# CENTSABLE™ 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 8 different actuators including roller levers, plungers, and wobble sticks
- Choose from 6 interchangeable combinations of contact blocks

| AAP Series | | | | | | |
|---|---|---|---|---|---|---|
| ***Part Number*** | | ***Actuator Type*** | ***Number of Conduit Openings*** | ***Conduit Threads*** | ***Dimensions Body/Head*** | ***Photo*** |
| ***AAP2T14Z11*** | | Mini w/ galvanized steel plunger | One cable hole | PG11 threads with a 1/2" NPT adapter | Figures 4, 13 | A |
| ***AAP2T13Z11*** | | Mini w/ galvanized steel plunger with roller | One cable hole | PG11 threads with a 1/2" NPT adapter | Figures 4, 14 | B |
| ***AAP2T35Z11*** | | Mini w/ one-way lever with polyamide roller | One cable hole | PG11 threads with a 1/2" NPT | Figures 4, 15 | C |
| ***AAP2T41Z11*** | | Mini side rotary with polyamide roller | One cable hole | PG11 threads with a 1/2" NPT adapter | Figures 4, 16 | D |
| ***AAP2T51Z11*** | | Mini side rotary adjustable lever with polyamide roller | One cable hole | PG11 threads with a 1/2" NPT adapter | Figures 4, 17 | E |
| ***AAP2T71Z11*** | | Mini side rotary with steel rod | One cable hole | PG11 threads with a 1/2" NPT adapter | Figures 4, 18 | F |

*A*

*B*

*C*


*D*


*E*


*F*

# CENTSABLE™ IEC CONTACT BLOCK 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<br>Aluminum models: IP65 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)<br>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 |
| ***Pollution Degree*** | | 3 |
| **Mechanical Ratings** | | |
| ***Working Positions*** | | All (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) (Actuators can be rotated in 90° increments) |
| ***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 |
| ***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 ohms |
| ***Recommended Minimum Operating Speed*** | | With snap-action contacts: 20 mm per minute**<br>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 |
| ***Working Factor*** | | 0.5 |
| ***Usage Class*** | ***AC15*** | 24VAC: 10A, 130VAC: 6.5A, 230VAC: 4A, 400VAC: 2.5A |
| | ***DC13*** | 24VDC: 1.5A, 110VDC: 0.5A |
| **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 change-over 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.

# CENTSABLE™ IEC LIMIT SWITCHES BAR CHARTS

## 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.

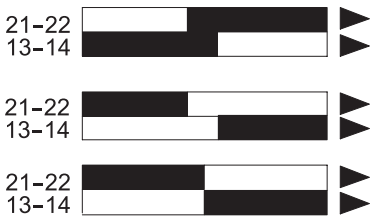
### Terminal identification (IEC)

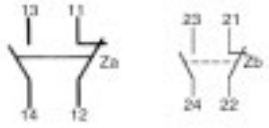
Each terminal is marked with two digits. The first digit indicates the pole (circuit). The second digit indicates the type of contact.

_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] |
| *13-14* | N.O. contact of pole no. 1 [2] |

[1] With non-isolated contacts [2] With isolated contacts

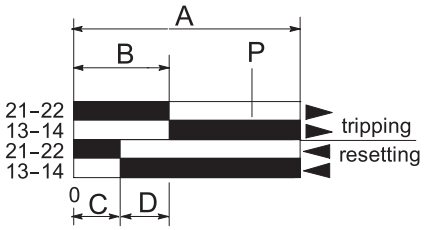



**Make-before-break** (overlapping) SPDT: the N.O. contact closes before the N.C. contact opens.

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

**Simultaneous make and break** SPDT: the N.C. contact opens at the same time as the N.O. contact closes.




= Contact open

= Contact closed

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

B = Tripping travel of the contact

C = Resetting travel of the contact

D = Differential travel (B - C)

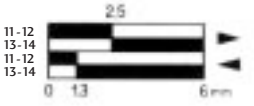
P = Point from which positive opening is assured



