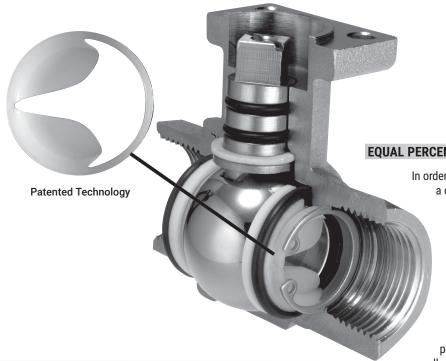


Features and Benefits



BENEFIT OF THE BELIMO CHARACTERIZING DISC

- ☐ Equal percentage flow characteristic.
- ☐ Excellent control stability assured with the characterizing disc.
- \Box C_v values equal to C_v values of globe valves the same size.
- $\hfill \square$ The need for multiple pipe reduction is usually eliminated.
- ☐ Better control prevents "hunting" of the control loop, increasing life span of actuator and valve.

EQUAL PERCENTAGE VALVE CHARACTERISTIC

In order to ensure good stability of control, it is essential for a control valve to have an equal percentage

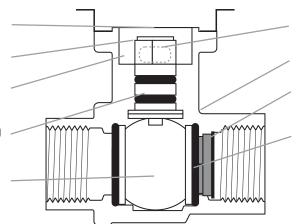
characteristic. This type of characteristic produces a linear variation in thermal output according to the amount of opening of the valve (also known as the system characteristic). Under normal testing conditions a conventional ball valve exhibits an S-shaped characteristic. When it is installed in a real system, however, this characteristic is seriously deformed because, compared with its nominal size, a ball valve possesses an extremely high flow coefficient. Whether used with or without pipe reducers or a reduced bore, they do not normally allow stable regulation of the thermal capacity.

Belimo's unique Characterized Control Valve $^{\text{\tiny M}}$ (CCV) is very different. A special characterizing disc inside the valve gives it an equal percentage characteristic which is comparable with that of a globe valve of the same nominal size. The flow (the C_V value) is reduced to the required value by a combination of the hole in the ball and the shaped aperture in the disc. The increase in flow as the valve is opened is very slow and controlled.

This produces better part-load behavior and improved stability of control while also optimizing energy consumption.

FEATURES

- ☐ Thermal isolating adapter between flange and actuator.
- Easy direct coupling of actuator with a single screw.
- Perpendicular mounting flange and square drive head eliminate lateral forces on the stem.
- □ Blow-out proof stem with thrust-bearing Teflon® disc and double O-ring design for long service life.*
- Non-corroding chrome-plated brass or stainless ball.



- Vent holes reduce condensation build-up.
- Forged brass valve body no pin-hole leaks.
- Characterizing disc made of Tefzel[®] known for excellent strength and chemical resistance.
- ☐ Teflon® seats with O-rings provide constant seating force against the ball and reduce torque requirement.
- Actuator can be mounted in four different positions.

* Designed for service life of over 100,000 full cycles.
Teflon® and Tefzel® are both registered trademarks of Dupont.

Characterized Control Valves™ (CCV)



COORDINATED MOTORIZED OPERATION

The optimum functionality of the Belimo CCV is assured by properly coordinating its actuation with MFT. Specially developed rotary actuators provide the necessary precision for modulating, floating-point, and on/off methods of control.

All CCVs are supplied with the appropriate rotary actuator to provide the close-off and operation desired.

OPTIMIZED FOR CONTROL

The Belimo CCV marries known technology with an innovative development – the unique characterizing disc.

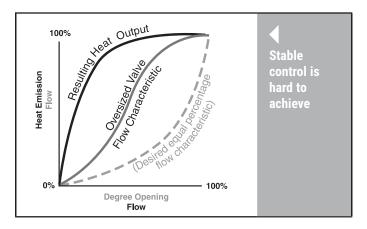
The marriage of CCV and MFT technologies has produced a range of valuable features which surpass the capabilities of globe valves at a very attractive price level:

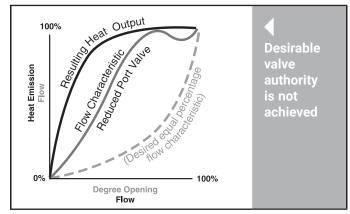
- ☐ An equal-percentage valve characteristic
- Unlike a globe valve, no sudden change in inlet flow upon opening
- Excellent stability of control
- ☐ Higher close-off ratings than standard globe valves
- \square 100% tight shut-off on two-way valves means NO leak-by unlike globe valves that have ANSI IV shutoff (leakage rate of 0.01% of the C_{ν} rating)
- ☐ Three-way valve can be piped in mixing or diverting application

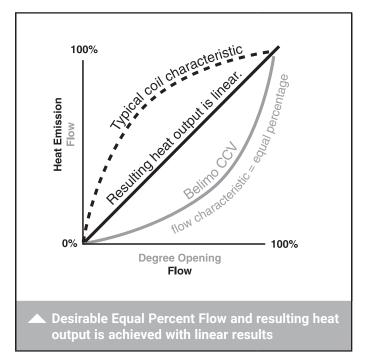
B2 Series	Two-way ½" to 3"
B3 Series	Three-way ½" to 2" Mixing*/Diverting
B6 Series	Two-way Flanged 2½" to 6"
Service:	Chilled/hot water, 60% glycol
C _v Range	0.3-240
Material:	Stainless trim or Brass trim
Control:	On/Off, Floating, 2-10 VDC
	Multi-Function Technology®
	Spring Return or Non-Spring Return

Mixing* (Not for use in change over applications)

Flow Characteristics of Conventional Ball Valves versus BELIMO CHARACTERIZED CONTROL VALVES









2-Way Valve Flow Rate for Water Applications (Gallons Per Minute, GPM)

C _v		DN	2-Way	Pressure Drop Across the Valve									
Maximum Rating	Inches	mm	ccv	1 psi	2 psi	3 psi	4 psi	5 psi	6 psi	7 psi	8 psi	9 psi	10 psi
0.3	1/2"	15	B207(B)	0.3	0.4	0.5	0.6	0.7	0.7	0.8	0.8	0.9	0.9
0.46	1/2"	15	B208(B)	0.5	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5
0.8	1/2"	15	B209(B)	8.0	1.1	1.4	1.6	1.8	2.0	2.1	2.3	2.4	2.5
1.2	1/2"	15	B210(B)	1.2	1.7	2.1	2.4	2.8	2.9	3.2	3.4	3.6	3.8
1.9	1/2"	15	B211(B)	1.9	2.7	3.3	3.8	4.2	4.7	5.0	5.4	5.7	6.0
3	1/2"	15	B212(B)	3.0	4.2	5.2	6.0	6.8	7.3	7.9	8.5	9.0	9.5
4.7	1/2"	15	B213(B)	4.7	6.6	8.1	9.4	11	12	12	13	14	15
7.4	1/2"	15	B214(B)	7.4	10	13	15	17	18	20	21	22	23
10	1/2"	15	B215(B)*	10	14	17	20	22	24	26	28	30	32
16	1/2"	15	B216(B)*	14	20	24	28	31	34	37	40	42	44
4.7	3/4"	20	B217(B)	4.7	6.6	8.1	9.4	11	12	12	13	14	15
7.4	3/4"	20	B218(B)	7.4	10	13	15	17	18	20	21	22	23
10	3/4"	20	B219(B)	10	14	17	20	22	24	26	28	30	32
14	3/4"	20	B220(B)*	14	20	24	28	31	34	37	40	42	44
24	3/4"	20	B221(B)*	24	34	42	48	54	59	63	68	72	76
7.4	1"	25	B222	7.4	10	13	15	17	18	20	21	22	23
10	1"	25	B223	10	14	17	20	22	24	26	28	30	32
19	1"	25	B224	19	27	33	38	42	47	50	54	57	60
30	1"	25	B225*	30	42	52	60	67	73	79	85	90	95
10	1¼"	32	B229	10	14	17	20	22	24	26	28	30	32
19	1¼"	32	B230*	19	27	33	38	42	47	50	54	57	60
25	1¼"	32	B231	25	35	43	50	56	61	66	71	75	79
37	1¼"	32	B232*	37	52	64	74	83	91	98	105	111	117
19	1½""	40	B238	19	27	33	38	42	47	50	54	57	60
29	1½"	40	B239	29	41	50	58	65	71	77	82	87	92
37	1½"	40	B240*	37	52	64	74	83	91	98	105	111	117
29	2"	50	B248	29	41	50	58	65	71	77	82	87	92
46	2"	50	B249	46	65	80	92	103	113	122	130	138	145
57	2"	50	B250*	57	81	99	114	127	140	151	161	171	180
65	2"	50	B251	65	92	113	130	145	159	170	194	195	206
85	2"	50	B252	85	120	147	170	190	208	225	240	255	269
120	2"	50	B253	120	170	208	240	268	294	318	339	360	380
240	2"	50	B254*	240	339	416	480	537	588	635	679	720	759
60	2½"	65	B261	60	85	104	120	134	147	159	170	180	190
75	2½"	65	B262	75	106	130	150	168	194	198	212	225	237
110	2½"	65	B263	110	156	191	220	246	269	291	311	330	348
150	2½"	65	B264	150	212	260	300	335	367	397	424	450	474
210	2½"	65	B265*	210	297	364	420	470	514	556	594	630	664
70	3"	80	B277	70	99	121	140	157	172	185	198	210	221
130	3"	80	B278	130	194	225	260	290	318	344	368	390	411
170	3"	80	B280*	170	240	294	340	380	416	450	481	510	538
70	2½"	65	B6250S-070	70	99	121	140	157	171	185	198	210	221
110	2½"	65	B6250S-110	110	156	191	220	244	266	282	296	312	320
110	3"	80	B6300S-110	110	156	191	220	244	266	282	296	312	320
186	4"	100	B6400S-186	186	263	322	372	416	456	492	526	558	588
290	5"	125	B6500S-290	290	410	502	580	648	710	767	820	870	917
400	6"	150	B6600S-400	400	566	693	800	894	980	1058	1131	1200	1265

$$\label{eq:GPM} \begin{split} &\text{GPM} = C_V \, x \, \sqrt[]{p} \\ &\text{*Models with no characterizing disc.} \end{split}$$
 The influence of the pipe geometry due to reduced flow is negligible for all valves 57 C_v and below with characterizing discs.

Sizing/Selection Characterized Control Valves™ (CCV)



3-Way Valve Flow Rate for Water Applications (Gallons Per Minute, GPM)

C _v		DN	3-Way	Pressure Drop Across the Valve									
Maximum Rating	Inches	mm	CCV	1 psi	2 psi	3 psi	4 psi	5 psi	6 psi	7 psi	8 psi	9 psi	10 psi
0.3	1/2"	15	B307(B)	0.3	0.4	0.5	0.6	0.7	0.7	0.8	0.8	0.9	0.9
0.46	1/2"	15	B308(B)	0.5	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5
8.0	1/2"	15	B309(B)	0.8	1.1	1.4	1.6	1.8	2.0	2.1	2.3	2.4	2.5
1.2	1/2"	15	B310(B)	1.2	1.7	2.1	2.4	2.8	2.9	3.2	3.4	3.6	3.8
1.9	1/2"	15	B311(B)	1.9	2.7	3.3	3.8	4.2	4.7	5.0	5.4	5.7	6.0
3	1/2"	15	B312(B)	3.0	4.2	5.2	6.0	6.8	7.3	7.9	8.5	9.0	9.5
4.7	1/2"	15	B313(B)	4.7	6.6	8.1	9.4	11	12	12	13	14	15
10	1/2"	15	B315(B)*	10	14	17	20	22	24	26	28	30	32
16	1/2"	15	B316(B)*	14	20	24	28	31	34	37	40	42	44
4.7	3/4"	20	B317(B)	4.7	6.6	8.1	9.4	11	12	12	13	14	15
7.4	3/4"	20	B318(B)	7.4	10	13	15	17	18	20	21	22	23
14	3/4"	20	B320(B)*	14	20	24	28	31	34	37	40	42	44
24	3/4"	20	B321(B)*	24	34	42	48	54	59	63	68	72	76
7.4	1"	25	B322	7.4	10	13	15	17	18	20	21	22	23
10	1"	25	B323	10	14	17	20	22	24	26	28	30	32
30	1"	25	B325*	30	42	52	60	67	73	79	85	90	95
10	1¼"	32	B329	10	14	17	20	22	25	27	28	30	32
19	1¼"	32	B330	19	27	33	38	43	47	50	54	57	60
25	1¼"	32	B331	25	35	43	50	56	61	66	71	75	79
19	1½"	40	B338	19	27	33	38	43	47	50	54	57	60
29	1½"	40	B339	29	41	50	58	65	71	77	82	87	92
37	1½"	40	B340	37	52	64	74	83	91	98	105	111	117
46	1½"	40	B341	46	65	80	92	103	113	122	130	138	146
29	2"	50	B347	29	41	50	58	65	71	77	82	87	92
37	2"	50	B348	37	52	64	74	83	91	98	105	111	117
46	2"	50	B349	46	65	80	92	103	113	122	130	138	146
57	2"	50	B350	57	81	99	114	128	140	151	161	171	180
68	2"	50	B351	68	96	118	136	152	167	180	192	204	215
83	2"	50	B352	83	117	144	166	186	204	220	235	249	263

GPM = $C_v x \sqrt{\Delta p}$ * = Models with no characterizing disc.

The influence of the pipe geometry due to reduced flow is negligible for all valves 83 C_v and below with characterizing discs.



Characterized Control Valves™ (CCV)

SET-UP

		2-WAY	VALVE	3-WAY	VALVE
		SPECIFY UPO	N ORDERING	SPECIFY UPO	ON ORDERING
	TR24-3-T US TR24-3 US On/Off or Floating Point Actuators	Power to pin 2 will drive valve CCW. Power to pin 3 will drive valve CW.		Power to pin 2 will drive valve CCW. Power to pin 3 will drive valve CW.	
NON-SPRING RETURN Stays in Last Position	TR24-SR-T US TR24-SR US Proportional Type Actuators	NC: Closed A to AB, will open as voltage increases.	NO: Open A to AB, will close as voltage increases. (Can be chosen with switch inside terminal block of actuator.)	NC: Closed A to AB, will open as voltage increases.	NO: Open A to AB, will close as voltage increases. (Can be chosen with switch inside terminal block of actuator.)
NON-S Stays	LRB24 (-3), MFT, SR LRX24 (-3), MFT, SR ARB24 (-3), MFT, SR ARX24 (-3), MFT, SR Floating Point or Proportional Type Actuators	Power to pin 2 will drive valve CW. Power to pin 3 will drive valve CCW. The above will function when the directional switch is in the "1" position, to reverse select the "0" position.	NO: Open A to AB, will close as voltage increases or power applied. (Can be chosen with CW/CCW switch.)	Power to pin 2 will drive valve CW. Power to pin 3 will drive valve CCW. The above will function when the directional switch is in the "1" position, to reverse select the "0" position.	NO: Open A to AB, will close as voltage increases or power applied. (Can be chosen with CW/CCW switch.)
	TFRB24 LF24 US AFRB24	NO/FO Valve: Open A to AB will drive closed. Spring Action: Will spring open A to AB upon power loss.	NC/FC Valve: Closed A to AB will drive open. Spring Action: Will spring closed A to AB upon power loss.	NO/FO Valve: Open A to AB will drive closed. Spring Action: Will spring open A to AB upon power loss.	NC/FC Valve: Closed A to AB will drive open. Spring Action: Will spring closed A to AB upon power loss.
SPRING RETURN Note Fail Position	TF (-3), MFT, SR LF (-3), MFT, SR AF SR AFR, MFT Floating Point or Proportional Type Actuators	NC/FO Valve: Closed A to AB will drive open. Spring Action: Will spring open A to AB upon power loss.	NC/FC or NO/FC Valve: Closed A to AB or Open A to AB. (Can be chosen with CW/CCW switch.) Spring Action: Will spring closed A to AB upon power loss.	NC/FO Valve: Closed A to AB will drive open Spring Action: Will spring open A to AB upon power loss.	NC/FC or NO/FC Valve: Closed A to AB or Open A to AB. (Can be chosen with CW/CCW switch.) Spring Action: Will spring closed A to AB upon power loss.
			NO/FO Valve: Open A to AB Spring Action: Will spring open A to AB upon power loss. (NO action can be chosen with CW/CCW switch.)		NO/FO Valve: Open A to AB Spring Action: Will spring open A to AB upon power loss. (NO action can be chosen with CW/CCW switch.)

GENERAL WIRING INSTRUCTIONS

WARNING The wiring technician must be trained and experienced with electronic circuits. Disconnect power supply before attempting any wiring connections or changes. Make all connections in accordance with wiring diagrams and follow all applicable local and national codes. Provide disconnect and overload protection as required. Use copper, twisted pair, conductors only. If using electrical conduit, the attachment to the actuator must be made with flexible conduit.

Always read the controller manufacturer's installation literature carefully before making any connections. Follow all instructions in this literature. If you have any questions, contact the controller manufacturer and/or Belimo.

Transformer(s)

Belimo actuators require a 24 VAC class 2 transformer and draws a maximum of 10 VA per actuator. The actuator enclosure cannot be opened

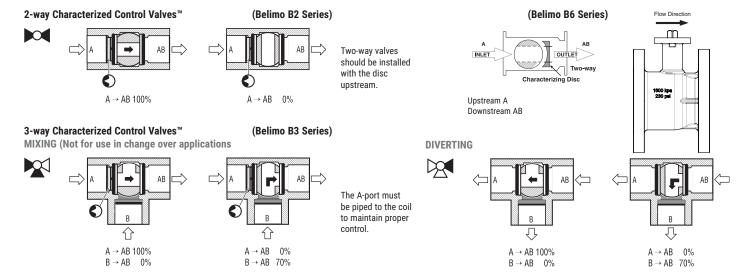
in the field, there are no parts or components to be replaced or repaired.

- EMC directive: 89/336/EEC
- Software class A: Mode of operation type 1
- Low voltage directive: 73/23/EEC

CAUTION It is good practice to power electronic or digital controllers from a separate power transformer than that used for actuators or other end devices. The power supply design in our actuators and other end devices use half wave rectification. Some controllers use full wave rectification. When these two different types of power supplies are connected to the same power transformer and the DC commons are connected together, a short circuit is created across one of the diodes in the full wave power supply, damaging the controller. Only use a single power transformer to power the controller and actuator if you know the controller power supply uses half wave rectification.

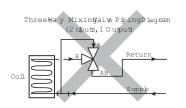
BELIMO

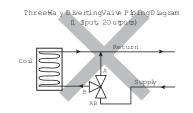
FLOW PATTERNS



INCORRECT PIPING

The A-port must be piped to the coil to maintain proper control.





WARNING! Do Not Pipe in this manner! Note Valve Porting!

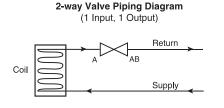
The A-port must be piped to the coil! Not the B-port!

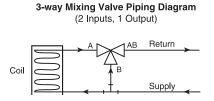
Flow is not possible from A to B. If AB-port is not piped as the common port, the valve must be re-piped. It is good practice to install a balancing valve in the bypass line. These valves are intended for closed loop systems. Do not install in an open loop system or in an application that is open to atmospheric pressure.

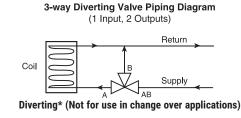
OPERATION/INSTALLATION - CORRECT PIPING

2-way valves should be installed with the characterizing discs upstream. No damage to the valve will result if installed incorrectly with the characterizing discs downstream.

3-WAY VALVES MUST BE PIPED CORRECTLY. They can be mixing or diverting. Mixing is the preferred piping arrangement.







The BELIMO Characterized Control Valve is a CONTROL valve, not a manual valve adapted for actuation. The control port is the A-port. It is similar to the globe valve in that the middle port is the B or bypass port. The common port AB is on the main opposite the A-port. These diagrams are for typical applications only. Consult engineering specification and drawings for particular circumstances.

REDUCED B-PORT FLOW

Note: The B-port flow of the 3-way CCV is lower than that of the A-port. In most applications this is beneficial since the reduced flow compensates for the inexistent pressure drop across the coil in the bypass mode. Therefore, proper sizing is important to avoid flow noise in particular when the system is designed with constant speed pumps. Please refer to our valve sizing and selection guidelines.

The flow velocity in the pipe upstream and downstream of the valve should be considered as well. The typical HVAC design maximum flow is 4 to 8 ft/s to avoid noise issues

Also, the pipe reduction factor must be considered and can be found on pages 3 and 4. Pipe reducers decrease the C_V value of a valve and consequently increase the pressure drop across the valve, a situation that could lead to noise or a lower than designed flow.

Diverting* (Not for use in change over applications)

800-543-9038 USA 866-805-7089 CANADA 203-791-8396 LATIN AMERICA

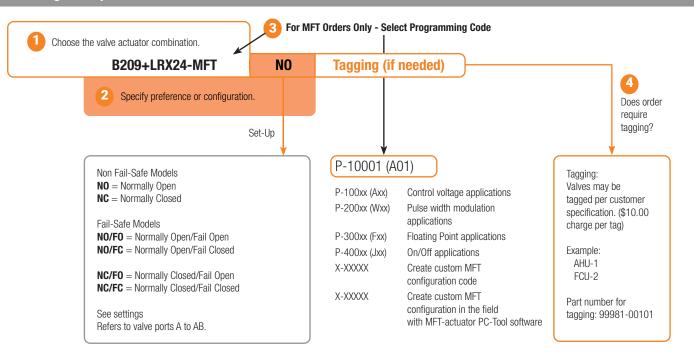


Characterized Control Valve™ (CCV)

B2	09		+LRX	24	-MFT	
Valve B2 = 2-way B3 = 3-way	Valve Size 07-80 = ½" to 3"	Trim Material B = Chrome Plated Brass Ball, Nickel Plated Stem Blank = Stainless Steel Ball and Stem	Actuator Type Non Fail-Safe TR LRB, LRX LRQX NRB, NRX NRQX ARB, ARX ARQX Fail-Safe Spring Return TFR, TFRX LF AFR, AFRX Electronic GKR	Power Supply 24 = 24 VAC/DC 120 = 120 VAC* 230 = 230 VAC UP = 24 to 240 VAC		-S = Built-in Auxiliary Switch -T = Terminal Strip N4 = NEMA 4/4X

*LR and AR include 120-240 VAC

Ordering Example



Complete Ordering Example: B209+LRX24-MFT

Configuration: +NO Programming: +A01

P10419 - 09/13 - Subject to change. © Belimo Aircontrols (USA), Inc.

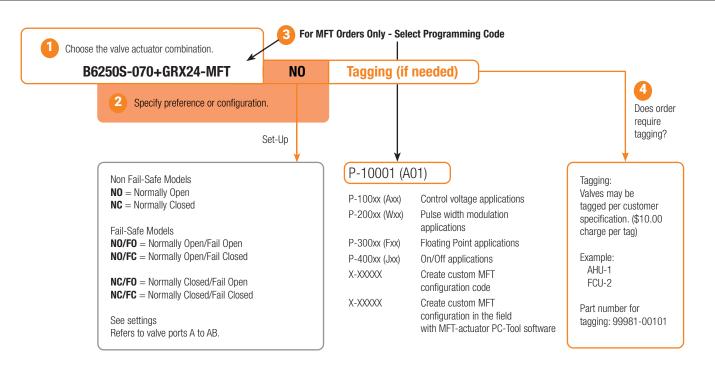
Characterized Control Valve™ (CCV)



В6	250	S	-070	+GRX	24	-MFT	
Valve B6 = 2-way Flanged	Valve Size 250-600 = 2½" to 6"	Trim Material S = Stainless Steel Ball and Stem	070 = 70 Cv	Actuator Type Non Fail-Safe ARB, ARX GRB, GRX Fail-Safe Spring Return AFRB, AFRX Electronic GKRB, GKRX	Power Supply 24 = 24 VAC/DC 120 = 120 VAC* 230 = 230 VAC UP = 24 to 240 VAC		N4 = NEMA 4/4X

*AR includes 120-240 VAC

Ordering Example



5 Complete Ordering Example: B6250S-070+GRX24-MFT

Configuration: +NOProgramming: +AO1 P10419 - 09/13 - Subject to change. @ Belimo Aircontrols (USA), Inc.

BELIMO







B2 Series, 2-Way, Characterized Control Valve Chrome Plated Brass Ball and Brass Stem

Application

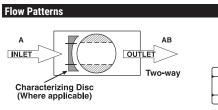
This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable flow.

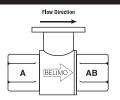
Technical Data	
Service	chilled or hot water, 60% glycol
Flow characteristic	A-port equal percentage
Controllable Flow Range	75°
Sizes	1/2", 3/4"
Type of end fitting	NPT female ends
Materials:	
Body	forged brass, nickel plated
Ball	chrome plated brass
Stem	nickel plated brass
Seats	PTFE
Characterizing disc	Tefzel®
Packing	2 EPDM O-rings, lubricated
Body pressure rating	600 psi
Media temp. range	0°F to 250°F [-18°C to 120°C]
Close off pressure	200 psi
Maximum differential	50 psi for typical applications
pressure (∆P)	
Leakage	0% for A to AB
External leakage	according to EN 12266-1:2003
C _v rating	A-port: see product chart for values
Tofzal® in a ragistared trademark of DuDe	ant .

Tefzel® is a registered trademark of DuPont

Dimensions B A A A

	Valve Nor	ninal Size	Dimensions (Inches [mm])			
Valve Body	Inches	DN [mm]	Α	В		
B207B-B211B	1/2"	15	2.38" [60.8]	1.39" [35.2]		
B212B-B216B	1/2"	15	2.38" [60.8]	1.78" [45.2]		
B217B-B221B	3/4"	20	2.73" [69.3]	1.87" [47.4]		





	Valve Nominal Size		Type		Suitable <i>i</i>	Actuators		
Cv	Inches	DN [mm]	2-way NPT	Non-S	Spring	Spr	ing	
0.3	1/2	15	B207B					
0.46	1/2	15	B208B					
0.8	1/2	15	B209B					
1.2	1/2	15	B210B					
1.9	1/2	15	B211B					
3	1/2	15	B212B					
4.7	1/2	15	B213B			Series	es	
7.4	1/2	15	B214B			Ser	Seri	
10	1/2	15	B215B		2	Ĕ	LF Series	
16	1/2	15	B216B					
4.7	3/4	20	B217B					
7.4	3/4	20	B218B					
10	3/4	20	B219B					
14	3/4	20	B220B					
24	3/4	20	B221B*					

*Models without characterizing disc

P10419 - 09/13 - Subject to change. © Belimo Aircontrols (USA), Inc.

B3 Series, 3-Way, Characterized Control Valve Chrome Plated Brass Ball and Brass Stem



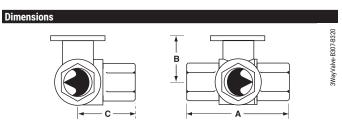




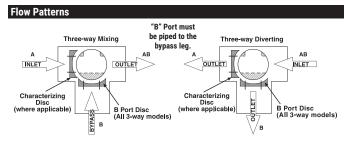


Technical Data	
Service	chilled or hot water, 60% glycol
Flow characteristic	A-port equal percentage
	B-port modified for constant common port flow
Controllable Flow Range	75°
Sizes	1/2", 3/4"
Type of end fitting	NPT female ends
Materials:	
Body	forged brass, nickel plated
Ball	chrome plated brass
Stem	nickel plated brass
Seats	PTFE
Characterizing disc	Tefzel®
Packing	2 EPDM O-rings, lubricated
Body pressure rating	600 psi
Media temp. range	0°F to 250°F [-18°C to 120°C]
Close off pressure	200 psi
Maximum differential	50 psi for typical applications
pressure (∆P)	
Leakage	0% for A to AB
	<2.0% for B to AB
External leakage	according to EN 12266-1:2003
C _v rating	A-port: see product chart for values
	B-port: 70% of A to AB C _v

Tefzel® is a registered trademark of DuPont



	Valve No	minal Size	Dimer	[mm])	
Valve Body	Inches	DN [mm]	Α	В	С
B307B-B311B	1/2"	15	2.41" [61.1]	1.39" [35.2]	1.20" [30.6]
B312B-B316B	1/2"	15	2.38" [60.4]	1.78" [45.2]	1.29" [32.8]
B317B-B321B	3/4"	20	2.73" [69.3]	1.87" [47.4]	1.47" [37.3]



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 or constant flow.

* (Not for use in change over applications)

	ninal Size	Type	:	Suitable I	Actuators	;
Inches	DN [mm]	3-way NPT	Non-S	Spring	Spr	ing
1/2	15	B307B				
1/2	15	B308B				
1/2	15	B309B				
1/2	15	B310B				
1/2	15	B311B				
1/2	15	B312B			ies	ies
1/2	15	B313B			Ser	LF Series
1/2	15	B315B		~	L 는	느
1/2	15	B316B				
3/4	20	B317B				
3/4	20	B318B				
3/4	20	B320B				
3/4	20	B321B				
	1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2	½ 15 ½ 15 ½ 15 ½ 15 ½ 15 ½ 15 ½ 15 ½ 15 ½ 15 ½ 15 ¾ 20 ¾ 20 ¾ 20 ¾ 20 ¾ 20 ¾ 20 ¾ 20 ¾ 20 ¾ 20 ¾ 20	½ 15 B307B ½ 15 B308B ½ 15 B309B ½ 15 B310B ½ 15 B311B ½ 15 B312B ½ 15 B313B ½ 15 B315B ½ 15 B316B ¾ 20 B317B ¾ 20 B318B ¾ 20 B320B	½ 15 B307B ½ 15 B308B ½ 15 B309B ½ 15 B310B ½ 15 B311B ½ 15 B312B ½ 15 B313B ½ 15 B316B ¾ 20 B318B ¾ 20 B320B ¾ 20 B321B	½ 15 B307B ½ 15 B308B ½ 15 B309B ½ 15 B310B ½ 15 B311B ½ 15 B312B ½ 15 B313B ½ 15 B315B ½ 15 B316B ¾ 20 B317B ¾ 20 B320B ¾ 20 B321B	½ 15 B307B ½ 15 B308B ½ 15 B309B ½ 15 B310B ½ 15 B311B ½ 15 B312B ½ 15 B313B ½ 15 B315B ½ 15 B316B ¾ 20 B317B ¾ 20 B320B ¾ 20 B321B

*Models without characterizing disc



B2 Series, 2-Way, Characterized Control Valve Stainless Steel Ball and Stem





Technical Data	
Service	chilled or hot water, 60% glycol
Flow characteristic	A-port equal percentage
Controllable Flow Range	75°
Sizes	1/2", 3/4", 1", 11/4", 11/2", 2", 21/2", 3"
Type of end fitting	NPT female ends
Materials:	
Body	forged brass, nickel plated
Ball	stainless steel
Stem	stainless steel
Seats	PTFE
Characterizing disc	Tefzel®
Packing	2 EPDM O-rings, lubricated
Body pressure rating	
600 psi	½" - 1¼" (B230)
400 psi	1¼" (B231) - 3"
Media temp. range	0°F to 250°F [-18°C to 120°C]
Close off pressure	
200 psi	½" - 2" (B254)
100 psi	2½" (B261) - 3"
Maximum differential	50 psi for typical applications
pressure (∆P)	
Leakage	0% for A to AB
External leakage	according to EN 12266-1:2003
C _v rating	A-port: see product chart for values

Tefzel® is a registered trademark of DuPont

Dimensions

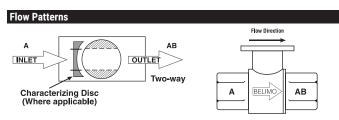
	Valve Nor	ninal Size	Dimensions (Inches [mm])
Valve Body	Inches	DN [mm]	A A	B
B207-B211	1/2"	15	2.41" [61.1]	1.39" [35.2]
B212-B216	1/2"	15	2.38" [60.4]	1.78" [45.2]
B217-B221	3/4"	20	2.73" [69.3]	1.87" [47.4]
B222-B225	1"	25	3.09" [78.4]	1.87" [47.4]
B229-B230	1¼"	32	3.72" [94.6]	1.87" [47.4]
B231-B232	1¼"	32	3.72" [94.6]	2.04" [51.9]
B238-B240	1½"	40	3.88" [98.5]	2.04" [51.9]
B248-B250	2"	50	4.21" [107.0]	2.27" [57.7]
B251-B254	2"	50	4.93" [125.2]	2.73" [69.5]
B261-B265	2½"	65	5.55" [140.9]	2.73" [69.5]
B277-B280	3"	80	5.82" [147.9]	2.73" [69.5]

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.

		minal Size	Туре		Sui	table /	Actua	tors	
Cv	Inches	DN [mm]	2-Way NPT	Noi	1-Spr	ing	;	Spring	j
0.3	1/2	15	B207						
0.46	1/2	15	B208						
0.8	1/2	15	B209						
1.2	1/2	15	B210						
1.9	1/2	15	B211						
3	1/2	15	B212				S		
4.7	1/2	15	B213				TF Series		
7.4	1/2	15	B214				Š		
10	1/2	15	B215			es	F		
16	1/2	15	B216			Seri		ies	
4.7	3/4	20	B217		LR Series	NRN4 Series		LF Series	
7.4	3/4	20	B218		3			4	
10	3/4	20	B219			뿔			
14	3/4	20	B220						
24	3/4	20	B221*						
7.4	1	25	B222						
10	1	25	B223						
19	1	25	B224						
30	1	25	B225*						
10	11/4	32	B229						
19	11/4	32	B230*						
25	11/4	32	B231						
37	11/4	32	B232*						
19	11/2	40	B238						
29	11/2	40	B239						
37	1½	40	B240*						
29	2	50	B248						
46	2	50	B249						
57	2	50	B250*			s			
65	2	50	B251		S	ARN4 Series			တ္သ
85	2	50	B252		AR Series	S			AF Series
120	2	50	B253		R S	ž			FS
240	2	50	B254*			<u>~</u>			⋖
60	21/2	65	B261			٩			
75	21/2	65	B262						
110	21/2	65	B263						
150	21/2	65	B264						
210	21/2	65	B265*						
70	3	80	B277						
130	3	80	B278						
170	3	80	B280*						

*Models without characterizing disc



2WayValve-B207-B220

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B3 Series, Three Way, Characterized Control Valve Stainless Steel Ball and Stem









Technical Data	
Service	chilled or hot water, 60% glycol
Flow characteristic	A-port equal percentage
	B-port modified for constant common port flow
Controllable Flow Range	75°
Sizes	1/2", 3/4", 1", 11/4", 11/2", 2"
Type of end fitting	NPT female ends
Materials:	
Body	forged brass, nickel plated
Ball	stainless steel
Stem	stainless steel
Seats	PTFE
Characterizing disc	Tefzel®
Packing	2 EPDM 0-rings, lubricated
Body pressure rating	
600 psi	1/2" - 1"
400 psi	1¼" - 2"
Media temp. range	0°F to 250°F [-18°C to 120°C]
Close off pressure	
200 psi	1/2" - 2"
Maximum differential	50 psi for typical applications
pressure (∆P)	
Leakage	0% for A to AB
	<2.0% for B to AB
External leakage	according to EN 12266-1:2003
C _v rating	A-port: see product chart for values
	B-port: 70% of A to AB C _v

Tefzel® is a registered trademark of DuPont

Dimensions OCER - LOES - AVEX - LOES - AVEX

	Valve Nor	ninal Size	Dime	nsions (Inches [mm])
Valve Body	Inches	DN [mm]	Α	В	С
B307-B311	1/2"	15	2.41" [61.1]	1.39" [35.2]	1.20" [30.6]
B312-B316	1/2"	15	2.38" [60.4]	1.78" [45.2]	1.29" [32.8]
B317-B321	3/4"	20	2.73" [69.3]	1.87" [47.4]	1.47" [37.3]
B322-B325	1"	25	3.09" [78.4]	1.87" [47.4]	1.59" [40.3]
B329-B331	1¼"	32	3.96" [100.6]	2.27" [57.7]	2.14" [54.3]
B338-B341	1½"	40	4.39" [111.6]	2.51" [63.7]	2.40" [61.1]
B347-B352	2"	50	4.90" [124.5]	2.73" [69.5]	2.74" [69.7]

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 or constant flow.

* (Not for use in change over applications)

	Valve Nor	ninal Size	Туре		Sui	table /	Actua	tors	
C _v	Inches	DN [mm]	3-Way NPT	No	n-Spr	ing	;	Spring	1
0.3	1/2	15	B307						
0.46	1/2	15	B308						
0.8	1/2	15	B309						
1.2	1/2	15	B310						
1.9	1/2	15	B311				Ś		
3	1/2	15	B312			S	TF Series		
4.7	1/2	15	B313			rie	S	က္	
10	1/2	15	B315			Se	F	i j	
16	1/2	15	B316		LR Series	NRN4 Series		LF Series	
4.7	3/4	20	B317		=	~			
7.4	3/4	20	B318			2			
14	3/4	20	B320						
24	3/4	20	B321						
7.4	1	25	B322						
10	1	25	B323						
30	1	25	B325*						
10	11/4	32	B329						
19	11/4	32	B330						
25	11/4	32	B331						
19	1½	40	B338						
29	1½	40	B339			es			
37	1½	40	B340		AR Series	ARN4 Series			AF Series
46	1½	40	B341		Sel	4			Sel
29	2	50	B347		AR				₽
37	2	50	B348			AA			
46	2	50	B349						
57	2	50	B350						
68	2	50	B351						
83	2	50	B352						

*Models without characterizing disc

"B" Port must be piped to the bypass leg. Characterizing Disc (where applicable) B Port Disc (All 3-way models) B Port Disc (All 3-way models)



Characterized Control Valve Product Range Overview B2.., B3.., 2-way, 3-way, Stainless Steel Ball and Stem

	Valve Nor	minal Size	Ту	pe			Suita	ble Actu	ıators		
C _v	Inches	DN [mm]	2-way NPT	3-way NPT	N	on-Sprir Return	ng		Spring Return		NEMA 4X
0.3	1/2	15	B207(B)	B307(B)							
0.46	1/2	15	B208(B)	B308(B)							
0.8	1/2	15	B209(B)	B309(B)							
1.2	1/2	15	B210(B)	B310(B)							
1.9	1/2	15	B211(B)	B311(B)							
3	1/2	15	B212(B)	B312(B)							
4.7	1/2	15	B213(B)	B313(B)	TR Series			TFR Series			
7.4	1/2	15	B214(B)		TR S			FR.S			
10	1/2	15	B215(B)	B315(B)							
14	1/2	15	B216(B)*	B316(B)*							
4.7	3/4	20	B217(B)	B317(B)		eries			eries		
7.4	3/4	20	B218(B)	B318(B)		LR Series			LF Series		NR Series
10	3/4	20	B219(B)								
14	3/4	20	B220(B)*								
14	3/4	20		B320(B)							
24	3/4	20	B221(B)*	B321(B)*							
7.4	1	25	B222	B322							
10	1	25	B223	B323							
19	1	25	B224								
30	1	25	B225*	B325*							
10	1¼	32	B229								
19	1¼	32	B230*								
10	1¼	32		B329							
19	1¼	32		B330							
25	1¼	32	B231	B331							
37	1¼	40	B232*								
19	1½	40	B238	B338							
29	1½	40	B239	B339							
37	1½	40	B240*	B340							
46	1½	40		B341			s			S	s
29	2	50	B248	B347			AR Series			Serie	AR Series
37	2	50		B348			AR S			AFR Series	AR S
46	2	50	B249	B349							
57	2	50	B250*	B350							
65	2	50	B251								
68	2	50		B351							
83	2	50		B352							
85	2	50	B252								
120	2	50	B253								
240	2	50	B254*								



^{* 3-}Way Valves not for use in change over applications





Mode of Operation

The Characterized Control Valve is operated by a rotary actuator. The actuators are controlled by a standard voltage for on/off control or a proportional signal or 3-point control system which move the ball of the valve to the position dictated by the control system.

Product Features

The equal-percentage characteristic of the flow is ensured by the integral characterizing disc. This characteristic provides linear heating or cooling output from the coil improving energy efficiency and comfort.

Actuator Specification	ns
Control type	on/off, floating point, 2-10 VDC, multi-function technology (MFT)
Manual override	TR, LR, AR, NR, AFR series
Electrical connection	3 ft [1m] cable with ½" conduit fitting or covered screw terminal strip
Valve Specifications	
Service	chilled or hot water, 60% glycol
Flow characteristic	A-port equal percentage

B-port modified for constant

	common port flow
Controllable flow range	75°
Sizes	1/2" - 2"
Type of end fitting	NPT female ends
Materials	
Body	forged brass, nickel plated
Ball	stainless steel or chrome
Stem	stainless steel or chrome
Seats	Teflon® PTFE
Characterizing disc	
½"- 1 ½" (2-way)	Tefzel®
½"-1" (3-way)	Tefzel®
2" (2-way)	stainless steel
1¼"- 2" (3-way)	stainless steel
Packing	2 EPDM 0-rings, lubricated
Media temp range	0°F to 250°F [-18°C to 120°C]

 Media temp range
 0°F to 250°F [-18°C to 120°C]

 Body pressure rating
 ½" - 1½" (B230)
 600 psi

 ½" - 1½" (B231) - 2"(B251)
 400 psi

 Close-off pressure
 200 psi

 Maximum differential pressure (ΔP)
 50 psi

 Leakage
 0% for A to AB

 < 2.0% for B to AB</th>

C_V rating/GPM A port: see product chart above for values B port: 70% of A to AB C_V

Tefzel® and Teflon® are registered trademarks of DuPont

Characterized Control Valve Product Range Overview B6.., 2-way, Stainless Steel Ball and Stem

		lominal ze	2-wa	y Flanged			Suitable	Actuato	rs		
Cv	Inches	DN [mm]	ANSI 125	ANSI 250	Non Fail- Safe	NEMA 4X	Fail- Safe	NEMA 4X	Interi	net Pro	otocol
70	2½	65	B6250S-070	B6250S-070-250						۵	Ь
110	2½	65	B6250S-110	B6250S-110-250		AR	AFR	AFR	ARIP	AFRIP	AKRIP
110	3	80	B6300S-110	B6300S-110-250					4	4	A
186	4	100	B6400S-186	B6400S-186-250				æ			
290	5	125	B6500S-290	B6500S-290-250	GR.		GKR	GR / GKR			
400	6	150	B6600S-400	B6600S-400-250				<u>5</u>			





Mode of Operation

The Characterized Control Valve is operated by a rotary actuator. The actuators are controlled by a standard voltage for on/off control, a modulating signal, or floating point control system which move the ball of the valve to the position dictated by the control system.

