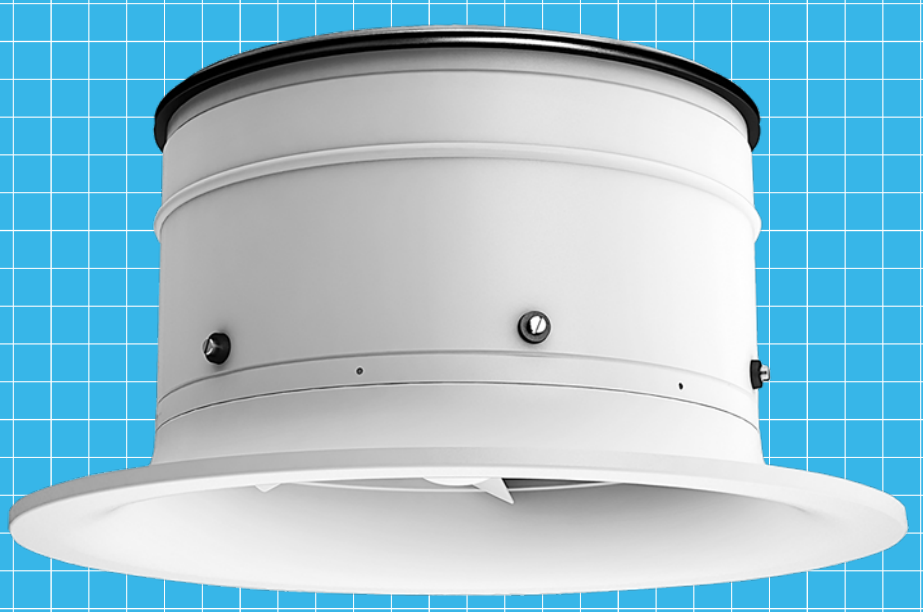
lindab | for a better climate



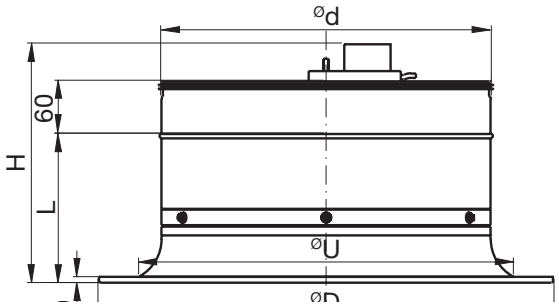
Lindab **Swirl diffuser RCW/RCWB**

Installation instructions

Installation instructions RCW/RCWB

Installation

RCW/RCWB is equipped with a Safe connection. The connection is mounted directly in the duct or fittings and is secured with pop rivets or duct screws. RCWB is equipped with 3 pcs. of Ø6 mm thread rivets on top of the box for suspending of the box.



Adjustment

Control of the air volume and adjustment is made on external dampers.

Maintenance

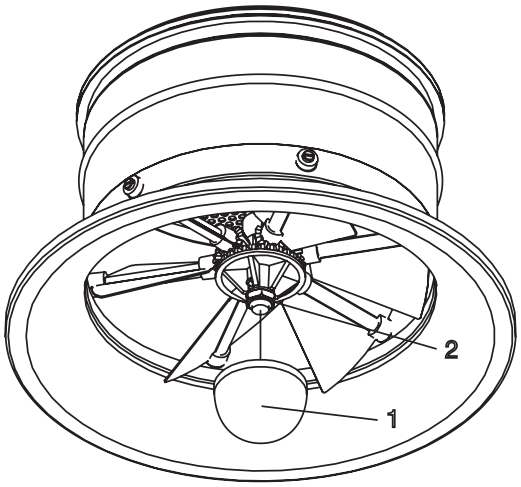
To service the motor or cleaning the duct the diffusor is demounted from the duct/the box itself, whereafter there is free access to the duct. The visible parts of the diffusor and the box can be wiped with a damp cloth.

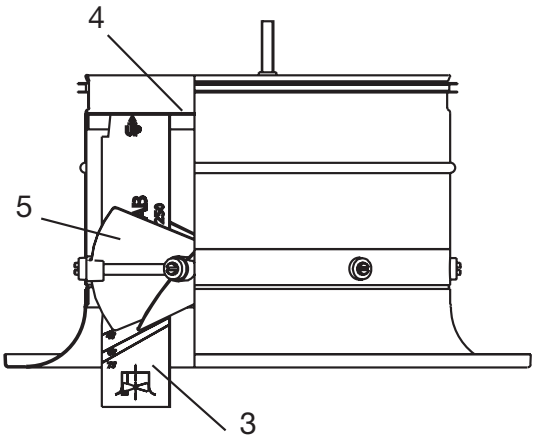
RCWB

Demounting of RCW from the box (4) is done by disengaging m4 lock nut (1) from m4 threaded rod (2), pls. note that the blades have to be in vertical position. Thereafter the diffusor is loose and can be disengaged from the box (4). When remounting you must be aware that the terminal strip (3) is placed properly on the box (4).

Blade settings

As standard the manual models are delivered with 30 degrees blade setting. If other blade settings are required these can be adjusted manually by using the enclosed angle meter.



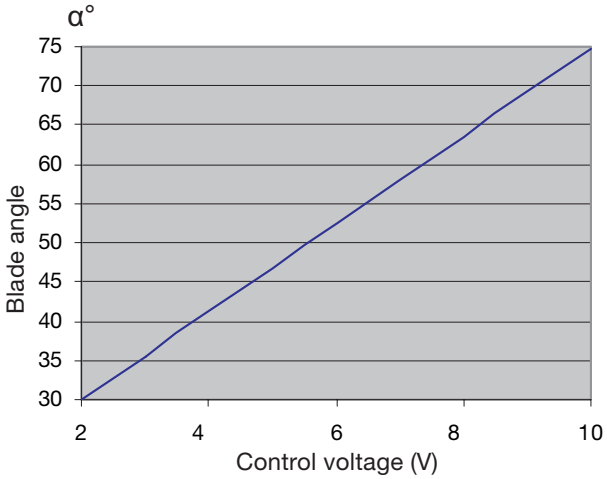


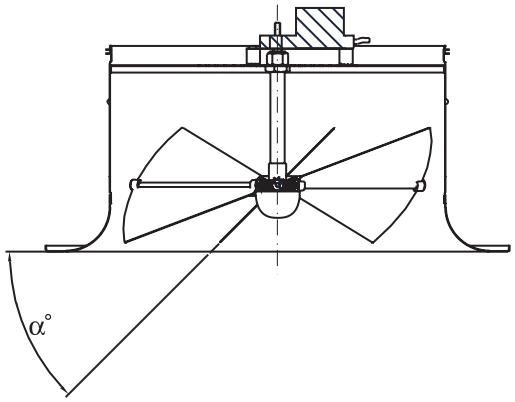
To change the standard blade setting the plactic button (1) is demounted and the center nut (2) is loosened a bit. The angle meter (3) is placed towards the perforated plate (4) in the diffusor, whereafter you can turn the blades (5) to the wanted angle which is read on the angle meter (3). After that the center nut is tightened (2) and the plastic button (1) is mounted.

Installation instructions RCW/RCWB

Technical data

RCW with electric modulating motor



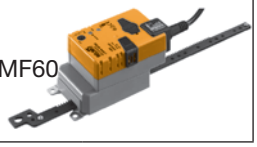


RCW with thermal actuator

To achieve horizontal dispersal pattern keep supply temperature at the diffuser below 17°C for minimum 15 minutes.
To achieve vertical dispersal pattern keep supply temperature above 26°C for minimum 15 minutes.

Choice of motortype

RCW-1 / RCWB-1

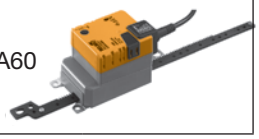
RCW-1 / RCWB-1 size	Belimo motor
Ød 315 - 400	NM24A-MF-F 
Ød 500 - 630	LH24A-MF60 

Technical data sheets NM24A-MF / LH24A-MF
Technical data can be found on the following pages:

NM24A-MF go to page 4.
LH24A-MF go to page 9.

