

Achieve™ Compact Limit Switches

Plastic Housing Plunger Actuator AEP Series

- Double insulated plastic housing
- 3.28 ft [1m] cable/5-pin M12 quick-disconnect (right exit)
- Compact size with standard 25mm [0.98 in] hole spacing
- Epoxy resin-filled for IP67 rating
- Snap-action (Z11) and (Z22) contacts are available
- N.C. contacts are positive-opening operated unless otherwise noted.

Compact Limit Switches AEP Series Selection Chart

Part Number	Price	Drawing Link	Actuator Type	Max. Actuation Speed	Min. Actuation Force	Min. Positive Opening Force	Number of Contacts	Connection Type
AEP2G11Z11-1	\$16.00	PDF	Metal plunger	0.5 ms	15N [3.37 lbf]	30N [6.74 lbf]	1 N.O./1 N.C.	3.28 ft [1m] cable (bottom exit)
AEP2G11Z11MR	\$19.00	PDF						5-pin M12 quick-disconnect (right exit)
AEP2G11Z22-1	\$22.00	PDF					2 N.O./2 N.C.	3.28 ft [1m] cable (bottom exit)
AEP2G12Z11-1	\$18.00	PDF	Metal plunger with metal roller	0.1 ms	10N [2.25 lbf]	30N [6.74 lbf]	1 N.O./1 N.C.	3.28 ft [1m] cable (bottom exit)
AEP2G12Z11MR	\$22.00	PDF		0.1 ms	10N	30N [6.74 lbf]		5-pin M12 quick-disconnect (right exit)
AEP2G12Z22-1	\$25.00	PDF					2 N.O./2 N.C.	3.28 ft [1m] cable (bottom exit)
AEP2G16Z11-1	\$18.00	PDF	Metal plunger with dust cap	0.5 ms	15N [3.37 lbf]	30N [6.74 lbf]	1 N.O./1 N.C.	3.28 ft [1m] cable (bottom exit)
AEP2G16Z11MR	\$22.00	PDF						5-pin M12 quick-disconnect (right exit)
AEP2G16Z22-1	\$24.00	PDF					2 N.O./2 N.C.	3.28 ft [1m] cable (bottom exit)
AEP2G21Z22-1	\$24.00	PDF	Metal plunger fixing nuts					3.28 ft [1m] cable (bottom exit)
AEP2G22Z22-1	\$26.00	PDF	Metal plunger with metal roller and fixing nuts		10N [2.25 lbf]			3.28 ft [1m] cable (bottom exit)



[AEP2G11Z11-1](#)



[AEP2G12Z11-1](#)



[AEP2G16Z11-1](#)

Housing style



3.28 ft [1m] cable,
(bottom exit)



5-pin M12 quick-disconnect
(right exit)

Compact Limit Switches



AEP2G11Z22-1



AEP2G12Z22-1



AEP2G16Z22-1

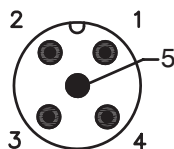


AEP2G21Z22-1

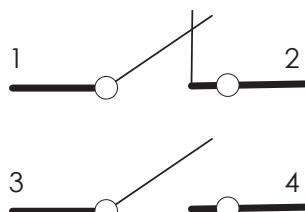


AEP2G22Z22-1

Connector

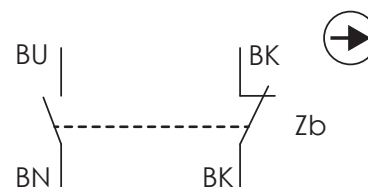


Contact Configuration

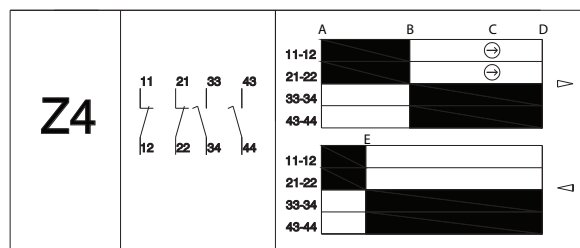


Note: Pin 5 is not connected

Z11 Snap-action contacts
1 N.O. and 1 N.C.

