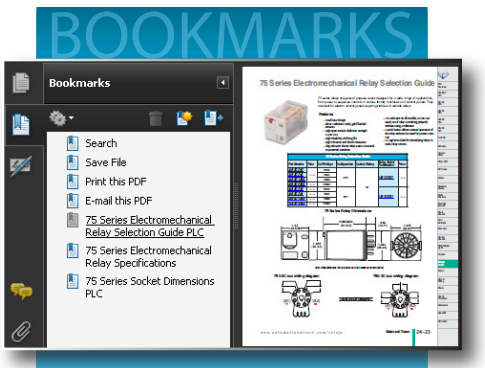
AUTOMATIONDIRECT.com

Limit Switches



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Rugged IEC Limit Switches for Peanuts

Heavy-duty metal - the most rugged IEC limit switch around

Our IEC metal limit switches feature:

- Diecast aluminum bodies for heavy-duty industrial applications
- Single and multiple conduit openings save wiring time and money when interconnecting several limit switches
- Conduit openings in ½" NPT or PG13.5 sizes
- Splined actuator shafts for fine adjustment of switch to fit all applications
- Eight different actuators, including roller levers and plungers
- Six interchangeable combinations of contact blocks

Starting from **$17.50**

Starting from **$27.50**

Double-insulated plastic IEC limit switch

Double-insulated plastic IEC limit switches feature:

- Electrically-isolated PBT bodies for corrosive environments
- Single conduit openings in ½" NPT or PG13.5 sizes
- Splined actuator shafts for very fine adjustment of switch to fit all applications
- Eight different actuators, including roller levers, plungers, and wobble sticks
- Six interchangeable combinations of contact blocks

Starting from **$14.50**

Miniature double-insulated plastic IEC limit switch

Miniature double-insulated plastic IEC limit switches feature:

- Small bodies for mounting in tight spaces
- Electrically-isolated PBT body for corrosive environments
- Single conduit openings in ½" NPT or PG11 sizes
- Splined actuator shafts for very fine adjustment of switch to fit all applications
- Eight different actuators, including roller levers, plungers, and wobble sticks
- Six interchangeable combinations of contact blocks

Starting from **$24.00**

Compact Limit Switches

- Die-cast metal housings
- 3-meter cable on all units
- 1 N.O. and 1 N.C. contact on all units
- Compact size with standard 25mm hole spacing
- Wide offering of head actuators
- Epoxy resin-filled for IP67 rating
- Both snap-action (Z11) and slow-make/slow-break (X11) contacts available
- N.C. contacts are positive-opening operated unless otherwise noted.

Contact blocks and replacement levers

Contact blocks feature:

- Six types for all applications:
- 10 A rating for heavy-duty operationing for heavy-duty operation

Starting from **$5.00**

Anatomy of an IEC Limit Switch

NEMA versus IEC limit switches

In the past, the U.S. market standardized on NEMA limit switches while the European market standardized on IEC limit switches. Now, however, the IEC standard is moving heavily into the U.S. market.

The primary difference between NEMA and IEC is the cost. A NEMA limit switch is typically over twice the price of an IEC limit switch. In many rugged applications, such as heavy machinery, foundries, or even mining, the performance of a NEMA limit switch is an absolute must. However, in many applications, such as material handling, ASRS (automated storage and retrieval systems), an IEC limit switch will perform very well and will save you money.

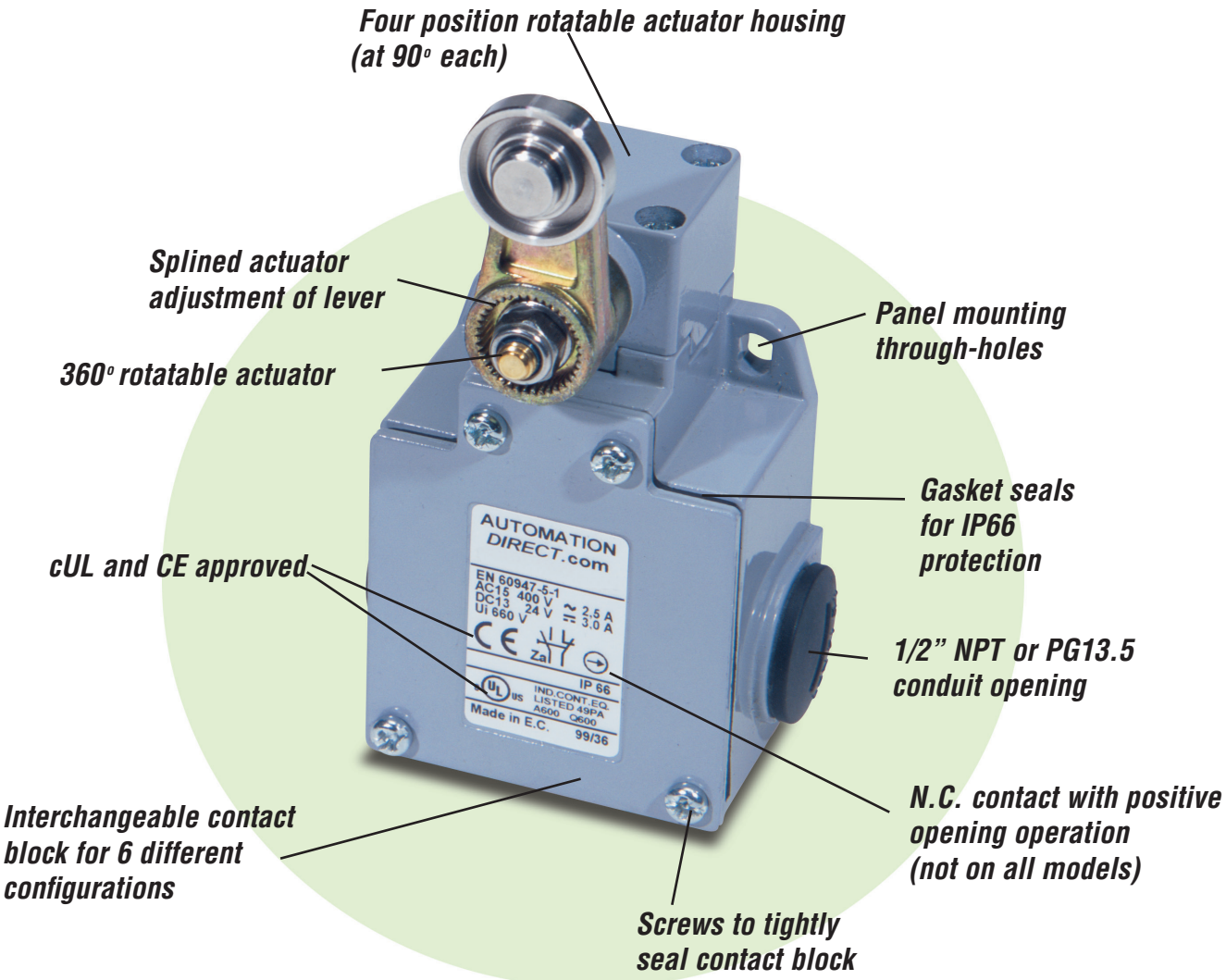
So remember, take a close look at your application needs and choose the most cost effective limit switch for you.

How long does an IEC limit switch last?

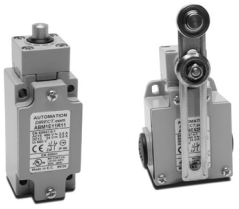
Limit switches are involved in physical contact applications that cause wear and tear on the switch. We recognize this concern and supply only the highest quality, longest lasting limit switch.

In addition, don't be fooled by specifications on the mechanical life of a limit switch. Typically, the electrical life of the contact block is the limiting factor in the overall life of a limit switch. Because of this, we offer replacement contact blocks for as little as $5.00. You shouldn't have to pay a lot to maintain your system.

In evaluating the specification, you will find that the AUTOMATIONDIRECT limit switch has an astounding mechanical life of 30 million operations, while the electrical life is an incredible 5 million operations. Compare this to some competitors' specifications and you'll see the AUTOMATIONDIRECT advantage.



