

Step 1

Determine if the actuators need to be electric or manual.

Step 2

If the actuators are to be electric, determine what voltage (120 VAC, 24 VAC, etc.) and what Hertz (50 or 60 cycles/second) are required. If the voltage requirement is not the same as the actuator, (i.e. the actuator is 120 VAC and the requirement is 460 VAC) a transformer is needed.

Step 3

If the actuator is manual, refer to the 'Manual Hand Quadrant' section on page 4.

Step 4

If the actuator is electric, then the operation type must be determined.

- **Two position - spring return:** This actuator will power to either the open or closed position. When the power supply is removed, the actuator will fail to the initial position by means of a spring.
- **Two position - power open/power closed:** This actuator will power in either direction. When the power supply is removed, the actuator will fail in place.
- **Floating - power open/power closed:** This actuator is powered in both directions and will stop in any position. No spring is used.
- **Modulating - spring return:** This actuator will power in either direction and will spring return upon power loss much like the two position actuators. The difference is that a control signal (4-20 mA_{dc}, 0-10 V_{dc}, etc.) is used. The control signal acts much like a valve; as the signal is increased or decreased, the actuator will open or close or vice versa.
- **Modulating - power open/power closed:** This actuator is the same as the floating except for its response to a control signal input (4-20 mA_{dc}, 0-10 V_{dc}, etc.).

See tables on the following pages for more information.

Step 5

Once the actuator operation is determined, then the fail position must be known. There are two options:

- Power open - fail closed
- Power closed - fail open

If a non-spring return actuator is required, then the fail positions would become "fail in place".

Step 6

Auxiliary switch - Separate switch in actuator which can be wired to either make a circuit (normally open) or break a circuit (normally closed) when actuated. Actuation point is adjustable in Belimo.

Step 7

Determine if the actuator is be:

- Internally mounted: The actuator is mounted in the airstream.
- Externally mounted: The actuator is mounted out of the airstream at factory in a sleeve or external sideplate.
- External kit: The actuator is installed out of the airstream in the field.

Step 8

At this point there may be more than one actuator from which to choose. The final step is to determine which actuator will best operate the damper sizes needed. An actuator selection table can be found on the following pages. Contact your local representative or Greenheck for further assistance.



Two Position, Spring Return Actuators

Actuator Selection for Control Dampers									
Model	Voltage	Frequency (Hz)	Torque (in. lbs)	VCD Actuator Limitations*			Description	Actuator Part #	External Mount
				Maximum Damper Sq/Ft		VCDR			Actuator Kit # (includes actuator)
				With Seals	Without Seals	Maximum Diameter (inches)			
Two-position Spring Return*									
Belimo									
AFBUP	24 - 240	50/60	180	35	50	24		384376	863856
AFBUP-S			180	35	50	24	includes auxiliary SPDT end switches	384377	863857
TFB24 (TFB24-3)	24	50/60	22	4.5	6	24		384237	848933
TFB24-S (TFB24-3-S)	24	50/60	22	4.5	6	24	includes auxiliary SPDT end switches	384238	848934
FSLF24-S	24	50/60	30	7	12	24	includes auxiliary SPDT end switches	383394	832779
FSNF24	24	50/60	70	12	20	24		382889	834449
FSNF24-S	24	50/60	70	12	20	24	includes auxiliary SPDT end switches	382966	863862
LF24	24	50/60	35	7	12	24		381724	871844
LF24-S	24	50/60	35	7	12	24	includes auxiliary SPDT end switches	381725	871845
EFB24	24	50/60	270	35	50	24		475462	913978
EFB24-S	24	50/60	270	35	50	24	includes auxiliary SPDT end switches	475463	913980
EFB24-S N4	24	50/60	270	35	50	24	includes auxiliary SPDT end switches	475469	913981
NFBUP	24-240	50/60	90	17.5	20			1033833	-
NFBUP-S	24-240	50/60	90	17.5	20		includes auxiliary SPDT end switches	1033834	-
TFB120	100 - 240	50/60	22	4.5	6	24		384241	848931
TFB120-S	100 - 240	50/60	22	4.5	6	24	includes auxiliary SPDT end switches	384236	848932
EFB120	100 - 240	50/60	270	35	50	24		475466	913975
EFB120-S	100 - 240	50/60	270	35	50	24	includes auxiliary SPDT end switches	475467	913976
EFB120-S N4	100 - 240	50/60	270	35	50	24	includes auxiliary SPDT end switches	475472	913977
EFCX120-S N4	100 - 240	50/60	270	35	50	24	includes auxiliary SPDT end switches	386345	913986
FSLF120	120	50/60	30	7	12	24		383242	832776
FSLF120-S	120	50/60	30	7	12	24	includes auxiliary SPDT end switches	383392	832777
FSNF120	120	50/60	70	12	20	24		382888	834450
FSNF120-S	120	50/60	70	12	20	24	includes auxiliary SPDT end switches	382965	834453
LF120	120	50/60	35	7	12	24		381722	876283
LF120-S	120	50/60	35	7	12	24	includes auxiliary SPDT end switches	381723	876284
FSLF230-S	230	50/60	30	7	12	24	includes auxiliary SPDT end switches	383400	833250
FSNF230-S	230	50/60	70	12	20	24	includes auxiliary SPDT end switches	382964	834454

Consult factory for actuator applications on UL rated fire and smoke dampers.

