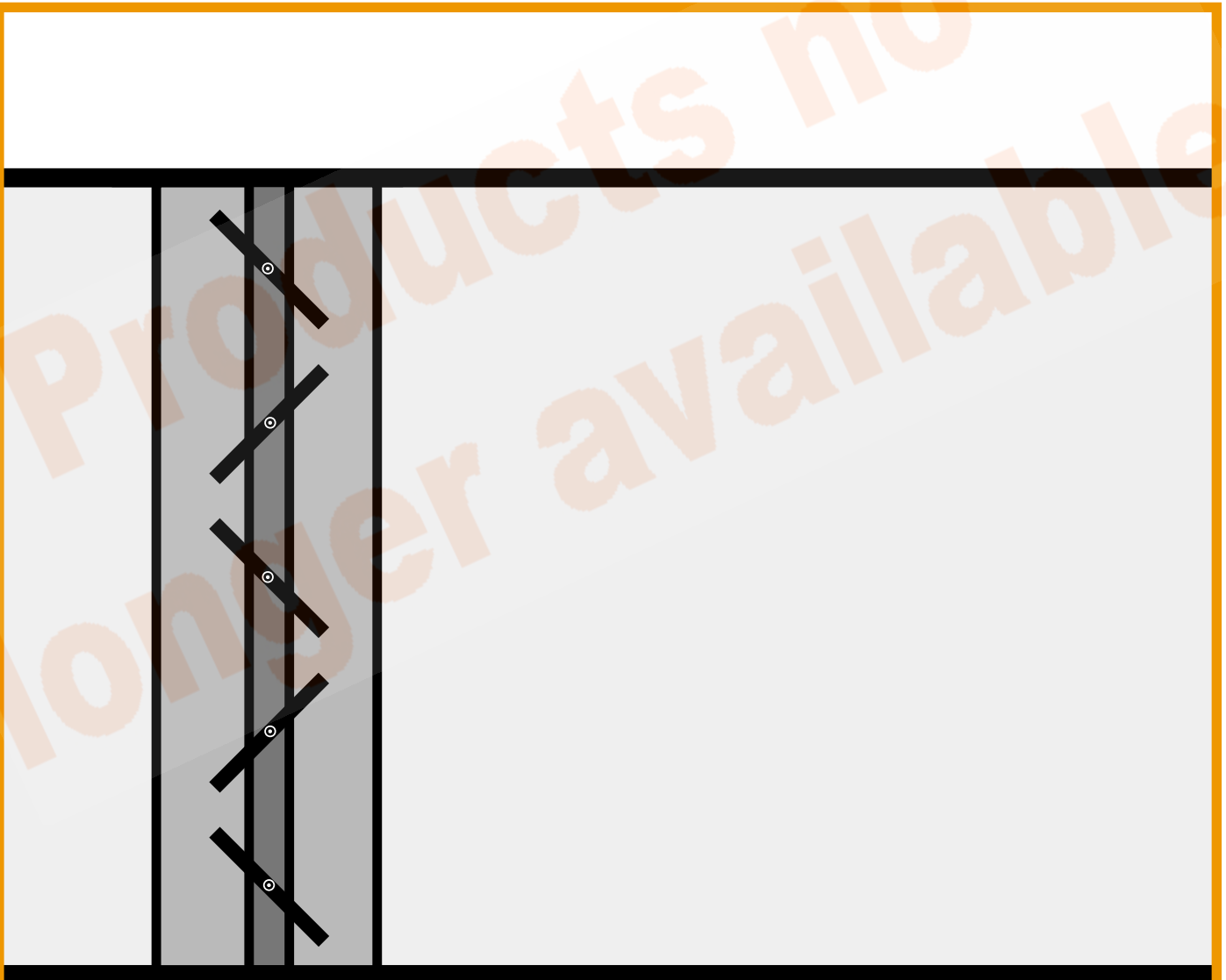


2. LM-5

Product Information

Damper actuators

LM



The complete range of damper actuators for general use in HVAC systems

Type	LM	NM	SM	AM	GM	LF	AF(R)
							
Torque	4 Nm	8 Nm	15 Nm	18 Nm	30 Nm	4 Nm	15 Nm
Spring return function	—	—	—	—	—		
For dampers up to approx.	0.8 m ²	1.5 m ²	3 m ²	3.6 m ²	6 m ²	0.8 m ²	3 m ²

For more information, please contact your Belimo Representative or order any brochures you need by fax.

Fax to: **BELIMO** (address overleaf)

Please send us product brochures on the following damper actuators:

☐ NM... ☐ SM... ☐ AM... ☐ GM... ☐ LF... ☐ AF... ☐ AFR... ☐ Electrical accessories

Please send also information on:

- ☐ Motorized fire and smoke dampers
- ☐ Variable air-volume control (VAV-Control)
- ☐ Rotary-motion actuators and valves
- ☐ Linear-motion actuators and valves

☐ Please call us back

Sender

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Date:

Selection table

		LM24	LM24-S	LM230	LM230-S	LM24-SR
Torque	4 Nm					
Nominal voltage	AC 24 V DC 24 V AC 230 V	• •	• •		• •	• •
Running time	80...110 s	•	•	•	•	•
Control	Open/Close Single-wire Modulating 2-wire DC 0...10 V	• •	• •	•	•	•
Direction of rotation reversible (right/left)		•	•	•	•	•
Manual operation by pushbutton		•	•	•	•	•
Auxiliary switch potential-free			•		•	
Mechanical angle of rotation limiting		•	•	•	•	
Electronic angle of rotation limiting						•
Continuous position feedback						•
Damper rotation with universal spindle clamp		•	•	•	•	•

Actuators with damper rotation for square form-fit spindles (8 mm), actuators with running time (25...35 s), 60 mm linear adapter and actuators conforming to US standards on request.

Damper actuators, Open/Close

LM24	4
LM24-S	4
LM230	5
LM230-S	5
Mounting instructions	6
Adjusting the auxiliary switch	7

Damper actuator, modulating

LM24-SR	8
Mounting instructions	9
Control and monitoring functions	10

Note

Using BELIMO damper actuators

The actuators listed in this catalogue are intended for the operation of air dampers in HVAC systems.

Torque requirements

When calculating the torque required to operate dampers, it is essential to take into account all the data supplied by the damper manufacturer concerning cross sectional area, design, mounting and air flow conditions.



p0001707

Dampers up to approx. 0.8 m²
Open/Close actuator
(AC/DC 24 V)
Single-wire or 2-wire control

Application
The type LM24(-S) is intended for the operation of air control dampers in ventilation and air-conditioning systems.

Mode of operation
Open/Close control by single-wire or 2-wire system.

