

Actuators for harsh environmental conditions in ventilation applications

Edition 2025





Special actuators, non fail-safe / fail-safe



Actuator type	Fail-safe	Nominal torque	Shaft diameter	Damper size up to approx. ¹⁾	Page
RobustLine r	otary actuators for extreme o	conditions, non fail-safe / fail-safe			4
NMP		10 Nm	1020 mm	2 m²	
SMP		20 Nm	1420 mm	4 m²	
NKQP		6 Nm	1020 mm	1.2 m²	
IP66/67 NEM	IA 4X rotary actuators for out	door applications, non fail-safe / fail	-safe		5-6
SMQG		16 Nm	1226.7 mm	3.2 m²	
GMG		40 Nm	1426.7 mm		8 m²
NFG	-	10 Nm	1226.7 mm	2 m²	
SFG	-	20 Nm	1226.7 mm	4 m²	
GKG		40 Nm	1426.7 mm		8 m²
Rotary actua	tors with high torque				7
PMCA		160 Nm	17x17 mm	Special	
PKCA		160 Nm	17x17 mm	Special	
Configuratio	n options				10-11

Use of damper actuators from Belimo: The actuators listed in this documentation are designed for adjusting dampers in technical building installations.

1) The recommended damper sizes are guidelines. When determining the torque or actuating force requirement of air dampers, the information provided by the damper manufacturer on the cross-section and design, as well as the installation situation and the ventilation conditions, must be observed.

Bus solutions from Belimo, save costs and energy!



Bus systems can be used to exchange any volume of data from various bus participants over the same physical lines. The user has unrestricted access to control, feedback and parameters on the individual devices. Cabling expenditures are reduced by up to 90% compared with actuators with conventional wiring.

Thanks to time and material savings (cables, connecting terminals, connectors, etc.), installation work is simpler and cheaper. Additional positive selling points for bus solutions include their lower fire load and the fact that they take up less space in cable trays and control cabinets. Depending on the application and requirements, different bus systems are used.

One or two sensors can also be connected to most communicative actuators. This may be a passive resistance sensor (Pt1000, Ni1000, NTC, etc.), an active sensor (e.g. with a DC 0...10 V output) or a switching contact. Its signals are digitised in the Belimo actuator and transferred to the higher-level bus system.



The Belimo MP-Bus was specially developed as a single-client/multi-server system for HVAC actuators and sensors. It allows up to eight different control devices to be grouped together and connected to any higher-level system. It is very resistant to external interferences and does not need bus terminals.



Modbus is a communication protocol, which has become the de-facto standard. It is used commonly all around the globe and in a huge range of applications. Its simple implementation makes Modbus very popular with many manufacturers.



BACnet is a proven, widely used communication protocol for building automation. The standard is open, requires no licence and is used by a large number of international providers, universities and associations. Implementing the BACnet Standard Device Profiles and the associated BACnet Interoperability Building Blocks guarantees genuine compatibility between various BACnet devices.



KNX is a well-engineered building automation system used around the world to control systems spanning several maintenance groups, such as heaters, blinds and security technology in buildings. The KNX-certified actuators enable direct connection to the KNX network. Communication takes place via the integrated KNX interface (TP, S-Mode).



IoT actuators with Ethernet interface can exchange operating and setting data with the Belimo Cloud. It is controlled locally via an analogue signal or BACnet/Modbus. Thanks to the open client API of the Belimo Cloud, a connection to a specific cloud solution can be implemented.