Note: All bar charts are for standard models with snap-action contacts

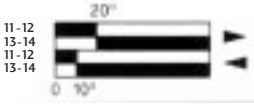
## Heavy-duty IEC models

Plunger and one-way lever models



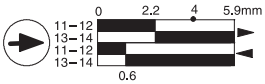

All rotary lever models


All wobble-lever models

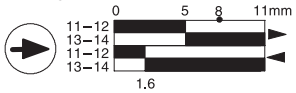



## Double-insulated models

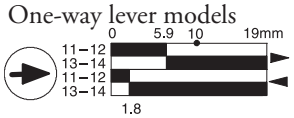
Steel plunger models



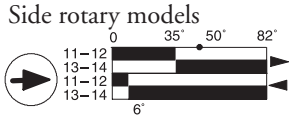

Plunger with roller models



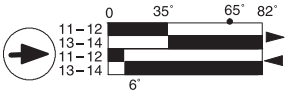

One-way lever models



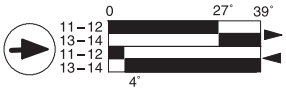

Side rotary models




Steel rod models

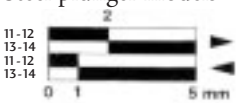



Wobble lever models

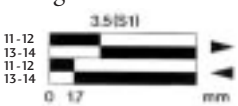



## Mini DIN models

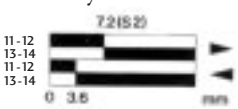
Steel plunger models



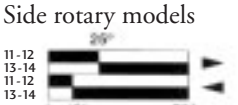

Plunger with roller models




One-way lever models



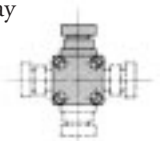

Side rotary models



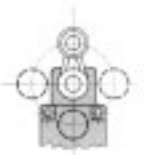

## Changeable working heads (E42,E52,E71) models; view from the bottom

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

Positioning - 90° each way



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



# CENTSABLE™ 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.

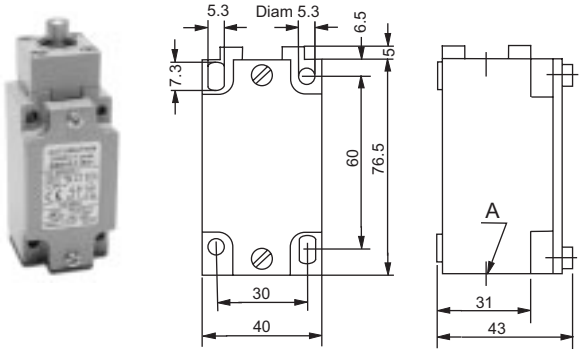



Figure 2: ABM models — 3-cable entry style

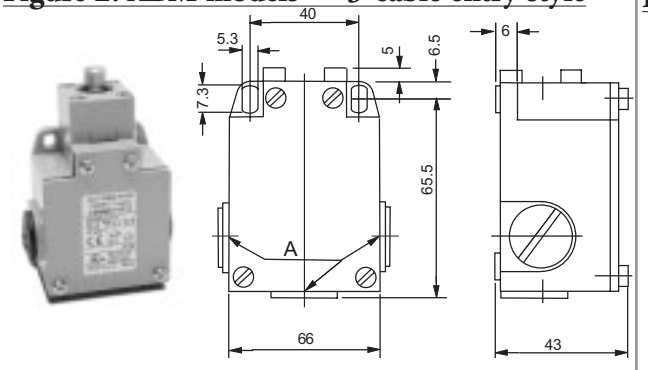



Figure 3: ABP models

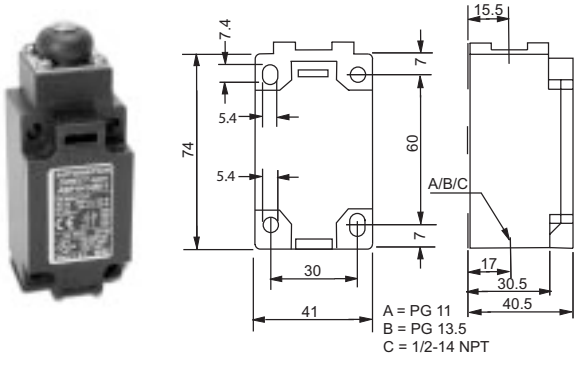
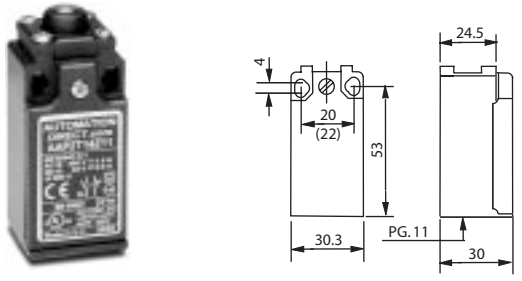



Figure 4: AAP (Mini DIN) models




## Actuators - ABM, ABP models

Figure 5: Steel plunger (ABM, ABP models)

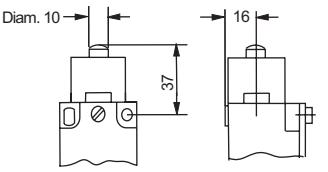



Figure 6: Plunger with roller (ABM, ABP models)

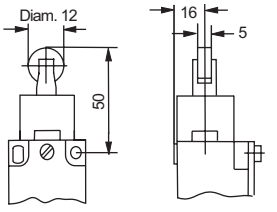



Figure 7: 1-way lever with roller (ABM, ABP models)

