



## NENUTEC AIR - ROTARY DAMPER ACTUATOR

WITH ELECTRONIC FAIL-SAFE® FUNCTION 8 Nm | 16 Nm | 24 Nm | MODULATING CONTROL

### FSAM...08/16/24 SERIES

Rotary damper actuators with Electronic Fail-Safe® (EFS®) function are designed and produced for extended functionalities in HVAC systems and opens up new perspectives in system protection.

Electronic Fail-Safe® (EFS®) is able to manage short voltage interruptions for max. 4 seconds. In case of longer voltage interruption they will move the dampers or valves if necessary to a pre-defined emergency position (EPS).



Pictures might not correspond with technical data.

- Damper size 1.5 m<sup>2</sup> / 3.0 m<sup>2</sup> / 4.5 m<sup>2</sup>
- Power supply AC/DC 24V and AC 230V
- Control DC 0(2)...10 V and 0(4)...20 mA
- 2 adjustable auxiliary switches (SPDT)
- Digital greentech technology
- Shaft dimensions  
Ø 10 to 20 mm round / 10 to 16 mm square  
minimum shaft length 50 mm
- Selectable direction of rotation
- Adjustable angle of rotation
- Customised versions and functions (on request)

#### MODEL SELECTION TABLE

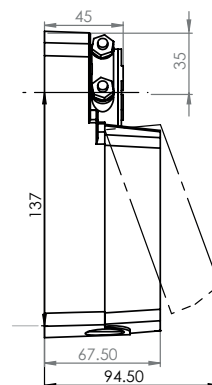
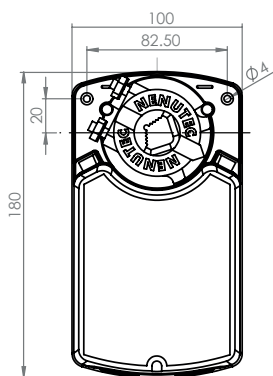
Torque	Running time (Power)	(Fail-Safe)	Power supply	Auxiliary Switches	Model / Type
8 Nm	60 sec	30 sec	AC/DC 24 V ± 15%	No	FSAM24.1-08
8 Nm	60 sec	30 sec	AC/DC 24 V ± 15%	2 x SPDT	FSAM24.1-08S
8 Nm	60 sec	30 sec	AC 230V ± 10%	No	FSAM230.1-08
8 Nm	60 sec	30 sec	AC 230V ± 10%	2 x SPDT	FSAM230.1-08S
16 Nm	145 sec	80 sec	AC/DC 24 V ± 15%	No	FSAM24.1-16
16 Nm	145 sec	80 sec	AC/DC 24 V ± 15%	2 x SPDT	FSAM24.1-16S
16 Nm	145 sec	80 sec	AC 230V ± 10%	No	FSAM230.1-16
16 Nm	145 sec	80 sec	AC 230V ± 10%	2 x SPDT	FSAM230.1-16S
24 Nm	185 sec	130 sec	AC/DC 24 V ± 15%	No	FSAM24.1-24
24 Nm	185 sec	130 sec	AC/DC 24 V ± 15%	2 x SPDT	FSAM24.1-24S
24 Nm	185 sec	130 sec	AC 230V ± 10%	No	FSAM230.1-24
24 Nm	185 sec	130 sec	AC 230V ± 10%	2 x SPDT	FSAM230.1-24S



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### ACTUATOR DIMENSIONS (mm)