Product features

Simple direct mounting on the damper spindle by universal spindle clamp. An antirotation device is supplied to prevent unwanted rotation of the whole unit.

Manual operation by self-resetting pushbutton when necessary (the gearing is disengaged while the pushbutton is held depressed).

Adjustable angle of rotation with mechanical stops.

High functional reliability
The actuator is overload-proof, needs no limit switches and halts automatically at the end stops.

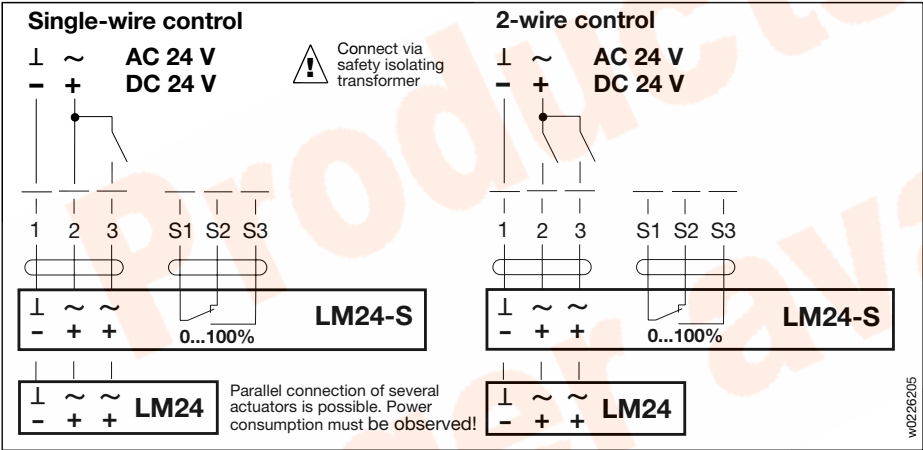
Flexible signalling 0...100%, with adjustable auxiliary switch (LM24-S only).

Mounting instructions, page 6

Adjusting auxiliary switch LM24-S, page 7.

Important
Read the notes about the use and torque requirements of the damper actuators on page 2.

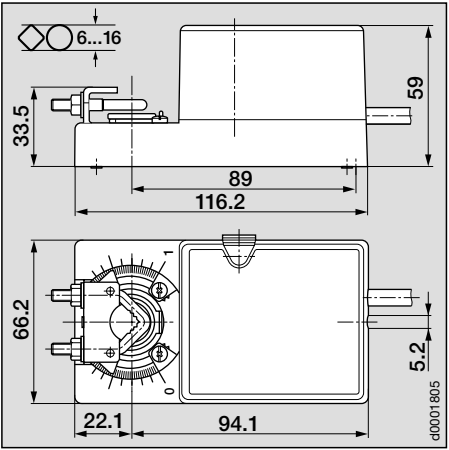
Wiring diagram



w0226205

Technical data	LM24, LM24-S
Nominal voltage	AC 24 V 50/60 Hz, DC 24 V
Nominal voltage range	AC/DC 19.2...28.8 V
For wire sizing	3 VA
Power consumption	2 W
Connecting cable	– motor 1 m long, 3 × 0.75 mm ² – auxiliary switch (LM24-S) 1 m long, 3 × 0.75 mm ²
Auxiliary switch (LM24-S)	1 × SPDT 5(2.5) A, AC 250 V (adjustable 0...100%)
Direction of rotation	selected with L/R switch
Manual operation	Pushbutton, self-resetting
Torque	min. 4 Nm (at rated voltage)
Angle of rotation	max. 95° (adjustable by mechanical stops)
Running time	80...110 s (0...4 Nm)
Sound power level	max. 35 dB(A)
Position indication	mechanical
Protection class	(safety low voltage)
Degree of protection	IP 54 (bottom cable entry)
Ambient temperature range	– 30... + 50 °C
Non-operating temperature	– 40... + 80 °C
Humidity test	to EN 60335-1
EMC	CE according to 89/336/EEC, 92/31/EEC, 93/68/EEC
Low Voltage Directive	CE according to 73/23/EEC
Maintenance	maintenance-free
Weight	650 g

Dimensions





Dampers up to approx. 0.8 m²
Open/Close actuator (AC 230 V)
Control by single-pole contact (single-wire control)

Application

The type LM230(-S) is intended for the operation of air control dampers in ventilation and air-conditioning systems.

Mode of operation

Open/Close control by single-wire system.

Product features

Simple direct mounting on the damper spindle by universal spindle clamp. An antirotation device is supplied to prevent unwanted rotation of the whole unit.

Manual operation by self-resetting pushbutton when necessary (the gearing is disengaged while the pushbutton is held depressed).

Adjustable angle of rotation with mechanical stops.

High functional reliability

The actuator is overload-proof, needs no limit switches and halts automatically at the end stops.

Flexible signalling 0...100%, with adjustable auxiliary switch (LM230-S only).

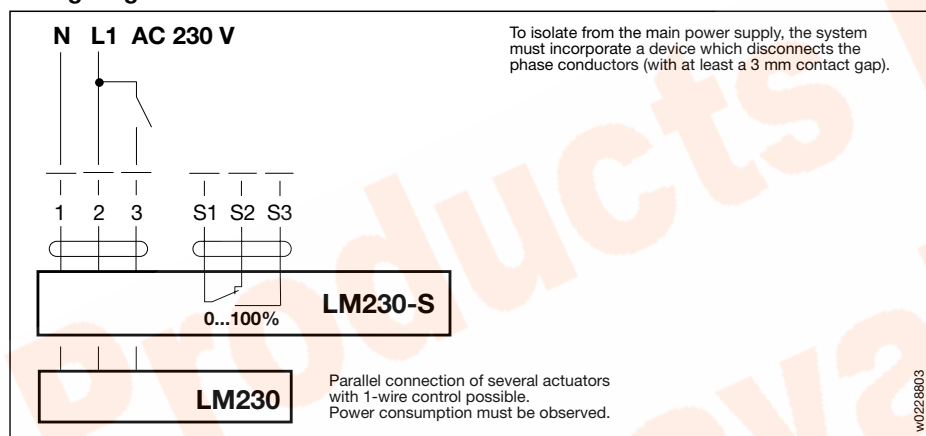
Mounting instructions, page 6

Adjusting auxiliary switch LM230-S, page 7.

