free
Standards	
- Mechanics	EN 60 529 / EN 60 730-2-14
- Electronics	EN 60 730-2-14
- EMC Emissions	EN 50 081-1:92 / IEC 61000-6-3:96
- EMC Immunity	EN 50 082-2:95 / IEC 61000-6-2:99

***Caution:** Please note damper manufacturer's information concerning the open/close torque.

Ordering Codes

Codes	Descriptions
M9216-AGA-1	AC/DC 24 V
M9216-AGC-1	AC/DC 24 V, with 2 auxiliary switches
M9216-AGE-1	AC/DC 24 V, with 1 KΩ feedback potentiometer
M9216-AGD-1	AC/DC 24 V, with 140 Ω feedback potentiometer

M9216-Bxx-1 - *1/3 pages*

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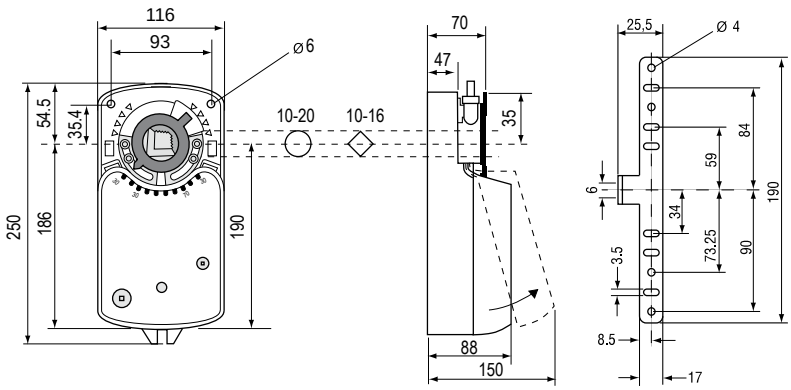
ON/OFF Actuators

The electric, Spring Return damper-actuator series has been specially developed for the motorized operation of safety air dampers (anti-icing) in air conditioning systems, smoke evacuation dampers and sealing dampers.

When the control signal is applied, the actuator drives the damper to the operational position, while evenly tensioning the integrated spring. After a power failure the stored energy in the spring immediately brings the damper to the safety position.

Manual operation is automatically cancelled when the actuator is in electrical operation. The compact design and universal adapter fitted with limitation of rotation angle make this actuator highly versatile.



Dimensions in mm

Features

- ON/OFF control
- Up to 5 actuators in parallel operation possible
- Plug-in terminal block connection
- Simple direct mounting with universal adapter on Ø 10 mm to 20 mm shaft or 10 mm to 16 mm square shaft. 77 mm min shaft length
- Selectable direction of rotation
- Limitation of rotation angle
- Manual positioning with crank handle
- 2 adjustable auxiliary switches *(See next page for settings)*
- Automatic shut-off at end position (overload switch)
- Energy saving at end positions
- Actuators available with 1m halogen-free cable
- Customized versions available

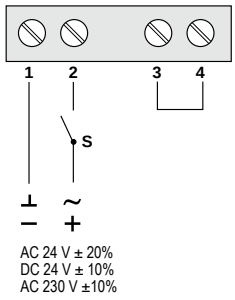
Accessories

- ZK Damper linkage selection
- ZKG Ball joints *(See data sheet 6.10)*

M9216-Bxx-1 - *2/3 pages*

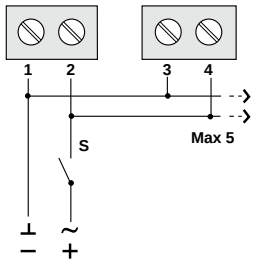
ON/OFF Actuators

Wiring Diagram

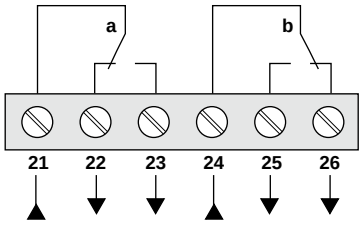


AC 24 V ± 20%
DC 24 V ± 10%
AC 230 V ±10%

Parallel Connections



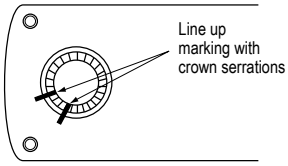
Auxiliary Switches (S)



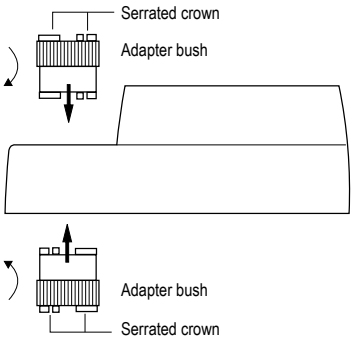
3 (1.5) A, AC 230 V
Activator at 0° position

Changing the direction of rotation

The change in rotation direction is archieved by removing the adapter bush from one side and replacing it on the other side.



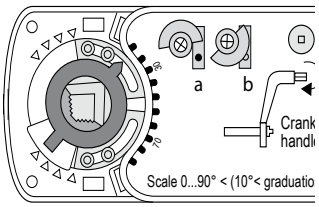
Factory setting:
Clockwise rotation.



Setting the auxiliary switches

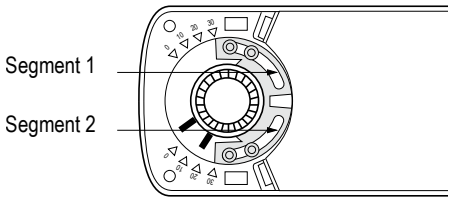
Factory setting:
Switch **a** at 10°
Switch **b** at 80°

The switching position can be manually changed to any required position by turning the ratchet.



Limitation of rotation Angle

The limitation or rotation/ working range can, through segments 1 and 2, be reduced by up to 30° from both end positions.



M9216-Bxx-1 - *3/3 pages*

ON/OFF Actuators

Technical Specifications

Actuator	M9216-BGx-1	M9216-BDx-1
Torque	16 Nm	
Damper area*	3.0 m²	
Running Time Motor	90...120 s	
Running Time Spring Return	10 s	
Supply Voltage	AC/DC 24 V	AC 230 V
Frequency	50-60 Hz	
Power Consumption		
- Running	10.0 W	8.0 W
- At end position	4.0 W	4.5 W
Dimensioning	18.0 VA / 4 A @ 2 ms	13.0 VA / 0.3 A @ 2 ms
Control Signal	2-Point ON/OFF	
Position Signal	None	
Angle of rotation/Working range	90° (93°mech.)	
Angle of rotation/Limitation	0°...30° and 90...60°	
Auxiliary Switches	3(1.5) A, AC 230 V	
- Setting range	5°...85° < adjustable	
Cable aperture connection	PG11	
Life time	60.000 rotations	
Noise level	50 dB (A)	
Protection Class	II	
Degree of Protection	IP 54	
Mode of Action	Type 1	
Ambient conditions		
- Operating temperature	-20...+50 °C / IEC 721-3-3	
- Storage temperature	-30...+60°C / IEC 721-3-2	
- Humidity	5...95% r.F. no condensed	
Weight	2.7 Kg	
Service	Maintenance-free	
Standards		
- Mechanics	EN 60 529 / EN 60 730-2-14	
- Electronics	EN 60 730-2-14	
- EMC Emissions	EN 50 081-1:92 / IEC 61000-6-3:96	
- EMC Immunity	EN 50 082-2:95 / IEC 61000-6-2:99	

***Caution:** Please note damper manufacturer's information concerning the open/close torque.

Ordering Codes

Codes	Descriptions
M9216-BGA-1	AC/DC 24 V
M9216-BGC-1	AC/DC 24 V, with 2 auxiliary switches
M9216-BDA-1	AC 230 V
M9216-BDC-1	AC 230 V, with 2 auxiliary switches

M9216-HGx-1- *1/4 pages*

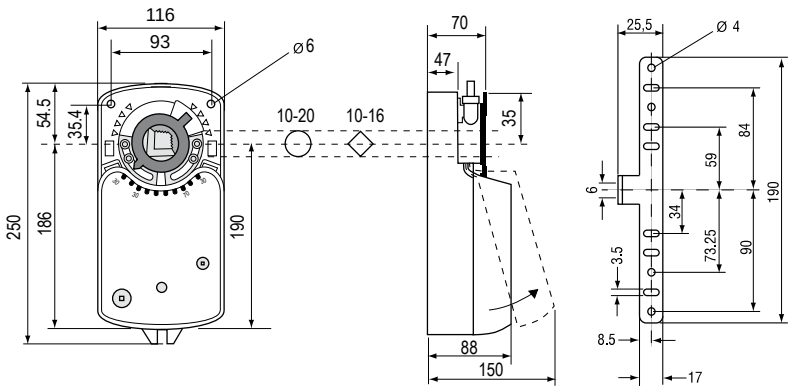
Page 78

Proportional Actuators

The electric, Spring Return damper-actuator series has been specially developed for the motorized operation of safety air dampers (anti-icing) in air conditioning systems, smoke evacuation dampers and sealing dampers.

When the control signal is applied the actuator drives the damper to the operational position, while evenly tensioning the integrated spring. After a power failure the stored energy in the spring immediately brings the damper to the safety position.

Manual operation is automatically cancelled when the actuator is in electrical operation. The compact design and universal adapter fitted with limitation of rotation angle make this actuator highly versatile.



Dimensions in mm

Features

- DC 0...10 V or 0...20 mA control
- Load independent running time
- Up to 5 actuators in parallel operation possible
- Plug-in terminal block connection
- Simple direct mounting with universal adapter on Ø 10 mm to 20 mm shaft or 10 mm to 16 mm square shaft 77 mm min shaft length
- Selectable direction of rotation
- Limitation of rotation angle
- Manual positioning with crank handle
- 2 adjustable auxiliary switches *(See next page for settings)*
- Automatic shut-off at end position (overload switch)
- Energy saving at end positions
- Actuators available with 1 m halogen-free cable
- Customized versions available

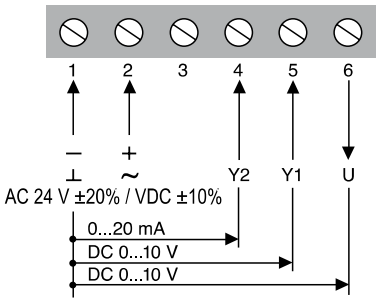
Accessories

- ZK damper linkage selection
- ZKG ball joints *(see data sheet 6.10)*

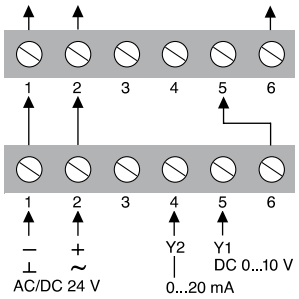
M9216-HGx-1- *2/4 pages*

Proportional Actuators

Wiring Diagram



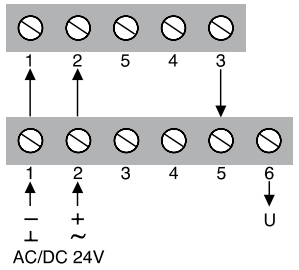
Parallel Connections



For parallel operation of the actuators, the DC 0...10 V output signal U = DC 0...10 V is connected, from the master actuator trough terminal 6, to the slave actuator trough terminal 5 etc.

Caution: Parallel connection of up to a maximum of 5 actuator possible.

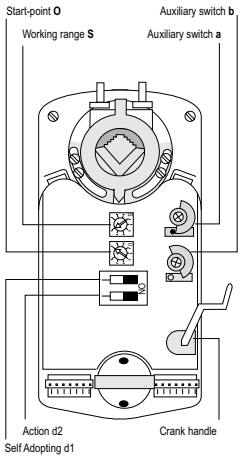
Position trasmitter



The actuator can also be controlled using the Johnson Positioner (PA-PF) with Control signal of DC 0...10 V.

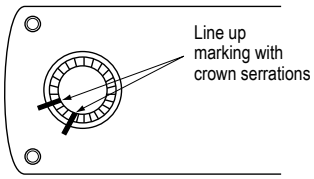
For further information concerning the PA and PF Positioner please refer to data sheet 6.20.

Actuator open

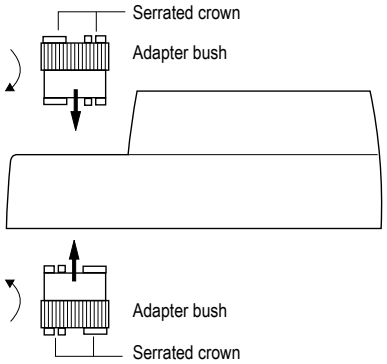


Changing the direction of rotation

The change in rotation direction is archieved by removing the adapter bush from one side and replacing it on the other side.



Factory setting:
Clockwise rotation.

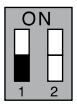


Control Signal: Factory setting

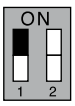
Control signal Y1	DC 0...10V
Input Resistance	Ri = 200 kΩ
Control signal Y2	0...20 mA
Input Resistance	Ri = 388 Ω
Position signal U1	DC 0...10 V
Load resistance	R ≥ 10 kΩ

Microswitch **d1**

Self-adapting **OFF**

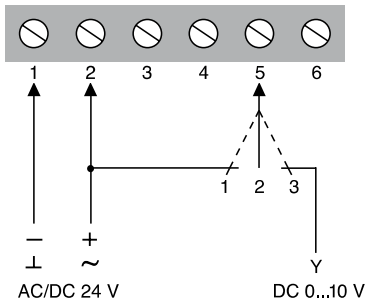


Self-adapting **ON**



The self-adapting mode is activated by switching the micro-switch d1 to ON.
In this mode the running time, control signals Y1 and Y2 and the output signal U will set to match the mechanically selected range of rotation.
The minimum working range that can be adapted to is 30°.
During the self-adapting procedure the actuator finds and stores both end positions.
Even after a power failure the stored values can be recalled.
If the angle of rotation is changed the actuator will automatically match the new working range.

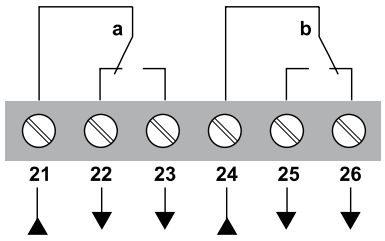
Override Control



The actuator can also forced to override control when wired in accordance with the diagram.

Switch position:
1 = Actuator runs at 10 V
2 = Actuator runs at 0 V
3 = Automatic control operation

Auxiliary Switches



Changing the control setting

The potentiometers **O** and **S** help to match control signals Y1 and Y2 to any make of controller.

Example 1
Control signal Y1 working between DC 2...10 V
Setting: Starting point O = 2
working range S = 8

Example 2
Control signal Y2 working between 6...18 mA
Setting: Starting point O = 3
Working range S = 6

Start point O

Scale O	0	1	2	3	4	5	6	7	8
for Y1 (VDC)	0	1	2	3	4	5	6	7	8
for Y2 (mA)	0	2	4	6	8	10	12	14	16

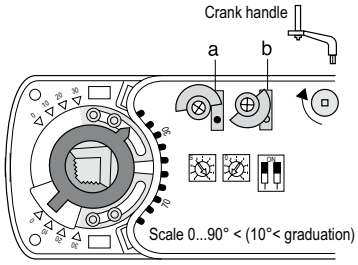
Working range S

Scale S	2	3	4	5	6	7	8	9	10
for Y1 (VDC)	2	3	4	5	6	7	8	9	10
for Y2 (mA)	4	6	8	10	12	14	16	18	20

Setting the auxiliary switches

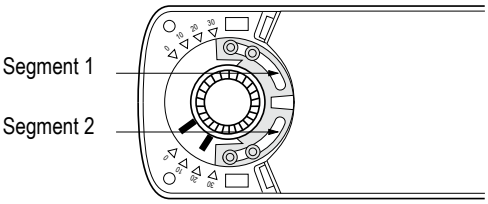
Factory setting:
Switch **a** at 10°
Switch **b** at 80°

The switching position can be manually changed to any required position by turning the ratchet.



Limitation of rotation angle

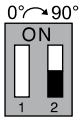
The 90° angle of rotation/ working range can, through segments 1 and 2, be reduced by up to 30° from both end positions.



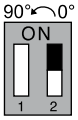
Action Setting

The action settig of control signal Y1 and Y2 can be reversed by switching the microswitch d2.
This reverses the action of the output signal U.

Normal operation.
By increasing control signal Y1 and Y2, tensioning of the spring will occur.



Reversed operation.
By decreasing control signal Y1 and Y2, tensioning of the spring will occur.



