









Technical data

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Valve Size	0.75" [20]
Fluid	chilled or hot water, up to 60% glycol
Fluid Temp Range (water)	0250°F [-18120°C]
Body Pressure Rating	600 psi
Close-off pressure Δps	200 psi
Flow characteristic	equal percentage
Servicing	maintenance-free
Flow Pattern	2-way
Leakage rate	0% for A – AB
Controllable flow range	75°
Cv	4.7
Body pressure rating note	600 psi
Cv Flow Rating	A-port: as stated in chart B-port: 70% of A – AB Cv
Valve body	Nickel-plated brass body
Stem seal	EPDM (lubricated)
Seat	PTFE
Pipe connection	NPT female ends

Materials

Valve body	Nickel-plated brass body
Stem seal	EPDM (lubricated)
Seat	PTFE
Pipe connection	NPT female ends
0-ring	EPDM (lubricated)
Ball	stainless steel
Non-Spring	TR

Suitable actuators

Non-Spring	TR
	LRB(X)
	NR

Safety notes



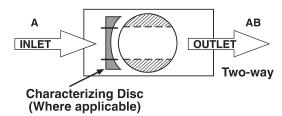
· WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to www.p65warnings.ca.gov

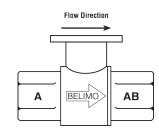
Product features

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.

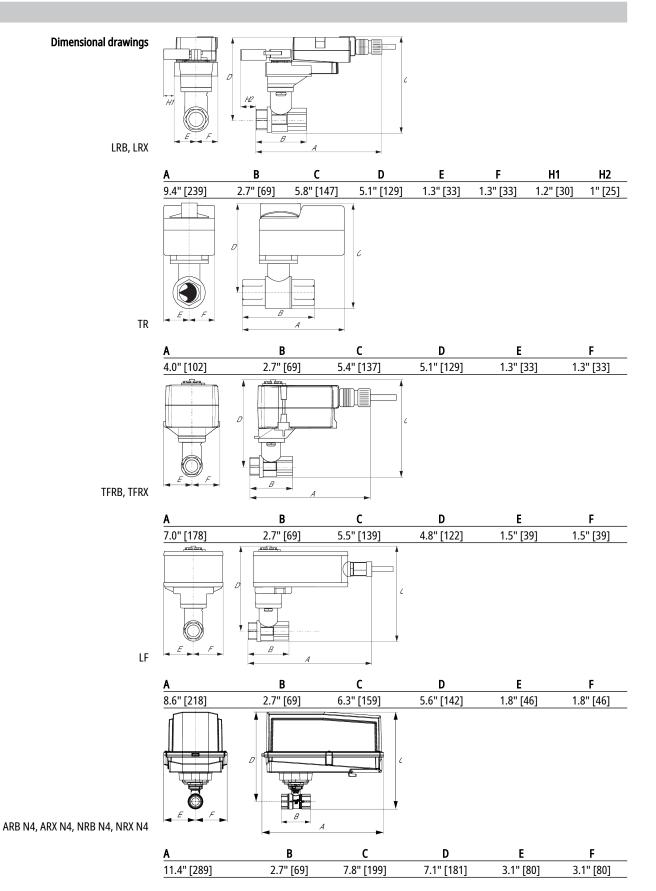
Flow/Mounting details



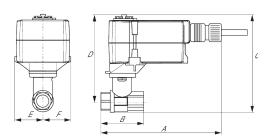




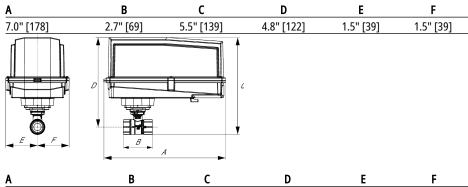
Dimensions







TFRB, TFRX



ARB N4, ARX N4, NRB N4, NRX N4

A	В	С	D	E	F
11.4" [289]	2.7" [69]	7.8" [199]	7.1" [181]	3.1" [80]	3.1" [80]