Product Features

The equal-percentage characteristic of the flow is ensured by the integral characterizing disc. This characteristic provides linear heating or cooling output from the coil improving energy efficiency and comfort.

Actuator Specifications

AR, GR, AFR and GKR series 3 ft. [1 m] cable with ½" conduit fitting or covered screw terminal strip chilled or hot water, up to 60% glycol max. A-port equal percentage 75°
conduit fitting or covered screw terminal strip chilled or hot water, up to 60% glycol max. A-port equal percentage 75°
60% glycol max. A-port equal percentage 75°
60% glycol max. A-port equal percentage 75°
75°
**
2½", 3", 4", 5", 6"
ANSI Class 125 flange, flat face*, ANSI 250
cast iron GG25
stainless steel
stainless steel
Teflon® PTFE
EPDM rubber
stainless steel
EPDM
0250°F [-18+120°C]
ANSI 125, Class B, ANSI 250
175 psid, 310 psid (-250)
50 psid
0% for A to AB

^{*125} psi flanges have a plain flat face and should not be bolted to a raised face flange.

Tefzel® and Teflon® are registered trademarks of DuPont $^{\mathtt{m}}.$

BELIMO









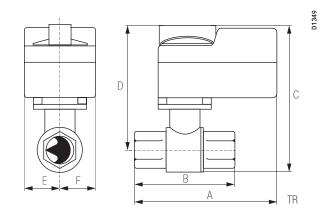
Models TR24-3-T US

TR24-3 US TR24-3/300 US TR24-3/500 US

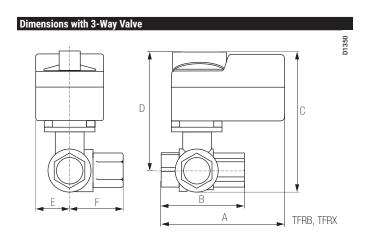
TR24-3-T US with 3 ft plenum rated cable TR24-3-T US with 10 ft plenum rated cable TR24-3-T US with 16 ft plenum rated cable

Control	on/off, floating point
Nominal voltage	24 VAC 50/60 Hz
Nominal voltage range	19.228.8 VAC
Power consumption	1 W
Transformer sizing	1VA (class 2 power source)
Electrical connection	screw terminals accessible after removal of
	small cover (3 ft, 10 ft, 16 ft cables optional)
Input impedance	0.36 kΩ
Angle of rotation	90°
Position indication	integrated into handle
Manual override	push down handle
Running time	90 seconds @ 60 hz, 108 seconds @ 50 hz
Humidity	5 to 95% non-condensing
Ambient temperature	-22°F to 122°F (-30°C to 50°C)
Storage temperature	-40°F to 176°F (-40°C to 80°C)
Housing	NEMA 1/IP40
Housing rating	UL94-5V(B)
Agency listing†	cULus according to UL 60730-1A/-2-14, CAN/
	CSA E60730-1:02, CE according to 2004/108/
	EC and 2006/95/EC for line voltage and/or -S
	versions
Noise level	max. 35 db (A)
Quality standard	ISO 9001
† Rated impulse voltage 330V,	Control pollution degree 2, Type of action 1

TR24-3 Actuators, On-Off, Floating Point



	Valve Nominal Size		Dimensions (Inches [mm])
Valve Body	Inches	DN [mm]	Α	В
B207(B)-B211(B)	1/2"	15	2.41" [61.1]	1.39" [35.2]
B212(B)-B215(B)	1/2"	15	2.38" [60.4]	1.78" [45.2]
B217(B)-B221(B)	3/4"	20	2.73" [69.3]	1.87" [47.4]



	Valve Nominal Size		Dimensions (Inches [mm])		
Valve Body	Inches	DN [mm]	Α	В	С
B307(B)-B311(B)	1/2"	15	2.41" [61.1]	1.39" [35.2]	1.20" [30.6]
B312(B)-B315(B)	1/2"	15	2.38" [60.4]	1.78" [45.2]	1.29" [32.8]
B317(B)-B321(B)	3/4"	20	2.73" [69.3]	1.87" [47.4]	1.47" [37.3]

TR24-3 Actuators, On-Off, Floating Point



Wiring Diagrams



🖊 INSTALLATION NOTES



The common connection from the actuator must be connected to the Hot connection of the controller.



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

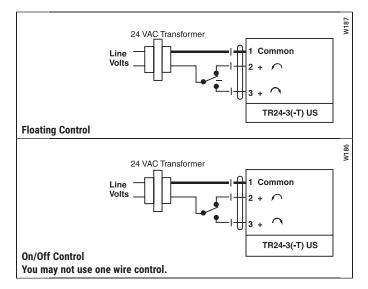


The actuator Hot must be connected to the control board Hot.

WARNING 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.

NOTE: TR24-3(-T) US cannot be wired in parallel with themselves or any other actuator.

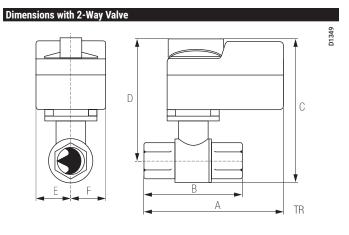


P10419 - 09/13 - Subject to change. © Belimo Aircontrols (USA), Inc.









	Valve Nominal Size		Dimensions (Inches [mm])
Valve Body	Inches	DN [mm]	Α	В
B207(B)-B211(B)	1/2"	15	2.41" [61.1]	1.39" [35.2]
B212(B)-B215(B)	1/2"	15	2.38" [60.4]	1.78" [45.2]
B217(B)-B221(B)	3/4"	20	2.73" [69.3]	1.87" [47.4]

Dimensions with 3-Way Valve	_
	C 01350
A1	TFRB, TFRX

	Valve Nominal Size		Dimer	[mm])	
Valve Body	Inches	DN [mm]	Α	В	C
B307(B)-B311(B)	1/2"	15	2.41" [61.1]	1.39" [35.2]	1.20" [30.6]
B312(B)-B315(B)	1/2"	15	2.38" [60.4]	1.78" [45.2]	1.29" [32.8]
B317(B)-B321(B)	3/4"	20	2.73" [69.3]	1.87" [47.4]	1.47" [37.3]

Models TR24-SR-T US TR24-SR US

TR24-SR/300 US TR24-SR/500 US

TR24-SR-T US with 3 ft plenum rated cable TR24-SR-T US with 10 ft plenum rated cable TR24-SR-T US with 16 ft plenum rated cable

Tarabata d Bata	
Technical Data	
Control	proportional
Nominal voltage	24 VAC 50/60 Hz, 24 VDC
Nominal voltage range	19.228.8 VAC, 21.628.8 VDC
Power consumption	0.5 W
Transformer sizing	1VA (class 2 power source)
Electrical connection	screw terminals accessible after removal of small cover (3 ft, 10 ft, 16 ft cables optional)
Input impedance	100 kΩ
Angle of rotation	90°
Direction of rotation	reversible with switch under cover
Position indication	integrated into handle
Manual override	push down handle
Running time	90 seconds
Humidity	5 to 95% non-condensing
Ambient temperature	-22°F to 122°F (-30°C to 50°C)
Storage temperature	-40°F to 176°F (-40°C to 80°C)
Housing	NEMA 1/IP40
Housing rating	UL94-5V(B)
Agency listing†	cULus according to UL 60730-1A/-2-14, CAN/
	CSA E60730-1:02, CE according to 2004/108/
	EC and 2006/95/EC for line voltage and/or -S
	versions
Noise level	max. 35 db (A)
Quality standard	ISO 9001

† Rated impulse voltage 500V, Control pollution degree 2, Type of action 1

NOTE: Response sensitivity is 75mV

TR24-SR Actuators, Proportional



Wiring Diagrams



C INSTALLATION NOTES



Actuators with color coded wires are optional. Wire numbers are provided for reference.

CAUTION Equipment damage!

Actuators may be connected in parallel.

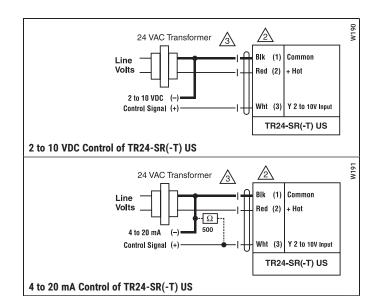
Power consumption and input impedance must be observed.



Actuators may also be powered by 24 VDC.

WARNING 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.



Direct/Reverse acting switch is under wiring cover.

R = CW with decrease in signal

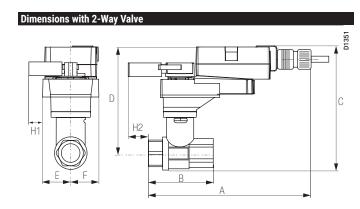
L = CCW with decrease in signal

No feedback

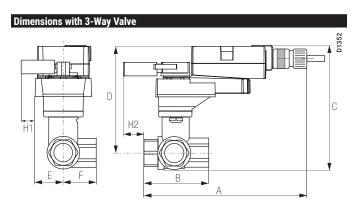


CE LISTED 94 D5 TEMP, IND. & CUL) us

LR...24-3 Actuators, On/Off, Floating Point



	Valve Nominal Size		Dimensions (Inches [mm])
Valve Body	Inches	DN [mm]	Α	В
B207(B)-B211(B)	1/2"	15	1.39" [35.2]	1.39" [35.2]
B212(B)-B215(B)	1/2"	15	1.78" [45.2]	1.78" [45.2]
B217(B)-B221(B)	3/4"	20	1.87" [47.4]	1.87" [47.4]
B222-B225	1"	25	1.87" [47.4]	1.87" [47.4]
B229-B231	1¼"	32	1.87" [47.4]	1.87" [47.4]



	Valve No	Valve Nominal Size		Dimensions (Inches [mm])	
Valve Body	Inches	DN [mm]	Α	В	С
B307(B)-B311(B)	1/2"	15	2.06" [52.2]	1.39" [35.2]	1.20" [30.6]
B312(B)-B315(B)	1/2"	15	2.38" [60.4]	1.78" [45.2]	1.29" [32.8]
B317(B)-B321(B)	3/4"	20	2.73" [69.3]	1.87" [47.4]	1.47" [37.3]
B322-B325	1"	25	3.09" [78.4]	1.87" [47.4]	1.59" [40.3]

Models

LRB24-3-T LRX24-3-T w/Terminal Block LRB24-3 LRX24-3 w/3 ft. cable LRB24-3-S LRX24-3-S w/built-in Aux. Switch

Technical Data		
Control		on/off, floating point
Power supply		24 VAC ± 20% 50/60 Hz
,		24 VDC ± 10%
Power consumption ru	inning	1.5 W
ho	olding	0.2 W
Transformer sizing		2 VA (class 2 power source)
Electrical connection		½" conduit connector
		18 GA, plenum rated cable
LRB24-3		3 ft [1m]
LRX24-3		3 ft [1m], 10 ft [3m], 16 ft [5m]
Overload protection		electronic throughout 0° to 95° rotation
Input impedance		600 Ω
Angle of rotation		90°, adjustable with mechanical stop
Direction of rotation		reversible with protected \frown/\frown switch
Position indication		handle
Manual override		external push button
Running time		
LRB24-3		90 seconds, constant independent of load
LRX24-3		150, 95, 60, 45, 35 seconds,
		constant independent of load
Humidity		5 to 95% RH, non-condensing (EN 60730-1)
Ambient temperature		-22°F to 122°F [-30°C to 50°C]
Storage temperature		-40°F to 176°F [-40°C to 80°C]
Housing type		NEMA 2/IP54
Housing material		UL94-5VA
Agency listings†		cULus according to UL 60730-1A/-2-14, CAN/
		CSA E60730-1:02, CE according to 2004/108/
		EC and 2006/95/EC for line voltage and/or -S
		versions
Noise level		less than 35 dB (A)
Quality standard		ISO 9001

LR...24-3-T Electrical connection screw terminal (for 26 to 14 GA wire) protected (NEMA 2, IP20)

LR24-3-S	
Auxiliary switch	1 SPDT, 3A (0.5A) @ 250 VAC, UL Listed, adjustable 0° to 100°

† Rated impulse voltage 800V, Control pollution degree 3, Type of action 1 (1.B for -S models)

LR...24-3 Actuators, On/Off, Floating Point



Wiring Diagrams



🖊 INSTALLATION NOTES



CAUTION Equipment damage!

Actuators may be connected in parallel.

Power consumption and input impedance must be observed.

Actuators are provided with color coded wires. Wire numbers are provided for reference.



Actuators may also be powered by 24 VDC.



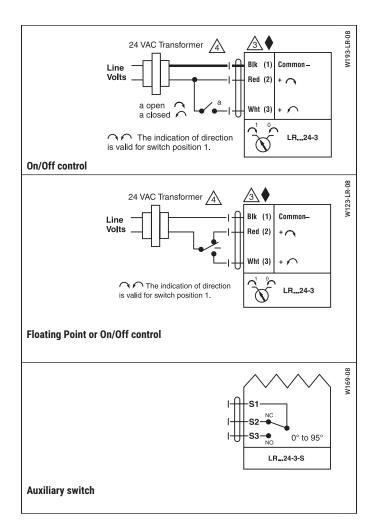
APPLICATION NOTES



Meets cULus or UL and CSA requirements without the need of an electrical ground connection.

WARNING 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.





Models

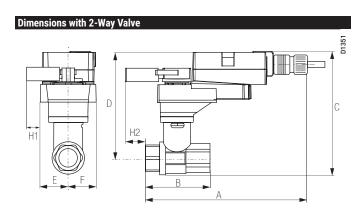
LRB24-SR-T LRX24-SR-T w/Terminal Block LRB24-SR LRX24-SR w/3ft. cable

Power supply	
	24 VAC ± 20% 50/60 Hz 24 VDC ± 10%
Power consumption running	1 1.5 W
	0.4 W
Transformer sizing	3 VA (class 2 power source)
Electrical connection	½" conduit connector
	18 GA, plenum rated cable
LRB24-SR	3 ft [1m]
LRX24-SR	3 ft [1m], 10 ft [3m], 16 ft [5m]
Overload protection	electronic throughout 0° to 95° rotation
Operating range Y	2 to 10 VDC, 4 to 20 mA
Feedback output U	1 to 10 VDC, max 0.5 mA
nput impedance	100 kΩ (0.1 mA), 500 Ω
Angle of rotation	90°, adjustable with mechanical stop
Direction of rotation	reversible with protected \frown / \frown switch
Position indication	handle
Manual override	external push button
Running time	constant independent of load
LRB24-SR	90 seconds
LRX24-SR	150, 95, 60, 45, 35 seconds
Humidity	5 to 95% RH non-condensing
	(EN 60730-1)
Ambient temperature	-22°F to 122°F [-30°C to 50°C]
Storage temperature	-40°F to 176°F [-40°C to 80°C]
Housing	NEMA 2/IP54
Housing material	UL94-5VA
Agency listings†	cULus according to UL 60730-1A/-2-14, CAN/
	CSA E60730-1:02, CE according to 2004/108/
	EC and 2006/95/EC for line voltage and/or
	-S versions
Noise level	<35 dB(A)
Quality standard	ISO 9001

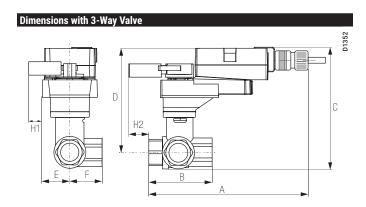


screw terminal (for 26 to 14 GA wire)

Electrical connection



	Valve Nominal Size		Dimensions (Inches [mm])
Valve Body	Inches	DN [mm]	Α	В
B207(B)-B211(B)	1/2"	15	2.41" [61.1]	1.39" [35.2]
B212(B)-B215(B)	1/2"	15	2.38" [60.4]	1.78" [45.2]
B217(B)-B221(B)	3/4"	20	2.73" [69.3]	1.87" [47.4]
B222-B225	1"	25	3.09" [78.4]	1.87" [47.4]
B229-B231	1¼"	32	3.72" [94.6]	1.87" [47.4]



	Valve Nominal Size		Dimen	Dimensions (Inches [mm])		
Valve Body	Inches	DN [mm]	Α	В	С	
B307(B)-B311(B)	1/2"	15	2.06" [52.2]	1.39" [35.2]	1.20" [30.6]	
B312(B)-B315(B)	1/2"	15	2.38" [60.4]	1.78" [45.2]	1.29" [32.8]	
B317(B)-B321(B)	3/4"	20	2.73" [69.3]	1.87" [47.4]	1.47" [37.3]	
B322-B325	1"	25	3.09" [78.4]	1.87" [47.4]	1.59" [40.3]	

LR...24-SR Actuators, Proportional



Wiring Diagrams



🖊 INSTALLATION NOTES



CAUTION Equipment damage!

Actuators may be connected in parallel.

Power consumption and input impedance must be observed.



Actuators may also be powered by 24 VDC.



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



APPLICATION NOTES



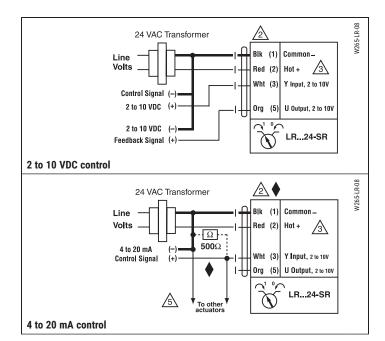
Meets cULus or UL and CSA requirements without the need of an electrical ground connection.



The ZG-R01 500 Ω resistor converts the 4 to 20 mA control signal to 2 to 10 VDC, up to 2 actuators may be connected in parallel.

WARNING Live Electrical Components!

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BELIMO°



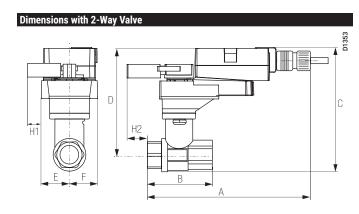
Models

LRB120-3 LRX120-3

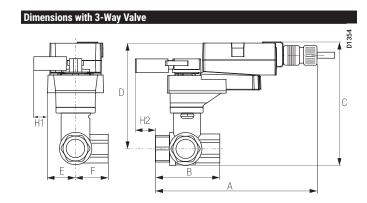
Technical Data	
Control	On/Off, Floating Point
Power supply	100 to 240 VAC, 50/60 Hz (nominal)
	85 to 265 VAC, 50/60 Hz (tolerance)
Power consumption running	2 W
holding	0.5 W
Transformer sizing	4 VA (class 2 power source)
Electrical connection	½" conduit connector
	18 GA, plenum rated cable
LRB120-3	3 ft [1m]
LRX120-3	3 ft [1m], 10 ft [3m], 16 ft [5m]
Overload protection	electronic throughout 0° to 95° rotation
Input impedance	600 Ω
Angle of rotation	90°, adjustable with mechanical stop
Direction of rotation	reversible with protected
Position indication	handle
Manual override	external push button
Running time	
LRB120-3	90 seconds, constant independent of load
LRX120-3	150, 95, 60, 45, 35 seconds,
	constant independent of load
Humidity	5 to 95% RH non-condensing
	(EN 60730-1)
Ambient temperature	-22°F to 122°F [-30°C to 50°C]
Storage temperature	-40°F to 176°F [-40°C to 80°C]
Housing	NEMA 2/IP54
Housing material	UL94-5VA
Agency listings†	cULus according to UL 60730-1A/-2-14, CAN/
	CSA E60730-1:02, CE according to 2004/108/
	EC and 2006/95/EC for line voltage and/or
	-S versions
Noise level	<35 dB(A)
Quality standard	ISO 9001

[†] Rated impulse voltage 4kV, Control pollution degree 3, Type of action 1

LR...120-3 Actuators, On/Off, Floating Point



	Valve Nominal Size		Dimensions (Inches [mm])	
Valve Body	Inches	DN [mm]	Α	В
B207(B)-B211(B)	1/2"	15	2.41" [61.1]	1.39" [35.2]
B212(B)-B215(B)	1/2"	15	2.38" [60.4]	1.78" [45.2]
B217(B)-B221(B)	3/4"	20	2.73" [69.3]	1.87" [47.4]
B222-B225	1"	25	3.09" [78.4]	1.87" [47.4]
B229-B230	1¼"	32	3.72" [94.6]	1.87" [47.4]



30.6]
32.8]
37.3]
10.3]

LR...120-3 Actuators, On/Off, Floating Point



Wiring Diagrams



💢 INSTALLATION NOTES



CAUTION Equipment damage!

Actuators may be connected in parallel.

Power consumption and input impedance must be observed.



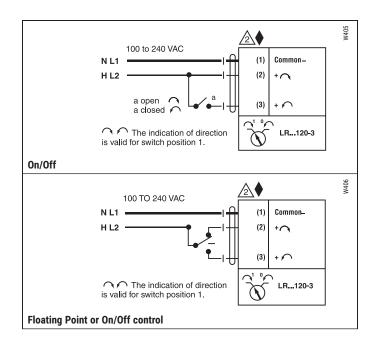
APPLICATION NOTES

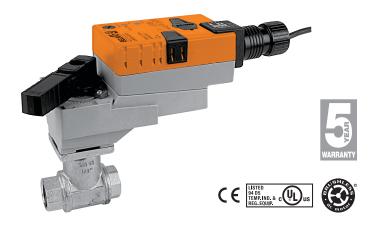


Meets cULus or UL and CSA requirements without the need of an electrical ground connection.

WARNING Live Electrical Components!

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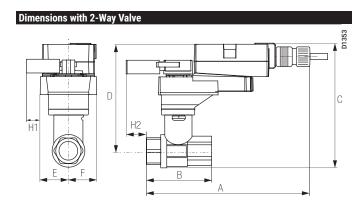


Models

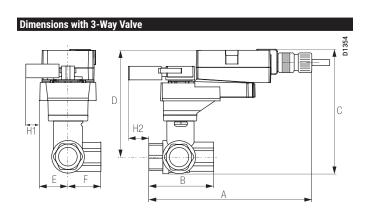
LRB120-SR LRX120-SR

Technical Data	
Power supply	100 to 240 VAC, 50/60 Hz (nominal)
	85 to 265 VAC, 50/60 Hz (tolerance)
Power consumption running	2.5 W
holding	
Transformer sizing	4.5 VA (class 2 power source)
Electrical connection	½" conduit connector
	18 GA, plenum rated cable
LRB120-SR	3 ft [1m]
LRX120-SR	3 ft [1m], 10 ft [3m], 16 ft [5m]
Overload protection	electronic throughout 0° to 95° rotation
Operating range Y	2 to 10 VDC, 4 to 20 mA
Feedback output U	1 to 10 VDC, max 0.5 mA
Input impedance	100 kΩ (0.1 mA), 500 Ω
Angle of rotation	90°, adjustable with mechanical stop
Direction of rotation	reversible with protected
Position indication	handle
Manual override	external push button
Running time	constant independent of load
LRB120-SR	90 seconds
LRX120-SR	150, 95, 60, 45, 35 seconds
Humidity	5 to 95% RH non-condensing
	(EN 60730-1)
Ambient temperature	-22°F to 122°F [-30°C to 50°C]
Storage temperature	-40°F to 176°F [-40°C to 80°C]
Housing	NEMA 2/IP54
Housing material	UL94-5VA
Agency listings†	cULus according to UL 60730-1A/-2-14, CAN/
	CSA E60730-1:02, CE according to 2004/108/
	EC and 2006/95/EC for line voltage and/or
	-S versions
Noise level	<35 dB(A)
Quality standard	ISO 9001

[†] Rated impulse voltage 4kV, Control pollution degree 3, Type of action 1



	Valve Nominal Size		Dimensions (Inches [mm])	
Valve Body	Inches	DN [mm]	Α	В
B207(B)-B211(B)	1/2"	15	2.41" [61.1]	1.39" [35.2]
B212(B)-B215(B)	1/2"	15	2.38" [60.4]	1.78" [45.2]
B217(B)-B221(B)	3/4"	20	2.73" [69.3]	1.87" [47.4]
B222-B225	1"	25	3.09" [78.4]	1.87" [47.4]
B229-B230	1¼"	32	3.72" [94.6]	1.87" [47.4]



	Valve Nominal Size		Dimen	Dimensions (Inches [mm])		
Valve Body	Inches	DN [mm]	Α	В	C	
B307(B)-B311(B)	1/2"	15	2.41" [61.1]	1.39" [35.2]	1.20" [30.6]	
B312(B)-B315(B)	1/2"	15	2.38" [60.4]	1.78" [45.2]	1.29" [32.8]	
B317(B)-B321(B)	3/4"	20	2.73" [69.3]	1.87" [47.4]	1.47" [37.3]	
B322-B325	1"	25	3.09" [78.4]	1.87" [47.4]	1.59" [40.3]	

LR...120-SR Actuators, Proportional



Wiring Diagrams



🖊 INSTALLATION NOTES



CAUTION Equipment damage!

Actuators may be connected in parallel.

Power consumption and input impedance must be observed.



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



A 500 Ω resistor converts the 4 to 20 mA control signal to 2 to 10 VDC.



LRB(X) can be supplied with both 120 VAC and 230 VAC.



All 120 VAC and 230 VAC actuators use appliance rated cables.



APPLICATION NOTES

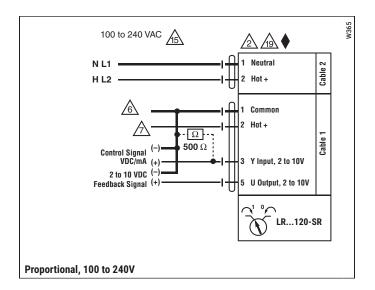


Meets cULus or UL and CSA requirements without the need of an electrical ground connection.

↑ WARNING

WARNING 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.





LR...24-MFT Actuators, Multi-Function Technology

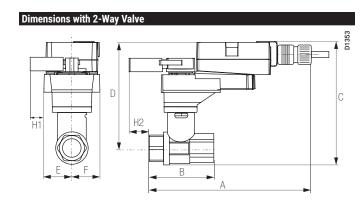


Models

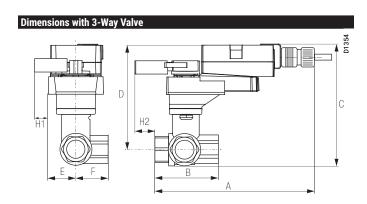
LRX24-MFT Flexible Version

Technical Data	
Power supply	24 VAC ± 20% 50/60 Hz
	24 VDC ± 10%
Power consumption running	
holding	
Transformer sizing	6 VA (class 2 power source)
Electrical connection	½" conduit connector
	18 GA, plenum rated cable
LRX24-MFT	3 ft [1m], 10 ft [3m], 16 ft [5m]
Overload protection	electronic throughout 0° to 95° rotation
Operating range Y	2 to 10 VDC (default)
	4 to 20 mA
	variable (VDC, PWM, floating point, on/off)
Feedback output U	2 to 10 VDC, 0.5mA max
	VDC variable
Input impedance	100 k Ω (0.1 mA), 500 Ω
	1500 Ω (PWM, floating point, on/off)
Angle of rotation	90° electronically variable
	adjustable with mechanical stop
Direction of rotation	reversible with protected
Position indication	handle
Manual override	external push button
Running time	150 seconds (default)
	Variable (35 to 150 secs)
Humidity	5 to 95% RH non-condensing
	(EN 60730-1)
Ambient temperature	-22°F to 122°F [-30°C to 50°C]
Storage temperature	-40°F to 176°F [-40°C to 80°C]
Housing	NEMA 2/IP54
Housing material	UL94-5VA
Agency listings†	cULus according to UL 60730-1A/-2-14, CAN/
-	CSA E60730-1:02, CE according to 2004/108/
	EC and 2006/95/EC for line voltage and/or
	-S versions
Noise level	<35 dB(A)
Quality standard	ISO 9001
1.0 . 1: 1 1: 0001/0 :	

[†] Rated impulse voltage 800V, Control pollution degree 3, Type of action 1 (1.B for -S models)



	Valve Nominal Size		Dimensions (Inches [mm])
Valve Body	Inches	DN [mm]	Α	В
B207-B211	1/2"	15	2.41" [61.1]	1.39" [35.2]
B212-B215	1/2"	15	2.38" [60.4]	1.78" [45.2]
B217-B221	3/4"	20	2.73" [69.3]	1.87" [47.4]
B222-B225	1"	25	3.09" [78.4]	1.87" [47.4]
B229-B230	1¼"	32	3.72" [94.6]	1.87" [47.4]



	Valve Nominal Size		Dimensions (Inches [mm])		
Valve Body	Inches	DN [mm]	Α	В	С
B307-B311	1/2"	15	2.41" [61.1]	1.39" [35.2]	1.20" [30.6]
B312-B315	1/2"	15	2.38" [60.4]	1.78" [45.2]	1.29" [32.8]
B317-B321	3/4"	20	2.73" [69.3]	1.87" [47.4]	1.47" [37.3]
B322-B325	1"	25	3.09" [78.4]	1.87" [47.4]	1.59" [40.3]

LR...24-MFT Actuators, Multi-Function Technology



Wiring Diagrams



🖊 INSTALLATION NOTES



CAUTION Equipment damage!

Actuators may be connected in parallel.

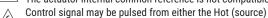
Power consumption and input impedance must be observed.

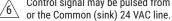


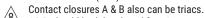
Actuators may also be powered by 24 VDC.



Position feedback cannot be used with Triac sink controller. The actuator internal common reference is not compatible.









A& B should both be closed for triac source and open for triac sink.



For triac sink the common connection from the actuator must be connected to the hot connection.



APPLICATION NOTES

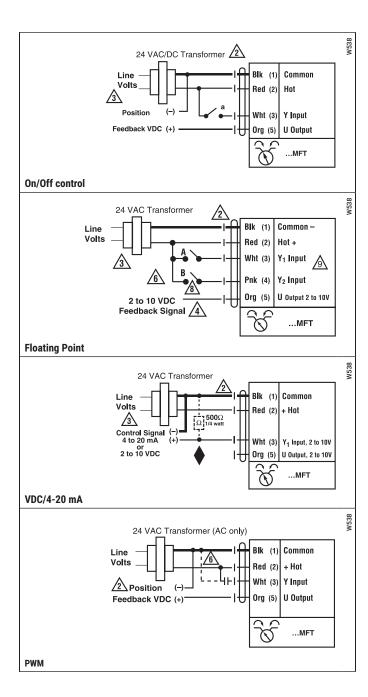


The ZG-R01 500 Ω resistor converts the 4 to 20 mA control signal to 2 to 10 VDC, up to 2 actuators may be connected in parallel.

WARNIN During inst

WARNING Live Electrical Components!

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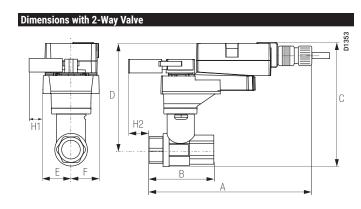


LRX24-PC Actuators, 0 to 20V Phasecut, Proportional

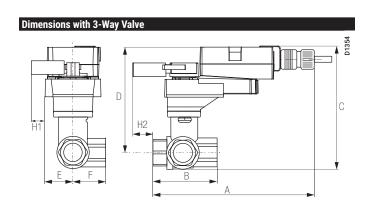


Models LRX24-PC

Technical Data	
Power supply	24 VAC ± 20% 50/60 Hz
	24 VDC ± 10%
Power consumption runnin	g 2 W
holdin	g 1.2 W
Transformer sizing	5 VA (Class 2 power source)
Electrical connection	½" conduit connector
	18 GA plenum rated cable
	3 ft [1m], 10 ft [3m], 16 ft [5m]
Overload protection	electronic throughout 0 to 95° rotation
Operating range Y	0 to 20V phasecut
Feedback output U	2 to 10 VDC, 0.5mA max
Input impedance	8 kΩ (50 mW)
Angle of rotation	90°, adjustable with mechanical stop
	electronically variable
Direction of rotation	reversible with \bigcirc/\bigcirc switch
Position indication	handle
Manual override	external push button
Running time	150 seconds (default)
Humidity	5 to 95% RH non-condensing
	(EN 60730-1)
Ambient temperature	-22°F to 122°F [-30°C to 50°C]
Storage temperature	-40°F to 176°F [-40°C to 80°C]
Housing	NEMA 2/IP54
Housing material	UL94-5VA
Agency listings†	cULus according to UL 60730-1A/-2-14, CAN/
	CSA E60730-1:02, CE according to 2004/108/
	EC and 2006/95/EC for line voltage and/or
	-S versions
Noise level	<35 dB(A)
Quality standard	ISO 9001



	Valve Nominal Size		Dimensions (Inches [mm]	
Valve Body	Inches	DN [mm]	Α	В
B207-B211	1/2"	15	2.41" [61.1]	1.39" [35.2]
B212-B215	1/2"	15	2.38" [60.4]	1.78" [45.2]
B217-B221	3/4"	20	2.73" [69.3]	1.87" [47.4]
B222-B225	1"	25	3.09" [78.4]	1.87" [47.4]
B229-B230	1¼"	32	3.72" [94.6]	1.87" [47.4]



Valve Nominal Size		Dimensions (Inches [mm])		
Inches	DN [mm]	Α	В	С
1/2"	15	2.41" [61.1]	1.39" [35.2]	1.20" [30.6]
1/2"	15	2.38" [60.4]	1.78" [45.2]	1.29" [32.8]
3/4"	20	2.73" [69.3]	1.87" [47.4]	1.47" [37.3]
1"	25	3.09" [78.4]	1.87" [47.4]	1.59" [40.3]
	1/2" 1/2" 3/4"	Inches DN [mm] ½" 15 ½" 15 ¾" 20	Inches DN [mm] A ½" 15 2.41" [61.1] ½" 15 2.38" [60.4] ¾" 20 2.73" [69.3]	Inches DN [mm] A B ½" 15 2.41" [61.1] 1.39" [35.2] ½" 15 2.38" [60.4] 1.78" [45.2] ¾" 20 2.73" [69.3] 1.87" [47.4]

LRX24-PC Actuators, 0 to 20V Phasecut, Proportional



Wiring Diagrams



INSTALLATION NOTES



Provide overload protection and disconnect as required.



CAUTION Equipment damage!

Actuators may be connected in parallel.

Power consumption and input impedance must be observed.

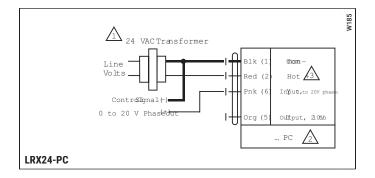


Actuators may also be powered by 24 VDC.

WARNING Live Electrical Components!

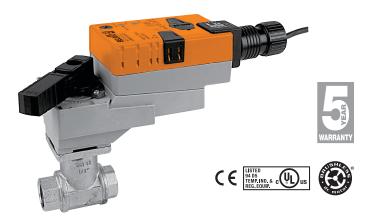
During installation, testing, servicing and troubleshooting of this product, it may

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.





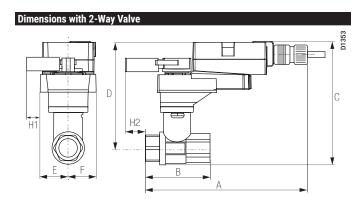
LRX24-MFT95 Actuators, 0 to 135 Ω , Proportional



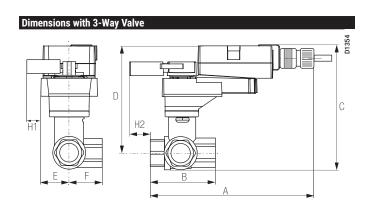
Models LRX24-MFT95

Technical Data	
Power supply	24 VAC ± 20% 50/60 Hz
	24 VDC ± 10%
Power consumption running	
holding	
Transformer sizing	5 VA (Class 2 power source)
Electrical connection	½" conduit connector
	18 GA plenum rated cable
	3 ft [1m], 10 ft [3m], 16 ft [5m]
Overload protection	electronic throughout 0 to 95° rotation
Operating range WRB	0 to 135 Ω Honeywell Electronic
	Series 90, 0 to 135 Ω input
Feedback output U	2 to 10 VDC, 0.5mA max
Input impedance	100 kΩ (0.1 mW)
Angle of rotation	90°, adjustable with mechanical stop
-	electronically variable
Direction of rotation	reversible with \bigcirc / \bigcirc switch
Position indication	handle
Manual override	external push button
Running time	150 seconds (default)
	variable (35 to 150 seconds)
Humidity	5 to 95% RH non-condensing
•	(EN 60730-1)
Ambient temperature	-22°F to 122°F [-30°C to 50°C]
Storage temperature	-40°F to 176°F [-40°C to 80°C]
Housing	NEMA 2/IP54
Housing material	UL94-5VA
Agency listings†	cULus according to UL 60730-1A/-2-14, CAN/
	CSA E60730-1:02, CE according to 2004/108/
	EC and 2006/95/EC for line voltage and/or
	-S versions
Noise level	<35 dB(A)
	00 02(1)

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



	Valve Nominal Size		Dimensions (Inches [mm])
Valve Body	Inches	DN [mm]	Α	В
B207-B211	1/2"	15	2.41" [61.1]	1.39" [35.2]
B212-B215	1/2"	15	2.38" [60.4]	1.78" [45.2]
B217-B221	3/4"	20	2.73" [69.3]	1.87" [47.4]
B222-B225	1"	25	3.09" [78.4]	1.87" [47.4]
B229-B230	1¼"	32	3.72" [94.6]	1.87" [47.4]



	Valve Nominal Size		Dimensions (Inches [mm])		
Valve Body	Inches	DN [mm]	Α	В	С
B307-B311	1/2"	15	2.41" [61.1]	1.39" [35.2]	1.20" [30.6]
B312-B315	1/2"	15	2.38" [60.4]	1.78" [45.2]	1.29" [32.8]
B317-B321	3/4"	20	2.73" [69.3]	1.87" [47.4]	1.47" [37.3]
B322-B325	1"	25	3.09" [78.4]	1.87" [47.4]	1.59" [40.3]

Wiring Diagrams



INSTALLATION NOTES



Provide overload protection and disconnect as required.



Actuators and controller must have separate transformers.



Consult controller instruction data for more detailed information.



Resistor value depends on the type of controller and the number of actuators. No resistor is used for one actuator. Honeywell® resistor kits may also be used.

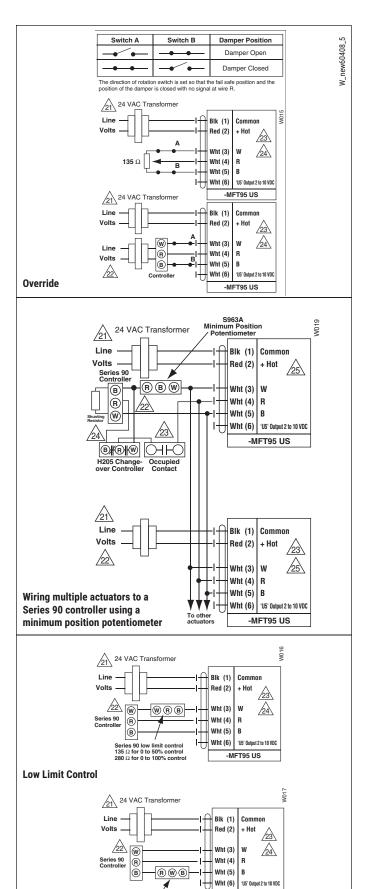


To reverse control rotation, use the reversing switch.2524232221

^!

WARNING Live Electrical Components!