M9216-HGx-1 - *4/4 pages*

Proportional Actuators

Technical Specifications

Actuator	M9216-HGx-1
Torque	16 Nm
Damper area*	3.0 m²
Running Time Motor	90 s
Running Time Spring Return	10 s
Supply Voltage	AC/DC 24 V
Frequency	50-60 Hz
Power Consumption	
- Running	7.0 W
- At end position	0.6 W
Dimensioning	12.0 VA / 6 A @ 2 ms
Control Signal	
- Y1	DC 0...10 V
- Y 2	0...20 mA
Position Signal	DC 0...10 V
Angle of rotation/Working range	90° (93°mech.)
Angle of rotation/Limitation	0°...30° and 90°...60°
Auxiliary Switches	3(1.5) A, AC 230 V
- Setting range	5°...85°
Life time	60.000 rotations
Noise level	50 dB (A)
Protection Class	II
Degree of Protection	IP 54
Cable aperture connections	PG11
Mode of Action	Type 1
Ambient conditions	
- Operating temperature	-20...+50 °C / IEC 721-3-3
- Storage temperature	-30...+60°C / IEC 721-3-2
- Humidity	5...95% r.F. no condensed
Weight	2.7 Kg
Service	Maintenance-free
Standards	
- Mechanics	EN 60 529 / EN 60 730-2-14
- Electronics	EN 60 730-2-14
- EMC Emissions	EN 50 081-1:92 / IEC 61000-6-3:96
- EMC Immunity	EN 50 082-2:95 / IEC 61000-6-2:99

***Caution:** Please note damper manufacturer's information concerning the open/close torque.

Ordering Codes

Codes	Descriptions
M9216-HGA-1	AC/DC 24 V
M9216-HGC-1	AC/DC 24 V, with 2 auxiliary switches

M91xx-Axx-1N4 - *1/3 pages*

Page 82

ON/OFF and Floating Actuators - Speed Version

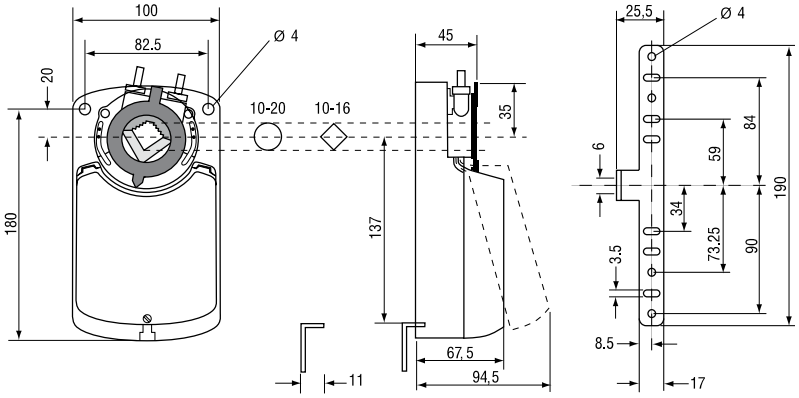
The special electric damper actuator series is designed to operate air dampers in ventilation and air conditioning systems.
The compact design and universal adapter fitted with limitation of rotation angle make this actuator highly versatile.

Features

- ON/OFF or Floating control signal
- Load-independent running time
- Up to 5 actuators in parallel operation possible
- Plug-in terminal block connection
- Simple direct-mount with universal adapter
  on 10...20 mm Ø round-axis
  or 10...16 mm square shaft
  48 mm minimum damper shaft lenght
- Selectable direction of rotation
- Limitation of rotation angle
- Manual release button
- 2 adjustable auxiliary switches
- Automatic shut-off at end position (overload switch)
- Actuators available with 1 m cable
- Customized versions available

Accessories

- M9000- ZK Damper linkage selection
- M9000- ZKG Ball joints

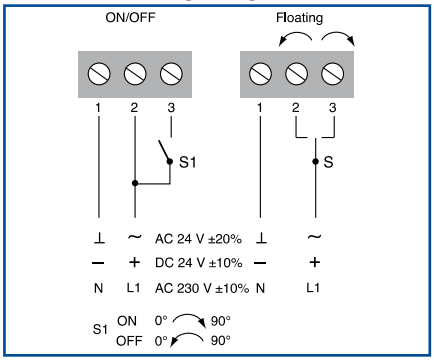


Dimensions in mm

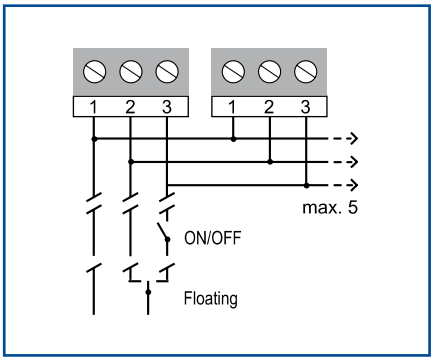
M91xx-Axx-1N4 - *2/3 pages*

ON/OFF and Floating Actuators - Speed Version

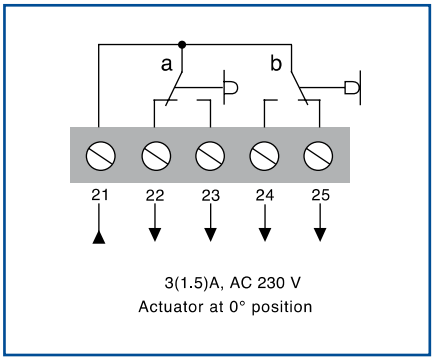
Wiring Diagrams



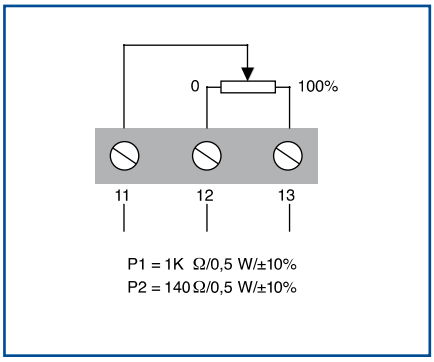
Parallel Connections



Auxiliary Switches (S)



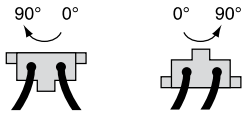
Potentiometer (P)

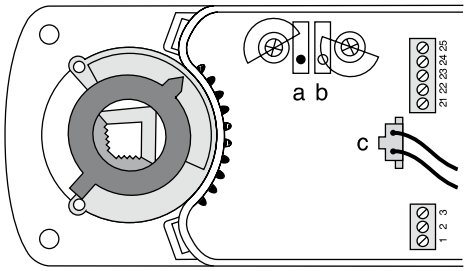


Changing the direction of rotation

The direction of rotation can be changed by reversing plug **c**

Factory setting:

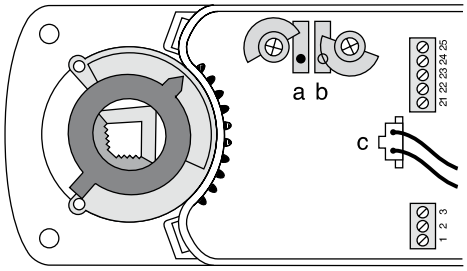




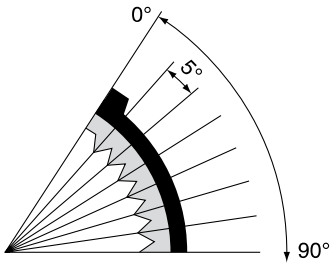
Setting the auxiliary switches

Factory setting:
Switch a at 10°
Switch b at 80°

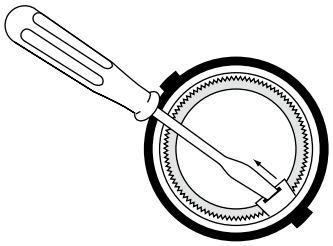
The switching position can be manually changed to any required position by turning the ratchet.



Limitation of rotation angle



Adapter release



Johnson Controls

M91xx-Axx-1N4 - *3/3 pages*

ON/OFF and Floating Actuators - Speed Version

Technical Specifications

Actuator	M9116-AG..	M9108-AG..	M9116-AD..	M9108-AD..
Torque	16 Nm	8 Nm	16 Nm	8 Nm
Damper area*	3.0 m²	1.5 m²	3.0 m²	1.5 m²
Running Time OPEN	16 s	8 s	16 s	8 s
Running Time CLOSE	16 s	8 s	16 s	8 s
Supply Voltage	AC/DC 24 V		AC 230 V	
Frequency	50-60 Hz			
Power Consumption				
- Running	7.0 W		12.0 W	
- At end position	0.7 W		3.7 W	
Dimensioning	13.0 VA / 3.4 A @ 2 ms		13.0 VA / 0.35 A @ 2 ms	
Control Signal	ON/OFF or Floating			
Position Signal	Potentiometer 0.5 W / ±10%			
Angle of rotation/Working range	90° (93°mech.)			
Angle of rotation/Limitation	5°...85° in 5° < steps			
Auxiliary Switches	3(1.5) A, AC 230 V			
- S1 setting range	5°...85° < adjustable			
- S2 setting range				
Cable	1.0 m halogen-free			
- Motor	3-Wire 1-2-3			
- Switches	5-Wire 21-22-23-24-25			
- Potentiometer	3-Wire 11-12-13			
Life time	60.000 rotations			
Noise level	45 dB (A)			
Protection Class	II			
Degree of Protection	IP 54			
Mode of Action	Type 1			
Ambient conditions				
- Operating temperature	-20...+50 °C / IEC 721-3-3			
- Storage temperature	-30...+60°C / IEC 721-3-2			
- Humidity	5...95% r.F. no condensed			
Weight	1.1 Kg		1.2 Kg	
Service	Maintenance-free			
Standards				
- Mechanics	EN 60 529 / EN 60 730-2-14			
- Electronics	EN 60 730-2-14			
- EMC Emissions	EN 50 081-1:92 / IEC 61000-6-3:96			
- EMC Immunity	EN 50 082-2:95 / IEC 61000-6-2:99			

***Caution:** Please note damper manufacturer's information concerning the open/close torque.

Ordering Codes

Codes	Descriptions
M9108-AGA-1N4	AC/DC 24 V
M9108-AGC-1N4	AC/DC 24 V, with 2 auxiliary switches
M9108-AGE-1N4	AC/DC 24 V, with 1000 Ω feedback potentiometer
M9108-AGD-1N4	AC/DC 24 V, with 140 Ω feedback potentiometer
M9108-AGF-1N4	AC/DC 24 V, with 2000 Ω feedback potentiometer
M9108-ADA-1N4	AC 230 V
M9108-ADC-1N4	AC 230 V, with 2 auxiliary switches
M9108-ADE-1N4	AC 230 V, with 1000 Ω feedback potentiometer
M9108-ADD-1N4	AC 230 V, with 140 Ω feedback potentiometer
M9108-ADF-1N4	AC 230 V, with 2000 Ω feedback potentiometer
M9116-AGA-1N4	AC/DC 24 V
M9116-AGC-1N4	AC/DC 24 V, with 2 auxiliary switches
M9116-AGE-1N4	AC/DC 24 V, with 1000 Ω feedback potentiometer
M9116-AGD-1N4	AC/DC 24 V, with 140 Ω feedback potentiometer
M9116-AGF-1N4	AC/DC 24 V, with 2000 Ω feedback potentiometer
M9116-ADA-1N4	AC 230 V
M9116-ADC-1N4	AC 230 V, with 2 auxiliary switches
M9116-ADE-1N4	AC 230 V, with 1000 Ω feedback potentiometer
M9116-ADD-1N4	AC 230 V, with 140 Ω feedback potentiometer
M9116-ADF-1N4	AC 230 V, with 2000 Ω feedback potentiometer

M91xx-GGx-1N4 - *1/4 pages*

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Proportional Actuators AC/DC 24 V - Speed Version

The special electric damper actuator series is designed to operate air dampers in ventilation and air conditioning systems.

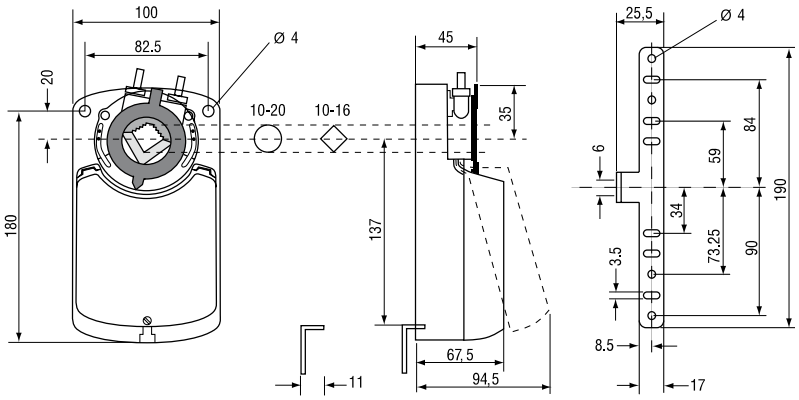
The compact design and universal adapter fitted with limitation of rotation angle make this actuator highly versatile.

Features

- DC 0(2)...10 V or 0(4)...20 mA control signal
- Working area adjustable
- Load-independent running time
- Up to 5 actuators in parallel operation possible
- Plug-in terminal block connection
- Simple direct-mount with universal adapter
  on 10...20 mm Ø round-axis
  or 10...16 mm square shaft
  48 mm minimum damper shaft lenght
- Selectable direction of rotation
- Limitation of rotation angle
- Manual release button
- 2 adjustable auxiliary switches
- Automatic shut-off at end position (overload switch)
- Actuators available with 1 m cable
- Customized versions available

Accessories

- M9000- ZK Damper linkage selection
- M9000- ZKG Ball joints

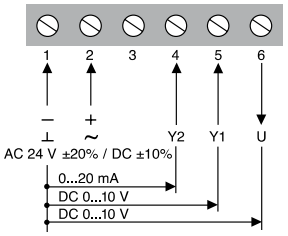


Dimensions in mm

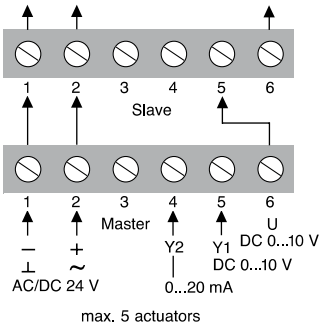
M91xx-GGx-1N4 - *2/4 pages*

Proportional Actuators AC/DC 24 V - Speed Version

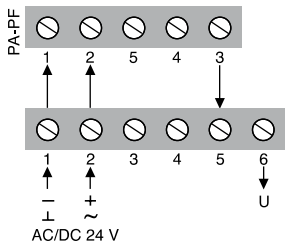
Wiring Diagram



Parallel Connections



Position transmitter



The M91xx-GG...-1N4 can also be controlled using the JOHNSON CONTROLS Positioner (PA/PF) with control signal of DC 0...10 V.

For further information concerning the PA and PF positioner please refer to sheet 6.20.

A maximum of 5 actuators can be controlled in parallel operation.

Setting the control Signal

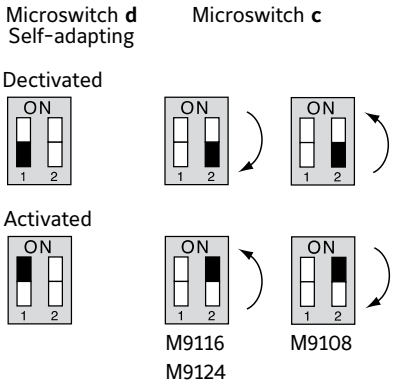
Control signal Y1 DC 0...10 V
Input resistance Ri 250 kΩ

Control signal Y2 0...20 mA
Input resistance Ri 388 Ω

Position signal U DC 0...10 V
Load resistance > 50 kΩ

By switching microswitch **d** to ON position, the control signal Y1 or Y2 will be adapted to the chosen angle of rotation.

By switching microswitch c the direction of rotation can be changed.



Setting Span and OFFSET

The potentiometers **O** and **S** help to match control signals Y1 and Y2 to any make of controller.

Example 1

Control signal Y1 working between DC 2...10 V

Setting: Starting point O = 2
working range S = 8

Example 2

Control signal Y2 working between 6...18 mA

Setting: Starting point O = 3
Working range S = 6

Start point O

Scale O	0	1	2	3	4	5	6	7	8
for Y1 (VDC)	0	1	2	3	4	5	6	7	8
for Y2 (mA)	0	2	4	6	8	10	12	14	16

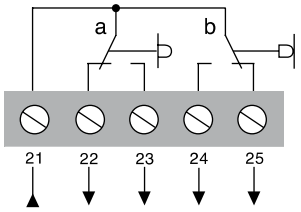
Working range S

Scale S	2	3	4	5	6	7	8	9	10
for Y1 (VDC)	2	3	4	5	6	7	8	9	10
for Y2 (mA)	4	6	8	10	12	14	16	18	20

M91xx-GGx-1N4 - *3/4 pages*

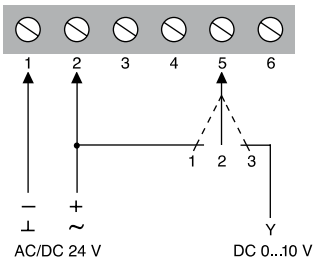
Proportional Actuators AC/DC 24 V - Speed Version

Auxiliary Switches (S)



3(1.5)A, AC 230 V
Actuator at 0° position

Override Control



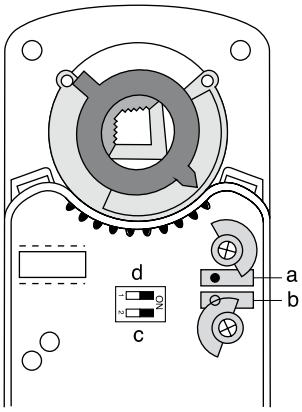
The actuator M91..-GG..-1N4 can be forced to override control when wired in accordance with the diagram.