Technical data sheet

Modulating, Spring Return, AC 24 V for DC 2...10 V or 4...20 mA Control Signal





TFRB24-SR



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Connector Overload Protection Punctional data Operating range Y Operating range Y Operating range Y overload Max. 2G-R01 (500 Ω, 1/4 W resistor) Input Impedance Position feedback U Position feedback U onte Direction of motion motor Direction of motion fail-safe Angle of rotation Angle of rotation note Running Time (Motor) Running time fail-safe Noise level, motor Safety data Safety data Degree of protection NEMA/UL Agency Listing Connector electronic throughout 095° rotation 210 V 210 V And w/ ZG-R01 (500 Ω, 1/4 W resistor) And w/ ZG-R01 (
Power consumption in operation Power consumption in rest position 1 W Transformer sizing Electrical Connection Overload Protection Operating range Y Operation	Electrical data	Nominal voltage	AC/DC 24 V
Power consumption in rest position Transformer sizing 4 VA (class 2 power source) Electrical Connection 0verload Protection 0verload Protection 18 GA plenum cable, 3 ft [1 m], with 1/2" conconnector 0verload Protection electronic throughout 095° rotation Functional data Operating range Y 210 V Operating range Y note Input Impedance 100 kΩ for 210 V (0.1 mA), 500 Ω for 420 r Position feedback U Position feedback U note Max. 0.5 mA Direction of motion motor selectable with switch 0/1 Direction of motion fail-safe Angle of rotation Max. 95°, 90° Angle of rotation Angle of rotation note 90° Running Time (Motor) Noise level, fail-safe Noise level, fail-safe Position indication Mechanical Safety data Safety data Safety data Degree of protection IEC/EN Degree of protection NEMA/UL Agency Listing Cullus acc. to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC Quality Standard Ambient temperature 4-016° F[-4080°C] Ambient humidity max. 95% r.H., non-condensing maintenance-free		Nominal voltage frequency	50/60 Hz
Transformer sizing 4 VA (class 2 power source) Electrical Connection 18 GA plenum cable, 3 ft [1 m], with 1/2" conconnector Overload Protection electronic throughout 095° rotation Functional data Operating range Y 210 V Operating range Y 100 kΩ for 210 V Operating range Y 100 kΩ for 210 V (0.1 mA), 500 Ω for 420 r Position feedback U 210 V Position feedback U 100 kΩ for 210 V (0.1 mA), 500 Ω for 420 r Direction of motion motor selectable with switch 0/1 Direction of motion fail-safe reversible with cw/ccw mounting Angle of rotation Max. 95°, 90° Angle of rotation note 90° Running Time (Motor) 95 s Running Time (Motor) 95 s Running time fail-safe <25 s tamb = 68°F [20°C] Noise level, fail-safe 62 dB(A) Position indication Mechanical Safety data Degree of protection IEC/EN IP42 Degree of protection NEMA/UL NEMA 2 UL Enclosure Type 2 CULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014 EU; tisted to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC Quality Standard ISO 9001 Ambient temperature -22122°F [-3050°C] Ambient humidity max. 95% r.H., non-condensing maintenance-free		Power consumption in operation	2 W
Electrical Connection 18 GA plenum cable, 3 ft [1 m], with 1/2" conconnector Overload Protection electronic throughout 095" rotation Punctional data Operating range Y Operating range Y Operating range Y 100 kΩ for 210 V Operating range Y 100 kΩ for 210 V (0.1 mA), 500 Ω for 420 m Max. 0.5 mA Direction feedback U 1010 V Position feedback U 1010 V Position feedback U 1010 V Position for motion motor 10 selectable with switch 0/1 Direction of motion fail-safe 10 max. 95°, 90° Angle of rotation 10 max. 95°, 90° Angle of rotation 10 mote 10 90° Running Time (Motor) 10 95 s Running Time (Motor) 10 95 s Running time fail-safe 10 c25 s tamb = 68°F [20°C] Noise level, motor 10 sold (A) Noise level, fail-safe 10 c2 dB(A) Position indication 10 mechanical Safety data 10 Degree of protection IEC/EN 11 P42 Degree of protection NEMA/UL 10 NEMA 2 UL Enclosure Type 2 CULus acc. to UL60730-1A/-2-14, CAN/CSA 160730-1-102, CE acc. to 2014/30/EU and 2014 EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the IMC Quality Standard 150 9001 Ambient temperature 10 2-12122°F [-3050°C] Storage temperature 10 2-12122°F [-3050°C] Ambient humidity 10 max. 95% r.H., non-condensing 10 maintenance-free		Power consumption in rest position	1 W