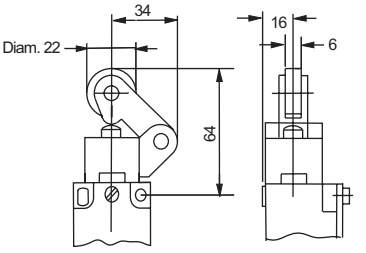



Figure 1: ABM models — single-cable entry style

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

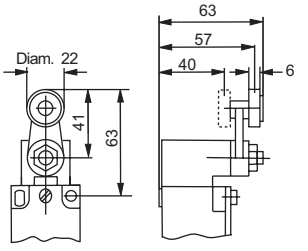
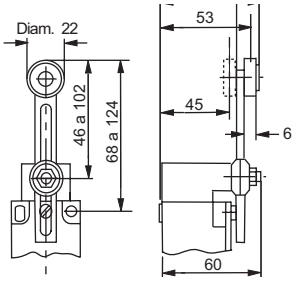



Figure 9: Side rotary with adjustable lever roller (ABM, ABP models)



# CENTSABLE™ IEC LIMIT SWITCHES DIMENSIONS

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

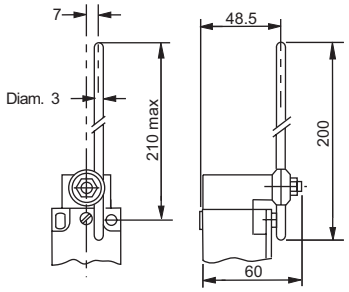



**Figure 11: Wobble-type with spring with tip (ABM, ABP models)**

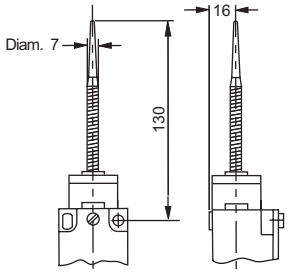
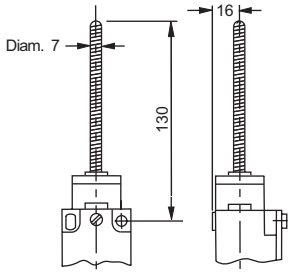



**Figure 12: Wobble-type steel spring (ABM, ABP models)**




## Actuators — mini-DIN (AAP) models

**Figure 13: Steel plunger (AAP models)**

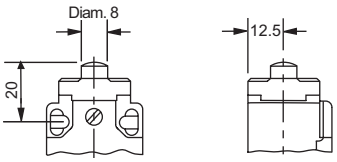



**Figure 14: Steel plunger with roller (AAP models)**

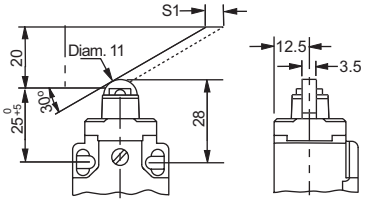



**Figure 15: One-way lever with roller (AAP models)**

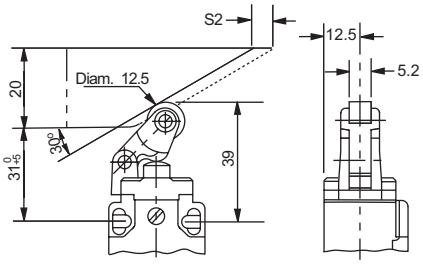



**Figure 16: Side rotary lever with roller (AAP models)**

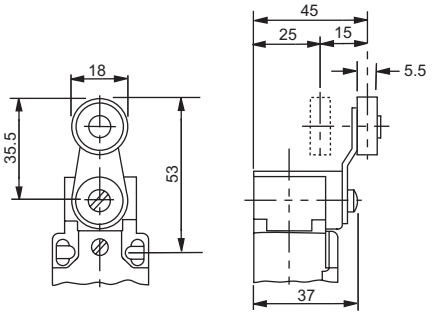



**Figure 17: Side rotary lever with adj. lever roller (AAP models)**

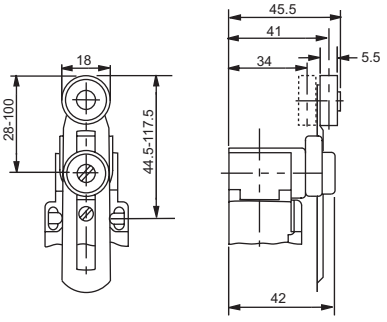
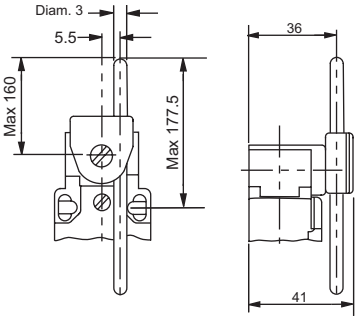



**Figure 18: Side rotary lever with rod actuator (AAP models)**






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