IEC Limit Switches Selection Guide



Series	ABM Series	ABP Series	AAP Series
Prices start at	$17.50	$27.50	$14.50
Description	Heavy duty IEC	Double-insulated, non-metallic IEC	Double-insulated, non-metallic mini-DIN IEC
Material	Aluminum	PBT (plastic)	PBT (plastic)
Degree of Protection (IEC529)	IEC IP66	IEC IP65	IEC IP65
Maximum Switching Frequency	Contact blocks: all two cycles per second	Contact blocks: all two cycles per second	Contact blocks: all two cycles per second
Mechanical Service Life	25 million cycles	25 million cycles	25 million cycles
Contact Configuration	One snap-action set of N.O. / N.C. contacts. (Optional contact blocks with other configurations are available)	One snap-action set of N.O. / N.C. contacts. (Optional contact blocks with other configurations are available)	One snap-action set of N.O. / N.C. contacts. (Optional contact blocks with other configurations are available)
Conduit Opening	One and three cable holes, PG 13.5 or 1/2 NPT	One cable hole, PG 13.5 or 1/2 NPT	One cable hole, PG 11 or 1/2 NPT
Connection	2x2.5mm^2 (AWG14) to 2x0.5mm^2 (AWG 18)	2x2.5mm^2 (AWG14) to 2x0.5mm^2 (AWG 18)	2x2.5mm^2 (AWG14) to 2x0.5mm^2 (AWG 18)
Agency Approvals	CE markings for applicable CE Directives UL certified (UL508), File E191072. RoHS	CE markings for applicable CE Directives UL certified (UL508), File E191072. RoHS	CE markings for applicable CE Directives UL certified (UL508), File E191072. RoHS

Series	AEM Series
Prices start at	$24.00
Description	Compact 25mm mount
Material	Zinc Alloy
Degree of Protection (IEC529)	IEC IP67
Maximum Switching Frequency	Contact blocks: all one cycle per second
Mechanical Service Life	10 million cycles
Contact Configuration	One snap-action set of N.O. / N.C. contacts. One slow-action set of N.O. / N.C. contacts.
Conduit Opening	N/A
Connection	3 meter PVC cable
Agency Approvals	CE markings for applicable CE Directives (UL certified (UL508), File E191072. RoHS

IEC Limit Switches

ABM series heavy-duty IEC limit switches

- Featuring a diecast aluminum body for heavy-duty industrial applications
- Single and multiple conduit openings to save wiring time and money when interconnecting several limit switches
- Conduit openings in 1/2" NPT or PG13.5
- Splined actuator shaft allows very fine adjustment of switch to fit all applications
- Choose from eight different actuators including roller levers and plungers

ABM Series

Part Number	Price	Actuator Type	No. of Conduit Holes	Conduit Threads	Max. Actuation Speed (m/s)	Min. Actuation Force (N) /Torque (Nm)	Min. Positive Opening Force (N) /Torque (Nm)	Dimensions: Body / Head	Photo
ABM1E11Z11	$17.50	Stainless steel plunger	One	PG13.5	0.5	30(N)	45(N)	Figures 1, 5	A
ABM2E11Z11	$40.50		One	1/2" NPT	0.5	30(N)	45(N)	Figures 1, 5	A
ABM5E11Z11	$39.00		Three	PG13.5	0.5	30(N)	45(N)	Figures 2, 5	B
ABM6E11Z11	$40.50		Three	NPT	0.5	30(N)	45(N)	Figures 2, 5	B
ABM1E13Z11	$39.00	Stainless steel plunger with roller	One	PG13.5	0.5	22(N)	40(N)	Figures 1, 6	C
ABM2E13Z11	$40.50		One	1/2" NPT	0.5	22(N)	40(N)	Figures 1, 6	C
ABM5E13Z11	$40.50		Three	PG13.5	0.5	22(N)	40(N)	Figures 2, 6	D
ABM6E13Z11	$40.50		Three	1/2" NPT	0.5	22(N)	40(N)	Figures 2, 6	D
ABM1E32Z11	$39.00	One-way lever with stainless steel roller	One	PG13.5	1.5	12(N)	40(N)	Figures 1, 7	E
ABM2E32Z11	$40.50		One	1/2" NPT	1.5	12(N)	40(N)	Figures 1, 7	E
ABM5E32Z11	$39.00		Three	PG13.5	1.5	12(N)	40(N)	Figures 2, 7	F
ABM6E32Z11	$40.50		Three	1/2" NPT	1.5	12(N)	40(N)	Figures 2, 7	F
ABM1E42Z11	$40.50	Rotary lever with stain. steel roller (See accessories for opt. roller and actuator levers)	One	PG13.5	1.5	0.15(Nm)	0.30(Nm)	Figures 1, 8	G
ABM2E42Z11	$40.50		One	1/2" NPT	1.5	0.15(Nm)	0.30(Nm)	Figures 1, 8	G
ABM5E42Z11	$40.50		Three	PG13.5	1.5	0.15(Nm)	0.30(Nm)	Figures 2, 8	H
ABM6E42Z11	$40.50		Three	1/2" NPT	1.5	0.15(Nm)	0.30(Nm)	Figures 2, 8	H
ABM1E52Z11	$40.50	Adj. rotary lever w/ stainless steel roller (See accessaries for opt. roller and actuator levers)	One	PG13.5	1.5	0.15(Nm)	0.30(Nm)	Figures 1, 9	I
ABM2E52Z11	$40.50		One	1/2" NPT	1.5	0.15(Nm)	0.30(Nm)	Figures 1, 9	I
ABM5E52Z11	$39.00		Three	PG13.5	1.5	0.15(Nm)	0.30(Nm)	Figures 2, 9	J
ABM6E52Z11	$40.50		Three	NPT	1.5	0.15(Nm)	0.30(Nm)	Figures 2, 9	J
ABM1E71Z11	$40.50	Adjustable rotary lever w/ stainless steel rod	One	PG13.5	1.5	0.15(Nm)	0.30(Nm)	Figures 1, 10	K
ABM2E71Z11	$40.50		One	1/2" NPT	1.5	0.15(Nm)	0.30(Nm)	Figures 1, 10	K
ABM5E71Z11	$23.50		Three	PG13.5	1.5	0.15(Nm)	0.30(Nm)	Figures 2, 10	L
ABM6E71Z11	$40.50		Three	1/2" NPT	1.5	0.15(Nm)	0.30(Nm)	Figures 2, 10	L
ABM1E92Z11	$20.00	Wobble lever w/ polyamide tip stainless steel spring	One	PG13.5	1.0	0.18(Nm)	-	Figures 1, 11	M
ABM2E92Z11	$40.50		One	1/2" NPT	1.0	0.18(Nm)	-	Figures 1, 11	M
ABM5E92Z11	$39.00		Three	PG13.5	1.0	0.18(Nm)	-	Figures 2, 11	N
ABM6E92Z11	$39.00		Three	1/2" NPT	1.0	0.18(Nm)	-	Figures 2, 11	N
ABM1E93Z11	$40.50	Wobble lever w/stainless steel spring	One	PG13.5	1.0	0.18(Nm)	-	Figures 1, 12	O
ABM2E93Z11	$40.50		One	1/2" NPT	1.0	0.18(Nm)	-	Figures 1, 12	O
ABM5E93Z11	$40.50		Three	PG13.5	1.0	0.18(Nm)	-	Figures 2, 12	P
ABM6E93Z11	$40.50		Three	1/2" NPT	1.0	0.18(Nm)	-	Figures 2, 12	P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IEC Limit Switches

ABP series double insulated limit switches

- Featuring an electrically isolated PBT body for corrosive environments
- Single conduit openings in 1/2" NPT or PG13.5
- Conduit openings splined actuator shaft allows very fine adjustment of switch to fit all applications
- Choose from eight different actuators including roller levers, plungers, and wobble sticks