Switch position:
1 = Actuator runs at 10 V
2 = Actuator runs at 0(2) V
3 = Automatic control

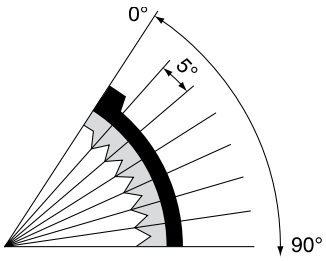
Settings the auxiliary switches

Factory setting:
Switch **a** at 10°
Switch **b** at 80°

The switching position can be manually changed to any required position by turning the ratchet.

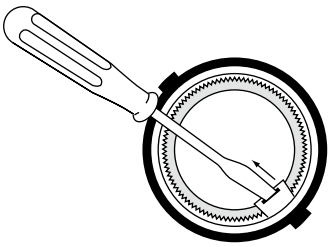


Limitation of Rotation Angle



The limitation or rotation angle can be set in 5° steps by moving the adapter.

Adapter release



The adapter can be remove simply by pressing the adapter clip on the underside of the actuator.

M91xx-GGx-1N4 - *4/4 pages*

Page 88

Proportional Actuators AC/DC 24 V - Speed Version

Technical Specifications

Actuator	M9108-GGx-1N4	M9116-GGx-1N4
Torque	8 Nm	16 Nm
Damper area*	1.5 m²	3.0 m²
Running Time OPEN	8 s	16 s
Running Time CLOSE	8 s	16 s
Supply Voltage	AC/DC 24 V	
Frequency	50-60 Hz	
Power Consumption		
- Running	6.0 W	
- At end position	0.6 W	
Dimensioning	15.0 VA / 3.6 A @ 2 ms	
Working area Y	not adjustable	
Control Signal Y1	DC 0(2)... 10 V	
Imput resistance Y1	Ri 250 Ω	
Control Signal Y2	0(4)...20 mA	
Imput resistance Y2	Ri 388 Ω	
Position signal U	DC 0...10 V	
Load resistance	> 50 kΩ	
Angle of rotation/Working range	90° (93°mech.)	
Angle of rotation/Limitation	5°...85° in 5° < steps	
Auxiliary Switches	3(1.5) A, AC 230 V	
- S1 setting range	5°...85° < adjustable	
- S2 setting range		
Cable	1 m halogen-free	
- Motor	5-Wire 1-2-4-5-6	
- Switches	5-Wire 21-22-23-24-25	
Life time	60.000 rotations	
Noise level	45 dB (A)	
Protection Class	II	
Degree of Protection	IP 54	
Mode of Action	Type 1	
Ambient conditions		
- Operating temperature	-20...+50 °C / IEC 721-3-3	
- Storage temperature	-30...+60°C / IEC 721-3-2	
- Humidity	5...95% r.F. no condensed	
Weight	1.1 Kg	
Service	Maintenance-free	
Standards		
- Mechanics	EN 60 529 / EN 60 730-2-14	
- Electronics	EN 60 730-2-14	
- EMC Emissions	EN 50 081-1:92 / IEC 61000-6-3:96	
- EMC Immunity	EN 50 082-2:95 / IEC 61000-6-2:99	

***Caution:** Please note damper manufacturer's information concerning the open/close torque.

Ordering Codes

Codes	Descriptions
M9108-GGA-1N4	AC/DC 24 V
M9108-GGC-1N4	AC/DC 24 V, with 2 auxiliary switches
M9116-GGA-1N4	AC/DC 24 V
M9116-GGC-1N4	AC/DC 24 V, with 2 auxiliary switches

M91xx-GAx-1 - *1/3 pages*

Page 89

Proportional Current Controlled Damper-Actuators (110 VAC)

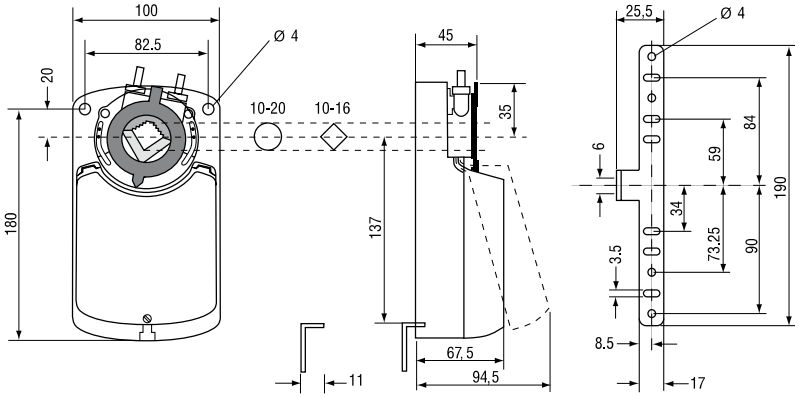
The electric actuators have been specially designed for use with medium and large air dampers.

Thanks to their very small size and clever construction they are ideal for applications where space is limited.

A key feature of the design is the Johnson Controls stem adapter which also incorporates angle-of-rotation limiting and position indication.

Features

- 0(4)...20 mA control
- Paralleling of up to 5 actuators possible
- Screw terminal connections
- Universal adapter for:
  Round shafts from 10...20 mm Ø
  Square shaft from 10...16 mm
- Direction of rotation selection
- Angle-of rotation limiting
- Manual control by pushbutton
- 2 floating auxiliary switches
- Power saving at end stops
- Shaft min. length 48 mm

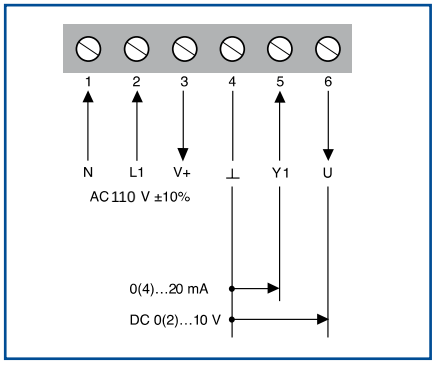


Dimensions in mm

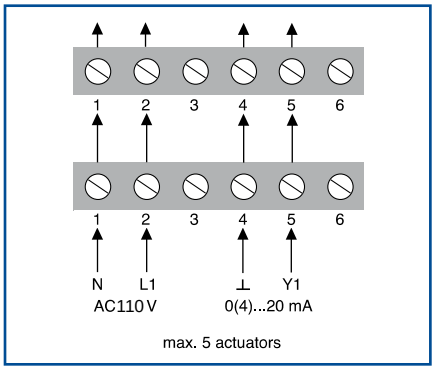
M91xx-GAx-1 - *2/3 pages*

Proportional Current Controlled Damper-Actuators (110 VAC)

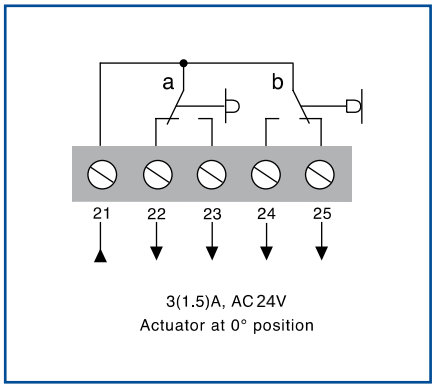
Wiring Diagram



Parallel Connections



Auxiliary Switches (S)



Angle of rotation

The limitation or rotation angle can be set in 5° steps by moving the adapter.

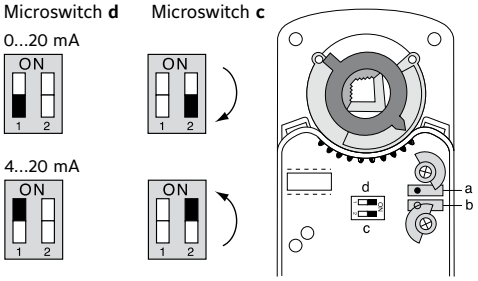
The adapter can be removed simply by pressing the adapter clip on the underside of the actuator.

Setting the control Signal

Control signal Y1	0(4)...20 mA
Input resistance	Ri 100 kΩ
Position signal U	DC 0...2...10 V
Load resistance	> 50 kΩ

Switching microswitch **d1** to the ON position, will change the control signal to 4...20 mA.

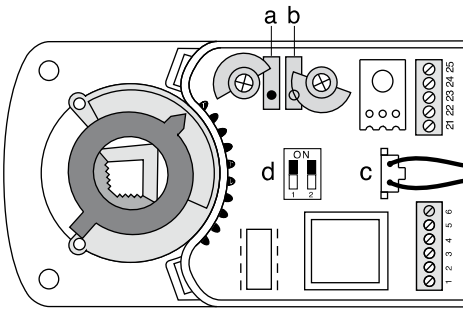
Changing the direction of rotation



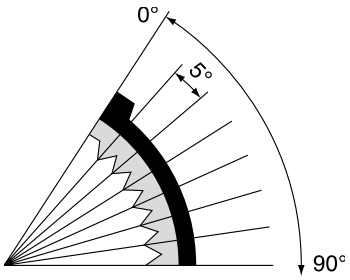
Setting the auxiliary switches

Factory setting:
Switch a at 10°
Switch b at 80°

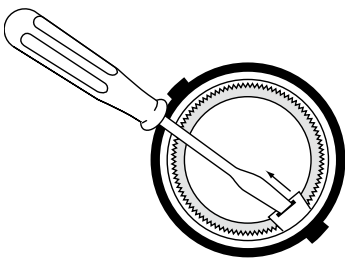
The switching position can be manually changed to any required position by turning the ratchet.



Limitation of rotation Angle



Adapter release



Johnson Controls

M91xx-GAx-1 - *3/3 pages*

Proportional Current Controlled Damper-Actuators (110 VAC)

Technical Specifications

Actuator	M9108-GAx-1	M9116-GAx-1	M9124-GAx-1
Drive torque	8 Nm	16 Nm	24Nm
Damper area approx.	1.5 m²	3.0 m²	4.5 m²
Running time	30...45 s	80...110 s	125...160 s
Power supply	110 VAC		
Frequency	50-60 Hz		
Power consumption:			
- Operating	5.5 W		
- At end stops	0.6 W		
For wire gauge	6.0 VA / 0.1 A @ 2 ms		
Control signal Y1	0(4)...20 mA / Ri > 100 k Ω		
Position signal U	0(2)...10 VDC / Ri > 50 k Ω		
Angle of rotation			
- Working range	90° (93° mech.)		
- Limiting	5°...85° in 5° steps		
Auxiliary switch rating	3 (1.5) Amp 24 V		
Noise level	45 dB (A)		
Protection class	II		
Enclosure	IP 54 (cable downwards)		
Ambient operating temperature	-20...50 °C		
Ambient storage temperature	-30...70 °C		
Ambient humidity	5...95% r.F. non-condensing		
Weight	1.2 Kg		
Maintenance	Maintenance-free		
Standards			
- Mechanics	EN 60 529 / EN 60 730-2-14		
- Electronics	EN 60 730-2-14		
- EMC Emissions	EN 50 081-1:92 / IEC 61000-6-3:96		
- EMC Immunity	EN 50 082-2:95 / IEC 61000-6-2:99		

***Caution:** Please note damper manufacturer's information concerning the open/close torque.

Ordering Codes

Codes	Descriptions
M91xx-GAA-1	Damper actuator 110 VAC
M91xx-GAC-1	Damper actuator 110 VAC with 2 adjustable auxiliary switches

M9116-AAx-1- *1/3 pages*

Page 92

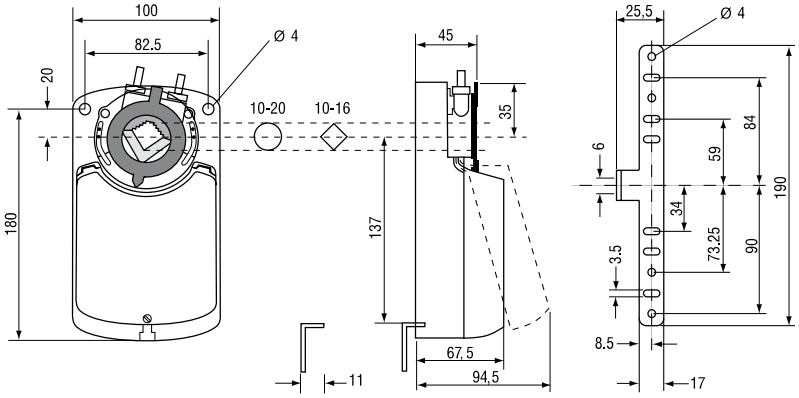
ON/OFF and Floating Electric Damper-Actuator (110 VAC)

The electric actuators have been develped to adjust dampers in ventilation and air conditioning systems.

Due to their very small size, and the universal adapter with agle of rotation limiting, these actuators are highly versatile.

Features

- ON/OFF and floating control
- Paralleling of up to 5 actuators possible
- Screw terminal connections
- Universal adapter for:
  Round shafts from 10...20 mm Ø
  Square shaft from 10...16 mm
- Direction of rotation selection
- Angle-of rotation limiting
- Manual control by pushbutton
- 2 floating auxiliary switches
- Power saving at end stops
- Shaft min. length 48 mm

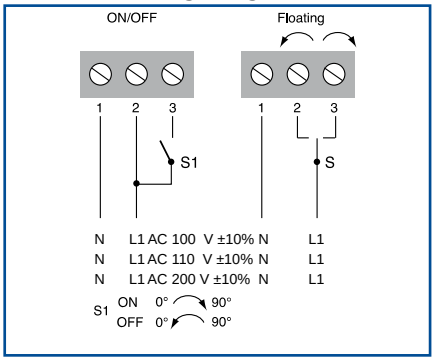


Dimensions in mm

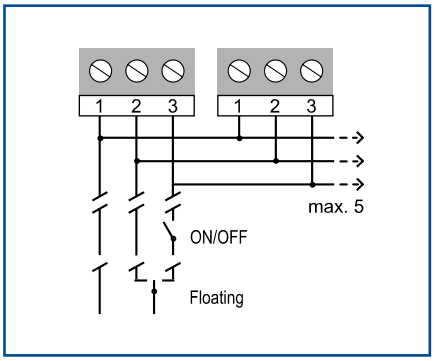
M9116-AAx-1 - *2/3 pages*

ON/OFF and Floating Electric Damper-Actuator (110 VAC)

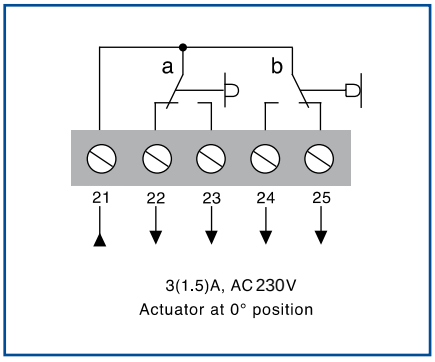
Wiring Diagrams



Parallel Connections



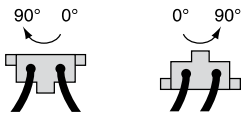
Auxiliary Switches (S)

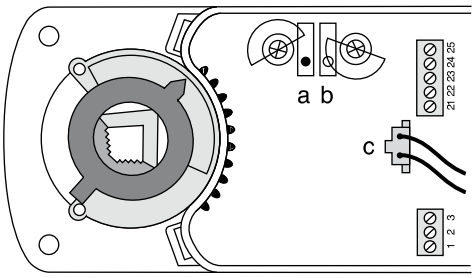


Changing the direction of rotation

The direction of rotation can be changed by reversing plug **c.**

Factory setting:

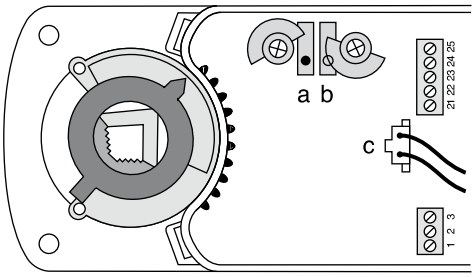




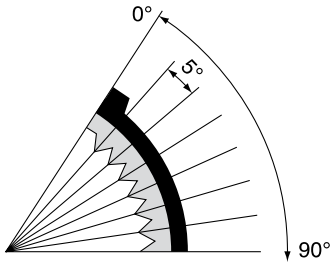
Setting the auxiliary switches

Factory setting:
Switch **a** at 10°
Switch **b** at 80°

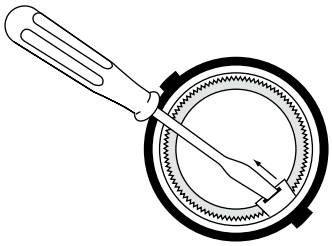
The switching position can be manually changed to any required position by turning the ratchet.