1 Unless otherwise specified, spring return actuators will be linked "power open - fail closed" which is also called "normally closed" or "NC". If "power closed - fail open" operation is desired, be sure to indicate this requirement. "Power closed - fail open" is also referred to as "normally open" or "NO".

Two Position, Spring Return Actuators

Actuator Selection for Control Dampers									
Model	Voltage	Frequency (Hz)	Torque (in. lbs.)	VCD Actuator Limitations*			Description	Actuator Part #	External Mount
				Maximum Damper Sq/Ft		VCDR			Actuator Kit # (includes actuator)
				With Seals	Without Seals				
Two-position Spring Return*									
Honeywell									
MS8103F1025	24	50/60	27	7	12	24		386685	881942
MS8103F1225	24	50/60	27	7	12	24	includes auxiliary SPDT end switches	386686	881943
MS8104F1010/B	24	50/60	20	7	12	24		385162	870666
MS8104F1210/B	24	50/60	20	7	12	24	includes auxiliary SPDT end switches	385163	870667
MS8110A1206	24	50/60	88	17.5	20	24	includes auxiliary SPDT end switches	383818	849415
MS8120F1002	24	50/60	175	31	50	24		382824	880349
MS8120F1200	24	50/60	175	31	50	24	includes auxiliary SPDT end switches	383255	831682
MS4104F1010/B	120	60	20	7	12	24		385158	870662
MS4104F1210/B	120	60	20	7	12	24	includes auxiliary SPDT end switches	385159	870663
MS4109F1010/B	120	60	88	10	20	24		385164	870668
MS4109F1210/B	120	60	88	10	20	24	includes auxiliary SPDT end switches	385165	870669
MS4120F1006	120	60	175	31	50	24		382823	880347
MS4120F1204	120	60	175	31	50	24	includes auxiliary SPDT end switches	383024	831681
MS4103F1225	120 - 230	50/60	27	7	12	24	includes auxiliary SPDT end switches	386688	881945
MS4604F1210/B	230	50/60	20	7	12	24	includes auxiliary SPDT end switches	385161	870665
MS4609F1210/B	230	60	88	10	20	24	includes auxiliary SPDT end switches	385167	870671
Siemens									
GJD121.1	24	50/60	20	7	12	24		1036892	1037837
GJD221.1	120	50/60	35	7	12	24		1036894	1037835
GJD126.1	24	50/60	20	7	12	24	includes auxiliary SPDT end switches	1036893	1037838
GJD226.1	120	50/60	35	7	12	24	includes auxiliary SPDT end switches	1036895	1037836
GRD121.1	24	50/60	30	7	12	24		1036896	1037841
GRD221.1	120	50/60	80	7	12	24		1036898	1037839
GRD126.1	24	50/60	30	7	12	24	includes auxiliary SPDT end switches	1036897	1037842
GRD226.1	120	50/60	80	7	12	24	includes auxiliary SPDT end switches	1036899	1037840
GVD121.1U	24	50/60	80	30	50	48		10335576	1035592
GVD221.1U	120	50/60	200	30	50	48		10335574	1035590
GVD126.1U	24	50/60	80	30	50	48	includes auxiliary SPDT end switches	10335577	1035593
GVD226.1U	120	50/60	200	30	50	48	includes auxiliary SPDT end switches	10335575	1035591
Consult factory for actuator applications on UL rated fire and smoke dampers.									
1 Unless otherwise specified, spring return actuators will be linked "power open - fail closed" which is also called "normally closed" or "NC". If "power closed - fail open" operation is desired, be sure to indicate this requirement. "Power closed - fail open" is also referred to as "normally open" or "NO".									