ABP Series									
Part Number	**Price**	**Actuator Type**	**Number of Conduit Holes**	**Conduit Threads**	**Max. Actuation Speed (m/s)**	**Min. Actuation Force (N) / Torque (Nm)**	**Min. Positive Opening Force (N) / Torque (Nm)**	**Dimensions: Body / Head**	**Photo**
ABP1H14Z11	$27.50	Galvanized steel plunger	One	PG13.5	0.5	14(N)	40(N)	Figures 3, 5	A
ABP2H14Z11	$28.00		One	1/2" NPT	0.5	14(N)	40(N)	Figures 3, 5	A
ABP1H19Z11	$27.50	Galvanized steel plunger with roller	One	PG13.5	0.5	14(N)	40(N)	Figures 3, 6	B
ABP2H19Z11	$28.00		One	1/2" NPT	0.5	14(N)	40(N)	Figures 3, 6	B
ABP1H35Z11	$28.00	One-way lever with polyamide roller	One	PG13.5	1.0	8(N)	30(N)	Figures 3, 7	C
ABP2H35Z11	$28.00		One	1/2" NPT	1.0	8(N)	30(N)	Figures 3, 7	C
ABP1H41Z11	$27.50	Side rotary lever with polyamide roller	One	PG13.5	1.5	0.15(Nm)	0.30(Nm)	Figures 3, 8	D
ABP2H41Z11	$28.00		One	1/2" NPT	1.5	0.15(Nm)	0.30(Nm)	Figures 3, 8	D
ABP1H51Z11	$28.00	Side rotary adjustable lever with polyamide roller	One	PG13.5	1.5	0.15(Nm)	0.30(Nm)	Figures 3, 9	E
ABP2H51Z11	$28.00		One	1/2" NPT	1.5	0.15(Nm)	0.30(Nm)	Figures 3, 9	E
ABP1H71Z11	$28.00	Side rotary with stainless steel rod	One	PG13.5	1.5	0.15(Nm)	0.30(Nm)	Figures 3, 10	F
ABP2H71Z11	$28.00		One	1/2" NPT	1.5	0.15(Nm)	0.30(Nm)	Figures 3, 10	F
ABP1H92Z11	$28.00	Wobble lever w/ polyamide tip stainless steel spring	One	PG13.5	1.0	0.18(Nm)	-	Figures 3, 11	G
ABP2H92Z11	$28.00		One	1/2" NPT	1.0	0.18(Nm)	-	Figures 3, 11	G
ABP1H93Z11	$28.00	Wobble lever w/ stainless steel spring	One	PG13.5	1.0	0.18(Nm)	-	Figures 3, 12	H
ABP2H93Z11	$28.00		One	1/2" NPT	1.0	0.18(Nm)	-	Figures 3, 12	H


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IEC Limit Switches

AAP series miniature DIN limit switches

- Small body allows mounting in tight spaces
- Featuring an electrically isolated PBT body for corrosive environments
- Single conduit openings in 1/2" NPT or PG11
- Splined actuator shaft allows very fine adjustment of switch to fit all applications
- Choose from six different actuators including roller levers, plungers, and wobble sticks

AAP Series									
Part Number	*Price*	*Actuator Type*	*Number of Conduit Holes*	*Conduit Threads*	*Max. Actuation Speed (m/s)*	*Min. Actuation Force (N) / Torque (Nm)*	*Min. Positive Opening Force (N) / Torque (Nm)*	*Dimensions Body / Head*	*Photo*
AAP2T14Z11	$14.50	Mini w/ galvanized steel plunger	One	PG11 threads with a 1/2" NPT adapter	0.5	15(N)	30(N)	Figures 4, 15	A
AAP2T13Z11	$14.50	Mini w/ galvanized steel plunger with polyamide plastic roller	One	PG11 threads with a 1/2" NPT adapter	0.5	12(N)	30(N)	Figures 4, 16	B
AAP2T35Z11	$14.50	Mini w/ one-way lever with polyamide roller	One	PG11 threads with a 1/2" NPT adapter	1.0	7(N)	24(N)	Figures 4, 17	C
AAP2T41Z11	$14.50	Mini side rotary with polyamide roller	One	PG11 threads with a 1/2" NPT adapter	1.5	0.10(Nm)	0.32(Nm)	Figures 4, 18	D
AAP2T51Z11	$14.50	Mini side rotary adjustable lever with polyamide roller	One	PG11 threads with a 1/2" NPT adapter	1.5	0.10(Nm)	0.32(Nm)	Figures 4, 19	E
AAP2T71Z11	$14.50	Mini side rotary with steel rod	One	PG11 threads with a 1/2" NPT adapter	1.5	0.10(Nm)	0.32(Nm)	Figures 4, 20	F

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IEC Limit Switches Accessories

Replacement contact blocks

Easily-installed replacement contact blocks fit both heavy-duty IEC and double-insulated limit switches, including mini-DIN models.

Note: Limit switches come standard with snap-action contacts (AGZ11-SWITCH.) To replace contact block, remove limit switch cover. Carefully remove old contact block and install replacement. Contact blocks are supplied with an adapter to fit into larger ABM and ABP switches. Remove this adapter when installing contacts in mini-DIN AAP models.

Replacement Contact Blocks			
Part Number	***Price***	***Contact Type***	***Action***
AGZ11-SWITCH	$5.25	Snap-action 1 N.C. and N.O.	3ms change-over time
AGZ02-SWITCH	$5.00	Snap-action 2 N.C.	3ms change-over time
AGX11-SWITCH	$5.00	Slow-action 1 N.C. and 1 N.O.	Break before make
AGY11-SWITCH	$5.00	Slow-action overlay 1 N.C. and 1 N.O.	Make before break
AGW02-SWITCH	$5.50	Slow-action delay 2 N.C.	Simultaneous
AGW20-SWITCH	$4.00	Slow-action overlay 2 N.O.	Simultaneous

Additional lever arms, spare parts and accessories for ABM series

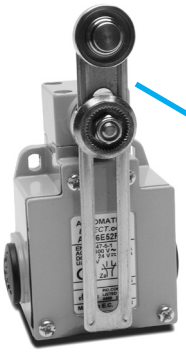
Additional Lever Arms/Spare Parts and Accessories			
Part Number	***Price***	***Dimensions***	***Actuator Type***
AGE42-LEVER	$5.00	Figure 8	Lever with stainless steel roller for E42 models (replacement lever)
AGE44-LEVER	$5.00	Figure 13	Lever with 50mm diameter rubber roller (fits E42 models)
AGE52-LEVER	$6.00	Figure 9	Lever with stainless steel roller for E52 models (replacement lever)
AGE54-LEVER	$6.00	Figure 14	Lever with 50mm diameter rubber roller (fits E52 models)

Note: See the Bar Charts page of this section for more information.

Replacement actuator levers for heavy-duty IEC models

Easily-replaceable actuators for E42 and E52 model limit switches.

Note: These models have an E42 or E52 in the part number, for example, ABM1E42Z11.

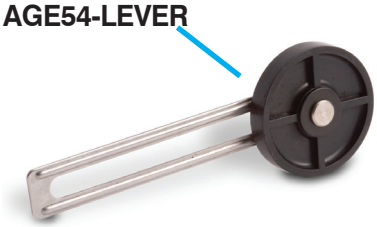


AGE52-LEVER

(Replacement lever shown installed on ABM5E52Z11 limit switch)