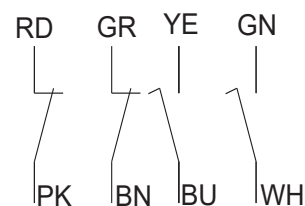


AEP2G11Z22-1, AEP2G16Z22-1 and AEP2G21Z22-1

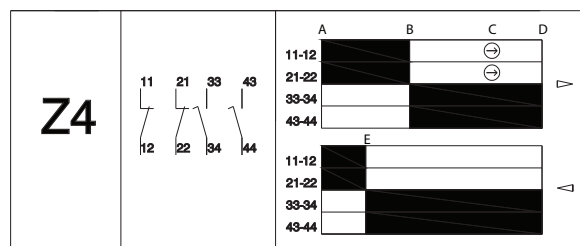


TAG	mm
A	0
B	2.1
C	4
D	5
E	1.3

Z22 Snap-action contacts
2 N.O. and 2 N.C.



AEP2G12Z22-1 and AEP2G22Z22-1



TAG	mm
A	0
B	3.6
C	7
D	8.7
E	2.3



Compact Limit Switch Specifications

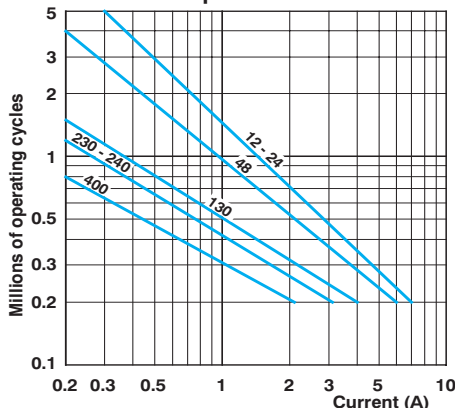
Compact Limit Switches AEP Series Specifications			
Type		1 N.O. / 1 N.C.	2 N.O. / 2 N.C.
Environmental			
Degree of Protection		IP67 according to IEC 60529	
Temperature Range		Storage: -40 to 70°C [-40 to 158°F]. Operating: -25 to 70°C [-13 to 158°F]	
Mechanical Ratings			
Mechanical Life		10 million operations. Models G11,G12,G41,G42,G43,G51,G71 5 million operations. Models G16, G92, G93	10 million operations
Enclosure Material		Reinforced Thermoplastic	
Contact Blocks Rating			
Positive Opening		All models except 92 and 93 operating heads	
Electrical Ratings	AC-15	Make: 100A @ 24VAC; 60A @ 120VAC; 30A @ 240VAC Break: 10A @ 24VAC; 6A @ 120VAC; 3A @ 240VAC	4A @ 24VDC, 3A @ 240VAC
	DC-13	2.8A @ 24VDC; 0.55A @ 125VDC; 0.27A@250VDC	2A @ 24VDC, 0.4 A @ 250VDC
Maximum Switching Frequency		Contact blocks: all one cycle per second	3600 [cycles/hour]
Repeat Accuracy		0.05 mm on the operating points at 1 million operations	
Short-Circuit Protection		10A @ <500V	4A @ <500VAC Part number: AEP2G93Z22-1 10A @ <500VAC
Contact Resistance		25mΩ	
Head Rotation		180 Degree Only	
Rated Insulation Voltage		B300, R300 according to UL508 400V (degree of pollution: 3) according to IEC 60947-1	C300 - R300 according to UL508, 250V (degree of pollution 3)
Connection Type		Cable: 1m [3.28 ft] PVC cable, 4 x 0.75mm² (18 AWG). Overall cable diameter: 7mm [0.275 in.] Connector: 5-pin M12 quick disconnect	Pigtail 1m [3.28 ft], PVC, 0.5 mm² [20AWG]
Wiring Terminal Markings		Cable Models: N.C. Black/Black, N.O. Blue/Brown M12 Models: N.C. Pin 1-2, N.O. Pin 3-4	N.C. Gray/Brown Red/Pink N.O. Blue/Yellow Green/White
Electrical Protection		Class II according to IEC60536-1	
Contact Blocks Performance			
Operation Frequency		3600 ops/h	
Electrical Durability (according to IEC 947-5-1)		Utilization categories AC-15 and DC-13; load factor of 0.5	
Torque		N/A	
Approvals *		UL file E191072, CE	