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High Limit Control

-MFT95 US

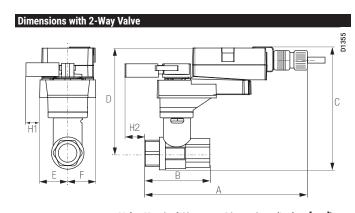


LISTED 94 D5 TEMP.IND. & c UL) us

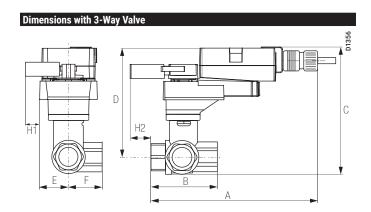
Models LRQB24-1 LRQX24-1 **Basic Version** Flexible Version

Tarket al Date	
Technical Data	
Control	on/off
Power supply	24 VAC ± 20% 50/60 Hz
	24 VDC ± 10%
Power consumption running	
holding	
Transformer sizing	18 VA (Class 2 power source)
	20A @ 5ms max
Electrical connection	½" conduit connector
	18 GA plenum rated cable
LRQB24-1	3 ft [1m]
LRQX24-1	3 ft [1m], 10 ft [3m], 16 ft [5m]
Overload protection	electronic throughout 0 to 95° rotation
Input impedance	600 Ω
Angle of rotation	max 95°, adjustable with mechanical stop
Direction of rotation	reversible with $\bigcirc/\!$
Position indication	handle
Manual override	external push button
Running time	
LRQB24-1	5 seconds
	constant of independent load
LRQX24-1	5 or 10 seconds
	constant of independent load
Humidity	5 to 95% RH non-condensing
	(EN 60730-1)
Ambient temperature	-22°F to 122°F [-30°C to 50°C]
Storage temperature	-40°F to 176°F [-40°C to 80°C]
Housing	NEMA 2/IP54
Housing material	UL94-5VA
Agency listings†	cULus according to UL 60730-1A/-2-14, CAN/
	CSA E60730-1:02, CE according to 2004/108/
	EC and 2006/95/EC for line voltage and/or
	-S versions
Noise level	<52 dB(A)
Quality standard	ISO 9001

LRQ...24-1 Quick Running Actuators, On/Off



	Valve Nominal Size		Dimensions (Inches [mm])
Valve Body	Inches	DN [mm]	Α	В
B207-B211	1/2"	15	2.41" [61.1]	1.39" [35.2]
B212-B215	1/2"	15	2.38" [60.4]	1.78" [45.2]
B217-B221	3/4"	20	2.73" [69.3]	1.87" [47.4]
B222-B225	1"	25	3.09" [78.4]	1.87" [47.4]
B229-B230	1¼"	32	3.72" [94.6]	1.87" [47.4]



	Valve Nominal Size		Dime	Dimensions (Inches [mm])		
Valve Body	Inches	DN [mm]	Α	В	C	
B307-B311	1/2"	15	2.41" [61.1]	1.39" [35.2]	1.20" [30.6]	
B312-B315	1/2"	15	2.38" [60.4]	1.78" [45.2]	1.29" [32.8]	
B317-B321	3/4"	20	2.73" [69.3]	1.87" [47.4]	1.47" [37.3]	
B322-B325	1"	25	3.09" [78.4]	1.87" [47.4]	1.59" [40.3]	

LRQ...24-1 Quick Running Actuators, On/Off



Wiring Diagrams



INSTALLATION NOTES



Provide overload protection and disconnect as required.



Actuators may also be powered by 24 VDC.



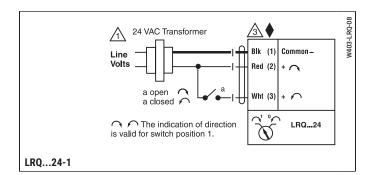
APPLICATION NOTES



Meets cULus or UL and CSA requirements without the need of an electrical ground connection.

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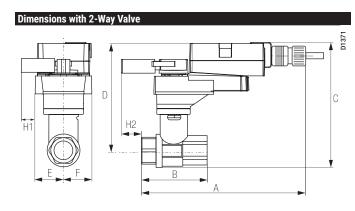
LRQ...24-MFT Quick Running Actuators, Multi-Function Technology



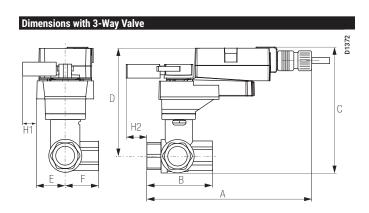
Models

LRQB24-MFT Basic Version LRQX24-MFT Flexible Version

Technical Data	
Power supply	24 VAC ± 20% 50/60 Hz
	24 VDC ± 10%
Power consumption running	12 W
holding	
Transformer sizing	18 VA (Class 2 power source)
-	20A @ 5ms max
Electrical connection	½" conduit connector
	18 GA plenum rated cable
LRQB24-MFT	3 ft [1m]
LRQX24-MFT	3 ft [1m], 10 ft [3m], 16 ft [5m]
Overload protection	electronic throughout 0 to 95° rotation
Operating range Y	2 to 10 VDC, 4 to 20 mA (default)
	variable (VDC, on/off)
Feedback output U	2 to 10 VDC, 0.5mA max
	VDC variable
Input impedance	100 k Ω (0.1 mA), 500 Ω
	1500 Ω (on/off)
Angle of rotation	max 95°, adjustable with mechanical stop
Direction of rotation	reversible with
Position indication	reflective visual indicator (snap-on)
Manual override	external push button
Running time	
LRQB24-MFT	5 seconds
	constant of independent load
LRQX24-MFT	5 or 10 seconds
	constant of independent load
Humidity	5 to 95% RH non-condensing
	(EN 60730-1)
Ambient temperature	-22°F to 122°F [-30°C to 50°C]
Storage temperature	-40°F to 176°F [-40°C to 80°C]
Housing	NEMA 2/IP54
Housing material	UL94-5VA
Agency listings†	cULus according to UL 60730-1A/-2-14, CAN/
	CSA E60730-1:02, CE according to 2004/108/
	EC and 2006/95/EC for line voltage and/or
	-S versions
Noise level	<52 dB(A)
Quality standard	ISO 9001



	Valve Nominal Size		Dimensions (Inches [mm])
Valve Body	Inches	DN [mm]	Α	В
B207-B211	1/2"	15	2.41" [61.1]	1.39" [35.2]
B212-B215	1/2"	15	2.38" [60.4]	1.78" [45.2]
B217-B221	3/4"	20	2.73" [69.3]	1.87" [47.4]
B222-B225	1"	25	3.09" [78.4]	1.87" [47.4]
B229-B230	1¼"	32	3.72" [94.6]	1.87" [47.4]



	Valve Nominal Size		Dimensions (Inches [mm])		
Valve Body	Inches DN [mm]		Α	В	С
B307-B311	1/2"	15	2.41" [61.1]	1.39" [35.2]	1.20" [30.6]
B312-B315	1/2"	15	2.38" [60.4]	1.78" [45.2]	1.29" [32.8]
B317-B321	3/4"	20	2.73" [69.3]	1.87" [47.4]	1.47" [37.3]
B322-B325	1"	25	3.09" [78.4]	1.87" [47.4]	1.59" [40.3]

LRQ...24-MFT Quick Running Actuators, Multi-Function Technology



Wiring Diagrams



INSTALLATION NOTES



Provide overload protection and disconnect as required.



CAUTION Equipment damage!

Actuators may be connected in parallel.

Power consumption and input impedance must be observed.



Actuators may also be powered by 24 VDC.



Control signal may be pulsed from either the Hot (source) or the Common (sink) 24 VAC line.



APPLICATION NOTES

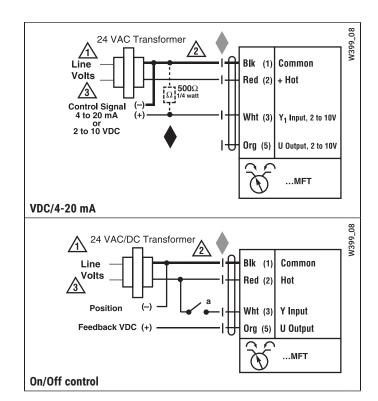


The ZG-R01 500 Ω resistor may be used.

⋒ WAI

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WARRANTY C E SUSTED STEWRING, & CUD US RES. EQUIP.

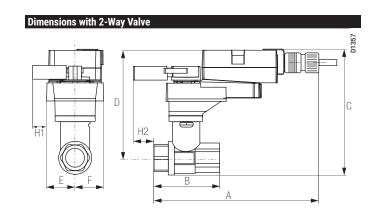
Models

NRQB24-1 Basic Version NRQX24-1 Flexible Version

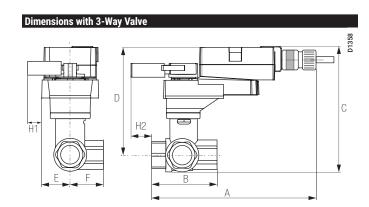
Technical Data	
Control	on/off
Power supply	24 VAC ± 20% 50/60 Hz
	24 VDC ± 10%
Power consumption runnin	g 12 W
holdin	g 1.5 W
Transformer sizing	18 VA (Class 2 power source)
Electrical connection	½" conduit connector,
	18 GA plenum rated cable
NRQB24-1	3 ft [1m]
NRQX24-1	3 ft [1m], 10 ft [3m], 16 ft [5m]
Overload protection	electronic throughout 0 to 95° rotation
Input impedance	600 Ω
Angle of rotation	max 95°, adjustable with mechanical stop
Direction of rotation	reversible with \bigcirc/\bigcirc switch
Position indication	reflective visual indicator (snap-on)
Manual override	external push button
Running time	constant of independent load
NRQB24-1	5 seconds
NRQX24-1	5, 10 or 15 seconds
Humidity	5 to 95% RH non-condensing
	(EN 60730-1)
Ambient temperature	-22°F to 122°F [-30°C to 50°C]
Storage temperature	-40°F to 176°F [-40°C to 80°C]
Housing	NEMA 2/IP54
Housing material	UL94-5VA
Agency listings†	cULus according to UL 60730-1A/-2-14, CAN/
	CSA E60730-1:02, CE according to 2004/108/
	EC and 2006/95/EC for line voltage and/or
	-S versions
Noise level	<52 dB(A)
Ouality standard	ISO 9001

Quality standard ISO 9001
Rated Impulse Voltage 800V, Type of action 1, Control Pollution Degree 3.

NRQ...24-1 Quick Running Actuators, On/Off



	Valve Nominal Size		Dimensions (Inches [mm])
Valve Body	Inches	DN [mm]	Α	В
B231-B232	1¼"	32	3.72" [94.6]	2.04" [51.9]
B238-B240	1½"	40	3.88" [98.5]	2.04" [51.9]
B248-B250	2"	50	4.21" [107]	2.27" [57.7]



Valve Nominal Size			Dime	nsions (Inches [mm])
Valve Body Inches DN [mm]			Α	В	С
B329-B331	1¼"	32	3.96" [100.6]	2.27" [57.7]	2.14" [54.3]

NRQ...24-1 Quick Running Actuators, On/Off



Wiring Diagrams



INSTALLATION NOTES



Provide overload protection and disconnect as required.



Actuators may also be powered by 24 VDC.

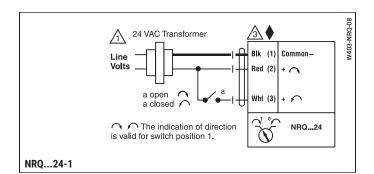


APPLICATION NOTES



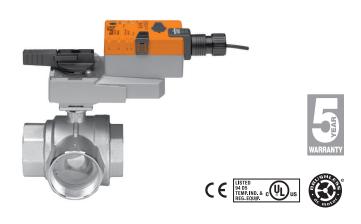
Meets cULus or UL and CSA requirements without the need of an electrical ground connection.

WARNING Live Electrical Components!





NRQ...24-MFT Quick Running Actuators, Multi-Function Technology

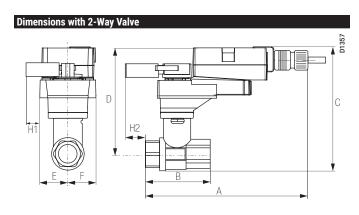


Models

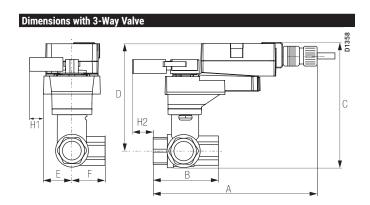
NRQB24-MFT Basic Version NRQX24-MFT Flexible Version

Technical Data	
Power supply	24 VAC ± 20% 50/60 Hz
	24 VDC ± 10%
Power consumption running	12 W
holding	
Transformer sizing	18 VA (Class 2 power source)
Electrical connection	½" conduit connector,
	18 GA plenum rated cable
NRQB24-MFT	3 ft [1m]
NRQX24-MFT	3 ft [1m], 10 ft [3m], 16 ft [5m]
Overload protection	electronic throughout 0 to 95° rotation
Operating range Y	2 to 10 VDC, 4 to 20 mA (default)
	variable (VDC, on/off)
Feedback output U	2 to 10 VDC, 0.5mA max
	VDC variable
Input impedance	100 kΩ (0.1 mA), 500 Ω, 1500 Ω
	(on/off)
Angle of rotation	max 95°, adjustable with mechanical stop
	electronically variable
Direction of rotation	reversible with $\bigcirc/\!$
Position indication	reflective visual indicator (snap-on)
Manual override	external push button
Running time	constant of independent load
NRQB24-MFT	5 seconds
NRQX24-MFT	5, 10 or 15 seconds
Humidity	5 to 95% RH non-condensing
	(EN 60730-1)
Ambient temperature	-22°F to 122°F [-30°C to 50°C]
Storage temperature	-40°F to 176°F [-40°C to 80°C]
Housing	NEMA 2/IP54
Housing material	UL94-5VA
Agency listings†	cULus according to UL 60730-1A/-2-14, CAN/
	CSA E60730-1:02, CE according to 2004/108/
	EC and 2006/95/EC for line voltage and/or
Noise level	-S versions
	<52 dB(A)
Quality standard	ISO 9001

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



	Valve Nominal Size		Dimensions (Inches [mm])
Valve Body	Inches	DN [mm]	Α	В
B231-B232	1¼"	32	3.72" [94.6]	2.04" [51.9]
B238-B240	1½"	40	3.88" [98.5]	2.04" [51.9]
B248-B250	2"	50	4.21" [107]	2.27" [57.7]



Valve Nominal Size			Dime	nsions (Inches	mm])
Valve Body Inches DN [mm]			Α	В	С
B329-B331	1¼"	32	3.96" [100.6]	2.27" [57.7]	2.14" [54.3]

NRQ...24-MFT Quick Running Actuators, Multi-Function Technology



Wiring Diagrams



INSTALLATION NOTES



Provide overload protection and disconnect as required.



CAUTION Equipment damage!

Actuators may be connected in parallel.

Power consumption and input impedance must be observed.



Actuators may also be powered by 24 VDC.



Control signal may be pulsed from either the Hot (source) or the Common (sink) 24 VAC line.



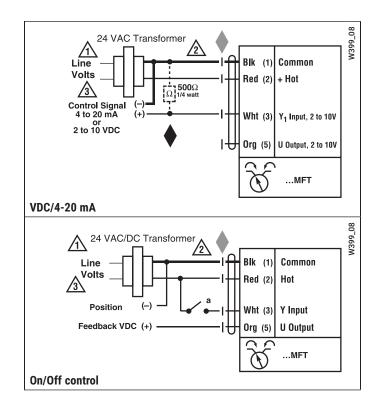
APPLICATION NOTES



The ZG-R01 500 Ω resistor may be used.

∧ WAR

WARNING Live Electrical Components!







NRB24-3-T N4, NRX24-3-T N4 NEMA 4X Actuators, On/Off, Floating Point









Models

NRB24-3-T N4 NRB24-3-T N4H

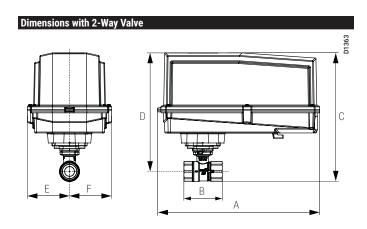
w/built in heater

NRX24-3-T N4

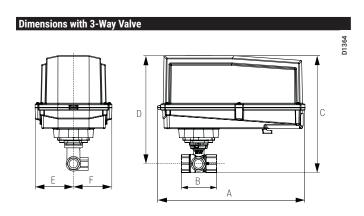
NRX24-3-T N4H w/built in heater

Technical Data		
Control		on/off, floating point
Power supply		24 VAC ± 20% 50/60 Hz
		24 VDC ± 10%
Power consumption	running	2.0 W / heater 24 W
	holding	0.2 W
Transformer sizing	_	4 VA (class 2 power source) / heater 19 VA
Electrical connection		screw terminal (for 26 to 14 GA wire)
Overload protection		electronic throughout 0° to 95° rotation
Input impedance		600 Ω
Angle of rotation		90°, adjustable with mechanical stop
Direction of rotation		reversible with $\frown/\!$
Position indication		visual pointer
Manual override		external push button
Running time		90 seconds constant independent of load
Humidity		100% RH
Ambient temperature		-22°F to 122°F [-30°C to 50°C]
Storage temperature		-40°F to 176°F [-40°C to 80°C]
Housing type		UL Type 4X/NEMA 4X/IP66 & IP67
Housing material		Polypropylene
Agency listings†	·	cULus according to UL 60730-1A/-2-14, CAN/
		CSA E60730-1, CSA C22.2 No. 24-93, CE ac-
		cording to 89/336/EEC.
Quality standard		ISO 9001
*Connot be used with the	20V EVE V	т

^{*}Cannot be used with the CCV-EXT-KIT



	Valve Nominal Size		Dimensions (Inches [mm])	
Valve Body	Inches	DN [mm]	Α	В
B207-B211	1/2"	15	2.41" [61.1]	1.39" [35.2]
B212-B215	1/2"	15	2.38" [60.4]	1.78" [45.2]
B217-B221	3/4"	20	2.73" [69.3]	1.87" [47.4]
B222-B225	1"	25	3.09" [78.4]	1.87" [47.4]
B229-B230	1¼"	32	3.72" [94.6]	1.87" [47.4]



	Valve Nominal Size		Dimensions (Inches [mm])		
Valve Body	Inches	DN [mm]	Α	В	С
B307-B311	1/2"	15	2.41" [61.1]	1.39" [35.2]	1.20" [30.6]
B312-B315	1/2"	15	2.38" [60.4]	1.78" [45.2]	1.29" [32.8]
B317-B321	3/4"	20	2.73" [69.3]	1.87" [47.4]	1.47" [37.3]
B322-B325	1"	25	3.09" [78.4]	1.87" [47.4]	1.59" [40.3]

[†] Rated impulse voltage 800V, Control pollution degree 3, Type of action 1.

P10419 - 09/13 - Subject to change. @ Belimo Aircontrols (USA), Inc.

NRB24-3-T N4, NRX24-3-T N4 NEMA 4X Actuators, On/Off, Floating Point



Wiring Diagrams



INSTALLATION NOTES

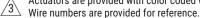


CAUTION Equipment damage!

Actuators may be connected in parallel.

Power consumption and input impedance must be observed.

Actuators are provided with color coded wires.





Actuators may also be powered by 24 VDC.

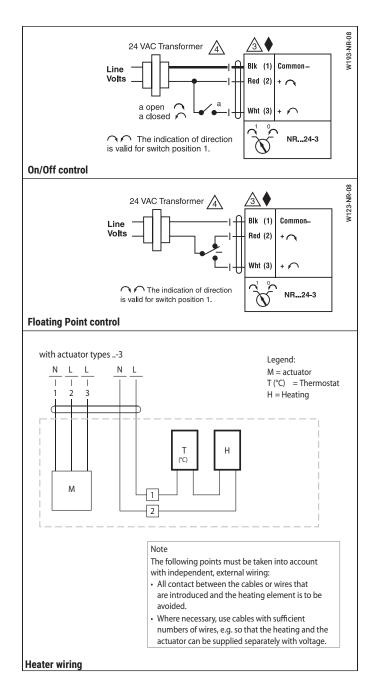


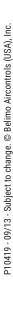
APPLICATION NOTES



Meets cULus or UL and CSA requirements without the need of an electrical ground connection.

WARNING Live Electrical Components!







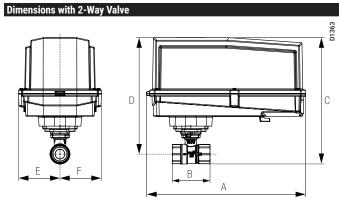
NRB24-SR-T N4, NRX24-SR-T N4 NEMA 4X Actuators, Proportional











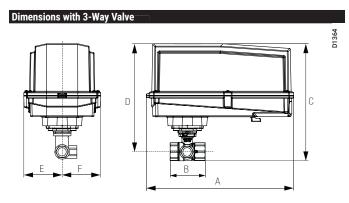
	Valve Nominal Size		Dimensions (Inches [mm])
Valve Body	Inches	DN [mm]	Α	В
B207-B211	1/2"	15	2.41" [61.1]	1.39" [35.2]
B212-B215	1/2"	15	2.38" [60.4]	1.78" [45.2]
B217-B221	3/4"	20	2.73" [69.3]	1.87" [47.4]
B222-B225	1"	25	3.09" [78.4]	1.87" [47.4]
B229-B230	1¼"	32	3.72" [94.6]	1.87" [47.4]

NRB24-SR-T N4 NRB24-SR-T N4H w/built in heater NRX24-SR-T N4H w/built in heater

Technical Data		
Control		2 to 10 VDC, 4 to 20 mA
Power supply		24 VAC ± 20% 50/60 Hz
		24 VDC ± 10%
Power consumption	running	2.5 W / heater 24 W
	holding	0.4 W
Transformer sizing		5 VA (class 2 power source) / heater 20 VA
Electrical connection		screw terminal (for 26 to 14 GA wire)
Overload protection		electronic throughout 0° to 95° rotation
Input impedance		100 kΩ (0.1mA), 500Ω
Angle of rotation		90°, adjustable with mechanical stop
Direction of rotation		reversible with \frown / \frown switch
Position indication		visual pointer
Manual override		external push button
Running time		90 seconds constant independent of load
Humidity		100% RH
Ambient temperature		-22°F to 122°F [-30°C to 50°C]
Storage temperature		-40°F to 176°F [-40°C to 80°C]
Housing type		UL Type 4X/NEMA 4X/IP66 & IP67
Housing material		Polypropelene
Agency listings†		cULus according to UL 60730-1A/-2-14, CAN/
		CSA E60730-1, CSA C22.2 No. 24-93, CE ac-
·		cording to 89/336/EEC.
Quality standard		ISO 9001

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

*Cannot be used with the CCV-EXT-KIT



Valve Nominal Size Dimensions (Inch			nsions (Inches	[mm])	
Valve Body	Inches	DN [mm]	Α	В	С
B307-B311	1/2"	15	2.41" [61.1]	1.39" [35.2]	1.20" [30.6]
B312-B315	1/2"	15	2.38" [60.4]	1.78" [45.2]	1.29" [32.8]
B317-B321	3/4"	20	2.73" [69.3]	1.87" [47.4]	1.47" [37.3]
B322-B325	1"	25	3.09" [78.4]	1.87" [47.4]	1.59" [40.3]

NRB24-SR-T N4, NRX24-SR-T N4 NEMA 4X Actuators, Proportional



Wiring Diagrams



INSTALLATION NOTES



CAUTION Equipment damage!

Actuators may be connected in parallel.

Power consumption and input impedance must be observed.



Actuators may also be powered by 24 VDC.



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

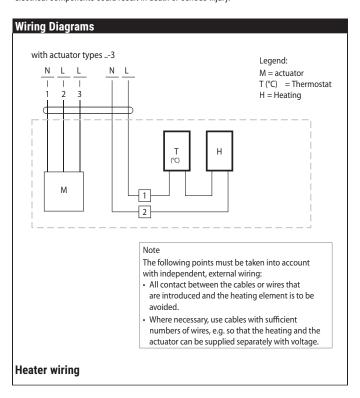


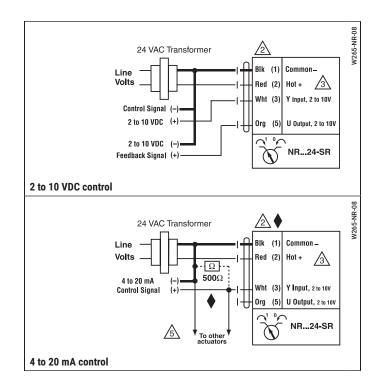
APPLICATION NOTES



The ZG-R01 500 Ω resistor converts the 4 to 20 mA control signal to 2 to 10 VDC, up to 2 actuators may be connected in parallel.

WARNING Live Electrical Components!









NRX24-MFT-T N4 NEMA 4X Actuators, Multi-Function Technology









Models

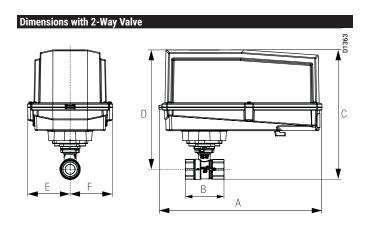
NRX24-MFT-T N4 NRX24-MFT-T N4H

w/built in heater

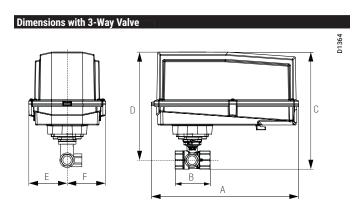
Technical Data			
Control		2 to 10 VDC, 4 to 20 mA (default)	vari-
		able (VDC, PWM, floating point, on/off)	
Power supply		24 VAC ± 20% 50/60 Hz	
		24 VDC ± 10%	
Power consumption	running	3.5 W (1.25 W) / heater 24 W	
	holding	1.25 W	
Transformer sizing		6 VA (class 2 power source) / heater 21 V	Α
Electrical connection		screw terminal (for 26 to 14 GA wire)	
Overload protection		electronic throughout 0° to 95° rotation	
Input impedance		100 kΩ (0.1 mA), 500 Ω	
		1500 Ω (PWM, floating point, on/off)	
Angle of rotation		95°, adjustable with mechanical stop	
		electronically variable	
Direction of rotation		reversible with $\bigcirc/\!$	
Position indication		visual pointer	
Manual override		external push button	
Running time		150 seconds (default)	
		constant independent of load	
		variable (75 to 350 seconds)	
Humidity		100% RH	
Ambient temperature		-22°F to 122°F [-30°C to 50°C]	
Storage temperature		-40°F to 176°F [-40°C to 80°C]	
Housing type		UL Type 4X/NEMA 4X/IP66 & IP67	
Housing material		Polypropelene	
Agency Listings†		cULus according to UL 60730-1A/-2-14, C/	
		CSA E60730-1, CSA C22.2 No. 24-93, CE a	IC-
		cording to 89/336/EEC.	
Quality standard		ISO 9001	

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

*Cannot be used with the CCV-EXT-KIT



	Valve Nominal Size		Dimensions (Inches [mm])
Valve Body	Inches	DN [mm]	Α	В
B207-B211	1/2"	15	2.41" [61.1]	1.39" [35.2]
B212-B215	1/2"	15	2.38" [60.4]	1.78" [45.2]
B217-B221	3/4"	20	2.73" [69.3]	1.87" [47.4]
B222-B225	1"	25	3.09" [78.4]	1.87" [47.4]
B229-B230	1¼"	32	3.72" [94.6]	1.87" [47.4]



	Valve No	minal Size Dimensions (Inches [mm])			
Valve Body	Inches	DN [mm]	Α	В	С
B307-B311	1/2"	15	2.41" [61.1]	1.39" [35.2]	1.20" [30.6]
B312-B315	1/2"	15	2.38" [60.4]	1.78" [45.2]	1.29" [32.8]
B317-B321	3/4"	20	2.73" [69.3]	1.87" [47.4]	1.47" [37.3]
B322-B325	1"	25	3.09" [78.4]	1.87" [47.4]	1.59" [40.3]

NRX24-MFT-T N4 NEMA 4X Actuators, Multi-Function Technology



Wiring Diagrams



🖊 INSTALLATION NOTES



CAUTION Equipment damage!

Actuators may be connected in parallel.

Power consumption and input impedance must be observed.



Actuators may also be powered by 24 VDC.



Position feedback cannot be used with Triac sink controller. The actuator internal common reference is not compatible.



Control signal may be pulsed from either the Hot (source) or the Common (sink) 24 VAC line.



Contact closures A & B also can be triacs.



A& B should both be closed for triac source and open for triac sink.



For triac sink the common connection from the actuator must be connected to the hot connection.

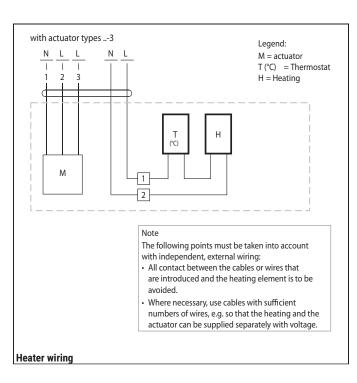


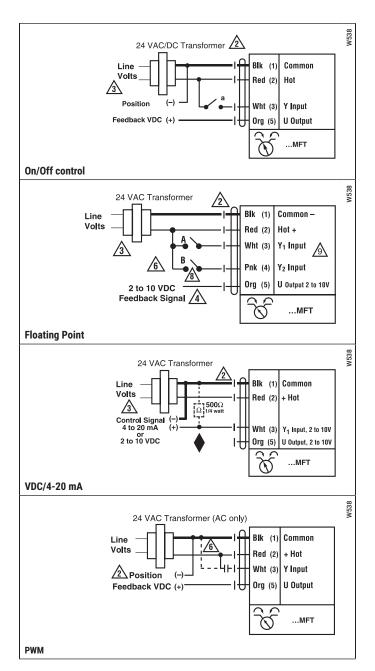
APPLICATION NOTES



The ZG-R01 500 Ω resistor converts the 4 to 20 mA control signal to 2 to 10 VDC, up to 2 actuators may be connected in parallel.

WARNING Live Electrical Components!







BELIMO



Models

ARB24-3

ARB24-3-S

w/built-in Aux. Switch

ARX24-3 Flexible

ARX24-3-S

Flexible w/built-in Aux. Switch

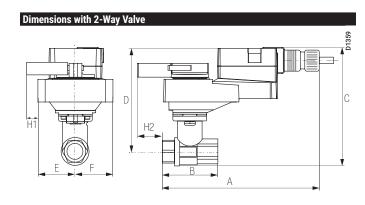
ARB24-3-5-14 ARX24-3-5-14

Technical Data	
Control	on/off, floating point
Power supply	24 VAC ± 20% 50/60 Hz
	24 VDC ± 10%
Power consumption running	2.5 W
holding	0.2 W
Transformer sizing	5.5 VA (class 2 power source)
Electrical connection	½" conduit connector
	18 GA plenum rated cable
ARB24-3	3 ft. [1m]
ARX24-3	3 ft. [1m] 10 ft. [3m] 16 ft. [5m]
Overload protection	electronic throughout 0° to 95° rotation
Input impedance	600 Ω
Angle of rotation	90°, adjustable with mechanical stop
Direction of rotation	reversible with protected
Position indication	handle
Manual override	external push button
Running time	
ARB24-3	90 seconds
ARX24-3	300, 150, 90 seconds,
	constant independent of load
Humidity	5 to 95% RH non-condensing (EN 60730-1)
Ambient temperature	-22°F to 122°F [-30°C to 50°C]
Storage temperature	-40°F to 176°F [-40°C to 80°C]
Housing	NEMA 2/IP54
Housing material	UL94-5VA
Agency listings†	cULus according to UL 60730-1A/-2-14, CAN/
	CSA E60730-1:02, CE according to 2004/108/
	EC and 2006/95/EC for line voltage and/or
	-S versions
Noise level	<45 dB(A)
Quality standard	ISO 9001

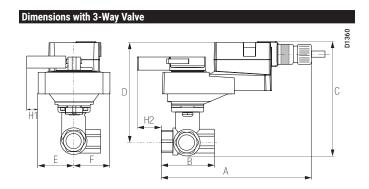
AR24-3-S	
	1 x SPDT, 3A (0.5A) @ 250 VAC, UL Listed, adjustable 0 to 90°

[†] Rated impulse voltage 800V, Control pollution degree 3, Type of action 1 (1.B for -S models)

AR...24-3 Actuators, On/Off, Floating Point



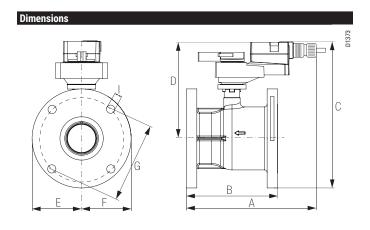
	Valve Nor	ninal Size	Dimensions (Inches [mm])
Valve Body	Inches	DN [mm]	Α	В
B231-B232	1¼"	32	3.72" [94.6]	1.98" [50.4]
B238-B240	1½"	40	3.88" [98.5]	1.98" [50.4]
B248-B250	2"	50	4.21" [107.0]	2.21" [56.2]
B251-B254	2"	50	4.93" [125.2]	2.68" [68.0]
B261-B265	2½"	65	5.55" [140.9]	2.68" [68.0]
B277-B280	3"	80	5.82" [147.9]	2.68" [68.0]



	vaive Nominai Size		Dimensions (inches [mm])		
Valve Body	Inches	DN [mm]	Α	В	С
B329-B331	1¼"	32	3.96" [100.6]	2.21" [56.2]	2.14" [54.3]
B338-B341	1½"	40	4.39" [111.6]	2.45" [62.2]	2.33" [59.1]
B347-B352	2"	50	4.90" [124.5]	2.68" [68.0]	2.60" [66.0]

AR...24-3 Actuators, On/Off, Floating Point





Valve Body	Nominal Pipe Size	Top Flange Design	Flange Diameter	Face-to-Face Length	Height
			Α	В	С
B6250	2½" [65]		7.50" [190.5]	5.50" [139.7]	8.10" [205.4]
B6300	3" [80]	F05	8.00" [203.2]	6.60" [167.6]	8.40" [213.1]
B6400	4" [100]		9.00" [228.6]	8.30" [210.8]	9.30" [235.9]

Wiring Diagrams

X INSTALLATION NOTES



CAUTION Equipment damage!

Actuators may be connected in parallel.

Power consumption and input impedance must be observed.

For end position indication, interlock control, etc.,

ARB24-3-S incorporates one built-in auxiliary switches: 1 x SPDT, 3A (0.5A) @250 VAC, UL listed, adjustable 0° to 95°.

Actuators may also be powered by 24 VDC.

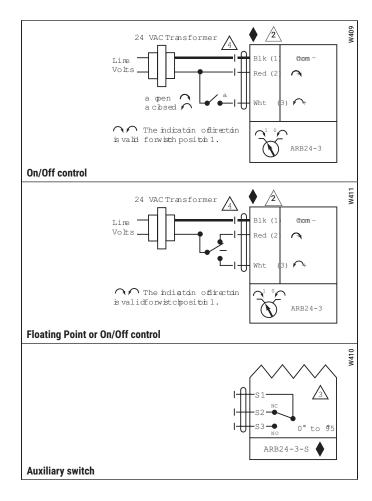


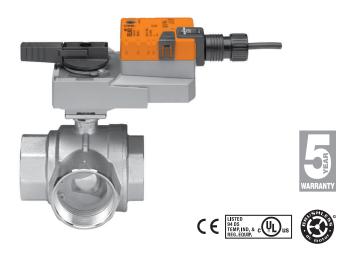
APPLICATION NOTES



Meets cULus or UL and CSA requirements without the need of an electrical ground connection.

WARNING Live Electrical Components!



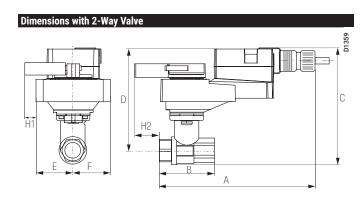


Models ARB24-SR

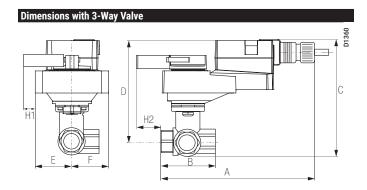
ARX24-SR Flexible Version

Technical Date		
Technical Data		24 VAC ± 20% 50/60 Hz
Power supply		24 VAC ± 20% 50/60 HZ 24 VDC ± 10%
Danier annumention mu	:	
		2.5 W
	olaing	0.4 W
Transformer sizing		5 VA (class 2 power source)
Electrical connection		½" conduit connector
		18 GA plenum rated cable
0 1 1 1 1		3 ft [1m], 10 ft [3m], 16 ft [5m]
Overload protection		electronic throughout 0° to 95° rotation
Operating range Y		2 to 10 VDC, 4 to 20 mA
Feedback output U		1 to 10 VDC, max 0.5 mA
Input impedance		100 kΩ <u>(</u> 0.1 mA), 500 Ω
Angle of rotation		90°, adjustable with mechanical stop
Torque		180 in-lb [20 Nm]
Direction of rotation		reversible with protected
Position indication		handle
Manual override		external push button
Running time		
ARB24-SR		90 seconds
ARX24-SR		300, 150, 90 seconds,
		constant independent of load
Humidity		5 to 95% RH non-condensing
		(EN 60730-1)
Ambient temperature		-22°F to +122°F [-30°C to +50°C]
Storage temperature		-40°F to +176°F [-40°C to +80°C]
Housing		NEMA 2/IP54
Housing material		UL94-5VA
Agency listings†		cULus according to UL 60730-1A/-2-14, CAN/
		CSA E60730-1:02, CE according to 2004/108/
		EC and 2006/95/EC for line voltage and/or
		-S versions
Noise level		<45 dB(A)
Quality standard		ISO 9001

[†] Rated impulse voltage 800V, Control pollution degree 3, Type of action 1 (1.B for -S models)



	Valve Nominal Size		Dimensions (Inches [mm])
Valve Body	Inches	DN [mm]	Α	В
B231-B232	1¼"	32	3.72" [94.6]	2.04" [51.9]
B238-B240	1½"	40	3.88" [98.5]	2.04" [51.9]
B248-B250	2"	50	4.21" [107.0]	2.27" [57.7]



	Valve Nominal Size		Size Dimensions (Inches [mm])		
Valve Body	Inches	DN [mm]	Α	В	C
B329-B331	1¼"	32	3.96" [100.6]	2.27" [57.7]	2.14" [54.3]
B338-B341	1½"	40	4.39" [111.6]	2.51" [63.7]	2.40" [61.1]
B347-B352	2"	50	4.90" [124.5]	2.73" [69.5]	2.74" [69.7]

AR...24-SR Actuators, Proportional



Wiring Diagrams



💢 INSTALLATION NOTES



CAUTION Equipment damage!

Actuators may be connected in parallel.

Power consumption and input impedance must be observed.



Actuators may also be powered by 24 VDC.



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

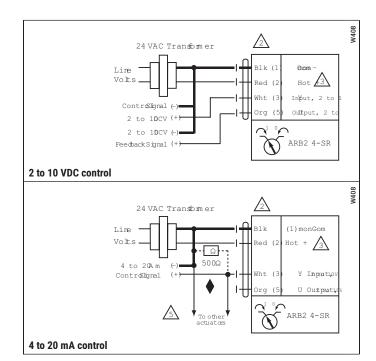


APPLICATION NOTES



The ZG-R01 500 Ω resistor converts the 4 to 20 mA control signal to 2 to 10 VDC, up to 2 actuators may be connected in parallel.

WARNING Live Electrical Components!





LISTED 94 D5 TEMP.IND. & c UL) us

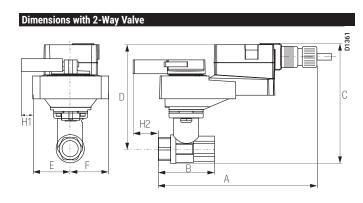
Models ARB120-3

ARX120-3 Flexible Version

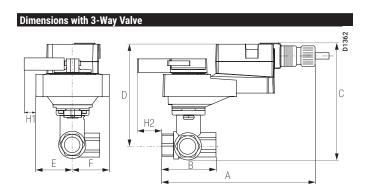
Technical Data	
Control	on/off, floating point
Power supply	100 to 240 VAC, 50/60 Hz (nominal)
	85 to 265 VAC, 50/60 Hz (tolerance)
Power consumption running	3 W
holding	0.6 W
Transformer sizing	7 VA (class 2 power source)
Electrical connection	½" conduit connector
	18 GA appliance rated cable
ARB120-3	3 ft [1m]
ARX120-3	3 ft [1m], 10 ft [3m], 16 ft [5m]
Overload protection	electronic throughout 0° to 95° rotation
Input impedance	600 Ω
Angle of rotation	90°, adjustable with mechanical stop
Direction of rotation	reversible with protected \bigcirc/\bigcirc switch
Position indication	handle
Manual override	external push button
Running time	
ARB120-3	90 seconds
ARX120-3	300, 150, 90 seconds,
	constant independent of load
Humidity	5 to 95% RH non-condensing
	(EN 60730-1)
Ambient temperature	-22°F to 122°F [-30°C to 50°C]
Storage temperature	-40°F to 176°F [-40°C to 80°C]
Housing	NEMA 2/IP54
Housing material	UL94-5VA
Agency listings†	cULus according to UL 60730-1A/-2-14, CAN/
rigency nothinger	CSA E60730-1:02, CE according to 2004/108/
	EC and 2006/95/EC for line voltage and/or
	-S versions
Noise level	<45 dB(A)
Servicing	maintenance free
Quality standard	ISO 9001
+ Pated impulse voltage 4kV Control	1.00

[†] Rated impulse voltage 4kV, Control pollution degree 3, Type of action 1

AR...120-3 Actuators, On/Off, Floating Point



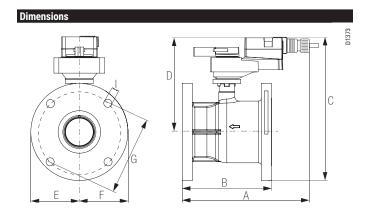
	Valve Nominal Size		Dimensions (Inches [mm])
Valve Body	Inches	DN [mm]	Α	В
B231-B232	1¼"	32	3.72" [94.6]	2.04" [51.9]
B238-B240	1½"	40	3.88" [98.5]	2.04" [51.9]
B248-B250	2"	50	4.21" [107.0]	2.27" [57.7]
B251-B254	2"	50	4.93" [125.2]	2.73" [69.5]
B261-B265	2½"	65	5.55" [140.9]	2.73" [69.5]
B277-B280	3"	80	5.82" [147.9]	2.73" [69.5]



Valve Nominal Size		Dimensions (Inches [mm])			
Valve Body	Inches	DN [mm]	Α	В	С
B329-B331	1¼"	32	3.96" [100.6]	2.27" [57.7]	2.14" [54.3]
B338-B341	1½"	40	4.39" [111.6]	2.51" [63.7]	2.40" [61.1]
B347-B352	2"	50	4.90" [124.5]	2.73" [69.5]	2.74" [69.7]

AR...120-3 Actuators, On/Off, Floating Point





Valve Body	Nominal Pipe Size	Top Flange Design	Flange Diameter	Face-to-Face Length	Height
			Α	В	С
B6250	2½" [65]		7.50" [190.5]	5.50" [139.7]	8.10" [205.4]
B6300	3" [80]	F05	8.00" [203.2]	6.60" [167.6]	8.40" [213.1]
B6400	4" [100]		9.00" [228.6]	8.30" [210.8]	9.30" [235.9]

Wiring Diagrams

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INSTALLATION NOTES



Provide overload protection and disconnect as required.