AGE44-LEVER

AGE54-LEVER



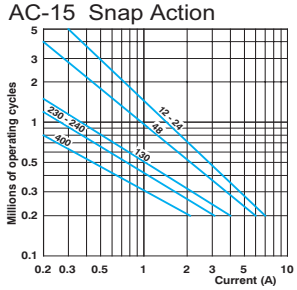
General Specifications

Approvals	
All: CENELEC EN 50041, CEI EN 60947-5-1 Plastic models: UL (508), CSA C22.2 No 14-M91	
Environmental	
Degree of Protection	Plastic models: IP65 according to IEC 529 Aluminum models: IP66 according to IEC 144-CEI70-1
Temperature Range	Plastic models: stocking: -30° to 80°C (-22° to 176° F) working: -25° to 70°C (-13° to 158°F) Aluminum models: stocking: -30° to 80°C (-22° to 176°F) working: -10° to 70°C (14° to 158°F); minimum temperatures assume that the atmosphere is free of moisture, which could cause moving parts to freeze up
Rated Insulation Voltage	690V (degree of pollution 3)
Mechanical Ratings	
Working Positions	All actuators can be rotated in 90° increments(although some types of actuator, such as a long, heavy spring with the adjustable actuator fully extended, may not work properly if installed in a horizontal position).
Mechanical Life	Straight line working heads: 30 million operations, side rotary heads: 25 million operations, multidirectional heads: 10 million operations
Enclosure Material	Plastic models: fiberglass-reinforced plastic-V0 class (UL94); aluminum models: die cast aluminum
Contact Blocks Rating	
Positive Opening*	Yes, all models
Electrical Ratings ***AC15***	Make: 60A@120VAC; 30A @ 240VAC; 18A @ 400VAC Break:10A @ 24VAC; 6.5A @130VAC; 3.1A @ 230VAC; 1.8A @ 400VAC
Electrical Ratings ***DC13***	2.8A @ 24VDC; 0.5A @ 110VDC
Maximum Switching Frequency	Contact blocks: all two cycles per second
Repeat Accuracy	0.01mm on the operating points at 1 million operations
Short-Circuit Protection	Cartridge fuses gl 10A-500V 10.3x38 1 100KA
Contact Resistance	25 milli Ω
Recommended Minimum Operating Speed	With snap-action contacts: 20 mm per minute** With slow-action contacts: 500 mm per minute***
Rated Insulation Voltage	660V
Terminals Marking	According to CENELEC EN 50013
Wiring Connections	2 x 2.5mm^2 (AWG14) to 2 x 0.5mm^2 (AWG18)
Wiring Terminal Type	Captive screw with self-lifting pressure plate
Wiring Terminal Markings	According to CENELEC EN50013
User Protection	Double insulation (plastic models only)
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. See table and curves below.
Tools Needed	
Phillips screwdriver, #1 #2 / Hex wrench, 10mm	

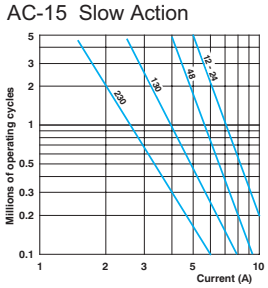
* Positive opening in a snap-action contact block is performed by a rigid mechanism that forces the N.C. contact to open in case the snap action mechanism fails. This would provide protection if, for example, the contacts became "welded" together by excessive current rush. Generally, positive opening is not considered to work properly on switches with actuators that are not a solid design (such as a spring or rubber roller), despite the fact that the contact block itself has positive opening. In order to be considered as having positive opening, a switch must not have flexible components between actuator actioning points and the electrical contact.
** This is the speed at which snap-action contact blocks are tested. There is no minimum operating speed for snap-action contacts because the speed has no influence on the switch action. When using spring actuators, the changeover time may vary from 1 to 3 ms from max. to min. operating speed.
*** Slow-action contacts must not be operated at very low speeds because of the tendency to maintain the arc if contacts are not rapidly separated.

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

AC-15 Snap Action



AC-15 Slow Action



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

IEC Limit Switches Bar Charts

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.

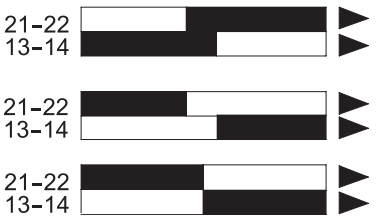
Slow-make/slow-break contacts: A contact element in which the contact motion is dependent on the actuator speed.

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.

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



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)

Note: Green/yellow wire is physical earth ground.

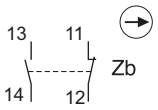
= Contact open

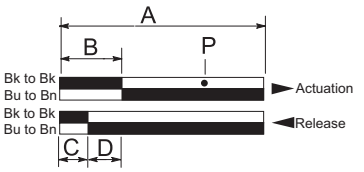
= Contact closed

Contacts Configuration

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

Bar Chart Examples

(cam angle is 30 degrees)

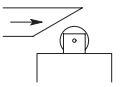
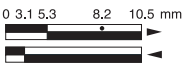


Diagram in millimeters/cam travel



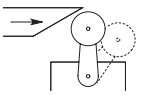
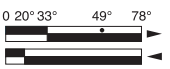


Diagram in degrees/lever rotation



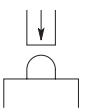
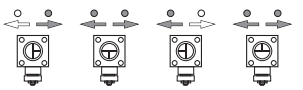


Diagram in millimeters/plunger travel

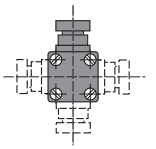
Part Series	***Displacement Values mm(in) or degrees***			
	A	***B***	***C***	***P***
ABMxE11Z11	6.0	3.0	1.8	4.6
ABMxE13Z11	10.5	5.3	3.1	8.2
ABMxE32Z11	15.5	6.3	3.1	10.8
ABMxE42Z11	78°	33°	20°	49°
ABMxE52Z11	78°	33°	20°	49°
ABMxE71Z11	78°	33°	20°	49°
ABMxE92Z11	—	21°	9°	—
ABMxE93Z11	—	21°	21°	—
ABPxH14Z11	5.9	2.2	1.0	3.8
ABPxH19Z11	10.5	4.6	2.4	7.5
ABPxH35Z11	17 mm	6.8	3.8	11.3
ABPxH41Z11	90°	31°	19°	47°
ABPxH51Z11	90°	31°	19°	47°
ABPxH71Z11	90°	31°	19°	47°
ABPxH92Z11	—	27°	15°	—
ABPxH93Z11	—	27°	15°	—
AAP2T14Z11	9.6 mm	4.7 mm	2.5 mm	7.6 mm
AAP2T13Z11	5.5 mm	2.5 mm	1.3 mm	4.1 mm
AAP2T35Z11	21 mm	9mm	4.9 mm	14.5 mm
AAP2T41Z11	74°	31°	17°	47°
AAP2T51Z11	74°	31°	17°	47°
AAP2T71Z11	74°	31°	17°	47°

Changeable working heads (E42,E52,E71) models; view of cam insert when looking at bottom of head once removed from switch body.

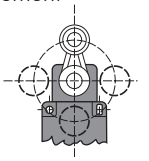
To change position, push in and twist until it locks into place



Positioning - 90° each way



Adjustable lever from 0-360°, 6° each increment



IEC Limit Switches Dimensions

Switch body dimensions

Dimensions are in millimeters. 25.4 mm = 1 inch
For example, 30 mm to inches = 30/25.4 = 1.181 inches.

Figure 1: ABM models — single-cable entry style

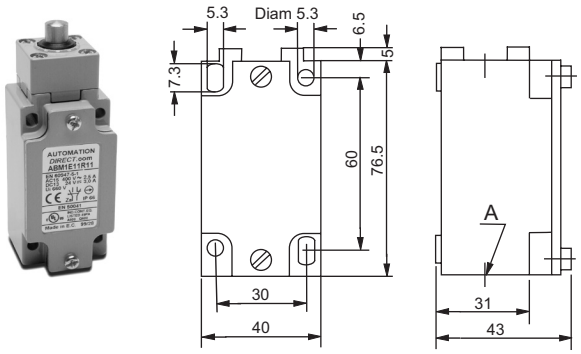


Figure 2: ABM models — 3-cable entry style

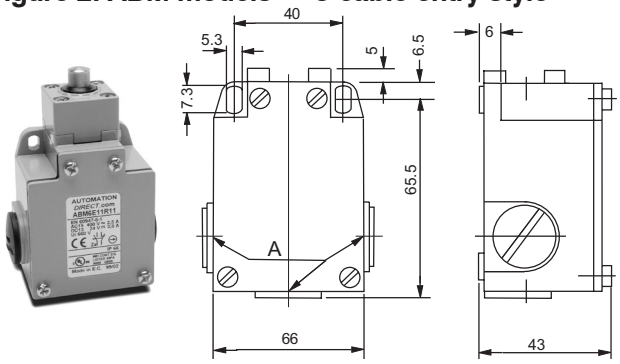


Figure 3: ABP models

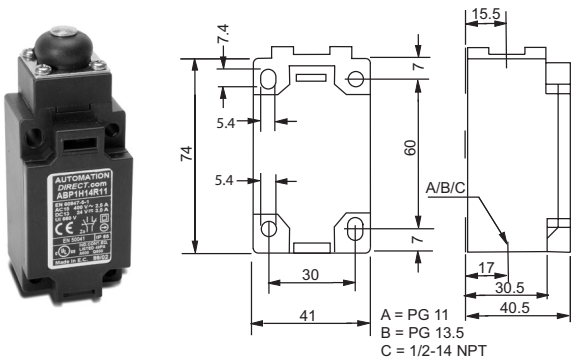
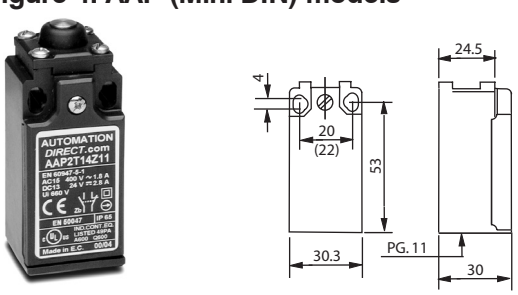