Limitation of rotation angle



Adapter release



M9116-AAx-1 - *3/3 pages*

ON/OFF and Floating Electric Damper-Actuator (110 VAC)

Technical Specifications

Actuator	M9116-AAx-1
Drive torque	16 Nm
Damper area approx.	3 m^2
Running time	80...110 s
Power supply	110 VAC
Frequency	50 Hz
Power consumption:	
- Operating	5.5 W
- At end stops	1.0 W
For wire gauge	6.5 VA / 0.1 A @ 2 msec
Control signal	ON/OFF and Floating
Position signal	Potentiometer
Angle of rotation	
- Working range	90° (93° mech.)
- Limiting	5°...85° in 5° steps
Auxiliary switch rating	3 (1.5) Amp 230 V
Service life approx.	60.000 cycles
Noise level	45 dB (A)
Protection class	II
Enclosure	IP 54 (cable downwards)
Ambient temperature range	-20...50 °C
Ambient humidity	5...95% r.F. non-condensing
Weight	1.1 Kg
Maintenance	Maintenance-free
Standards	
- Mechanics	EN 60 529 / EN 60 730-2-14
- Electronics	EN 60 730-2-14
- EMC Emissions	EN 50 081-1:92 / IEC 61000-6-3:96
- EMC Immunity	EN 50 082-2:95 / IEC 61000-6-2:99

***Caution:** Please note damper manufacturer's information concerning the open/close torque.

Ordering Codes

Codes	Descriptions
M91xx-AAC-1	Damper actuator 110 VAC with 2 adjustable auxiliary switches
M91xx-AAA-1	Damper actuator 110 VAC

S9208-BGC-33x / S9208-BDC-33x - *1/3 pages*

ON/OFF Electric Spring Return Actuator for Fire Damper

The Security Fire electric, Spring Return damper actuator series has been specially developed for the motorized operation of fire protection dampers.

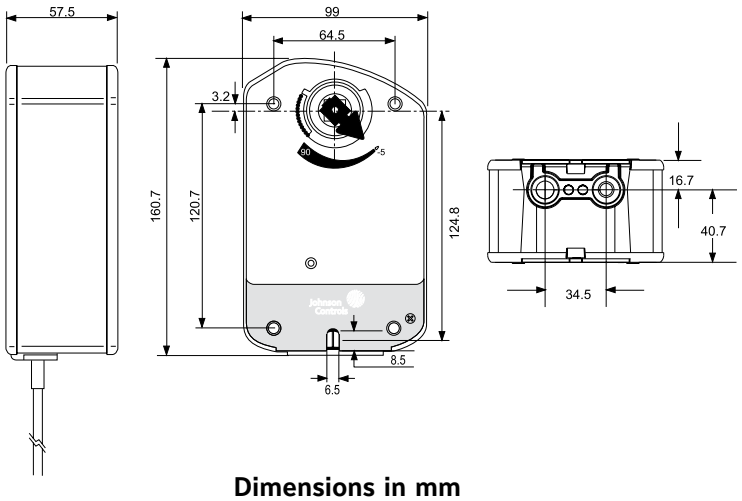
When the control signal is applied the actuator drives the damper to the operational position, while evenly tensioning the integrated spring.

After a power failure the stored energy in the spring immediately brings the damper to the safety position.

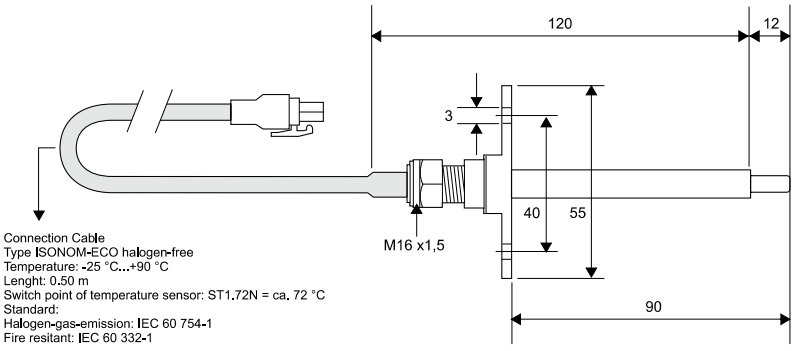
Manual operation is automatically cancelled when the actuator is in electrical operation.

Features

- 2-Point control signal
- 12 mm square shaft and 10 mm, 8 mm adapter inside the package
- Connection with halogen-free cable
- ST1.72N temperature sensor. Switch point of temperature sensor ca.72°C
- Actuator temperature sensor to monitor ambient sensor
- Low noise level
- Manual positioning with crank handle
- 2 fixed auxiliary switches (8° and 83°)



Dimensions in mm

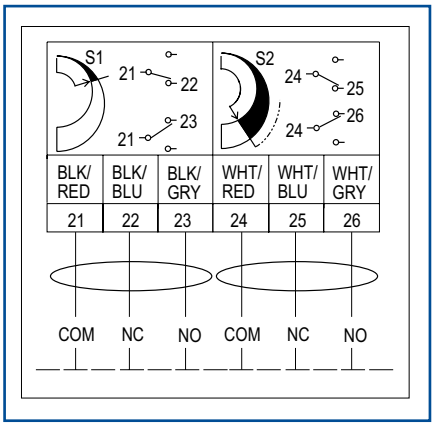


Thermal Fuse ST1.72N

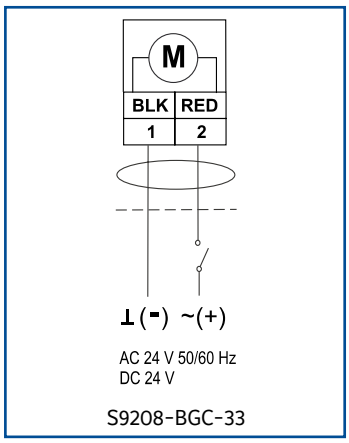
S9208-BGC-33x / S9208-BDC-33x - *2/3 pages*

ON/OFF Electric Spring Return Actuator for Fire Damper

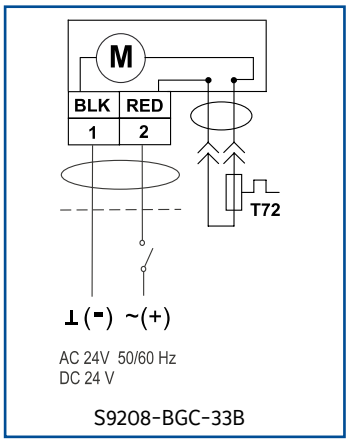
Auxiliary Switches (S)



ON/OFF Control Wiring Diagrams



S9208-BGC-33



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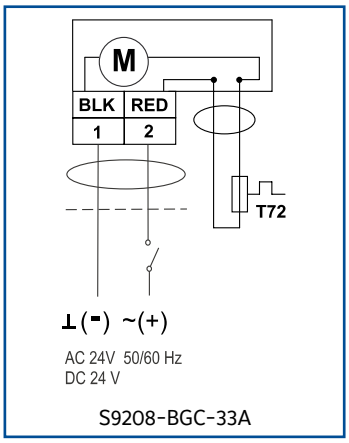

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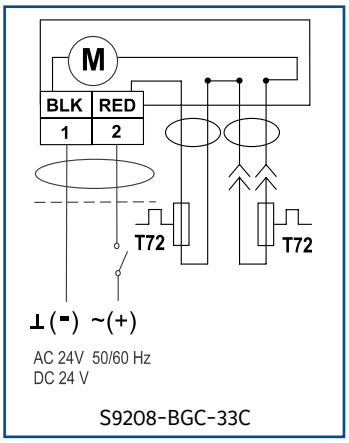

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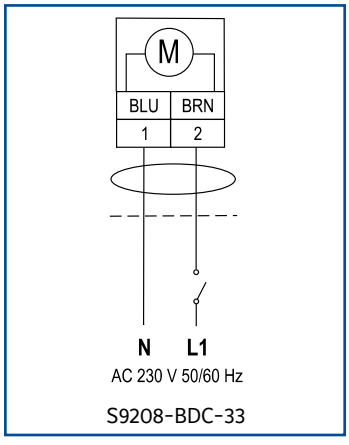

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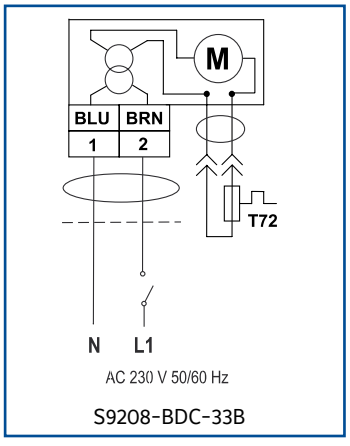

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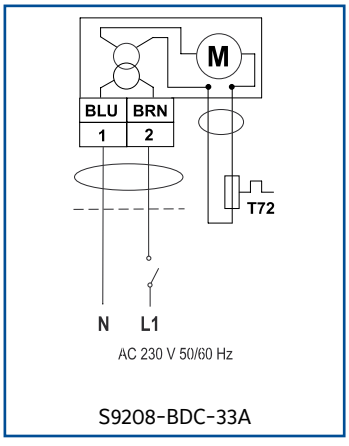
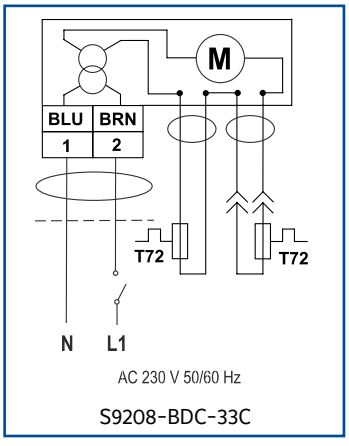


S9208-BDC-33A



S9208-BDC-33C

S9208-BGC-33x / S9208-BDC-33x - *3/3 pages*

ON/OFF Electric Spring Return Actuator for Fire Damper

Technical Specifications

Actuator	S9208-BGC-33x	S9208-BDC-33x
Action Control	ON/OFF	
Power Requirements	24 V AC at 50/60 Hz (AC 18 V to 30 V) 24 V DC (DC 21.6 V to 28.8 V)	230 V AC at 50/60 Hz (AC 198 to 264 V)
- Running (AC)	6.1 VA	9.2 VA
- Holding Position (AC)	1.2 VA	6.9 VA
- Running (DC)	3.5 W	---
- Holding Position (DC)	0.5 W	---
Transformer Sizing Requirements		
- Minimum per Actuator	7 VA	---
Auxiliary Switch Rating	Fix 8° and 83° Two Single-Pole, Double-Throw (SPDT), Double-Insulated Switches with Gold Flash Contacts: AC 24 V, 50 VA Pilot Duty; AC 240 V, 5.0 A Resistive, 1/4 hp, 275 VA Pilot Duty	
Spring Return	Direction is Selectable with Mounting Position of Actuator: Side A, Actuator Face Away from Damper for CCW Spring Return; Side B, Actuator Face Away from Damper for CW Spring Return	
Rated Torque		
- Power On (Running)	8 Nm at all operating temperatures	
- Power Off (Spring Running)	8 Nm at all operating temperatures	
Rotation Range	Maximum Full Stroke: 95 °	
Rotation Time for 95°		
- Power On (Running)	55 to 71 Seconds for 0 to 8 Nm Load, at All Operating Conditions 60 Seconds Nominal at Full Rated Load (0.251 rpm)	
- Power Off (Spring Returning)	13 to 26 Seconds for 0 to 8 Nm Load, at Room Temperature 21 Seconds Nominal at Full Rated Load 39 Seconds Maximum with 8 Nm load at -20° C	
Cycles	60,000 Full Stroke	
Audible Noise Rating		
- Power On (Running)	<47 dBA at 8 Nm Load, at a Distance of 1 m	
- Power On (Holding)	<20 dBA at a Distance of 1 m	
- Power Off (Spring Returning)	<52 dBA at 8 Nm Load, at a Distance of 1 m	
Electrical Connections		
- Actuator (all models)	1.2 m UL 758 Type AWM Halogen Free Cable with 0.85 mm² (18 AWG) conductors and 6 mm ferrule ends	
- Auxiliary Switches	1.2 m UL 758 Type AWM Halogen Free Cable with 0.85 mm² (18 AWG) conductors and 6 mm ferrule ends	
Mechanical Connections	12 mm square shaft, 10 mm and 8 mm adapter	
Enclosure Rating	IP 54 for all mounting orientations	
Ambient conditions		
Operating	-20 to 50° C; 90% RH Maximum, Non-condensing	
- Storage	-40 to 60° C; 95% RH Maximum, Non-condensing	
Shipping Weight	Models: S9208-BGC-33x: 1.7 kg Models: S9208-BDC-33x: 1.9 kg	
Dimensions	See figure	
CE **Compliance**	EMC Directive 2004/108/EC (Models: All) Low Voltage Directive 2006/95/EC (Models: All)	

Ordering Codes

S	9	2	0	8	-	B	x	C-33	x	ON/OFF Electric Spring Return Actuator for fire damper
									-	- = without sensor A = with ambient thermosensor B = with duct sensor C = with duct and ambient sensors
										G = 24 V AC/DC D = 230 VAC

S9210-BxC-xxx / S9220-BxC-xxx - *1/3 pages*

ON/OFF Spring Return Actuator for Fire Damper

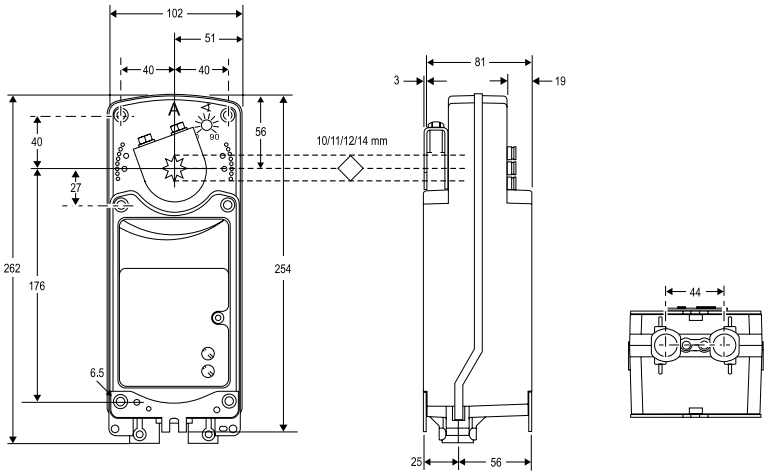
The security fire electric, Spring Return damper actuator series has been specially developed for the motorized operation of fire protection dampers.

When the control signal is applied the actuator drives the damper to the operational position, while evenly tensioning the integrated spring. After a power failure the stored energy in the spring immediately brings the damper to the safety position.

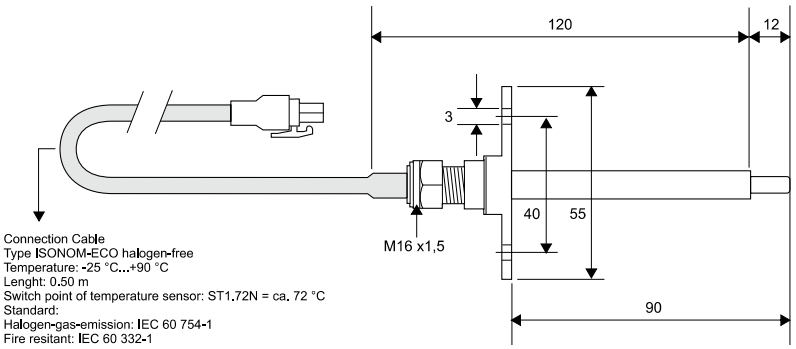
Manual operation is automatically cancelled when the actuator is in electrical operation.