10 Nm

Naminal targue

RobustLine rotary actuators for extreme conditions, non fail-safe / fail-safe

6 NIm

Nominal torque				10 Nm		20 Nm		6 Nm		
Dampe	er size	up to a	pprox.		2 m²		4 m²		1.2 m²	
Open/close	3-point	Modulating (210 V)	Configurable	Nominal voltage		NMP		SMP	NKQP	
					Without auxiliary switch	With 1 SPDT auxiliary switch	Without auxiliary switch	With 1 SPDT auxiliary switch	Without auxiliary switch	
Open/o		3-point						011010		
				AC/DC 24 V	NM24P	NM24P-S	SM24P	SM24P-S		
_				AC/DC 24 V					NKQ24P-1	
-			-> 4\	AC 230 V	NM230P ⁴⁾	NM230P-S 4)	SM230P ⁴⁾	SM230P-S ⁴⁾		
Modul	ating (210 V	/) ' [']	40/D0041/	NIMO 4D OD		OMO AD OD		All/COAD OD	
		_			NM24P-SR		SM24P-SR		NKQ24P-SR	
		- 0)		AC 230 V	NM230PSR		SM230PSR			
Comm	unicat	ive 2), c	onfigu	ırable 3)						
			_	AC/DC 24 V	NM24P-MP		SM24P-MP			
Techni	ical da	ta								
Fail-sa	afe				_		_		•	
Shaft	diame	eter			1020 mm		1420 mm		1020 mm	
Runnii	ng tim	ne moto	or 90°)	150 s		150 s		4 s	
Runni	ng tim	ne fail-s	safe 9	0°			_		4 s	
Manua	al ove	rride			Gear train diseng button, can be lo	agement with push cked	Gear train disenç button, can be lo	gagement with push ocked	Gear train disengagement with push button	
Motor	soun	d powe	er leve	ėl –	≤35 dB(A) @ 150	S	≤45 dB(A) @ 150	s	≤60 dB(A) @ 4 s	
Sound	powe	er level	l fail-s	afe position	-		_		≤60 dB(A) @ 4 s	
Ambie	ent ter	mperat	ure		-3050°C (with	neating to -40°C) 4)	-3050°C (with	heating to -40° C) $^{4)}$	-3050°C	
Conne	ection				Connecting cable	e 1 m, FRNC				
Direct	ion of	rotatio	on		Selectable with s	witch				
Angle	of rot	ation			Max. 95°, can be	limited on both sides b	y adjustable mecha	nical end stops		
		lication			Mechanical, add-	on				
Degre	e of p	rotecti	on		IP66/67 / NEMA	4X				
Storaç	ge ter	nperat	ure		-4080°C					
	ent hu	midity			100% RH					
EMC					CE according to 2	2014/30/EU				

¹⁾ Modulating actuators: Standard control signal Y = 0...10 V, 100 kΩ; operating range 2...10 V / position feedback U = 2...10 V, max. 1 mA for NM..P and SM..P, max. 0.5 mA for NKQ..P.

Electrical and mechanical accessories page 8-9 **Electrical installation** Open/close Modulating Configurable Modulating ..M24P, ..M24P-S, ..M230P, ..M24P, ..M24P-S, ..M230P, ..M230P-S, NKQ24P-1 ..M230P-S .24P-SR ..M230PSR Y = 2...10 V Y = variable Y = 2...10 V U = 2...10 V U = 2...10 V U = variable SG 24 **4** 2...10 V √**-** 2...10 V ·U**--** 2...10 V -U-**-** 2...10 V

²⁾ You can find suitable system diagrams at www.belimo.com.
3) Configurable with Belimo Assistant 2 or Service-Tool ZTH EU (e.g., for MP types, control, feedback, running time, and other functions can be set).
4) Available with heating and thermostat AC 230 V or with heating and humidistat AC 230 V for ambient temperatures down to -40°C (see overview of accessories page 8-9). Other versions on request. Please get in touch with your local Belimo contact person.