Figure 4: AAP (Mini DIN) models



Actuators - ABM, ABP models

Figure 5: Steel plunger (ABM, ABP models)

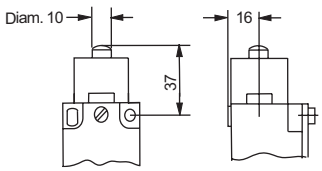


Figure 6: Plunger with roller (ABM, ABP models)

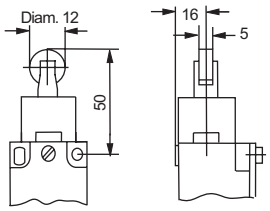


Figure 7: 1-way lever with roller (ABM, ABP models)

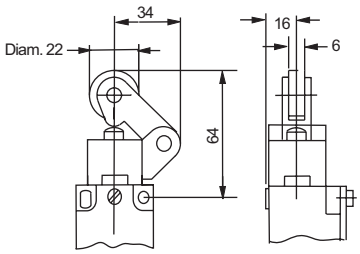


Fig. 8: Side rotary with roller (ABM, ABP models)

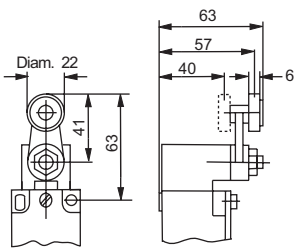
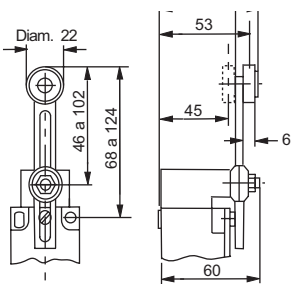


Figure 9: Side rotary with adjustable lever roller (ABM, ABP models)



IEC Limit Switches Dimensions

Figure 10: Side rotary with rod (ABM, ABP models)

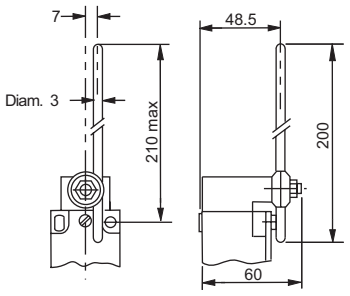


Figure 11: Wobble-type with spring with tip (ABM, ABP models)

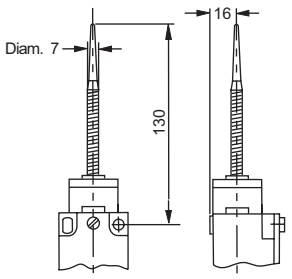


Figure 12: Wobble-type steel spring (ABM, ABP models)

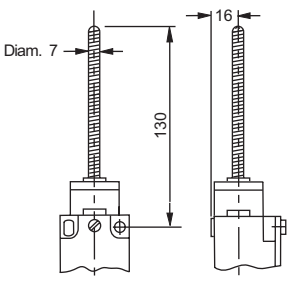


Figure 13: Optional lever arm (ABM models) AGE44-LEVER

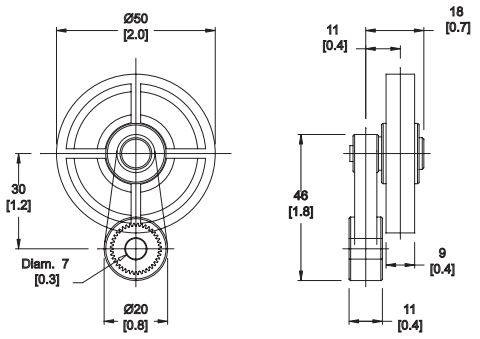
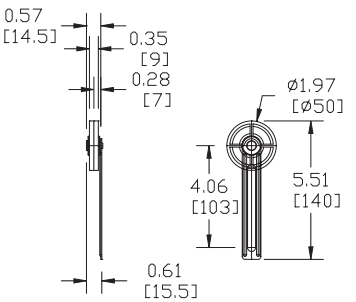


Figure 14: Optional lever arm (ABM models) AGE54-LEVER



Actuators — mini-DIN (AAP) models

Figure 15: Steel plunger (AAP models)

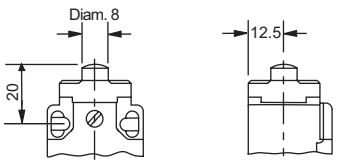


Figure 16: Steel plunger with roller (AAP models)

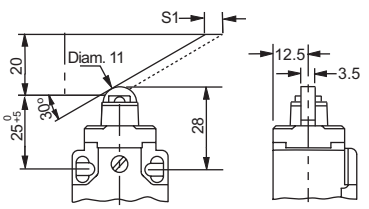


Figure 17: One-way lever with roller (AAP models)

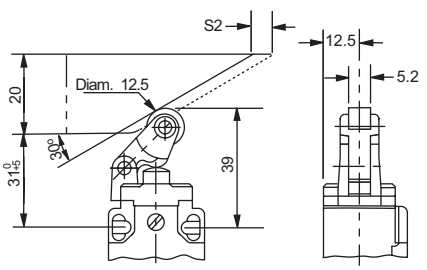


Figure 18: Side rotary lever with roller (AAP models)

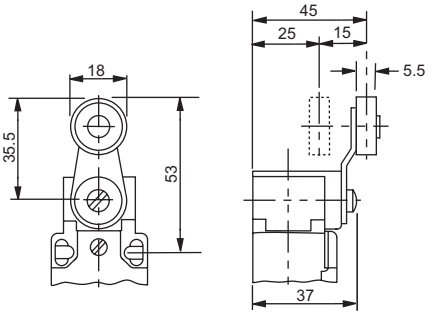


Figure 19: Side rotary lever with adj. lever roller (AAP models)

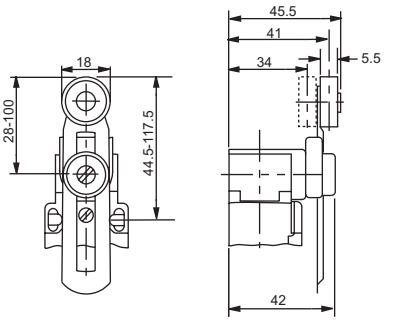
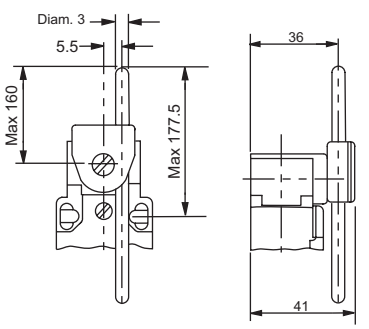


Figure 20: Side rotary lever with rod actuator (AAP models)



Dimensions are in millimeters (25.4 mm = 1 inch). For example, 30 mm to inches = 30/25.4 = 1.181 inches.

Compact Limit Switches


A


B

AEM2G Series Compact Limit Switches

- Die-cast metal housings
- 3-meter cable on all units
- 1 N.O. and 1 N.C. contact on all units
- Compact size with standard 25 mm hole spacing
- Wide offering of head actuators
- Epoxy resin-filled for IP67 rating
- Both snap-action (Z11) and slow-make/slow-break (X11) contacts available
- N.C. contacts are positive-opening operated unless otherwise noted.