Important

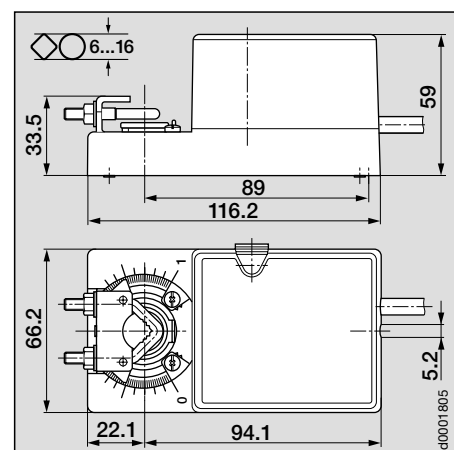
Read the notes about the use and torque requirements of the damper actuators on page 2.

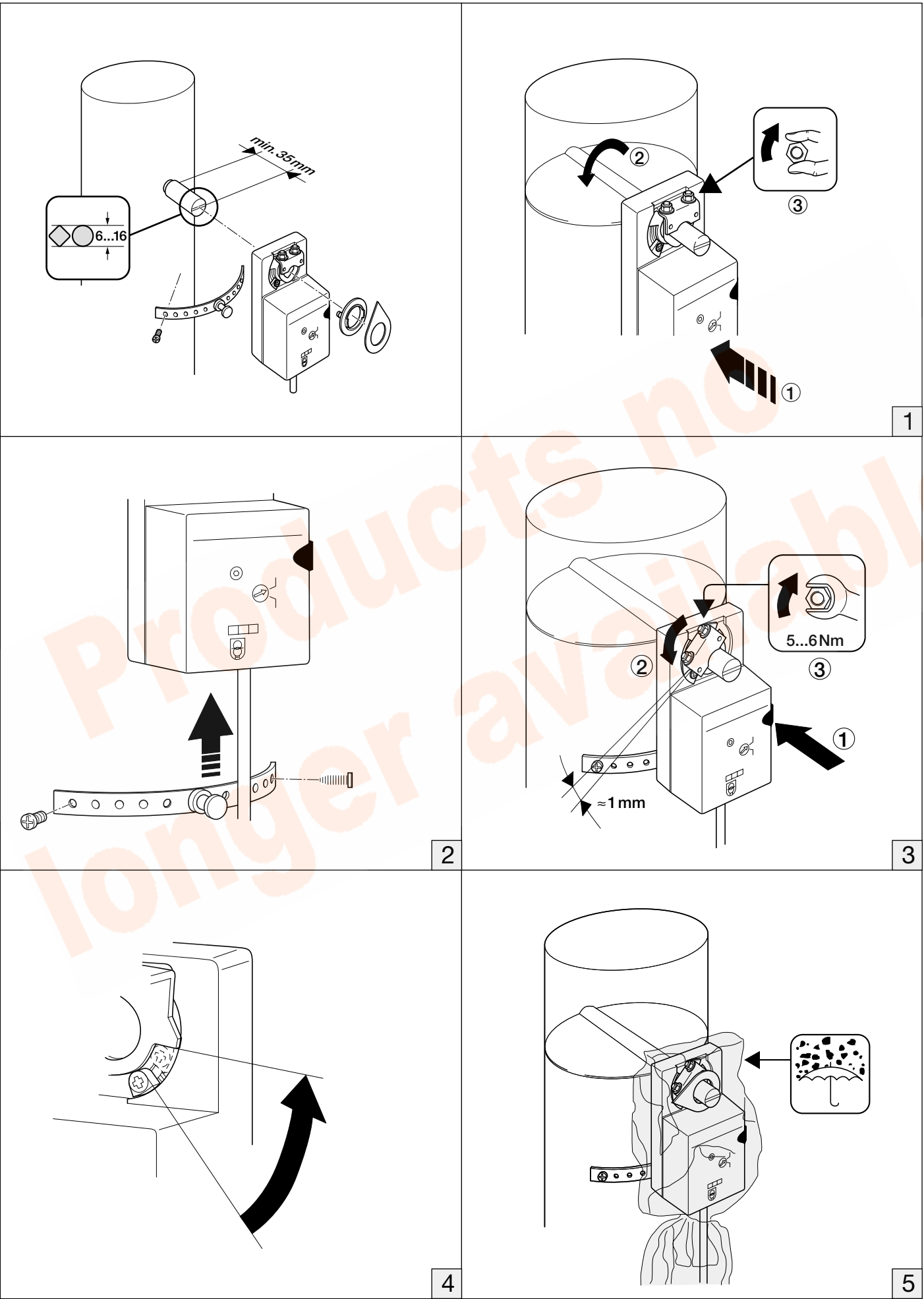
Wiring diagram



Technical data	LM230, LM230-S
Nominal voltage	AC 230 V 50/60 Hz
Nominal voltage range	AC 198...264 V
For wiring sizing	12 VA
Power consumption	1 W
Connecting cable	– motor 1 m long, 3 × 0.75 mm ² – auxiliary switch (LM230-S) 1 m long, 3 × 0.75 mm ²
Auxiliary switch (LM230-S)	1 × SPDT 5(2,5) A, AC 250 V ☐
– Switching point	adjustable 0...100% $\angle$
Direction of rotation	selected with L/R switch
Manual operation	pushbutton, self-resetting
Torque	min. 4 Nm (at rated voltage)
Angle of rotation	max. 95° (adjustable by mechanical stops)
Running time	80... 110 s (0... 4 Nm)
Sound power level	max. 35 dB(A)
Position indication	mechanical
Protection class	II (all insulated)
Degree of protection	IP 54 (bottom cable entry)
Ambient temperature range	– 30... + 50 °C
Non-operating temperature	– 40... + 80 °C
Humidity test	to EN 60335-1
EMC	CE according to 89/336/EEC, 92/31/EEC, 93/68/EEC
Low Voltage Directive	CE according to 73/23/EEC
Maintenance	maintenance-free
Weight	650 g

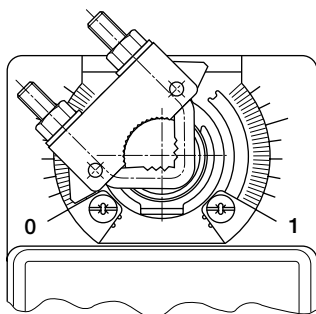
Dimensions



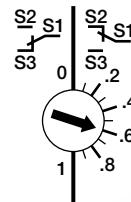


a) Referring to end stop 0

Option 1: Actuator at left-hand end stop

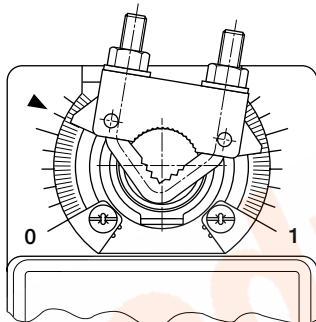


Procedure: – Turn the scale knob of the auxiliary switch clockwise (cw) from **0** until the tip of the arrow is pointing to the required switching position. The switch in the example is set to **.6** (2 scale divisions cw from **0** correspond to 60% rotation).

