BELIMO

Technical data sheet B209

2-way, Characterized Control Valve, Stainless Steel Ball and Stem



Picture may differ from product

5-year warranty

Type overview

Type	DN
B209	1/2" [15]

Technical data

Functional data	Valve size [mm]	0.5" [15]
	Fluid	chilled or hot water, up to 60% glycol
	Fluid Temp Range (water)	0...250°F [-18...120°C]
	Body Pressure Rating	600 psi
	Close-off pressure Δps	200 psi
	Flow characteristic	equal percentage
	Leakage rate	0% for A–AB
	Pipe connection	Internal thread NPT (female)
	Servicing	maintenance-free
	Flow Pattern	2-way
	Controllable flow range	75°
	Cv	0.8
Materials	Valve body	Nickel-plated brass body
	Stem	stainless steel
	Stem seal	EPDM (lubricated)
	Seat	PTFE
	Characterized disc	TEFZEL®
	O-ring	EPDM (lubricated)
	Ball	stainless steel
Suitable actuators	Non Fail-Safe	TR LRB(X) LRQB(X) NRB(X) N4
	Spring	TFRB(X) LF

Safety notes

- WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to www.p65warnings.ca.gov

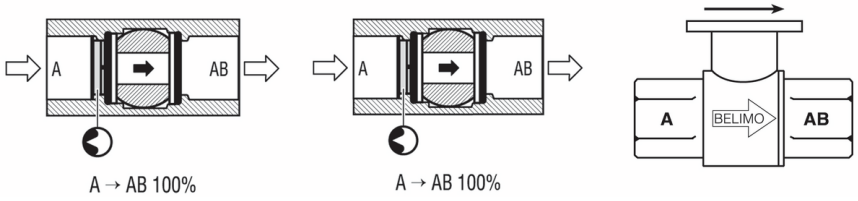
Product features

Application

This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable flow.

Flow/Mounting details

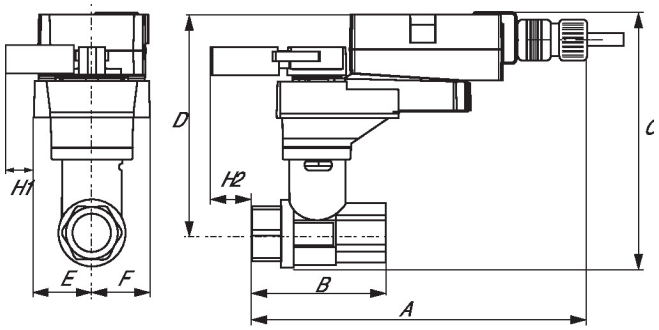
Two-way valves should be installed with the disc upstream.



Dimensions

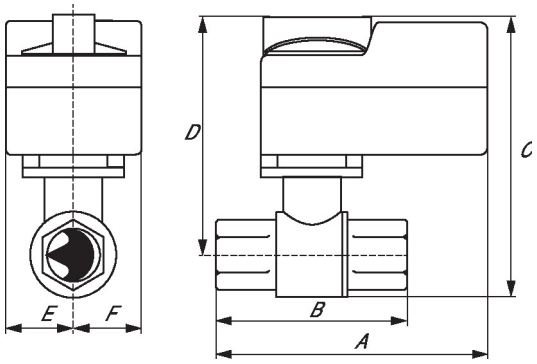
Type	DN	Weight
B209	1/2" [15]	0.50 lb [0.23 kg]

LRB, LRX



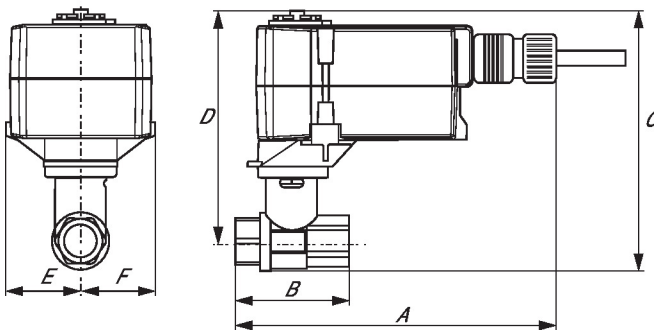
A	B	C	D	E	F	H1	H2
9.4" [239]	2.4" [60]	5.2" [132]	4.6" [117]	1.3" [33]	1.3" [33]	1.2" [30]	1.1" [28]

TR



A	B	C	D	E	F
3.7" [95]	2.4" [60]	4.8" [122]	4.2" [107]	1.3" [33]	1.3" [33]