CAUTION Equipment damage! Actuators may be connected in parallel.

Power consumption and input impedance must be observed.

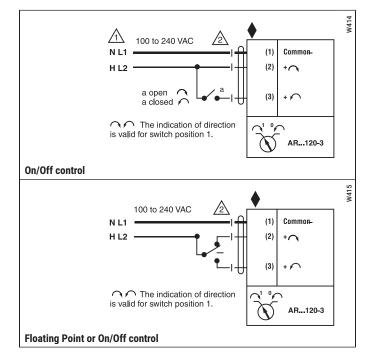


APPLICATION NOTES



Meets cULus or UL and CSA requirements without the need of an electrical ground connection.

WARNING Live Electrical Components!





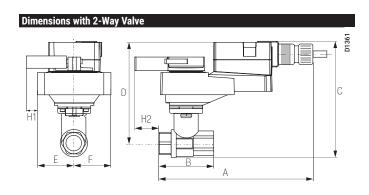


Models ARB120-SR

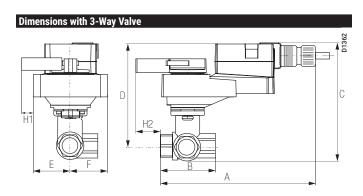
ARX120-SR Flexible Version

Control		on/off, floating point
Power supply		100 to 240 VAC, 50/60 Hz (nominal)
1 ower suppry		85 to 265 VAC, 50/60 Hz (tolerance)
Power consumption	running	3 W
•	holding	
Transformer sizing	norunig	7.5 VA (class 2 power source)
Electrical connection		½" conduit connector
Licotrical conficction		18 GA plenum rated cable
ARB120-SR		3 ft [1m]
ARX120-SR		3 ft [1m], 10 ft [3m], 16 ft [5m]
Overload protection		electronic throughout 0° to 95° rotation
Feedback output U		1 to 10 VDC, max 0.5 mA
Input impedance		600 Ω
Angle of rotation		90°, adjustable with mechanical stop
Direction of rotation		reversible with protected \bigcirc / \bigcirc switch
Position indication		handle
Manual override		external push button
Running time		external paon batton
ARB120-SR		90 seconds
ARX120-SR		300, 150, 90 seconds,
		constant independent of load
Humidity		5 to 95% RH non-condensing
,		(EN 60730-1)
Ambient temperature		-22°F to 122°F [-30°C to 50°C]
Storage temperature		-40°F to 176°F [-40°C to 80°C]
Housing		NEMA 2/IP54
Housing material		UL94-5VA
Agency listings†		cULus according to UL 60730-1A/-2-14, CAN/
3 , 3		CSA E60730-1:02, CE according to 2004/108/
		EC and 2006/95/EC for line voltage and/or
		-S versions
Noise level		<45 dB(A)
Servicing		maintenance free

[†] Rated impulse voltage 4kV, Control pollution degree 3, Type of action 1



	Valve Nominal Size		Dimensions (Inches [mm])
Valve Body	Inches	DN [mm]	Α	В
B231-B232	1¼"	32	3.72" [94.6]	2.04" [51.9]
B238-B240	1½"	40	3.88" [98.5]	2.04" [51.9]
B248-B250	2"	50	4.21" [107.0]	2.27" [57.7]
				•



	Valve Nominal Size		Dimensions (Inches [mm])		
Valve Body	Inches	DN [mm]	Α	В	С
B329-B331	1¼"	32	3.96" [100.6]	2.27" [57.7]	2.14" [54.3]
B338-B341	1½"	40	4.39" [111.6]	2.51" [63.7]	2.40" [61.1]
B347-B352	2"	50	4.90" [124.5]	2.73" [69.5]	2.74" [69.7]

AR...120-SR Actuators



Wiring Diagrams



🖊 INSTALLATION NOTES



CAUTION Equipment damage!

Actuators may be connected in parallel.

Power consumption and input impedance must be observed.



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



A 500 Ω resistor converts the 4 to 20 mA control signal to 2 to 10 VDC.



ARB(X) can be supplied with both 120 VAC and 230 VAC.



All 120 VAC and 230 VAC actuators use appliance rated cables.



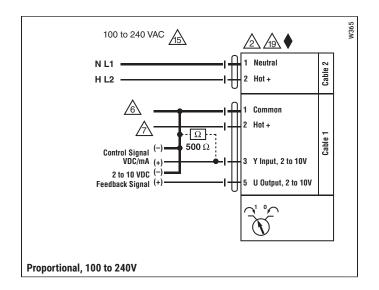
APPLICATION NOTES



Meets cULus or UL and CSA requirements without the need of an electrical ground connection.

WARNING Liv

WARNING Live Electrical Components!





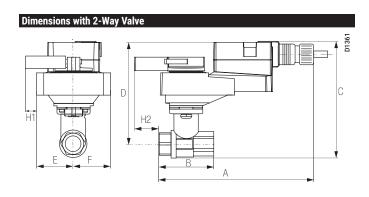
AR...24-MFT Actuators, Multi-Function Technology



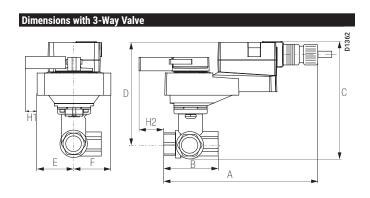
Models ARX24-MFT ARX24-MFT-5-14

Technical Data		24 VAC ± 20% 50/60 Hz
Power supply		24 VAC ± 20% 50/60 HZ
Danier againmentian		
Power consumption	running holding	
Transformer sizing	Holuling	
Electrical connection		6 VA (class 2 power source) ½" conduit connector
Electrical connection		18 GA plenum rated cable
ARX24-MFT		3 ft. [1m], 10 ft. [3m], 16 ft. [5m]
Overload protection		electronic throughout 0° to 95° rotation
Operating range Y		2 to 10 VDC, 4 to 20 mA (default)
Operating range 1		variable (VDC, PWM, floating point, on/off)
Feedback output U		2 to 10 VDC, 0.5 mA max
. ccasaon output o		VDC variable
Input impedance		100 kΩ (0.1 mA), 500 Ω
mpat impedance		1500 Ω (PWM, floating point, on/off)
Angle of rotation		95° electronically variable
Direction of rotation		reversible with protected switch
Position indication		handle
Manual override		external push button
Running time		
ARB24-MFT		150 seconds
ARX24-MFT		variable (90 to 350 seconds)
Humidity		5 to 95% RH non-condensing
		(EN 60730-1)
Ambient temperature		-22°F to 122°F [-30°C to 50°C]
Storage temperature		-40°F to 176°F [-40°C to 80°C]
Housing		NEMA 2/IP54
Housing material		UL94-5VA
Agency listings†		cULus according to UL 60730-1A/-2-14,
		CAN/CSA E60730-1:02, CE according to
		2004/108/EC and 2006/95/EC for line
		voltage and/or -S versions
Noise level		<45 dB(A)
Quality standard		ISO 9001

[†] Rated impulse voltage 4kV, Control pollution degree 3, Type of action 1



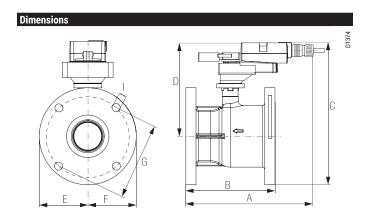
	Valve Nominal Size		Dimensions (Inches [mm])
Valve Body	Inches	DN [mm]	Α	В
B231-B232	1¼"	32	3.72" [94.6]	1.98" [50.4]
B238-B240	1½"	40	3.88" [98.5]	1.98" [50.4]
B248-B250	2"	50	4.21" [107.0]	2.21" [56.2]
B251-B254	2"	50	4.93" [125.2]	2.68" [68.0]
B261-B265	2½"	65	5.55" [140.9]	2.68" [68.0]
B277-B280	3"	80	5.82" [147.9]	2.68" [68.0]



Valve Nominal Size		Dimensions (Inches [mm])		
Inches	DN [mm]	Α	В	С
1¼"	32	3.96" [100.6]	2.21" [56.2]	2.14" [54.3]
1½"	40	4.39" [111.6]	2.45" [62.2]	2.33" [59.1]
2"	50	4.90" [124.5]	2.68" [68.0]	2.60" [66.0]
	1¼" 1½"	Inches DN [mm] 1¼" 32 1½" 40	Inches DN [mm] A 1¼" 32 3.96" [100.6] 1½" 40 4.39" [111.6]	Inches DN [mm] A B 1¼" 32 3.96" [100.6] 2.21" [56.2] 1½" 40 4.39" [111.6] 2.45" [62.2]

AR...24-MFT Actuators, Multi-Function Technology





Valve Body	Nominal Pipe Size	Top Flange Design	Flange Diameter	Face-to-Face Length	Height
			Α	В	С
B6250	2½" [65]		7.50" [190.5]	5.50" [139.7]	8.10" [205.4]
B6300	3" [80]	F05	8.00" [203.2]	6.60" [167.6]	8.40" [213.1]
B6400	4" [100]		9.00" [228.6]	8.30" [210.8]	9.30" [235.9]

Wiring Diagrams

> INSTALLATION NOTES



CAUTION Equipment damage!

Actuators may be connected in parallel.

Power consumption and input impedance must be observed.



Actuators may also be powered by 24 VDC.



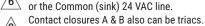
Position feedback cannot be used with Triac sink controller.

The actuator internal common reference is not compatible.

The actuator internal common reference is not compatible.



Control signal may be pulsed from either the Hot (source)





A& B should both be closed for triac source and open for triac sink.

For triac sink the common connection from the actuator must be connected to the hot connection.

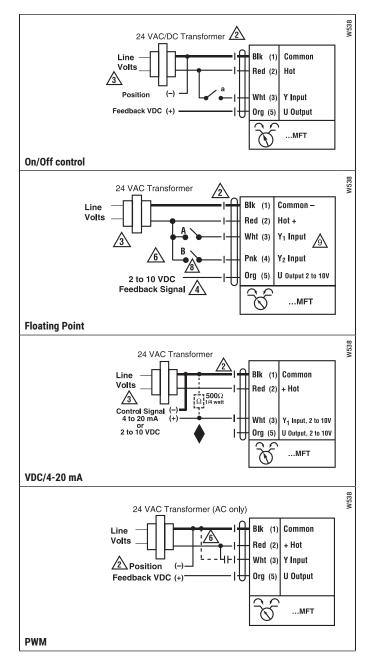


APPLICATION NOTES



The ZG-R01 500 Ω resistor converts the 4 to 20 mA control signal to 2 to 10 VDC, up to 2 actuators may be connected in parallel.

WARNING Live Electrical Components!

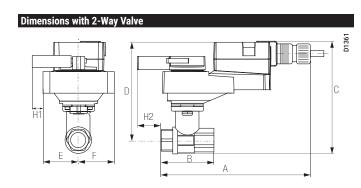




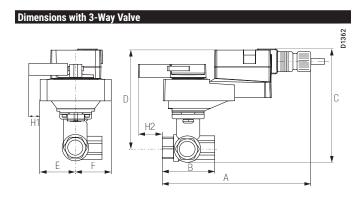
Models ARX24-PC

Technical Data	
Power supply	24 VAC ± 20% 50/60 Hz
	24 VDC ± 10%
Power consumption running	
	1.25 W
Transformer sizing	5.5 VA (Class 2 power source)
Electrical connection	½" conduit connector
	18 GA plenum rated cable
	3 ft. [1m], 10 ft. [3m], 16 ft. [5m]
Overload protection	electronic throughout 0 to 95° rotation
Operating range Y	0 to 20V phasecut
Feedback output U	2 to 10 VDC, 0.5mA max
	VDC variable
Input impedance	8 kΩ (50 mW)
Angle of rotation	90°, adjustable with mechanical stop
	electronically variable
Direction of rotation	reversible with
Position indication	handle
Manual override	external push button
Running time	150 seconds (default)
Humidity	5 to 95% RH non-condensing
	(EN 60730-1)
Ambient temperature	-22°F to 122°F [-30°C to 50°C]
Storage temperature	-40°F to 176°F [-40°C to 80°C]
Housing	NEMA 2/IP54
Housing material	UL94-5VA
Agency listings†	cULus according to UL 60730-1A/-2-14, CAN/
	CSA E60730-1:02, CE according to 2004/108/
	EC and 2006/95/EC for line voltage and/or
	-S versions
Noise level	<45 dB(A)
Quality standard	ISO 9001

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



	Valve Nominal Size		Dimensions (Inches [mm]	
Valve Body	Inches	DN [mm]	Α	В
B231-B232	1¼"	32	3.72" [94.6]	2.04" [51.9]
B238-B240	1½"	40	3.88" [98.5]	2.04" [51.9]
B248-B250	2"	50	4.21" [107.0]	2.27" [57.7]
B251-B254	2"	50	4.93" [125.2]	2.73" [69.5]
B261-B265	2½"	65	5.55" [140.9]	2.73" [69.5]
B277-B280	3"	80	5.82" [147.9]	2.73" [69.5]



Valve Nominal Size		Dimensions (Inches [mm])			
Valve Body	Inches	DN [mm]	Α	В	С
B329-B331	1¼"	32	3.96" [100.6]	2.27" [57.7]	2.14" [54.3]
B338-B341	1½"	40	4.39" [111.6]	2.51" [63.7]	2.40" [61.1]
B347-B352	2"	50	4.90" [124.5]	2.73" [69.5]	2.74" [69.7]

ARX24-PC Actuators, Phasecut



Wiring Diagrams



💢 INSTALLATION NOTES



Provide overload protection and disconnect as required.



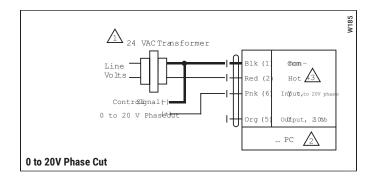
CAUTION Equipment damage!

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



Actuators may also be powered by 24 VDC.

WARNING Live Electrical Components!



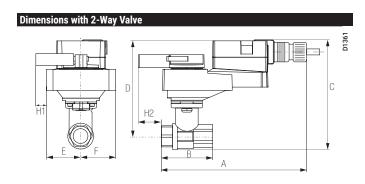




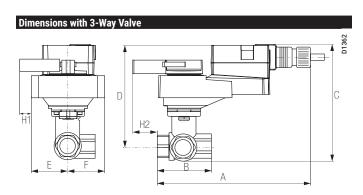
Models ARX24-MFT95

Technical Data	
Power supply	24 VAC + 20% 50/60 Hz
. over supply	24 VDC ± 10%
Power consumption running	
	1.25 W
Transformer sizing	6 VA (Class 2 power source)
Electrical connection	½" conduit connector
	18 GA plenum rated cable
	3 ft [1m], 10 ft [3m], 16 ft [5m]
Overload protection	electronic throughout 0 to 95° rotation
Operating range WRB	0 to 135 Ω Honeywell Electronic
	Series 90, 0 to 135 Ω input
Feedback output U	2 to 10 VDC, 0.5mA max
Input impedance	100 kΩ (0.1 mW)
Angle of rotation	90°, adjustable with mechanical stop
	electronically variable
Direction of rotation	reversible with
Position indication	handle
Manual override	external push button
Running time	150 seconds (default)
	variable (90 to 350 seconds)
Humidity	5 to 95% RH non-condensing
	(EN 60730-1)
Ambient temperature	-22°F to 122°F [-30°C to 50°C]
Storage temperature	-40°F to 176°F [-40°C to 80°C]
Housing	NEMA 2/IP54
Housing material	UL94-5VA
Agency listings†	cULus according to UL 60730-1A/-2-14, CAN/
	CSA E60730-1:02, CE according to 2004/108/
	EC and 2006/95/EC for line voltage and/or
	-S versions
Noise level	<45 dB(A)
Quality standard	ISO 9001

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



	Valve Nominal Size		Dimensions (Inches [mm])
Valve Body	Inches	DN [mm]	Α	В
B231-B232	1¼"	32	3.72" [94.6]	2.04" [51.9]
B238-B240	1½"	40	3.88" [98.5]	2.04" [51.9]
B248-B250	2"	50	4.21" [107.0]	2.27" [57.7]
B251-B254	2"	50	4.93" [125.2]	2.73" [69.5]
B261-B265	2½"	65	5.55" [140.9]	2.73" [69.5]
B277-B280	3"	80	5.82" [147.9]	2.73" [69.5]



Valve Nominal Size		Dimensions (Inches [mm])			
Valve Body	Inches	DN [mm]	Α	В	С
B329-B331	1¼"	32	3.96" [100.6]	2.27" [57.7]	2.14" [54.3]
B338-B341	1½"	40	4.39" [111.6]	2.51" [63.7]	2.40" [61.1]
B347-B352	2"	50	4.90" [124.5]	2.73" [69.5]	2.74" [69.7]

Wiring Diagrams



INSTALLATION NOTES



Provide overload protection and disconnect as required.



CAUTION Equipment damage!

Actuators and controller must have separate transformers.



Consult controller instruction data for more detailed installation information.



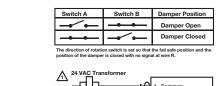
Resistor value depends on the type of controller and the number of actuators. No resistor is used for one actuator. Honeywell resistor kits may also be used.

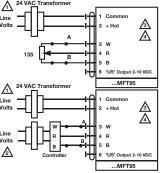


To reverse control rotation, use the reversing switch.

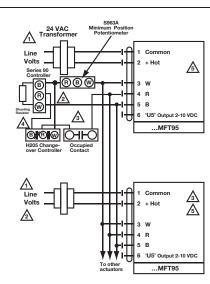
WARNING Live Electrical Components!

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.

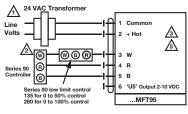




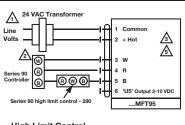
Override



Wiring multiple actuators to a Series 90 controller using a minimum position potentiometer.



Low Limit Control



High Limit Control





ARB24-3-T N4, ARX24-3-T N4 NEMA 4X Actuators, On/Off, Floating Point









Models

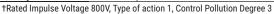
ARB24-3-T N4 ARB24-3-T N4H

w/built in heater

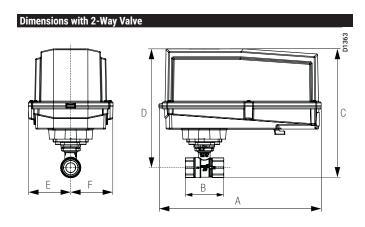
ARX24-3-T N4 ARX24-3-T N4H

w/built in heater

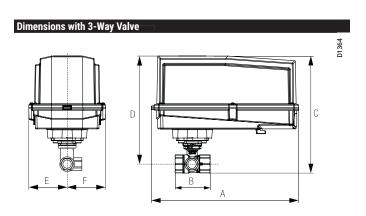
Taskais al Data		
Technical Data Control		on/off, floating point
		. 51
Power supply		24 VAC ± 20% 50/60 Hz
		24 VDC ± 10%
Power consumption	3	2.5 W / heater 23 W
	holding	0.5 W
Transformer sizing		5.5 VA (class 2 power source) / heater 20.5 VA
Electrical connection		screw terminal (for 26 to 14 GA wire)
Overload protection		electronic throughout 0° to 95° rotation
Input impedance		600 Ω
Angle of rotation		90°, adjustable with mechanical stop
Direction of rotation		reversible with $\bigcirc/\!$
Position indication		visual pointer
Manual override		external push button
Running time		90 seconds constant independent of load
Humidity		100% RH
Ambient temperature		-22°F to 122°F [-30°C to 50°C]
Storage temperature		-40°F to 176°F [-40°C to 80°C]
Housing type		UL Type 4X/NEMA 4X/IP66 & IP67
Housing material		Polypropelene
Agency listings†		cULus according to UL 60730-1A/-2-14, CAN/
		CSA E60730-1, CSA C22.2 No. 24-93, CE ac-
		cording to 89/336/EEC.
Quality standard		ISO 9001
+Datad Impulse Valtage 00	101/ Tuna a	faction 1 Control Dellution Doggoo 2



*Cannot be used with the CCV-EXT-KIT



	Valve Nominal Size		Dimensions (Inches [mm])
Valve Body	Inches	DN [mm]	Α	В
B231-B232	1¼"	32	3.72" [94.6]	2.04" [51.9]
B238-B240	1½"	40	3.88" [98.5]	2.04" [51.9]
B248-B250	2"	50	4.21" [107.0]	2.27" [57.7]
B251-B254	2"	50	4.93" [125.2]	2.73" [69.5]
B261-B265	2½"	65	5.55" [140.9]	2.73" [69.5]
B277-B280	3"	80	5.82" [147.9]	2.73" [69.5]



Valve Nominal Size		Dimensions (Inches [mm])			
Valve Body	Inches	DN [mm]	Α	В	С
B329-B331	1¼"	32	3.96" [100.6]	2.27" [57.7]	2.14" [54.3]
B338-B341	1½"	40	4.39" [111.6]	2.51" [63.7]	2.40" [61.1]
B347-B352	2"	50	4.90" [124.5]	2.73" [69.5]	2.74" [69.7]

ARB24-3-T N4, ARX24-3-T N4 NEMA 4X Actuators, On/Off, Floating Point



Wiring Diagrams



🖊 INSTALLATION NOTES

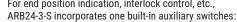


CAUTION Equipment damage!

Actuators may be connected in parallel.

Power consumption and input impedance must be observed.

For end position indication, interlock control, etc.,





1 x SPDT, 3A (0.5A) @250 VAC, UL listed, adjustable 0° to 95°. Actuators may also be powered by 24 VDC.

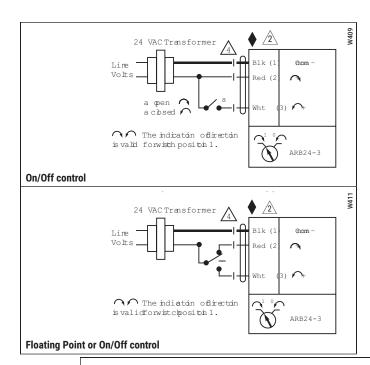


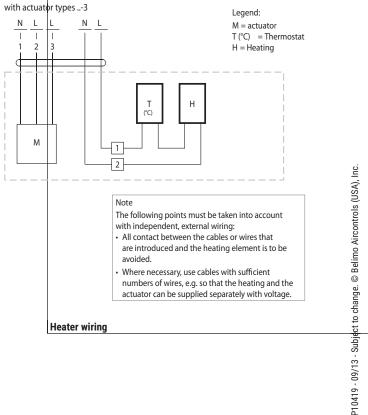
APPLICATION NOTES

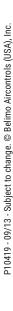


Meets cULus or UL and CSA requirements without the need of an electrical ground connection.

WARNING Live Electrical Components!









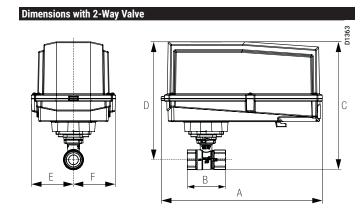
ARB24-SR-T N4, ARX24-SR-T N4 NEMA 4X Actuators, Proportional











	Valve Nominal Size		Dimensions (Inches [mm])
Valve Body	Inches	DN [mm]	Α	В
B231-B232	1¼"	32	3.72" [94.6]	2.04" [51.9]
B238-B240	1½"	40	3.88" [98.5]	2.04" [51.9]
B248-B250	2"	50	4.21" [107.0]	2.27" [57.7]
B251-B254	2"	50	4.93" [125.2]	2.73" [69.5]
B261-B265	2½"	65	5.55" [140.9]	2.73" [69.5]
B277-B280	3"	80	5.82" [147.9]	2.73" [69.5]

Models

ARB24-SR-T N4 ARB24-SR-T N4H ARX24-SR-T N4

w/built in heater

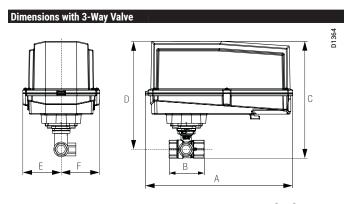
ARX24-SR-T N4 ARX24-SR-T N4H

N4H w/built in heater

- 1 ' 15 '		
Technical Data		04.440 + 000 50 (0.11
Power supply		24 VAC ± 20% 50/60 Hz
		24 VDC ± 10%
Power consumption	running	2.5 W / heater 23 W
	holding	0.4 W
Transformer sizing		5 VA (class 2 power source) / heater 20 VA
Electrical connection		screw terminal (for 26 tp 14 GA wire)
Overload protection		electronic throughout 0° to 95° rotation
Operating range Y		2 to 10 VDC, 4 to 20 mA
Input impedance		600 Ω
Angle of rotation		90°, adjustable with mechanical stop
Direction of rotation		reversible with \bigcirc/\bigcirc switch
Position indication		visual pointer
Manual override		external push button
Running time		90 seconds constant independent of load
Humidity		100% RH
Ambient temperature		-22°F to 122°F [-30°C to 50°C]
Storage temperature		-40°F to 176°F [-40°C to 80°C]
Housing type		UL Type 4X/NEMA 4X/IP66 & IP67
Housing material		Polypropelene
Agency listings†		cULus according to UL 60730-1A/-2-14, CAN/
		CSA E60730-1, CSA C22.2 No. 24-93, CE ac-
		cording to 89/336/EEC.
Quality standard		ISO 9001
+Dated Impulse Voltage 9	OOV Type o	faction 1 Control Pollution Dograp 2

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

*Cannot be used with the CCV-EXT-KIT



Valve Nominal Size		Dimensions (Inches [mm])			
Valve Body	Inches	DN [mm]	Α	В	С
B329-B331	1¼"	32	3.96" [100.6]	2.27" [57.7]	2.14" [54.3]
B338-B341	1½"	40	4.39" [111.6]	2.51" [63.7]	2.40" [61.1]
B347-B352	2"	50	4.90" [124.5]	2.73" [69.5]	2.74" [69.7]
		<u> </u>	•		

ARB24-SR-T N4, ARX24-SR-T N4 NEMA 4X Actuators, Proportional



Wiring Diagrams



🖊 INSTALLATION NOTES



CAUTION Equipment damage!

Actuators may be connected in parallel.

Power consumption and input impedance must be observed.



Actuators may also be powered by 24 VDC.



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

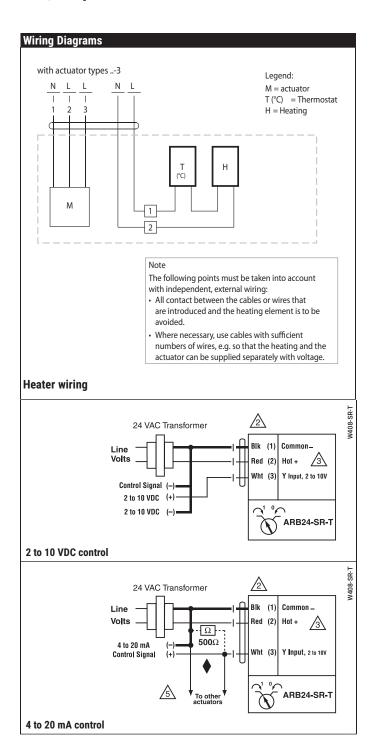


APPLICATION NOTES



The ZG-R01 500 Ω resistor converts the 4 to 20 mA control signal to 2 to 10 VDC, up to 2 actuators may be connected in parallel.

WARNING Live Electrical Components!







ARX24-MFT-T N4 NEMA 4X Actuators, Multi-Function Technology









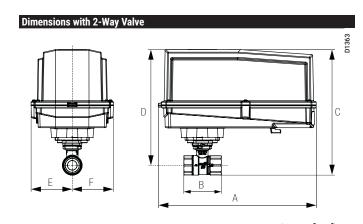
Models

ARX24-MFT-T N4 ARX24-MFT-T N4H

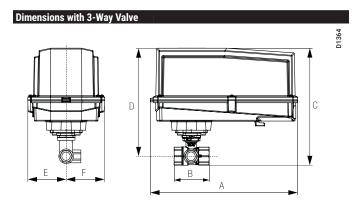
w/built in heater

Technical Data	
Control	2 to 10 VDC, 4 to 20 mA (default)
	variable (VDC, PWM, floating point, on/off)
Power supply	24 VAC ± 20% 50/60 Hz
	24 VDC ± 10%
Power consumption running	3.5 W / heater 24 W
holding	1.25 W
Transformer sizing	6 VA (class 2 power source) / heater 21 VA
Electrical connection	screw terminal (for 26 tp 14 GA wire)
Overload protection	electronic throughout 0° to 95° rotation
Input impedance	100 kΩ for 2 to 10 VDC (0.1 mA)
	500 Ω for 4 to 20 mA
	1500 Ω for PWM, floating point and
	on/off control
Angle of rotation	95°, adjustable with mechanical stop
	electronically variable
Direction of rotation	reversible with $\bigcirc/\!$
Position indication	visual pointer
Manual override	external push button
Running time	150 seconds (default)
	constant independent of load
	variable (75 to 350 seconds)
Humidity	100% RH
Ambient temperature	-22°F to 122°F [-30°C to 50°C]
Storage temperature	-40°F to 176°F [-40°C to 80°C]
Housing type	UL Type 4X/NEMA 4X/IP66 & IP67
Housing material	Polypropelene
Agency listings†	cULus according to UL 60730-1A/-2-14, CAN/
	CSA E60730-1, CSA C22.2 No. 24-93, CE ac-
	cording to 89/336/EEC.
Quality standard	ISO 9001

† Rated impulse voltage 4kV, Control pollution degree 3, Type of action 1 *Cannot be used with the CCV-EXT-KIT



	Valve Nominal Size		Dimensions (Inches [mm])
Valve Body	Inches	DN [mm]	Α	В
B231-B232	1¼"	32	3.72" [94.6]	2.04" [51.9]
B238-B240	1½"	40	3.88" [98.5]	2.04" [51.9]
B248-B250	2"	50	4.21" [107.0]	2.27" [57.7]
B251-B254	2"	50	4.93" [125.2]	2.73" [69.5]
B261-B265	2½"	65	5.55" [140.9]	2.73" [69.5]
B277-B280	3"	80	5.82" [147.9]	2.73" [69.5]



Valve Nominal Size			Dimensions (Inches [mm])		
Valve Body	Inches	DN [mm]	Α	В	С
B329-B331	1¼"	32	3.96" [100.6]	2.27" [57.7]	2.14" [54.3]
B338-B341	1½"	40	4.39" [111.6]	2.51" [63.7]	2.40" [61.1]
B347-B352	2"	50	4.90" [124.5]	2.73" [69.5]	2.74" [69.7]

ARX24-MFT-T N4 NEMA 4X Actuators, Multi-Function Technology



Wiring Diagrams



🖊 INSTALLATION NOTES



CAUTION Equipment damage!

Actuators may be connected in parallel.

Power consumption and input impedance must be observed.



Actuators may also be powered by 24 VDC.



Position feedback cannot be used with Triac sink controller. The actuator internal common reference is not compatible.



Control signal may be pulsed from either the Hot (source) or the Common (sink) 24 VAC line.



Contact closures A & B also can be triacs.



A& B should both be closed for triac source and open for triac sink.



For triac sink the common connection from the actuator must be connected to the hot connection.

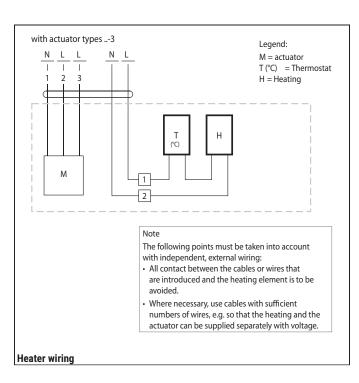


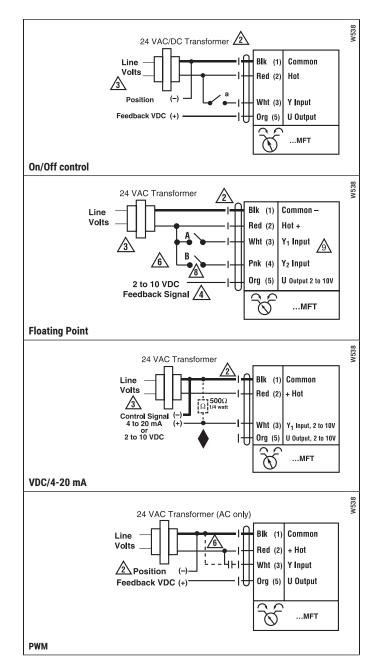
APPLICATION NOTES



The ZG-R01 500 Ω resistor converts the 4 to 20 mA control signal to 2 to 10 VDC, up to 2 actuators may be connected in parallel.

WARNING Live Electrical Components!





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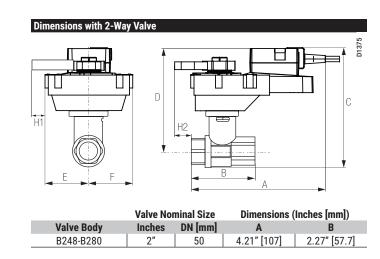
Models

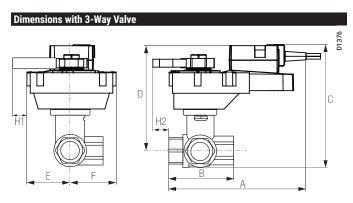
ARQX24-1 Flexible Version

Technical Data		
Control	on/off	
Power supply	24 VAC ± 20% 50/60 Hz	
	24 VDC ± 10%	
Power consumption running	15 W	
holding	1.5 W	
Transformer sizing	26 VA (Class 2 power source)	
Electrical connection	½" conduit connector,	
	18 GA plenum rated cable	
	3 ft [1m], 10 ft [3m], 16 ft [5m]	
Overload protection	electronic throughout 0 to 95° rotation	
Input impedance	100 Ω	
Angle of rotation	max 95°, adjustable with mechanical stop	
Direction of rotation	reversible with $\bigcirc/\!$	
Position indication	reflective visual indicator (snap-on)	
Manual override	external push button	
Running time	constant of independent load	
	10 or 15 seconds	
Humidity	5 to 95% RH non-condensing	
	(EN 60730-1)	
Ambient temperature	-22°F to 122°F [-30°C to 50°C]	
Storage temperature	-40°F to 176°F [-40°C to 80°C]	
Housing	NEMA 2/IP54	
Housing material	UL94-5VA	
Agency listings†	cULus according to UL 60730-1A/-2-14, CAN/	
	CSA E60730-1:02, CE according to 2004/108/	
	EC and 2006/95/EC for line voltage and/or	
	-S versions	
Noise level	<52 dB(A)	
Quality standard	ISO 9001	

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

ARQX24-1 Quick Running Actuators, On/Off





	Valve Nominal Size		Dimensions (Inches [mm])		
Valve Body	Inches	DN [mm]	Α	В	С
B330-B332	1¼"	32	3.96" [100.6]	2.27" [57.7]	2.14" [54.3]
B338-B340	1½"	40	4.39" [111.6]	2.51" [63.7]	2.90" [61.1]
B348-B352	2"	50	4.95" [124.5]	2.73" [69.5]	2.74" [69.7]
					-

ARQX24-1 Quick Running Actuators, On/Off



Wiring Diagrams



INSTALLATION NOTES



Provide overload protection and disconnect as required.



Actuators may also be powered by 24 VDC.

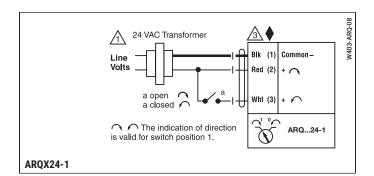


APPLICATION NOTES



Meets cULus or UL and CSA requirements without the need of an electrical ground connection.

WARNING Live Electrical Components!





ARQX24-MFT Quick Running Actuators, Multi-Function Technology

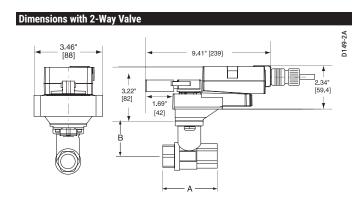


Models

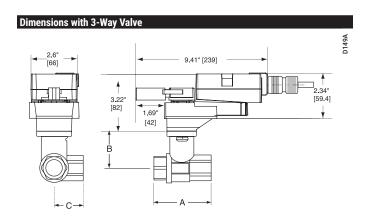
ARQX24-MFT Flexible Version

Technical Data	
Power supply	24 VAC ± 20% 50/60 Hz
	24 VDC ± 10%
Power consumption running	15 W
holding	1.5 W
Transformer sizing	26 VA (Class 2 power source)
Electrical connection	½" conduit connector,
	18 GA plenum rated cable
	3 ft [1m], 10 ft [3m], 16 ft [5m]
Overload protection	electronic throughout 0 to 95° rotation
Operating range Y	2 to 10 VDC, 4 to 20 mA (default)
	variable (VDC, on/off)
Feedback output U	2 to 10 VDC, 0.5mA max
	VDC variable
Input impedance	100 k Ω (0.1 mA), 500 Ω , 1500 Ω
	(on/off)
Angle of rotation	max 95°, adjustable with mechanical stop
	electronically variable
Direction of rotation	reversible with $\bigcirc/\!$
Position indication	reflective visual indicator (snap-on)
Manual override	external push button
Running time	constant of independent load
	10 or 15 seconds
Humidity	5 to 95% RH non-condensing
	(EN 60730-1)
Ambient temperature	-22°F to 122°F [-30°C to 50°C]
Storage temperature	-40°F to 176°F [-40°C to 80°C]
Housing	NEMA 2/IP54
Housing material	UL94-5VA
Agency listings†	cULus according to UL 60730-1A/-2-14, CAN/
	CSA E60730-1:02, CE according to 2004/108/
	EC and 2006/95/EC for line voltage and/or
	-S versions
Noise level	<52 dB(A)
Quality standard	ISO 9001

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



	Valve Nominal Size		Dimensions (Inches [mm])	
Valve Body	Inches	DN [mm]	Α	В
B231-B232	1¼"	32	3.72" [94.6]	2.04" [51.9]
B238-B240	1½"	40	3.88" [98.5]	2.04" [51.9]
B248-B250	2"	50	4.21" [107.0]	2.21" [56.2]
B251-B254	2"	50	4.93" [125.2]	2.68" [68.0]
B261-B265	2½"	65	5.55" [140.9]	2.68" [68.0]
B277-B280	3"	80	5.82" [147.9]	2.68" [68.0]



Valve Nominal Size			Dimensions (Inches [mm])		
Valve Body	Inches	DN [mm]	Α	В	С
B330-B332	1¼"	32	3.96" [100.6]	2.27" [57.7]	2.14" [54.3]
B338-B340	1½"	40	4.39" [111.6]	2.51" [63.7]	2.90" [61.1]
B348-B352	2"	50	4.95" [124.5]	2.73" [69.5]	2.74" [69.7]

ARQX24-MFT Quick Running Actuators, Multi-Function Technology



Wiring Diagrams



INSTALLATION NOTES



Provide overload protection and disconnect as required.



CAUTION Equipment damage!

Actuators may be connected in parallel.

Power consumption and input impedance must be observed.



Actuators may also be powered by 24 VDC.



Control signal may be pulsed from either the Hot (source) or the Common (sink) 24 VAC line.



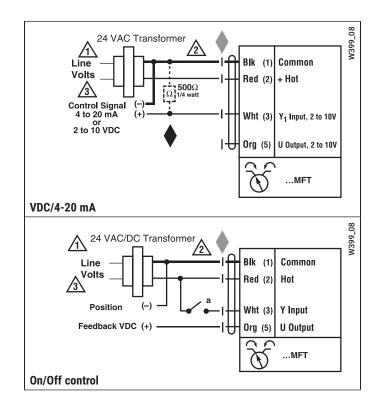
APPLICATION NOTES



The ZG-R01 500 Ω resistor may be used.

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GRB24-3, GRX24-3 Actuators, On/Off, Floating Point







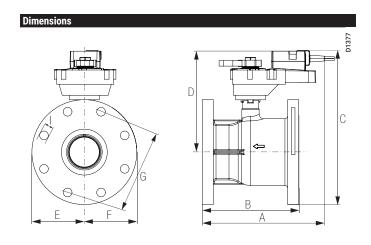




Models GRB24-3-5-14 GRX24-3-5-14

Technical Data		
Control		on/off, floating point
Power supply		24 VAC ± 20% 50/60 Hz
Power consumption	running	4 W
	holding	2 W
Transformer sizing		6 VA (Class 2 power source)
Electrical connection		3 ft,18 GA plenum rated cable
		½" conduit connector
	GRX	3 ft. [1m], 10 ft. [3m], 16 ft. [5m]
Overload protection		electronic throughout 0° to 95° rotation
Input impedance		600 Ω
Angle of rotation		max. 95°, adjustable with mechanical stop
Direction of rotation		reversible with $^{\sim}/^{\sim}$ switch
Position indication		visual indicator
Running time		150 seconds, constant independent of load
Manual override		external push button
Ambient temperature		-22°F to 122°F [-30°C to 50°C]
Housing		NEMA 2/IP54, Enclosure Type 2
Agency listings †		cULus according to UL 60730-1A/-2-14,
		CAN/CSA E60730-1:02, CE according to
		2004/108/EEC and 2006/95/EC.
Noise level		<45 dB(A)
Quality standard	•	ISO 9001

[†] Rated Impulse Voltage 800V, Type of action 1.AA (1.AA.B for -S version), Control Pollution Degree 3.