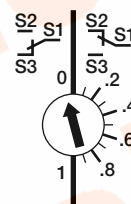


– Now, when the actuator rotates clockwise, the switch will operate at 60% angle of rotation. (Connection S1 to S3 made)

Option 2: Actuator at switching position



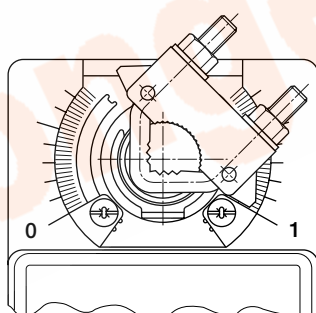
Procedure: – Depress the manual-operation pushbutton and move the actuator to the position where the auxiliary switch is needed to operate (e.g. at 60% angle of rotation).



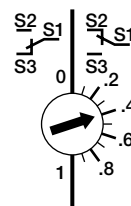
– Turn the scale knob of the auxiliary switch anticlockwise (ccw) until the tip of the arrow is just past the scale zero. (Connection S1 to S3 made and switching position set for 60% angle of rotation)

b) Referring to end stop 1

Option 1: Actuator at right-hand end stop

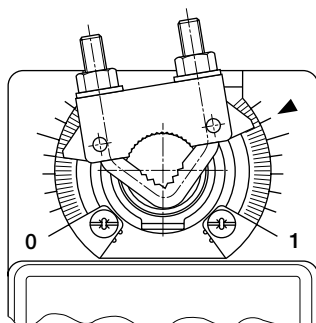


Procedure: – Turn the scale knob of the auxiliary switch anticlockwise (ccw) from **1** until the tip of the arrow is pointing to the required switching position. The switch in the example is set to **.4** (6 scale divisions ccw from **1** correspond to 60% rotation).

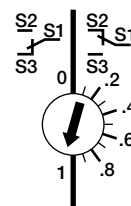


– Now, when the actuator rotates anticlockwise, the switch will operate at 60% angle of rotation. (Connection S1 to S3 made)

Option 2: Actuator at switching position



Procedure: – Depress the manual-operation pushbutton and move the actuator to the position where the auxiliary switch is needed to operate (e.g. at 60% angle of rotation).



– Turn the scale knob of the auxiliary switch clockwise until the tip of the arrow is just past the **1** on the scale. (Connection S1 to S3 made and switching position set for 60% angle of rotation)



Dampers up to approx. 0.8 m²

**Modulating damper actuator
(AC/DC 24 V)**

Control DC 0...10 V and position feedback DC 2...10 V

Application

The type LM24-SR is intended for the operation of air control dampers in ventilation and air-conditioning systems.

Mode of operation

The actuator is controlled by a standard DC 0...10 V signal and runs to whatever position is specified by the signal. The purpose of measuring voltage U is to provide 0...100% electrical indication of damper position and to act as a master-slave control signal for other actuators.

Product features

Simple direct mounting on the damper spindle by universal spindle clamp. An antirotation device is supplied to prevent unwanted rotation of the whole unit.

Steplessly adjustable angle of rotation by integral potentiometer. Range matching of the working range and measuring signal U is performed automatically by the actuator.

Manual operation by self-resetting pushbutton when necessary (the gearing is disengaged while the pushbutton is held depressed).

High functional reliability

The actuator is overload-proof, needs no limit switches and halts automatically at the end stops.

Electrical accessories (see Doc. 2.Z-)

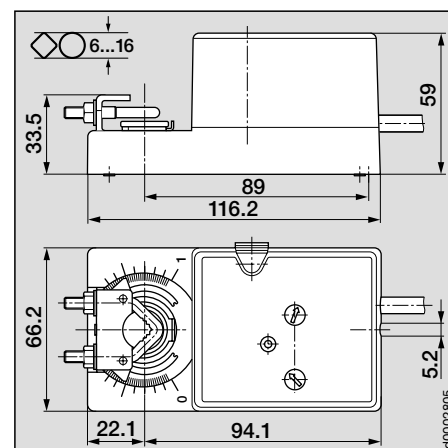
SG..24 Positioners
ZAD24 Digital position indicator

Control and monitoring functions, page 10

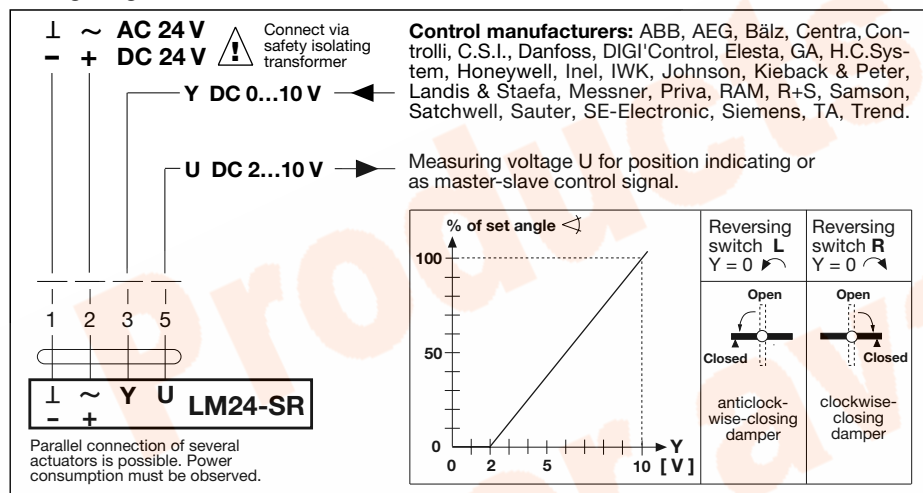
Important

Read the notes about the use and torque requirements of the damper actuators on page 2.