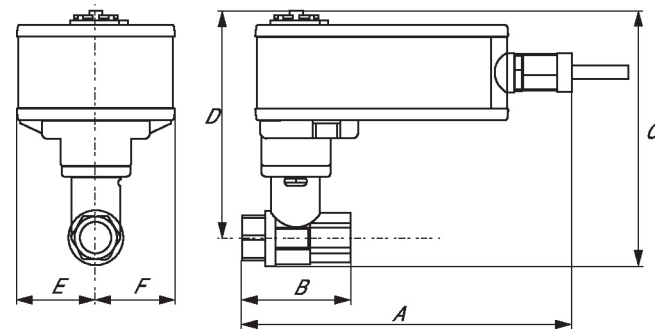
TFRB, TFRX



A	B	C	D	E	F
6.6" [167]	2.4" [60]	4.9" [124]	4.3" [110]	1.5" [39]	1.5" [39]

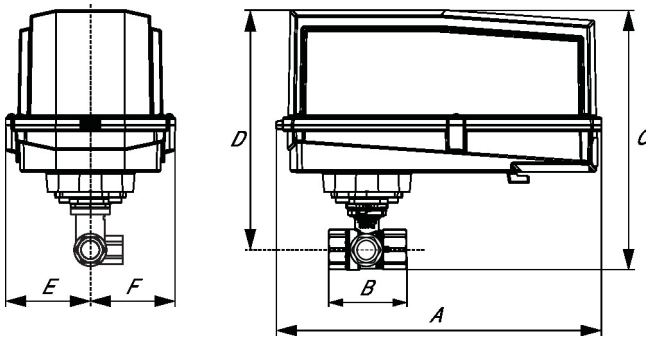
Dimensions

LF



A	B	C	D	E	F
7.91" [200]	2.4" [60]	5.7" [146]	5.1" [129]	1.8" [46]	1.8" [46]

ARB N4, ARX N4



A	B	C	D	E	F
11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]

MFT/programmable, Non fail-safe, 24 V



5-year warranty

Please note: Due to a supplier issue, certain NEMA 4 actuator covers will be supplied in gray instead of orange until further notice. This change ensures uninterrupted shipping and the same protective properties and product specifications.

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
	Transformer sizing	6 VA
	Electrical Connection	Screw terminal (for 26...14 AWG wire), 1/2" NPT conduit connector
	Overload Protection	electronic throughout 0...95° rotation
Functional data	Operating range Y	2...10 V
	Operating range Y note	4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor)
	Input impedance	100 kΩ for DC 2...10 V (0.1 mA), 500 Ω for 4...20 mA, 1500 Ω for PWM and On/Off
	Operating range Y variable	Start point 0.5...30 V End point 2.5...32 V
	Operating modes optional	variable (VDC, PWM, on/off, floating point)
	Position feedback U	2...10 V
	Position feedback U note	Max. 0.5 mA
	Position feedback U variable	VDC variable
	Direction of motion motor	selectable with switch 0/1
	Manual override	external push button
	Angle of rotation	Max. 90°
	Angle of rotation note	adjustable with mechanical stop
	Running Time (Motor)	150 s / 90°
	Running time motor variable	45...150 s
	Sound power level, motor	45 dB(A)
	Position indication	pointer
Safety data	Power source UL	Class 2 Supply
	Degree of protection IEC/EN	IP66/67
	Degree of protection NEMA/UL	NEMA 4X
	Housing	UL Enclosure Type 4X
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU
	Quality Standard	ISO 9001
	Ambient humidity	Max. 100% RH

Technical data

Safety data	Ambient temperature	-22...122°F [-30...50°C]
	Ambient temperature note	-40...122°F [-40...50°C] for actuator with integrated heating
	Storage temperature	-22...122°F [-30...50°C]
	Servicing	maintenance-free
Weight	Weight	3.7 lb [1.7 kg]
Materials	Housing material	Die cast aluminium and plastic casing

Footnotes †Rated Impulse Voltage 800V, Type of action 1.AA, Control Pollution Degree 3