Choice of motortype

RCW-2 / RCWB-2

RCW-2 / RCWB-2 size	Belimo motor
Ød 250 - 400	NM24A-F 
Ød 500 - 630	LH24A60 

Technical data sheets NM24A / LH24A
Technical data can be found on the following pages:

NM24A go to page 15.
LH24A go to page 17.

Installation instructions RCW-1/RCWB-1

BELIMO

Technical data sheet NM24A-MF

Parameterisable damper actuator for adjusting dampers in technical building installations

- **Air damper size up to approx. 2 m²**
- **Nominal torque 10 Nm**
- **Nominal voltage AC/DC 24 V**
- **Control Modulating DC (0)2...10 V Variable**
- **Position feedback DC 2...10 V Variable**

Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Nominal voltage range	AC 19.2...28.8 V / DC 21.6...28.8 V
	Power consumption in operation	3.5 W
	Power consumption in rest position	1.3 W
	Power consumption for wire sizing	6 VA
	Connection supply / control	Cable 1 m, 4 x 0.75 mm²
	Parallel operation	Yes (note the performance data)
Functional data	Torque motor	Min. 10 Nm
	Torque variable	25%, 50%, 75% reduced
	Positioning signal Y	DC 0...10 V
	Positioning signal Y note	Input impedance 100 kΩ
	Control signal Y variable	Open-close 3-point (AC only) Modulating (DC 0...32 V)
	Operating range Y	DC 2...10 V
	Operating range Y variable	Start point DC 0.5...30 V End point DC 2.5...32 V
	Position feedback U	DC 2...10 V
	Position feedback U note	Max. 0.5 mA
	Position feedback U variable	Start point DC 0.5...8 V End point DC 2.5...10 V
	Position accuracy	±5%
	Direction of motion motor	Selectable with switch 0 / 1
	Direction of motion note	Y = 0 V: At switch position 0 (ccw rotation) / 1 (cw rotation)
	Direction of motion variable	Electronically reversible
	Manual override	Gear disengagement with push-button, can be locked
	Angle of rotation	Max. 95°
	Angle of rotation note	can be limited on both sides with adjustable mechanical end stops
	Running time motor	150 s / 90°
	Motor running time variable	43...173 s
	Adaption setting range	manual
	Adaption setting range variable	No action Adaption when switched on Adaption after pushing the gear disengagement button
	Override control	MAX (maximum position) = 100% MIN (minimum position) = 0% ZS (intermediate position, AC only) = 50%
	Override control variable	MAX = (MIN + 32%)...100% MIN = 0%...(MAX – 32%) ZS = MIN...MAX
	Sound power level motor	35 dB(A)
	Spindle driver	Universal spindle clamp 8...26.7 mm
	Position indication	Mechanically, pluggable
Safety	Protection class IEC/EN	III Safety extra-low voltage

Lindab

Installation instructions RCW-1/RCWB-1

NM24A-MF

Damper actuator, parameterisable, Modulating, AC/DC 24 V, 10 Nm

BELIMO

Technical data

Safety	Protection class UL	UL Class 2 Supply
	Degree of protection IEC/EN	IP54
	Degree of protection NEMA/UL	NEMA 2, UL Enclosure Type 2
	EMC	CE according to 2004/108/EC
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14
	Certification UL	cULus according to UL 60730-1A, UL 60730-2-14 and CAN/CSA E60730-1:02
	Mode of operation	Type 1
	Rated impulse voltage supply / control	0.8 kV
	Control pollution degree	3
	Ambient temperature	-30...50°C
	Non-operating temperature	-40...80°C
	Ambient humidity	95% r.h., non-condensing
	Maintenance	Maintenance-free
Weight	Weight approx.	0.82 kg

Safety notes

- The device must not be used outside the specified field of application, especially not in aircraft or in any other airborne means of transport.
- Outdoor application: only possible in case that no (sea)water, snow, ice, insolation or aggressive gases interfere directly with the actuator and that is ensured that the ambient conditions remain at any time within the thresholds according to the data sheet.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- Cables must not be removed from the device.
- To calculate the torque required, the specifications supplied by the damper manufacturers concerning the cross-section, the design, the installation site and the ventilation conditions must be observed.
- The device contains electrical and electronic components and must not be disposed of as household refuse. All locally valid regulations and requirements must be observed.

Product features

Mode of operation
The actuator is connected with a standard modulating signal of DC 0...10V and drives to the position defined by the positioning signal. Measuring voltage U serves for the electrical display of the damper position 0...100% and as slave control signal for other actuators.

Parameterisable actuators
The factory settings cover the most common applications. Single parameters can be modified with the Belimo Service Tools MFT-P or ZTH EU.

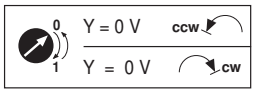
Simple direct mounting
Simple direct mounting on the damper spindle with an universal spindle clamp, supplied with an anti-rotation device to prevent the actuator from rotating.

Manual override
Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).

High functional reliability
The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.

Adjustable angle of rotation
Adjustable angle of rotation with mechanical end stops.

Home position
The first time the supply voltage is switched on, i.e. at the time of commissioning, the actuator carries out a synchronisation. The synchronisation is in the home position (0%).
The actuator then moves into the position defined by the positioning signal.



Installation instructions RCW-1/RCWB-1

NM24A-MF

Damper actuator, parameterisable, Modulating, AC/DC 24 V, 10 Nm

BELIMO

Product features

Adaption and synchronisation

An adaption can be triggered manually by pressing the “Adaption” button or with the PC-Tool. Both mechanical end stops are detected during the adaption (entire setting range).
Automatic synchronisation after pressing the gearbox disengagement button is configured. The synchronisation is in the home position (0%).
The actuator then moves into the position defined by the positioning signal.
A range of settings can be adapted using the PC-Tool (see MFT-P documentation)

Accessories

Electrical accessories

Description	Type
Auxiliary switch, add-on, 1 x SPDT	S1A
Auxiliary switch, add-on, 2 x SPDT	S2A
Auxiliary switch, add-on, 2 x SPDT, grey	S2A GR
Feedback potentiometer 140 Ohm, add-on	P140A
Feedback potentiometer 140 Ohm, add-on, grey	P140A GR
Feedback potentiometer 200 Ohm, add-on	P200A
Feedback potentiometer 500 Ohm, add-on	P500A
Feedback potentiometer 500 Ohm, add-on, grey	P500A GR
Feedback potentiometer 1 kOhm, add-on	P1000A
Feedback potentiometer 2.8 kOhm, add-on	P2800A
Feedback potentiometer 2.8 kOhm, add-on, grey	P2800A GR
Feedback potentiometer 1 kOhm, add-on, grey	P1000A GR
Feedback potentiometer 5 kOhm, add-on	P5000A
Feedback potentiometer 5 kOhm, add-on, grey	P5000A GR
Feedback potentiometer 10 kOhm, add-on	P10000A
Feedback potentiometer 10 kOhm, add-on, grey	P10000A GR
Signal converter voltage/current, supply AC/DC 24V	Z-UIC
Digital position indicator for front-panel mounting, 0...99%, front mass 72 x 72 mm	ZAD24
Range controller for wall mounting, adjustable electron. Min./max. angle of rotation limitation	SBG24
Positioner for wall mounting, range 0...100%	SGA24
Positioner in a conduit box, range 0...100%	SGE24
Positioner for front-panel mounting, range 0...100%	SGF24
Positioner for wall mounting, range 0...100%	CRP24-B1
Connecting cable 5 m, A+B: RJ12 6/6, To ZTH/ZIP-USB-MP	ZK1-GEN
Connection cable 5 m, A: RJ11 6/4, B: Free wire end, To ZTH/ZIP-USB-MP	ZK2-GEN