### TECHNICAL SPECIFICATIONS

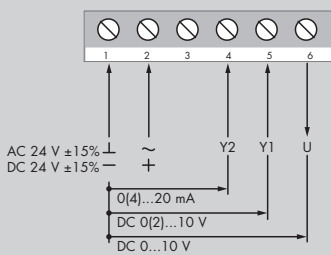
	FSAM24.1...(S)	FSAM230.1...(S)
Torque	8 Nm / 16 Nm / 24 Nm	8 Nm / 16 Nm / 24 Nm
Damper size	1.5 m <sup>2</sup> / 3.0 m <sup>2</sup> / 4.5 m <sup>2</sup>	1.5 m <sup>2</sup> / 3.0 m <sup>2</sup> / 4.5 m <sup>2</sup>
Shaft dimensions	Ø 10 to 20 mm round / 10 to 16 mm square	Ø 10 to 20 mm round / 10 to 16 mm square
Power supply	AC/DC 24V ± 15%	AC 230V ± 10%
Frequency	50 - 60 Hz	50 - 60 Hz
Control signal (Input)	DC 0(2)...10 V or 0(4)...20 mA	DC 0(2)...10 V or 0(4)...20 mA
Position signal (Output)	DC 0...10 V	DC 0...10 V
Power consumption		
- Operating	3.6 W	3.6 W
- End position	0.5 W	0.5 W
For wire sizing	6.5 VA	6.5 VA
Auxiliary switch rating	1.5 A, AC 230 V	1.5 A, AC 230 V
Protection class	III	II
Charging time comissioning	30 sec	30 sec
Angle of rotation	0°...90° (93° mechanical)	0°...90° (93° mechanical)
Angle of limiting	0°...90° in 5° steps	0°...90° in 5° steps
Weight	1.2 kg - 1.4 kg	1.3 kg - 1.5 kg
Life cycle	100'000 full cycles / 1'000'000 partial cycles	100'000 full cycles / 1'000'000 partial cycles
Sound level	42 dB (A)	42 dB (A)
IP protection	IP 54 (dust protected & protected against splash water)	IP 54 (dust protected & protected against splash water)
Operating temperature	-30°...+50° C / IEC 721-3-3	-30°...+50° C / IEC 721-3-3
Non-operating temperature	-40°...+80° C / IEC 721-3-2	-40°...+80° C / IEC 721-3-2
Ambient humidity	5%...95% rH non condensing / EN 60730-1	5%...95% rH non condensing / EN 60730-1
Maintenance	Maintenance free	Maintenance free
Mode of operation	Type I / EN 60730-1	Type I / EN 60730-1
EMC	CE according to 2004 / 108 / EC	CE according to 2004 / 108 / EC



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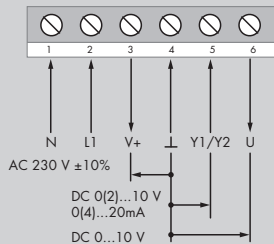
WITH ELECTRONIC FAIL-SAFE® FUNCTION 8 Nm | 16 Nm | 24 Nm | MODULATING CONTROL

Wiring diagram FSAM24.1...(S)  
Power supply AC/DC 24 V



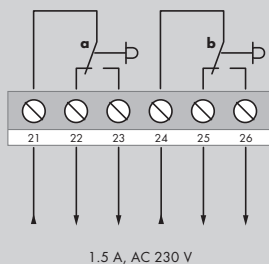
⚠ Connect via safety isolating transformer

Wiring diagram FSAM230.1...(S)  
Power supply AC 230 V



⚠ V+ is only for override purposes

Wiring diagram auxiliary switches

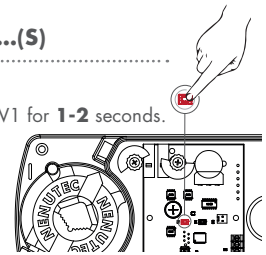


### ■ Changing direction of rotation FSAM24.1/230.1...(S)

Factory setting CW!

The direction of rotation can be changed by pushing micro switch SW1 for 1-2 seconds.

The green LED indicates the selected rotation direction with pulses.



### ■ Control signal specification

Control signal Y1

DC 0(2)...10 V

Input resistance

Ri 100  $\Omega$

Control signal Y2

0(4)...20 mA

Input resistance

Ri 500  $\Omega$

Position signal U

DC 0...10 V

Load resistance

Ri > 50  $\Omega$

### ■ Adjustment of control signal FSAM 24.1/230.1...(S)www

Factory setting: 0-10 V / 0-20 mA

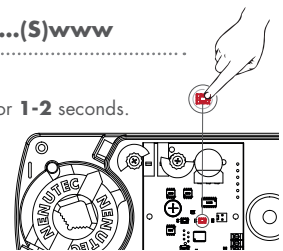
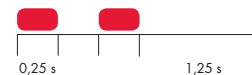
The control signal can be adjusted by pushing micro switch SW2 for 1-2 seconds.

The red LED indicates the selected input range with pulses.

for 0-10V / 0-20 mA



for 2-10V / 4-20 mA



### ■ Changing control signal

To change the control signal for the FSAM230.1...(S) between mA and V.

