

# Achieve™ Compact Limit Switches

## AEM Series (Metal Plunger Actuator)

- Die-cast metal housings
- 9.8 ft [3m] cable/5-pin M12 quick-disconnect (bottom and right)
- Compact size with standard 25mm [0.98 in] hole spacing
- Wide offering of head actuators
- Epoxy resin-filled for IP67 rating
- Snap-action (Z11) and (Z22), slow-make/slow-break (X11), contacts available
- N.C. contacts are positive-opening operated unless otherwise noted.

### AEM Series Compact Limit Switches Selection Chart

Part Number	Price	Drawing Link	Actuator Type	Max. Actuation Speed	Min. Actuation Force	Min. Positive Opening Force	Number of Contacts	Contact Configuration	Connection Type	Photo
<a href="#">AEM2G11Z11-3</a>		<a href="#">PDF</a>	Metal plunger	0.5 ms	15N	30N	1 N.O./1 N.C.	Diagram 1	9.8 ft [3m] cable (bottom exit)	A
<a href="#">AEM2G11X11-3</a>		<a href="#">PDF</a>						Diagram 2		
<a href="#">AEM2G1101Z11-3R</a>		<a href="#">PDF</a>						Diagram 1	9.8 ft [3m] cable (right exit)	
<a href="#">AEM2G1101Z11M</a>		<a href="#">PDF</a>							5-pin M12 quick-disconnect (bottom exit)	
<a href="#">AEM2G1101Z11MR</a>		<a href="#">PDF</a>							5-pin M12 quick-disconnect (right exit)	
<a href="#">AEM2G1101Z22-3</a>		<a href="#">PDF</a>								
<a href="#">AEM2G16Z11-3</a>		<a href="#">PDF</a>	Metal plunger with dust cap	0.5 ms	15N	30N	1 N.O./1 N.C.	Diagram 1	9.8 ft [3m] cable (bottom exit)	C
<a href="#">AEM2G16X11-3</a>		<a href="#">PDF</a>						Diagram 2		
<a href="#">AEM2G1601Z11-3R</a>		<a href="#">PDF</a>						Diagram 1	9.8 ft [3m] cable (right exit)	
<a href="#">AEM2G1601Z11M</a>		<a href="#">PDF</a>							5-pin M12 quick-disconnect (bottom exit)	
<a href="#">AEM2G1601Z11MR</a>		<a href="#">PDF</a>							5-Pin M12 quick-disconnect (right exit)	
<a href="#">AEM2G1601Z22-3</a>		<a href="#">PDF</a>								
<a href="#">AEM2G18Z11-3</a>		<a href="#">PDF</a>	Metal plunger with bevel cut	0.5 ms	15N	30N	1 N.O./1 N.C.	Diagram 1	9.8 ft [3m] cable (bottom exit)	E
<a href="#">AEM2G1801Z11-3R</a>		<a href="#">PDF</a>							9.8 ft [3m] cable (right exit)	
<a href="#">AEM2G1801Z11MR</a>		<a href="#">PDF</a>							5-pin M12 quick-disconnect (right exit)	
<a href="#">AEM2G21Z11-3</a>		<a href="#">PDF</a>	Metal plunger with fixing nuts	0.5 ms	15N	30N	1 N.O./1 N.C.	Diagram 1	9.8 ft [3m] cable (bottom exit)	F
<a href="#">AEM2G21X11-3</a>		<a href="#">PDF</a>						Diagram 2		
<a href="#">AEM2G2101Z11-3R</a>		<a href="#">PDF</a>						Diagram 1	9.8 ft [3m] cable (right exit)	
<a href="#">AEM2G2101Z11M</a>		<a href="#">PDF</a>							5-pin M12 quick-disconnect (bottom exit)	
<a href="#">AEM2G2101Z11MR</a>		<a href="#">PDF</a>							5-pin M12 quick-disconnect (right exit)	
<a href="#">AEM2G2101Z22-3</a>		<a href="#">PDF</a>								

# Achieve™ Compact Limit Switches

## AEM Series (Metal Plunger Actuator)



A



B



C



D



E



F



G



Cable Out (bottom)



Cable Out (right)



5-pin M12 quick-disconnect (bottom exit)



5-pin M12 quick-disconnect (right exit)



# Compact Limit Switches Specifications

AEM Series Compact Limit Switches Specifications				
Type	1 N.O. / 1 N.C.		2 N.O. / 2 N.C.	
<b>Environmental</b>				
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]			
<b>Mechanical Ratings</b>				
Mechanical Life	10 million operations. Models G16, G92, G93: 5 million operations.			
Enclosure Material	ZAMAK (zinc alloy)			
<b>Contact Blocks Rating</b>				
Positive Opening	Yes, except G61, G92, G93		All models except 92, 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	2.8 A @ 24VDC; 0.55 A @ 125VDC; 0.27 A @ 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 <a href="#">AEM2G9301Z22-3</a> is 10A @ <500VAC	
Contact Resistance	25mΩ			
Recommended Min Operating Speed	With snap-action contacts: 20mm per minute With slow-action contacts: 500mm per minute			
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: 3m [9.8 ft] PVC cable, 5 x 0.75 mm <sup>2</sup> (18AWG). Overall cable diameter: 8.20 mm (0.32 in) Connector: 5-pin M12 quick-disconnect		Pigtail 3m [9.8 ft], PVC, 0.5 mm <sup>2</sup> [20AWG]	
Wiring Terminal Markings	According to CENELEC EN50013		N.C. Gray/Brown Red/Pink N.O. Blue/Yellow Green/White	
Electrical Protection	Class I according to IEC60536-1			
<b>Contact Blocks Performance</b>				
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	All: 0.5 N•m [0.8 N•m max]		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.