IP66/67 / NEMA 4X rotary actuators for outdoor applications

16 Nm 40 Nm Nominal torque Damper size up to approx. $3.2 \, m^2$ 8 m² Nominal voltage SMQ..G.. GM..G..

		Without auxiliary switch	Without auxiliary switch
Open/close		adminity of the second	- Canada y Canada
A C / D C C A V /	7 s	SMQ24G	
AC/DC 24 V	150 s		GM24G-T
AC 230 V	150 s		GM230G-T
Modulating (210 V) ¹⁾		
AO/DO 24 V	7 s	SMQ24G-SR	
AC/DC 24 V	150 s		GM24G-SR-T
Communicative 2), co	onfigurable 3)		
AC/DC 24 V	150 s		GM24G-MP-T
Technical data			
Shaft diameter		1226.7 mm	1426.7 mm
Manual override		Gear train disengagement with push button, can be locked	Manual override button with push button, can be locked
Motor sound powe	r level	≤63 dB(A) @ 7 s	≤45 dB(A) @ 150 s
Ambient temperatu	ıre	-3040°C ⁴⁾ (4050°C limited) ⁵⁾	-3050°C (with heating to -40°C) ⁴⁾
Connection		Connecting cable 1 m, FRNC	Connecting terminals
Direction of rotatio	n	Selectable with switch	
Angle of rotation		Max. 95°, can be limited on both sides by adjustable mechan	nical end stops
Position indication		Mechanical, add-on	
Degree of protection	on	IP66/67 / NEMA 4X	
Storage temperatu	ıre	-4080°C	
Ambient humidity		100% RH	

¹⁾ Modulating actuators: Standard control signal Y = 0...10 V, 100 kΩ; operating range 2...10 V / position feedback U = 2...10 V, max. 1 mA for GM..G, NF..G and SF..G, max. 0.5 mA for SMQ..G and GK..G.

2) You can find suitable system diagrams at www.belimo.com.

³⁾ Configurable with Belimo Assistant 2 or service tool ZTH EU (e.g., for MP types, control, feedback, running time, and other functions can be set).

CE according to 2014/30/EU

4) Available with heating and thermostat AC 230 V or with heating and humidistat AC 230 V for ambient temperatures down to -40°C (see overview of accessories page 8-9).

⁵⁾ Please get in touch with your local Belimo contact person.

Other versions on request.

 EMC

Electrical installation Electrical and mechanical accessories page 8-9 Open/close Modulating Configurable GM..G, SMQ24G .24G-SR. ..24G-MP. Y = 2...10 V Y = variable U = 2...10 VU = variable -U**-∢►**- MP

10 Nm

Nominal torque

Sound power level

fail-safe position Ambient temperature

Direction of rotation

Angle of rotation

Position indication

Degree of protection

Storage temperature

Ambient humidity

EMC

Connection

IP66/67 / NEMA 4X rotary actuators for outdoor applications fail-safe

20 Nm

40 Nm

≤61 dB(A) @ 35 s

Connecting cable 1 m, FRNC

Selectable with switch

-30...50°C

Damper size up to approx.		2 m²		4 m²		8 m²		
Nominal voltage	Running time motor 90°		NFG		SFG	GKG		
		Without auxiliary switch	With 2 SPDT auxiliary switches	Without auxiliary switch	With 2 SPDT auxiliary switches	Without auxiliary switch		
Open/close								
AC/DC 24 V	150 s					GK24G-1		
AC 24240 V DC 24125 V	<75 s	NFG-L	NFG-S2-L	SFG-L	SFG-S2-L			
Modulating (21	I0 V) 1)							
AC/DC 24 V	150 s	NF24G-SR-L	NF24G-SR-S2-L	SF24G-SR-L	SF24G-SR-S2-L	GK24G-SR		
Communicative ³	²⁾ , configura	ble 3)						
	<75 s	NF24G-MP-L		SF24G-MP-L				
AC/DC 24 V	150 s					GK24G-MP		
Technical data								
Shaft diameter		1226.7 mm		1226.7 mm		1426.7 mm		
Running time fail-safe 90°		<20 s		<20 s		35 s		
Manual override		Hand crank		Hand crank		Gear train disengagement with push button		
Sound power le	evel	≤45 dB(A) @ 150	S	≤45 dB(A) @ 150 s	S	≤52 dB(A) @ 150 s		
<u> </u>		_						

≤62 dB(A) @ 20 s

-30...50°C (with heating to -40°C) ⁴⁾

Connecting cable 1 m, FRNC

counterclockwise rotation

Max. 95°, can be limited on one side by adjustable mechanical end stops

Other versions on request. Please get in touch with your local Belimo contact person.

