IEC Limit Switches

Heavy-duty IEC Limit Switches ABM Series

- Featuring a die-cast 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

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Part Number	Price	Drawing Link	Actuator Type	Number of Conduit Holes	Conduit Threads	Max. Actuation Speed (m/s)	Min. Actuation Force (N) Torque (N•m)	Min. Positive Opening Force (N) /torque (N•m)	Photo
ABM1E11Z11	$088q:	PDF	Stainless steel plunger	1	PG13.5	0.5	30N	45N	A
ABM2E11Z11	$088s:	PDF		1	1/2" NPT	0.5	30N	45N	A
ABM5E11Z11	$;088t:	PDF		3	PG13.5	0.5	30N	45N	B
ABM6E11Z11	$088u:	PDF		3	NPT	0.5	30N	45N	B
ABM2E13Z11	$088x:	PDF	Stainless steel plunger with roller	1	1/2" NPT	0.5	22N	40N	C
ABM6E13Z11	$088z:	PDF		3	1/2" NPT	0.5	22N	40N	D
ABM1E32Z11	$-088l:	PDF	One-way lever with stainless steel roller	1	PG13.5	1.5	12N	40N	E
ABM2E32Z11	$088n:	PDF		1	1/2" NPT	1.5	12N	40N	E
ABM5E32Z11	$088o:	PDF		3	PG13.5	1.5	12N	40N	F
ABM6E32Z11	$088p:	PDF		3	1/2" NPT	1.5	12N	40N	F
ABM1E42Z11	$088h:	PDF	Rotary lever with stain. steel roller (See accessories for opt. roller and actuator levers)	1	PG13.5	1.5	0.15 N•m	0.30 N•m	G
ABM2E42Z11	$-088i:	PDF		1	1/2" NPT	1.5	0.15 N•m	0.30 N•m	G
ABM5E42Z11	$-088j:	PDF		3	PG13.5	1.5	0.15 N•m	0.30 N•m	H
ABM6E42Z11	$088k:	PDF		3	1/2" NPT	1.5	0.15 N•m	0.30 N•m	H
ABM1E52Z11	$088d:	PDF	Adj. rotary lever w/ stainless steel roller (See accessories for opt. roller and actuator levers)	1	PG13.5	1.5	0.15 N•m	0.30 N•m	I
ABM2E52Z11	$088e:	PDF		1	1/2" NPT	1.5	0.15 N•m	0.30 N•m	I
ABM5E52Z11	$;088f:	PDF		3	PG13.5	1.5	0.15 N•m	0.30 N•m	J
ABM6E52Z11	$088g:	PDF		3	NPT	1.5	0.15 N•m	0.30 N•m	J
ABM1E71Z11	$;088]:	PDF	Adjustable rotary lever w/ stainless steel rod	1	PG13.5	1.5	0.15 N•m	0.30 N•m	K
ABM2E71Z11	$;088[:	PDF		1	1/2" NPT	1.5	0.15 N•m	0.30 N•m	K
ABM5E71Z11	$088_:	PDF		3	PG13.5	1.5	0.15 N•m	0.30 N•m	L
ABM6E71Z11	$088#:	PDF		3	1/2" NPT	1.5	0.15 N•m	0.30 N•m	L
ABM1E92Z11	$;087,:	PDF	Wobble lever w/ polyamide tip stainless steel spring	1	PG13.5	1.0	0.18 N•m	-	M
ABM2E92Z11	$0880:	PDF		1	1/2" NPT	1.0	0.18 N•m	-	M
ABM6E92Z11	$0882:	PDF		3	1/2" NPT	1.0	0.18 N•m	-	N
ABM1E93Z11	$087_:	PDF	Wobble lever w/ stainless steel spring	1	PG13.5	1.0	0.18 N•m	-	O
ABM2E93Z11	$087#:	PDF		1	1/2" NPT	1.0	0.18 N•m	-	O
ABM6E93Z11	$087?:	PDF		3	1/2" NPT	1.0	0.18 N•m	-	P


A


B


C


D

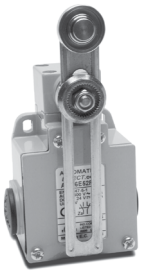

E


F


G


H


I


J


K


L


M


N


O


P

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	$88c:	Snap action (1) N.O. and (1) N.C.	3ms change-over time
AGZ02-SWITCH	$88b:	Snap action (2) N.C.	3ms change-over time
AGX11-SWITCH	$889:	Slow action (1) N.O. and (1) N.C.	Break before make
AGY11-SWITCH	$88a:	Slow action overlay (1) N.O. and (1) N.C.	Make before break
AGW02-SWITCH	$887:	Slow action delay (2) N.C.	Simultaneous
AGW20-SWITCH	$888:	Slow action overlay (2) N.O.	Simultaneous

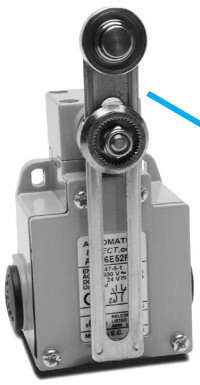
Additional Lever Arms, Spare Parts and Accessories for ABM Series

Additional Lever Arms/Spare Parts and Accessories			
Part Number	***Price***	***Drawing Link***	***Actuator Type***
AGE42-LEVER	$883:	PDF	Lever with stainless steel roller for E42 models (replacement lever)
AGE44-LEVER	$884:	N/A	Lever with 50mm diameter rubber roller (fits E42 models)
AGE52-LEVER	$885:	PDF	Lever with stainless steel roller for E52 models (replacement lever)
AGE54-LEVER	$886:	PDF	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.