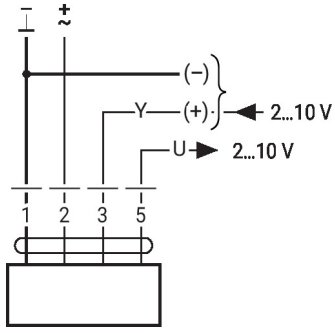
Accessories

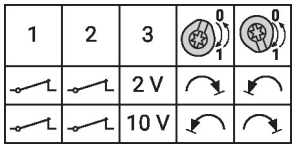
Tools	**Description**	**Type**
	Connecting cable 10 ft [3 m], A: RJ11 6/4 LINK.10, B: 3-pin Weidmüller and supply connection	ZK4-GEN
	Service tool, with ZIP-USB function, for configurable and communicative Belimo actuators, VAV controller and HVAC performance devices	ZTH US
Electrical accessories	**Description**	**Type**
	Auxiliary switch 1x SPDT add-on	S1A
	Auxiliary switch 2x SPDT add-on	S2A
	Feedback potentiometer 140 Ω add-on, grey	P140A GR
	Feedback potentiometer 1 kΩ add-on, grey	P1000A GR
	Feedback potentiometer 10 kΩ add-on, grey	P10000A GR
	Feedback potentiometer 2.8 kΩ add-on, grey	P2800A GR
	Feedback potentiometer 500 Ω add-on, grey	P500A GR
	Feedback potentiometer 5 kΩ add-on, grey	P5000A GR
Gateways	**Description**	**Type**
	Gateway MP to BACnet MS/TP	UK24BAC
	Gateway MP to Modbus RTU	UK24MOD
	Gateway MP to LonWorks	UK24LON
Factory add-on option only	**Description**	**Type**
	Heater, with adjustable thermostat	ACT_PACK_H

Electrical installation

Wire colors:
1 = black
2 = red
3 = white
5 = orange

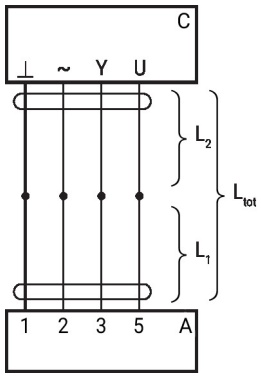
AC/DC 24 V, modulating





Electrical installation

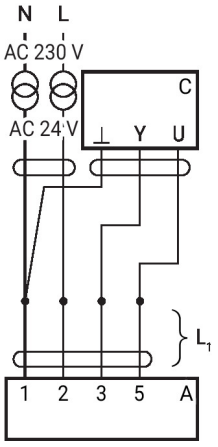
Signal cable lengths



L_2	$L_{tot} = L_1 + L_2$	
⊥ / ~	AC	DC
0.75 mm²	≤30 m	≤5 m
1.00 mm²	≤40 m	≤8 m
1.50 mm²	≤70 m	≤12 m
2.50 mm²	≤100 m	≤20 m

A = Actuator
C = Control unit (controlling unit)
L1 = Connecting cable of the actuator
L2 = Customer cable
Ltot = Maximum signal cable length

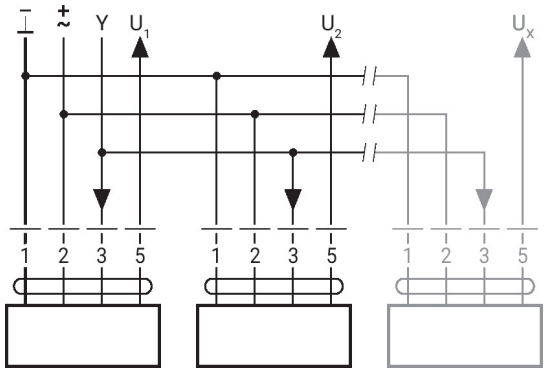
Note:
When several actuators are connected in parallel, the maximum signal cable length must be divided by the number of actuators.



A = Actuator
C = Control unit (controlling unit)
L1 = Connecting cable of the actuator

Note:
There are no special restrictions on installation if the supply and the data cable are routed separately.

Parallel operation

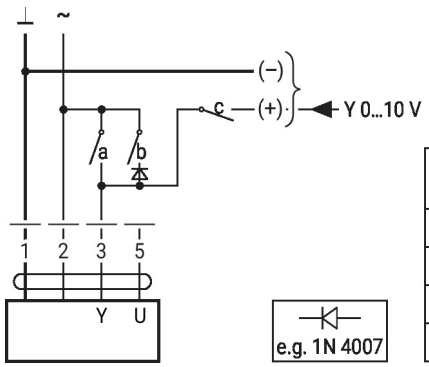


Max. 8 actuators in parallel
Parallel operation is permitted only on non-connected axes
Do not fail to observe performance data with parallel operation

Further electrical installations

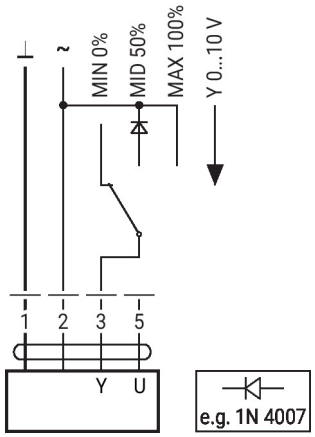
Functions with basic values (conventional mode)