Mechanical accessories

Description	Type
Actuator arm, for standard spindle clamp (reversible) K-SA	AH-20
Actuator arm, for one-sided spindle clamp K-ENSA	AH-25
Shaft extension 250 mm, for damper spindles Ø 8...25 mm	AV8-25
Spindle clamp, one side for NM..A	K-ENMA
Spindle clamp, one side for NM..A, SM..A	K-ENSA
Straight ball joint with M8, suitable for damper crank arms KH8	KG10A
Angled ball joint with M8, suitable for damper crank arms KH8	KG8
Damper crank arm, for damper spindles	KH8
Spindle clamp, reversible for NM..A and LMQ..	K-NA
Angle of rotation limiter, for K-NA	20334-00001
Universal mounting bracket 180 mm	Z-ARS180
Form fit insert 8x8 mm, for NM..A	ZF8-NMA
Form fit insert 10x10 mm, for NM..A / SM..A	ZF10-NSA
Form fit insert 12x12 mm, for NM..A / SM..A	ZF12-NSA
Form fit insert 15x15 mm	ZF15-NSA
Form fit insert 16x16 mm, for NM..A / SM..A	ZF16-NSA
Mounting kit for linkage operation, NM..A for flat installation	ZG-NMA

Lindab

Installation instructions RCW-1/RCWB-1

NM24A-MF

Damper actuator, parameterisable, Modulating, AC/DC 24 V, 10 Nm

BELIMO

Accessories

	Description	Type
	Base plate extension from NM..A to NM..	Z-NMA
	Position indication for LM..A, NM..A, SM..A, GM..A	Z-PI
Service Tools	**Description**	**Type**
	Service Tool, for MF/MP/Modbus/LonWorks actuators and VAV-Controller	ZTH EU
	Belimo PC-Tool, software for adjustments and diagnostics	MFT-P
	Adapter to Service-Tool ZTH	MFT-C

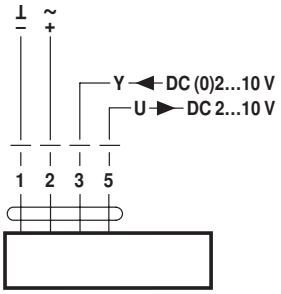
Electrical installation

Notes

- Connection via safety isolating transformer.
- Parallel connection of other actuators possible. Observe the performance data.

Wiring diagrams

AC/DC 24 V, modulating

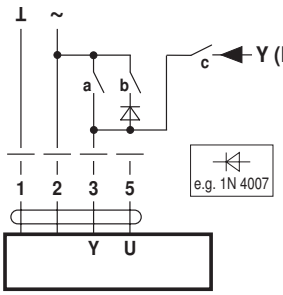


Cable colours:
1 = black
2 = red
3 = white
5 = orange

Functions

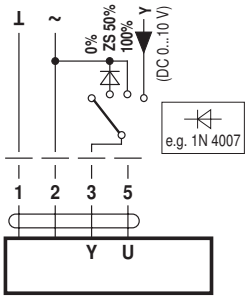
Functions with basic values (conventional mode)

Override control with AC 24 V with relay contacts

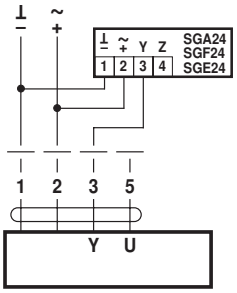


	a	b	c
0%	⁄	⁄	⁄
ZS 50%	⁄	⊥	⁄
100%	⊥	⁄	⁄
Y	⁄	⁄	⊥

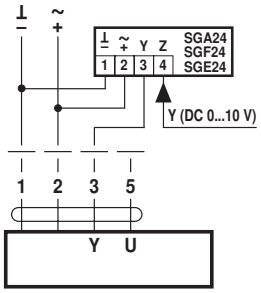
Override control with AC 24 V with rotary switch

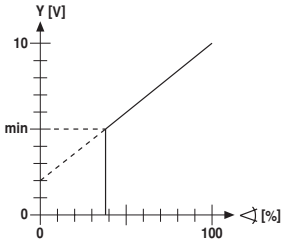


Remote control 0...100% with positioner SG..



Minimum limit with positioner SG..





Installation instructions RCW-1/RCWB-1

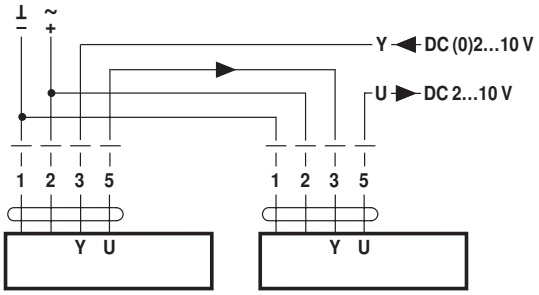
NM24A-MF

Damper actuator, parameterisable, Modulating, AC/DC 24 V, 10 Nm

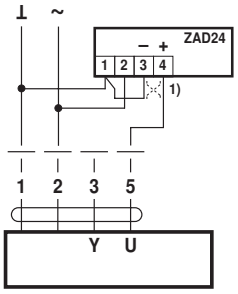
BELIMO

Functions

Follow-up control (position-dependent)

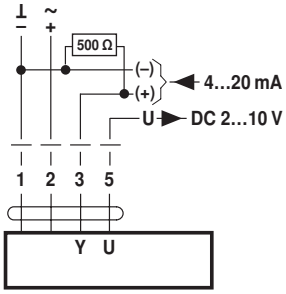


Position indication



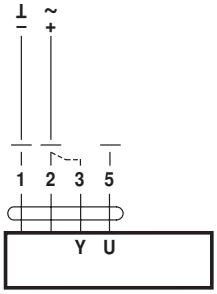
(1) Adapting the direction of rotation

Control with 4...20 mA via external resistor



Caution:
The operating range must be set to DC 2...10 V.
The 500 Ω resistor converts the 4...20 mA current signal to a voltage signal DC 2...10 V

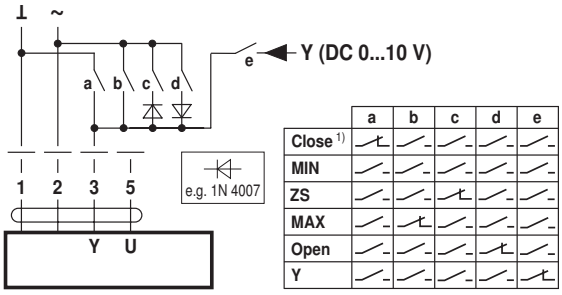
Functional check



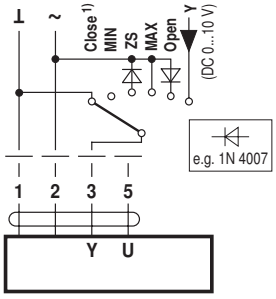
Procedure
1. Connect 24V to connections 1 and 2
2. Disconnect connection 3:
– with direction of rotation 0: Actuator rotates to the left
– with direction of rotation 1: Actuator rotates to the right
3. Short-circuit connections 2 and 3:
– Actuator runs in opposite direction

Functions for actuators with specific parameters (Parametrisation with PC-Tool necessary)

Override control and limiting with AC 24 V with relay contacts

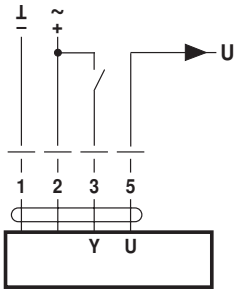


Override control and limiting with AC 24 V with rotary switch

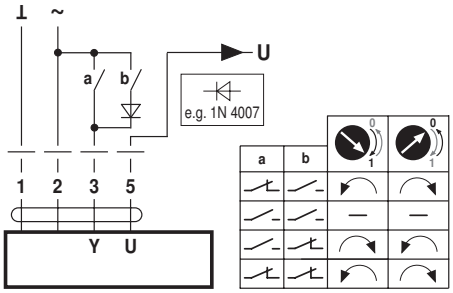


1) **Caution:** This function is only guaranteed if the start point of the operating range is defined as min. 0.5 V.