*To obtain the most current agency approval information, see the Agency Compliance & Certifications Checklist section on the specific part number's web page.

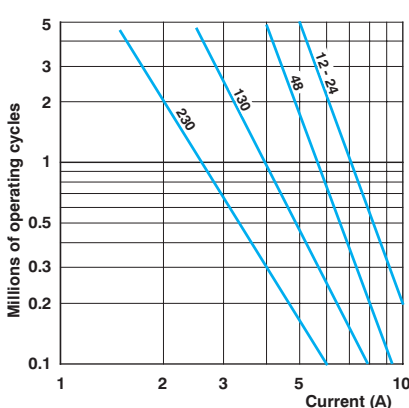
Limit Switches Supplemental

Electrical Durability (according to IEC 947-5-1)

AC-15 Snap Action



AC-15 Slow Action



Limit switch types

Snap-action contact: A contact element in which the contact motion is independent of the speed of the actuator. This feature ensures reliable electrical performance even in applications involving very slow moving actuators.

Slow-make/slow-break contacts: A contact element in which the contact motion is dependent on the actuator speed.

Terminal identification (IEC)

Each terminal is marked with two digits. The first digit indicates the pole (circuit). The second digit indicates the type of contact.

_1-_2 is N.C., _3-_4 is N.O.
so 11-12, 21-22 are N.C., while 13-14, 23-24 are N.O.

DC-13	Snap Action	Slow Action
	Power breaking for a durability of 5 million cycles	
24V	9.5 W	12W
48V	6.8 W	9W
110V	3.6 W	6W

Terminal Markings

European	
Terminal No.	Type
11-12	N.C. contact of pole no. 1 ¹
13-14	N.O. contact of pole no. 2 ¹
21-22	N.C. contact of pole no. 2 ²
23-24	N.O. contact of pole no. 1 ²

¹ With non-isolated contacts ² With isolated contacts

Note: Green/yellow wire is physical earth ground.



Make-before-break (overlapping) SPDT: the N.O. contact closes before the N.C. contact opens. (See ex: Y11)



Break-before-make (offset) SPDT: the N.C. contact opens before the N.O. contact closes. (See ex: X11)



Simultaneous make and break SPDT: the N.C. contact opens at the same time as the N.O. contact closes. (See ex: Z11)

Bar Chart Examples (cam angle is 30 degrees)

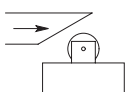


Diagram in millimeters/cam travel

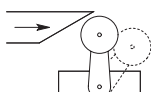
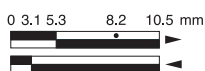


Diagram in degrees/lever rotation

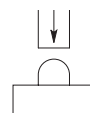
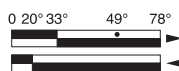
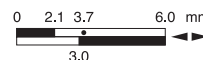


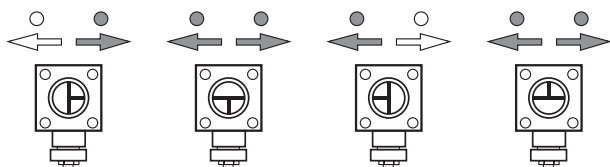
Diagram in millimeters/plunger travel



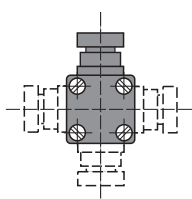
Changeable working heads (E42, E52, E71)

View of cam insert when looking at bottom of head once removed from switch body.