C


D


E


F

AEM2G Series Compact Limit Switches Selection Chart

Part Number	Price	Actuator Type	Max. Actuation Speed (m/s)	Min. Actuation Force (N)/ Torque (Nm)	Min. Positive Opening Force (N)/ Torque (Nm)	Head Dimensions	Contact Config. Diagram	Photo
AEM2G11Z11-3	$24.00	Metal plunger	0.5	15	30	Figure1	1	A
AEM2G11X11-3	$24.00						2	
AEM2G12Z11-3	$29.00	Metal plunger with metal roller actuator	0.1	10		Figure 2	1	B
AEM2G12X11-3	$29.00						2	
AEM2G13Z11-3	$28.00	Metal plunger with nylon roller actuator					1	C
AEM2G13X11-3	$28.00						2	
AEM2G14Z11-3	$28.50	Metal plunger with metal cross roller actuator				Figure 3	1	D
AEM2G14X11-3	$28.50						2	
AEM2G15Z11-3	$27.00	Metal plunger with nylon cross roller actuator					1	E
AEM2G15X11-3	$27.00						2	
AEM2G16Z11-3	$28.00	Metal plunger with dust cap	0.5	15		Figure 4	1	F
AEM2G16X11-3	$28.00						2	
AEM2G21Z11-3	$26.00	Metal plunger actuator with fixing nuts				Figure 5	1	G
AEM2G21X11-3	$26.00						2	
AEM2G22Z11-3	$28.50	Metal plunger with metal roller actuator with fixing nuts	0.1	10		Figure 6	1	H
AEM2G22X11-3	$28.50						2	
AEM2G23Z11-3	$28.50	Metal plunger with nylon roller actuator with fixing nuts					1	I
AEM2G23X11-3	$28.50						2	
AEM2G24Z11-3	$28.50	Metal plunger with metal cross roller actuator with fixing nuts				Figure 7	1	J
AEM2G24X11-3	$28.50						2	
AEM2G25Z11-3	$28.50	Metal plunger with nylon cross roller actuator with fixing nuts					1	K
AEM2G25X11-3	$28.50						2	
AEM2G41Z11-3	$26.00	Lever with 14 mm nylon roller actuator	1.5	0.08	0.28	Figure 8	1	L
AEM2G41X11-3	$26.00						2	


G


H


I


J


K


L

Compact Limit Switches


M


N


O


P


Q


R


S


T


U


V


W


X

AEM2G Series Compact Limit Switches Selection Chart, Continued

Part Number	Price	Actuator Type	Max. Actuation Speed (m/s)	Min. Actuation Force (N)/ Torque (Nm)	Min. Positive Opening Force (N)/ Torque (Nm)	Head Dimensions	Contact Config. Diagram	Photo
AEM2G42Z11-3	$26.50	Lever with 14 mm metal roller actuator	1.5	0.08	0.28	Figure 8	1	M
AEM2G42X11-3	$26.50						2	
AEM2G43Z11-3	$27.00	Lever with 14 mm ball bearing roller actuator					1	N
AEM2G43X11-3	$27.00						2	
AEM2G45Z11-3	$28.00	Lever with 18 mm nylon roller actuator				Figure 9	1	O
AEM2G45X11-3	$28.00						2	
AEM2G51Z11-3	$28.50	Adjustable lever with 18 mm nylon roller actuator				Figure 10	1	P
AEM2G51X11-3	$28.50						2	
AEM2G61Z11-3	$28.00	Lever with nylon-tipped stainless steel spring actuator			–	Figure 11	1*	Q
AEM2G61X11-3	$28.00						2*	
AEM2G71Z11-3	$28.00	Adjustable 3 mm stainless steel rod actuator			0.28	Figure 12	1	R
AEM2G71X11-3	$28.00						2	
AEM2G72Z11-3	$28.00	Adjustable 3 mm fiberglass rod actuator					1	S
AEM2G72X11-3	$28.00						2	
AEM2G73Z11-3	$27.50	Adjustable 6 mm nylon rod actuator				Figure 13	1	T
AEM2G73X11-3	$27.50						2	
AEM2G74Z11-3	$27.50	Adjustable 6 mm fiberglass rod actuator					1	U
AEM2G74X11-3	$27.50						2	
AEM2G75Z11-3	$27.50	Adjustable 3 mm square steel actuator				Figure 12	1	V
AEM2G75X11-3	$27.50						2	
AEM2G92Z11-3	$27.00	360 degree stainless steel spring with nylon tip actuator	1.0	0.10	–	Figure 14	1*	W
AEM2G93Z11-3	$27.00	360 degree stainless steel spring actuator				Figure 15	1*	X

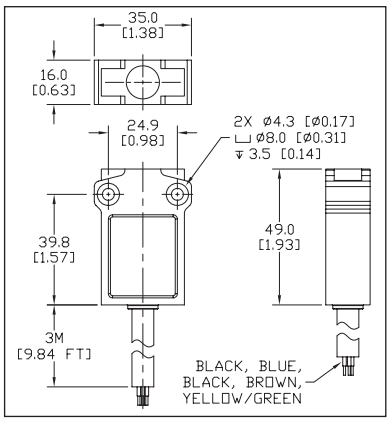
**** Note: Not positive-opening***

Compact Limit Switches Dimensions

Dimensions

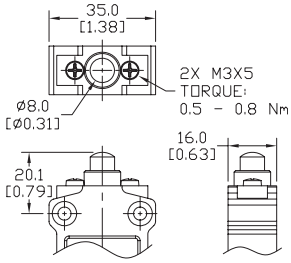
mm [inches]