Control open-close



Control 3-point



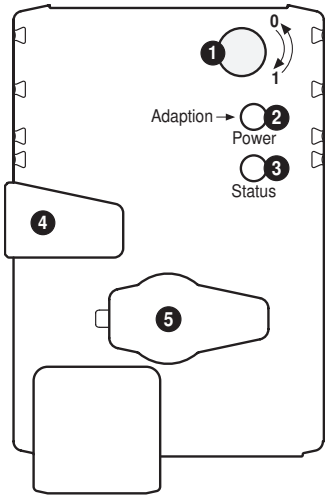
Lindab

Installation instructions RCW-1/RCWB-1

NM24A-MF

Damper actuator, parameterisable, Modulating, AC/DC 24 V, 10 Nm

Operating controls and indicators



1 Direction of rotation switch
Switch over: Direction of rotation changes

2 Push-button and LED display green
Off: No power supply or malfunction
On: In operation
Press button: Triggers angle of rotation adaptation, followed by standard mode

3 Push-button and LED display yellow
Off: Standard mode
On: Adaptation or synchronising process active
Press button: No function

4 Gear disengagement button
Press button: Gear disengages, motor stops, manual override possible
Release button: Gear engages, synchronisation starts, followed by standard mode

5 Service plug
For connecting parameterisation and service tools

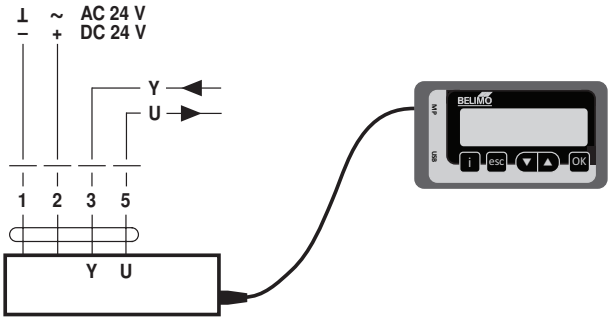
Check power supply connection
2 Off and 3 On Possible wiring error in power supply

Service

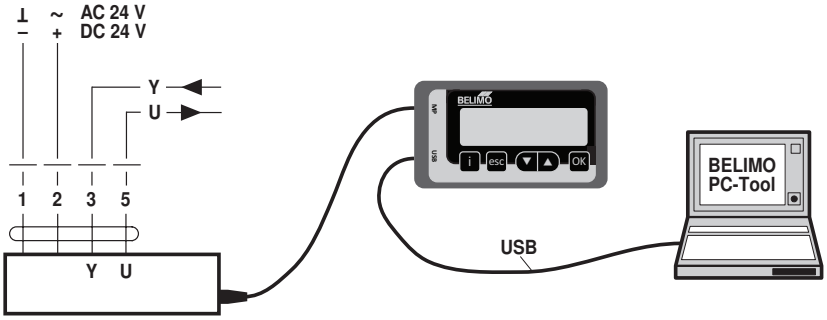
Notes

- The actuator can be parameterised by PC-Tool and ZTH EU via the service socket.

ZTH EU connection



PC-Tool connection



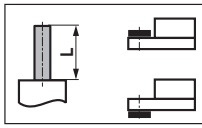
Installation instructions RCW-1/RCWB-1

NM24A-MF

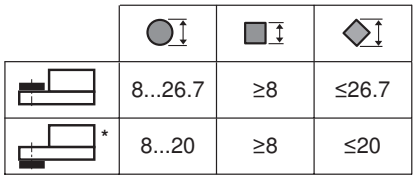
Damper actuator, parameterisable, Modulating, AC/DC 24 V, 10 Nm

Dimensions [mm]

Spindle length

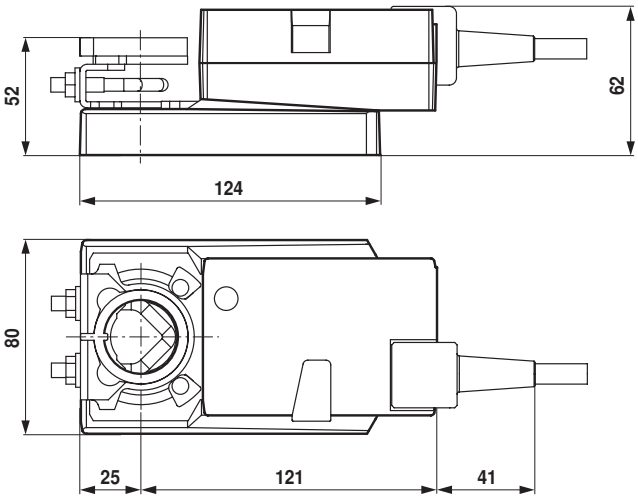
	Min. 40
	Min. 20

Clamping range

	8...26.7	≥8	≤26.7
*	8...20	≥8	≤20

*Option: Spindle clamp mounted below (accessories K-NA needed)

Dimensional drawings



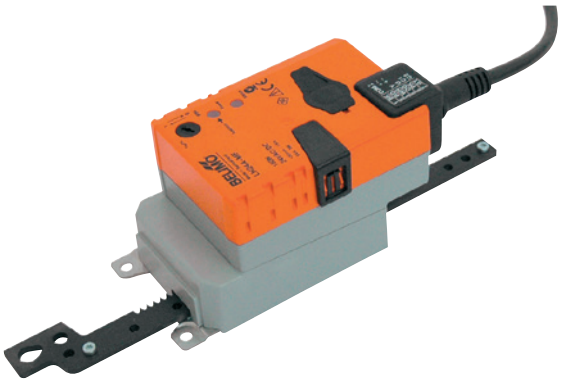
Installation instructions RCW-1/RCWB-1

BELIMO

Technical data sheet LH24A-MF60

Parmeterisable linear actuator for adjusting dampers and slide valves in technical building installations

- **Air damper size up to approx. 1 m²**
- **Actuating force 150 N**
- **Nominal voltage AC/DC 24 V**
- **Control modulating DC (0)2...10 V Variable**
- **Position feedback DC 2...10 V Variable**
- **Length of Stroke Max. 60 mm, adjustable in 20 mm increments**



Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Nominal voltage range	AC 19.2...28.8 V / DC 21.6...28.8 V
	Power consumption in operation	2.5 W
	Power consumption in rest position	1.2 W
	Power consumption for wire sizing	5 VA
	Connection supply / control	Cable 1 m, 4 x 0.75 mm²
	Parallel operation	Yes (note the performance data)
Functional data	Actuating force motor	Min. 150 N
	Modifiable actuating force	25%, 50%, 75% reduziert
	Positioning signal Y	DC 0...10 V
	Positioning signal Y note	Input impedance 100 kΩ
	Control signal Y variable	Open-close 3-point (AC only) Modulating (DC 0...32 V)
	Operating range Y	DC 2...10 V
	Operating range Y variable	Start point DC 0.5...30 V End point DC 2.5...32 V
	Position feedback U	DC 2...10 V
	Position feedback U note	Max. 0.5 mA
	Position feedback U variable	Start point DC 0.5...8 V End point DC 2.5...10 V
	Position accuracy	±5%
	Direction of motion motor	Selectable with switch
	Direction of motion note	Y = 0 V: with switch 0 (retracted) / 1 (extended)
	Direction of motion variable	Electronically reversible
	Manual override	With push-button, can be locked
	Length of Stroke	Max. 60 mm, adjustable in 20 mm increments
	Stroke limitation	can be limited on both sides with mechanical end stops
	Running time motor	150 s / 100 mm
	Running time motor note	corresponds to 90 s / 60 mm
	Motor running time variable	70...270 s / 100 mm
	Adaption setting range	manual
	Adaption setting range variable	No action Adaption when switched on Adaption after pushing the gear disengagement button
	Override control	MAX (maximum position) = 100% MIN (minimum position) = 0% ZS (intermediate position, AC only) = 50%
	Override control variable	MAX = (MIN + 32%)...100% MIN = 0%...(MAX – 32%) ZS = MIN...MAX
	Sound power level motor	45 dB(A)
Safety	Protection class IEC/EN	III Safety extra-low voltage
	Protection class UL	UL Class 2 Supply
	Degree of protection IEC/EN	IP54
	Degree of protection NEMA/UL	NEMA 2, UL Enclosure Type 2