≤62 dB(A) @ 20 s

Mechanical, add-on

IP66/67 / NEMA 4X -40...80°C

100% RH

-30...50°C (with heating to -40°C) $^{4)}$

Connecting cable 1 m, FRNC

CE according to 2014/30/EU

counterclockwise rotation

Electrical installation Electrical and mechanical accessories page 8-9 Open/close Modulating Configurable ..FG..-L GK24G-1 .24G-SR. .24G-MP. Y = 2...10 V Y = variable U = 2...10 VU = variable -U-**-** 2...10 V

 $^{^{1)}}$ Modulating actuators: Standard control signal Y = 0 ...10 V, 100 k Ω ; operating range 2 ... 10 V / position feedback U = 2 ...10 V, max. 1 mA for GM...G, NF..G and SF...G, max. 0.5 mA for SMQ..G and GK..G.

²⁾ You can find suitable system diagrams at www.belimo.com

³⁾ Configurable with Belimo Assistant 2 or service tool ZTH EU (e.g., for MP types, control, feedback, running time, and other functions can be set).

⁴⁾ Available with heating and thermostat/humidistat for ambient temperatures down to -40°C (see overview of accessories page 8-9).

Actuators with high torque, non fail-safe / fail-safe

Nominal torque 160 Nm Damper size up to approx. Special

Nominal voltage





Communicative, configurable			
AC 24240 V DC 24125 V	PMCA-S2-T	PMCA-BAC-S2-T	PKCA-BAC-S2-T
Control	Open/close	Modulating (210 V)	Modulating (210 V)
	3-point	Modulating (420 mA)	Modulating (420 mA)
		BACnet MS/TP	BACnet MS/TP
		Modbus RTU	Modbus RTU
		MP-Bus	MP-Bus
		Open/close	Open/close
		3-point	3-point
Technical data			
Fail-safe			
Form fit	17x17 mm	17x17 mm	17x17 mm
Running time motor 90°	35 s (30120 s adjustable)	35 s (30120 s adjustable)	35 s (30120 s adjustable)
Running time fail-safe 90°	_	_	30 s
Motor sound power level	68 dB(A)	68 dB(A)	68 dB(A)
Sound power level fail-safe position	_		68 dB(A)
Configuration, commissioning, maintenance	Belimo Assistant 2, ZTH EU		
Manual override	Hand crank		
Auxiliary switches	2x SPDT		
Connection	Connecting terminals		
Direction of rotation	Selectable with Tool		
Position indication	Mechanical		
Degree of protection	IP66/67 / NEMA 4X		
Ambient temperature	-3040°C		
Storage temperature	-4080°C		
Ambient humidity	100% RH		
EMC	CE according to 2014/30/EU		

Electrical installation

Electrical and mechanical accessories page 8-9

Special actuators, non fail-safe / fail-safe

		RobustLine rotary actuators for extreme conditions			IP66/67 / NEMA 4X rotary actuators for outdoor applications					Actuators with high torque	
		Non fail-safe		Fail-safe	Non fail-safe		Fail-safe			Non fail-safe / fail-safe	
\rightarrow		NMP	SMP	NKQP	SMQG	GMG	NFG	SFG	GKG	PMCA PKCA	
_						•			•		
Mechanical accessories											
Lever for actuator drive shafts					AH-GMA	AH-GMA	AH-GMA	AH-GMA	AH-GMA		
Lever for damper shafts	0 0		_		KH10	KH10	KH10	KH10	KH10		
Ball joints	STAN STAN				KG10A	KG10A	KG10A	KG10A	KG10A		
Mounting kit for linkage operation	DIIII TST				ZG-GMA	ZG-GMA	ZG-GMA	ZG-GMA	ZG-GMA		
Adapter kits	1100									ZPR	
Electrical accessories											
Heaters with humidistat AC 230 V (only available fitted at the factory)	head	HH230	HH230		HH230-MG	HH230-MG	HH230-FG	HH230-FG	HH230-MG		
Heaters with humidistat AC/DC 24 V (only available fitted at the factory)	· ·				HH24-MG	HH24-MG	HH24-FG	HH24-FG	HH24-MG		
Heaters with thermostat AC 230 V (only available fitted at the factory)	head C	HT230	HT230		HT230-MG	HT230-MG	HT230-FG	HT230-FG	HT230-MG		
Heaters with thermostat AC/DC 24 V (only available fitted at the factory)	head .				HT24-MG	HT24-MG	HT24-FG	HT24-FG	HT24-MG		