Dimensions

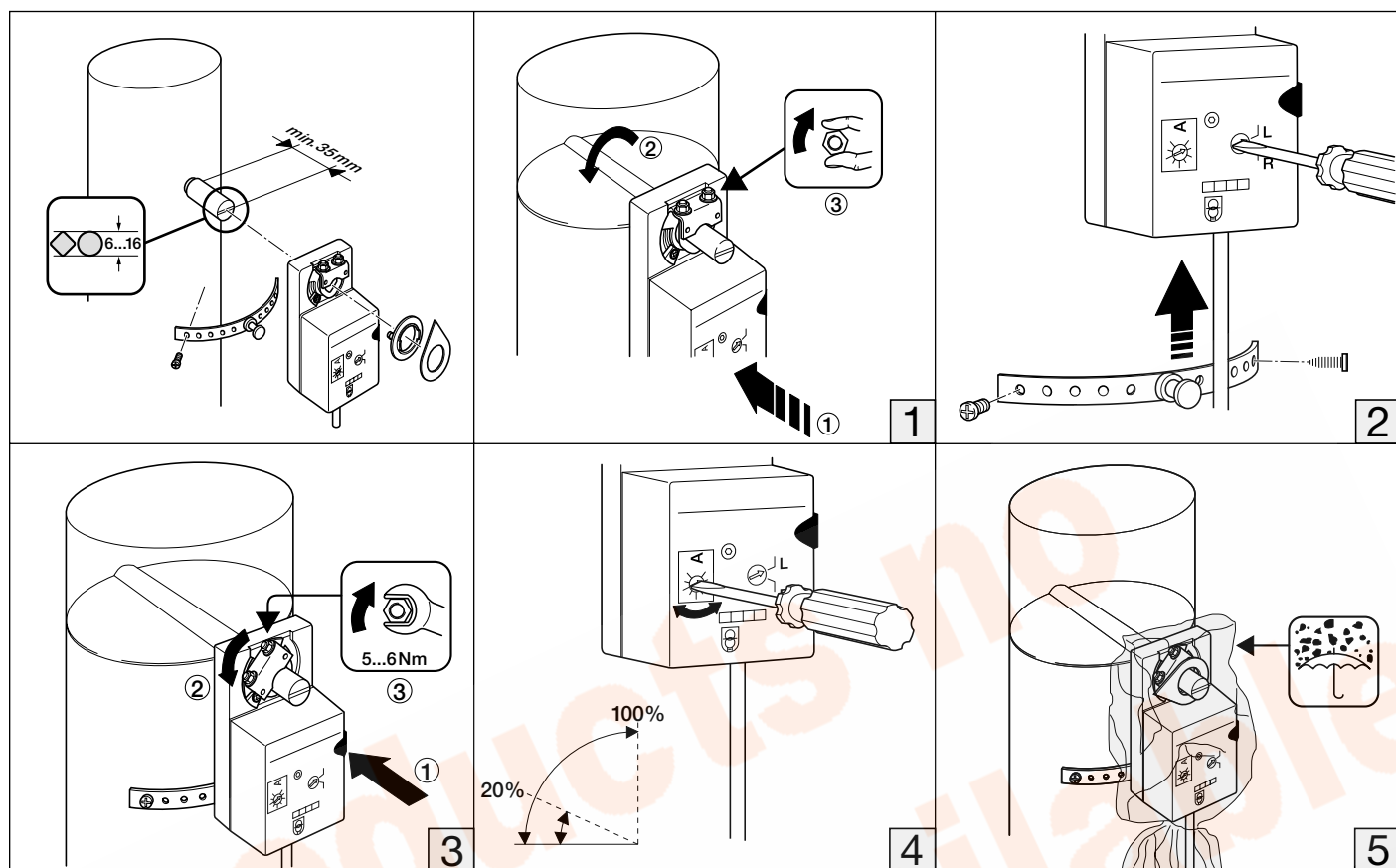


Wiring diagram



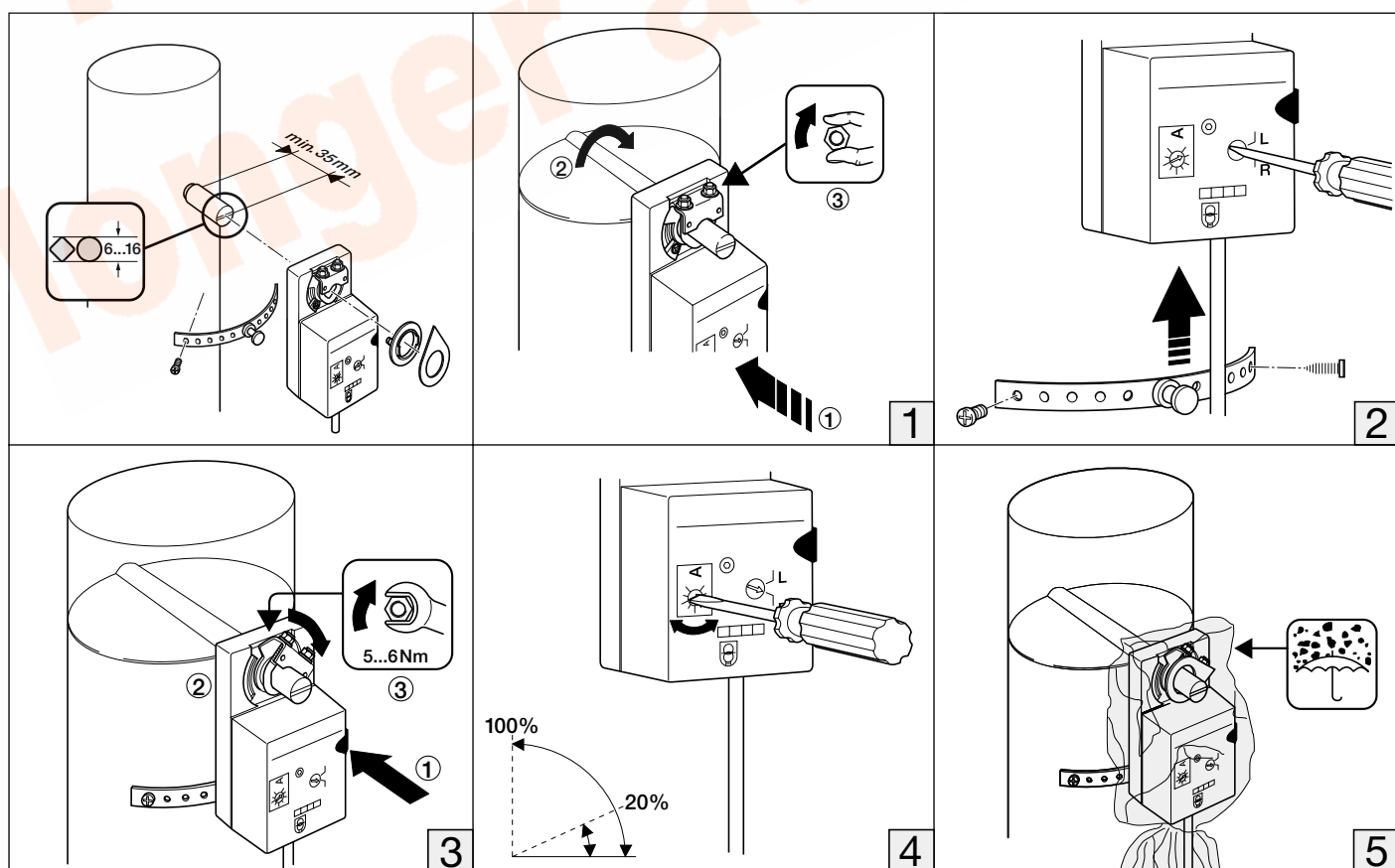
Technical data	LM24-SR
Nominal voltage	AC 24 V 50/60 Hz, DC 24 V
Nominal voltage range	AC 19.2...28.8 V, DC 21.6...28.8 V
For wire sizing	4 VA
Power consumption	2 W
Connecting cable	1 m long, 4 × 0.75 mm ²
Control signal Y	DC 0...10 V @ input resistance = 100 kΩ
Operating range	DC 2...10 V (for set angle of rotation)
Measuring voltage U	DC 2...10 V @ ≤ 0.5 mA (for set angle of rotation)
Synchronism tolerance	± 5%
Direction of rotation	selected with L/R switch
(at Y = 0 V)	at switch position L ↺ resp. R ↻
Manual operating	Pushbutton, self resetting
Torque	min. 4 Nm (at rated voltage)
Angle of rotation	max. 95° (adjustable with potentiometer 20...100%)
Running time	80...110 s for < 95° (0...4 Nm)
Sound power level	max. 35 dB (A)
Position indication	mechanical
Protection class	⊡ (safety low voltage)
Degree of protection	IP 54 (bottom cable entry)
Ambient temperature range	− 30... + 50 °C
Non-operating temperature	− 40... + 80 °C
Humidity test	to EN 60335-1
EMC	CE according to 89/336/EEC, 92/31/EEC, 93/68/EEC
Maintenance	maintenance-free
Weight	620 g