Installation instructions RCW-1/RCWB-1

LH24A-MF60

Linear actuator, parameterisable, modulating, AC/DC 24 V, 150 N

Technical data

Safety	EMC	CE according to 2014/30/EU
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14
	Certification UL	cULus according to UL 60730-1A, UL 60730-2-14 and CAN/CSA E60730-1:02
	Mode of operation	Type 1
	Rated impulse voltage supply / control	0.8 kV
	Control pollution degree	3
	Ambient temperature	-30...50°C
	Non-operating temperature	-40...80°C
	Ambient humidity	95% r.h., non-condensing
	Maintenance	Maintenance-free
Weight	Weight	0.5 kg

Safety notes

- The device must not be used outside the specified field of application, especially not in aircraft or in any other airborne means of transport.
- Outdoor application: only possible in case that no (sea)water, snow, ice, insolation or aggressive gases interfere directly with the actuator and that is ensured that the ambient conditions remain at any time within the thresholds according to the data sheet.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- Cables must not be removed from the device.
- The rotary supports and coupling pieces available as accessories must always be used if transverse forces are likely. In addition, the actuator must not be tightly bolted to the application. It must remain movable via the rotary support (refer to «Assembly notes»).
- If the actuator is exposed to severely contaminated ambient air, appropriate precautions must be taken on the system side. Excessive deposits of dust, soot etc. can prevent the gear rod from being extended and retracted correctly.
- If not installed horizontally, the gear disengagement pushbutton may only be actuated when there is no pressure on the gear rod.
- To calculate the actuating force required for air dampers and slide valves, the specifications supplied by the damper manufacturers concerning the cross section, the design, the installation site and the ventilation conditions must be observed.
- If a rotary support and/or coupling piece is used, actuation force losses are to be expected.
- The device contains electrical and electronic components and must not be disposed of as household refuse. All locally valid regulations and requirements must be observed.

Product features

Mode of operation	The actuator is connected with a standard modulating signal of DC 0...10V and drives to the position defined by the positioning signal. Measuring voltage U serves for the electrical display of the damper position 0...100% and as slave control signal for other actuators.
Parameterisable actuators	The factory settings cover the most common applications. Single parameters can be modified with the Belimo Service Tools MFT-P or ZTH EU.
Simple direct mounting	The actuator can be directly connected with the application using the enclosed screws. The head of the gear rod is connected to the moving part of the ventilating application individually on the mounting side or with the Z-KS2 coupling piece provided.
Manual override	Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).
Adjustable stroke	If a stroke limitation will be adjusted, the mechanical operating range on this side of the gear rod can be used starting with an extension length of 20 mm and then can be limited respectively in increments of 20 mm by means of mechanical end stops Z-AS2.

Installation instructions RCW-1/RCWB-1

LH24A-MF60

Linear actuator, parameterisable, modulating, AC/DC 24 V, 150 N

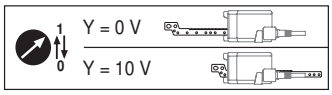
Product features

High functional reliability

The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.

Home position

The first time the supply voltage is switched on, i.e. at the time of commissioning, the actuator carries out a synchronisation. The synchronisation is in the home position (0%).
The actuator then moves into the position defined by the positioning signal.



Adaption and synchronisation

An adaption can be triggered manually by pressing the “Adaption” button or with the PC-Tool. Both mechanical end stops are detected during the adaption (entire setting range).
Automatic synchronisation after pressing the gearbox disengagement button is configured. The synchronisation is in the home position (0%).
The actuator then moves into the position defined by the positioning signal.
A range of settings can be adapted using the PC-Tool (see MFT-P documentation)

Accessories

Electrical accessories

Description	Type
Digital position indicator for front-panel mounting, 0...99%, front mass 72 x 72 mm	ZAD24
Range controller for wall mounting, adjustable electron. Min./max. angle of rotation limitation	SBG24
Positioner for wall mounting, range 0...100%	SGA24
Positioner in a conduit box, range 0...100%	SGE24
Positioner for front-panel mounting, range 0...100%	SGF24
Positioner for wall mounting, range 0...100%	CRP24-B1
Connecting cable 5 m, A+B: RJ12 6/6, To ZTH/ZIP-USB-MP	ZK1-GEN
Connection cable 5 m, A: RJ11 6/4, B: Free wire end, To ZTH/ZIP-USB-MP	ZK2-GEN

Mechanical accessories

Description	Type
End stop set for LH	Z-AS2
Rotary support for compensation of transverse forces	Z-DS1
Coupling piece M6 for LH, galvanised steel	Z-KS2

Service Tools

Description	Type
Service Tool, for MF/MP/Modbus/LonWorks actuators and VAV-Controller	ZTH EU
Belimo PC-Tool, software for adjustments and diagnostics	MFT-P
Adapter to Service Tool ZTH	MFT-C

Installation instructions RCW-1/RCWB-1

LH24A-MF60

Linear actuator, parameterisable, modulating, AC/DC 24 V, 150 N

BELIMO

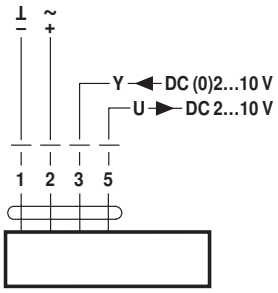
Electrical installation

Notes

- Connection via safety isolating transformer.
- Parallel connection of other actuators possible. Observe the performance data.

Wiring diagrams

AC/DC 24 V, modulating

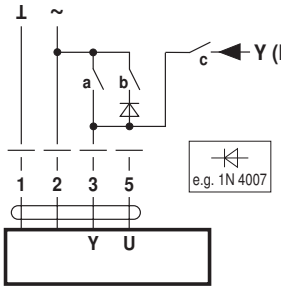


Cable colours:
1 = black
2 = red
3 = white
5 = orange

Functions

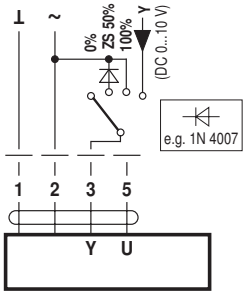
Functions with basic values (conventional mode)

Override control with AC 24 V with relay contacts

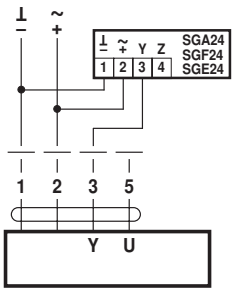


	a	b	c
0%	⁄	⁄	⁄
ZS 50%	⁄	⊥	⁄
100%	⊥	⁄	⁄
Y	⁄	⁄	⊥

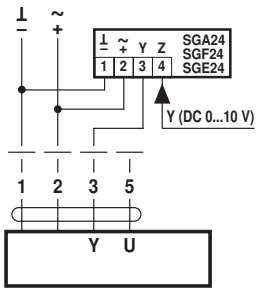
Override control with AC 24 V with rotary switch

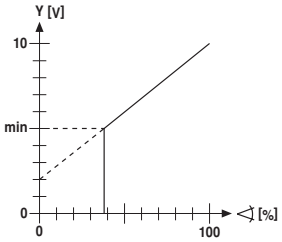


Remote control 0...100% with positioner SG..

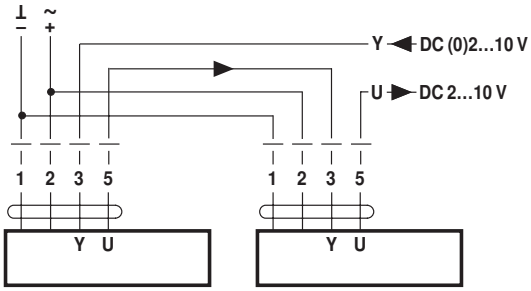


Minimum limit with positioner SG..