Features

- 2-Point control signal
- 10/11/12/14 mm steel adapter for a square shaft
- Connection with halogen-free cable
- Direct connection of ST1.72E temperature sensor. Switch point of temperature sensor ca.72°C
- Actuator temperature sensor to monitor ambient sensor
- Low noise level
- Manual positioning with crank handle
- 2 fixed auxiliary switches(5° and 85°) *(See next page for settings)*



Dimensions in mm

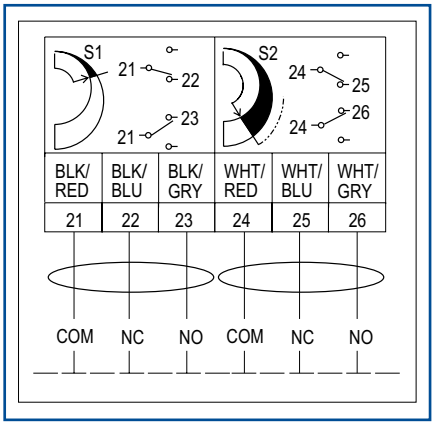


Thermal Fuse ST1.72E

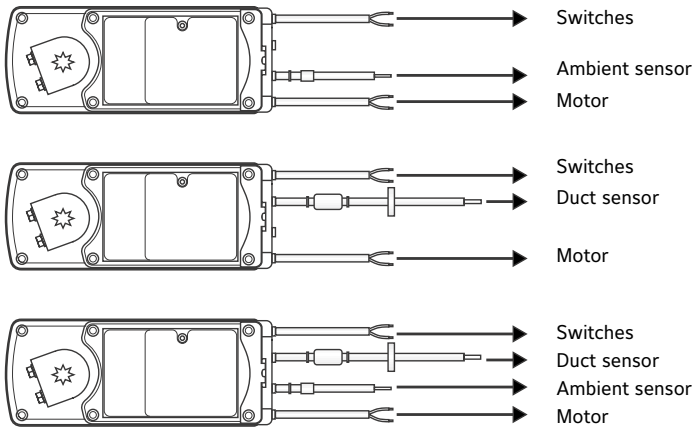
S9210-BxC-xxx / S9220-BxC-xxx *- 2/3 pages*

ON/OFF Spring Return Actuator for Fire Damper

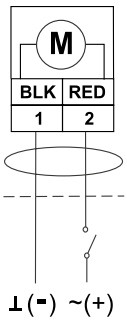
Auxiliary Switches (S)



Settings the auxiliary switches

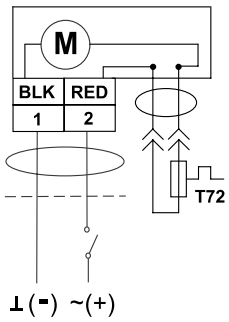


ON/OFF Control Wiring Diagrams



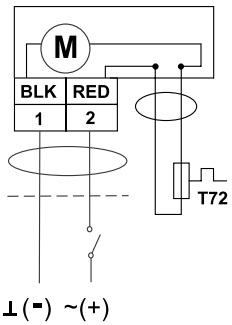
AC 24 V 50/60 Hz
DC 24 V

S9210-BGC-xx
S9220-BGC-xx



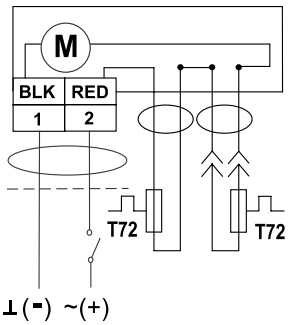
AC 24V 50/60 Hz
DC 24 V

S9210-BGC-xxB
S9220-BGC-xxB



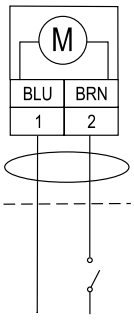
AC 24V 50/60 Hz
DC 24 V

S9210-BGC-xxA
S9220-BGC-xxA



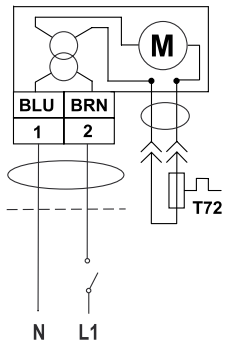
AC 24V 50/60 Hz
DC 24 V

S9210-BGC-xxC
S9220-BGC-xxC



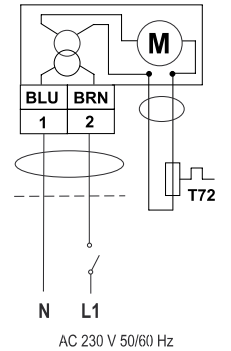
AC 230 V 50/60 Hz

S9210-BDC-xx
S9220-BDC-xx



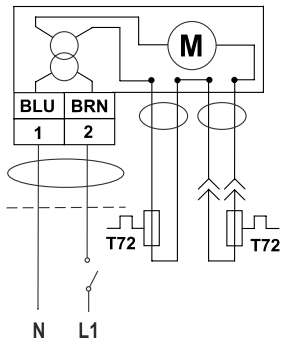
AC 230 V 50/60 Hz

S9210-BDC-xxB
S9220-BDC-xxB



AC 230 V 50/60 Hz

S9210-BDC-xxA
S9220-BDC-xxA



AC 230 V 50/60 Hz

S9210-BDC-xxC
S9220-BDC-xxC

S9210-BxC-xxx / S9220-BxC-xxx - *3/3 pages*

ON/OFF Spring Return Actuator for Fire Damper

Technical Specifications

Actuator	S9210-BGC-xxx	S9210-BDC-xxx	S9220-BGC-xxx	S9220-BDC-xxx
Torque	10 Nm	10 Nm	20 Nm	20 Nm
Damper area*	Per manufacturer's information			
Running time Motor	24...57 s			
Running time Spring return	10...15 s			
Supply Voltage	AC/DC 24V	AC 230 V	AC/DC 24V	AC 230 V
Frequency	50-60 Hz			
Power Consumption				
- Running AC	26 VA	0.12 VA	24.6 VA	0.15 A
- Running DC	15.6 W	---	17.6 W	---
- At end position AC	9.3 VA	0.09 A	5.4 VA	0.09 A
- At end position DC	2.6 W	---	2.8 W	---
Control signal	ON/OFF (2-Point)			
Position signal	None			
Angle of rotation				
- Working range	90°			
- Limitation	None			
Auxiliary Switches	3(1.5) A, AC 230 V			
- S1 setting range	5° fix			
- S2 setting range	85° fix			
Cable	1.2 m halogen-free			
- Motor	2-wire 1-2			
- Switches	6-wire 21-22-23-24-25-26			
Lifetime	60'000 Rotations			
Noise level	66 dB (A)			
Protection class	II			
Degree of protection	IP 54			
Mode of action	Type1			
Ambient conditions				
- Operating temperature	-40...+55 °C / IEC 721-3-3			
- Storage temperature	-65...+70 °C / IEC 721-3-2			
- Humidity	5...95% r.F. no condensed			
Service	Maintenance-free			
Standards				
- Mechanics	EN 60 529 / EN 60 730-2-14			
- Electronics	EN 60 730-2-14			
- EMC Emissions	EN 50 081-1:92 / IEC 61000-6-3:96			
- EMC Immunity	EN 50 082-2:95 / IEC 61000-6-2:99			

***Caution:** Please note damper manufacturer's information concerning the open/close torque.

Ordering Codes

S	9	2	10	-	B	D	C	-	31	A	ON/OFF actuator with 2 auxiliary switches
											- = without sensor A = with ambient thermosensor B = with duct sensor C = with duct and ambient sensors
											31 =10mm Couppler 32 =11mm Couppler 33 =12mm Couppler 34 =14mm Couppler
											D = 230Vac G = 24V AC/DC
											10 = 10Nm 20 = 20Nm

VA9104-AGA-xS / VA9104-IGA-xS - *1/3 pages*

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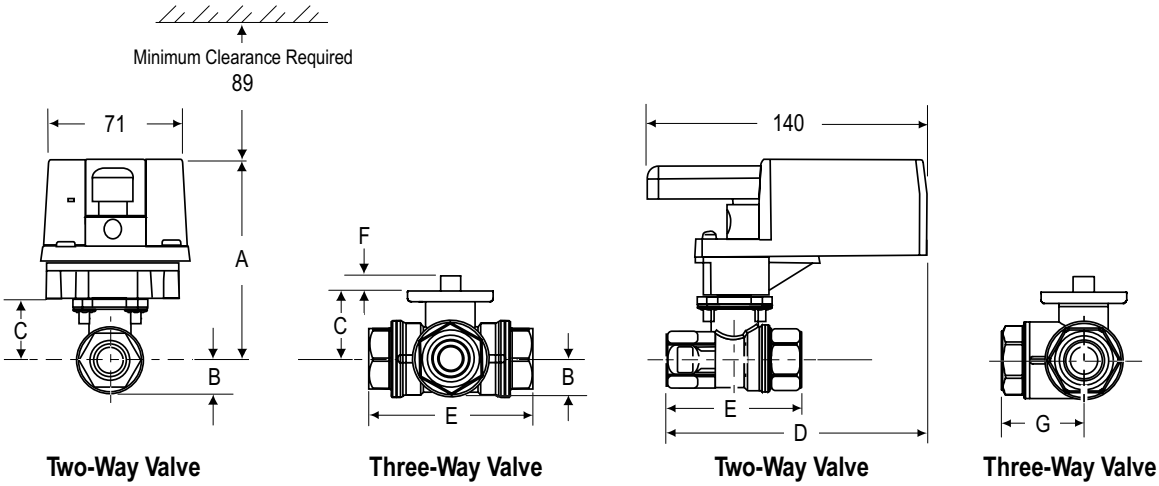
Floating Actuators

The VA9104 electric actuator series have been developped for the operation of ball valves.

These synchronous, motor-driven direct mountable actuators are used to provide accurate positioning on VG1000 series DN15, DN20 and DN25 ball valves.

Features

- Floating control with Timeout
- Load-independent running time
- Up to 5 actuators in parallel operation possible
- Manual release button
- 1.2 m. PVC cable or Terminal block



Two-Way Valve | Three-Way Valve | Two-Way Valve | Three-Way Valve

Dimensions in mm

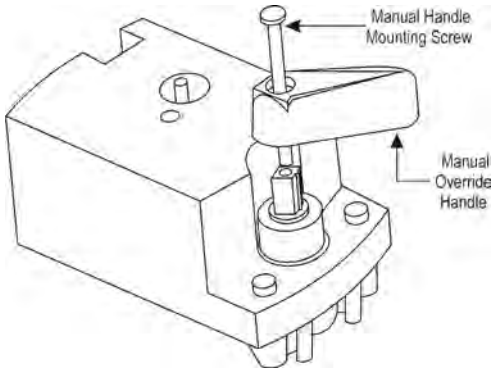
Valve Size (DN)*	A	B	C	D	E	F	G
DN15	98	17	31	129	64	9	32
DN20	98	17	31	133	71	9	36
DN25	100	19	33	141	87	9	43

Note: * On models with the flow-characterizing disk, the disk is located in Port A. Port A must be the Valve inlet.

VA9104-AGA-xS / VA9104-IGA-xS - *2/3 pages*

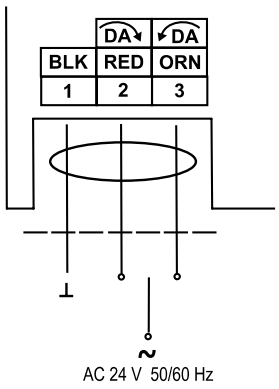
Floating Actuators

Mounting

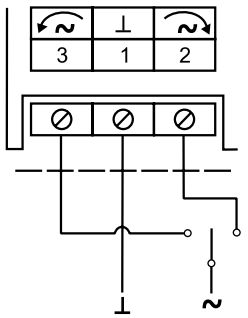


Wiring Diagrams

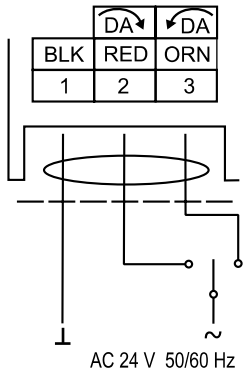
VA9104-AGA-1S



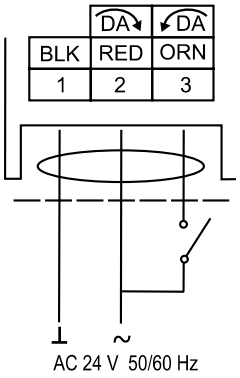
VA9104-AGA-5S



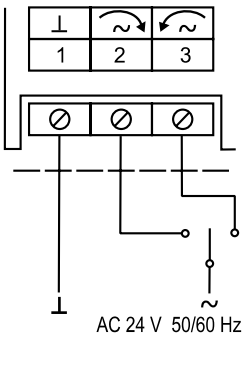
VA9104-IGA-1S - Floating



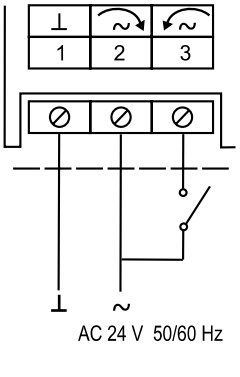
VA9104-IGA-1S - ON/OFF



VA9104-IGA-5S - Floating



VA9104-IGA-5S - ON/OFF



VA9104-AGA-xS / VA9104-IGA-xS - *3/3 pages*

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Floating Actuators

Technical Specifications

Actuator	VA9104-AGA-1S	VA9104-AGA-5S	VA9104-IGA-1S	VA9104-IGA-5S
Torque	4 Nm			
Valve size	DN15, DN20, DN25			
Running Time OPEN	72 s			
Supply Voltage	AC 24 V +25% -20%			
Frequency	50-60 Hz			
Power Requirement	2.1 VA		3.0 VA	
Control signal	Floating without Timeout	Floating without Timeout	ON/OFF and Floating with Timeout	
Position signal	None			
Angle of rotation/working range	93° < ± 3°			
Connection	1.2 PVC Cable	---	1.2 PVC Cable	---
Service Lifetime ca.	100.000			
Auxiliary Switches	None			
Noise Level	35 dB (A)			
Protection Class	II			
Degree of Protection	IP 42	IP 40	IP 42	IP 40
Ambient conditions				
- *Operating temperature*	-20...+60 °C			
- *Storage temperature*	-30...+65 °C			
- *Humidity*	5...95% r.F. no condensed			
Service	Maintenance-free			
Fluid Temperature Limits (Actuator and Valve Assembly)				
- *Water*	VG1201 and VG1801 Series Valves: -5 to 95 °C VG1205 and VG1805 Series Valves: -30 to 100 °C			
- *Steam*	Not Rated for Steam Service			
Weight	0.55 Kg			
CE Compliance				
- *EMC Directive*	89/336/EEC			

Ordering Codes

Codes	Descriptions
VA9104-AGA-1S	4 Nm, AC 24 V with 1,2 PVC cable
VA9104-AGA-5S	4 Nm, AC 24 V with Terminal block
VA9104-IGA-1S	4 Nm, AC 24 V with 1,2 PVC cable
VA9104-IGA-5S	4 Nm, AC 24 V with Terminal block

VA9104-GGA-xS - *1/3 pages*

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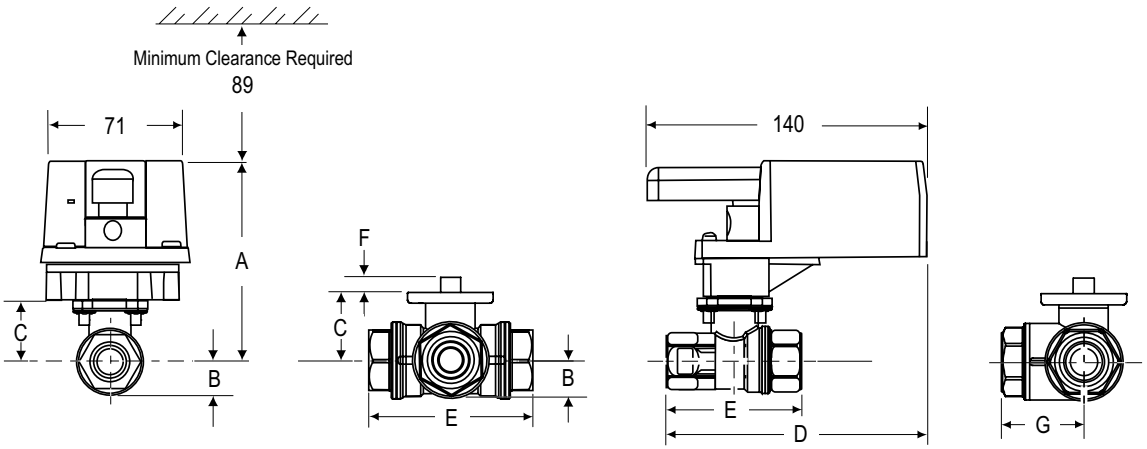
Proportional Actuators

The VA9104 electric actuator series have been developped for the operation of ball valves.

These synchronous, motor-driven direct mountable actuators are used to provide accurate positioning on VG1000 series DN15, DN20 and DN25 ball valves.

Features

- DC 0(2)...10 V or 0(4)...20 mA control signal with field furnished 500 Ω resistor
- Load-independent running time
- Up to 5 actuators in parallel operation possible
- 1.2 m PVC cable or Terminal block
- Selectable direction of rotation
- Manual release button
- Authomatic shut-off at end position



Two-Way Valve | Three-Way Valve | Two-Way Valve | Three-Way Valve

Dimensions in mm

Valve Size (DN)*	A	B	C	D	E	F	G
DN15	98	17	31	129	64	9	32
DN20	98	17	31	133	71	9	36
DN25	100	19	33	141	87	9	43

Note: * On models with the flow-characterizing disk, the disk is located in Port A. Port A must be the Valve inlet.

VA9104-GGA-xS - *2/3 pages*

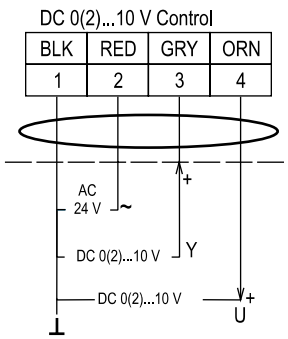
Proportional Actuators

Wiring Diagrams

VA9104-GGA-1S

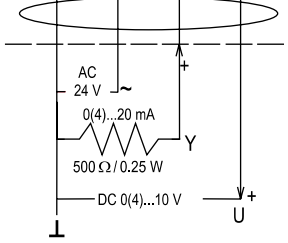
DC 0(2)...10 V Control

BLK	RED	GRY	ORN
1	2	3	4



0(4)...20 mA Control with External Resistor

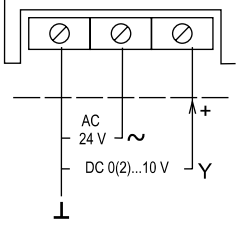
BLK	RED	GRY	ORN
1	2	3	4



VA9104-GGA-5S

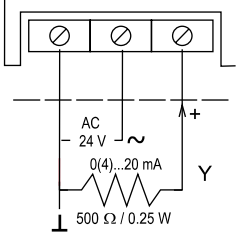
DC 0(2)...10 V Control

⊥	~	0(2)...10 V
1	2	3

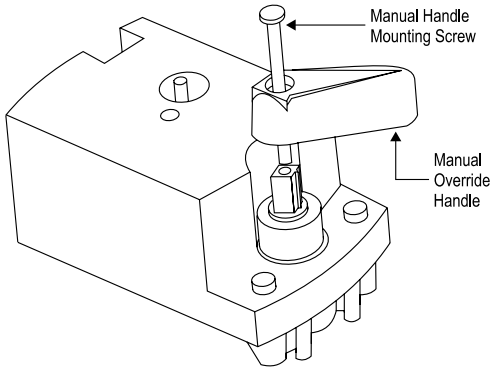


0(4)...20 mA Control with External Resistor

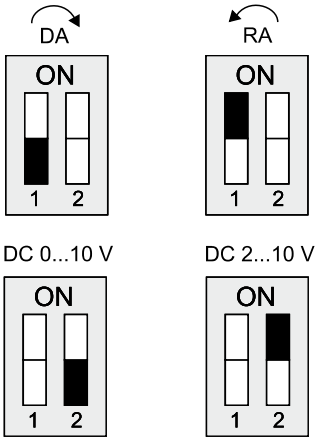
⊥	~	0(2)...10 V
1	2	3



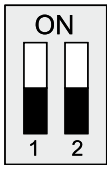
Mounting



Changing the Factory Settings



Factory setting



To change the factory setting, remove the actuator cover and adjust the switches on the circuit boards as figure.