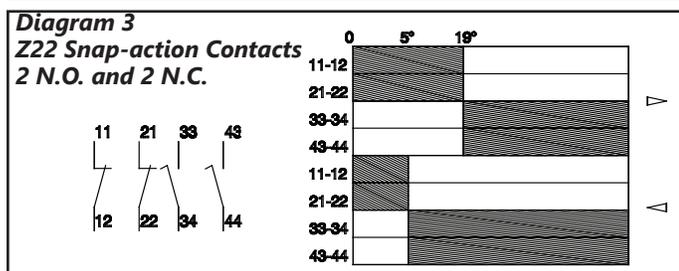
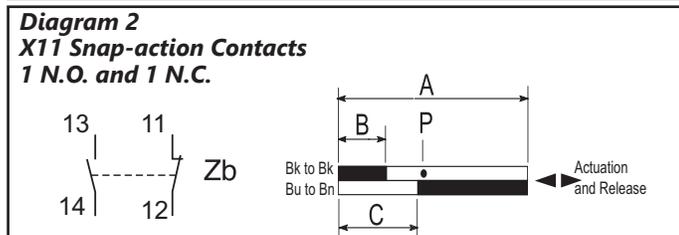
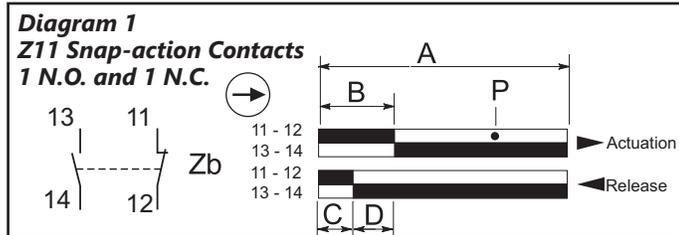
# Achieve™ Compact Limit Switches Supplemental

## 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.

## Contact Displacement Values and Bar Charts



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

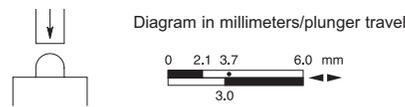
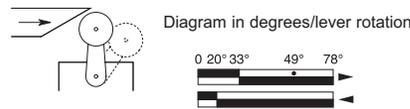
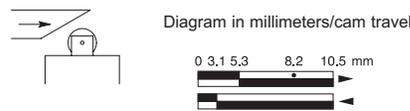
B = Tripping travel of the N.C. contact

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

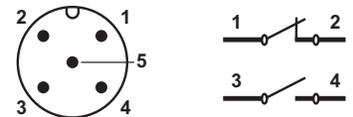
### Bar Chart Examples (cam angle is 30 degrees)



Note: Values represent travel of cam in direction of arrow.

Contact Displacement Values					
Part Series	Contact Configuration	Displacement Values mm [in] or degrees			
		A	B	C	P
AEM2G11, AEM2G16, AEM2G18, AEM2G21	Z11	5.0 [0.20]	2.2 [0.09]	1.4 [0.06]	4.3 [0.17]
AEM2G11, AEM2G16, AEM2G21	X11	5.0 [0.20]	1.9 [0.07]	3.2 [0.13]	3.4 [0.13]
AEM2G11, AEM2G16, AEM2G21	Z22	5.0 [0.20]	2.1 [0.82]	1.3 [0.05]	4.0 [0.16]
AEM2G12, AEM2G13, AEM2G14, AEM2G15, AEM2G17, AEM2G18, AEM2G22, AEM2G23, AEM2G24, AEM2G25	Z11	8.7 [0.34]	3.8 [0.15]	2.4 [0.09]	7.5 [0.30]
AEM2G12, AEM2G13, AEM2G14, AEM2G15, AEM2G22, AEM2G23, AEM2G24, AEM2G25	X11	8.7 [0.34]	3.3 [0.13]	5.7 [0.22]	5.9 [0.23]
AEM2G12, AEM2G22	Z22	3.6 [0.14]	8.7 [0.34]	2.3 [0.09]	7.0 [0.27]
AEM2G41, AEM2G42, AEM2G43, AEM2G45, AEM2G51, AEM2G71, AEM2G72, AEM2G73, AEM2G74, AEM2G75	Z11	74°	32°	21°	65°
AEM2G41, AEM2G42, AEM2G43, AEM2G45, AEM2G51, AEM2G71, AEM2G72, AEM2G73, AEM2G74, AEM2G75	X11	74°	28°	48°	50°
AEM2G41, AEM2G51	Z22	75°	30°	10°	55°
AEM2G61	Z11	74°	32°	21°	Not positive-opening
AEM2G61	X11	74°	28°	48°	
AEM2G92	Z11	—	20°	10°	
AEM2G93	Z11	—	20°	10°	
AEM2G93	Z22	—	19°	5°	

5-Pin M12 connector



Note: Green/yellow wire is physical earth ground.

□ = Contact open  
 ■ = Contact closed