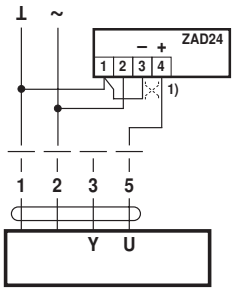




Follow-up control (position-dependent)



Position indication



1) Adapting the direction of stroke

Lindab

Installation instructions RCW-1/RCWB-1

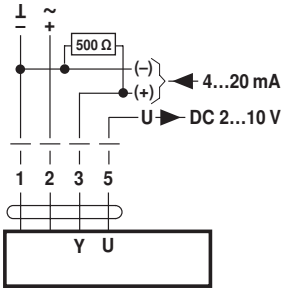
LH24A-MF60

Linear actuator, parameterisable, modulating, AC/DC 24 V, 150 N

BELIMO

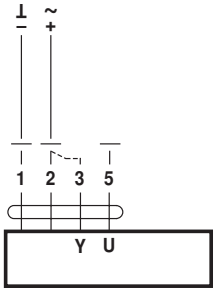
Functions

Control with 4...20 mA via external resistor



Caution:
The operating range must be set to DC 2...10 V.
The 500 Ω resistor converts the 4...20 mA current signal to a voltage signal DC 2...10 V

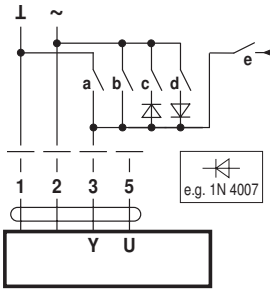
Functional check



Procedure
1. Apply 24 V to connection 1 and 2
2. Disconnect connection 3:
- for direction of stroke 0: Actuator travels in the direction “retracted”
- for direction of stroke 1: Actuator travels in the direction “extended”
3. Short circuit connections 2 and 3:
- Actuator runs in the opposite direction

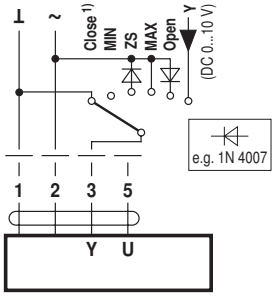
Functions for actuators with specific parameters (Parametrisation with PC-Tool necessary)

Override control and limiting with AC 24 V with relay contacts



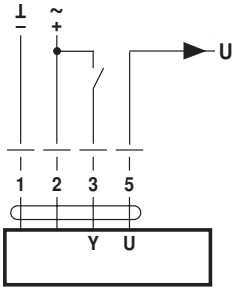
	a	b	c	d	e
Close [1]	⁄	—	—	—	—
MIN	—	—	—	—	—
ZS	—	—	⁄	—	—
MAX	—	⁄	—	—	—
Open	—	—	—	⁄	—
Y	—	—	—	—	⁄

Override control and limiting with AC 24 V with rotary switch

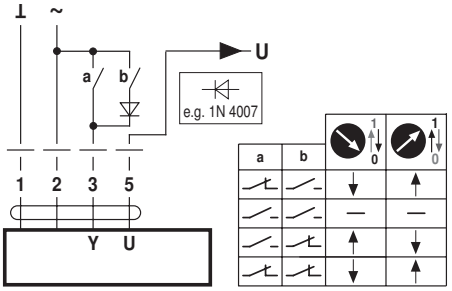


1) **Caution:** This function is only guaranteed if the start point of the operating range is defined as min. 0.5 V.

Control open-close



Control 3-point



a	b		
⁄	—	↓	↑
—	—	—	—
—	⁄	↑	↓
⁄	⁄	↓	↑

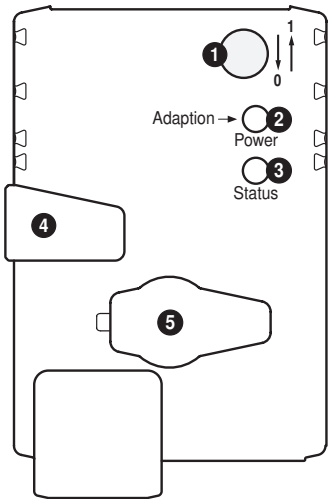
Installation instructions RCW-1/RCWB-1

LH24A-MF60

Linear actuator, parameterisable, modulating, AC/DC 24 V, 150 N

BELIMO

Operating controls and indicators



1 Direction of stroke switch

Switch over:	Direction of stroke changes

2 Push-button and LED display green

Off:	No power supply or malfunction
On:	In operation
Press button:	Triggers stroke adaptation, followed by standard mode

3 Push-button and LED display yellow

Off:	Standard mode
On:	Adaptation or synchronising process active
Press button:	No function

4 Gear disengagement button

Press button:	Gear disengages, motor stops, manual override possible
Release button:	Gear engages, synchronisation starts, followed by standard mode

5 Service plug

For connecting parameterisation and service tools

Check power supply connection

2 Off and 3 On	Possible wiring error in power supply

Installation notes

Notes

- If a rotary support and/or coupling piece is used, losses in the actuation force losses are to be expected.

Applications without transverse force

The linear actuator is screwed directly to the housing at three points. Afterwards, the head of the gear rod is fastened to the moving part of the ventilation application (e.g. damper or slide valve).

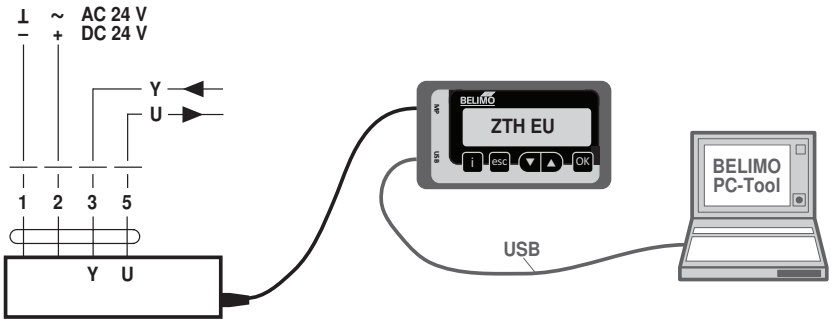
Applications with transverse forces

Connect the coupling piece with the internal thread (Z-KS2) to the head of the gear rod. Screw the rotary support (Z-DS1) to the ventilation application. Afterwards, the linear actuator is screwed to the previously mounted rotary support with the enclosed screw. Afterwards, the coupling piece, which is mounted to the head of the gear rod, is attached to the moving part of the ventilating application (e.g. damper or slide valve). The transverse forces can be compensated for to a certain limit with the rotary support and/or coupling piece. The maximum permissible swivel angle of the rotary support and coupling piece is 10°, laterally and upwards.

Service

Service Tools connection

The actuator can be parameterised by ZTH EU via the service socket.
For an extended parameterisation the PC tool can be connected.



Lindab

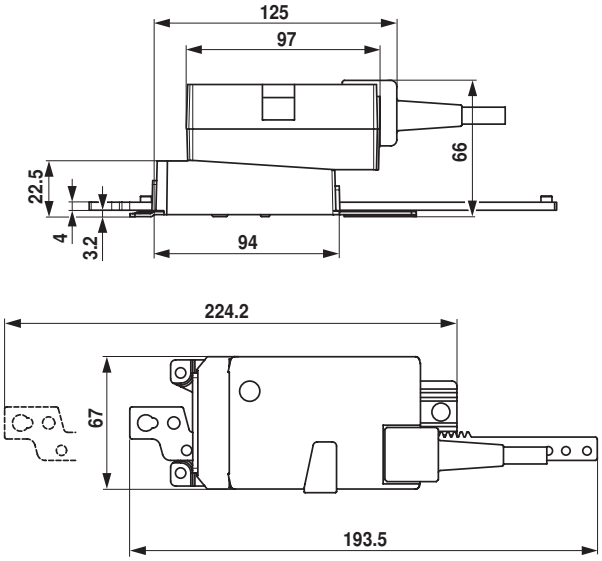
Installation instructions RCW-1/RCWB-1

LH24A-MF60

Linear actuator, parameterisable, modulating, AC/DC 24 V, 150 N

Dimensions [mm]

Dimensional drawings



Installation instructions RCW-2/RCWB-2

BELIMO

Technical data sheet NM24A

Damper actuator for adjusting dampers in technical building installations

- **Air damper size up to approx. 2 m²**
- **Nominal torque 10 Nm**
- **Nominal voltage AC/DC 24 V**
- **Control Open-close, 3-point**

Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Nominal voltage range	AC 19.2...28.8 V / DC 19.2...28.8 V
	Power consumption in operation	1.5 W
	Power consumption in rest position	0.2 W
	Power consumption for wire sizing	3.5 VA
	Connection supply / control	Cable 1 m, 3 x 0.75 mm²
	Parallel operation	Yes (note the performance data)
Functional data	Torque motor	Min. 10 Nm
	Direction of motion motor	selectable with switch 0 (ccw rotation) / 1 (cw rotation)
	Manual override	with push-button, can be locked
	Angle of rotation	Max. 95°
	Angle of rotation note	can be limited on both sides with adjustable mechanical end stops
	Running time motor	150 s / 90°
	Sound power level motor	35 dB(A)
	Spindle driver	Universal spindle clamp 8...26.7 mm
	Position indication	Mechanically, pluggable
Safety	Protection class IEC/EN	III Safety Extra-Low Voltage (SELV)
	Protection class UL	UL Class 2 Supply
	Degree of protection IEC/EN	IP54
	Degree of protection NEMA/UL	NEMA 2, UL Enclosure Type 2
	EMC	CE according to 2014/30/EU
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14
	Certification UL	cULus according to UL 60730-1A, UL 60730-2-14 and CAN/CSA E60730-1:02
	Mode of operation	Type 1
	Rated impulse voltage supply / control	0.8 kV
	Control pollution degree	3
	Ambient temperature	-30...50°C
	Non-operating temperature	-40...80°C
	Ambient humidity	95% r.h., non-condensing
	Maintenance	Maintenance-free
Weight	Weight	0.75 kg

Safety notes

- The device must not be used outside the specified field of application, especially not in aircraft or in any other airborne means of transport.
- Outdoor application: only possible in case that no (sea)water, snow, ice, insolation or aggressive gases interfere directly with the actuator and that is ensured that the

Lindab

Installation instructions RCW-2/RCWB-2

NM24A **Damper actuator, Open-close, 3-point, AC/DC 24 V, 10 Nm** BELIMO

Safety notes

- Cables must not be removed from the device.
- To calculate the torque required, the specifications supplied by the damper manufacturers concerning the cross-section, the design, the installation site and the ventilation conditions must be observed.
- The device contains electrical and electronic components and must not be disposed of as household refuse. All locally valid regulations and requirements must be observed.

Product features

Simple direct mounting Simple direct mounting on the damper spindle with an universal spindle clamp, supplied with an anti-rotation device to prevent the actuator from rotating.

Manual override Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).

Adjustable angle of rotation Adjustable angle of rotation with mechanical end stops.

High functional reliability The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.

Accessories

	Description	Type
Electrical accessories	Auxiliary switch, add-on, 1 x SPDT	S1A
	Auxiliary switch, add-on, 2 x SPDT	S2A
	Feedback potentiometer 140 Ohm, add-on	P140A
	Feedback potentiometer 140 Ohm, add-on, grey	P140A GR
	Feedback potentiometer 200 Ohm, add-on	P200A
	Feedback potentiometer 500 Ohm, add-on	P500A
	Feedback potentiometer 500 Ohm, add-on, grey	P500A GR
	Feedback potentiometer 1 kOhm, add-on	P1000A
	Feedback potentiometer 1 kOhm, add-on, grey	P1000A GR
	Feedback potentiometer 2.8 kOhm, add-on	P2800A
	Feedback potentiometer 2.8 kOhm, add-on, grey	P2800A GR
	Feedback potentiometer 5 kOhm, add-on	P5000A
	Feedback potentiometer 5 kOhm, add-on, grey	P5000A GR
	Feedback potentiometer 10 kOhm, add-on	P10000A
	Feedback potentiometer 10 kOhm, add-on, grey	P10000A GR

	Description	Type
Mechanical accessories	Actuator arm, for one-sided spindle clamp K-ENSA	AH-25
	Shaft extension 250 mm, for damper spindles Ø 8...25 mm	AV8-25
	Angled ball joint with M8, suitable for damper crank arms KH8	KG8
	Straight ball joint with M8, suitable for damper crank arms KH8	KG10A
	Damper crank arm, for damper spindles	KH8
	Spindle clamp, one side for NM..A	K-ENMA
	Spindle clamp, one side for NM..A, SM..A	K-ENSA
	Spindle clamp, reversible for NM..A and LMQ..	K-NA
	Angle of rotation limiter, for K-NA	20334-00001
	Form fit insert 8x8 mm, for NM..A	ZF8-NMA
	Form fit insert 10x10 mm, for NM..A / SM..A	ZF10-NSA
	Form fit insert 12x12 mm, for NM..A / SM..A	ZF12-NSA
	Form fit insert 15x15 mm	ZF15-NSA
	Form fit insert 16x16 mm, for NM..A / SM..A	ZF16-NSA
	Mounting kit for linkage operation, NM..A for flat installation	ZG-NMA
	Universal mounting bracket 180 mm	Z-ARS180
	Base plate extension from NM..A to NM..	Z-NMA
	Position indication for LM..A, NM..A, SM..A, GM..A	Z-PI

Installation instructions RCW-2/RCWB-2

NM24A

Damper actuator, Open-close, 3-point, AC/DC 24 V, 10 Nm

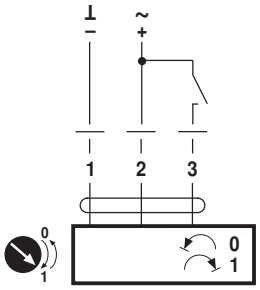
Electrical installation

Notes

- Connection via safety isolating transformer.
- Parallel connection of other actuators possible. Observe the performance data.

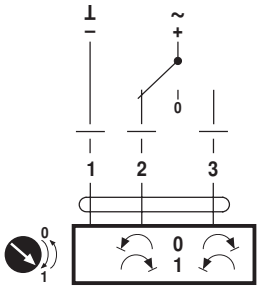
Wiring diagrams

AC/DC 24 V, open-close



Cable colours:
1 = black
2 = red
3 = white

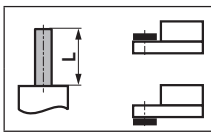
AC/DC 24 V, 3-point



Cable colours:
1 = black
2 = red
3 = white

Dimensions [mm]

Spindle length

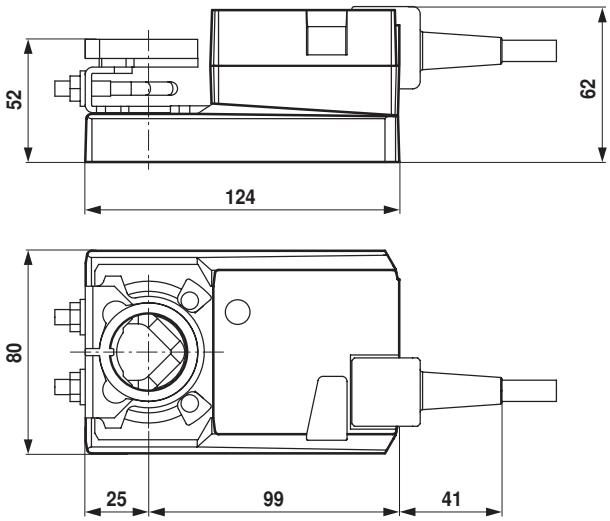
	Min. 40
	Min. 20

Clamping range

	8...26.7	≥8	≤26.7
*	8...20	≥8	≤20

*Option: Spindle clamp mounted below (accessories K-NA needed)

Dimensional drawings



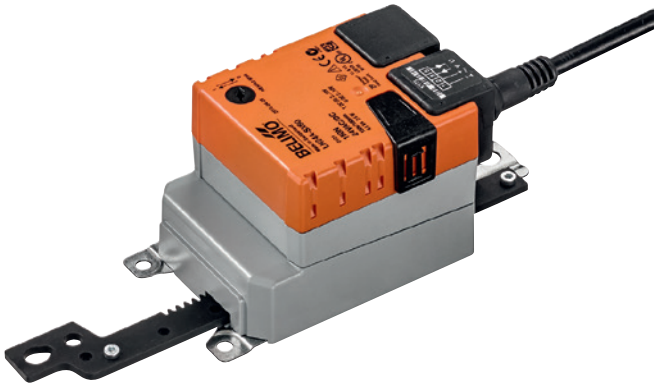
Installation instructions RCW-2/RCWB-2

BELIMO

Technical data sheet **LH24A60**

Linear actuator for adjusting dampers and slide valves in technical building installations