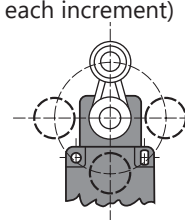
To change position, push in and twist until it locks into place



Positioning - 90° each way

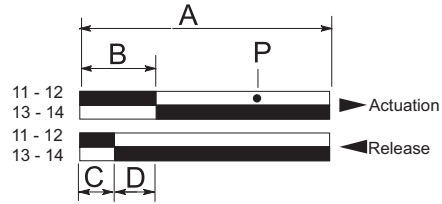
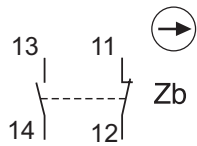


Adjustable lever from 0-360°
(6° each increment)



Contact Displacement Values

Z11 Snap Action Contacts 1 N.O. and 1 N.C.



A = Max. travel of the operator in mm or degrees

B = Tripping travel of both contacts on actuation

C = Tripping travel of both contacts on release

D = Differential travel (between actuation and release)

P = Point from which positive opening is assured during actuation

Contact Displacement Values

Part Series	Displacement Values — mm [in] or degrees			
	A	B	C	P
AEM Halogen				
AEM2G12Z11-HF1	8.7 [0.343]	3.8 [0.150]	2.4 [0.095]	7.5 [0.295]
AEM2G16Z11-HF1	5 [0.197]	2.2 [0.867]	1.4 [0.055]	4.3 [0.169]
AEM2G42Z11-HF1	74°	32°	21°	65°
AEM2G51Z11-HF1	74°	32°	21°	65°
AEM2G71Z11-HF1	74°	32°	21°	65°
AEM2G93Z11-HF1	—	10°	20°	—
AAM Series				
AAMxF11Z11x	5.6 [0.220]	2.5 [0.098]	1.3 [0.051]	4.1 [0.161]
AAMxF12Z11x	5.6 [0.220]	2.5 [0.098]	1.3 [0.051]	4.1 [0.161]
AAMxT14Z11x	5.6 [0.220]	2.5 [0.098]	1.3 [0.051]	4.1 [0.161]
AAMxT35Z11x	21 [0.827]	9 [0.354]	4.5 [0.177]	14.5 [0.571]
AAMxF43Z11x	74°	31°	17°	47°
AAMxF46Z11x	74°	31°	17°	47°
AAMxF53Z11x	74°	31°	17°	47°
AAMxF71Z11x	74°	31°	17°	47°
AAMxT93Z11x	—	12°	23°	—
AAP Series				
AAPxT10Z11x	5.6 [0.220]	2.5 [0.098]	1.3 [0.051]	4.1 [0.161]
AAPxT13Z11x	9.6 [0.378]	4.7 [0.185]	2.5 [0.098]	7.6 [0.299]
AAPxT14Z11x	5.6 [0.220]	2.5 [0.098]	1.3 [0.051]	4.1 [0.161]
AAPxT35Z11x	21 [0.827]	9 [0.354]	4.5 [0.177]	14.5 [0.571]
AAPxT41Z11x	74°	31°	17°	47°
AAPxT42Z11x	74°	31°	17°	47°
AAPxT45Z11x	74°	31°	17°	47°
AAPxT51Z11x	74°	31°	17°	47°
AAPxT5100Z11x	74°	31°	17°	47°
AAPxT5200Z11x	74°	31°	17°	47°
AAPxT71Z11x	74°	31°	17°	47°
AAPxT93Z11x	—	12°	23°	—