Valve Body	Nominal Pipe Size	Top Flange Design	Flange Diameter	Face-to-Face Length	Height
			Α	В	С
B6400	4" [100]	505	9.00" [228.6]	8.30" [210.8]	9.30" [235.9]
B6500	5" [125]		10.00" [254]	10.30" [261.6]	10.50" [266.4]
B6600	6" [150]	F05	11.00" [279.4]	12.50" [317.5]	11.70" [296.9]

GRB24-3, GRX24-3 Actuators, On/Off, Floating Point



Wiring Diagrams

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INSTALLATION NOTES



Provide overload protection and disconnect as required.



Actuators may also be powered by 24 VDC.



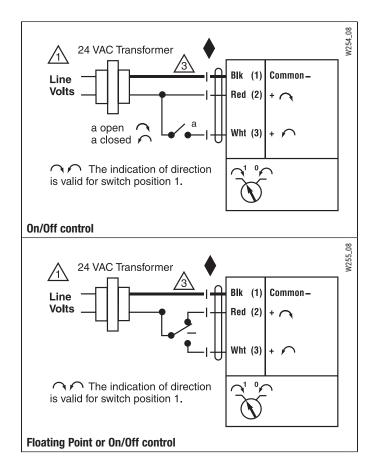
APPLICATION NOTES



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

№ N

WARNING Live Electrical Components!



P10419 - 09/13 - Subject to change. © Belimo Aircontrols (USA), Inc.











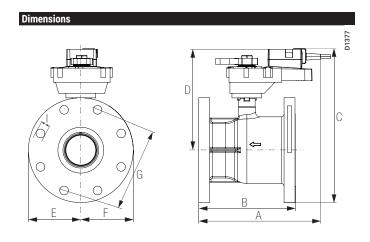


Models GRB120-3

GRX120-3

Technical Data	
Power Supply	100 to 240 VAC, 50/60 Hz (nominal)
	85 to 265 VAC, 50/60 Hz (tolerance)
Power consumption running	4 W
holding	2 W
Transformer sizing	7 VA (Class 2 power source)
Electrical connection	18 GA appliance rated cable
	½" conduit connector
	3 ft. [1m], 10 ft. [3m], 16 ft. [5m]
Overload protection	electronic throughout 0° to 95° rotation
Control	on/off, floating point
Input impedance	600 Ω
Angle of rotation	max. 95°, adjustable with mechanical stop
Direction of rotation	reversible with $^{\sim}/^{\sim}$ switch
Position indication	external push button
Running time	150 seconds, constant independent of load
Humidity	5 to 95% RH non condensing (EN 60730-1)
Ambient temperature	-22°F to 122°F [-30°C to 50°C]
Housing	NEMA 2/IP54, Enclosure Type 2
Housing material	UL94-5VA
Agency listings †	cULus according to UL 60730-1A/-2-14,
	CAN/CSA E60730-1:02, CE according to
	2004/108/EEC and 2006/95/EC.
Noise level	<45 dB(A)
Quality standard	ISO 9001

† Rated Impulse Voltage 800V, Type of action 1.AA (1.AA.B for -S version), Control Pollution Degree 3.



Valve Body	Nominal Pipe Size	Top Flange Design	Flange Diameter	Face-to-Face Length	Height
			Α	В	С
B6400	4" [100]		9.00" [228.6]	8.30" [210.8]	9.30" [235.9]
B6500	5" [125]	F0.F	10.00" [254]	10.30" [261.6]	10.50" [266.4]
B6600	6" [150]	F05	11.00" [279.4]	12.50" [317.5]	11.70" [296.9]

GRB120-3, GRX120-3



Wiring Diagrams



💢 INSTALLATION NOTES



Provide overload protection and disconnect as required.



Actuators may be connected in parallel.

Power consumption and input impedance must be observed.

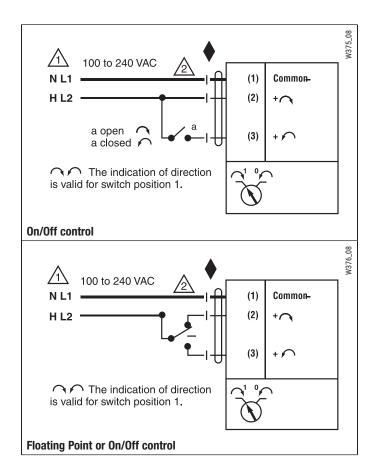


APPLICATION NOTES



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

WARNING Live Electrical Components!





GRX24-MFT Actuators, Multi-Function Technology





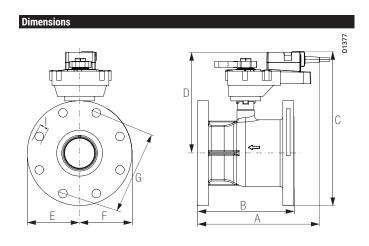


Models

GRX24-MFT-5-14

Technical Data			
Control	2 to 10 VDC, 4 to 40 mA (default)		
	variable (VDC, PWM, floating point, on/off)		
Power supply	24 VAC ± 20% 50/60 Hz		
	24 VDC ± 10%		
Power consumption running	4.5 W		
holding	1.5 W		
Transformer sizing	7 VA (Class 2 power source)		
Electrical connection	3 ft,18 GA plenum rated cable		
	½" conduit connector		
	3 ft. [1m], 10 ft. [3m], 16 ft. [5m]		
Overload protection	electronic throughout 0° to 95° rotation		
Feedback output	2 to 10 VDC, 0.5 mA max, VDC variable		
Input impedance	100 kΩ (0.1 mA, 500 Ω)		
	1500 Ω (PWM, floating point , on/off)		
Angle of rotation	max. 95°, adjustable with mechanical stop		
	electronically variable		
Direction of rotation	reversible with $^{\sim}/^{\sim}$ switch		
Position indication	visual indicator		
Running time	150 seconds (default)		
	variable (75 to 300 seconds)		
Manual override	external push button		
Ambient temperature	-22°F to 122°F [-30°C to 50°C]		
Housing	NEMA 2/IP54, Enclosure Type 2		
Housing material	UL94-5V (flammability rating)		
Agency listings †	cULus according to UL 60730-1A/-2-14,		
	CAN/CSA E60730-1:02, CE according to		
	2004/108/EEC and 2006/95/EC.		
Noise level	<45 dB(A)		
Quality standard	ISO 9001		

[†] Rated Impulse Voltage 800V, Type of action 1.AA (1.AA.B for -S version), Control Pollution Degree 3.



Valve Body	Nominal Pipe Size	Top Flange Design	Flange Diameter	Face-to-Face Length	Height
			Α	В	С
B6400	4" [100]		9.00" [228.6]	8.30" [210.8]	9.30" [235.9]
B6500	5" [125]	F0.F	10.00" [254]	10.30" [261.6]	10.50" [266.4]
B6600	6" [150]	F05	11.00" [279.4]	12.50" [317.5]	11.70" [296.9]

GRX24-MFT Actuators, Multi-Function Technology



Wiring Diagrams



INSTALLATION NOTES



Provide overload protection and disconnect as required.



CAUTION Equipment Damage!

Actuators may be connected in parallel if not mechanically mounted to the same shaft. Power consumption and input impedance must be observed.



Actuators may also be powered by 24 VDC.



Position feedback cannot be used with Triac sink controller. The actuator internal common reference is not compatible.



Control signal may be pulsed from either the Hot (source) or the Common (sink) 24 VAC line.



Contact closures A & B also can be triacs.



A & B should both be closed for triac source and open for triac sink.



For triac sink the common connection from the actuator must be connected to the hot connection of the controller.



APPLICATION NOTES



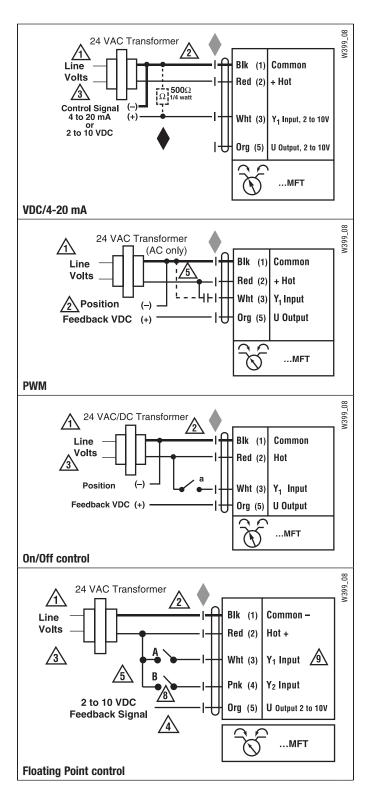
Meets UL requirements without the need of an electrical ground connection.



The ZG-R01 500 Ω resistor may be used.

WARNING 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.



P10419 - 09/13 - Subject to change. © Belimo Aircontrols (USA), Inc





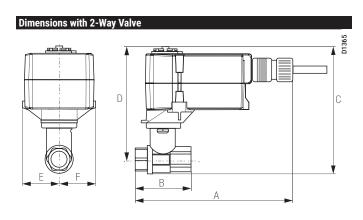
Models

TFRB(X)24 TFRB(X)120

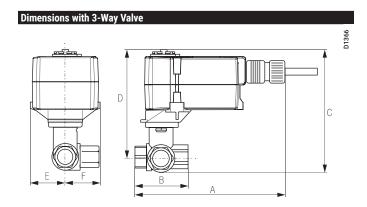
TFRB(X)24-S TFRB(X)120-S w/built-in Aux. Switch

Control on/off Power supply TFRB(X)24(-S) 24VAC ± 20%, 50/60Hz 24VDC ± 10% (nominal) 100 to 240 VAC, 50/60 Hz (tolerance) 85 to 265 VAC, 50/60 Hz Power consumption running holding TFRB(X)24(-S) 5 VA (class 2 power source) 5 VA (class 2 power source) TFRB(X)120(-S) 5 VA (class 2 power source) TFRB(X)120(-S) 5 VA (class 2 power source) TFRB(X)24 3 ft [1m] 16 ft [5m] Overload protection electronic throughout 0° to 95° rotation Angle of rotation 95° Direction of rotation reversible with protected // mounting Position indication visual indicator, 0° to 95° Running time motor rotation reversible with protected // mounting Position indication visual indicator, 0° to 95° Running time motor rotation reversible with protected // mounting Position indication visual indicator, 0° to 95° Running time motor rotation 22° F to 122° F [-20° C to 50° C] Humidity 5 to 95% RH non-condensing Ambient temperature -22° F to 122° F [-30° C to 50° C] Storage temperature -40° F to 176° F [-40° C to 80° C] Housing NEMA type 2/IP42 Housing material UL94 - 5VA CSA E60730-1:02, CE according to 2004/108/ EC and 2006/95/EC for line voltage and/or -S versions Noise level (max) running <40 db (A)	Technical Data			
Power supply TFRB(X)24(-S) 24VAC ± 20%, 50/60Hz 24VDC ± 10% (nominal) 100 to 240 VAC, 50/60 Hz (tolerance) 85 to 265 VAC, 50/60 Hz Power consumption Trunning Holding Transformer sizing TFRB(X)24(-S) TFRB(X)120(-S) Electrical connection (-S models have 2 cables) TFRB(X)24 TFRB(X)120 10 ft [3m] 16 ft [5m] Overload protection Angle of rotation Position indication Running time Totalion Position indication Running time Totalion Totalion Running time Totalion Totalion Position indication Running time Totalion Totalion Totalion Running time Totalion Totalion Totalion Running time Totalion		on/off		
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TFRB(X)120(-S) Commination Commination		24VAC + 20% 50/60Hz		
TFRB(X)120(-S) (nominal) 100 to 240 VAC, 50/60 Hz (tolerance) 85 to 265 VAC, 50/60 Hz Power consumption running holding Transformer sizing TFRB(X)24(-S) TFRB(X)120(-S) Electrical connection (-S models have 2 cables) TFRB(X)24 TFRB(X)120 10 ft [3m] Overload protection Angle of rotation Position indication Running time motor Spring Humidity Ambient temperature Housing New August (max) Noise level (max) FOM August (mominal) 100 to 240 VAC, 50/60 Hz (tolerance) 85 to 265 VAC, 50/60 Hz (tolerance) 85 to 26 VAC, 50/60 Hz (tolerance) 85 to 265 VAC, 50/60 Hz (tolerance) 85 to 265 VAC, 50/60 Hz (tolerance) 85 to 265 VAC, 50/60 Hz 5 VA (class 2 power source) 5 VA (class 2 power source) 18 GA appliance cable 3 ft [1m] 16 ft [5m] Overload protection electronic throughout 0° to 95° rotation 95° 75 seconds (0 to 18 in-lb) 5 to 95% RH non-condensing Ambient temperature -22°F to 122°F [-20°C to 50°C] Storage temperature -40°F to 176°F [-40°C to 80°C] Housing NEM type 2/IP42 Housing naterial UL94 - 5VA CSA E60730-1:02, CE according to 2004/108/ EC and 2006/95/EC for line voltage and/or -S versions Noise level (max) running	11 ND(X)24(-3)			
Continued by Power consumption	TEDR(Y)120(-S)			
Power consumption running holding 1.3 W Transformer sizing TFRB(X)24(-S) 5 VA (class 2 power source) Electrical connection (-S models have 2 cables) 18 GA appliance cable 3 ft [1m] 16 ft [5m] Overload protection electronic throughout 0° to 95° rotation Angle of rotation 95° Direction of rotation reversible with protected √/ mounting visual indicator, 0° to 95° Running time motor spring 75 sec @ -22°F to 122°F [-20°C to 50°C] Humidity 5 to 95% RH non-condensing NEMA type 2/IP42 Housing material UL94 - 5VA Agency listings† cULus according to UL 60730-1A/-2-14, CAN/ CSA E60730-1:02, CE according to 2004/108/ EC and 2006/95/EC for line voltage and/or −S versions Noise level (max) running <40 db (A)	11 ND(X) 120(-3)			
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TFRB(X)120(-S) Electrical connection (-S models have 2 cables) TFRB(X)24 TFRB(X)120 Overload protection Angle of rotation Position indication Running time Humidity Humidity Ambient temperature Flowing Housing material Housing material Noise level (max) Noise level (max) FRB(X)120 18 GA appliance cable 3 ft [1m] 10 ft [3m] 10 ft [5m] 10 ft [5m] 10 ft [5m] 10 ft [5m] 10 ft [5m] 10 ft		5 VA (-1 0)		
Electrical connection (-S models have 2 cables) TFRB(X)24 TFRB(X)120 10 ft [3m] 16 ft [5m] Overload protection Angle of rotation Position indication Running time Teversible with protected // mounting Fosition indication Running time To spring Humidity The spring The spri				
(-S models have 2 cables) TFRB(X)24 TFRB(X)120 10 ft [3m] 16 ft [5m] Overload protection Angle of rotation Position indication Running time motor spring -22°F to 122°F [-30°C to 50°C] Storage temperature Housing Housing material Agency listings† Noise level (max) Noise level (max) 18 GA appliance cable 3 ft [1m] 10 ft [3m] 16 ft [5m] reversible with protected \(\cdot \) mounting electronic throughout 0° to 95° rotation reversible with protected \(\cdot \) mounting reversible with protected \(\cdot \) fo 95° Running time reversible with protected \(\cdot \) fo 95° reversible with protected \(\cdot \) fo 95° Running time reversible with protected \(\cdot \) fo 95° reversible with protected \(\cdot \) fo 95° Running time reversible with protected \(\cdot \) fo 95° reversible with protected \(\cdot \) fo 95° Running time reversible with protected \(\cdot \) fo 95° reversible with protected \(\cdot \) fo 95° Running \(\cdot \) fo 122°F [-20°C to 50°C] Humidity				
TFRB(X)24 TFRB(X)120 3 ft [1m] 10 ft [3m] 16 ft [5m] Overload protection Angle of rotation Position indication Running time motor 75 seconds (0 to 18 in-lb) spring 75 sec @ -22°F to 122°F [-20°C to 50°C] Humidity 5 to 95% RH non-condensing Ambient temperature -22°F to 122°F [-30°C to 50°C] Storage temperature -40°F to 176°F [-40°C to 80°C] Housing Housing material UL94 - 5VA Agency listings† CULus according to UL 60730-1A/-2-14, CAN/ CSA E60730-1:02, CE according to 2004/108/ EC and 2006/95/EC for line voltage and/or -S versions Noise level (max) running 3 ft [1m] 10 ft [3m] 10 ft [3				
TFRB(X)120 10 ft [3m] 16 ft [5m] Overload protection Angle of rotation Position indication Running time motor 75 seconds (0 to 18 in-lb) spring 75 sec @ -22°F to 122°F [-20°C to 50°C] Humidity 5 to 95% RH non-condensing Ambient temperature -40°F to 176°F [-40°C to 80°C] Housing material Agency listings† CULus according to UL 60730-1A/-2-14, CAN/ CSA E60730-1:02, CE according to 2004/108/ EC and 2006/95/EC for line voltage and/or -S versions Noise level (max) running 10 ft [3m] 16 ft [5m] 10 ft [5m] 10 f				
Overload protection Angle of rotation Position indication Running time Ambient temperature Storage temperature Housing material Agency listings† Item (SA) In ft (5m) electronic throughout 0° to 95° rotation Position indication Visual indicator, 0° to 95° **To seconds (0 to 18 in-lb) **To sec @ -22°F to 122°F [-20°C to 50°C] **Humidity		• •		
Overload protection Angle of rotation Position indication Running time Ambient temperature Housing material Agency listings† Noise level (max) Position of rotation Position indication Position indication Position indication Position indication Position indication Position indication Visual indicator, 0° to 95° Visual indicator, 0° to	1FRB(X)120			
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Direction of rotation Position indication Running time motor spring Ambient temperature Housing material Agency listings† Noise level (max) Running time reversible with protected √/ mounting reversible with protected √/ mounting visual indicator, 0° to 95° reversible with protected √/ mounting visual indicator, 0° to 95° reversible with protected √/ mounting visual indicator, 0° to 95° reversible with protected √/ mounting reversible with protected √/ mounting visual indicator, 0° to 95° reversible with protected √/ mounting reversible with protected visual indicator, 0° to 95° reversible with protected				
Position indication				
Running time				
Spring <75 sec @ -22°F to 122°F [-20°C to 50°C]				
Humidity				
Ambient temperature				
Storage temperature Housing Housing Housing material Agency listings† CSA E60730-1:02, CE according to 2004/108/ EC and 2006/95/EC for line voltage and/or -S versions Noise level (max) VEMA type 2/IP42 UL94 - 5VA CULus according to UL 60730-1A/-2-14, CAN/ CSA E60730-1:02, CE according to 2004/108/ EC and 2006/95/EC for line voltage and/or -S versions				
Housing NEMA type 2/IP42 Housing material UL94 - 5VA Agency listings† cULus according to UL 60730-1A/-2-14, CAN/ CSA E60730-1:02, CE according to 2004/108/ EC and 2006/95/EC for line voltage and/or -S versions Noise level (max) running <40 db (A)				
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Agency listings† cULus according to UL 60730-1A/-2-14, CAN/ CSA E60730-1:02, CE according to 2004/108/ EC and 2006/95/EC for line voltage and/or -S versions Noise level (max) running <40 db (A)		71 .		
CSA E60730-1:02, CE according to 2004/108/ EC and 2006/95/EC for line voltage and/or -S versions Noise level (max) running <40 db (A)				
EC and 2006/95/EC for line voltage and/or -S versions Noise level (max) running <40 db (A)	Agency listings†			
versions Noise level (max) running <40 db (A)				
Noise level (max) running <40 db (A)				
spring return < 10 dB (A)	, ,			
	spring return			
Quality standard ISO 9001	Quality standard	ISO 9001		
TFRB(X)S	` '			
Auxiliary switch 1 x SPDT, 3A (0.5A) @ 250 VAC, UL Listed	Auxiliary switch			
adjustable 0° to 95°				

[†] Rated impulse voltage 800V (4kV for 120V model), Control pollution degree 3, Type of action 1.AA (1.AA.B for -S models)



	Valve Nominal Size		Valve Nominal Size Dimensions (Inches [mn		Inches [mm])
Valve Body	Inches DN [mm]		Α	В	
B207(B)-B211(B)	1/2"	15	2.41" [61.1]	1.39" [35.2]	
B212(B)-B215(B)	1/2"	15	2.38" [60.4]	1.78" [45.2]	
B217(B)-B221(B)	3/4"	20	2.73" [69.3]	1.87" [47.4]	



Valve Nominal Size		Dimensions (Inches [mm])		
Inches DN [mm]		Α	В	С
1/2"	15	2.41" [61.1]	1.39" [35.2]	1.20" [30.6]
1/2"	15	2.38" [60.4]	1.78" [45.2]	1.29" [32.8]
3/4"	20	2.73" [69.3]	1.87" [47.4]	1.47" [37.3]
	½" ½"	½" 15 ½" 15	½" 15 2.41" [61.1] ½" 15 2.38" [60.4]	½" 15 2.41" [61.1] 1.39" [35.2] ½" 15 2.38" [60.4] 1.78" [45.2]

TFRB(X) Actuators, On/Off



Wiring Diagrams



💢 INSTALLATION NOTES



CAUTION Equipment damage!

Actuators may be connected in parallel.

Power consumption and input impedance must be observed.



Actuators may also be powered by 24 VDC.

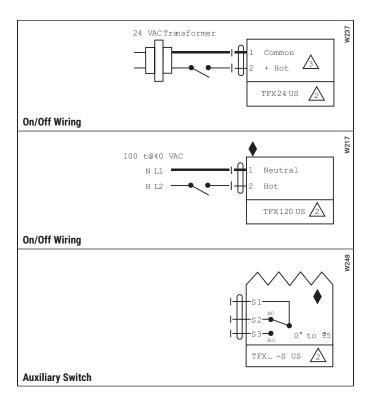


APPLICATION NOTES



Meets cULus or UL and CSA requirements without the need of an electrical ground connection.

WARNING Live Electrical Components!











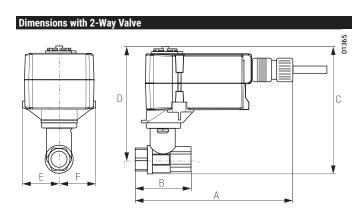
Models

TFRB(X)24-3 TFRB(X)24-3-S

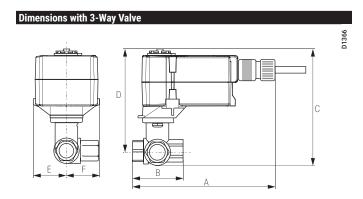
w/built-in Aux. Switch

Technical Data		
Control	floating point	
Power supply	24VAC ± 20%, 50/60Hz	
Power consumption running	2.5 W	
holding	1.0 W	
Transformer sizing	4 VA (class 2 power source)	
Electrical connection	½" conduit connector	
(-S models have 2 cables)	18 GA plenum rated cable	
TFRB(X)24-3	3 ft [1m]	
	10 ft [3m]	
	16 ft [5m]	
Overload protection	electronic throughout 0° to 95° rotation	
Input impedance	1000 Ω (0.6w) control inputs	
Angle of rotation	95°	
Direction of rotation spring		
motor	reversible with built-in $\frown/\!$	
Position indication	visual indicator, 0° to 95°	
Running time motor	95 sec constant, independent of load	
spring	<25 sec @ -4°F to 122°F [-20°C to 50°C]	
	<60 sec @ -22°F [-30°C]	
Humidity	5 to 95% RH non-condensing	
Ambient temperature	-22°F to 122°F [-30°C to 50°C]	
Storage temperature	-40°F to 176°F [-40°C to 80°C]	
Housing	NEMA type 2/IP42	
Housing material	UL94 - 5VA	
Agency listings†	cULus according to UL 60730-1A/-2-14, CAN/	
	CSA E60730-1:02, CE according to 2004/108/	
	EC and 2006/95/EC for line voltage and/or -S	
	versions	
Noise level (max) running		
spring return		
Quality standard	ISO 9001	

TFRB(X)24-3-S US 1 x SPDT, 3A (0.5A) @ 250 VAC, UL Listed, adjustable 0° to 95° Auxiliary switch



	Valve Nominal Size		Dimensions (Inches [mm])
Valve Body	Inches DN [mm]		Α	В
B207(B)-B211(B)	1/2"	15	2.41" [61.1]	1.39" [35.2]
B212(B)-B215(B)	1/2"	15	2.38" [60.4]	1.78" [45.2]
B217(B)-B221(B)	3/4"	20	2.73" [69.3]	1.87" [47.4]
	•			



	Valve Nominal Size		Dimensions (Inches [mm])		
Valve Body	Inches	DN [mm]	Α	В	С
B307(B)-B311(B)	1/2"	15	2.41" [61.1]	1.39" [35.2]	1.20" [30.6]
B312(B)-B315(B)	1/2"	15	2.38" [60.4]	1.78" [45.2]	1.29" [32.8]
B317(B)-B321(B)	3/4"	20	2.73" [69.3]	1.87" [47.4]	1.47" [37.3]

[†] Rated impulse voltage 800V (4kV for 120V model), Control pollution degree 3, Type of action 1.AA (1.AA.B for -S models)

TFRB(X)24-3 Actuators, Floating Point



Wiring Diagrams



INSTALLATION NOTES



CAUTION Equipment damage!

Actuators may be connected in parallel.

Power consumption and input impedance must be observed.



The common connection from the actuator must be connected to the Hot connection of the controller.



The actuator Hot must be connected to the control board common.



For end position indication, interlock control, fan startup, etc., TF24-3-S US incorporates one built-in auxiliary switch: 1 x SPDT, 3A (0.5A) @250 VAC, UL listed, adjustable 0° to 95°.



Actuators with plenum rated cable do not have numbers on wires; use color coded instead. Actuators with appliance rated cable use numbers.

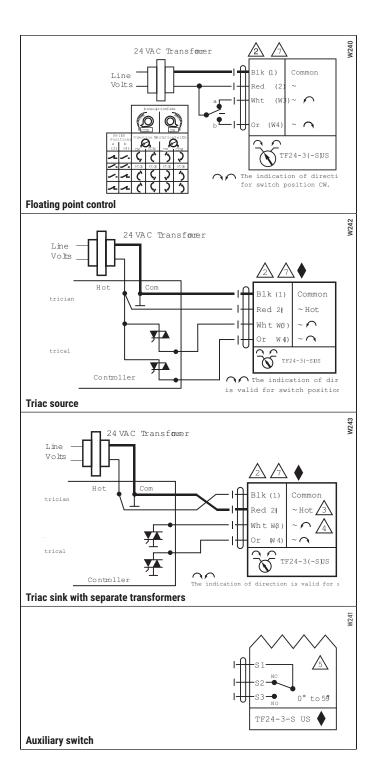


APPLICATION NOTES



Meets cULus or UL and CSA requirements without the need of an electrical ground connection.

WARNING Live Electrical Components!







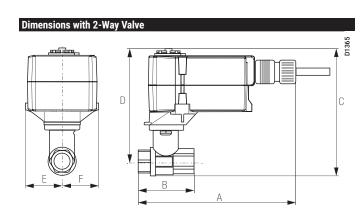
Models TFRB(X)24-SR

TFRB(X)24-SR-S w/built-in Aux. Switch

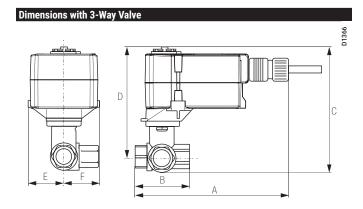
Control proportional Power supply 24 VAC ± 20%, 50/60 Hz 24 VDC ± 10% Power consumption running 1.0 W Transformer sizing 4 VA (class 2 power source) Electrical connection ½" conduit connector (-S models have 2 cables) 18 GA plenum rated cable 3 ft [1m] 10 ft [3m] 16 ft [5m] 16 ft [5m] Electrical protection actuators are double insulated Overload protection electronic throughout 0° to 95° rotation Operating range Y 2 to 10 VDC, 4 to 20 mA Input impedance 100k Ω (0.1mA), 500 Ω Feedback Output U 2-10 VDC Angle of rotation 95° Direction of rotation spring reversible with CW/CCW mounting reversible with built-in N/C switch Position indication visual indicator, 0° to 95° Running time motor motor 95 sec constant, independent of load <25 sec @-4°F to 122°F [-20°C to 50°C] <60 sec @-22°F [-30°C] Storage temperature -40°F to 176°F [-40°C to 80°C]	Technical Data		
Power supply 24 VAC ± 20%, 50/60 Hz 24 VDC ± 10% 24 VDC ± 10% Power consumption running holding Lectrical connection (-S models have 2 cables) 18 GA plenum rated cable TFRB(X)24-SR 3 ft [1m] 10 ft [3m] 16 ft [5m] Electrical protection actuators are double insulated Overload protection electronic throughout 0° to 95° rotation Operating range Y 2 to 10 VDC, 4 to 20 mA Input impedance 100k Ω (0.1mA), 500 Ω Feedback Output U 2-10 VDC Angle of rotation 95° Direction of rotation gring reversible with CW/CCW mounting reversible with built-in √/ switch Position indication visual indicator, 0° to 95° Running time motor Sec constant, independent of load <25 sec @-4°F to 122°F [-30°C]	<td></td> <td>proportional</td>		proportional
Power consumption running holding 1.0 W	Power supply		
Transformer sizing	· c. c. capp.y		
Transformer sizing 4 VA (class 2 power source)	Power consumption running	2.5 W	
Section Sec	holding	1.0 W	
Section Sec	Transformer sizing	4 VA (class 2 power source)	
TFRB(X)24-SR 3 ft [1m] 10 ft [3m] 16 ft [5m] Electrical protection Overload protection Operating range Y Input impedance Feedback Output U Angle of rotation Direction of rotation Position indication Running time motor Spring Total indicator, 0° to 95° Feedback Output U Angle of rotation Position indication Running time Motor Spring Teversible with CW/CCW mounting reversible with built-in // switch visual indicator, 0° to 95° Sec constant, independent of load 25 sec @-4°F to 122°F [-20°C to 50°C] 460 sec @-22°F [-30°C] Humidity Ambient temperature Feedback Output U 2-10 VDC Angle of rotation 95° reversible with CW/CCW mounting reversible with built-in // switch visual indicator, 0° to 95° 5 sec constant, independent of load 25 sec @-4°F to 122°F [-20°C to 50°C] 460 sec @-22°F [-30°C] 5 to 95% RH non-condensing Ambient temperature 4-40°F to 176°F [-40°C to 80°C] Housing NEMA type 2/IP42 Housing material UL94 - 5VA Agency listings† CULus according to UL 60730-1A/-2-14, CAN/ CSA E60730-1:02, CE according to 2004/108/ EC and 2006/95/EC for line voltage and/or -S versions Noise level (max) running 450 dB (A)	Electrical connection		
10 ft [3m] 16 ft [5m]	(-S models have 2 cables)	18 GA plenum rated cable	
Telectrical protection actuators are double insulated	TFRB(X)24-SR	3 ft [1m]	
		10 ft [3m]	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		16 ft [5m]	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Electrical protection	actuators are double insulated	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Overload protection	electronic throughout 0° to 95° rotation	
Feedback Output U Angle of rotation Direction of rotation Position indication Running time motor Fundity Ambient temperature Housing Housing Housing material Agency listings† Noise level (max) Noise level (max) Psyring 2-10 VDC 95° reversible with CW/CCW mounting reversible with built-in \(\cdot \cdot \) switch visual indicator, 0° to 95° 85° 85° 80° 95 sec constant, independent of load 95 sec constant, independent of load 95 sec constant, independent of load 95° 85° 86° 95° 95° 87° 95° 95° 96° 96° 97° 98° 98° 98° 98° 98° 98° 98		2 to 10 VDC, 4 to 20 mA	
Angle of rotation Direction of rotation Direction of rotation Position indication Running time motor Running time motor spring 40 sec @-22°F [-30°C] Humidity Ambient temperature Storage temperature Housing Housing Housing Agency listings† CULus according to UL 60730-1A/-2-14, CAN/CSA E60730-1:02, CE according to 2004/108/EC and 2006/95/EC for line voltage and/or -S versions Noise level (max) Position indication spring reversible with CW/CCW mounting reversible with CW/CEW mounting reversible with culting reversible with cult	Input impedance	100k Ω (0.1mA), 500 Ω	
Direction of rotation spring motor reversible with CW/CCW mounting reversible with built-in \(\sqrt{\circ}\) switch Position indication visual indicator, 0° to 95° Running time motor 95 sec constant, independent of load v25 sec @-4°F to 122°F [-20°C to 50°C] v60 sec @-22°F [-30°C] Humidity 5 to 95% RH non-condensing Ambient temperature -22°F to 122°F [-30°C to 50°C] Storage temperature -40°F to 176°F [-40°C to 80°C] Housing NEMA type 2/IP42 Housing material UL94 - 5VA Agency listings† cULus according to UL 60730-1A/-2-14, CAN/CSA E60730-1:02, CE according to 2004/108/EC and 2006/95/EC for line voltage and/or -S versions Noise level (max) running spring return versions	Feedback Output U		
motor reversible with built-in \(\triangle / \) switch Position indication visual indicator, 0° to 95° Running time motor \(95 \) sec constant, independent of load \(25 \) sec \(@-4^\text{F} \) to 122^\text{F} [-20^\text{C} \) to 50^\text{C}] \(<60 \) sec \(@-22^\text{F} \) [-30^\text{C}] Humidity 5 to 95\(\text{RH non-condensing} \) Ambient temperature -22^\text{F} \) to 122^\text{F} [-30^\text{C} \) to 50^\text{C}] Storage temperature -40^\text{F} \) to 176^\text{F} [-40^\text{C} \) to 80^\text{C}] Housing NEMA type 2/IP42 Housing material UL94 - 5VA Agency listings† cULus according to UL 60730-1A/-2-14, CAN/ CSA E60730-1:02, CE according to 2004/108/ EC and 2006/95/EC for line voltage and/or -S versions Noise level (max) running spring return <62 dB (A)	Angle of rotation		
Position indication Running time motor spring ### Storage temperature Housing material Housing material Agency listings† Noise level (max) Running time ### wisual indicator, 0° to 95° visual indicator, 0° to 95° visual indicator, 0° to 95° ### visual indicator, 0° to 95° ### Visual indicator, 0° to 95° ### visual indicator, 0° to 95° ### Storage temperature 95 sec constant, independent of load 25 sec @-4°F to 122°F [-30°C] 5 to 95% RH non-condensing -22°F to 122°F [-30°C to 50°C] 5 to 95% RH non-condensing -40°F to 176°F [-40°C to 80°C] NEMA type 2/IP42 Housing material UL94 - 5VA CULus according to UL 60730-1A/-2-14, CAN/CSA E60730-1:02, CE according to 2004/108/EC and 2006/95/EC for line voltage and/or -S versions Noise level (max)	Direction of rotation spring	reversible with CW/CCW mounting	
Running time motor spring 95 sec constant, independent of load <25 sec @-4°F to 122°F [-20°C to 50°C] <60 sec @-22°F [-30°C] Humidity 5 to 95% RH non-condensing Ambient temperature -22°F to 122°F [-30°C to 50°C] Storage temperature -40°F to 176°F [-40°C to 80°C] Housing NEMA type 2/IP42 Housing material UL94 - 5VA CULus according to UL 60730-1A/-2-14, CAN/ CSA E60730-1:02, CE according to 2004/108/ EC and 2006/95/EC for line voltage and/or -S versions Noise level (max) running <35 db (A) <62 dB (A)	motor	reversible with built-in \frown/\frown switch	
Spring <25 sec @-4°F to 122°F [-20°C to 50°C]	Position indication	visual indicator, 0° to 95°	
Column C	Running time motor	95 sec constant, independent of load	
Humidity 5 to 95% RH non-condensing Ambient temperature -22°F to 122°F [-30°C to 50°C] Storage temperature -40°F to 176°F [-40°C to 80°C] Housing NEMA type 2/IP42 Housing material UL94 - 5VA Agency listings† cULus according to UL 60730-1A/-2-14, CAN/ CSA E60730-1:02, CE according to 2004/108/ EC and 2006/95/EC for line voltage and/or -S versions Noise level (max) running spring return <62 dB (A)	spring	<25 sec @-4°F to 122°F [-20°C to 50°C]	
Ambient temperature -22°F to 122°F [-30°C to 50°C] Storage temperature -40°F to 176°F [-40°C to 80°C] Housing NEMA type 2/IP42 Housing material UL94 - 5VA Agency listings† cULus according to UL 60730-1A/-2-14, CAN/ CSA E60730-1:02, CE according to 2004/108/ EC and 2006/95/EC for line voltage and/or -S versions Noise level (max) running spring return <62 dB (A)			
Storage temperature	Humidity	5 to 95% RH non-condensing	
Housing NEMA type 2/IP42 Housing material UL94 - 5VA Agency listings† cULus according to UL 60730-1A/-2-14, CAN/ CSA E60730-1:02, CE according to 2004/108/ EC and 2006/95/EC for line voltage and/or -S versions Noise level (max) running spring return <62 dB (A)	Ambient temperature	-22°F to 122°F [-30°C to 50°C]	
Housing material Agency listings† CULus according to UL 60730-1A/-2-14, CAN/ CSA E60730-1:02, CE according to 2004/108/ EC and 2006/95/EC for line voltage and/or -S versions Noise level (max) running <35 db (A) spring return <62 dB (A)	Storage temperature	-40°F to 176°F [-40°C to 80°C]	
Agency listings† cULus according to UL 60730-1A/-2-14, CAN/ CSA E60730-1:02, CE according to 2004/108/ EC and 2006/95/EC for line voltage and/or -S versions Noise level (max) running <35 db (A) spring return <62 dB (A)	Housing	NEMA type 2/IP42	
CSA E60730-1:02, CE according to 2004/108/ EC and 2006/95/EC for line voltage and/or -S versions Noise level (max) running <35 db (A) spring return <62 dB (A)	Housing material		
EC and 2006/95/EC for line voltage and/or -S versions Noise level (max) running <35 db (A) spring return <62 dB (A)	Agency listings†	, , ,	
versions Noise level (max) running <35 db (A) spring return <62 dB (A)		, ,	
Noise level (max) running <35 db (A) spring return <62 dB (A)		1	
spring return <62 dB (A)		1.51.51.51	
	` ,	— · · ·	
Quality standard ISO 9001			
	Quality standard	ISO 9001	

adjustable 0° to 95° † Rated impulse voltage 800V (4kV for 120V model), Control pollution degree 3, Type of action 1.AA (1.AA.B for -S models)

1 x SPDT, 3A (0.5A) @ 250 VAC, UL Listed,



		Valve Nominal Size Inches DN [mm]		Dimensions (inches [mm])
	Valve Body			Α	В
	B207(B)-B211(B)	1/2"	15	2.41" [61.1]	1.39" [35.2]
	B212(B)-B215(B)	1/2"	15	2.38" [60.4]	1.78" [45.2]
	B217(B)-B221(B)	3/4"	20	2.73" [69.3]	1.87" [47.4]
-					



	Valve No	minal Size	Dimen	Dimensions (Inches [mm])		
Valve Body	Inches	DN [mm]	Α	В	С	
B307(B)-B311(B)	1/2"	15	2.41" [61.1]	1.39" [35.2]	1.20" [30.6]	
B312(B)-B315(B)	1/2"	15	2.38" [60.4]	1.78" [45.2]	1.29" [32.8]	
B317(B)-B321(B)	3/4"	20	2.73" [69.3]	1.87" [47.4]	1.47" [37.3]	

TFRB(X)24-SR-S Auxiliary switch

TFRB(X)24-SR Actuators, Proportional



Wiring Diagrams



🖊 INSTALLATION NOTES



CAUTION Equipment damage!

Actuators may be connected in parallel.

 $Power\ consumption\ and\ input\ impedance\ must\ be\ observed.$

Up to 4 actuators may be connected in parallel. With 4 actuators wired to one 500 Ω resistor, a +2% shift of control signal may be required. Power consumption must be observed.



Actuators may also be powered by 24 VDC.



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



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



For end position indication, interlock control, fan startup, etc., TF24-SR-S US incorporates one built-in auxiliary switch: 1 x SPDT, 3A (0.5A) (0.5A) (0.250 VAC, UL listed, adjustable 0° to 95°.



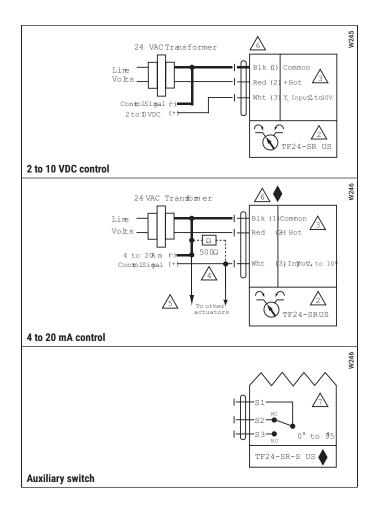
APPLICATION NOTES



Meets cULus or UL and CSA requirements without the need of an electrical ground connection.

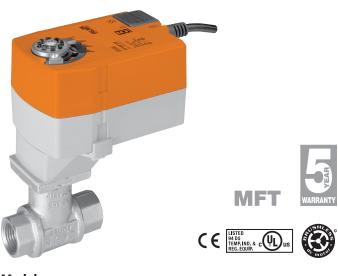
WARNING Live Electrical Components!