Special actuators, non fail-safe / fail-safe

			rotary actua conditions	ntors	IP66/67 / NEMA 4X rotary actuators for outdoor applications				Actuators with high torque Non fail-safe / fail-safe	Actuators with damper blade Non fail-safe	
		Non fail-safe			Non fail-safe		Fail-safe				
\rightarrow		NMP SMP		NKQP	SMQG	GMG	NFG	SFG	GKG	PMCA PKCA	CMD
Electrical accessories											
Auxiliary switches		S2A GR	S2A GR		S2A	S2A	(S2A-F GR) 1)	(S2A-F GR) 1)	(S2A) 1)		
Room temperature controller for modulating actuators	200	CR24	CR24	CR24	CR24	CR24	CR24	CR24	CR24		CR24
Feedback potentiometer	3	PA GR ²⁾	PA GR ²⁾		P A GR ²⁾	PA GR ²⁾	PA GR ^{1) 2)}	PA GR ^{1) 2)}	PA GR ^{1) 2)}		
Signal converter voltage/current for modulating actuators		Z-UIC	Z-UIC	Z-UIC	Z-UIC	Z-UIC	Z-UIC	Z-UIC	Z-UIC		Z-UIC
Positioner / range controller for modulating actuators	•	CRP24-B1 SGA24 SGE24 SGF24	CRP24-B1 SGA24 SGE24 SGF24	CRP24-B1 SGA24 SGE24 SGF24	CRP24-B1 SGA24 SGE24 SGF24	CRP24-B1 SGA24 SGE24 SGF24	CRP24-B1 SGA24 SGE24 SGF24	CRP24-B1 SGA24 SGE24 SGF24	CRP24-B1 SGA24 SGE24 SGF24		CRP24-B1 SGA24 SGE24 SGF24
Tools											
Service tools 3)	Frank	ZTH EU	ZTH EU		ZTH EU	ZTH EU	ZTH EU	ZTH EU	ZTH EU	ZTH EU	
Belimo Assistant 2			-								

 $^{1)}$ Combination only on request. $^{2)}$ Resistance values 140 Ω , 1 kΩ, 10 kΩ available. $^{3)}$ For configurable actuators. For form fit inserts, please get in touch with your local Belimo contact person.

Configuration options

Some actuator product ranges permit adaptation to special customer preferences. These allow - on the basis of existing components - a selection of different cable lengths, mechanical interfaces, running times and operating ranges. Please get in touch with your local Belimo contact person.

Example

Housing cover colour Label with company logo Running time / operating range Mechanical interface

Configuration

	Rotary actuators										
Actuator range	CM	LMA	NMA	SMA	GMA						
	Cial .										
Housing cover colour	orange grey	orange grey	orange grey	orange grey	orange grey						
Label with company logo, colour	Label: Font: transparent black	Label: Font: transparent black blue white	Label: Font: transparent black blue white	Label: Font: transparent black blue white	Label: Font: transparent black blue white						
Mechanical interface	Shaft clamp, one-sided 612.7 mm Form fit 6x6 mm Form fit 8x8 mm Form fit 10x10 mm	612.7 mm one-sided 620 mm 826.7 mm Form fit 6x6 mm Form fit 8x8 mm Shaft clamp, reversible Form fit 8x8 mm Form fit 10x10 mm 820 mm		Shaft clamp, one-sided 826.7 mm Shaft clamp, reversible 1020 mm Form fit 10x10 mm Form fit 12x12 mm Form fit 16x16 mm	Shaft clamp, reversible 1226.7 mm						
Electrical interface	Terminal connection IP20 Cable 1 m, PVC Cable 1 m, FRNC Cable 3 m, FRNC Cable 5 m, FRNC	Terminal connection IP20 Terminal connection IP54 Cable 1 m, PVC Cable 1 m, FRNC Cable 3 m, FRNC Cable 5 m, FRNC	Terminal connection IP20 Terminal connection IP54 Cable 1 m, PVC Cable 1 m, FRNC Cable 3 m, FRNC Cable 5 m, FRNC	Terminal connection IP20 Terminal connection IP54 Cable 1 m, PVC Cable 1 m, FRNC Cable 3 m, FRNC Cable 5 m, FRNC	Terminal connection IP20 Terminal connection IP54 Cable 1 m, PVC Cable 1 m, FRNC Cable 3 m, FRNC Cable 5 m, FRNC						
Running time	35 s 45 s 75 s	35 s 45 s 90 s 150 s	45 s 90 s 150 s	90 s 150 s	90 s 150 s						
Operating range	210 V 0.510 V Adaptation option	210 V 0.510 V Adaptation option	210 V 0.510 V Adaptation option	210 V 0.510 V Adaptation option	210 V 0.510 V Adaptation option						
Packaging	Single pack Multipack at 20 pieces	Single pack Multipack at 20 pieces	Single pack Multipack at 20 pieces	Single pack Multipack at 20 pieces	Single pack Multipack at 20 pieces						
General	Feasibility of the combinat Minimum order quantity w	ions on request ith coloured label or custome	er logo: 20 pieces.								