Contact Displacement Values tables continued on next page



IEC Limit Switches Bar Charts

Contacts Configuration and Bar Charts

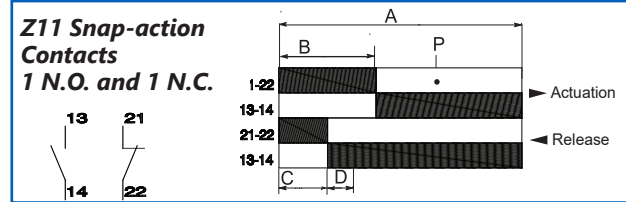
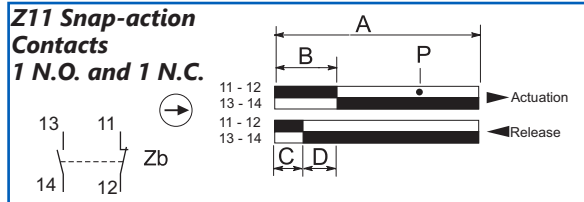
A = Max. travel of the operator in mm or degrees

B = Tripping travel of both contacts on actuation

C = Tripping travel of both contacts on release

D = Differential travel (between actuation and release)

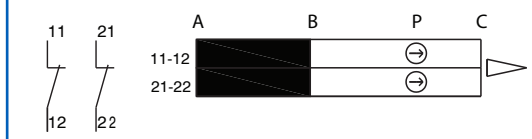
P = Point from which positive opening is assured during actuation



Contact Displacement Values				
Part Series	Displacement Values (mm [in] or degrees)			
	A	B	C	P
ABMxE11Z11	6.0 [0.24]	3.0 [0.12]	1.8 [0.07]	4.6 [0.18]
ABMxE13Z11	10.5 [0.41]	5.3 [0.21]	3.1 [0.12]	8.2 [0.32]
ABMxE32Z11	15.5 [0.61]	6.3 [0.25]	3.1 [0.12]	10.8 [0.43]
ABMxE42Z11	78°	33°	20°	49°
ABMxE52Z11	78°	33°	20°	49°
ABMxE71Z11	78°	33°	20°	49°
ABMxE92Z11	—	21°	9°	—
ABMxE93Z11	—	21°	21°	—
ABPxH14Z11	5.9 [0.23]	2.2 [0.09]	1.0 [0.04]	3.8 [0.15]
ABPxH19Z11	10.5 [0.41]	4.6 [0.18]	2.4 [0.09]	7.5 [0.30]
ABPxH35Z11	17 [0.67]	6.8 [0.27]	3.8 [0.15]	11.3 [0.44]
ABPxH41Z11	90°	31°	19°	47°
ABPxH51Z11	90°	31°	19°	47°
ABPxH71Z11	90°	31°	19°	47°
ABPxH92Z11	—	27°	15°	—
ABPxH93Z11	—	27°	15°	—

Contact Displacement Values				
Part Number	Displacement Values (mm [in] or degrees)			
	A	B	C	P
ADP2T13Z11	9.6 [0.37]	4.7 [0.19]	2.5 [0.10]	7.6 [0.29]
ADP2T14Z11	5.6 [0.22]	2.5 [0.10]	1.3 [0.05]	4.1 [0.16]
ADP2T35Z11	21 [0.82]	9.0 [0.35]	4.9 [0.19]	14.5 [0.57]
ADP2T41Z11	74°	31°	17°	47°
ADP2T45Z11	74°	31°	17°	47°
ADP2T51Z11	74°	31°	17°	47°
ADP2T5100Z11	74°	31°	17°	47°
ADP2T71Z11	74°	31°	17°	47°
ADM2F11Z11	5.6 [0.22]	2.5 [0.10]	1.3 [0.05]	4.1 [0.16]
ADM2F12Z11	9.6 [0.37]	4.7 [0.19]	2.5 [0.10]	7.6 [0.29]
ADM2T35Z11	21 [0.82]	9.0 [0.35]	4.9 [0.19]	14.5 [0.57]
ADM2F43Z11	74°	31°	17°	47°
ADM2F46Z11	74°	31°	17°	47°
ADM2F53Z11	74°	31°	17°	47°
ADM2F71Z11	74°	31°	17°	47°
ADM2T93Z11	23°	23°	12°	—
ADM2T9805Z11A	5.6 [0.22]	2.0 [0.07]	0.9 [0.03]	—

J02 Snap-action Contacts
2 N.C.