- **Air damper size up to approx. 1 m²**
- **Actuating force 150 N**
- **Nominal voltage AC/DC 24 V**
- **Control Open-close, 3-point**
- **Length of Stroke Max. 60 mm, adjustable in 20 mm increments**



Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Nominal voltage range	AC 19.2...28.8 V / DC 19.2...28.8 V
	Power consumption in operation	1.5 W
	Power consumption in rest position	0.5 W
	Power consumption for wire sizing	3 VA
	Connection supply / control	Cable 1 m, 3 x 0.75 mm²
	Parallel operation	Yes (note the performance data)
Functional data	Actuating force motor	Min. 150 N
	Direction of motion motor	Selectable with switch 0 (extended) / 1 (retracted)
	Manual override	Gear disengagement with push-button, can be locked
	Length of Stroke	Max. 60 mm, adjustable in 20 mm increments
	Stroke limitation	can be limited on both sides with mechanical end stops
	Running time motor	150 s / 100 mm
	Running time motor note	corresponds to 90 s / 60 mm
	Sound power level motor	45 dB(A)
Safety	Protection class IEC/EN	III Safety extra-low voltage
	Protection class UL	UL Class 2 Supply
	Degree of protection IEC/EN	IP54
	Degree of protection NEMA/UL	NEMA 2, UL Enclosure Type 2
	EMC	CE according to 2004/108/EC
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14
	Certification UL	cULus according to UL 60730-1A, UL 60730-2-14 and CAN/CSA E60730-1:02
	Mode of operation	Type 1
	Rated impulse voltage supply / control	0.8 kV
	Control pollution degree	3
	Ambient temperature	-30...50°C
	Non-operating temperature	-40...80°C
	Ambient humidity	95% r.h., non-condensing
	Maintenance	Maintenance-free
Weight	Weight	0.43 kg

Safety notes

- The device must not be used outside the specified field of application, especially not in aircraft or in any other airborne means of transport.
- Outdoor application: only possible in case that no (sea)water, snow, ice, insolation or aggressive gases interfere directly with the actuator and that is ensured that the ambient conditions remain at any time within the thresholds according to the data sheet.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.

Installation instructions RCW-2/RCWB-2

LH24A60

Linear actuator, Open-close, 3-point, AC/DC 24 V, 150 N

BELIMO

Safety notes

- The rotary supports and coupling pieces available as accessories must always be used if transverse forces are likely. In addition, the actuator must not be tightly bolted to the application. It must remain movable via the rotary support (refer to «Assembly notes»).
- If the actuator is exposed to severely contaminated ambient air, appropriate precautions must be taken on the system side. Excessive deposits of dust, soot etc. can prevent the gear rod from being extended and retracted correctly.
- If not installed horizontally, the gear disengagement pushbutton may only be actuated when there is no pressure on the gear rod.
- To calculate the actuating force required for air dampers and slide valves, the specifications supplied by the damper manufacturers concerning the cross section, the design, the installation site and the ventilation conditions must be observed.
- If a rotary support and/or coupling piece is used, actuation force losses are to be expected.
- The device contains electrical and electronic components and must not be disposed of as household refuse. All locally valid regulations and requirements must be observed.

Product features

Simple direct mounting
The actuator can be directly connected with the application using the enclosed screws. The head of the gear rod is connected to the moving part of the ventilating application individually on the mounting side or with the Z-KS2 coupling piece provided.

Manual override
Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).

Adjustable stroke
If a stroke limitation will be adjusted, the mechanical operating range on this side of the gear rod can be used starting with an extension length of 20 mm and then can be limited respectively in increments of 20 mm by means of mechanical end stops Z-AS2.

High functional reliability
The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.

Accessories

Mechanical accessories

Description	Type
End stop set for LH	Z-AS2
Rotary support for compensation of transverse forces	Z-DS1
Coupling piece M6 for LH, galvanised steel	Z-KS2

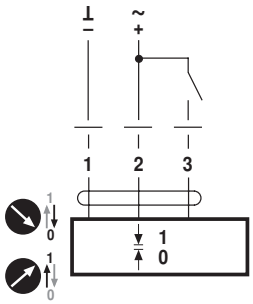
Electrical installation

Notes

- Connection via safety isolating transformer.
- Parallel connection of other actuators possible. Observe the performance data.

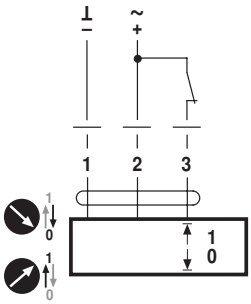
Wiring diagrams

AC/DC 24 V, open-close



Cable colours:
1 = black
2 = red
3 = white

Connection 3 takes priority



Cable colours:
1 = black
2 = red
3 = white

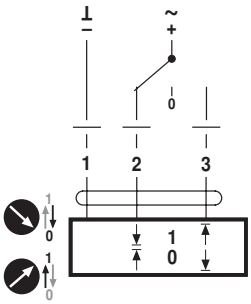
Lindab

Installation instructions RCW-2/RCWB-2

LH24A60 **Linear actuator, Open-close, 3-point, AC/DC 24 V, 150 N**

Electrical installation

AC/DC 24 V, 3-point



Cable colours:
1 = black
2 = red
3 = white

Installation notes

Notes

- If a rotary support and/or coupling piece is used, losses in the actuation force losses are to be expected.

Applications without transverse force

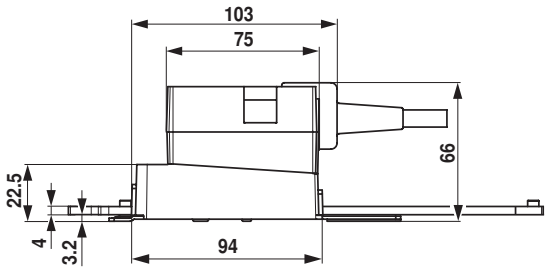
The linear actuator is screwed directly to the housing at three points. Afterwards, the head of the gear rod is fastened to the moving part of the ventilation application (e.g. damper or slide valve).

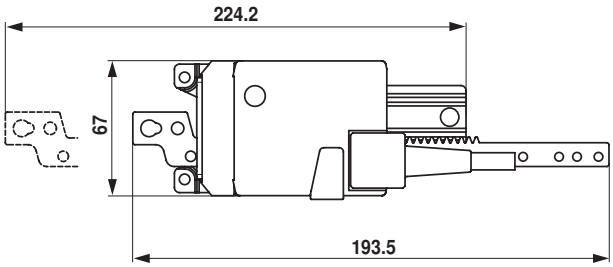
Applications with transverse forces

Connect the coupling piece with the internal thread (Z-KS2) to the head of the gear rod. Screw the rotary support (Z-DS1) to the ventilation application. Afterwards, the linear actuator is screwed to the previously mounted rotary support with the enclosed screw. Afterwards, the coupling piece, which is mounted to the head of the gear rod, is attached to the moving part of the ventilating application (e.g. damper or slide valve). The transverse forces can be compensated for to a certain limit with the rotary support and/or coupling piece. The maximum permissible swivel angle of the rotary support and coupling piece is 10°, laterally and upwards.

Dimensions [mm]

Dimensional drawings





Installation instructions RCW-2/RCWB-2

RCW mounting instruction with electric motor

20 mm hole is drilled in duct where connection is wanted.

Put electric cable through drilled hole.

Cable lead-in.

Cable lead-in is mounted on electric cable.

Cable lead-in is mounted in duct.

Most of us spend the majority of our time indoors. Indoor climate is crucial to how we feel, how productive we are and if we stay healthy.

We at Lindab have therefore made it our most important objective to contribute to an indoor climate that improves people's lives. We do this by developing energy-efficient ventilation solutions and durable building products. We also aim to contribute to a better climate for our planet by working in a way that is sustainable for both people and the environment.

Lindab | For a better climate