During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrical





TFRX24-MFT Actuators, Multi-Function Technology



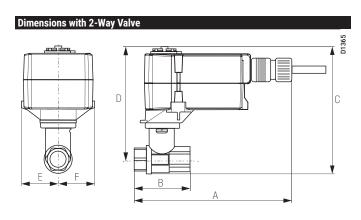
Models TFRX24-MFT

Control		MFT
		24 VAC ± 20% 50/60 Hz
Power supply		
Dawar aanamantian		24 VDC ± 10%
	running	
	holding	
Transformer sizing		4 VA (class 2 power source)
Electrical connection		½" conduit connector
0		3 ft [1m], 18 GA plenum rated cable
Overload protection		electronic throughout 0° to 95° rotation
Operating range Y*		2 to 10 VDC, 4 to 20 mA (default)
Established and a second like		variable (VDC, PWM, floating point, on/off)
Feedback output U*		2 to 10 VDC, 0.5 mA max
Input impedance		100 kΩ for 2 to 10 VDC (0.1 mA)
		500Ω for 4 to 20 mA
		1500 Ω for PWM, floating point and
Machaniaal angla of vate	4:+	on/off control 95°
Mechanical angle of rota		-
Angle of rotation adapta		Off (Default)
Direction of rotation	spring	reversible with CW/CCW mounting
Danisian indicasian	motor	reversible with built-in \(\sigma \) switch
Position indication Override control*		visual indicator, 0° to 95°
Override controi^		Min. (Min Position) = 0% - ZS (Mid. Position) = 50%
		- 25 (Mid. Position) = 50% - Max. (Max. Position) = 100%
Running time	motor*	95 seconds constant independent of load
Rullilling tillle	spring	
	spiniy	<50 seconds @-4 F to 122 F [-20 C to 50 C] <60 seconds @-22°F [-30°C]
Humidity		5 to 95% RH, non-condensing
Ambient temperature		-22 to 122° F (-30 to 50° C)
Storage temperature		-40 to 176° F (-40 to 80° C)
Housing		NEMA 2/IP42
Housing material		UL 94-5VA
Agency listings†		cULus according to UL 60730-1A/-2-14, CAN/
Agency listings i		CSA E60730-1:02, CE according to 2004/108/
		EC and 2006/95/EC for line voltage and/or -S
		versions
Noise level (max)	running	
	g return	
	o renorth	1803 UD (A)

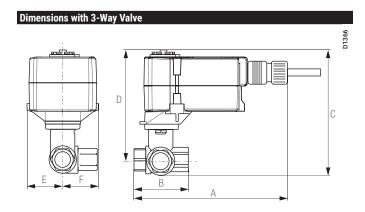


Quality standard | ISO 9001

* Variable when configured with MFT options
† Rated impulse voltage 0.8 kV, Control pollution degree 3, Type of action 1.AA.



vaive Noi	ninai Size	Dimensions (inches [mm])
Inches	DN [mm]	Α	В
1/2"	15	2.41" [61.1]	1.39" [35.2]
1/2"	15	2.38" [60.4]	1.78" [45.2]
3/4"	20	2.73" [69.3]	1.87" [47.4]
	1nches 1/2" 1/2"	½" 15 ½" 15	Inches DN [mm] A ½" 15 2.41" [61.1] ½" 15 2.38" [60.4]



	valve Nor	ninai Size	Dimen	isions (Inches	[mm])
Valve Body	Inches	DN [mm]	Α	В	С
B307-B311	1/2"	15	2.41" [61.1]	1.39" [35.2]	1.20" [30.6]
B312-B315	1/2"			1.78" [45.2]	
B317-B321	3/4"	20	2.73" [69.3]	1.87" [47.4]	1.47" [37.3]

TFRX24-MFT Actuators, Multi-Function Technology



Wiring Diagrams



INSTALLATION NOTES



Provide overload protection and disconnect as required.



CAUTION Equipment damage!

Actuators may be connected in parallel.

Power consumption and input impedance must be observed.

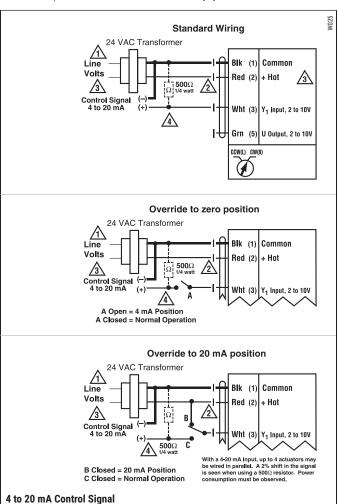


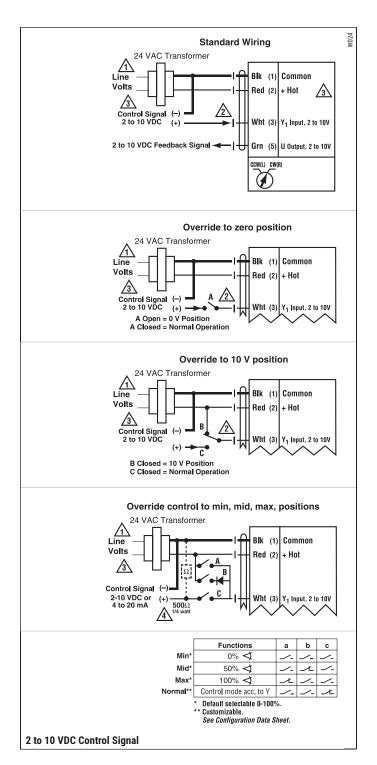
Actuators may also be powered by 24 VDC.



ZG-R01 may be used.

WARNING Live Electrical Components!









Models

LF24 US LF24-S US LF120 US

w/built-in Aux. Switch

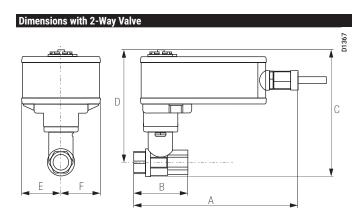
LF120-S US

w/built-in Aux. Switch

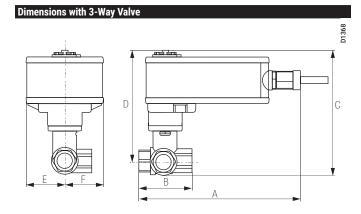
Taskais al Data				
Technical Data Control		on/off, floating point		
		on/on, noating point		
Power supply		04.1/40 + 00% 50 /60 11-		
LF24(-S) US		24 VAC ± 20% 50/60 Hz		
1 5400/ 0) 110		24 VDC ± 10%		
LF120(-S) US		120 VAC ± 10% 50/60 Hz		
Power consumption				
LF24(-S) US	running			
	holding			
LF120(-S) US	running	5.5 W		
	holding	3.5 W		
Transformer sizing				
LF24(-S) US		7 VA, class 2 power source		
LF120(-S) US		7.5 VA, class 2 power source		
Electrical connection		½" conduit connector		
(-S models have 2 cable	es)	3 ft [1m], 18 GA appliance cable		
Electrical protection		120V actuators double insulated		
Overload protection		electronic throughout rotation		
Angle of rotation		95°		
Spring return direction		reversible with CW/CCW mounting		
Position indication		visual indicator 0° to 90°		
Running time	motor	<40 to 75 seconds (on/off)		
	spring	<25 sec. @-4°F to 122°F [-20°C to 50°C]		
		<60 sec. @-22°F [-30°C]		
Ambient temperature		-22° F to 122° F [-30° C to 50° C]		
Housing		NEMA 2		
Agency listings†		cULus according to UL 873 and CAN/CSA		
•		C22.2 No. 24-93		
Noise level (max)	running	<30 db(A)		
sprii	ng return	62 dB(A)		
Quality standard		ISO 9001		
·				

LFS US	
Auxiliary switch	1 x SPDT, 6A (1.5A) @ 250 VAC, UL Listed, adjustable 0° to 95° (double insulated)

[†] Rated impulse voltage 800V (4kV for 120V model), Control pollution degree 3, Type of action 1.AA (1.AA.B for -S models)



	Valve Nor	ninal Size	Dimensions (Inches [mm])
Valve Body	Inches DN [mm]		Α	В
B207(B)-B211(B)	1/2"	15	2.41" [61.1]	1.39" [35.2]
B212(B)-B215(B)	1/2"	15	2.38" [60.4]	1.78" [45.2]
B217(B)-B220(B)	3/4"	20	2.73" [69.3]	1.87" [47.4]
B222-B225	1"	25	3.09" [78.4]	1.87" [47.4]
B229-B230	1¼"	32	3.72" [94.6]	1.87" [47.4]



	Valve Nor	ninal Size	Dimen	isions (Inches	[mm])
Valve Body	Inches DN [mm]		Α	В	C
B307(B)-B311(B)	1/2"	15	2.41" [61.1]	1.39" [35.2]	1.20" [30.6]
B312(B)-B315(B)	1/2"	15	2.38" [60.4]	1.78" [45.2]	1.29" [32.8]
B317(B)-B320(B)	3/4"	20	2.73" [69.3]	1.87" [47.4]	1.47" [37.3]
B322-B325	1"	25	3.09" [78.4]	1.87" [47.4]	1.59" [40.3]

LF Actuators, On/Off



Wiring Diagrams



INSTALLATION NOTES



Provide overload protection and disconnect as required.



CAUTION Equipment damage!

Actuators may be connected in parallel. Power consumption must be observed.



Actuator may also be powered by 24 VDC.



For end position indication, interlock control, fan startup, etc., LF24-S US and LF120-S US incorporates a built-in auxiliary switch: 1 x SPDT, 6A (1.5A) @ 250 VAC, UL listed, adjustable 0° to 95°.

perform these tasks. Failure to follow all electrical safety precautions when exposed to live



APPLICATION NOTES



Meets cULus or UL and CSA requirements without the need of an electrical ground connection.

WARNING 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

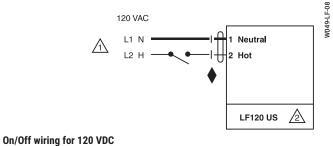
electrical components could result in death or serious injury.

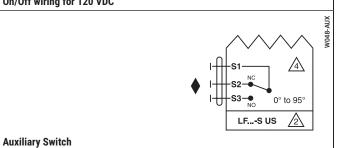
24 VACTransformer

Line Volts

On/Off wiring for 24 VDC

120 VAC





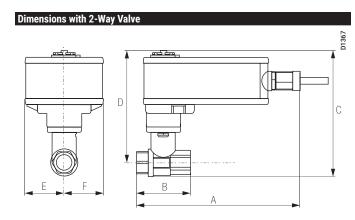


Models LF24-3 US

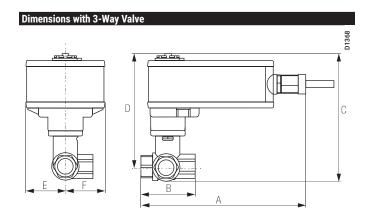
LF24-3-S US w/

w/built-in Aux. Switch

Technical Data	
Power supply	24 VAC ± 20% 50/60 Hz
	24 VDC ± 10%
Power consumption running	2.5 W
holding	1W
Transformer sizing	5 VA (class 2 power source)
Electrical connection	½" conduit connector
(-S models have 2 cables)	3 ft [1m], 18 GA appliance cable
Overload protection	electronic throughout 0° to 95° rotation
Input impedance	1000 Ω (0.6w) control inputs
Angle of rotation	95°
Direction of rotation spring	reversible with CW/CCW mounting
motor	reversible with built-in \frown / \frown switch
Position indication	visual indicator 0° to 90°
Running time motor	150 seconds constant independent of load
spring	
	<60 seconds @ -22°F [-30°C]
Humidity	5 to 95% RH non-condensing
Ambient temperature	-22° F to 122° F [-30° C to 50° C]
Storage temperature	-40° F to 176° F [-40° C to 80° C]
Housing	NEMA type 2/IP54
Housing material	zinc coated metal
Agency listings	cULus according to UL 873 and CAN/CSA
	C22.2 No. 24-93
` ,	<30 db(A)
spring return	62 dB(A)
Servicing	maintenance free
Quality standard	ISO 9001
LF24-3-S US	
Auxiliary switch	1 x SPDT, 6A (1.5A) @ 250 VAC, UL Listed,
	adjustable 0° to 95° (double insulated)



	Valve Nor	ninal Size	Dimensions (Inches [mm])
Valve Body	Inches DN [mm]		Α	В
B207(B)-B211(B)	1/2"	15	2.41" [61.1]	1.39" [35.2]
B212(B)-B215(B)	1/2"	15	2.38" [60.4]	1.78" [45.2]
B217(B)-B220(B)	3/4"	20	2.73" [69.3]	1.87" [47.4]
B222-B225	1"	25	3.09" [78.4]	1.87" [47.4]
B229-B230	1¼"	32	3.72" [94.6]	1.87" [47.4]



	Valve Nor	ninal Size	Dimen	isions (Inches	[mm])
Valve Body	Inches DN [mm]		Α	В	С
B307(B)-B311(B)	1/2"	15	2.41" [61.1]	1.39" [35.2]	1.20" [30.6]
B312(B)-B315(B)	1/2"	15	2.38" [60.4]	1.78" [45.2]	1.29" [32.8]
B317(B)-B320(B)	3/4"	20	2.73" [69.3]	1.87" [47.4]	1.47" [37.3]
B322-B325	1"	25	3.09" [78.4]	1.87" [47.4]	1.59" [40.3]

LF24-3 Actuators, Floating Point



Wiring Diagrams



INSTALLATION NOTES



CAUTION Equipment damage!



Actuators may be connected in parallel. Power consumption must be observed.



Actuators may also be powered by 24 VDC.



The common connection from the actuator must be connected to the Hot connection of the controller.



The actuator Hot must be connected to the control board common.



For end position indication, interlock control, fan startup, etc., LF24-3-S US incorporates one built-in auxiliary switch: 1 x SPDT, 6A (1.5A) @ 250 VAC, UL listed, adjustable 0° to 95°.



Actuators with plenum rated cable do not have numbers on wires; use color coded instead. Actuators with appliance rated cable use



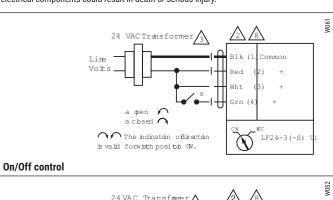
APPLICATION NOTES

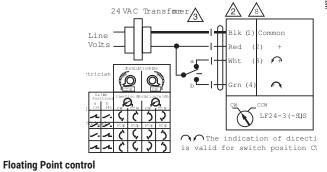


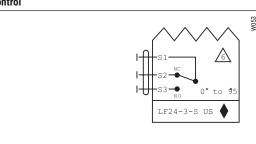
Meets cULus or UL and CSA requirements without the need of an electrical ground connection.

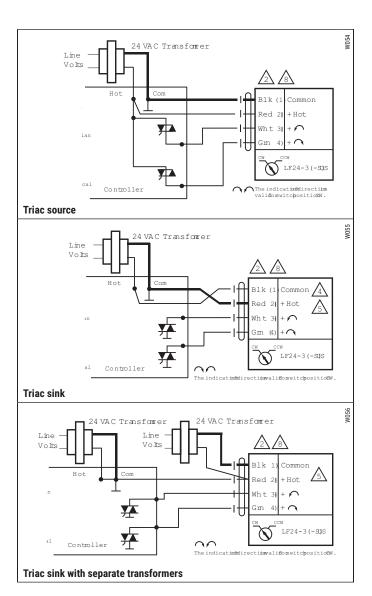
WARNING Live Electrical Components!

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.









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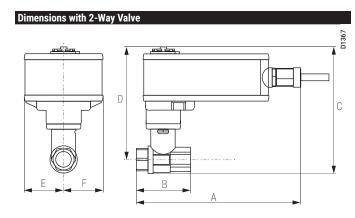
Auxiliary switch

Models LF24-SR US LF24-SR-S US

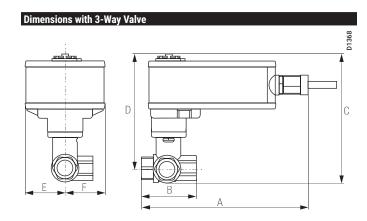
S w/built-in Aux. Switch

Technical Data		
Control		proportional
Control signal		2 to 10 VDC
		4 to 20 mA (with 500 Ω resistor)
Power consumption ru	nning	2.5 W
ho	olding	1 W
Transformer sizing		5 VA, class 2 power
Electrical connection		½" conduit connector
(-S models have 2 cables)		3 ft [1m], 18 GA appliance cable
Overload protection		electronic throughout 0° to 95° rotation
Feedback output		2 to 10 VDC
Input impedance		100 kΩ
Angle of rotation		95°
Direction of rotation s	pring	reversible with CW/CCW mounting
	notor	- / -
Position indication		visual indicator
Running time	notor	150 sec. independent of load (proportional)
	pring	
		<60 seconds @ -22°F [-30°C]
Ambient temperature		-22° F to 122° F [-30° C to 50° C]
Housing		NEMA 2
Agency listings		cULus according to UL 873 and CAN/CSA
, ,		C22.2 No. 24-93
Noise level (max) ru	nning	<30 db(A)
spring r	9	
Quality standard		ISO 9001
LF24-SR-S US		
Auxiliary switch		1 x SPDT, 6A (1.5A) @ 250 VAC, UL Listed,
,		1

adjustable 0° to 95° (double insulated)



	Valve Nominal Size		Dimensions (Inches [mm])	
Valve Body	Inches DN [mm]		Α	В
B207(B)-B211(B)	1/2"	15	2.41" [61.1]	1.39" [35.2]
B212(B)-B215(B)	1/2"	15	2.38" [60.4]	1.78" [45.2]
B217(B)-B220(B)	3/4"	20	2.73" [69.3]	1.87" [47.4]
B222-B225	1"	25	3.09" [78.4]	1.87" [47.4]
B229-B230	1¼"	32	3.72" [94.6]	1.87" [47.4]



	Valve Nominal Size		Dimensions (Inches [mm])		
Valve Body	Inches	DN [mm]	Α	В	С
B307(B)-B311(B)	1/2"	15	2.41" [61.1]	1.39" [35.2]	1.20" [30.6]
B312(B)-B315(B)	1/2"	15	2.38" [60.4]	1.78" [45.2]	1.29" [32.8]
B317(B)-B320(B)	3/4"	20	2.73" [69.3]	1.87" [47.4]	1.47" [37.3]
B322-B325	1"	25	3.09" [78.4]	1.87" [47.4]	1.59" [40.3]

Wiring Diagrams



< INSTALLATION NOTES



CAUTION Equipment damage!

Actuators may be connected in parallel. Up to 4 actuators may be connected in parallel. With 4 actuators wired to one 500 Ω resistor, a +2% shift of control signal may be required. Power consumption must be observed.



Actuators may also be powered by 24 VDC.



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



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



For end position indication, interlock control, fan startup, etc., LF24-SR-S US incorporates one built-in auxiliary switch: 1 x SPDT, 6A (1.5A) @ 250 VAC, UL listed, adjustable 0° to 95°.



The LF24-SR-S US wire 5 is white.



APPLICATION NOTES



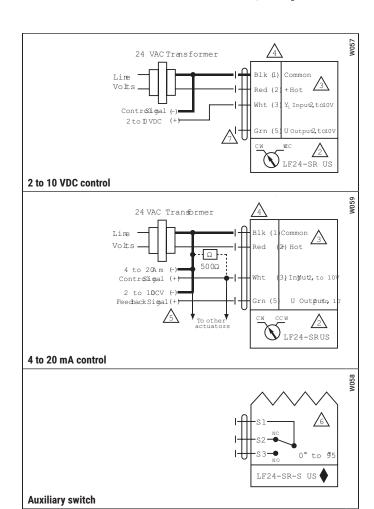
The ZG-R01 500 Ω resistor converts the 4 to 20 mA control signal to 2 to 10 VDC, up to 2 actuators may be connected in parallel.



Meets cULus or UL and CSA requirements without the need of an electrical ground connection.

\triangle

WARNING Live Electrical Components!



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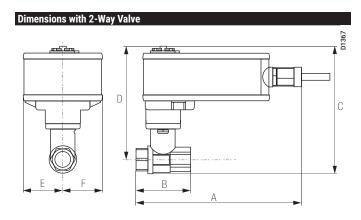
BELIMO ctuators, Multi-Function Technology



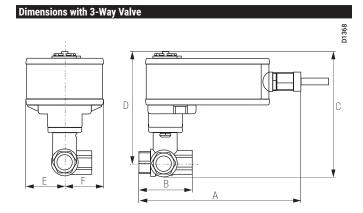
Models LF24-MFT US

LF24-MFT-S US w/built-in Aux. Switch

Technical Data	
Control	MFT
Control signal	2 to 10 VDC
Power consumption running	2.5 W
holding	1 W
Transformer sizing	5 VA (class 2 power source)
Electrical connection	½" conduit connector
(-S models have 2 cables)	3 ft [1m], 18 GA appliance cable
Overload protection	electronic throughout 0° to 95° rotation
Feedback output	2 to 10 VDC, 0.5 mA max
Input impedance	100 kΩ for 2 to 10 VDC (0.1 mA)
	500Ω for 4 to 20mA
	750 Ω for PWM
	500Ω for on/off and floating point
Angle of rotation	95°
Direction of rotation spring	reversible with CW/CCW mounting
motor	reversible with built-in \frown / \frown switch
Position indication	visual indicator
Running time motor	150 seconds independent of load
	(proportional, default)
spring	<25 seconds @-4°F to 122°F [-20°C to 50°C]
	<60 seconds @-22°F [-30°C]
Ambient temperature	-22° F to 122° F [-30° C to 50° C]
Housing	NEMA 2
Agency listings	cULus according to UL 873 and CAN/CSA
	C22.2 No. 24-93
` ,	<30 db(A)
spring return	62 dB(A)
Quality standard	ISO 9001
LF24-MFT-S US	
Auxiliary switch	1 x SPDT, 6A (1.5A) @ 250 VAC, UL Listed,
	adjustable 0° to 95° (double insulated)



	Valve Nominal Size		Dimensions (Inches [mm])
Valve Body	Inches DN [mm]		Α	В
B207-B211	1/2"	15	2.41" [61.1]	1.39" [35.2]
B212-B215	1/2"	15	2.38" [60.4]	1.78" [45.2]
B217-B220	3/4"	20	2.73" [69.3]	1.87" [47.4]
B222-B225	1"	25	3.09" [78.4]	1.87" [47.4]
B229-B230	1¼"	32	3.72" [94.6]	1.87" [47.4]



	Valve Nominal Size		Dimen	[mm])	
Valve Body	Inches	DN [mm]	Α	В	С
B307-B311	1/2"	15	2.41" [61.1]	1.39" [35.2]	1.20" [30.6]
B312-B315	1/2"	15	2.38" [60.4]	1.78" [45.2]	1.29" [32.8]
B317-B320	3/4"	20	2.73" [69.3]	1.87" [47.4]	1.47" [37.3]
B322-B325	1"	25	3.09" [78.4]	1.87" [47.4]	1.59" [40.3]

LF24-MFT Actuators, Multi-Function Technology



Wiring Diagrams



INSTALLATION NOTES



CAUTION Equipment damage!

Actuators may be connected in parallel if not mechanically mounted to the same shaft. Power consumption and input impedance must be observed.



Actuators may also be powered by 24 VDC.



IN4004 or IN4007 diode (IN4007 supplied, Belimo part number 40155).



Triac A and B can also be contact closures.



Control signal may be pulsed from either the Hot (Source) or Common (Sink) 24 VAC line.



Position feedback cannot be used with Triac sink controller. The actuators internal common reference is not compatible.

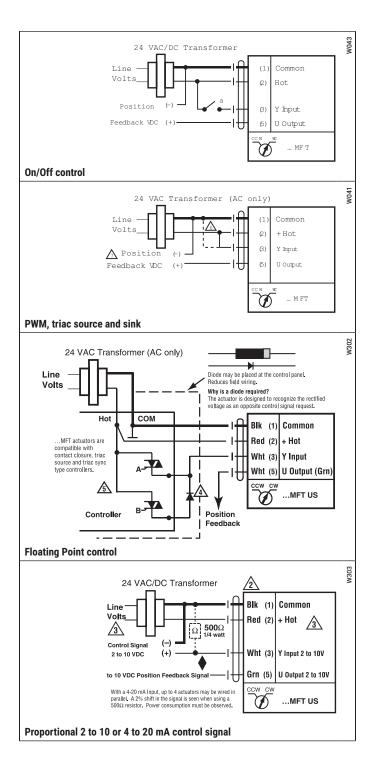


APPLICATION NOTES



The ZG-R01 500 Ω resistor converts the 4 to 20 mA control signal to 2 to 10 VDC, up to 2 actuators may be connected in parallel.

WARNING Live Electrical Components!









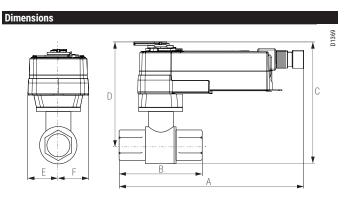
Models

AFRB24 AFRB24-S AFRX24 AFRX24-S

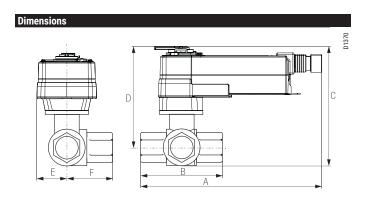
Technical Data		24 VAC ± 20% 50/60 Hz		
Dower consumntion		24 VDC +20% / -10%		
·	running			
	holding			
Transformer sizing		7.5 VA (class 2 power source)		
Electrical connection				
AFRB24		3 ft., 18 GA appliance cable, 1/2" conduit		
		connector		
		-S models: two 3 ft., 18 gauge appliance		
A EDVO A		cables with 1/2" conduit connectors		
AFRX24		3 ft. [1m], 10 ft. [3m] or 16 ft. [5m] 18 GA		
		appliance or plenum cables, with or without 1/2" conduit connector		
		-S models: two 3 ft. [1m], 10 ft. [3m] or 16 ft. [5m] appliance cables, with or without		
		1/2" conduit connectors		
Overload protection		electronic throughout 0 to 95° rotation		
Control		on/off		
Direction of rotation	spring	reversible with CW/CCW mounting		
Angle of rotation	Spring	95°		
Running time	motor	< 75 seconds		
nullilling tillle		20 seconds @ -4°F to 122°F [-20°C to 50°C];		
	spring			
Position indication		< 60 seconds @ -22°F [-30°C] visual indicator, 0° to 95°		
Position mulcation		(0° is full spring return position)		
Manual override		5 mm hex crank (3/16" Allen), supplied		
Ambient temperature		-22°F to 122°F [-30°C to 50°C]		
Storage temperature		-40°F to 176°F [-40°C to 80°C]		
Housing		NEMA 2, IP54, Enclosure Type2		
Agency listings †		cULus according, to UL60730-1A/-2-14,		
Agency namings		CAN/CSA E60730-1:02, CE according. to		
		2004/108/EC & 2006/95/EC		
Noise level		<50dB(A) motor @ 75 seconds		
110130 16761		≤62dB(A) spring return		
Ouglity atomdord		* * * -		
Quality standard		ISO 9001		

[†] Rated Impulse Voltage 800V, Type of action 1.AA (1.AA.B for -S version), Control Pollution Degree 3.

AFRB24-S, AFRX24-S	
Auxiliary switches	2 x SPDT 3A (0.5A) @ 250 VAC, UL approved one set at +10°, one adjustable 10° to 90°



	Valve Nominal Size		Dimensions (Inches [mm])	
Valve Body	Inches	DN [mm]	Α	В
B212-B216	1/2"	15	2.38" [60.4]	1.72" [43.7]
B217-B221	3/4"	20	2.73" [69.3]	1.81" [45.9]
B222-B225	1"	25	3.09" [78.4]	1.81" [45.9]
B229-B230	1¼"	32	3.72" [94.6]	1.81" [45.9]
B231-B232	1¼"	32	3.72" [94.6]	1.98" [50.4]
B238-B240	1½"	40	3.88" [98.5]	1.98" [50.4]
B248-B250	2"	50	4.21" [107.0]	2.21" [56.2]
B251-B254	2"	50	4.93" [125.2]	2.68" [68.0]
B261-B265	2½"	65	5.55" [140.9]	2.68" [68.0]
B277-B280	3"	80	5.82" [147.9]	2.68" [68.0]



	Valve Nominal Size		Dimensions (Inches [mm])			
Valve Body	Inches	DN [mm]	Α	В	С	
B312-B316	1/2"	15	2.38" [60.4]	1.72" [43.7]	1.26" [32.1]	
B317-B321	3/4"	20	2.73" [69.3]	1.81" [45.9]	1.45" [36.8]	
B322-B325	1"	25	3.09" [78.4]	1.81" [45.9]	1.56" [39.8]	
B329-B331	1¼"	32	3.96" [100.6]	2.21" [56.2]	2.14" [54.3]	
B338-B341	1½"	40	4.39" [111.6]	2.45" [62.2]	2.33" [59.1]	
B347-B352	2"	50	4.90" [124.5]	2.68" [68.0]	2.60" [66.0]	

AFRB24(-S), AFRX24(-S) Actuators, On/Off



Wiring Diagrams



INSTALLATION NOTES



Provide overload protection and disconnect as required.



CAUTION Equipment Damage!

Actuators may be connected in parallel.

Power consumption and input impedance must be observed.



Actuators may also be powered by 24 VDC.



For end position indication, interlock control, fan startup, etc., AFRB24-S and AFRX24-S incorporates two built-in auxiliary switches: 2 x SPDT, 3A (0.5A) @250 VAC, UL Approved, one switch is fixed at +10°, one is adjustable 10° to 90°.



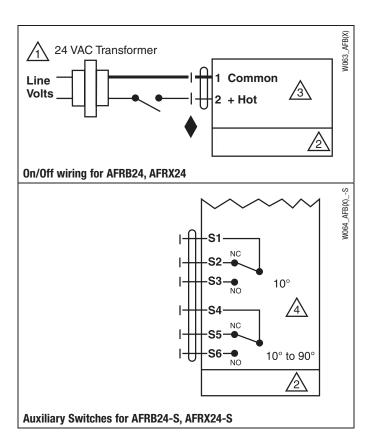
APPLICATION NOTES



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

∧ WA

WARNING Live Electrical Components!













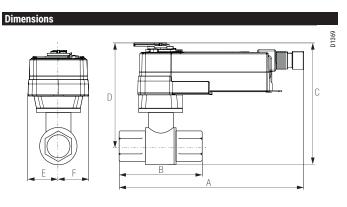
Models AFRBUP

AFRBUP-S AFRXUP AFRXUP-S

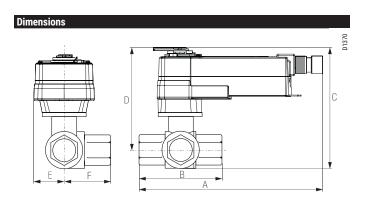
Technical Data		
Power supply		24 to 240 VAC -20% / +10%, 50/60 Hz
1 Owor Suppry		24 to 125 VDC ±10%
Power consumption	running	
1 owor concumption		
Transformer sizing	noluling	7 VA @ 24 VAC (class 2 power source)
Transformer sizing		8.5 VA @ 120 VAC
		18 VA @ 240 VAC
Electrical connection		10 11 0 110
AFRBUP		3 ft., 18 GA appliance cable, 1/2" conduit
711 11201		connector
		-S models: two 3 ft., 18 gauge appliance
		cables with 1/2" conduit connectors
AFRXUP		3 ft. [1m], 10 ft. [3m] or 16 ft. [5m] 18 GA
		appliance or plenum cables, with or without
		1/2" conduit connector
		-S models: two 3 ft. [1m], 10 ft. [3m] or
		16 ft. [5m] appliance cables, with or without
		1/2" conduit connectors
Overload protection		electronic throughout 0 to 95° rotation
Control		on/off
Direction of rotation	spring	reversible with CW/CCW mounting
Angle of rotation		95° (adjustable with mechanical end stop, 35°
		to 95°)
Running time		< 75 seconds
	spring	20 seconds @ -4°F to 122°F [-20°C to 50°C];
-		< 60 seconds @ -22°F [-30°C]
Position indication		visual indicator, 0° to 95°
		(0° is full spring return position)
Manual override		5 mm hex crank (3/16" Allen), supplied
Ambient temperature		-22°F to 122°F [-30°C to 50°C]
Storage temperature		-40°F to 176°F [-40°C to 80°C]
Housing		NEMA 2/IP54, Enclosure Type2
Agency listings †		cULus according. to UL60730-1A/-2-14,
		CAN/CSA E60730-1:02, CE according. to
-		2004/108/EC & 2006/95/EC
Noise level		<50dB(A) motor @ 75 seconds
		≤62dB(A) spring return
Quality standard		ISO 9001

† Rated Impulse Voltage 800V, Type of action 1.AA (1.AA.B for -S version), Control Pollution Degree 3.

AFRBUP-S, AFRXUP-S	
	2 x SPDT 3A (0.5A) @ 250 VAC, UL approved
	one set at +10°, one adjustable 10° to 90°



	Valve Nominal Size		Dimensions (Inches [mm]	
Valve Body	Inches	DN [mm]	Α	В
B212-B216	1/2"	15	2.38" [60.4]	1.72" [43.7]
B217-B221	3/4"	20	2.73" [69.3]	1.81" [45.9]
B222-B225	1"	25	3.09" [78.4]	1.81" [45.9]
B229-B230	1¼"	32	3.72" [94.6]	1.81" [45.9]
B231-B232	1¼"	32	3.72" [94.6]	1.98" [50.4]
B238-B240	1½"	40	3.88" [98.5]	1.98" [50.4]
B248-B250	2"	50	4.21" [107.0]	2.21" [56.2]
B251-B254	2"	50	4.93" [125.2]	2.68" [68.0]
B261-B265	2½"	65	5.55" [140.9]	2.68" [68.0]
B277-B280	3"	80	5.82" [147.9]	2.68" [68.0]



Valve Nominal Size		Dimensions (Inches [mm])			
Valve Body	Inches	DN [mm]	Α	В	С
B312-B316	1/2"	15	2.38" [60.4]	1.72" [43.7]	1.26" [32.1]
B317-B321	3/4"	20	2.73" [69.3]	1.81" [45.9]	1.45" [36.8]
B322-B325	1"	25	3.09" [78.4]	1.81" [45.9]	1.56" [39.8]
B329-B331	1¼"	32	3.96" [100.6]	2.21" [56.2]	2.14" [54.3]
B338-B341	1½"	40	4.39" [111.6]	2.45" [62.2]	2.33" [59.1]
B347-B352	2"	50	4.90" [124.5]	2.68" [68.0]	2.60" [66.0]

AFRBUP(-S), AFRXUP(-S) Actuators, On/Off



Wiring Diagrams



X INSTALLATION NOTES



Provide overload protection and disconnect as required.



CAUTION Equipment Damage!

Actuators may be connected in parallel.

Power consumption and input impedance must be observed.



No ground connection is required.



For end position indication, interlock control, fan startup, etc., AFRBUP-S and AFRXUP-S incorporates two built-in auxiliary switches: 2 x SPDT, 3A (0.5A) @250 VAC, UL Approved, one switch is fixed at +10°, one is adjustable 10° to 90°.



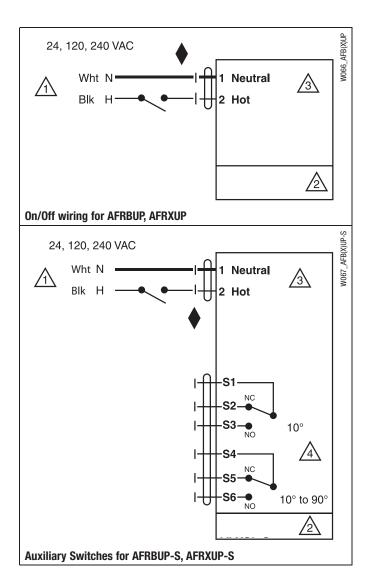
APPLICATION NOTES



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

WARNING 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.



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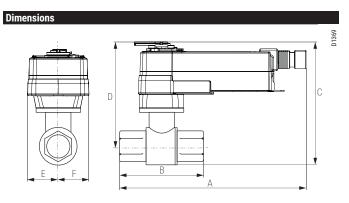




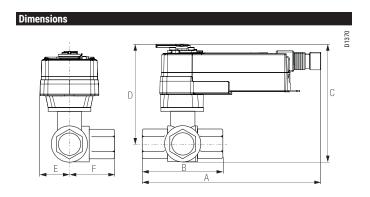


Tankwis al Bata		
Technical Data		
Power supply		24 VAC ±20%, 50/60 Hz
		24 VDC +20% / -10%
Power consumption	running	
	holding	
Transformer sizing		8.5 VA (class 2 power source)
Electrical connection		
AFRB		3 ft, 18 GA appliance cable, 1/2" conduit
		connector
		-S models: two 3 ft, 18 gauge appliance cables
AEV		with 1/2" conduit connectors
AFX		3 ft [1m], 10 ft [3m] or 16 ft [5m] 18 GA
		appliance or plenum cables, with or without 1/2" conduit connector
		-S models: Two 3 ft [1m], 10 ft [3m] or
		16 ft [5m] appliance cables, with or without 1/2"
		conduit connectors
Overload protection		electronic throughout 0 to 95° rotation
Operating range Y		2 to 10 VDC, 4 to 20mA
Input impedance		100 kΩ for 2 to 10 VDC (0.1 mA)
input impodance		500 Ω for 4 to 20 mA
Feedback output U		2 to 10 VDC (max. 0.5 mA)
Direction of rotation	spring	reversible with CW/CCW mounting
Direction of retation		reversible with built-in switch
Mechanical angle of ro		95° (adjustable with mechanical end stop, 35° to
moonamour anglo of ro	auon	95°)
Running time	spring	< 20 seconds @ -4°F to 122°F [-20°C to 50°C];
g	9,9	< 60 seconds @ -22°F [-30°C]
	motor	
Position indication		visual indicator, 0° to 95°
		(0° is full spring return position)
Manual override		5 mm hex crank (3/16" Allen), supplied
Humidity		max. 95% RH non-condensing
Ambient temperature		-22°F to 122°F [-30°C to 50°C]
Storage temperature		-40°F to 176°F [-40°C to 80°C]
Housing		Nema 2, IP54, Enclosure Type2
Housing material		zinc coated metal and plastic casing
Agency listings†		cULus acc. to UL60730-1A/-2-14, CAN/CSA
5 , 5-,		E60730-1:02, CE acc. to 2004/108/EC &
		2006/95/EC
Noise level		≤40dB(A) motor @ 95 seconds
		≤62dB(A) spring return
Servicing		maintenance free
Quality standard		ISO 9001
Weight		4.6 lbs (2.1 kg); 4.9 lbs (2.25 kg) with switches

Weight 4.6 lbs (2.1 kg); 4.9 lbs (2.25 kg) with switches † Rated Impulse Voltage 800V, Type of action 1.AA (1.AA.B for -S version), Control Pollution Degree 3.



	Valve Nor	ninal Size	Dimensions (Inches [mm])	
Valve Body	Inches	DN [mm]	Α	В
B212-B216	1/2"	15	2.38" [60.4]	1.72" [43.7]
B217-B221	3/4"	20	2.73" [69.3]	1.81" [45.9]
B222-B225	1"	25	3.09" [78.4]	1.81" [45.9]
B229-B230	1¼"	32	3.72" [94.6]	1.81" [45.9]
B231-B232	1¼"	32	3.72" [94.6]	1.98" [50.4]
B238-B240	1½"	40	3.88" [98.5]	1.98" [50.4]
B248-B250	2"	50	4.21" [107.0]	2.21" [56.2]
B251-B254	2"	50	4.93" [125.2]	2.68" [68.0]
B261-B265	2½"	65	5.55" [140.9]	2.68" [68.0]
B277-B280	3"	80	5.82" [147.9]	2.68" [68.0]



Valve Nominal Size		Dimensions (Inches [mm])			
Valve Body	Inches	DN [mm]	Α	В	С
B312-B316	1/2"	15	2.38" [60.4]	1.72" [43.7]	1.26" [32.1]
B317-B321	3/4"	20	2.73" [69.3]	1.81" [45.9]	1.45" [36.8]
B322-B325	1"	25	3.09" [78.4]	1.81" [45.9]	1.56" [39.8]
B329-B331	1¼"	32	3.96" [100.6]	2.21" [56.2]	2.14" [54.3]
B338-B341	1½"	40	4.39" [111.6]	2.45" [62.2]	2.33" [59.1]
B347-B352	2"	50	4.90" [124.5]	2.68" [68.0]	2.60" [66.0]

Shaft extension
Damper position indicator
Crank arm
Universal clamp for up to 1.05" dia jackshafts
Conduit fitting
8mm and 10 mm wrench
Universal mounting bracket
Universal mounting bracket
Mounting bracket for Barber Colman® MA 3/4, Honeywell® Mod III or IV or Johnson® Series 100 replacement or new crank arm type installations
Crank arm adaptor kit
Crank arm adaptor kit
Weather shield (metal)
Weather shield (polycarbonate)
Explosion-proof housing
NEMA 4X housing

NOTE: When using AFRB24-SR, AFRB24-SR-S, AFRX24-SR and AFRX24-SR-S actuators, only use accessories listed on this page.

For actuator wiring information and diagrams, refer to Belimo Wiring Guide.