Modulating and Floating Actuators, Manual Quadrants

Actuator Selection for Control Dampers										
Model	Voltage	Frequency (Hz)	Torque (in. lbs.)	VCD Actuator Limitations			Description	Actuator Part #	External Mount	
				Maximum Damper Sq/Ft		VCDR			Actuator Kit # (includes actuator)	
				With Seals	Without Seals	Maximum Diameter (inches)				
Modulating Spring Return¹										
Belimo										
AFB24-MFT	24	50/60	180	35	50	24		384374	863855	
AFB24-MFT-S	24	50/60	180	35	50	24	includes auxiliary SPDT end switches	384375	863859	
AFB24-SR	24	50/60	180	35	50	24		385250	872685	
AFB24-SR-S	24	50/60	180	35	50	24	includes auxiliary SPDT end switches	385251	872686	
LF24-SR-S	24	50/60	35	7	12	24	includes auxiliary SPDT end switches	383011	833253	
NFB24-SR-S	24	50/60	90	17.5	20	24	includes auxiliary SPDT end switches	384373	849251	
TFB24-MFT	24	50/60	22	4.5	6	24		385997	878054	
TFB24-MFT-S	24	50/60	22	4.5	6	24	includes auxiliary SPDT end switches	385998	878055	
TFB24-SR	24	50/60	22	4.5	6	24		384239	848935	
TFB24-SR-S	24	50/60	22	4.5	6	24	includes auxiliary SPDT end switches	384240	848936	
EFB24-SR	24	50/60	270	35	50	24		475464	913982	
EFB24-SR-S	24	50/60	270	35	50	24	includes auxiliary SPDT end switches	475465	913984	
EFB24-SR-S N4	24	50/60	270	35	50	24	includes auxiliary SPDT end switches	475471	913985	
Honeywell										
MS7103K1023	24	50/60	27	7	12	24		386524	880740	
MS7103K2223	24	50/60	27	7	12	24	includes auxiliary SPDT end switches	386525	880741	
MS7510A2206	24	50/60	88	17.5	20	24	includes auxiliary SPDT end switches	383213	849414	
MS7520A2015 (/B)	24	50/60	175	31	50	24		383785	849417	
MS7520A2213 (/B)	24	50/60	175	31	50	24	includes auxiliary SPDT end switches	383784	849416	
Modulating NON Spring Return										
LMB24-SR	24	50/60	45	7	12	24		381728	833286	
NMB24-SR	24	50/60	90	12	20	24		381138	833288	
AMB24-SR	24	50/60	180	35	50	24		382131	833290	
Floating PO/PC										
LMB24 (LMB24-3)	24	50/60	45	7	12	24		381726	833284	
LMQB24-1	24	50/60	35	-	-	24		385363	-	
AMB24-3	24	50/60	180	35	50	24		382132	833289	
NMB24-3 (NMB24)	24	50/60	90	12	20	24		381601	833287	
Manual Hand Quadrant										
1/2 in. diameter shaft - For use on all VCD's								811518	815607	
1 in. diameter shaft - For use on all VCD's								842633	813938	
1 Unless otherwise specified, spring return actuators will be linked "power open - fail closed" which is also called "normally closed" or "NC". If "power closed - fail open" operation is desired, be sure to indicate this requirement. "Power closed - fail open" is also referred to as "normally open" or "NO".										

WD Damper Series Actuator Selection		
Part#	Description	Used on
851038	End switch kit	All WD dampers
383243	Micron transformer 550/575/600 input	All WD dampers
WD-100 series		
826848	MP-100 24V motorpack kit (60 Hz)	WD-100 series
826840	MP-100 110V - 240V motorpack kit (50/60 Hz)	WD-100 series
826855	MP-100 380V motorpack kit (50 Hz)	WD-100 series
826844	MP-100 460V motorpack kit (60 Hz)	WD-100 series
WD-200 series		
826851	MP-210 24V motorpack kit (60 Hz)	WD-200 series
826842	MP-210 110V - 240V motorpack kit (50/60 Hz)	WD-200 series
826847	MP-210 460V motorpack kit (60 Hz)	WD-200 series
826857	MP-210 380V motorpack kit (50 Hz)	WD-200 series
826858	MP-220 24V motorpack kit (60 Hz)	WD-200 series
826860	MP-220 110V - 240V motorpack kit (60 Hz)	WD-200 series
826861	MP-220 460V motorpack kit (60Hz)	WD-200 series
WD-300 series		
826850	MP-310 24V motorpack kit (60 Hz)	WD-300 series
826853	MP-310 24V motorpack kit (50 Hz)	WD-300 series
826841	MP-310 110V - 240V motorpack kit (50/60 Hz)	WD-300 series
826856	MP-310 380V motorpack kit (50 Hz)	WD-300 series
826846	MP-310 460V motorpack kit (60 Hz)	WD-300 series
WD-323 series		
826849	MP-323 24V motorpack kit (60 Hz)	WD-323
826843	MP-323 110V - 240V motorpack kit (50/60 Hz)	WD-323
826845	MP-323 460V motorpack kit (60 Hz)	WD-323

Model	Description	Part #
NEMA Housings		
Greenheck NEMA 4X housing kit (w/galvanized mounting components)	Used on most brands of direct mount actuators	878264
Greenheck NEMA 4X housing kit (w/SS mounting components)	Used on most brands of direct mount actuators	878265
Belimo ZS-260 NEMA 7 housing		459332
Belimo ZS-300 NEMA 4X housing		459331
Transformers		
120V to 24V Transformer	Primary 120 VAC, secondary 24 VAC Compatible on any 24 VAC actuator	385338
Multi-Voltage Transformer	Primary 480/277/240/208, secondary 120 VAC Compatible on any 120 VAC actuator	385709