Mounting on anticlockwise-closing damper



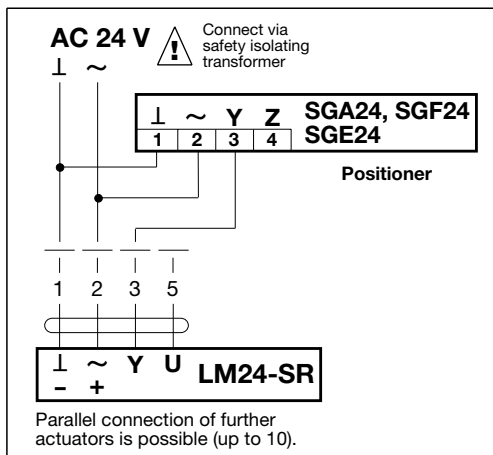
m0006707

Mounting on clockwise-closing damper

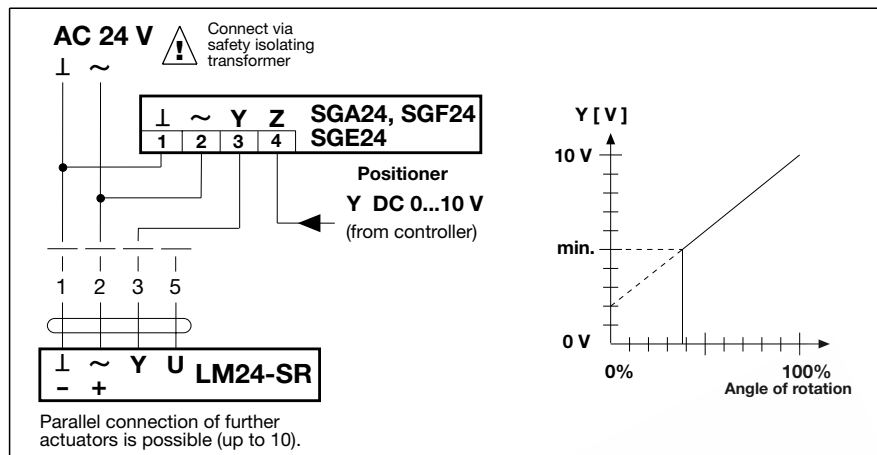


m0007707

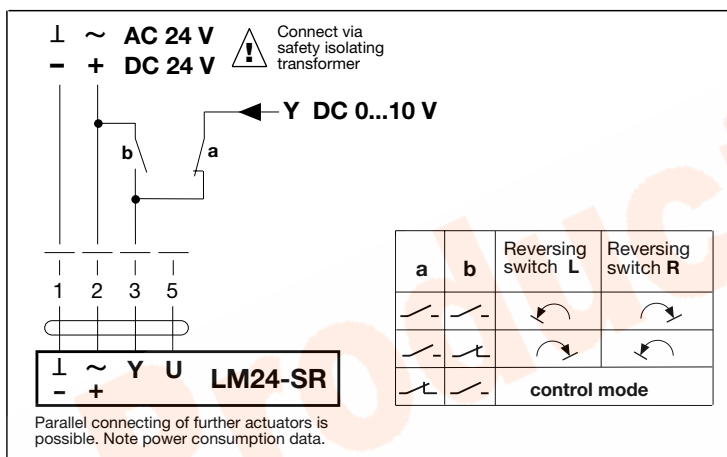
Remote control 0...100%



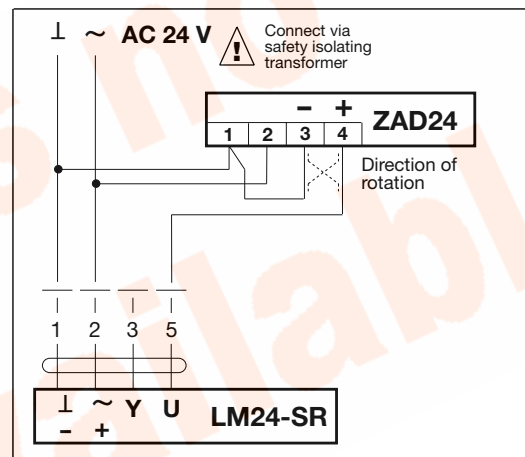
Minimum position



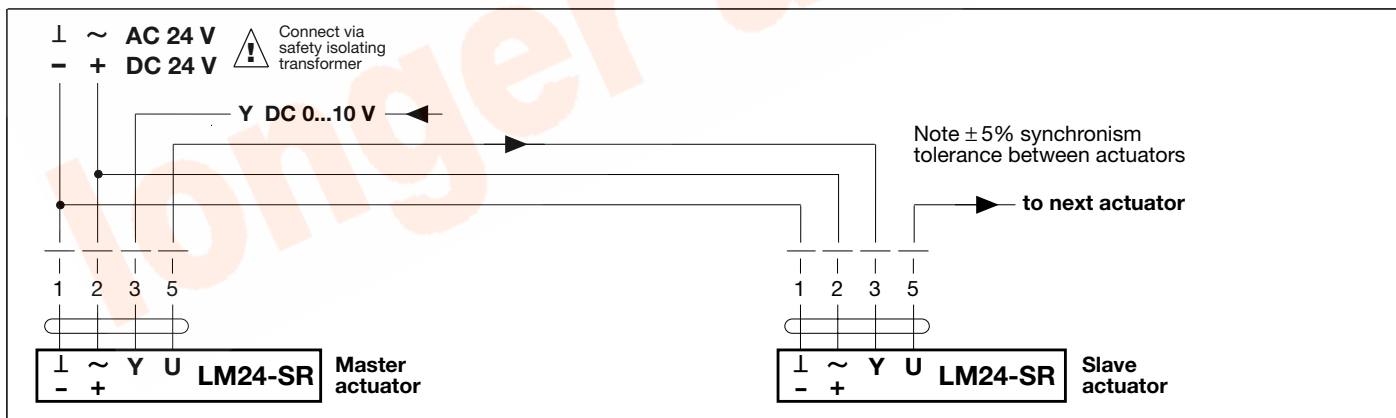
Override control



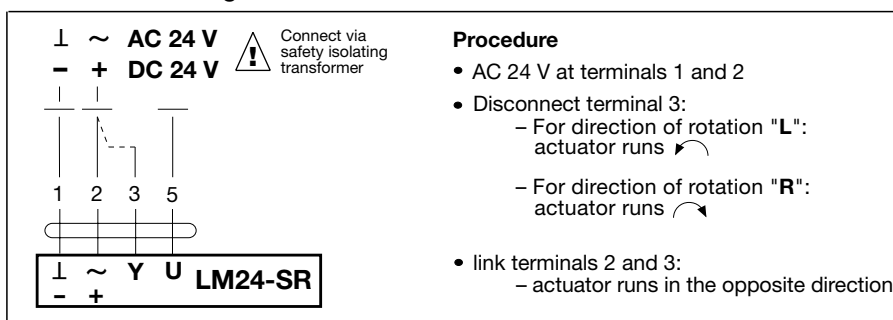
Position indication



Master-slave control (depending on position)



Function monitoring





Innovation, Quality and Consultancy: A partnership for motorizing HVAC actuators

Air applications



Standard actuators and spring-return actuators for air control dampers in HVAC systems



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Contact the following for further information:

Belimo Headquarters

CH BELIMO Holding AG
Guyer-Zeller-Strasse 6
8620 Wetzikon, Switzerland
Tel. ++41 (0) 933 11 11
Telefax ++41 (0) 933 12 68
E-Mail: info@belimo.ch
Internet: http://www.belimo.ch

Belimo Subsidiaries

AT/ HR/ HU/ SK/ SL BELIMO Automation
Handels-Gesellschaft m.b.H.
Geiselbergstrasse 26-32
1110 Wien, Austria
Tel. ++43 (0) 1 749 03 61-0
Telefax ++43 (0) 1 749 03 61-99
E-Mail: info@belimo.at

AU BELIMO Actuators Pty. Ltd.
Unit 10, 266 Osborne Avenue
Clayton South, VIC 3169
Australia
Tel. ++61 (0) 3 9551 0201
Telefax ++61 (0) 3 9551 0215
E-Mail: belimo@belimoactuators.com

CA BELIMO Aircontrols (CAN), Inc.
5716 Coopers Ave., Units 14&15
Mississauga, Ontario L4Z 2E8
Canada
Tel. ++1 (1) 905 712 31 18
Telefax ++1 (1) 905 712 31 24
E-Mail: webmaster@belimo.com

CH BELIMO Automation AG
Sales Switzerland
Guyer-Zeller-Strasse 6
8620 Wetzikon, Switzerland
Tel. ++41 (0) 933 12 12
Telefax ++41 (0) 933 12 66
E-Mail: verk@belimo.ch
Internet: http://www.belimo.ch