AEM2G Series Body



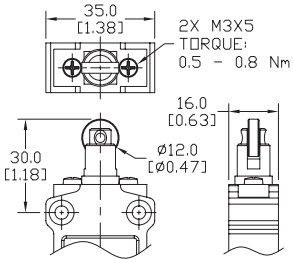
AEM2G Series Heads Figures 1 thru 15

Figure 1



AEM2G11*11-3

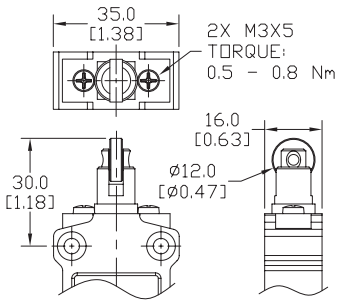
Figure 2



AEM2G12*11-3

AEM2G13*11-3

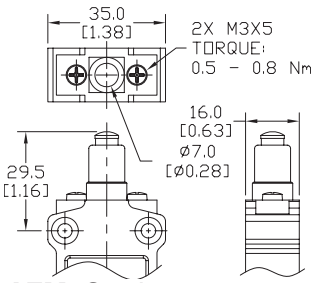
Figure 3



AEM2G14*11-3

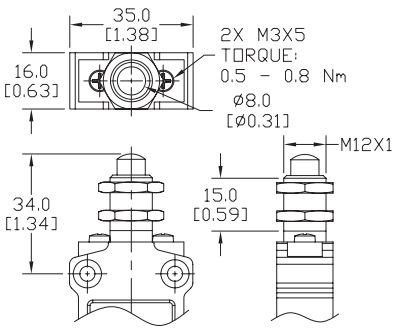
AEM2G15*11-3

Figure 4



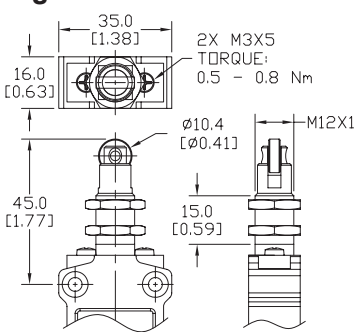
AEM2G16*11-3

Figure 5



AEM2G21*11-3

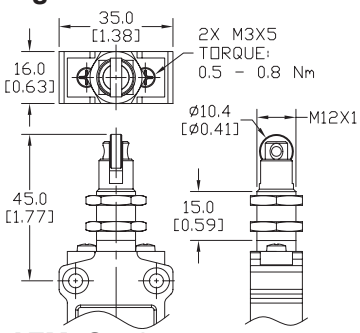
Figure 6



AEM2G22*11-3

AEM2G23*11-3

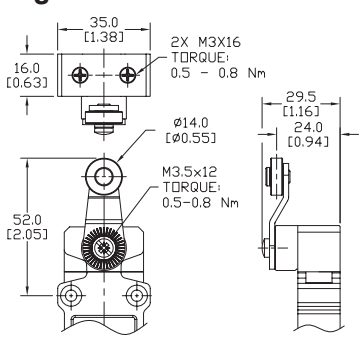
Figure 7



AEM2G24*11-3

AEM2G25*11-3

Figure 8



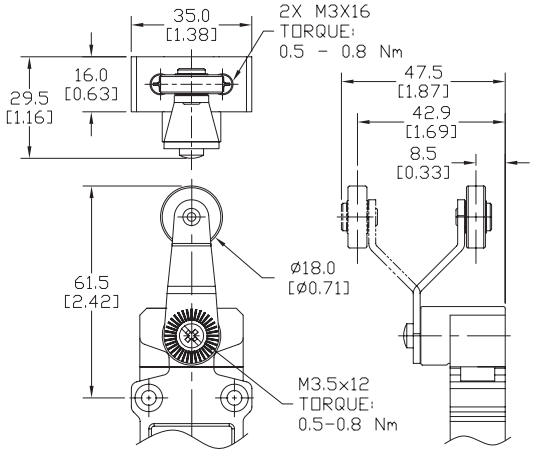
AEM2G41*11-3

AEM2G43*11-3

AEM2G42*11-3

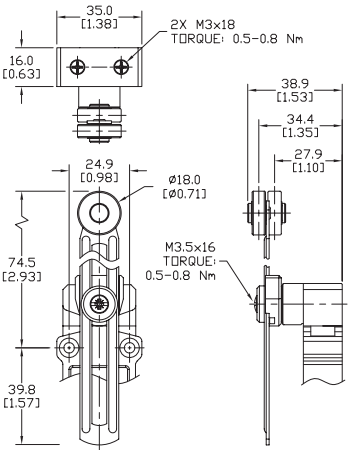
Compact Limit Switches Dimensions, cont.

Figure 9



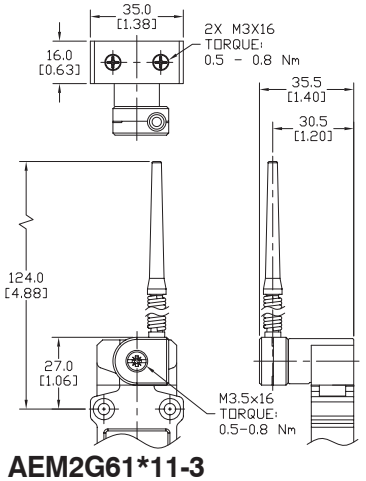
AEM2G45*11-3

Figure 10



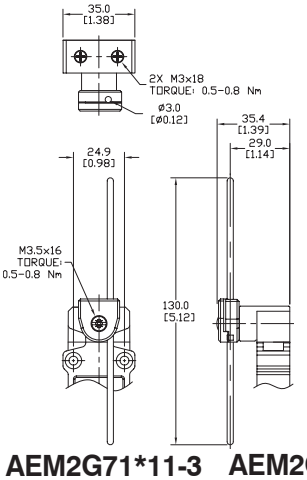
AEM2G51*11-3

Figure 11



AEM2G61*11-3

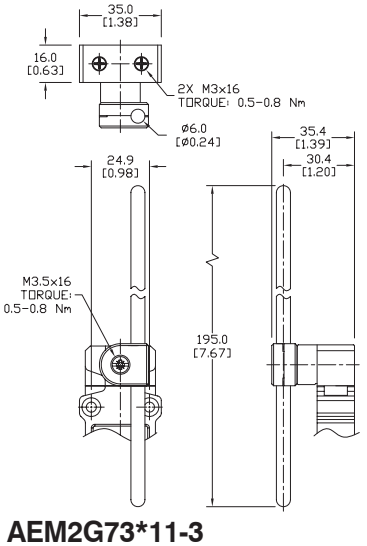
Figure 12



AEM2G71*11-3 **AEM2G75*11-3**

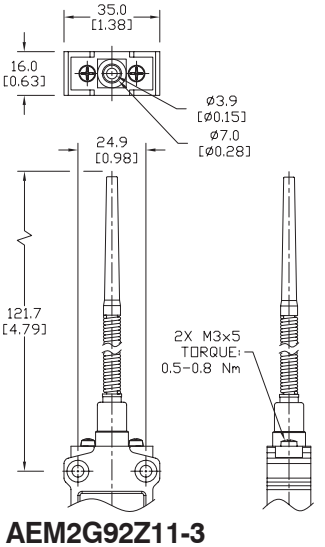
AEM2G72*11-3

Figure 13



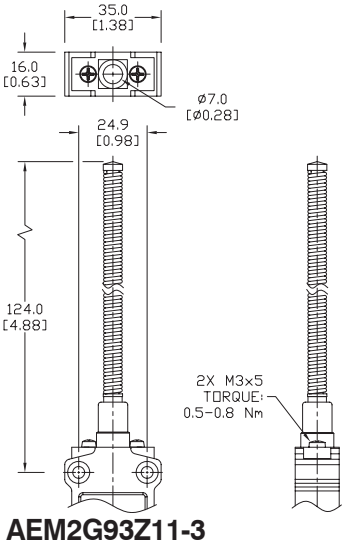
AEM2G73*11-3
AEM2G74*11-3

Figure 14



AEM2G92Z11-3

Figure 15



AEM2G93Z11-3

Compact Limit Switches

Compact Limit Switches Specifications		
Approvals		
UL file E191072, CE, RoHS		
Environmental		
Degree of Protection		IP67 according to IEC 529
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
Enclosure Material		ZAMAK (zinc alloy)
Contact Blocks Rating		
Positive Opening		Yes, except G61, G92, G93
Electrical Ratings	***AC15***	Make: 50A @ 24VAC; 30A @ 120VAC; 15A @ 240VAC Break: 5A @ 24VAC; 3A @ 130VAC; 1.5A @ 230VAC
	DC13	1.1A @ 24VDC; 0.22A @ 125VDC; 0.1A@250VDC
Maximum Switching Frequency		Contact blocks: all one cycle per second
Repeat Accuracy		0.05 mm on the operating points at 1 million operations
Short-Circuit Protection		6A @ <500V
Contact Resistance		25 milli Ω
Recommended Minimum Operating Speed		With slow-action contacts: 500 mm per minute
Rated Insulation Voltage		B300, R300 according to UL508; 400V (degree of pollution: 3) according to IEC 947-1
Cable Type		3m PVC cable, 5 x 0.75mm^2 (18 AWG). Overall cable diameter: 8.20 mm (0.32 in.)
Wiring Terminal Markings		According to CENELEC EN50013
Electrical Protection		Class I according to IEC536
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.
Screw Size		Heads G11 to G25, G92 and G93: M3 x 5mm screw. Heads G41 and over (except G92 and G93): M3 x 18 mm screw
Torque		All: 0.5 Nm (0.8 Nm max)

Compact Limit Switches
Contacts Configuration

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.

Contacts Configuration

Diagram 1

Z11 Snap-action contacts

1 N.O. and 1 N.C.

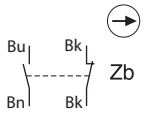
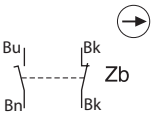


Diagram 2

X11 Slow-make/slow-break contacts

1 N.O. and 1 N.C.



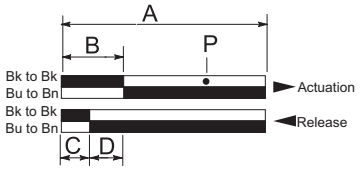
Note: Green/yellow wire is physical earth ground.