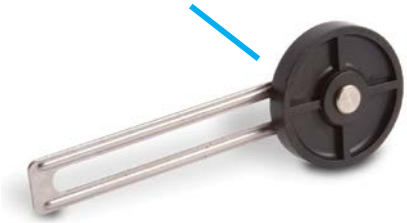


AGE52-LEVER

(Replacement lever shown installed on ABM5E52Z11 limit switch)

AGE44-LEVER

AGE54-LEVER



IEC Limit Switches Specifications

IEC Limit Switches Specifications			
Series		***AAM, AAP, ABM, ABP***	***ADM, ADP***
Environmental			
Degree of Protection		Plastic models: IP65 according to IEC 529 Metal models: IP66 according to IEC 144-CEI70-1; part number ADM2T93Z11 is IP65	
Temperature Range [1]	***Plastic Models***	Storage: -30 to 80°C [-22 to 176° F] Operating: -25 to 70°C [-13 to 158°F];	
	Metal Models	Storage: -30 to 80°C [-22 to 176°F] Operating: -10 to 70°C [14 to 158°F]; part number ADM2T9805Z11A -40 to 70°C [-40 to 158°F]	
Rated Impulse Withstand Voltage		6 kV (degree of pollution 3)	6 kV (degree of pollution 3)
Mechanical Ratings			
Working Positions [2]		All actuators can be rotated in 90° increments	
Mechanical Life		Straight line working heads: 30 million operations, side rotary heads: 25 million operations, multi directional heads: 10 million operations	25 million operations
Enclosure Material		Plastic models AAP and ABP: fiberglass-reinforced plastic-V0 class (UL94); Metal models AAM and ABM: die cast aluminum	ADP models: Reinforced thermoplastic ADM models: Zinc Alloy
Contact Blocks Rating			
Positive Opening [3]		All models except 98, 92, 93 operating heads	
Electrical Ratings	***AC15***	Make: 60A@120VAC; 30A @ 240VAC; 18A @ 400VAC Break:10A @ 24VAC; 6.5 A @130VAC; 3.1 A @ 230VAC; 1.8 A @ 400VAC	10A @ 24VAC, 6A @ 120VAC, 4A @ 400VAC
	DC13	2.8 A @ 24VDC; 0.5 A @ 110VDC	6A @ 24VDC, 0.55 A @125VDC, 0.4A @ 250VDC
Maximum Switching Frequency		Contact blocks: all two cycles per second	3600 (Cycles/hour)
Repeat Accuracy		0.01 mm on the operating points at 1 million operations	
Short-Circuit Protection		Cartridge fuses gl 10A-500V 10.3x38 1 100KA	10A @ < 500VAC (fuse type gG (gl))
Contact Resistance		25 mΩ	
Recommended Min. Operating Speed		With snap-action contacts: 20mm per minute [4] With slow-action contacts: 500mm per minute [5]	20mm per minute
Rated Insulation Voltage		690V	500V
Terminals Marking		According to CENELEC EN 50013	According to IEC 60947-5-1
Wiring Connections		2 x 2.5mm² (AWG14) to 2 x 0.5mm² (AWG18)	18-14 AWG [0.75 to 2.5 mm²]
Wiring Terminal Type		Captive screw with self-lifting pressure plate	M3.5 screw with cable clamp (+, -) pozidriv 2
Electrical Protection		Double insulation (plastic models only)	ADM models Class 1, ADP models Class II - double insulation
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.	
Tools Needed		Phillips screwdriver, #1 #2 / Hex wrench, 10mm	Pozidriv 2 screwdriver
Approvals		UL E191072, CE	

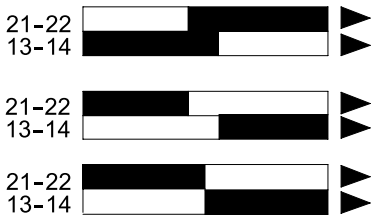
[1] Minimum temperatures assume that the atmosphere is free of moisture, which could cause moving parts to freeze up.
[2] Some types of actuators, such as a long, heavy spring with the adjustable actuator fully extended, may not work properly if installed in a horizontal position.
[3] Positive opening 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.
[4] 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 1ms to 3ms from maximum to minimum operating speed.
[5] 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.

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.

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)

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**

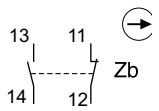
Note: Green/yellow wire is physical earth ground.

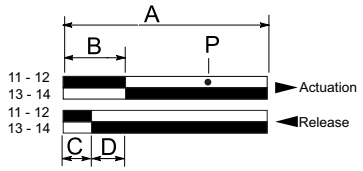
= Contact open

= 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

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°	—

Bar Chart Examples
(cam angle is 30 degrees)

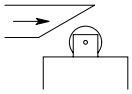
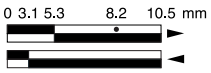


Diagram in millimeters/cam travel



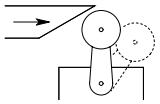
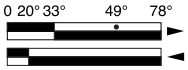


Diagram in degrees/lever rotation



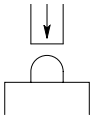
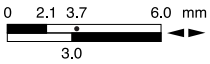
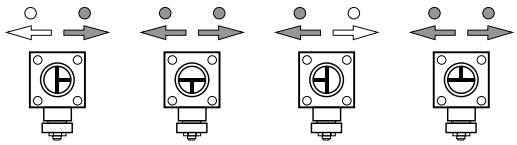


Diagram in millimeters/plunger travel

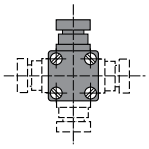


Changeable working heads (E42, E52, E71) models; view of cam insert when looking at bottom of head once removed from switch body.

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



Positioning - 90° each way



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