DE BELIMO Stellantriebe
Vertriebs GmbH
Welfenstr. 27, Postfach 72 02 30
70599 Stuttgart, Germany
Tel. ++49 (0) 711 1 67 83-0
Telefax ++49 (0) 711 1 67 83-73
E-Mail: info@belimo.de
Internet: http://www.belimo.de

ES BELIMO Ibérica
de Servomotores, S.A.
C/San Romualdo, 12-14
28037 Madrid, Spain
Tel. ++34 91 304 11 11
Telefax ++34 91 327 25 39
E-Mail: info@belimo.es

FR BELIMO Servomoteurs
Z.A. de Courmayeur
33, Rue de la Régale
77181 Courtry, France
Tel. ++33 (0) 1 64 72 83 70
Telefax ++33 (0) 1 64 72 94 09
E-Mail: mail@belimo.fr

GB BELIMO Automation UK Limited
The Lion Centre
Hampton Road West
Feltham, Middlesex, Great Britain
TW 13 8DS
Tel. ++44 (0) 20 8755 4411
Telefax ++44 (0) 20 8755 4042
E-Mail: belimo@belimo.co.uk

HK BELIMO Actuators Ltd.
Room 208, 2/F
New Commerce Centre
19 On Sum Street, Shatin, N.T.
Hong Kong
Tel. ++852 26 87 17 16
Telefax ++852 26 87 17 95
E-Mail: info@belimo.com.hk

PL BELIMO Silowniki S.A.
ul. Zagadki 21
02-227 Warszawa, Poland
Tel. ++48 (0) 22 817 35 10
Telefax ++48 (0) 22 817 35 06
E-Mail: info@belimo.pl

SG BELIMO Actuators Pte Ltd
2, Jurong East Street 21
#04-31F IMM Building
Singapore 609601
Tel. ++65 6564 9828
Telefax ++65 6564 9038
E-Mail: info@belimo.com.sg

US BELIMO Aircontrols (USA), Inc.
43 Old Ridgebury Road
P.O. Box 2928
Danbury, CT 06810 USA
Tel. ++1 (1) 203 791 99 15
Telefax ++1 (1) 203 792 29 67
E-Mail: webmaster@belimo.com
Internet: http://www.belimo.com

Belimo Representatives and Agencies

AE BELIMO Automation
Middle East Office
P.O. Box 55427
Dubai, U.A.E.
Tel. ++971 (0) 4 387 417
Telefax ++971 (0) 4 387 415
E-Mail: belimome@emirates.net.ae

BE BELIMO Automation N.V.-S.A.
Leuvensesteenweg 613
1930 Zaventem, Belgium
Tel. ++32 (0) 2 757 92 95
Telefax ++32 (0) 2 757 90 36
E-Mail: info@belimo.be