Connector Overload Protection electronic throughout 095° rotation Functional data Operating range Y 210 V Operating range Y note 420 mA w/ ZG-R01 (500 Ω, 1/4 W resistor) Input Impedance 100 kΩ for 210 V (0.1 mA), 500 Ω for 420 m Position feedback U 210 V Position feedback U note Max. 0.5 mA Direction of motion motor selectable with switch 0/1 Direction of motion fail-safe reversible with cw/ccw mounting Angle of rotation Max. 95°, 90° Angle of rotation note 90° Running Time (Motor) 95 s Running time fail-safe <25 s tamb = 68°F [20°C]		Transformer sizing	4 VA (class 2 power source)
Functional data Operating range Y Operating range Y note Input Impedance 100 kΩ for 210 V (0.1 mA), 500 Ω for 420 r Position feedback U Position feedback U note Direction of motion motor Selectable with switch 0/1 Direction of motion fail-safe Angle of rotation Angle of rotation Angle of rotation note Running Time (Motor) Safety data Safety data Safety data Degree of protection IEC/EN Degree of protection NEMA/UL Agency Listing Quality Standard Ambient temperature Ambient humidity Ambient humidity Amz. 95% r.H., non-condensing Angle of value in the sister of		Electrical Connection	18 GA plenum cable, 3 ft [1 m], with 1/2" conduit connector
Operating range Y note Input Impedance 100 kΩ for 210 V (0.1 mA), 500 Ω for 420 r Position feedback U 210 V Position feedback U note Max. 0.5 mA Direction of motion motor Selectable with switch 0/1 Direction of motion fail-safe Angle of rotation Angle of rotation note Running Time (Motor) Selevel, motor Noise level, fail-safe Degree of protection IEC/EN Degree of protection NEMA/UL Agency Listing Degree of protection NEMA/UL Agency Listing Quality Standard Ambient temperature Storage temperature Ambient humidity A20 mA w/ZG-R01 (500 Ω, 1/4 W resistor) Inou (0.1 mA), 500 Ω for 420 r A20 r A20 mA w/ZG-R01 (500 Ω, 1/4 W resistor) Inou (0.1 mA), 500 Ω for 420 r A20 r A20 mA w/ZG-R01 (500 Ω, 1/4 W resistor) Inou (0.1 mA), 500 Ω for 420 r Amz. 0.5 mA Amz. 0.5 mA Amz. 0.5 mA Amz. 0.5 mA Selectable with switch 0/1 reversible with cw/ccw mounting Amz. 95% r.H., non-condensing maintenance-free		Overload Protection	electronic throughout 095° rotation
Input Impedance Position feedback U note Max. 0.5 mA Direction of motion motor Selectable with switch 0/1 Direction of motion fail-safe Angle of rotation Max. 95°, 90° Angle of rotation note Position feelback U Running Time (Motor) Position indication Max. 95°, 90° Running time fail-safe Position indication Mechanical Safety data Safety data Degree of protection IEC/EN Degree of protection NEMA/UL Agency Listing Degree of protection NEMA/UL Agency Listing Quality Standard Ambient temperature Storage temperature -22122°F [-3050°C] Ambient humidity Max. 95% r.H., non-condensing maintenance-free	Functional data	Operating range Y	210 V
Position feedback U Position feedback U note Max. 0.5 mA Direction of motion motor Direction of motion fail-safe Angle of rotation Angle of rotation Angle of rotation note Running Time (Motor) Safety data Degree of protection IEC/EN Degree of protection NEMA/UL Agency Listing Quality Standard Ambient temperature Ambient humidity Amsu. 95% r.H., non-condensing Amax. 95% r.H., non-condensing		Operating range Y note	420 mA w/ ZG-R01 (500 Ω, 1/4 W resistor)
Position feedback U note Direction of motion motor Direction of motion fail-safe Angle of rotation Angle of rotation Angle of rotation note Running Time (Motor) Position indication Safety data Degree of protection NEMA/UL Agency Listing Quality Standard Ambient temperature Ambient humidity Ambient level, motor Angle of rotation note Angle of rotation note Box Selectable with switch 0/1 Ambient temperature Angle of rotation motor Angle of rotation note Box Selectable with switch 0/1 Ambient temperature Angle of rotation motor Angle of rotation note Box Selectable with switch 0/1 Ambient temperature Angle of rotation motor Ambient temperature Angle of rotation note Angle of rotation note Box Selectable with switch 0/1 Box Selectable with		Input Impedance	100 k Ω for 210 V (0.1 mA), 500 Ω for 420 mA