Contact Displacement Values				
Part Number	Displacement Values (mm [in] or degrees)			
	A	B	C	P
AHP2R002J02-024	—	2.4 [0.09]		4 [0.15]
AHP2T11J02-024	—	2.4 [0.09]		4 [0.15]
AHP2T12J02-024	—	4.5 [0.17]		7.4 [0.29]
AHP2T30J02-024	—	8.6 [0.33]		13.1 [0.51]
AHP2T32J02-024	—	8.6 [0.33]		13.1 [0.51]
AHP2T41J02-024	—	30°		46°
AHP2T5100J02-024	—	30°		46°
AHP2T5200J02-024	—	30°		46°

Contact Displacement Values (continued)

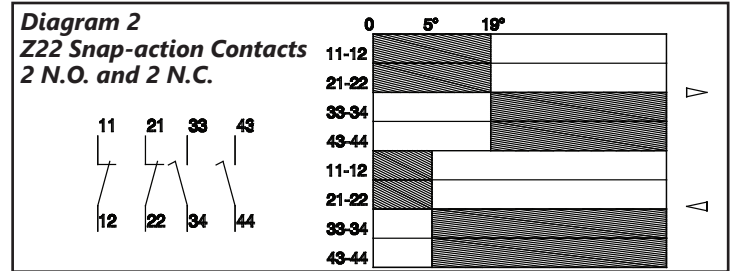
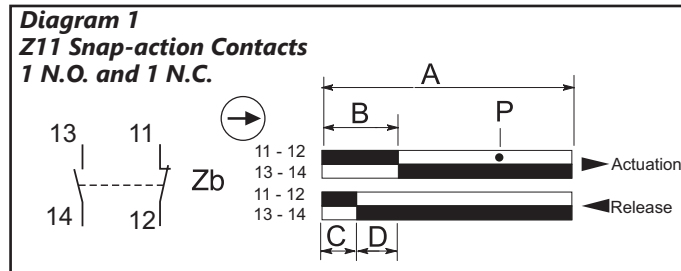
A = Max. travel of the operator in mm or degrees

B = Tripping travel of the N.C. contact

C = Tripping travel of the N.O. contact

D = Differential travel (between actuation and release)

P = Point from which positive opening is assured during actuation



Contact Displacement Values					
Part Series	Contact Configuration	Displacement Values mm [in] or degrees			
		A	B	C	P
AEP2G11	Z11	5.0 [0.20]	2.2 [0.09]	1.4 [0.06]	4.3 [0.17]
AEP2G11	Z22	5.0 [0.20]	2.1 [0.82]	1.3 [0.05]	4.0 [0.16]
AEP2G12	Z11	8.7 [0.34]	3.8 [0.15]	2.2 [0.09]	7.5 [0.30]
AEP2G12	Z22	8.7 [0.34]	3.8 [0.15]	2.3 [0.09]	7.0 [0.27]
AEP2G16	Z11	5.0 [0.20]	2.2 [0.09]	1.4 [0.06]	4.3 [0.17]
AEP2G16	Z22	5.0 [0.20]	2.1 [0.82]	1.3 [0.05]	4.0 [0.16]
AEP2G21	Z22	5.0 [0.20]	2.1 [0.82]	1.3 [0.05]	4.0 [0.16]
AEP2G22	Z22	8.7 [0.34]	3.8 [0.14]	2.3 [0.09]	7.0 [0.27]
AEP2G41	Z11	74°	32°	21°	65°
AEP2G41	Z22	75°	30°	10°	55°
AEP2G42	Z11	74°	32°	21°	65°
AEP2G43	Z11	74°	32°	21°	65°
AEP2G51	Z11	74°	32°	21°	65°
AEP2G51	Z22	75°	30°	10°	55°
AEP2G71	Z11	74°	32°	21°	65°
AEP2G92	Z11	—	20°	10°	—
AEP2G93	Z11	—	20°	10°	—
AEP2G93	Z22	—	19°	5°	—