BG BELIMO Bulgaria Ltd.
J.K. Lagera, 3 Smolyanska Str.
bl. 56, entr. B, ap. 50
1612 Sofia, Bulgaria
Tel. ++3592 952 3470/1
Telefax ++3592 545 995
E-Mail: belimo@intech.bg

CN BELIMO Actuators Ltd.
18 FA3, 585 Longhua West-Road
200232 Shanghai, China
Tel. ++86 21 6469 2895
Telefax ++86 21 6469 2909
E-Mail: shanghai@belimo.com.hk

CN BELIMO Beijing
Edifice, 44, Liang Ma Qiao Road
Chao Yang District
100016 Beijing, China
Tel. ++86 10 6462 1382
Telefax ++86 10 6462 1383
E-Mail: beijing@belimo.com.hk

CY R.E.S. Ltd.
P.O. Box 8297
Nicosia, Cyprus
Tel. ++357 (0) 2 51 10 07
Telefax ++357 (0) 2 49 65 47
E-Mail: reliance@spidernet.com.cy

CZ BELIMO CZ (Ing. Ivar Mentzl)
Charkovská 16
10100 Praha 10, Czech Republic
Tel. ++420 (0) 2 717 40 311
Telefax ++420 (0) 2 717 43 057
E-Mail: belimo@belimo.cz

DK BELIMO A/S
Thomas Helstedsvej 7A
8660 Skanderborg, Denmark
Tel. ++45 86 52 44 00
Telefax ++45 86 52 44 88
E-Mail: info@belimo.dk

EE BELIMO Balticum AS
Tõri 10 d
11313 Tallinn, Estonia
Tel. ++372 (0) 9 75 11 65 00
Telefax ++372 (0) 9 75 11 65 31
E-Mail: info@belimo.ee

FI Oy Suomen BELIMO Ab
Insinöörikatu 2
00810 Helsinki, Finland
Tel. ++358 (0) 9 75 11 65 00
Telefax ++358 (0) 9 75 11 65 31
E-Mail: belimo@belimo.fi

GR BELIMO Air Controls
29, Tagm. Plessa, Kallithea
GR 17674 Athens, Greece
Tel. ++30 (0) 1 94 00 766
Telefax ++30 (0) 1 94 00 767
E-Mail: belimogr@tee.gr

IE Safegard Systems Ltd.
Systems House, Unit 34
Southern Cross Business Park
Bray, Co Wicklow, Ireland
Tel. ++353 (0) 1 2761600
Telefax ++353 (0) 1 2761611
E-Mail: info@safegard.ie

IL Shemer Representations
P.O. Box 296
56101 Yehud, Israel
Tel. ++972 3 536 51 67
Telefax ++972 3 536 05 81
E-Mail: shemer@shemerep.co.il

IN BELIMO Vitek Air Controls
C-114 Lancelot, First Floor
S.V. Road, Borivali (West)
Mumbai 400 092, India
Tel. ++91 22 806 21 63
Telefax ++91 22 806 21 63
E-Mail: bvac@bom2.vsnl.net.in

IS Hitataekni ehf.
Langhóltsvegur 109
104 Reykjavík, Iceland
Tel. ++354 5 88 60 70
Telefax ++354 5 88 60 71
E-Mail: fridmar@hitataekni.is

IT BELIMO Servomotori S.r.l.
Via Stezzano, 5
24050 Zanica BG, Italy
Tel. ++39 035 67 26 82
Telefax ++39 035 67 02 00
E-Mail: info@belimo.it

KR HANMO Corporation
3rd Floor, Yeosam Bldg. 648-23
Gangnam-Ku, Seoul, Korea
Tel. ++822 3453 8225
Telefax ++822 3453 8228

LB Energy Center (EC)
Hamra, Leon Street, Shatilla,
Bldg. 4th Floor,
P.O. Box 113-6955
Beirut, Lebanon
Tel. ++961 (0) 1 35 38 23
Telefax ++961 (0) 1 35 38 23
E-Mail: belimome@emirates.net.ae

NL BELIMO Servomotoren B.V.
Radeweg 25, 8171 MD Vaassen
Postbus 300, 8160 AH Epe,
Netherlands
Tel. ++31 5 78 57 68 36
Telefax ++31 5 78 57 69 15
E-Mail: info@belimo.nl

NO BELIMO Spjældmotorer A/S
Konowgate 5
0192 Oslo 1, Norway
Tel. ++47 22 70 71 71
Telefax ++47 22 70 71 70
E-Mail: info@belimo.no

PH BELIMO Actuators Philippines
Rm. #507 Anita Build., 5th Floor
1300 Quezon Ave., Cor. South Ave.
1103 Quezon City, Philippines
Tel. ++63 (2) 373 5440
Telefax ++63 (2) 373 5424
E-Mail: philippines@belimo.com.hk

RO Mano Construct srl
Dr Felix 53, ap 14, sector 1
Bucuresti, Romania
Tel. ++401 220 05 78
Telefax ++401 221 59 95
E-Mail: manoconstruct@fx.ro

RU BELIMO Servomotors
Russia Ltd.
Nizhnaya Parvomaikaya,
46 Bld.1, Office 303
105203 Moscow, Russia
Tel. ++7 095 965 74 64
Telefax ++7 095 965 74 73
E-Mail: belimo.russia@mtu-net.ru

SE BELIMO Spjældmotorer AB
Hägerstens Allé 88
129 37 Hägersten, Sweden
Tel. ++46 (0) 8 88 07 00
Telefax ++46 (0) 8 97 85 75
E-Mail: info@belimo.se

SY Philippe A. Jebran
P.O. Box 7791
Damascus, Syria
Tel. ++963 11 231 6586
Telefax ++963 11 231 4052
E-Mail: belimome@emirates.net.ae

TR BELIMO Otomasyon A.S.
Hayriye Caddesi No. 16
TR-80060 Galatasaray-Istanbul
Turkey
Tel. ++90 (0) 212 249 76 43
Telefax ++90 (0) 212 243 02 58
E-Mail: info@belimo.com.tr

TW Chianseng Enterprise Co. Ltd.
2F, No. 21, Tong Fong Street
Taipei, Taiwan
Tel. ++886 2 27 08 77 80
Telefax ++886 2 27 02 90 90
E-Mail: taiwan@belimo.com.hk

UA BELIMO Ukraine S.A.R.
34-A, Ul. Yurkovskaya, Appt.N°2
254080 Kiev, Ukraine
Tel./Telefax ++380 44 463 7586
E-Mail: comaster@belimo.kiev.ua

ZA BELIMO Actuators Southern Africa cc
P. O. Box 2483
Alberton 1450, South Africa
Tel. ++27 (0) 11 868 5681
Telefax ++27 (0) 11 900 2673
E-Mail: belimo@mega.co.za