Direction of motion motor Direction of motion fail-safe Angle of rotation Angle of rotation of motion selectable with cw/ccw mounting Angle of rotation of motion fail-safe Running Time (Motor) Running Time (Motor) Running time fail-safe Safety data Safety data Safety data Degree of protection IEC/EN Degree of protection NEMA/UL Agency Listing Degree of protection NEMA/UL Agency Listing Quality Standard Ambient temperature -22122°F [-3050°C] Storage temperature -40176°F [-4080°C] Ambient humidity max. 95% r.H., non-condensing maintenance-free		Position feedback U	210 V
Direction of motion fail-safe Angle of rotation Angle of rotation Angle of rotation note 90° Running Time (Motor) 95 s Running time fail-safe <25 s tamb = 68°F [20°C] Noise level, motor 35 dB(A) Noise level, fail-safe 62 dB(A) Position indication Mechanical Safety data Degree of protection IEC/EN Degree of protection NEMA/UL Agency Listing CULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014 EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC Quality Standard Ambient temperature -22122°F [-3050°C] Storage temperature -40176°F [-4080°C] Ambient humidity max. 95% r.H., non-condensing maintenance-free		Position feedback U note	Max. 0.5 mA
Angle of rotation Max. 95°, 90° Angle of rotation note 90° Running Time (Motor) 95 s Running time fail-safe <25 s tamb = 68°F [20°C] Noise level, motor 35 dB(A) Noise level, fail-safe 62 dB(A) Position indication Mechanical Safety data Degree of protection IEC/EN IP42 Degree of protection NEMA/UL NEMA 2 UL Enclosure Type 2 Agency Listing CULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014 EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC Quality Standard ISO 9001 Ambient temperature -22122°F [-3050°C] Storage temperature -40176°F [-4080°C] Ambient humidity max. 95% r.H., non-condensing Servicing maintenance-free		Direction of motion motor	selectable with switch 0/1
Angle of rotation note Running Time (Motor) Running time fail-safe Position indication Safety data Degree of protection IEC/EN Degree of protection NEMA/UL Agency Listing Quality Standard Ambient temperature Ambient humidity Servicing Running Time (Motor) 95 s Running time fail-safe 90° Running time fail-safe 95 s Safeky data 1P42 Degree of protection IEC/EN NEMA 2 UL Enclosure Type 2 CULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014 EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC Quality Standard ISO 9001 Ambient temperature -22122°F [-3050°C] Ambient humidity max. 95% r.H., non-condensing maintenance-free		Direction of motion fail-safe	reversible with cw/ccw mounting
Running Time (Motor) Running time fail-safe <25 s tamb = 68°F [20°C] Noise level, motor 35 dB(A) Noise level, fail-safe 62 dB(A) Position indication Mechanical Degree of protection IEC/EN Degree of protection NEMA/UL Agency Listing CULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014 EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC Quality Standard Ambient temperature -22122°F [-3050°C] Storage temperature -40176°F [-4080°C] Ambient humidity max. 95% r.H., non-condensing maintenance-free		Angle of rotation	Max. 95°, 90°
Running time fail-safe Noise level, motor Safety data Degree of protection IEC/EN Degree of protection NEMA/UL Agency Listing Position 62.2 of the IMC Quality Standard Ambient temperature Ambient humidity Servicing Running time fail-safe <25 s tamb = 68°F [20°C] Noise level, motor 35 dB(A) NeMA 2 dB(A) Mechanical NEMA 2 UL Enclosure Type 2 CULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014 EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC Quality Standard ISO 9001 Ambient humidity Max. 95% r.H., non-condensing maintenance-free		Angle of rotation note	90°