= Contact open

= Contact closed

Bar Charts

Z11



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

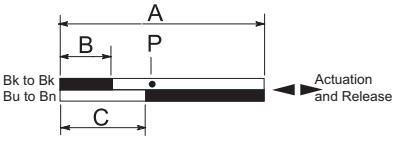
B = Tripping travel of both contacts on actuation

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

X11



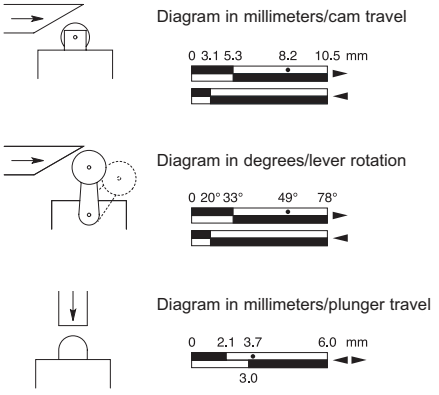
A = Max. travel of the operator in mm or degrees

B = Tripping travel of the N.C. contact

C = Tripping travel of the N.O. contact

P = Point from which positive opening is assured during actuation

Bar Chart Examples
(cam angle is 30 degrees)



Part Series	Contact Configuration	Displacement Values mm(in) or degrees			
		A	B	C	P
AEM2G11, AEM2G16, AEM2G21	Z11	5.0 (0.20)	1.9 (0.07)	1.0 (0.04)	4.0 (0.16)
AEM2G11, AEM2G16, AEM2G21	X11	5.0 (0.20)	1.9 (0.07)	3.2 (0.13)	3.4 (0.13)
AEM2G12, AEM2G13, AEM2G14, AEM2G15, AEM2G22, AEM2G23, AEM2G24, AEM2G25	Z11	8.7 (0.34)	3.3 (0.13)	1.7 (0.07)	6.9 (0.27)
AEM2G12, AEM2G13, AEM2G14, AEM2G15, AEM2G22, AEM2G23, AEM2G24, AEM2G25	X11	8.7 (0.34)	3.3 (0.13)	5.5 ((0.21)	5.9 (0.23)
AEM2G41, AEM2G42, AEM2G43, AEM2G45, AEM2G51, AEM2G71, AEM2G72, AEM2G73, AEM2G74, AEM2G75	Z11	74°	26°	14°	58°
AEM2G41, AEM2G42, AEM2G43, AEM2G45, AEM2G51, AEM2G71, AEM2G72, AEM2G73, AEM2G74, AEM2G75	X11	74°	27°	45°	49°
AEM2G61	Z11	74°	26°	14°	Not positive-opening
AEM2G61	X11	74°	27°	45°	
AEM2G92	Z11		14°	5°	
AEM2G93	Z11		14°	5°	

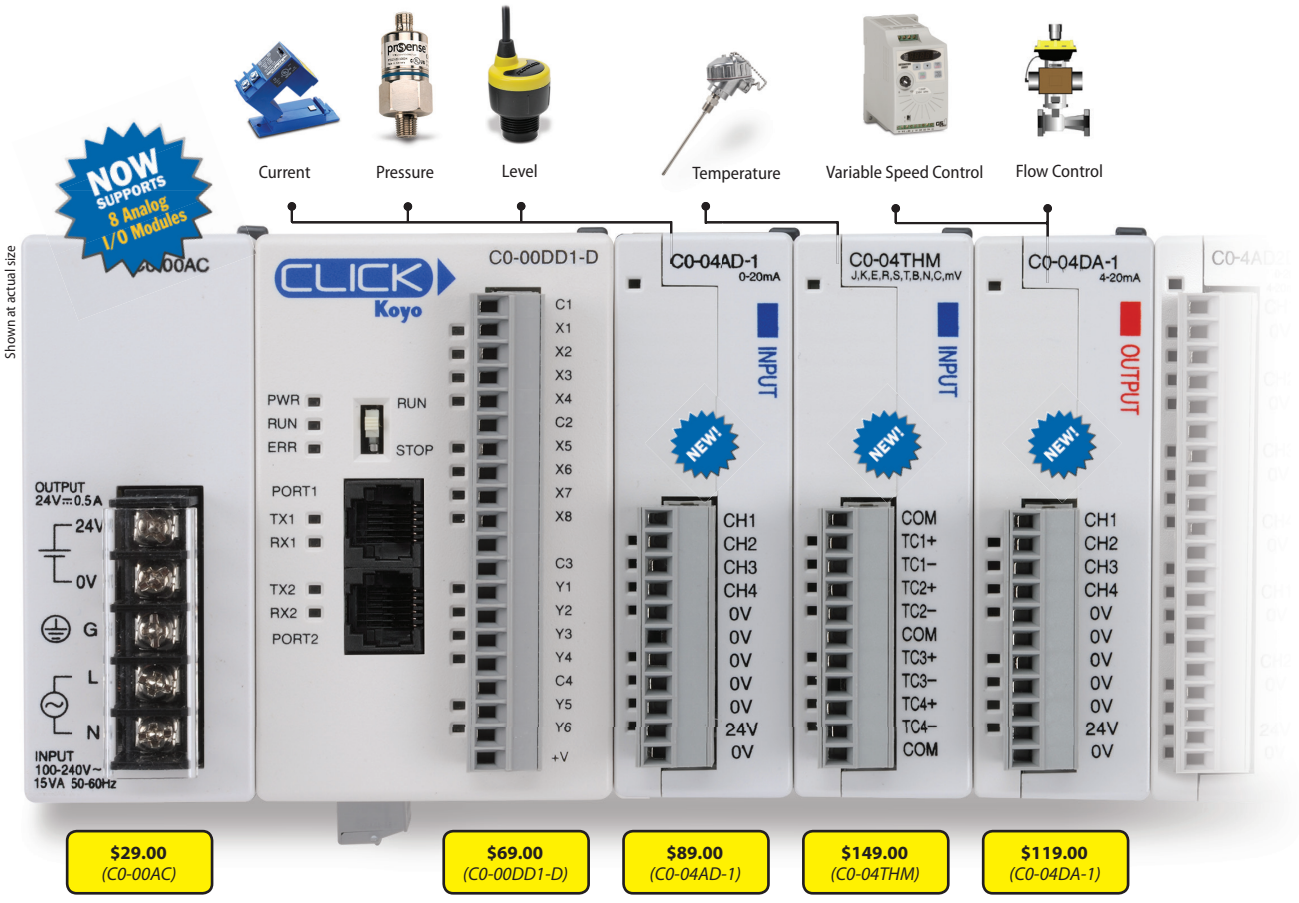
Compact Limit Switches Cross-reference Table

Compact Limit Switches Cross Reference				
ADC	***Allen-Bradley***	***Honeywell***	***Eaton Cutler-Hammer***	***Omron***
AEM2G11Z11-3	802B-CSABXSXC3	914CE1-3	E47BCC05	D4C-1601
AEM2G12Z11-3	802B-CSADXSXC3	914CE2-3	E47BCC07	D4C-1602
AEM2G14Z11-3	802B-CSAD1XSXC3	914CE3-3	E47BCC11	D4C-1603
AEM2G16Z11-3	802B-CSABBSXC3	914CE18-3	E47BCC06	D4C-1631
AEM2G42Z11-3	802B-CSAAXSXC3	914CE16-3	E47BCC15	D4C-1620
AEM2G51Z11-3	NA	NA	E47BCC21	NA
AEM2G71Z11-3	NA	NA	E47BCC22	NA
AEM2G92Z11	802B-CSACXSXC3	NA	E47BCC20	D4C-1650
AEM2G93Z11	NA	914CE20-3	NA	NA

Other products you might want to consider

Now simply CLICK for analog

The best little PLC keeps getting better



$29.00 (C0-00AC)	$69.00 (C0-00DD1-D)	$89.00 (C0-04AD-1)	$149.00 (C0-04THM)	$119.00 (C0-04DA-1)

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The CLICK PLC now has more ways to help you with simple control applications. Monitor pressure, level, current, even thermocouples and RTDs directly. Perform simple variable control* with analog outputs connected to devices such as drives. These high-resolution modules offer fast setup (no DIP switches) with software scaling to make your life (and program) easier. Choose from:

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- **4-channel, thermocouple or RTD in (16-bit) $149 each**
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- **Combo 4-channel in / 2-channel out, current or voltage $149 each**

** no PID*

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