VA9104-GGA-xS - *3/3 pages*

Proportional Actuators

Technical Specifications

Actuator	VA9104-GGA-1S	VA9104-GGA-5S
Torque	4 Nm	
Valve size	DN15, DN20, DN25	
Running Time	72 s	
Supply Voltage	AC 24 V +25% -20%	
Frequency	50-60 Hz	
Power Requirement	3.6 VA	
Control signal	DC 0(2)...10 V or 0(4)...20 mA	
Position signal	DC 0(2)...10 V	---
Angle of rotation/working range	90° (93° mech)	
Connection	1.2 m PVC cable	Terminal block
Service Lifetime ca.	100.000	
Auxiliary Switches	None	
Noise Level	35 dB (A)	
Protection Class	II	
Degree of Protection	IP 42	IP 40
Ambient conditions		
- Operating temperature	-20...+60 °C	
- Storage temperature	-30...+65 °C	
- Humidity	5...95% r.F. no condensed	
Service	Maintenance-free	
Fluid Temperature Limits (Actuator and Valve Assembly)		
- Water	VG1201 and VG1801 Series Valves: -5 to 95 °C VG1205 and VG1805 Series Valves: -30 to 100 °C	
- Steam	Not Rated for Steam Service	
Weight	0.55 Kg	
CE Compliance		
- EMC Directive	89/336/EEC	

Ordering Codes

Codes	Descriptions
VA9104-GGA-1S	4 Nm, AC 24 V with 1,2 PVC cable
VA9104-GGA-5S	4 Nm, AC 24 V with Terminal block

M9108-Axx-5 - *1/3 pages*

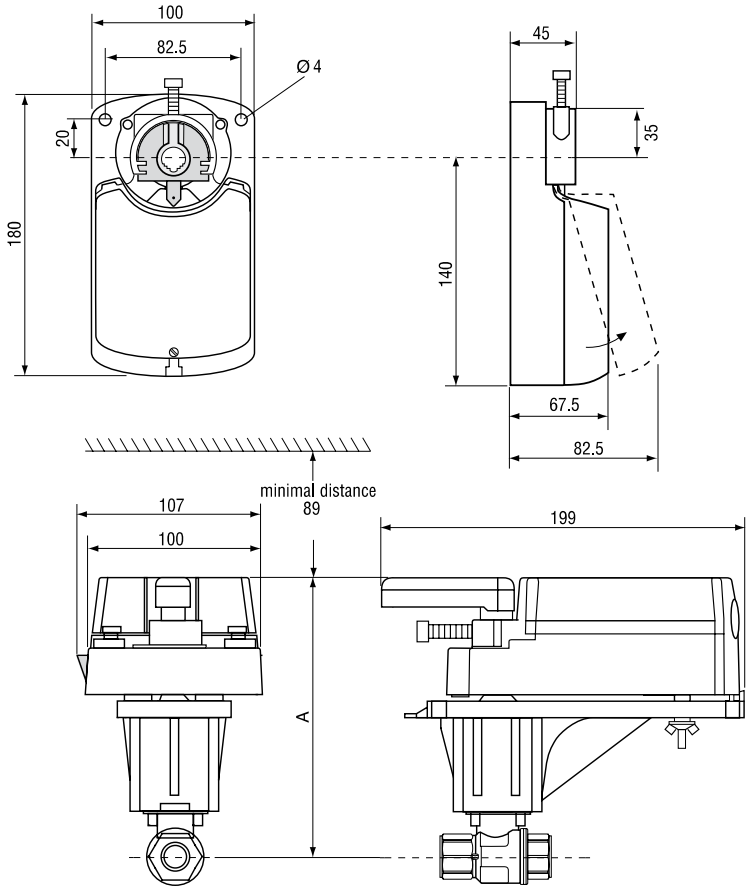
Page 107

ON/OFF and Floating Ball Valves Damper

These electric actuators are designed for operating VG1000 Ball Valves, by the means of the M9000-525-5 linkage kit.

Features

- ON/OFF or Floating control
- Load-independent running time
- Up to 5 actuators in parallel operation possible
- Plug-in terminal block connection
- Simple mount on valves with M-9000-525-5 linkage kit
- Selectable direction of rotation
- Manual release button
- 2 adjustable auxiliary switches
- Automatic shut-off at end position (overload switch)
- Customized versions available



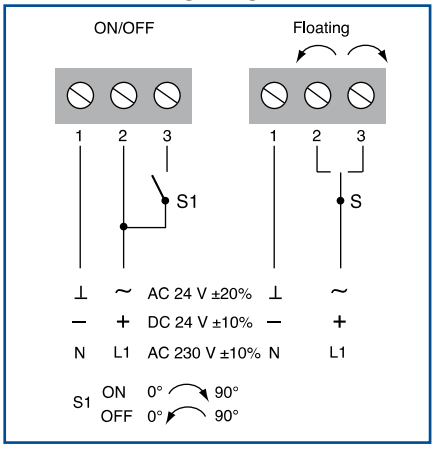
Type	A
DN15	160
DN20	160
DN25	162
DN32	173
DN40	177
DN50	182

Dimensions in mm

M9108-Axx-5 - *2/3 pages*

ON/OFF and Floating Ball Valves Damper

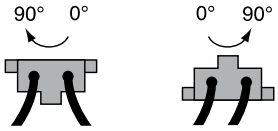
Wiring Diagrams



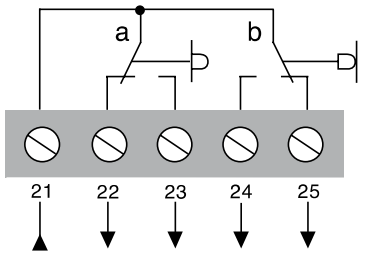
Changing the direction of rotation

The direction of rotation can be changed by reversing plug **c**.

Factory setting:



Auxiliary Switches (S)

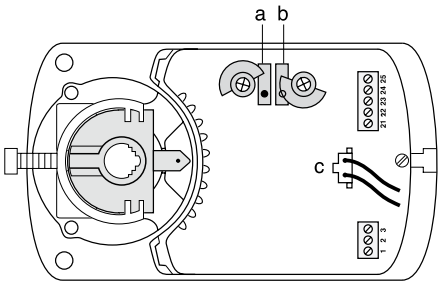


3(1.5)A, AC 230 V
Actuator at 0° position

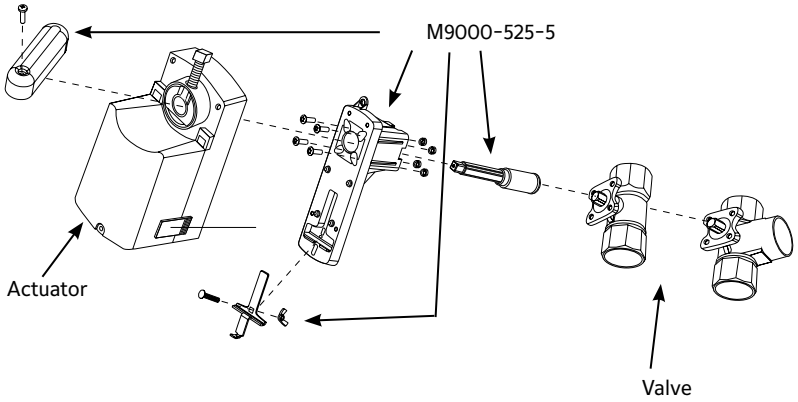
Setting the auxiliary switches

Factory setting:
Switch a at 10°
Switch b at 80°

The switching position can be manually changed to any required position by turning the ratchet.



Mounting Instruction onto Ball Valves



M9108-Axx-5 - *3/3 pages*

ON/OFF and Floating Ball Valves Damper

Technical Specifications

Actuator	M9108-AGx-5	M9108-ADx-5
Torque	8 Nm	
Running Time OPEN	30 s	
Running Time CLOSE	30 s	
Supply Voltage	AC/DC 24 V	AC 230 V
Frequency	50-60 Hz	
Power Consumption		
- Running	2.5 W	3.0 W
- At end position	0.5 W	
Dimensioning	5.0 VA / 3.4 A @ 2 ms	3.6 VA / 0.25 A @ 2 ms
Control Signal	ON/OFF or Floating	
Position Signal	None	
Angle of rotation/Working range	90° (93°mech.)	
Angle of rotation/Limitation	None	
Auxiliary Switches	2 x SPDT	
- S1 setting range	5°...85° < adjustable	
- S2 setting range		
Cable	1.0 m halogen-free	
- Motor	3-Wire 1-2-3	
- Switches	5-Wire 21-22-23-24-25	
Life time	60.000 rotations	
Noise level	45 dB (A)	
Protection Class	II	
Degree of Protection	IP 54	
Mode of Action	Type 1	
Ambient conditions		
- Operating temperature	-20...+50 °C	
- Storage temperature	-30...+60°C	
- Humidity	5...95% r.F. no condensed	
Weight	1.1 Kg	
Service	Maintenance-free	
CE Compliance	89/336 EEC: EN61000-6-2, EN61000-6-3, 72/73 EEC: EN60730	

Ordering Codes

Codes	Descriptions
M9108-AGA-5	AC/DC 24 V with cable
M9108-AGC-5	AC/DC 24 V, with 2 auxiliary switches and cable
M9108-ADA-5	AC 230 V with cable
M9108-ADC-5	AC 230 V, with 2 auxiliary switches and cable

M9108-GGx-5 - *1/3 pages*

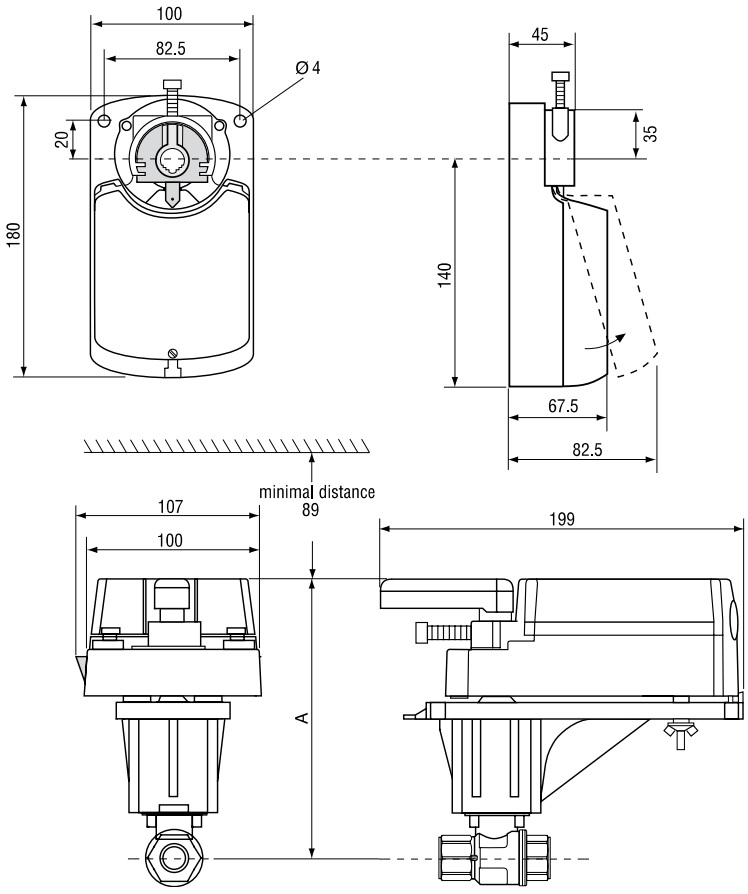
Page 110

Proportional Ball Valves Actuators AC/DC 24 V

These electric actuators are designed for operating VG1000 Ball Valves, by the means of the M9000-525-5 linkage kit.

Features

- DC 0(2)...10 V or 0(4)...20 mA control signal
- Up to 5 actuators in parallel operation possible
- Plug-in terminal block connection
- Simple mount on valves with M-9000-525-5 linkage kit
- Selectable direction of rotation
- Manual release button
- 2 adjustable auxiliary switches
- Automatic shut-off at end position (overload switch)

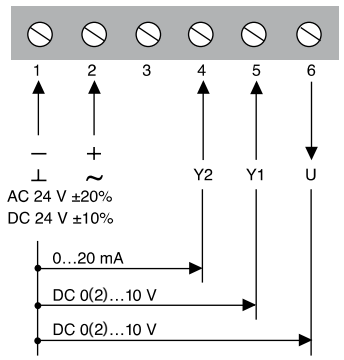


Type	A
DN15	160
DN20	160
DN25	162
DN32	173
DN40	177
DN50	182

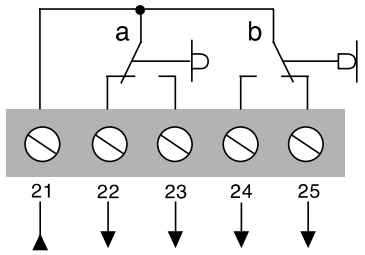
M9108-GGx-5 - *2/3 pages*

Proportional Ball Valves Actuators AC/DC 24 V

Wiring Diagram

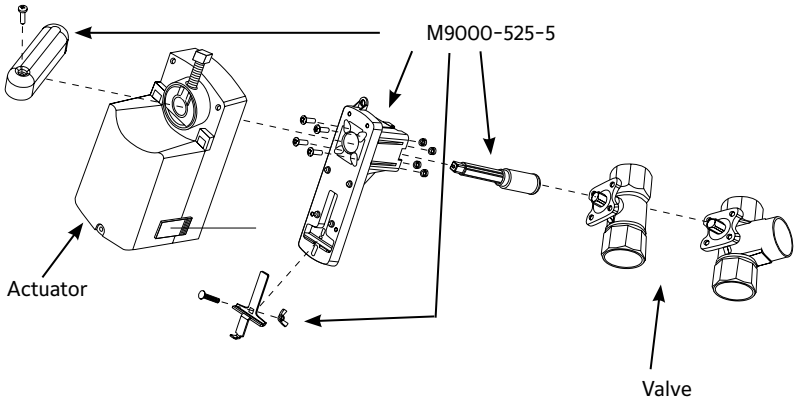


Auxiliary Switches (S)



3(1.5)A, AC 230 V
Actuator at 0° position

Mounting Instruction onto Ball Valve



Setting Span and OFFSET

The potentiometers **O** and **S** help to match control signals Y1 and Y2 to any make of controller.

Example 1

Control signal Y1 working between DC 2...10 V

Setting: Starting point O = 2
working range S = 8

Example 2

Control signal Y2 working between 6...18 mA

Setting: Starting point O = 3
Working range S = 6

Start point O

Scale O	0	1	2	3	4	5	6	7	8
for Y1 (VDC)	0	1	2	3	4	5	6	7	8
for Y2 (mA)	0	2	4	6	8	10	12	14	16

Working range S

Scale S	2	3	4	5	6	7	8	9	10
for Y1 (VDC)	2	3	4	5	6	7	8	9	10
for Y2 (mA)	4	6	8	10	12	14	16	18	20

Setting the control Signal

Control signal Y1 DC 0...10 V
Input resistance Ri 250 kΩ

Control signal Y2 0...20 mA
Input resistance Ri 388 Ω

Position signal U DC 0...10 V
Load resistance > 50 kΩ

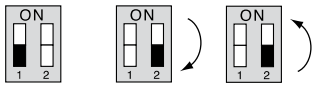
By switching microswitch **d** to ON position, the control signal Y1 or Y2 will be adapted to the chosen angle of rotation.

By switching microswitch **c** the direction of rotation can be changed.