Noise level, motor Noise level, fail-safe Position indication Mechanical Degree of protection IEC/EN Degree of protection NEMA/UL Agency Listing CULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014 EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC Quality Standard Ambient temperature Storage temperature Ambient humidity Ambient humidity Servicing Mechanical NEMA 2 UL Enclosure Type 2 CULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014 EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC Quality Standard ISO 9001 Ambient humidity Max. 95% r.H., non-condensing maintenance-free		Running Time (Motor)	95 s
Noise level, fail-safe Position indication Mechanical Degree of protection IEC/EN Degree of protection NEMA/UL Agency Listing CULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014 EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC Quality Standard Ambient temperature Storage temperature Ambient humidity Ambient humidity Ambient humidity Ambient numidity Ambient		Running time fail-safe	<25 s tamb = 68°F [20°C]
Position indication Mechanical Degree of protection IEC/EN Degree of protection NEMA/UL Agency Listing CULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014 EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC Quality Standard Ambient temperature -22122°F [-3050°C] Storage temperature -40176°F [-4080°C] Ambient humidity max. 95% r.H., non-condensing Servicing maintenance-free		Noise level, motor	35 dB(A)
Degree of protection IEC/EN Degree of protection NEMA/UL Agency Listing CULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014 EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC Quality Standard Ambient temperature Journal of Storage temperature -40176°F [-4080°C] Ambient humidity max. 95% r.H., non-condensing Servicing maintenance-free		Noise level, fail-safe	62 dB(A)
Degree of protection NEMA/UL Agency Listing CULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014 EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC Quality Standard ISO 9001 Ambient temperature -22122°F [-3050°C] Storage temperature -40176°F [-4080°C] Ambient humidity max. 95% r.H., non-condensing Servicing maintenance-free		Position indication	Mechanical
Agency Listing CULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014 EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC Quality Standard Ambient temperature Jegun 122°F [-3050°C] Storage temperature -40176°F [-4080°C] Ambient humidity max. 95% r.H., non-condensing Servicing maintenance-free	Safety data	Degree of protection IEC/EN	IP42
E60730-1:02, CE acc. to 2014/30/EU and 2014 EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC Quality Standard ISO 9001 Ambient temperature -22122°F [-3050°C] Storage temperature -40176°F [-4080°C] Ambient humidity max. 95% r.H., non-condensing Servicing maintenance-free		Degree of protection NEMA/UL	NEMA 2 UL Enclosure Type 2
Ambient temperature -22122°F [-3050°C] Storage temperature -40176°F [-4080°C] Ambient humidity max. 95% r.H., non-condensing Servicing maintenance-free		Agency Listing	E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and
Storage temperature -40176°F [-4080°C] Ambient humidity max. 95% r.H., non-condensing Servicing maintenance-free		Quality Standard	ISO 9001
Ambient humidity max. 95% r.H., non-condensing Servicing maintenance-free		Ambient temperature	-22122°F [-3050°C]
Servicing maintenance-free		Storage temperature	-40176°F [-4080°C]
		Ambient humidity	max. 95% r.H., non-condensing
Weight Weight 1.6 lb [0.80 kg]		Servicing	maintenance-free
	Weight	Weight	1.6 lb [0.80 kg]
Materials Housing material UL94-5VA	Materials	Housing material	UL94-5VA

Electrical installation

Technical data sheet TFRB24-SR

> INSTALLATION NOTES

<u>1</u> Provide overload protection and disconnect as required.

Actuators may be connected in parallel. Power consumption and input impedance must be observed.

Actuators may also be powered by 24 VDC.

6 Only connect common to negative (-) leg of control circuits.

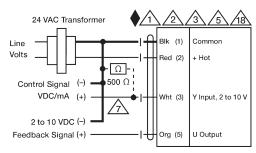
 Λ A 500 Ω resistor (ZG-R01) converts the 4...20 mA control signal to 2...10 V.

Actuators with plenum cable do not have numbers; use color codes instead.

• Meets cULus requirements without the need of an electrical ground connection.

Marning! Live Electrical Components!

During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.



2...10 V / 4...20 mA Control