Configuration options

Some actuator product ranges permit adaptation to special customer preferences. These allow - on the basis of existing components - a selection of different cable lengths, mechanical interfaces, running times and operating ranges. Please get in touch with your local Belimo contact person.

Example



Configuration

	Rotary actuators, fail-safe		Very fast running rotary actuators	Linear actuators	
Actuator range	NFA / SFA	EFA / EFG	LMQA		
			S		
Housing cover colour	orange grey		orange grey	orange grey	
Label with company logo, colour	Label: Font: orange black blue white grey black	Label: Font: orange black grey	Label: Font: transparent black blue white black white	Label: Font: transparent black blue white black white	
Mechanical interface	Shaft clamp, reversible 1025.4 mm Form fit 10x10 mm Form fit 12x12 mm Form fit 16x16 mm	Shaft clamp reversible 1226.7 mm	Shaft clamp, one-sided 826.7 mm Shaft clamp, reversible Form fit 8x8 mm Form fit 10x10 mm Form fit 12x12 mm Form fit 16x16 mm	Without stroke limitation With stroke limitation	
Electrical interface	Terminal connection IP20 Terminal connection IP54 Cable 1 m, PVC Cable 1 m, FRNC Cable 3 m, FRNC Cable 5 m, FRNC	Terminal connection IP66 Cable 1 m, FRNC Cable 3 m, FRNC Cable 5 m, FRNC	Cable 1 m, PVC Cable 1 m, FRNC Cable 3 m, FRNC Cable 5 m, FRNC	Terminal connection IP20 Terminal connection IP54 Cable 1 m, PVC Cable 1 m, FRNC Cable 3 m, FRNC Cable 5 m, FRNC	
Running time	45 s 75 s 90 s 150 s	75 s 90 s 150 s	2.5 s 4 s 5 s 7 s 10 s	75 s/100 mm 90 s/100 mm 120 s/100 mm 150 s/100 mm	
Operating range	210 V 0.510 V Adaptation option	210 V 0.510 V Adaptation option	210 V 0.510 V Adaptation option	210 V 0.510 V Adaptation option	
Packaging	Single pack Multipack at 20 pieces	Single pack Multipack at 20 pieces	Single pack Multipack at 20 pieces	Single pack Multipack at 20 pieces	
Special		Heating			
General	Feasibility of the combination Minimum order quantity with	ns on request coloured label or customer logo: 20	pieces		

All inclusive.

Belimo is the global market leader in the development, production, and sales of field devices for the energy-efficient control of heating, ventilation, and air conditioning systems. Damper actuators, control valves, sensors, and meters represent our core business.

Always focusing on customer value, we deliver more than only products. We offer you the complete product range of actuator and sensor solutions for the regulation and control of HVAC systems from a single source. At the same time, we rely on tested Swiss quality with a five-year warranty. Our worldwide representatives in over 80 countries guarantee short delivery times and comprehensive support through the entire product life. Belimo does indeed include everything.

The "small" Belimo devices have a big impact on comfort, energy efficiency, safety, installation and maintenance.

In short: Small devices, big impact.





5-year guarantee



On-site around the globe



Complete product range



Tested quality



Short delivery



Comprehensive support