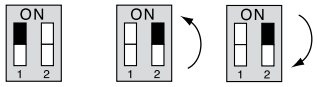
Microswitch **d** Self-adapting

Microswitch **c**

Dectivated



Activated



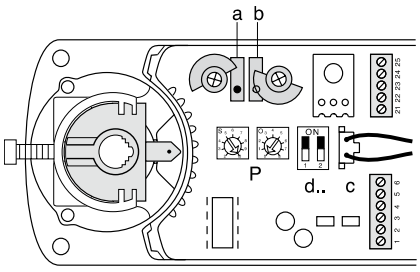
M9116
M9124

M9108

Setting the auxiliary switches

Factory setting:
Switch a at 10°
Switch b at 80°

The switching position can be manually changed to any required position by turning the ratchet.



Johnson Controls

M9108-GGx-5 - *3/3 pages*

Proportional Ball Valves Actuators AC/DC 24 V

Technical Specifications

Actuator	M9108-GGx-5
Torque	8 Nm
Running Time OPEN	30 s
Running Time CLOSE	30 s
Supply Voltage	AC/DC 24 V
Frequency	50-60 Hz
Power Consumption	
- Running	2.5 W
- At end position	0.3 W
Dimensioning	6.0 VA / 3.6 A @ 2 ms
Working area Y	Adjustable
Control Signal Y1	DC 0(2)...10 V
Input resistance Y1	Ri 250 Ω
Control signal Y2	0(4)...20 mA
Input resistance Y2	Ri 388 Ω
Position signal U	DC 0...10 V
Load resistance	>50 kΩ
Angle of rotation/Working range	90° (93°mech.)
Angle of rotation/Limitation	None
Auxiliary Switches	2 x SPDT
- S1 setting range	5°...85° < adjustable
- S2 setting range	
Cable	1.0 m halogen-free
- Motor	5-Wire 1-2-4-5-6
- Switches	5-Wire 21-22-23-24-25
Life time	60.000 rotations
Noise level	45 dB (A)
Protection Class	II
Degree of Protection	IP 54
Mode of Action	Type 1
Ambient conditions	
- Operating temperature	-20...+50 °C
- Storage temperature	-30...+60°C
- Humidity	5...95% r.F. no condensed
Weight	1.1 Kg
Service	Maintenance-free
CE **Compliance**	89/336 EEC: EN61000-6-2, EN61000-6-3, 72/73 EEC: EN60730

Ordering Codes

Codes	Descriptions
M9108-GGA-5	AC/DC 24 V with cable
M9108-GGC-5	AC/DC 24 V, with 2 auxiliary switches and cable

M9206-xxx-5S - *1/3 pages*

Page 113

Electric Spring Return Actuators

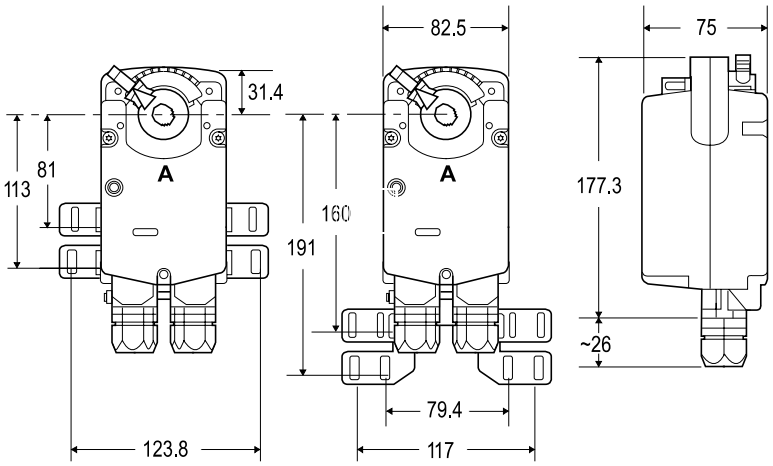
The M9206-xxx-5S Series Actuators are direct-mount, spring return electric actuators intended for use with ON/OFF, Floating or Proportional controllers.

BGx models operate on AC 24 V power, AGx and GGx models operate on AC/DC 24 V power, and BDx models operate on AC 230 V power. These bidirectional actuators are to be mounted onto Johnson Controls VG1000 Series Forged Brass Ball Valves using the M9000-520-5 Ball Valve Linkage Kit.The M9206-xxx-5S Series Electric Spring Return Actuators provide a running torque of 6 Nm.

The rotation range is mechanically adjustable. An integral line voltage auxiliary switch is available on the M9206-xxB models to indicate end-stop position, or to perform switching functions within the selected rotation range. Position feedback is provided on proportional control models through a proportional DC voltage signal.

Features

- Automatic Stroke Calibration at Installation.
- Reversible Mounting Design.
- Electronic Stall Detection Throughout Entire Rotation Range
- Removable Coupler
- Integral Auxiliary Switch (xxB Models)
- 24 VAC, 24 VAC/VDC and 230 VAC Power Options; 0(2)...10 VDC and 0(4)... 20 mA Input Signal Options
- Ambient Operating Temperature Limits of -32 to 60°C



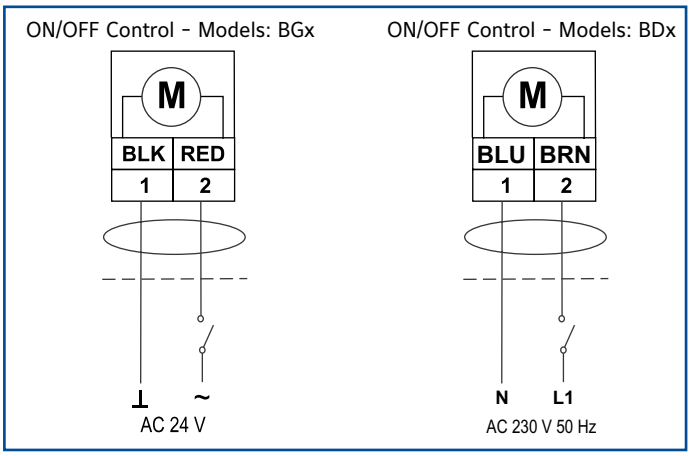
Dimensions in mm

M9206-xxx-5S - *2/3 pages*

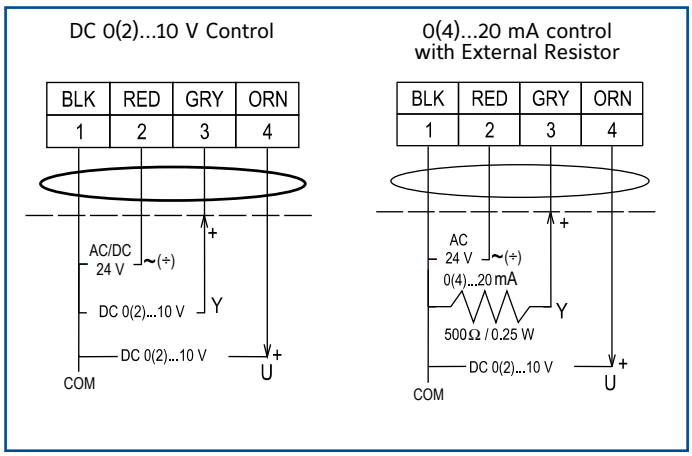
Electric Spring Return Actuators

Wiring Diagrams

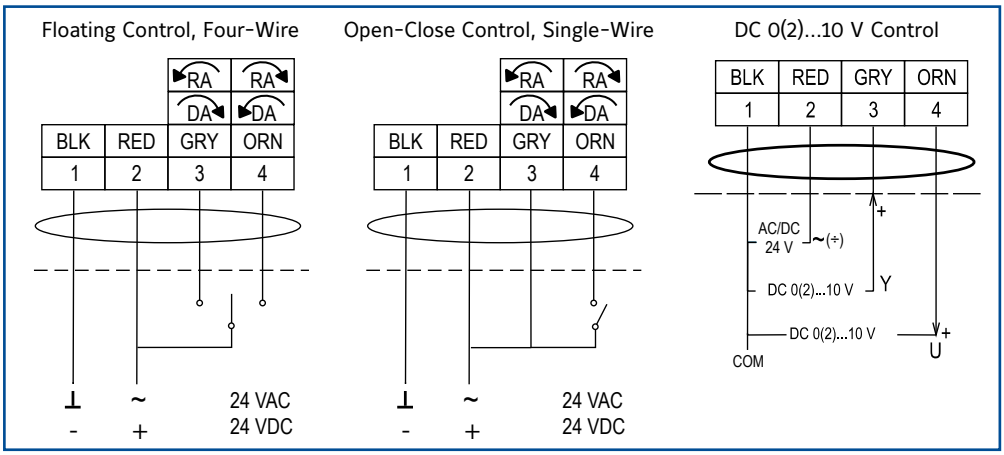
M9206-Bxx-5S Models



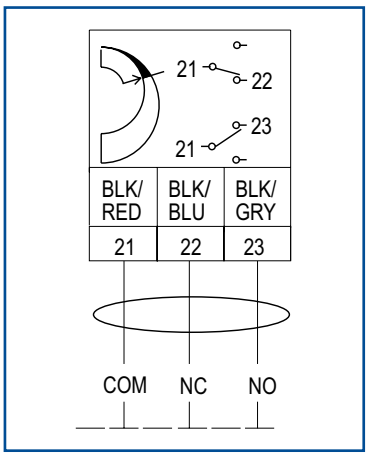
Proportional Control M9206-GGx-5S Models



M9206-Axx-5S Models



Auxiliary Switch for all M9206-xxB-5S Models



Ordering Codes

Codes	Descriptions
M9206-AGA-5S	Floating or ON/OFF, Input signal 24 VAC/VDC, Power Requirement 24 VAC/VDC
M9206-AGB-5S	Floating or ON/OFF, Input signal 24 VAC/VDC, Power Requirement 24 VAC/VDC, 1 Auxiliary switch
M9206-BDA-5S	ON/OFF, Input signal 230 VAC, Power Requirement 230 VAC
M9206-BDB-5S	ON/OFF, Input signal 230 VAC, Power Requirement 230 VAC, 1 Auxiliary switch
M9206-BGA-5S	ON/OFF, Input signal 24 VAC, Power Requirement 24 VAC
M9206-BGB-5S	ON/OFF, Input signal 24 VAC, Power Requirement 24 VAC, 1 Auxiliary switch
M9206-GGA-5S	Proportional, Input signal 0(2)...10 VDC, Power Requirement 24 VAC/VDC, Feedback signal 0(2)...10 VDC
M9206-GGB-5S	Proportional, Input signal 0(4...20 mA*, Power Requirement 24 VAC/VDC, Feedback signal 0(2)...10 VDC, 1 Auxiliary switch

M9206-xxx-5S - *3/3 pages*

Electric Spring Return Actuators

Technical Specifications

Actuator	M9206-AGx-5S	M9206-BGx-5S	M9206-BDx-5S	M9206-GG-5S
Power Requirements	AC 24 V ±25% at 50/60 Hz DC 24 V ±10%		AC 230 V ±10% at 50 Hz	AC 24 V ±25% at 50/60 Hz DC 24 V ±10%
- Class	2 or SELV		---	2 or SELV
- Running (AC)	8.0 VA	9.8 VA	11.0 VA	12.0 VA
- Holding Position (AC)	6.0 VA	5.8 VA	9.2 VA	5.0 VA
- Running (DC)	5.6 W	---	---	5.6 W
- Holding Position (DC)	2.2 W	---	---	2.2 W
Transformer Sizing Requirements	14 VA Minimum per Actuator			
Input Signal	24 V ±25% at 50/60 Hz or DC 24 V ±10%, Class 2 or SELV	24 V ±25% at 50/60 Hz, Class 2 or SELV	230 V ±10% at 50 Hz	0(2)...10 VDC or 0(4)...20 mA with Field Furnished 500 O Resistor
Input Signal Adjustments	---	---	---	Factory Set at 0...10 VDC, CW Rotation with Signal Increase; Selectable 0(2)...10 VDC or 0(4)...20 mA with Field Furnished 500 O Resistor; Switch Selectable Direct or Reverse Action with Signal Increase
Control Input Impedance	---	---	---	Voltage Input: 200 kO; Current Input: 500 O with Field Furnished 500 O Resistor
Feedback Signal	---	---	---	0(2)...10 VDC for Desired Rotation Range Up to 90°; 10 VDC at 2 mA with Field Furnished 500 O Resistor; Corresponds to Input Signal Selection and Rotation Limits
Auxiliary Switch Rating (xxB Models)	One Single-Pole, Double-Throw (SPDT), Double-Insulated Switch; 24 VAC, 50 VA Pilot Duty; 230 VAC, 2.9 A Inductive, 5.0 A Resistive, 1/4 hp, 275 VA Pilot Duty			
Spring Return	Direction is Selectable with Mounting Position of Actuator: CCW Actuator Face Away from Damper for CCW Spring Return; CW Actuator Face Away from Damper for CW Spring Return			
Rotation Torque	6 Nm			
Rotation Range	Adjustable from 34.5 to 90° CW or CCW; Mechanically Limited to 93°			
Rotation Time	Selectable 60 or 90 s ±10% at Nominal Conditions, Load Independent; Factory Set at 90 s	10 to 40 s for 0 to 6 N×m at All Operating Conditions		25 to 40 s for 0 to 6 N×m at All Operating Conditions
Spring Return Time No Power (OFF)	Nominal 35 s; 90 s Maximum	Nominal 35 s; 70 s Maximum		Nominal 35 s; 90 s Maximum
Cycles	60.000 Full Stroke Cycles			
	1,500,000 Repositions Rated at 6 N×m	---		1,500,000 Repositions Rated at 6 N×m
Audible Noise Rating	51 dBA Nominal at 1 m	55 dBA Nominal at 1 m		51 dBA Nominal at 1 m
Electrical Connections				
- Actuator	1.2 m Halogen-Free Cable with 0.75 mm2 Wire Leads			
- Auxiliary Switch				
Mechanical Connections	Mounted onto Johnson Controls DN15 through DN40 VG1000 Series Forged Brass Valves using M9000-520-5 Ball Valve Linkage Kit			
Enclosure	NEMA 2, IP 42			
Ambient Conditions				
- Operating	-32 to 60°C; 90% RH Maximum, Noncondensing			
- Storage	-40 to 85°C; 95% RH Maximum, Noncondensing			
Weight	1.6 Kg			
CE **Compliance**				
- Europe	EMC Directive 89/336/EEC - Low Voltage Directive 73/23/EEC (xDx and xxB Models)			

M9116-Axx-1N2 - *1/3 pages*

Page 116

ON/OFF and Floating Mixer Actuators

The valve electric mixer-actuator series is designed for operating water valves such as mixing valves, butterfly valves and ball valves.

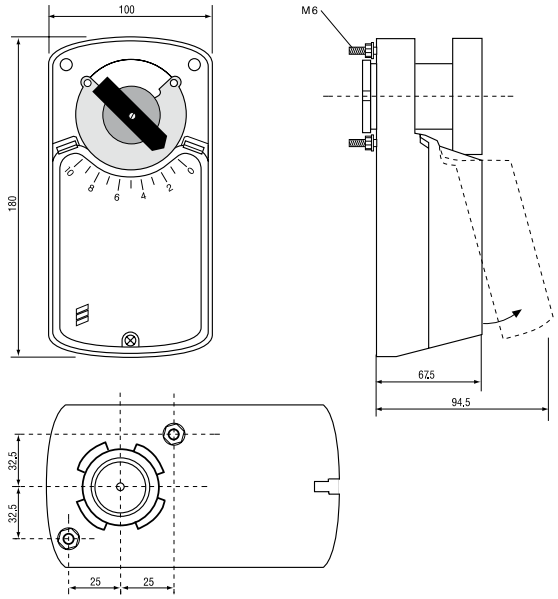
The mixing actuator is designed so that it can be fitted, using the relevant fitting kit, to many different makes of valves.