Override control with AC 24 V with relay contacts

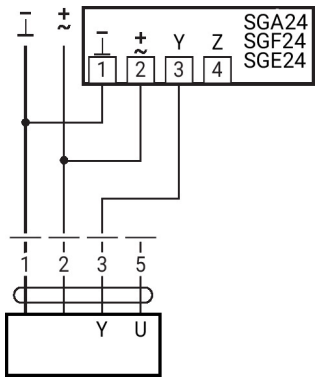


1	2	a	b	c	
					0 %
					ZS 50%
					100%
					Y

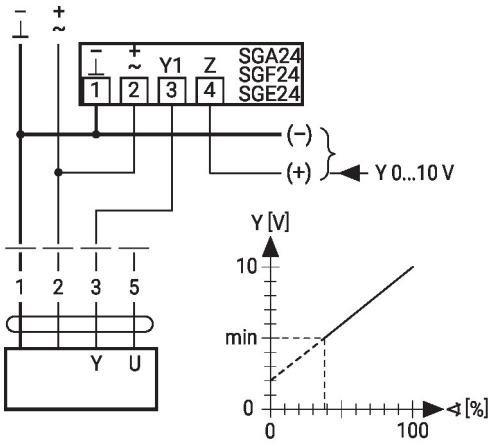
Override control with AC 24 V with rotary switch



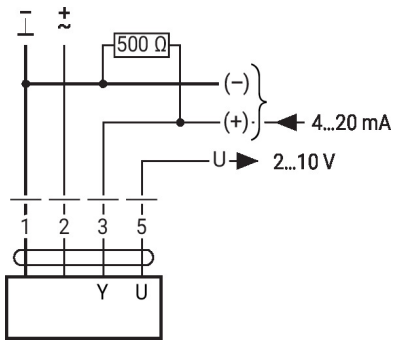
Control remotely 0...100% with positioner SG..



Minimum limit with positioner SG..



Control with 4...20 mA via external resistor

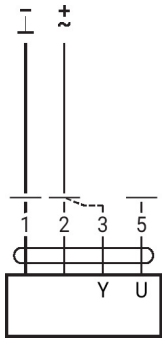


Caution:
The operating range must be set to DC 2...10 V.
The 500 Ohm resistor converts the 4...20 mA current signal to a voltage signal DC 2...10 V.

Further electrical installations

Functions with basic values (conventional mode)

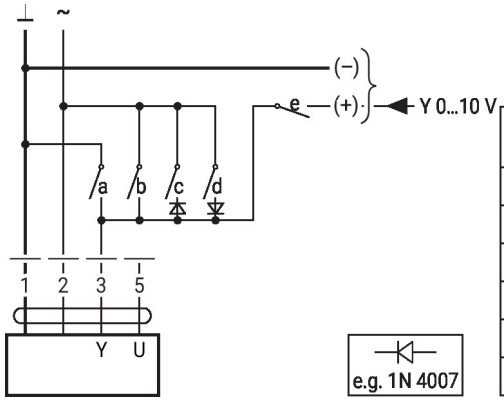
Functional check



Procedure
1. Connect 24 V 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

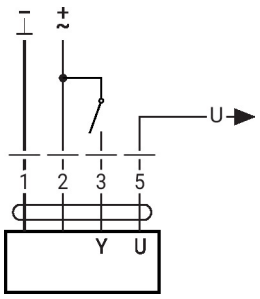
Functions with specific parameters (configuration necessary)

Override control and limiting with AC 24 V with relay contacts

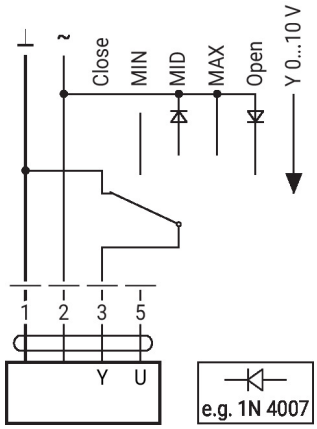


1	2	a	b	c	d	e	
⌐	⌐	⌐	_	_	_	_	Close
⌐	⌐	_	⌐	_	_	_	MIN
⌐	⌐	⌐	_	⌐	_	_	ZS
⌐	⌐	_	⌐	⌐	_	_	MAX
⌐	⌐	_	_	_	⌐	_	Open
⌐	⌐	_	_	_	_	⌐	Y

Control on/off



Override control and limiting with AC 24 V with rotary switch



Caution:
The "Close" function is only guaranteed if the start point of the operating range is defined as min. 0.5 V.