Typical Specification

Spring return control damper actuators shall be direct coupled type which require no crank arm and linkage and be capable of direct mounting to a jackshaft up to a 1.05" diameter. The actuator must provide proportional damper control in response to a 2 to 10 VDC or, with the addition of a 500Ω resistor, a 4 to 20 mA control input from an electronic controller or positioner. The actuators must be designed so that they may be used for either clockwise or counterclockwise fail-safe operation. Actuators shall use a brushless DC motor controlled by a microprocessor and be protected from overload at all angles of rotation. Run time shall be constant, and independent of torque. A 2 to 10 VDC feedback signal shall be provided for position feedback. Actuators shall be cULus Approved and have a 5 year warranty, and be manufactured under ISO 9001 International Quality Control Standards. Actuators shall be as manufactured by Belimo.

Wiring Diagrams



INSTALLATION NOTES



Provide overload protection and disconnect as required.



CAUTION Equipment Damage!

Actuators may be connected in parallel.

Power consumption and input impedance must be observed.



Up to 4 actuators may be connected in parallel if not mechanically mounted to the same shaft. With 4 actuators wired to one 500 Ω resistor. Power consumption must be observed.







For end position indication, interlock control, fan startup, etc., AFB24-SR-S and AFX24-SR-S incorporates two built-in auxiliary switches: 2 x SPDT, 3A (0.5A) @250 VAC, UL Approved, one switch is fixed at +10°, one is adjustable 10° to 90°.



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



APPLICATION NOTES

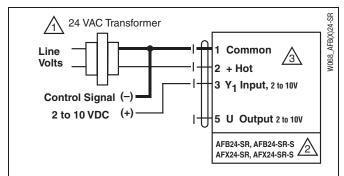


The ZG-R01 500 Ω resistor converts the 4 to 20 mA control signal to 2 to 10 VDC.

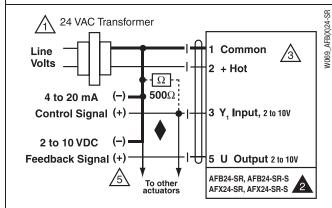
ATTENTION: AFRB24-SR(-S) and AFRX24-SR(-S) cannot be tandem mounted on the same damper or valve shaft. Only On/Off and MFT AF models can be used for tandem mount applications.

WARNING Live Electrical Components!

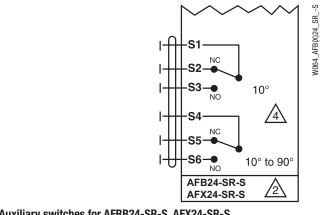
During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow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



2 to 10 VDC control of AFRB24-SR and AFRX24-SR



4 to 20 mA control of AFRB24-SR and AFRX24-SR with 2 to 10 VDC feedback output



Auxiliary switches for AFRB24-SR-S, AFX24-SR-S



AFRX Actuators, Multi-Function Technology











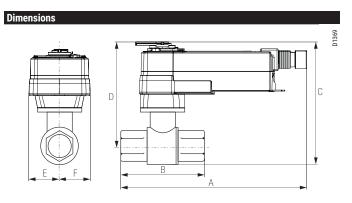
Models

AFRX24-MFT AFRX24-MFT-S

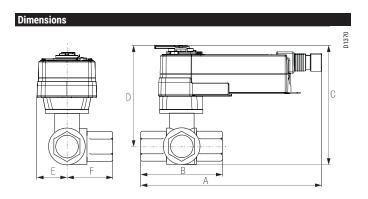
Technical Data		
Control		MFT
Control signal		2 to 10 VDC, 4 to 20 mA (default)
.		variable (VDC, PWM, floating point, on/off)
Power supply		24 VAC, +/- 20%, 50/60 Hz
		24 VDC, +20% / -10%
Power consumption†	running	7.5 W
	holding	3 W
Transformer sizing†		10 VA (Class 2 power source)
Electrical connection		3 ft. [1m], 10 ft. [3m] or 16 ft. [5m] 18 GA ap-
		pliance or plenum cables, with or without 1/2"
		conduit connector
		-S models: two 3 ft. [1m], 10 ft. [3m] or 16 ft.
		[5m] appliance cables with or without 1/2"
		conduit connectors
Overload protection		electronic throughout 0 to 90° rotation
Feedback output*		2 to 10 VDC, 0.5 mA max (variable)
Input impedance		100 kΩ for 2 to 10 VDC (0.1 mA)
		500 Ω for 4 to 20 mA
		1500 Ω for on/off and floating point
Angle of rotation		95°
Direction of rotation*		reversible with CW/CCW mounting
B 11 1 1 1	motor	reversible with built-in \bigcirc/\bigcirc switch
Position indication		visual indicator 0° to 95°(0° is spring return
		position)
Manual override		5 mm hex crank (3/16" Allen), supplied
Running time	motor*	150 seconds (default),
		variable (70 to 220 seconds)
Ambient temperature	spring	
Ambient temperature		-22° F to 122° F [-30° C to 50° C]
Housing		NEMA 2, IP54, Enclosure Type 2
Agency listings		cULus according. To UL60730-1A/-2-14,
		CAN/CSA E60730- 1:02, CE according. To 2004/108/EC & 2006/95/EC
Noise level		≤40dB(A) motor @ 150 seconds, run time
MOISE IEVEI		dependent
		≤62dB(A) spring return
Quality standard		ISO 9001
Quality Stallualu		100 7001

- † Programmed for 70 sec motor runtime. At 150 sec motor run time, transformer sizing is
- 8.5 VA and power consumption is 6 W running/3 W holding.
- * Variable when configured with MFT options
- ‡ Rated Impulse Voltage 800V, Type of action 1.AA (1.AA.B for -S version), Control Pollution Degree 3.

AFRX24-MFT-S	
Auxiliary switches	2 x SPDT 3A (0.5A) @ 250 VAC, UL approved
	one set at +10° to 90°

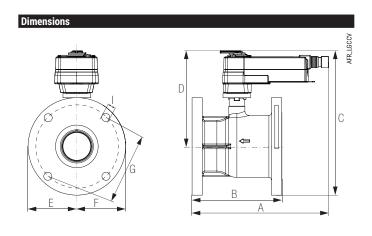


	Valve Nominal Size		Dimensions (Inches [mm])
Valve Body	Inches	DN [mm]	Α	В
B212-B216	1/2"	15	2.38" [60.4]	1.72" [43.7]
B217-B221	3/4"	20	2.73" [69.3]	1.81" [45.9]
B222-B225	1"	25	3.09" [78.4]	1.81" [45.9]
B229-B230	1¼"	32	3.72" [94.6]	1.81" [45.9]
B231-B232	1¼"	32	3.72" [94.6]	1.98" [50.4]
B238-B240	1½"	40	3.88" [98.5]	1.98" [50.4]
B248-B250	2"	50	4.21" [107.0]	2.21" [56.2]
B251-B254	2"	50	4.93" [125.2]	2.68" [68.0]
B261-B265	2½"	65	5.55" [140.9]	2.68" [68.0]
B277-B280	3"	80	5.82" [147.9]	2.68" [68.0]



	Valve Nominal Size		Dimensions (Inches [mm])		
Valve Body	Inches	DN [mm]	Α	В	С
B312-B316	1/2"	15	2.38" [60.4]	1.72" [43.7]	1.26" [32.1]
B317-B321	3/4"	20	2.73" [69.3]	1.81" [45.9]	1.45" [36.8]
B322-B325	1"	25	3.09" [78.4]	1.81" [45.9]	1.56" [39.8]
B329-B331	1¼"	32	3.96" [100.6]	2.21" [56.2]	2.14" [54.3]
B338-B341	1½"	40	4.39" [111.6]	2.45" [62.2]	2.33" [59.1]
B347-B352	2"	50	4.90" [124.5]	2.68" [68.0]	2.60" [66.0]





Valve Body	Nominal Pipe Size	Top Flange Design	Flange Diameter	Face-to-Face Length	Height
			Α	В	С
B6250	2½" [65]		7.50" [190.5]	5.50" [139.7]	8.10" [205.4]
B6300	3" [80]	F05	8.00" [203.2]	6.60" [167.6]	8.40" [213.1]
B6400	4" [100]		9.00" [228.6]	8.30" [210.8]	9.30" [235.9]

Wiring Diagrams

X INSTALLATION NOTES



Provide overload protection and disconnect as required.



CAUTION Equipment Damage!

Actuators may be connected in parallel if not mechanically mounted to the same shaft. Power consumption and input impedance must be observed.



Actuators may also be powered by 24 VDC.



Position feedback cannot be used with Triac sink controller. The actuator internal common reference is not compatible.



Control signal may be pulsed from either the Hot (source)



or the Common (sink) 24 VAC line.



Contact closures A & B also can be triacs.

A & B should both be closed for triac source and open for triac sink.



For triac sink the common connection from the actuator must be connected to the hot connection of the controller.



APPLICATION NOTES



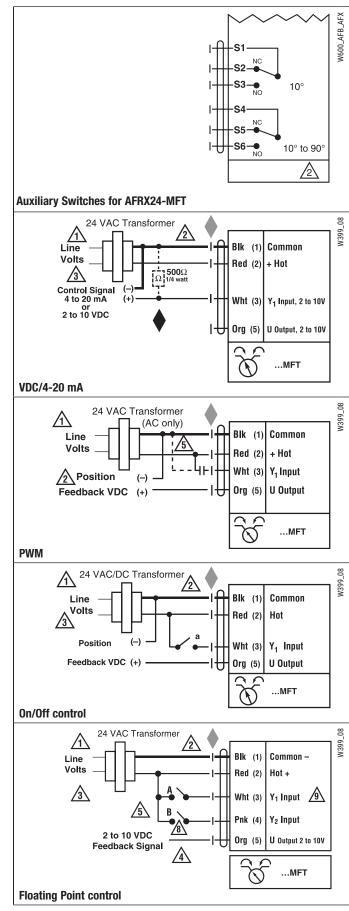
Meets UL requirements without the need of an electrical ground connection



The ZG-R01 500 Ω resistor may be used.



WARNING Live Electrical Components!







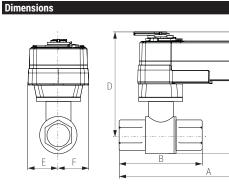
Models AFRX24-MFT95

AFRX24-MFT95 Actuator, Proportional Potentiometric Control





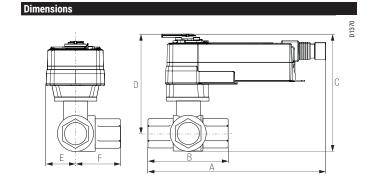




LISTED 94 DS 100. 8 CUL US REG. EAVIP.

	Valve Nominal Size		Dimensions (Inches [mm]	
Valve Body	Inches	DN [mm]	Α	В
B212-B215	1/2"	15	2.38" [60.4]	1.72" [43.7]
B217-B221	3/4"	20	2.73" [69.3]	1.81" [45.9]
B222-B225	1"	25	3.09" [78.4]	1.81" [45.9]
B229-B230	1¼"	32	3.72" [94.6]	1.81" [45.9]
B231-B232	1¼"	32	3.72" [94.6]	1.98" [50.4]
B238-B240	1½"	40	3.88" [98.5]	1.98" [50.4]
B248-B250	2"	50	4.21" [107.0]	2.21" [56.2]
B251-B254	2"	50	4.93" [125.2]	2.68" [68.0]
B261-B265	2½"	65	5.55" [140.9]	2.68" [68.0]
B277-B280	3"	80	5.82" [147.9]	2.68" [68.0]

Tankai and Bata		
Technical Data		MFT
Control		
Control signal		0 to 135 Ω Honeywell Electronic Series 90,
		0 to 135 Ω input
Power supply		24 VAC, +/- 20%, 50/60 Hz
		24 VDC, +20% / -10%
Power consumption†	running	7.5 W
	holding	3 W
Transformer sizing†		10 VA (Class 2 power source)
Electrical connection		3 ft. [1m], 10 ft. [3m] or 16 ft. [5m] 18 GA
		plenum cables, with or without 1/2" conduit
		connector
Overload protection		electronic throughout 0 to 90° rotation
Feedback output*		2 to 10 VDC, 0.5 mA max (variable)
Angle of rotation		95°
Direction of rotation*	spring	reversible with CW/CCW mounting
	motor	reversible with built-in \bigcirc/\bigcirc switch
Position indication		visual indicator 0° to 95°(0° is spring return
		position)
Manual override		5 mm hex crank (3/16" Allen), supplied
Running time	motor*	150 seconds (default),
· ·		variable (70 to 220 seconds)
	spring	<20 sec @ -4°F to 122°F [-20°C to 50°C]
Ambient temperature		-22° F to 122° F [-30° C to 50° C]
Housing		NEMA 2, IP54, Enclosure Type 2
Agency listings		cULus according. To UL60730-1A/-2-14,
- , ,		CAN/CSA E60730- 1:02, CE according. To
		2004/108/EC & 2006/95/EC
Noise level		<40dB(A) motor @ 150 seconds, run time
		dependent
		<u><62dB(A)</u> spring return
Quality standard		ISO 9001
+ D		: At 150t ti tf i-i i-



† Programmed for 70 sec motor runtime.	At 150 sec motor run time, transformer sizing is
8.5 VA and nower consumption is 6.W run	ning/3 W holding

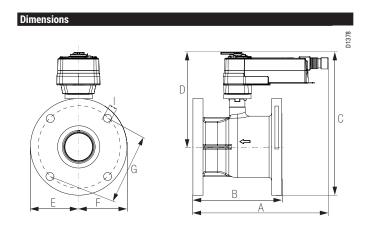
* Variable when configured with MFT options

‡ Rated Impulse Voltage 800V, Type of action 1.AA (1.AA.B for -S version), Control Pollution Degree 3.

	Valve Nominal Size		Dimensions (Inches [mm])			
Valve Body	Inches	DN [mm]	Α	В	С	
B312-B315	1/2"	15	2.38" [60.4]	1.72" [43.7]	1.26" [32.1]	
B317-B321	3/4"	20	2.73" [69.3]	1.81" [45.9]	1.45" [36.8]	
B322-B325	1"	25	3.09" [78.4]	1.81" [45.9]	1.56" [39.8]	
B329-B331	1¼"	32	3.96" [100.6]	2.21" [56.2]	2.14" [54.3]	
B338-B341	1½"	40	4.39" [111.6]	2.45" [62.2]	2.33" [59.1]	
B347-B352	2"	50	4.90" [124.5]	2.68" [68.0]	2.60" [66.0]	

AFRX24-MFT95 Actuator, Proportional Potentiometric Control





Valve Body	Nominal Pipe Size	Top Flange Design	Flange Diameter	Face-to-Face Length	Height
			Α	В	С
B6250	2½" [65]		7.50" [190.5]	5.50" [139.7]	8.10" [205.4]
B6300	3" [80]	F05	8.00" [203.2]	6.60" [167.6]	8.40" [213.1]
B6400	4" [100]		9.00" [228.6]	8.30" [210.8]	9.30" [235.9]

Wiring Diagrams

> INSTALLATION NOTES

1

Provide overload protection and disconnect as required.



Actuators and controller must have separate transformers.



Consult controller instruction data for more detailed installation information.

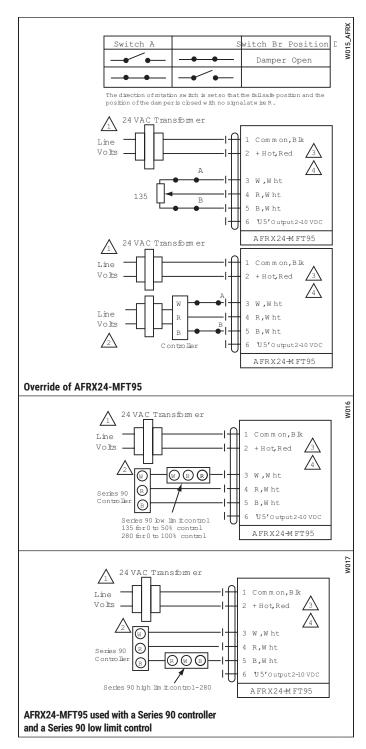


To reverse control rotation, use the reversing switch.



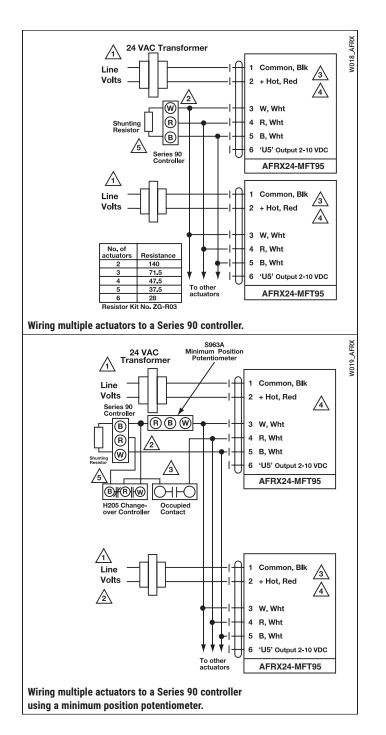
Resistor value depends on the type of controller and the number of actuators. No resistor is used for one actuator. Honeywell resistor kits may also be used.

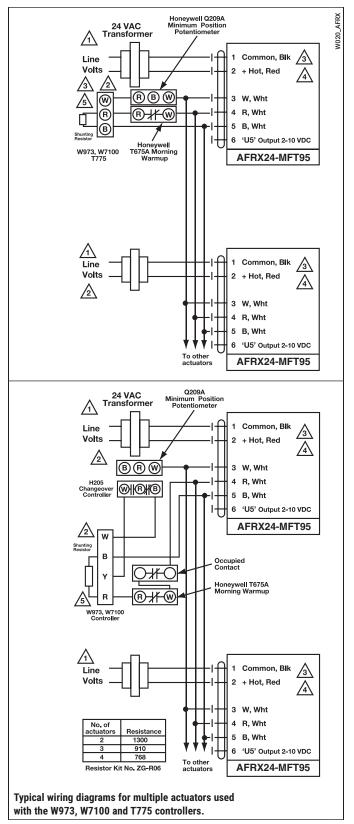
WARNING Live Electrical Components!





AFRX24-MFT95 Actuator, Proportional Potentiometric Control





AFRB24 N4, AFRB24 N4H, AFRB24-S N4, AFRB24-S N4H, AFRX24 N4, AFRX24 N4H, AFRX24-S N4, AFRX24-S N4H

NEMA 4, On/Off, Spring Return, 24 V











Models

AFRB24 N4 **Basic Version**

AFRB24 N4H Basic Version w/built in heater AFRB24-S N4 Basic Version w/built-in aux. switch

AFRB24-S N4H Basic Version w/built-in aux. switch & heater

AFRX24 N4 Flexible Version

AFRX24-S N4 Flexible Version w/built-in aux. switch AFRX24 N4H Flexible Version w/built in heater AFRX24-S N4H Flexible Version aux. switch & heater

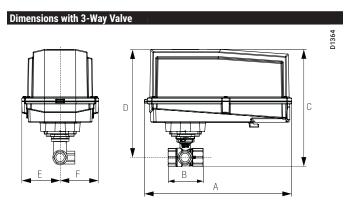
Technical Data	
Power supply	24 VAC ± 20% 50/60 Hz
	24 VDC +20% / -10%
Power consumption running	5 W / heater 25 W
holding	2.5 W
Transformer sizing	7.5 VA (class 2 power source) / heater 25 VA
Electrical connection	3 ft [1m], 10 ft [3m] or 16 ft [5m] 18 GA appliance
AFR N4	cable, with or without 1/2" conduit connector
	-S models: Two 3 ft [1m], 10 ft [3m] or
	16 ft [5m] appliance cables with or without 1/2"
	conduit connectors
heater (N4H)	terminal block, 26-16 GA
Overload protection	electronic throughout 0 to 95° rotation
Control	on/off
Torque	180 in-lb [20 Nm] minimum
Direction of rotation spring	reversible with CW/CCW mounting in housing
Mechanical angle of rotation	95° (adjustable with mechanical end stop, 35° to 95°)
Running time motor	< 75 seconds
spring	
	< 60 seconds @ -22°F [-30°C]

Direction of rotation spring	reversible with CW/CCW mounting in housing	
Mechanical angle of rotation	95° (adjustable with mechanical end stop, 35° to 95°	
Running time motor	< 75 seconds	
spring	20 seconds @ -4°F to 122°F [-20°C to 50°C];	
, ,	< 60 seconds @ -22°F [-30°C]	
spring (with heater)	20 seconds @ -4°F to 122°F [-20°C to 50°C], <60	
	seconds @ -49°F [-45°C]	
Position indication	visual indicator, 0° to 95°	
	(0° is full spring return position)	
Manual override	5 mm hex crank ($\frac{3}{16}$ " Allen), supplied	
Humidity	max. 95% RH non-condensing	
Ambient temperature	-22°F to 122°F [-30°C to 50°C]	
with heater	-49°F to 122°F [-45°C to 50°C]	
Storage temperature	-40°F to 176°F [-40°C to 80°C]	
Housing	UL Type 4, NEMA 4, IP66	
Housing material	polycarbonate	
Agency listings †	cULus acc. to UL60730-1A/-2-14,	
	CAN/CSA E60730-1:02, CE acc. to	
	2004/108/EC & 2006/95/EC	
Noise level	<50dB(A) motor @ 75 seconds	
	≤62dB(A) spring return	
Servicing	maintenance free	
Quality standard	ISO 9001	
Weight	9.7 lbs (4.4 kg); 10 lbs (4.5 kg) with switches;	
	10.5 lbs (4.8 kg) with heater	
† Rated Impulse Voltage 800V, Type of act	ion 1.AA (1.AA.B for -S version), Control Pollution Degree 4.	

2 x SPDT 3A (0.5A) @ 250 VAC, UL approved one set at +10°, one adjustable 10° to 90°

Dimensions with 2-Way Valve D С ٧

	Valve Nominal Size		Dimensions (Inches [mm])
Valve Body	Inches	DN [mm]	Α	В
B231-B232	1¼"	32	3.72" [94.6]	1.84" [47.4]
B238-B240	1½"	40	3.88" [98.5]	2.04" [51.9]
B248-B254	2"	50	4.93" [125.2]	2.73" [69.5]
B277-B280	3"	80	5.82" [147.9]	2.73" [69.5]



Valve Nominal Size		Dimensions (Inches [mm])			
Valve Body	Inches	DN [mm]	Α	В	С
B329-B332	1¼"	32	3.96" [100.6]	2.27" [57.7]	2.14" [54.3]
B338-B341	1½"	40	4.39" [111.6]	2.51" [63.7]	2.40" [61.1]
B347-B352	2"	50	4.90" [124.5]	2.73" [69.5]	2.74" [69.7]

AFRB24-S N4, AFRB24-S N4H, AFRX24-S N4, AFRX24-S N4H

Auxiliary switches



AFRB24 N4, AFRB24 N4H, AFRB24-S N4, AFRB24-S N4H, AFRX24 N4, AFRX24 N4H, AFRX24-S N4, AFRX24-S N4H

NEMA 4, On/Off, Spring Return, 24 V

Accessories	
Tool-06	8mm and 10 mm wrench
43442-00001	Gland (needed for additional wires)
11097-00001	Gasket for Gland (needed for additional wires)

NOTE: When using AFRB24 N4, AFRB24 N4H, AFRB24-S N4, AFRB24-S N4H, AFRX24 N4, AFRX24 N4H, AFRX24-S N4, AFRX24-S N4H actuators, only use accessories listed on this page.

For actuator wiring information and diagrams, refer to Belimo Wiring Guide.

Typical Specification

The actuators must be designed so that they may be used for either clockwise or counterclockwise fail-safe operation. Actuators shall be protected from overload at all angles of rotation. If required, two SPDT auxiliary switch shall be provided having the capability of one being adjustable. Actuators with auxiliary switches must be constructed to meet the requirements for Double Insulation so an electrical ground is not required to meet agency listings. Actuators shall be cULus Approved and have a 5 year warranty, and be manufactured under ISO 9001 International Quality Control Standards. Actuators shall be as manufactured by Belimo.

Wiring Diagrams

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INSTALLATION NOTES



Provide overload protection and disconnect as required.



CAUTION Equipment Damage!

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



Actuators may also be powered by 24 VDC.



For end position indication, interlock control, fan startup, etc., AFRB24-S N4, AFRB24-S N4, AFRX24-S N4, AFRX24-S N4H incorporates two built-in auxiliary switches: 2 x SPDT, 3A (0.5A) @250 VAC, UL Approved, one switch is fixed at +10°, one is adjustable 10° to 90°.

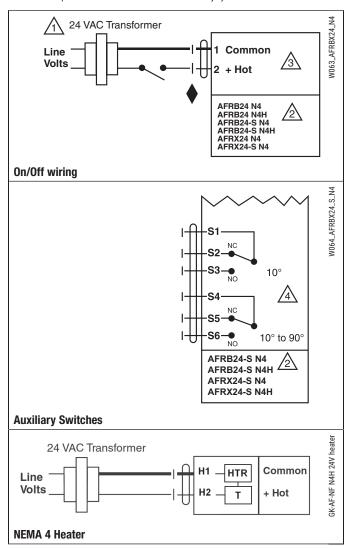


APPLICATION NOTES



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

WARNING Live Electrical Components!



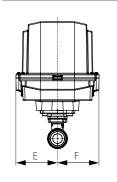
AFRBUP N4, AFRBUP-S N4, AFRBUP N4H, AFRBUP-S N4H, AFRXUP N4, AFRXUP-S N4, AFRXUP N4H, AFRXUP-S N4H

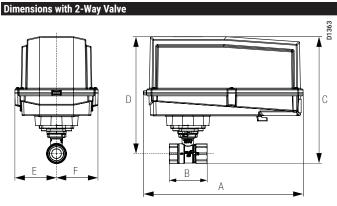
NEMA 4, On/Off, Spring Return, 24 to 240 VAC











	Valve Nominal Size		Valve Nominal Size Dimensions (Inche		Inches [mm])
Valve Body	Inches	DN [mm]	Α	В	
B231-B232	1¼"	32	3.72" [94.6]	1.84" [47.4]	
B238-B240	1½"	40	3.88" [98.5]	2.04" [51.9]	
B248-B254	2"	50	4.93" [125.2]	2.73" [69.5]	
B261-B265	2½"	65	5.55" [140.9]	2.73" [69.5]	
B277-B280	3"	80	5.82" [147.9]	2.73" [69.5]	

Models

AFRBUP N4 **Basic Version**

AFRBUP-S N4 Basic Version w/built-in aux. switch AFRBUP N4H Basic Version w/built in heater

AFRBUP-S N4H Basic Version w/built-in aux. switch & heater

AFRXUP N4 Flexible Version

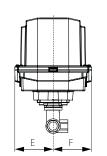
Flexible Version w/built-in aux. switch AFRXUP-S N4 AFRXUP N4H Flexible Version w/built in heater

AFRXUP-S N4H Flexible Version w/built-in aux. switch & heater

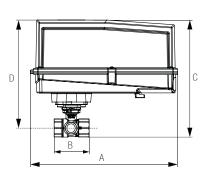
Technical Data		
Power supply	24240 VAC -20% / +10%, 50/60 Hz	
	24125 VDC ±10%	
Power consumption running	 	
holding		
Transformer sizing	7 VA @ 24 VAC (class 2 power source)	
Transformer sizing	8.5 VA @ 120 VAC / heater 25 VA @120 VAC	
	18 VA @ 240 VAC	
Electrical connection		
AFRBUP N4	3 ft [1m], 10 ft [3m] or 16 ft [5m] 18 GA appliance	
AFRXUP N4	cable, with or without 1/2" conduit connector	
	-S models: Two 3 ft [1m], 10 ft [3m] or	
	16 ft [5m] appliance cables with or without 1/2"	
	conduit connectors	
heater (N4H)		
Overload protection	electronic throughout 0 to 95° rotation	
Control	on/off	
Torque	180 in-lb [20 Nm] minimum	
Direction of rotation spring		
Mechanical angle of rotation	95° (adjustable with mechanical end stop,	
	35° to 95°)	
Running time motor	< 75 sec	
spring		
	< 60 sec @ -22°F [-30°C]	
spring (with heater)	20 sec @ -4°F to 122°F [-20°C to 50°C];	
D. W. J. B. W.	< 60 sec @ -49°F [-45°C]	
Position indication	visual indicator, 0° to 95°	
Manual override	(0° is full spring return position) 5 mm hex crank (3/16" Allen), supplied	
Humidity Ambient temperature	max. 95% RH non-condensing	
Starge temperature	-49 F to 122 F [-45 C to 50 C]	
Storage temperature Housing	UL Type 4, NEMA 4, IP66	
	polycarbonate	
Housing material Agency listings †		
Agency listings t	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to	
	2004/108/EC & 2006/95/EC	
Noise level	<50dB(A) motor @ 75 seconds	
	≤62dB(A) spring return	
Servicing	maintenance free	
Quality standard	ISO 9001	
Weight	9.7 lbs (4.4 kg), 10 lbs (4.5 kg) with switches	
3 ·	10.5 lbs (4.8 kg) with heater	
+ Dated Impulse Voltage 4kV Type of action	on 1 AA (1 AA B for -S version) Control Pollution Degree 4	

† Rated Impulse Voltage 4kV, Type of action 1.AA (1.AA.B for -S version), Control Pollution Degree 4.

AFRBUP-S N4, AFRBUP-S N4H, A	
	2 x SPDT 3A (0.5A) @ 250 VAC, UL Approved
	one set at +10°, one adjustable 10° to 90°



Dimensions with 3-Way Valve



	Valve Nominal Size		Valve Nominal Size Dimensions (Inc			nsions (Inches	[mm])
Valve Body	Inches	DN [mm]	Α	В	С		
B329-B331	11/4"	32	3.96" [100.6]	2.27" [57.7]	2.14" [54.3]		
B338-B341	1½"	40	4.39" [111.6]	2.51" [63.7]	2.40" [61.1]		
B347-B352	2"	50	4.90" [124.5]	2.73" [69.5]	2.74" [69.7]		



AFRBUP N4, AFRBUP-S N4, AFRBUP N4H, AFRBUP-S N4H, AFRXUP N4, AFRXUP-S N4, AFRXUP N4H, AFRXUP-S N4H

NEMA 4, On/Off, Spring Return, 24 to 240 VAC

Accessories	
Tool-06	8mm and 10 mm wrench
43442-00001	Gland (needed for additional wires)
11097-00001	Gasket for Gland (needed for additional wires)

NOTE: When using AFRBUP N4, AFRBUP-S N4, AFRBUP N4H, AFRBUP-S N4H, AFRXUP N4, AFRXUP-S N4, AFRXUP N4H, AFRXUP-S N4H actuators, only use accessories listed on this

For actuator wiring information and diagrams, refer to Belimo Wiring Guide.

Typical Specification

On/Off spring return damper actuators shall be direct coupled type which require no crank arm and linkage and be capable of direct mounting to a jackshaft up to a 1.05" diameter. The actuators must be designed so that they may be used for either clockwise or counterclockwise fail-safe operation. Actuators shall be protected from overload at all angles of rotation. If required, two SPDT auxiliary switch shall be provided having the capability of one being adjustable. Actuators with auxiliary switches must be constructed to meet the requirements for Double Insulation so an electrical ground is not required to meet agency listings. Actuators shall be cULus Approved and have a 5 year warranty, and be manufactured under ISO 9001 International Quality Control Standards. Actuators shall be as manufactured by Belimo.

Wiring Diagrams



C INSTALLATION NOTES



Provide overload protection and disconnect as required.



CAUTION Equipment Damage!

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



Actuators may also be powered by 24 VDC.



For end position indication, interlock control, fan startup, etc., AFRB24-S N4, AFRB24-S N4H, AFRX24-S N4, AFRX24-S N4H incorporates two built-in auxiliary switches: 2 x SPDT, 3A (0.5A) @250 VAC, UL Approved, one switch is fixed at +10°, one is adjustable 10° to 90°.



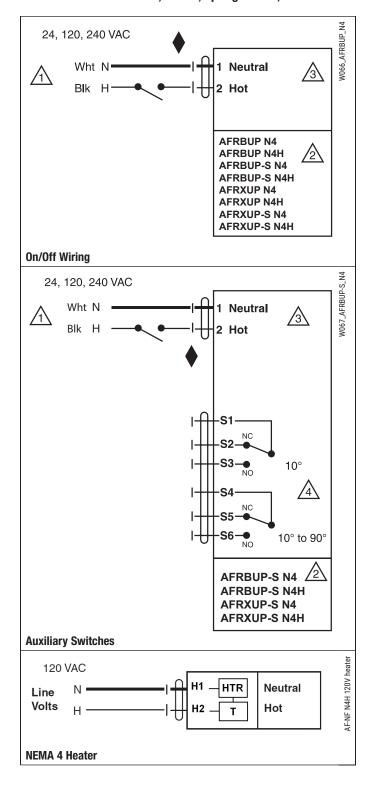
APPLICATION NOTES



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



WARNING Live Electrical Components!





NEMA 4, Proportional, Spring Return, Direct Coupled, 24V, Multi-Function Technology®





CE USTED 94 DS TEMP. IND. & CUL US REG, EQUIP.

Models

AFRB24-MFT N4 **Basic Version**

AFRB24-MFT-S N4 Basic Version w/built-in aux. switch AFRB24-MFT N4H Basic Version w/built in heater

Basic Version w/built-in aux. switch & heater AFRB24-MFT-S N4H

AFRX24-MFT N4 Flexible Version

AFRX24-MFT-S N4 Flexible Version w/built-in aux. switch AFRX24-MFT N4H Flexible Version w/built in heater

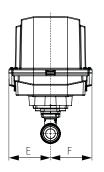
	exible Version w/built in aux. switch & heater		
Technical Data			
Power supply	24 VAC, +/- 20%, 50/60 Hz		
	24 VDC, +20% / -10%		
Power running			
consumption♦ holding			
Transformer sizing	10 VA (Class 2 power source) / heater 25 VA		
Electrical connection	3 ft [1m], 10 ft [3m] or 16 ft [5m] 18 GA appliance cables,		
AFRB N4 ♦	with 1/2" conduit connector		
AFRX N4 ◆	-S models: two 3 ft [1m], 10 ft [3m] or		
(1411)	16 ft [5m] appliance cables with 1/2" conduit connectors		
heater (N4H)	terminal block, 26-16 GA		
Overload protection	electronic throughout 0 to 95° rotation		
Operating range Y*	2 to 10 VDC, 4 to 20 mA (default) variable (VDC, PWM, floating point, on/off)		
Input impedance	100 kΩ for 2 to 10 VDC (0.1 mA)		
	500 Ω for 4 to 20 mA		
	1500 Ω for PWM, floating point and on/off control		
Feedback output U*	2 to 10 VDC, 0.5 mA max		
Torque	minimum 180 in-lb (20 Nm)		
	reversible with cw/ccw mounting inside housing		
rotation* motor			
Mechanical angle of rotation*	95° (adjustable with mechanical end stop, 35° to 95°)		
Running time motor*	150 seconds (default), variable (70 to 220 seconds)		
spring	<20 sec @ -4°F to 122°F [-20°C to 50°C]; <60 sec @ -22°F [-30°C]		
spring (with heater)	<20 sec @ -4°F to 122°F [-20°C to 50°C]; <60 sec @ -49°F [-45°C]		
Angle of Rotation adaptation	off (default)		
Override control*	min position = 0%		
	mid. position = 50%		
	max. position = 100%		
Position indication	visual indicator, 0° to 95°		
	(0° is spring return position)		
Manual override	5 mm hex crank (3/16" Allen), supplied		
Humidity	max. 95% RH non-condensing		
Ambient temperature	-22°F to 122°F (-30°C to 50°C)		
with heater			
Storage temperature	-40°F to 176°F (-40°C to 80°C)		
Housing	UL Type 4, NEMA 4, IP66		
Housing material	polycarbonate		
Noise level	≤40dB(A) motor @ 150 seconds, run time dependent ≤62dB(A) spring return		
Agency listings †	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-		
Ouglity standard	1:02, CE acc. to 2004/108/EC & 2006/95/EC		
Quality standard	ISO 9001		
Servicing	maintenance free		
Weight	9.7 lbs. (4.4 kg), 10 lbs. (4.5 kg) with switches 10.5 lbs (4.8 kg) with heater		

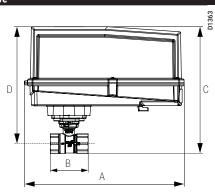
- * Variable when configured with MFT options
- Rated Impulse Voltage 800V, Type of action 1.AA (1.AA.B for -S version), Control Pollution Degree 4.
 Programmed for 70 sec motor run time. At 150 sec motor run time, transformer sizing is 8.5 VA and power consumption is 6 W running / 3 W holding.

AFRB24-MFT-S N4, AFRB24-MFT-S N4H, AFRX24-MFT-S N4, AFRX24-MFT-S N4H

Auxiliary switches 2 x SPDT 3A (0.5A) @ 250 VAC, UL approved one set at +10°, one adjustable 10° to 90°

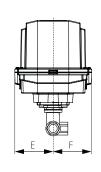
Dimensions with 2-Way Valve

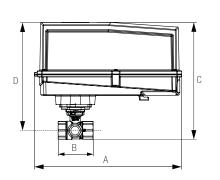




	Valve Nominal Size		Dimensions (Inches [mm])	
Valve Body	Inches	DN [mm]	Α	В
B231-B232	1¼"	32	3.72" [94.6]	1.84" [47.4]
B238-B240	1½"	40	3.88" [98.5]	2.04" [51.9]
B248-B254	2"	50	4.93" [125.2]	2.73" [69.5]
B261-B265	2½"	65	5.55" [140.9]	2.73" [69.5]
B277-B280	3"	80	5.82" [147.9]	2.73" [69.5]

Dimensions with 3-Way Valve





Valve Nominal Size		Dimensions (Inches [mm])			
Valve Body	Inches	DN [mm]	Α	В	С
B329-B331	1¼"	32	3.96" [100.6]	2.27" [57.7]	2.14" [54.3]
B338-B341	1½"	40	4.39" [111.6]	2.51" [63.7]	2.40" [61.1]
B347-B352	2"	50	4.90" [124.5]	2.73" [69.5]	2.74" [69.7]



AFRB24-MFT N4, AFRB24-MFT-S N4, AFRB24-MFT N4H, AFRB24-MFT-S N4H AFRX24-MFT N4, AFRX24-MFT-S N4, AFRX24-MFT N4H, AFRX24-MFT-S N4H

NEMA 4, Proportional, Spring Return, Direct Coupled, 24V, Multi-Function Technology®

Accessories	
Tool-06	8mm and 10 mm wrench
43442-00001	Gland (needed for additional wires)
11097-00001	Gasket for Gland (needed for additional wires)

NOTE: When using AFRB24-MFT N4, AFRB24-MFT-S N4, AFRB24-MFT N4H, AFRB24-MFT-S N4H

AFRX24-MFT N4, AFRX24-MFT-S N4, AFRX24-MFT N4H, AFRX24-MFT-S N4H actuators, only use accessories listed on this page. For actuator wiring information and diagrams, refer to Belimo Wiring Guide.

Typical Specification

The actuator must provide proportional damper control in response to a 2 to 10 VDC or, with the addition of a 500Ω resistor, a 4 to 20 mA control input from an electronic controller or positioner. The actuators must be designed so that they may be used for either clockwise or counterclockwise fail-safe operation. Actuators shall use a brushless DC motor controlled by a microprocessor and be protected from overload at all angles of rotation. Run time shall be constant, and independent of torque. A 2 to 10 VDC feedback signal shall be provided for position feedback. Actuators shall be cULus Approved and have a 5 year warranty, and be manufactured under ISO 9001 International Quality Control Standards. Actuators shall be as manufactured by Belimo.

Wiring Diagrams



INSTALLATION NOTES



Provide overload protection and disconnect as required.



CAUTION Equipment Damage!

Actuators may be connected in parallel if not mechanically linked. Power consumption and input impedance must be observed.



Actuators may also be powered by 24 VDC.



Position feedback cannot be used with Triac sink controller. The actuator internal common reference is not compatible.



Control signal may be pulsed from either the Hot (source) or the Common (sink) 24 VAC line.



Contact closures A & B also can be triacs.



A & B should both be closed for triac source and open for triac sink. For triac sink the common connection from the actuator must be connected to the hot connection of the controller.



APPLICATION NOTES



Meets UL requirements without the need of an electrical ground connection.

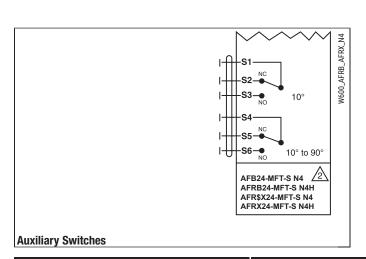


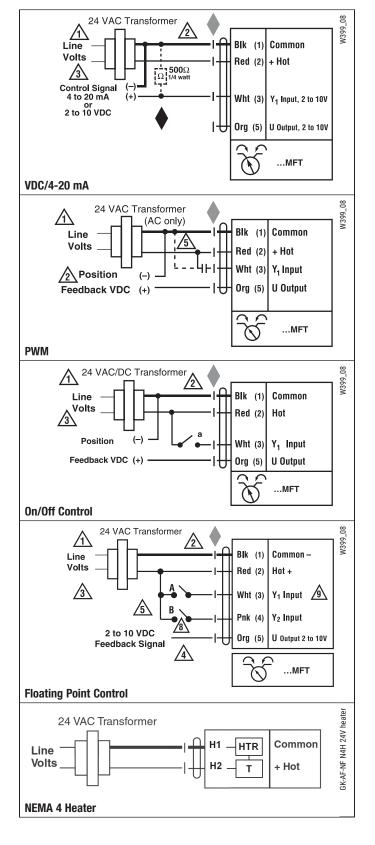
The ZG-R01 500 Ω resistor may be used.



WARNING 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.