Features

- ON/OFF and Floating Control
- Load-independent running time
- Up to 5 actuators in parallel operation possible
- Plug-in terminal block connection
- Simple mount with ball valves adapter ZMA...
- Selectable direction of rotation
- Manual release button
- 2 adjustable auxiliary switches
- Automatic shut-off at end position (overload switch)
- Actuators available with1 m halogen-free cable
- Customized versions available
- Devices meet CE requirements

Accessories

- M9000-ZMA 001 for ESBE mixers
- M9000-ZMA 002 for Centra Duplex mixers
- M9000-ZMA 003 for Holter mixers
- M9000-ZMA 004 for GF Ball valves

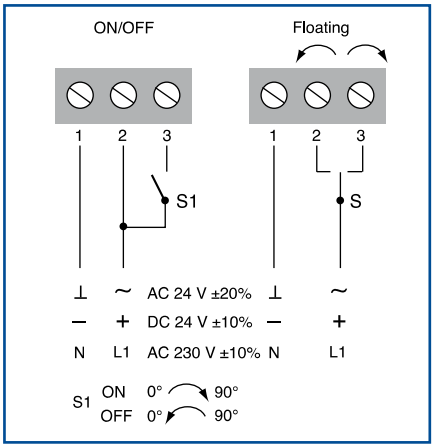


Dimensions in mm

M9116-Axx-1N2 - *2/3 pages*

ON/OFF and Floating Mixer Actuators

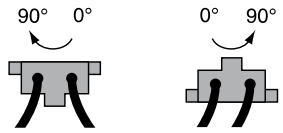
Wiring Diagrams



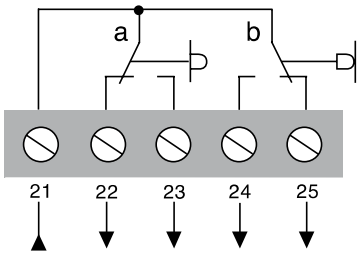
Changing the direction of rotation

The direction of rotation can be changed by reversing plug **c.**

Factory setting:



Auxiliary Switches (S)

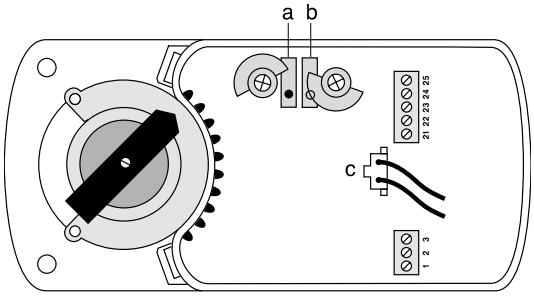


3(1.5)A, AC 230 V
Actuator at 0° position

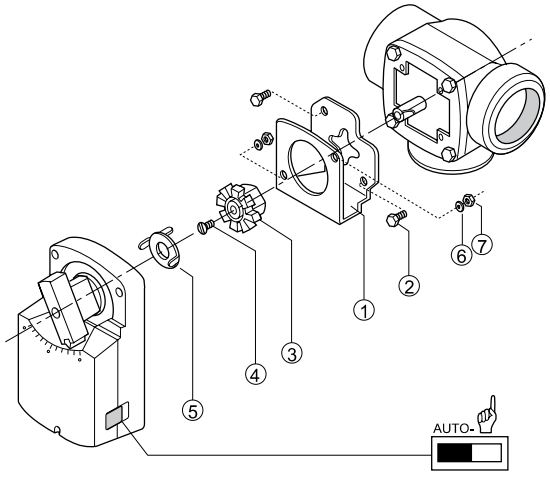
Setting the auxiliary switches

Factory setting:
Switch **a** at 10°
Switch **b** at 80°

The switching position can be manually changed to any required position by turning the ratchet.



Mounting Instruction



M9116-Axx-1N2 - *3/3 pages*

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ON/OFF and Floating Mixer Actuators

Technical Specifications

Actuator	M9116-AGx-1N2	M9116-ADx-1N2
Torque	16 Nm	
Running Time OPEN	120 s	
Running Time CLOSE	120 s	
Supply Voltage	AC/DC 24 V	AC 230 V
Frequency	50-60 Hz	
Power Consumption		
- Running	2.0 W	
- At end position	0.4 W	
Dimensioning	2.1 VA / 3.4 A @ 2 ms	2.0 VA / 0.25 A @ 2 ms
Control Signal	ON/OFF or Floating	
Position Signal	None	
Angle of rotation/Working range	90° (93°mech.)	
Angle of rotation/Limitation	None	
Auxiliary Switches	3(1.5) A, AC 230 V	
- S1 setting range	5°...85° < adjustable	
- S2 setting range		
Cable	1.0 m halogen-free	
- Motor	3-Wire 1-2-3	
- Switches	5-Wire 21-22-23-24-25	
Life time	60.000 rotations	
Noise level	45 dB (A)	
Protection Class	II	
Degree of Protection	IP 54	
Mode of Action	Type 1	
Ambient conditions		
- Operating temperature	-20...+50 °C / IEC 721-3-3	
- Storage temperature	-30...+60°C / IEC 721-3-2	
- Humidity	5...95% r.F. no condensed	
Weight	1.4 Kg	
Service	Maintenance-free	
Standards		
- Mechanics	EN 60 529 / EN 60 730-2-14	
- Electronics	EN 60 730-2-14	
- EMC Emissions	EN 50 081-1:92 / IEC 61000-6-3:96	
- EMC Immunity	EN 50 082-2:95 / IEC 61000-6-2:99	

Ordering Codes

Codes	Descriptions
M9116-AGA-1N2	AC/DC 24 V
M9116-AGC-1N2	AC/DC 24 V, with 2 auxiliary switches
M9116-ADA-1N2	AC 230 V
M9116-ADC-1N2	AC 230 V, with 2 auxiliary switches

M9116-GDx-1N2 - *1/3 pages*

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Proportional Mixer Actuators AC 230 V

The valve electric mixer-actuator series is designed for operating water valves such as mixing valves, butterfly valves and ball valves.

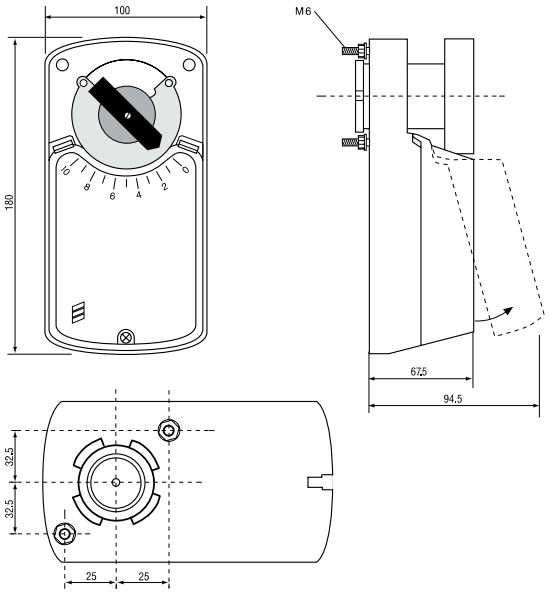
The mixing actuator is designed so that it can be fitted, using the relevant fitting kit, to many different makes of valves.

Features

- DC 0(2)...10 V control signal
- Up to 5 actuators in parallel operation possible
- Plug-in terminal block connection
- Simple mount with ball valves adapter ZMA...
- Selectable direction of rotation
- Limitation of rotation angle
- Manual release button
- 2 adjustable auxiliary switches
- Automatic shut-off at end position (overload switch)
- Actuators available with1m halogen-free cable
- Customized versions available
- Devices meet CE requirements

Accessories

- M9000-ZMA 001 for ESBE mixers
- M9000-ZMA 002 for Centra Duplex mixers
- M9000-ZMA 003 for Holter mixers
- M9000-ZMA 004 for GF Ball valves

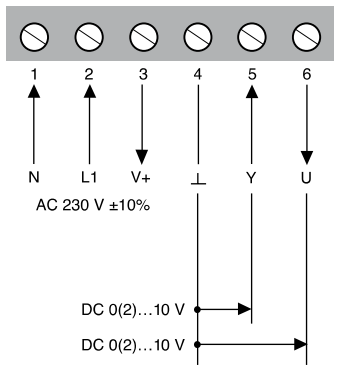


Dimensions in mm

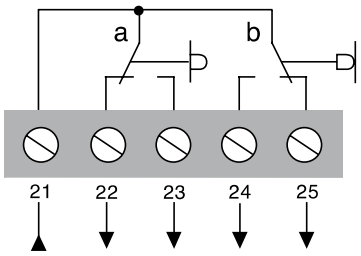
M9116-GDx-1N2 - *2/3 pages*

Proportional Mixer Actuators AC 230 V

Wiring Diagram



Auxiliary Switches (S)

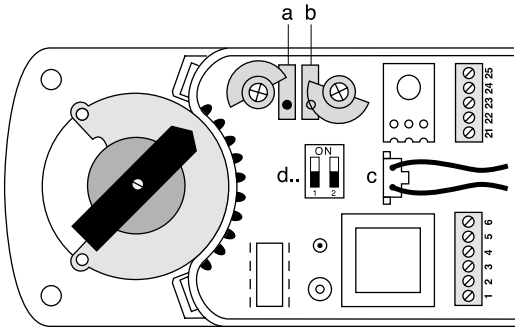


3(1.5)A, AC 230 V
Actuator at 0° position

Setting the auxiliary switches

Factory setting:
Switch a at 10°
Switch b at 80°

The switching position can be manually changed to any required position by turning the ratchet.



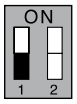
Setting the control signal

Control signal Y1	DC 0...10 V
Input Resistance	Ri > 250 kΩ
Control signal U	DC 0...10 V
Input Resistance	> 10 kΩ

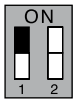
The control signal can be changed to DC 2...10 V by moving microswitch d1 to the ON position.

Microswitch **d1**
Self adapting

DC 0...10 V



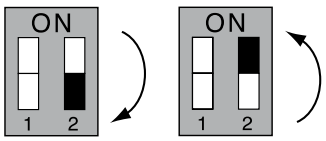
DC 2...10 V



Changing the direction of rotation

In order to reverse the direction of rotation, move microswitch **d2** to the **ON** position.
The action of the output signal will also be changed in the process.
Plug (**c**) must never be reversed.
The motor will not function correctly if (**c**) is reversed.

Microswitch **d2**



Johnson Controls

M9116-GDx-1N2 - *3/3 pages*

Proportional Mixer Actuators AC 230 V

Technical Specifications

Actuator	M9116-GDx-1N2
Torque	16 Nm
Running Time OPEN	120 s
Running Time CLOSE	120 s
Supply Voltage	AC 230 V
Frequency	50-60 Hz
Power Consumption	
- Running	5.5 W
- At end position	0.6 W
Dimensioning	6.0 VA / 0.1 A @ 2 ms
Working area Y	not adjustment
Control Signal Y1	DC 0(2)...10 V
Input resistance Y1	Ri 250 Ω
Position signal	DC 0...10 V
Load resistance	> 10 kΩ
Angle of rotation/Working range	90° (93°mech.)
Angle of rotation/Limitation	None
Auxiliary Switches	3(1.5) A, AC 230 V
- S1 setting range	5°...85° < adjustable
- S2 setting range	
Cable	1.0 m halogen-free
- Motor	6-Wire 1-2-3-4-5-6
- Switches	5-Wire 21-22-23-24-25
Life time	60.000 rotations
Noise level	45 dB (A)
Protection Class	II
Degree of Protection	IP 54
Mode of Action	Type 1
Ambient conditions	
- Operating temperature	-20...+50 °C / IEC 721-3-3
- Storage temperature	-30...+60°C / IEC 721-3-2
- Humidity	5...95% r.F. no condensed
Weight	1.1 Kg
Service	Maintenance-free
Standards	
- Mechanics	EN 60 529 / EN 60 730-2-14
- Electronics	EN 60 730-2-14
- EMC Emissions	EN 50 081-1:92 / IEC 61000-6-3:96
- EMC Immunity	EN 50 082-2:95 / IEC 61000-6-2:99

Ordering Codes

Codes	Descriptions
M9116-GDA-1N2	AC 230 V
M9116-GDC-1N2	AC 230 V, with 2 auxiliary switches

M9116-GGx-1N2 - *1/3 pages*

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Proportional Mixer Actuators AC/DC 24 V

The valve electric mixer-actuator series is designed for operating water valves such as mixing valves, butterfly valves and ball valves.

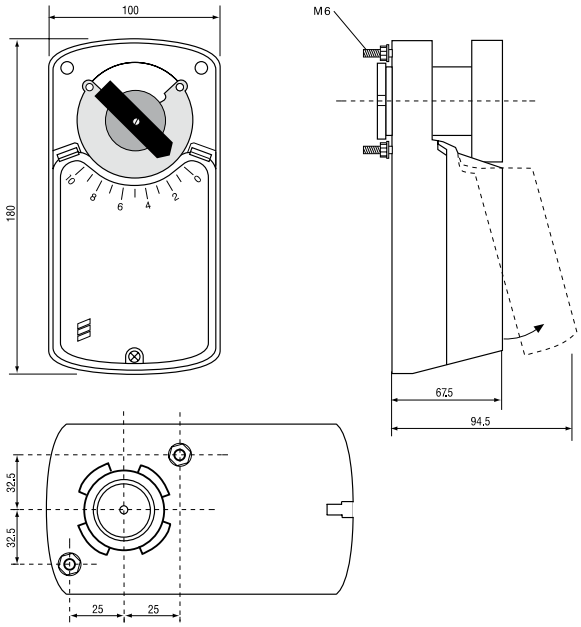
The mixing actuator is designed so that it can be fitted, using the relevant fitting kit, to many different makes of valves.

Features

- DC 0(2)...10 V or 0(4)...20 mA control signal
- Working area adjustable
- Load-independent running time
- Up to 5 actuators in parallel operation possible
- Plug-in terminal block connection
- Simple mount with ball valves adapter ZMA...
- Selectable direction of rotation
- Manual release button
- 2 adjustable auxiliary switches
- Automatic shut-off at end position (overload switch)
- Actuators available with1m halogen-free cable
- Customized versions available
- Devices meet CE requirements

Accessories

- M9000-ZMA 001 for ESBE mixers
- M9000-ZMA 002 for Centra Duplex mixers
- M9000-ZMA 003 for Holter mixers
- M9000-ZMA 004 for GF Ball valves

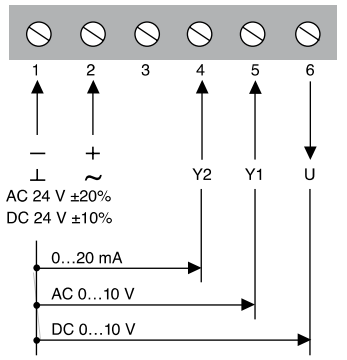


Dimensions in mm

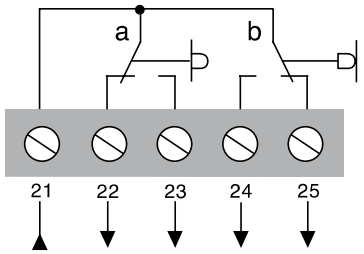
M9116-GGx-1N2 - *2/3 pages*

Proportional Mixer Actuators AC/DC 24 V

Wiring Diagram



Auxiliary Switches (S)

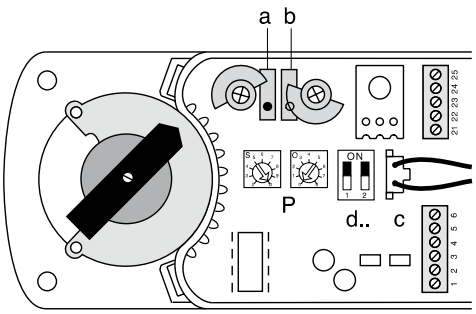


3(1.5)A, AC 230 V
Actuator at 0° position

Setting the auxiliary switches

Factory setting:
Switch **a** at 10°
Switch **b** at 80°

The switching position can be manually changed to any required position by turning the ratchet.



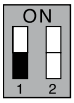
Setting the control signal

Control signal Y1 Input Resistance	DC 0...10 V Ri > 250 kΩ
Control signal Y2 Input Resistance	0...20 mA Ri >388 Ω
Position signal U Load resistance	DC 0...10 V > 10 kΩ

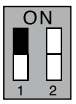
Leave microswitch **d1** in OFF position.

Microswitch **d1**
Self adapting

Dectivated



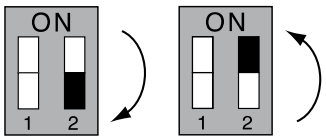
Activated



Changing the direction of rotation

In order to reverse the direction of rotation, move microswitch **d2** to the **ON** position.
The action of the output signal will also be changed in the process.
Plug (**c**) must never be reversed.
The motor will not function correctly if (**c**) is reversed.

Microswitch **d2**



M9116-GGx-1N2 - *3/3 pages*

Proportional Mixer Actuators AC/DC 24 V

Technical Specifications

Actuator	M9116-GGx-1N2
Torque	16 Nm
Running Time OPEN	120 s
Running Time CLOSE	120 s
Supply Voltage	AC/DC 24 V
Frequency	50-60 Hz
Power Consumption	
- Running	3.0 W
- At end position	0.7 W
Dimensioning	6.0 VA / 3.6 A @ 2 ms
Working area Y	not adjustment
Control Signal Y1	DC 0(2)...10 V
Input resistance Y1	RI 250 Ω
Control signal Y2	0...20 mA
Input resistance Y2	Ri 388 Ω
Position signal U	DC 0...10 V
Load resistance	>50 k Ω
Angle of rotation/Working range	90° (93°mech.)
Angle of rotation/Limitation	None
Auxiliary Switches	3(1.5) A, AC 230 V
- S1 setting range	5°...85° < adjustable
- S2 setting range	
Cable	1.0 m halogen-free
- Motor	5-Wire 1-2-4-5-6
- Switches	5-Wire 21-22-23-24-25
Life time	60.000 rotations
Noise level	45 dB (A)
Protection Class	II
Degree of Protection	IP 54
Mode of Action	Type 1
Ambient conditions	
- Operating temperature	-20...+50 °C / IEC 721-3-3
- Storage temperature	-30...+60°C / IEC 721-3-2
- Humidity	5...95% r.F. no condensed
Weight	1.1 Kg
Service	Maintenance-free
Standards	
- Mechanics	EN 60 529 / EN 60 730-2-14
- Electronics	EN 60 730-2-14
- EMC Emissions	EN 50 081-1:92 / IEC 61000-6-3:96
- EMC Immunity	EN 50 082-2:95 / IEC 61000-6-2:99

Ordering Codes

Codes	Descriptions
M9116-GGA-1N2	AC/DC 24 V
M9116-GGC-1N2	AC/DC 24 V, with 2 auxiliary switches

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