Choose the correct jumper position. Factory setting: Position A (V).

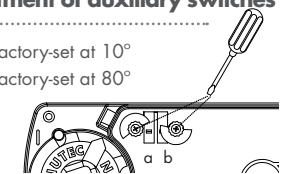
Choose the correct jumper position. Factory setting: Position A (V).

- Jumper position A: V input Y1
  - Jumper position B: mA input Y2
- (type FSAM230.1...(S))

### ■ Adjustment of auxiliary switches

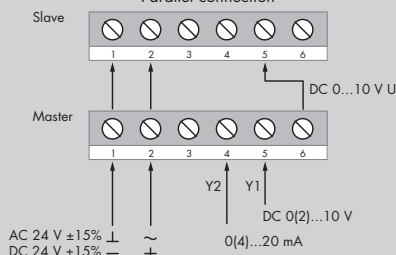
Switch a factory-set at 10°

Switch b factory-set at 80°

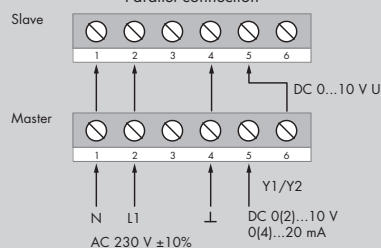


The auxiliary switches can be optimally adjusted between 0°...90°.  
(type FSAM24.1/230.1...(S))

Wiring diagram FSAM24.1...(S)  
Parallel connection



Wiring diagram FSAM230.1...(S)  
Parallel connection



### ■ Remark

Parallel connection of maximum five FSAM...(S) actuators is possible. The power consumption and distance between master and slave must be observed.

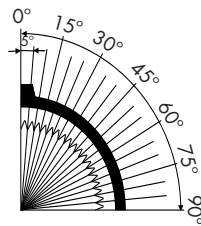
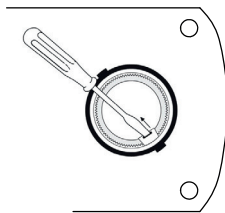
For more details of installation and commissioning, please observe our mounting instruction manual M-FSAA...08-16-24.



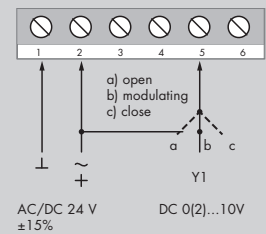
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### ■ Limiting angle of rotation FSAM24.1/230.1...(S)



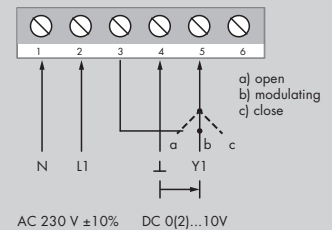
Wiring diagram FSAM24.1...(S)  
Override control



### SAFETY NOTES

- The FS... actuators are not allowed to be used outside the specified field of application as described at the front page of this data sheet.
- Only to be installed by skill educated persons. Any legal regulations or issued by authorities must be observed during installation.
- The FS... actuator may only opened by NENUTEC manufacturer site.
- AC 24V - 50/60 Hz - DC 24V: Connect via safety isolating transformer.
- AC 230V: To isolate from the main power supply, the system must incorporate a device which disconnects the phase conductor (with at least 3 mm contact gap).

Wiring diagram FSAM230.1...(S)  
Override control



### IMPORTANT REMARKS

The EFS® actuators are completely discharged after delivery from factory and need approximately 30 sec. pre-charging time before initial commissioning in order to bring the capacitors up to the required voltage level. This ensures that, in the event of a power (voltage) supply interruption, EFS® actuators can be moved at any time from its current position into a pre-defined emergency position.

This actuator includes electrical and electronic components and may not be disposed as household garbage. Please consider the local valid legislation.

Consult NENUTEC representatives for specific requirements and material selections for your intended application. The entire content of this technical datasheet is protected by copyright with all rights reserved®.

The performance specifications are nominal and conform to acceptable industry standards. NENUTEC shall not be liable for damages resulting from misapplication or misuse of its products.

### CUSTOMISED VERSION

NENUTEC offers you actuators in customised versions, e.g. with your own brand name, with colour-coordinated applications and with your particular demand on request.

Please contact us for further information.

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Distributor

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