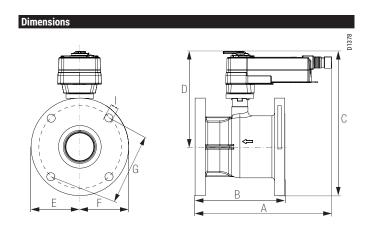
Models

AFRB24-5-14 AFRB24-S-5-14

Technical Data		
Power supply		24 VAC ± 20% 50/60 Hz
117		24 VDC +20% / -10%
Power consumption run	ning	5 W
•	9	2.5 W
Transformer sizing		7.5 VA (class 2 power source)
Electrical connection		
AFRB24		3 ft., 18 GA appliance cable, 1/2" conduit
		connector
		-S models: two 3 ft., 18 gauge appliance
		cables with 1/2" conduit connectors
AFRX24		3 ft. [1m], 10 ft. [3m] or 16 ft. [5m] 18 GA
		appliance or plenum cables, with or without
		1/2" conduit connector
		-S models: two 3 ft. [1m], 10 ft. [3m] or
		16 ft. [5m] appliance cables, with or without
		1/2" conduit connectors
Overload protection		electronic throughout 0 to 95° rotation
Control		on/off
	pring	5
Angle of rotation		95°
Running time m	notor	< 75 seconds
S	pring	20 seconds @ -4°F to 122°F [-20°C to 50°C];
		< 60 seconds @ -22°F [-30°C]
Position indication		visual indicator, 0° to 95°
		(0° is full spring return position)
Manual override		5 mm hex crank (3/16" Allen), supplied
Ambient temperature		-22°F to 122°F [-30°C to 50°C]
Storage temperature		-40°F to 176°F [-40°C to 80°C]
Housing		NEMA 2, IP54, Enclosure Type2
Agency listings †		cULus according. to UL60730-1A/-2-14,
		CAN/CSA E60730-1:02, CE according. to
		2004/108/EC & 2006/95/EC
Noise level		<50dB(A) motor @ 75 seconds
		≤62dB(A) spring return
Quality standard		ISO 9001

[†] Rated Impulse Voltage 800V, Type of action 1.AA (1.AA.B for -S version), Control Pollution Degree 3.

AFRB24-S, AFRX24-S	
Auxiliary switches	2 x SPDT 3A (0.5A) @ 250 VAC, UL approved one set at +10°, one adjustable 10° to 90°



Valve Body	Nominal Pipe Size	Top Flange Design	Flange Diameter	Face-to-Face Length	Height
			Α	В	С
B6250	2½" [65]	F05	7.50" [190.5]	5.50" [139.7]	8.10" [205.4]
B6300	3" [80]		8.00" [203.2]	6.60" [167.6]	8.40" [213.1]
B6400	4" [100]		9.00" [228.6]	8.30" [210.8]	9.30" [235.9]

×

INSTALLATION NOTES



Provide overload protection and disconnect as required.



CAUTION Equipment Damage!

Actuators may be connected in parallel.

Power consumption and input impedance must be observed.



Actuators may also be powered by 24 VDC.



For end position indication, interlock control, fan startup, etc., AFRB24-S and AFRX24-S incorporates two built-in auxiliary switches: $2 \times SPDT$, 3A (0.5A) @250 VAC, UL Approved, one switch is fixed at +10°, one is adjustable 10° to 90°.



APPLICATION NOTES

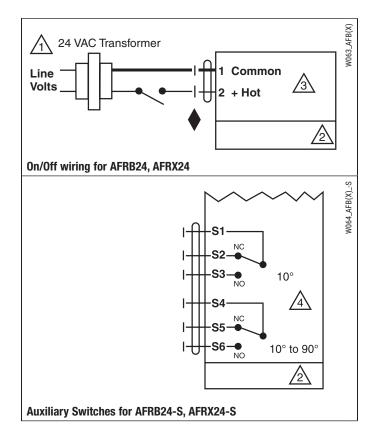


Meets cULus requirements without the need of an electrical ground connection.

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WARNING Live Electrical Components!

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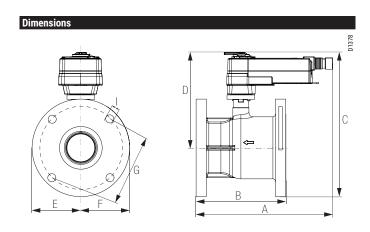
Models

AFRBUP-5-14 AFRBUP-S-5-14

Technical Data		
Power supply		24 to 240 VAC -20% / +10%, 50/60 Hz
rower supply		24 to 125 VDC ±10%
Power consumption	running	
Power consumption	holding	
Transformer sizing	noruning	7 VA @ 24 VAC (class 2 power source)
mansionner sizing		8.5 VA @ 120 VAC
		18 VA @ 240 VAC
Electrical connection	_	10 14 (6) 240 140
AFRRUP		3 ft., 18 GA appliance cable, 1/2" conduit
AFRDUF		connector
		-S models: two 3 ft., 18 gauge appliance
		cables with 1/2" conduit connectors
AFRXUP	_	3 ft. [1m], 10 ft. [3m] or 16 ft. [5m] 18 GA
ALIXOL		appliance or plenum cables, with or without
		1/2" conduit connector
		-S models: two 3 ft. [1m], 10 ft. [3m] or
		16 ft. [5m] appliance cables, with or without
		1/2" conduit connectors
Overload protection	_	electronic throughout 0 to 95° rotation
Control		on/off
Direction of rotation	spring	reversible with CW/CCW mounting
Angle of rotation		95° (adjustable with mechanical end stop, 35°
9		to 95°)
Running time	motor	< 75 seconds
3 · ·	spring	20 seconds @ -4°F to 122°F [-20°C to 50°C];
	-19	< 60 seconds @ -22°F [-30°C]
Position indication		visual indicator, 0° to 95°
		(0° is full spring return position)
Manual override		5 mm hex crank (3/16" Allen), supplied
Ambient temperature		-22°F to 122°F [-30°C to 50°C]
Storage temperature		-40°F to 176°F [-40°C to 80°C]
Housing		NEMA 2/IP54, Enclosure Type2
Agency listings †		cULus according. to UL60730-1A/-2-14,
- , ,		CAN/CSA E60730-1:02, CE according. to
		2004/108/EC & 2006/95/EC
Noise level		<50dB(A) motor @ 75 seconds
		≤62dB(A) spring return
Quality standard		ISO 9001
quanty otaliaala		1.00 2001

[†] Rated Impulse Voltage 800V, Type of action 1.AA (1.AA.B for -S version), Control Pollution Degree 3.

AFRBUP-S, AFRXUP-S	
Auxiliary switches	2 x SPDT 3A (0.5A) @ 250 VAC, UL approved one set at +10°, one adjustable 10° to 90°



Valve Body	Nominal Pipe Size	Top Flange Design	Flange Diameter	Face-to-Face Length	Height
			Α	В	С
B6250	2½" [65]	F05	7.50" [190.5]	5.50" [139.7]	8.10" [205.4]
B6300	3" [80]		8.00" [203.2]	6.60" [167.6]	8.40" [213.1]
B6400	4" [100]		9.00" [228.6]	8.30" [210.8]	9.30" [235.9]



Provide overload protection and disconnect as required.

CAUTION Equipment Damage!

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

No ground connection is required.

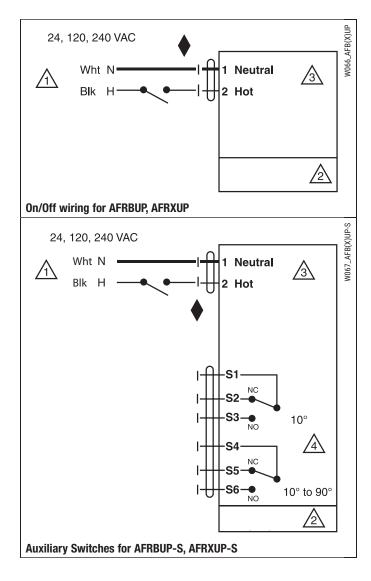
For end position indication, interlock control, fan startup, etc., AFRBUP-S and AFRXUP-S incorporates two built-in auxiliary switches: 2 x SPDT, 3A (0.5A) @250 VAC, UL Approved, one switch is fixed at +10°, one is adjustable 10° to 90°.



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

WARNING 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.



GKRB24-3-5-14 Actuators, On/Off, Floating Point, Fail-Safe







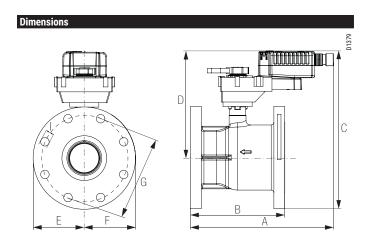




Models GKRB24-3-5-14

Technical Data Control on/off, floating point Power supply 24 VAC ± 20% 50/60 Hz 24 VDC ± 10% Power consumption holding 12 W 3 W Transformer sizing 18 VA (Class 2 power source) Electrical connection varied 3 ft,18 GA plenum rated cable varied connector Overload protection lnput impedance electronic throughout 0° to 95° rotation Input impedance point, on/off) 100 kΩ (0.1mA), 500 Ω, 1500 Ω (floating point, on/off) Angle of rotation preversible with mechanical stop max. 95°, adjustable with mechanical stop Direction of rotation reversible with visual indicator visual indicator Running time fail-safe Amail-safe Amail override 450 seconds and seconds and seconds Manual override Ambient temperature -22°F to 122°F [-30°C to 50°C]
Power supply 24 VAC ± 20% 50/60 Hz 24 VDC ± 10% Power consumption running 12 W holding 3 W Transformer sizing 18 VA (Class 2 power source) Electrical connection 3 ft,18 GA plenum rated cable ½" conduit connector 0verload protection electronic throughout 0° to 95° rotation Input impedance 100 kΩ (0.1mA), 500 Ω, 1500 Ω (floating point, on/off) Angle of rotation max. 95°, adjustable with mechanical stop Direction of rotation reversible with switch Position indication visual indicator Running time running 150 seconds fail-safe Manual override external push button Ambient temperature -22°F to 122°F [-30°C to 50°C]
24 VDC ± 10% Power consumption running 12 W holding 3 W
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$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
$ \begin{array}{c} \text{Electrical connection} & 3 \text{ ft,} 18 \text{ GA plenum rated cable} \\ \frac{1}{2}\text{" conduit connector} \\ \text{Overload protection} & \text{electronic throughout 0° to 95° rotation} \\ \text{Input impedance} & 100 \text{ k}\Omega (0.1\text{mA}), 500 \ \Omega, 1500 \ \Omega (\text{floating point, on/off})} \\ \text{Angle of rotation} & \text{max. 95°, adjustable with mechanical stop} \\ \text{Direction of rotation} & \text{reversible with } \boxed{//} \text{ switch} \\ \text{Position indication} & \text{visual indicator} \\ \text{Running time} & \text{running} \\ \text{fail-safe} & 35 \text{ seconds} \\ \\ \text{Manual override} & \text{external push button} \\ \text{Ambient temperature} & -22^{\circ}\text{F to } 122^{\circ}\text{F} [-30^{\circ}\text{C to } 50^{\circ}\text{C}] \\ \end{array} $
$\begin{tabular}{lllllllllllllllllllllllllllllllllll$
$\begin{array}{lll} \text{Overload protection} & \text{electronic throughout 0° to 95° rotation} \\ \text{Input impedance} & 100 \text{k}\Omega (0.1\text{mA}), 500 \Omega, 1500 \Omega (\text{floating point, on/off})} \\ \text{Angle of rotation} & \text{max. 95°, adjustable with mechanical stop} \\ \text{Direction of rotation} & \text{reversible with } \boxed{ // } \text{ switch} \\ \text{Position indication} & \text{visual indicator} \\ \text{Running time} & \text{running fail-safe} \\ \text{Manual override} & \text{external push button} \\ \text{Ambient temperature} & -22°F \text{to } 122°F \text{[-30°C to 50°C]} \\ \end{array}$
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
point, on/off) Angle of rotation max. 95°, adjustable with mechanical stop Direction of rotation reversible with \(^/\) switch Position indication visual indicator Running time running fail-safe fail-safe Manual override Ambient temperature point, on/off) Max. 95°, adjustable with mechanical stop reversible with \(^/\) switch 150 seconds 35 seconds external push button And the provide of the provide of the provided
Angle of rotation max. 95°, adjustable with mechanical stop Direction of rotation reversible with \(\frac{1}{2} \) switch Position indication visual indicator Running time running fail-safe Manual override Ambient temperature running external push button -22°F to 122°F [-30°C to 50°C]
Direction of rotation reversible with \(\bigcirc \) switch Position indication visual indicator Running time running fail-safe 35 seconds Manual override external push button Ambient temperature -22°F to 122°F [-30°C to 50°C]
Position indication visual indicator Running time running fail-safe Manual override Ambient temperature reversible with 77 switch 79 s
Running time running fail-safe 150 seconds 35 seconds 35 seconds 4 seconds 4 seconds 5 seconds 5 seconds 5 seconds 6 sec
fail-safe 35 seconds Manual override external push button Ambient temperature -22°F to 122°F [-30°C to 50°C]
Manual override external push button Ambient temperature -22°F to 122°F [-30°C to 50°C]
Ambient temperature -22°F to 122°F [-30°C to 50°C]
·
Housing NEMA 2/IP54, Enclosure Type 2
Agency listings † cULus according to UL 60730-1A/-2-14,
CAN/CSA E60730-1:02, CE according to
2004/108/EEC and 2006/95/EC
Noise level <45 dB(A)
Quality standard ISO 9001

[†] Rated Impulse Voltage 800V, Type of action 1.AA (1.AA.B for -S version), Control Pollution Degree 3.

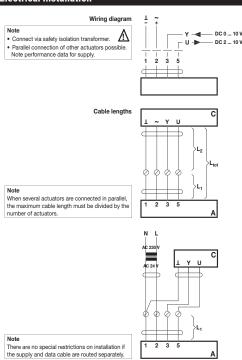


Valve Body	Nominal Pipe Size	Top Flange Design	Flange Diameter	Face-to-Face Length	Height
			Α	В	С
B6400	4" [100]		9.00" [228.6]	8.30" [210.8]	9.30" [235.9]
B6500	5" [125]	F0F	10.00" [254]	10.30" [261.6]	10.50" [266.4]
B6600	6" [150]	F05	11.00" [279.4]	12.50" [317.5]	11.70" [296.9]



GKRB24-3-5-14 Actuators, On/Off, Floating Point, Fail-Safe

Electrical Installation



- 1 = black 2 = red 3 = white 5 = orange

- C = Control unit L₁ = Belimo connecting cable, 1 m (4 x 0.75 mm²)

Cross section L ₂	Max. cable length L _{tot} = L ₁ + L ₂		Example for DC
1/~	AC	DC	
0.75 mm ²	≤30 m	≤5 m	1 m (L ₁) + 4 m (L ₂)
1.00 mm ²	≤40 m	≤8 m	1 m (L ₁) + 7 m (L ₂)
1.50 mm ²	≤70 m	≤12 m	1 m (L ₁) + 11 m (L ₂)
2.50 mm ²	<100 m	<20 m	1 m (L ₁) + 19 m (L ₂)

- Actuator Control unit
- Belimo connecting cable, 1 m (4 x 0.75 mm²)

Wiring Diagrams

INSTALLATION NOTES



Provide overload protection and disconnect as required.



CAUTION Equipment Damage!

Actuators may be connected in parallel if not mechanically mounted to the same shaft. Power consumption and input impedance must be observed



Actuators may also be powered by 24 VDC.



Position feedback cannot be used with Triac sink controller. The actuator internal common reference is not compatible.



Control signal may be pulsed from either the Hot (source) or the Common (sink) 24 VAC line.



Contact closures A & B also can be triacs.

A & B should both be closed for triac source and open for triac sink. For triac sink the common connection from the actuator



must be connected to the hot connection of the controller.



APPLICATION NOTES

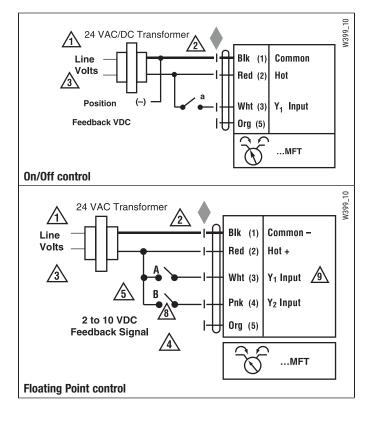


Meets UL requirements without the need of an electrical ground



WARNING 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.



GKRX24-MFT-5-14 Actuators, Multi-Function Technology, Fail-Safe









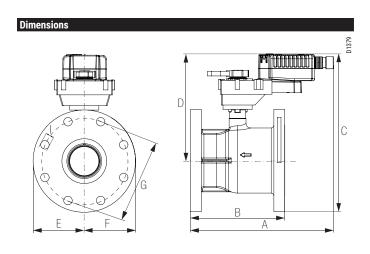


Models

GKRX24-MFT-5-14

Technical Data		
Control		2 to 10 VDC, 4 to 40 mA (default)
		variable (VDC, PWM, floating point, on/off)
Power supply		24 VAC ± 20% 50/60 Hz
,		24 VDC ± 10%
Power consumption	running	12 W
	holding	3 W
Transformer sizing		21 VA (Class 2 power source)
Electrical connection		3 ft,18 GA plenum rated cable
		½" conduit connector
		10 ft. [3m], 16 ft. [5m]
Overload protection		electronic throughout 0° to 95° rotation
Feedback output		2 to 10 VDC, 0.5 mA max, VDC variable
Input impedance		100 kΩ (0.1 mA, 500 Ω)
		1500 Ω (PWM, floating point , on/off)
Angle of rotation		max. 95°, adjustable with mechanical stop
		electronically variable
Direction of rotation		reversible with $^{\!$
Position indication		visual indicator
Running time		150 seconds (default)
		variable (90 to 150 seconds)
	fail-safe	35 seconds
Manual override		external push button
Ambient temperature		-22°F to 122°F [-30°C to 50°C]
Housing		NEMA 2/IP54, Enclosure Type 2
Housing material		UL94-5V (flammability rating)
Agency listings †		cULus according to UL 60730-1A/-2-14,
		CAN/CSA E60730-1:02, CE according to
		2004/108/EEC and 2006/95/EC.
Noise level		<45 dB(A)
Quality standard		ISO 9001
1.0 1.11 1.1/11 0001		4 4 4 4 4 5 6 6 7 7 9 7 1 5 1 5 1 7 7

[†] Rated Impulse Voltage 800V, Type of action 1.AA (1.AA.B for -S version), Control Pollution Degree 3.



Valve Body	Nominal Pipe Size	Top Flange Design	Flange Diameter	Face-to-Face Length	Height
			Α	В	С
B6400	4" [100]		9.00" [228.6]	8.30" [210.8]	9.30" [235.9]
B6500	5" [125]	F0.F	10.00" [254]	10.30" [261.6]	10.50" [266.4]
B6600	6" [150]	F05	11.00" [279.4]	12.50" [317.5]	11.70" [296.9]





GKRX24-MFT-5-14 Actuators, Multi-Function Technology, Fail-Safe

Wiring Diagrams



INSTALLATION NOTES



Provide overload protection and disconnect as required.



CAUTION Equipment Damage!

Actuators may be connected in parallel if not mechanically mounted to the same shaft. Power consumption and input impedance must be



Actuators may also be powered by 24 VDC.



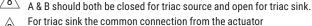
Position feedback cannot be used with Triac sink controller. The actuator internal common reference is not compatible.



Control signal may be pulsed from either the Hot (source) or the Common (sink) 24 VAC line.



Contact closures A & B also can be triacs.





APPLICATION NOTES



Meets UL requirements without the need of an electrical ground

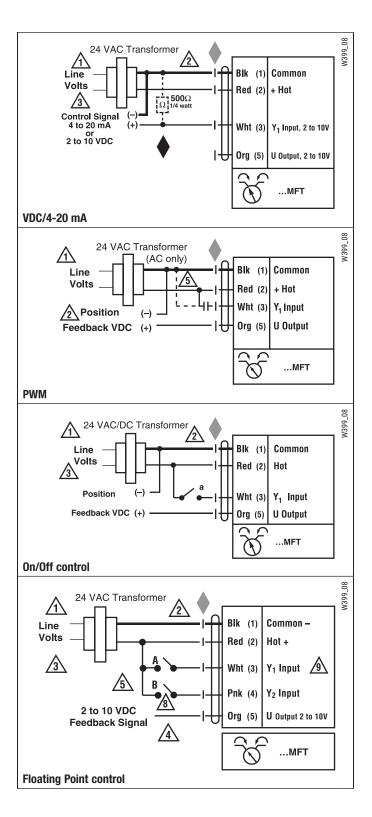


The ZG-R01 500 Ω resistor may be used.



WARNING Live Electrical Components!

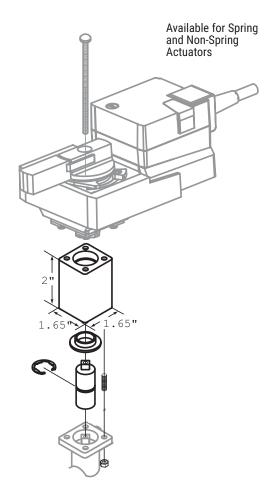
During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow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



ZR-EXT-01, CCV Valve Neck Extension Kit







Application

The ZR-EXT-01 can be used with most CCV's* in order to achieve a large clearance over the pipe. The Extension Kit will provide an additional 2" of space between the top of the valve and the base of the actuator. bracket is made from aluminum and is not intended as a thermal block.

Technical Data	
Extension Height	2"
Total Weight	0.7 lb

Material	
Extension Housing	Aluminum - Anodized
Shaft	Stainless Steel
Threaded Hardware	Stainless Steel
Bearing	Oilite® Bearing
Retaining Clip	Stainless Steel

	TR	LRB (X)	ARB (X)	TF	LF	AF
Extension Bracket						
ZR-EXT-01	•	•	•	•	•	•

- * Cannot be used with N4 actuators.
- * Available for previous NF assemblies.
- * ZR-EXT-01 cannot be used with any valve smaller than the B212(B) and B312(B).
- * For use with B2 and B3 series only. Cannot be used with B6 series.

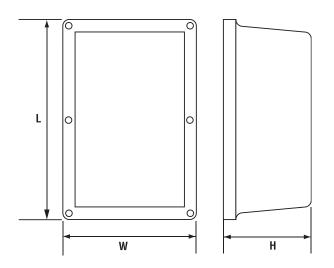


ZS-CCV... New Characterized Control Valve Weather Shield



Application

The ZS-CCV... weather shield provides moderate protection for valves which are mounted outdoors. This product is designed as a water tight enclosure. The housing allows easy mounting over the actuator, while allowing easy viewing of the actuator in operation. Weather shield for CCV to provide protection for actuators in outdoor applications.



Specifications	
Cover	PETG with UV resistant smoke tint
Perimeter Gasket	Silicon Rubber
Rubber Gasket	Silicon Rubber
Spring Clips	Stainless Steel
Temperature limitations:	-22°F to 122°F (-30°C to 50°C)
Plate (ZS-CCV-100)	Aluminum
Plate	Galvaneal w/black powder coat

Part Number	Actuator
ZS - CCV - 90	LF
ZS - CCV - 100	LRB(X), ARB(X)
ZS - CCV - 110	AFRB(X)

L	W	Н
16.25" [413]	8.75" [222]	4.5" [114]

Parts List

Cover including Rubber Perimeter Gasket, Rubber Gasket Back Plate Anti-Rotation Post with screw and lock washer Valve Gasket

Assorted Cap plugs for unused holes

Screws AF - 2 bolts with nylon insert locking nuts LRB(X), ARB(X) - 1 screw, 1 washer

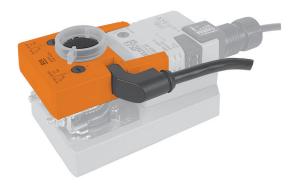
No weather shield available at this time for the TF and TR actuators. Designed for NEMA 4 specifications.

* Cannot be used with B6 series.

Auxiliary Switches S1A, S2A

For non-spring return direct-coupled actuators









Mounting Instructions

- 1. Press down the manual override button and rotate the actuator fully counter clockwise.
- 2. Place the switch/potentiometer adaptor onto the hex shaft of the handle which is in the center of the valve/actuator coupling.
- 3. Slide switch onto the actuator using the actuator guiding grooves on the sides of the actuator.
- 4. Check for correct mating of the adaptor to the switch.
- 5. Adjust switch dials as necessary.



Application

The S1A and S2A auxiliary switches are used to indicate when a desired position of a valve is reached or to interface additional controls for a specific control sequence.

Operation

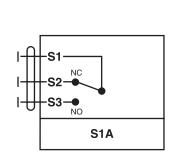
The S1A and S2A auxiliary switches are mounted onto the direct coupled actuator. The switches are modular units that mount directly onto LR and AR type actuators and are locked into place by guiding grooves on the sides of the actuator.

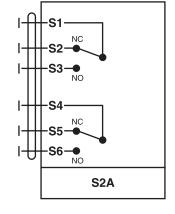
A driver disk is attached to the actuator handle and offers direct transmission of the actuator position to the micro switch cams. The switching points can be set over the full scale of 0 to 1 simply by adjusting the slotted discs.

Types		
S1A	1 SPDT	3 ft, 18 GA Appliance Cable
S1A/300	1 SPDT	6 ft, 18 GA Appliance Cable
S1A/500	1 SPDT	10 ft, 18 GA Appliance Cable
S2A	2 SPDT	3 ft, 18 GA Appliance Cable
S2A/300	2 SPDT	6 ft, 18 GA Appliance Cable
S2A/500	2 SPDT	10 ft, 18 GA Appliance Cable

Technical Data	S1A	S2A		
Number of switches	1 SPDT	2 SPDT		
Weight	4.6 oz [130 g]	6.0 oz [170 g]		
Switching capacity	3A (0.5A), 250 VAC			
Switching point	adjustable over full rotati	on (0° to 95°)		
Pre-setting	with scale possible			
Humidity	5 to 95% RH non-condens	sing		
Ambient temperature	-22°F to 122°F [-30°C to +50°C]			
Storage temperature	-40°F to 176°F [-40°C to 8	80°C]		
Housing	NEMA 2 / IP54			
Housing rating	UL94-5VA			
Servicing	maintenance free			
Agency listings	cULus acc. to UL60730-1			
	CE according to 73/23/EEC			
Quality standard	ISO 9001	=		

Wiring Diagram







Feedback Potentiometer P...A

For the non-spring return direct-coupled actuators

Application

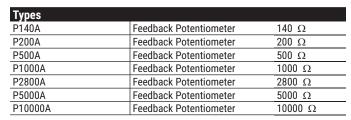
The P...A feedback potentiometers are used with LR and AR actuators to provide a resistive signal which varies with valve position.

The P...A units are applied with commercial proportional temperature controllers to provide feedback of the valve position, or with electric or electronic meters to provide position indication. The signal can also be used as a positioner for parallel operation of multiple actuators.

Operation

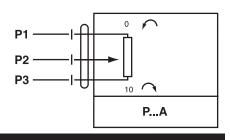
The P...A feedback potentiometers are mounted onto the direct coupled actuator. The switches are modular units that mount directly onto LR and AR type actuators and are locked into place by guiding grooves on the sides of the actuator.

A driver disk is attached to the actuator handle and offers direct transmission of the actuator position to the micro switch cams.

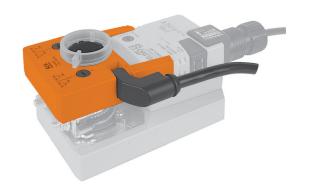


Technical Data	PA
Resistance values	as above
Output	1 W
Tolerance	± 5%
Linearity	± 2%
Resolution	min. 1%
Residual resistance	max. 5% on both sides
Electrical connection	3 ft, 18 GA appliance cable
	½" conduit connector
Humidity	5 to 95% RH non-condensing
Ambient temperature	-22°F to 122°F [-30°C to 50°C]
Storage temperature	-40°F to 176°F [-40°C to 80°C]
Housing	NEMA 2 / IP54
Housing rating	UL94-5VA
Servicing	maintenance free
Agency listings	cULus acc. to UL60730-1
	CE according to 73/23/EEC
Quality standard	ISO 9001
Weight	4.6 oz [130 g]

Wiring Diagram



Mounting Instructions







- Press down the manual override button and rotate the actuator fully counter clockwise.
- 2. Place the switch/potentiometer adaptor onto the hex shaft of the handle which is in the center of the valve/actuator coupling.
- 3. Slide switch onto the actuator using the actuator guiding grooves on the sides of the actuator.
- 4. Check for correct mating of the adaptor to the switch.
- 5. Adjust switch dials as necessary.

Protective Terminal Cover





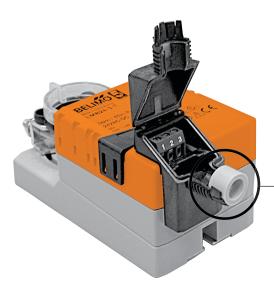


Application

Belimo non-spring return actuators with terminal strips are can be converted from NEMA 1/IP20 to NEMA 2/IP54 using the protective terminal cover ZS-T.

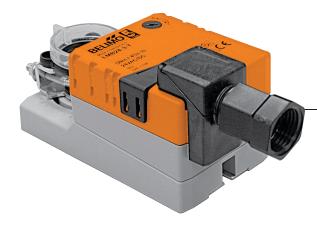
The ZS-T terminal cover accessory consists of:

- **Terminal Cover**
- Conduit Fitting
- Rubber Seal for Wire Diameter 4-6
- Rubber Seal for Wire Diameter 6-8



Mounting the Terminal Cover

- 1. Attach terminal cover to actuator, if not done already.
- 2. Slide the conduit fitting and correct size rubber seal onto wire.
- 3. Wire up actuator using the terminal strips. 4. Fit rubber seal into slot of terminal cover.
- 5. Shut terminal top and screw on conduit connector.





Configuration		Cor	ntrol		Motion	
(Substitute 'V' for 'P' NV[F] actuators)	for Code	Input Range	Position Feedback	Running Timet	Torque %	Adaptation
P-10001	A01	2.0 to 10.0 VDC	2.0 to 10.0 VDC	150	100	Manual
P-10002	A02	0.0 to 10.0 VDC	0.0 to 10.0 VDC	150	100	Manual
P-10003	A03	2.0 to 10.0 VDC	0.0 to 5.0 VDC	150	100	Manual
P-10004	A04	4.0 to 7.0 VDC	2.0 to 10.0 VDC	150	100	Manual
P-10005	A05	6.0 to 9.0 VDC	2.0 to 10.0 VDC	150	100	Manual
P-10006	A06	10.5 to 13.5 VDC	2.0 to 10.0 VDC	150	100	Manual
P-10007	A07	0.0 to 5.0 VDC	2.0 to 10.0 VDC	150	100	Manual
P-10009	A09	5.0 to 10.0 VDC	2.0 to 10.0 VDC	150	100	Manual
P-10010	A10	5.0 to 10.0 VDC	0.0 to 10.0 VDC	150	100	Manual
P-10010 P-10013 P-10015	A13	0.0 to 10.0 VDC	2.0 to 10.0 VDC	150	100	Manual
P-10015	A15	2.0 to 5.0 VDC	2.0 to 10.0 VDC	150	100	Manual
P-10016	A16	2.0 to 6.0 VDC	2.0 to 10.0 VDC	150	100	Manual
P-10017	A17	6.0 to 10.0 VDC	2.0 to 10.0 VDC	150	100	Manual
P-10018	A18	14.0 to 17.0 VDC	2.0 to 10.0 VDC	150	100	Manual
P-10020	A20	9.0 to 12.0 VDC	2.0 to 10.0 VDC	150	100	Manual
P-10028	A28	0.0 to 10.0 VDC	0.0 to 10.0 VDC	100	100	Manual
P-10031	A31	0.0 to 4.0 VDC	2.0 to 10.0 VDC	150	100	Manual
P-10063	A63	0.5 to 4.5 VDC	0.5 to 4.5 VDC	150	100	Manual
P-10064	A64	5.5 to 10.0 VDC	5.5 to 10.0 VDC	150	100	Manual
P-20001	W01	0.59 to 2.93 sec.	2.0 to 10.0 VDC	150	100	Manual
P-20002	W02	0.02 to 5.00 sec.	2.0 to 10.0 VDC	150	100	Manual
P-20002	W03	0.10 to 25.50 sec.	2.0 to 10.0 VDC	150	100	Manual
P-20004	W04	0.10 to 25.60 sec.	2.0 to 10.0 VDC	150	100	Manual
P-20005	W05	0.10 to 5.20 sec.	0.0 to 5.0 VDC	150	100	Manual
P-30001	F01	Floating point	2.0 to 10.0 VDC	150	100	Manual
F-30002	F02	Floating point	0.0 to 10.0 VDC	150	100	Manual
P-30003	F03	Floating point	2.0 to 10.0 VDC	100	100	Manual
₽-30004	F04	Floating point	0.0 to 5.0 VDC	100	100	Manual
P-30002 P-30003 P-30004 P-30005	F05	Floating point	0.0 to 10.0 VDC	100	100	Manual
P-30006	F06	Floating point	0.0 to 5.0 VDC	150	100	Manual
P-40001	J01	On/Off	2.0 to 10.0 VDC	75	100	Manual
₽-40002	J02	On/Off	2.0 to 10.0 VDC	150	100	Manual
P-40002 P-40003 P-40004	J03	On/Off	2.0 to 10.0 VDC	75	100	Manual
1 70007	J04	On/Off	0.0 to 5.0 VDC	100	100	Manual
P-40005	J05	On/Off	0.0 to 10.0 VDC	100	100	Manual

^{*}P-10001 is the default configuration.

Example: AF24-MFT US is the basic model. Add the P... pre-set MFT configuration number and list price to the actuator when ordering, as needed.

Note: V-codes used for NV...Series actuator. All other MFT actuators use P-codes.

Note: Most popular configurations available at no additional cost.

Note: If the configuration needed is not listed, please fill in pg. 112 or call Belimo Customer Service at 800-543-9038.

Note: For Non-Spring Return Actuators the 3-digit code can be used in place of the P... pre-set MFT configuration number.

MFT Programming Codes, Flexible Products



PRODUCTS

	MODEL	Base Actuator Codes	Control Input	Feedback	Running Time	Angle of Rotation/Stroke	Power Supply	VA Rating	Weight (lb)
	LRX24-3	LR000	On/Off, Floating Point	-	95 (Default)	95 deg	24 VAC/DC	3	1.08
F	LRX24-SR	LR030	2-10 VDC (4-20mA*)	_	95 (Default)	95 deg	24 VAC/DC	3	1.08
2	LRX24-PC	LRXX0†	0-20 V Phasecut	2-10 VDC	95 (Default)	95 deg	24 VAC/DC	3	1.08
우	LRX24-MFT	LR100	2-10 VDC (Default)	2-10 VDC	150 (Default)	95 deg	24 VAC/DC	3	1.08
. <u>=</u>	LRX24-MFT95	LRXX0†	0 to 135 Ohm	2-10 VDC	150 (Default)	95 deg	24 VAC/DC	3	1.08
45	LRX120-3	LR060	On/Off, Floating Point	_	95 (Default)	95 deg	120-240 VAC	3	1.08
	LRX120-SR	LR450	2-10 VDC (4-20mA*)	_	95 (Default)	95 deg	120-240 VAC	3	1.08
	ARX24-3	AR000	On/Off, Floating Point	-	95 (Default)	95 deg	24 VAC/DC	5	1.08
E N	ARX24-SR	AR030	2-10 VDC (4-20mA*)	_	95 (Default)	95 deg	24 VAC/DC	5	1.08
20	ARX24-PC	ARXX0†	0-20 V Phasecut	2-10 VDC	95 (Default)	95 deg	24 VAC/DC	5	1.08
	ARX24-MFT	AR100	2-10 VDC (Default)	2-10 VDC	150 (Default)	95 deg	24 VAC/DC	5	1.08
	ARX24-MFT95	ARXX0†	0 to 135 Ohm	2-10 VDC	150 (Default)	95 deg	24 VAC/DC	5	1.08
8	ARX120-3	AR060	On/Off, Floating Point	_	95 (Default)	95 deg	120-240 VAC	5	1.08
-	ARX120-SR	AR450	2-10 VDC (4-20mA*)	_	95 (Default)	95 deg	120-240 VAC	5	1.08

[†] For correct code please call Belimo Customer service 800-543-9038

	Configuration		Co	Control		Motion	
	(Substitute 'V' for 'P' for NV[F] actuators)	Code	Input Range	Position Feedback	Running Timet	Torque %	Adaptation
	P-10001	A01	2.0 to 10.0 VDC	2.0 to 10.0 VDC	150	100	Manual
	P-10002	A02	0.0 to 10.0 VDC	0.0 to 10.0 VDC	150	100	Manual
	P-10003	A03	2.0 to 10.0 VDC	0.0 to 5.0 VDC	150	100	Manual
	P-10004	A04	4.0 to 7.0 VDC	2.0 to 10.0 VDC	150	100	Manual
	P-10005	A05	6.0 to 9.0 VDC	2.0 to 10.0 VDC	150	100	Manual
	P-10006	A06	10.5 to 13.5 VDC	2.0 to 10.0 VDC	150	100	Manual
	P-10007	A07	0.0 to 5.0 VDC	2.0 to 10.0 VDC	150	100	Manual
	P-10009	A09	5.0 to 10.0 VDC	2.0 to 10.0 VDC	150	100	Manual
ě	P-10010	A10	5.0 to 10.0 VDC	0.0 to 10.0 VDC	150	100	Manual
Voltage	P-10013	A13	0.0 to 10.0 VDC	2.0 to 10.0 VDC	150	100	Manual
V ₀	P-10015	A15	2.0 to 5.0 VDC	2.0 to 10.0 VDC	150	100	Manual
	P-10016	A16	2.0 to 6.0 VDC	2.0 to 10.0 VDC	150	100	Manual
	P-10017	A17	6.0 to 10.0 VDC	2.0 to 10.0 VDC	150	100	Manual
	P-10018	A18	14.0 to 17.0 VDC	2.0 to 10.0 VDC	150	100	Manual
	P-10020	A20	9.0 to 12.0 VDC	2.0 to 10.0 VDC	150	100	Manual
	P-10028	A28	0.0 to 10.0 VDC	0.0 to 10.0 VDC	100	100	Manual
	P-10031	A31	0.0 to 4.0 VDC	2.0 to 10.0 VDC	150	100	Manual
	P-10063	A63	0.5 to 4.5 VDC	0.5 to 4.5 VDC	150	100	Manual
	P-10064	A64	5.5 to 10.0 VDC	5.5 to 10.0 VDC	150	100	Manual
	P-20001	W01	0.59 to 2.93 sec.	2.0 to 10.0 VDC	150	100	Manual
_	P-20002	W02	0.02 to 5.00 sec.	2.0 to 10.0 VDC	150	100	Manual
PWM	P-20003	W03	0.10 to 25.50 sec.	2.0 to 10.0 VDC	150	100	Manual
Δ.	P-20004	W04	0.10 to 25.60 sec.	2.0 to 10.0 VDC	150	100	Manual
	P-20005	W05	0.10 to 5.20 sec.	0.0 to 5.0 VDC	150	100	Manual
	P-30001	F01	Floating point	2.0 to 10.0 VDC	150	100	Manual
oj.	P-30002	F02	Floating point	0.0 to 10.0 VDC	150	100	Manual
g P	P-30003	F03	Floating point	2.0 to 10.0 VDC	100	100	Manual
Ē	P-30004	F04	Floating point	0.0 to 5.0 VDC	100	100	Manual
Floating Point	P-30005	F05	Floating point	0.0 to 10.0 VDC	100	100	Manual
	P-30006	F06	Floating point	0.0 to 5.0 VDC	150	100	Manual
	P-40001	J01	On/Off	None	75	100	Manual
#	P-40002	J02	On/Off	2.0 to 10.0 VDC	150	100	Manual
0n/Off	P-40003	J03	On/Off	None	75	100	Manual
ō	P-40004	J04	On/Off	0.0 to 5.0 VDC	100	100	Manual
	P-40005	J05	On/Off	0.0 to 10.0 VDC	100	100	Manual

^{*}P-10001 is the default configuration.



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Custom MFT Configuration Order Form

FAX: USA Toll Free 1-800-228-8283

#1 Select an Actuator (use one sheet for each unique actuator/configuration)				
Quantity AF24-MFT US	K1 K1 K1 95 95 95 95 95	Company Address City Phone Email FIELD LABELING: LBL-MFT Custom configuration 1-3/8" X 1-¼" orange labels		Zip
#2 Create a Custom Configuration Angle of rotation setting	Deactivated Activated Manu	ed (Default) al triggering by pressing matic triggering each tim pressing the push butto	The following settings ② - ⑤ are mechanical angle of rotation. I the push button twice. The the unit is powered up	er to the full angle of rotation of 95°. automatically adapted to the effective
2 Control Types	VDC 2 - 10 0 - 10 Variable Start Stop	PWM 0.2 to 5.0 s 0.1 to 25.5 0.59 to 2.9 Variable Start Stop	seconds	On/Off
3 Feedback Signals U₅	Position F	eedback U DC 01	DC V (08 V)	The finish must be at least 2 V above the start!
4 Running Time	Running til Note: The so increa	me second ound power level [dB(A)] lises when the running time low 150 seconds.	LM 35150 secon NM 45170 secon NM 45170 secon NM 90300 secon NM 90900 secon NM 90900 secon NM 90900	onds onds onds
Override control and electronic angle of rotation limiting	Min. (min. ZS (inter	mediate position) =	% (0100%) (0% =	ning of working range) default 0 Min.; 100% = Max.) default 50 of working range) default 100