

# Limit Switches

FA - FT - FT1R - Safety - FCT - FCM - Astra Series

Table of contents



AUTOMATION TECHNOLOGIES



Thermoplastic and die-cast aluminium limit switches



Limit switches with reset



Safety limit switches



Pre-wired thermoplastic limit switches

## TABLE OF CONTENTS

|                                    |          |                                   |          |
|------------------------------------|----------|-----------------------------------|----------|
| ■ Introduction                     | pag. 100 | ■ Installation and use            | pag. 119 |
| ■ FA Series limit switches         | pag. 102 | ■ Technical data                  | pag. 120 |
| ■ FT Series limit switches         | pag. 108 | ■ FCT - FCM Series limit switches | pag. 121 |
| ■ Safety limit switches with reset | pag. 115 | ■ Pre-wired                       |          |
| ■ Safety limit switches            | pag. 117 | ■ Astra universal limit switches  | pag. 123 |

# Limit Switches

## FA - FT - FT1R - Safety - FCT - FCM - Astra Series

### Terminology

#### DOUBLE INSULATION □

Materials of group II, according to IEC536, are made with double insulation. This consists of doubling the insulation capability by means

of an additional divider in order to eliminate any electrical shock risk and avoid the need for any additional protections.

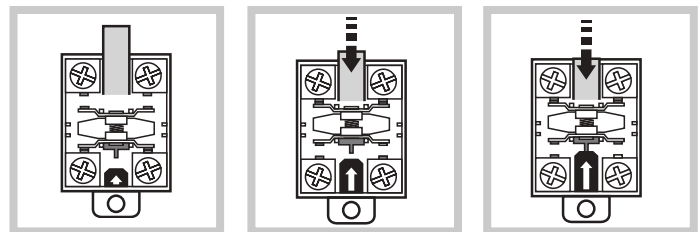
#### APERTURA POSITIVA ⊕

A limit switch complies to this specification when all the normally closed contact elements of the switch can be changed, with certainty, to the open position (no flexible link between the moving contacts and the operator of the switch, to which an actuating force is applied). Positive opening does not apply to NO contacts. Control switches

with positive opening operation can be equipped with either slow-break or snap-action contacts. In order to use different contacts on the same switch, it is necessary to electrically separate them; otherwise only one contact can be used. Every positive opening control switch must be marked on the external housing with the symbol. ⊕

#### CONTACT ELEMENTS ACTING INDEPENDENTLY (OR SNAP ACTION)

Is defined, under IEC947-5-1/EN6094-5-1, the contact element of a device for manual or automatic control circuits where the speed of motion of the contact is virtually independent of the speed of motion of the actuator. Commonly called "quick trigger" the electrical behavior of these elements means that the contact is in order even in the slow movements of the actuator. These contact elements have position does not coincide with the release of drive (differential stroke) See example page. 105.



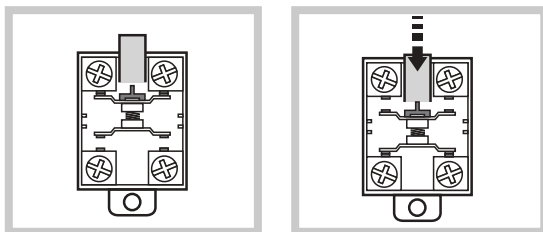
Contatto a riposo

Contatto azionato

Apertura positiva

#### CONTACT ELEMENTS DIRECT ACTING (OR SLOW ACTION)

Is defined, under IEC947-5-1/EN6094-5-1, the contact element of a device for manual or automatic control circuits where speed of movement of the contact depends on the speed of motion of the actuator. See example page. 105



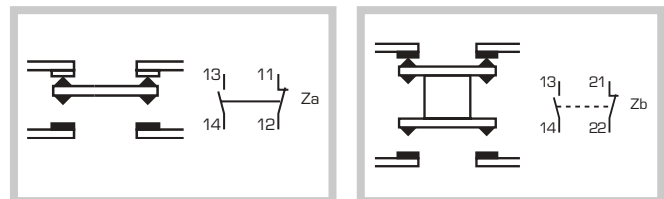
Contact in stand-by

Contact activated

#### CONTACT BLOCKS CONFIGURATION

##### ACCORDING TO IEC/EN60947-5-1

Contact blocks with 4 terminals must be marked with Za or Zb symbols as shown in the picture below.



Contacts with same polarity

The two moving contacts are electrically insulated

#### APPLICATIONS

**AC-15:** control of an electromagnet on a.c., test 10 le/le.

**AC-13:** control of an electromagnet on d.c., test le/le.

#### TERMINALS

For limit switches with metal housing, the fixing point of the earth conductor must be marked and must be positioned inside the housing next to the cable entry.

# Limit Switches

FA - FT - FT1R - Safety - FCT - FCM - Astra Series  
Terminology



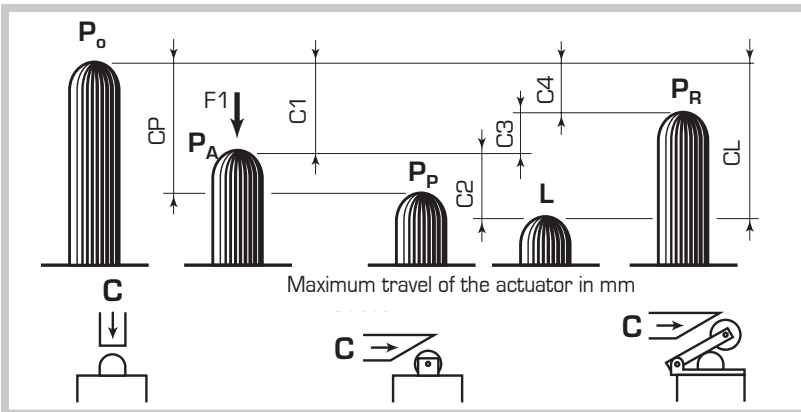
AUTOMATION TECHNOLOGIES

## MINIMUM OPENING FORCE/MOMENTUM

It is the minimum force/momentum that must be applied by the actuator for the contacts to trip.

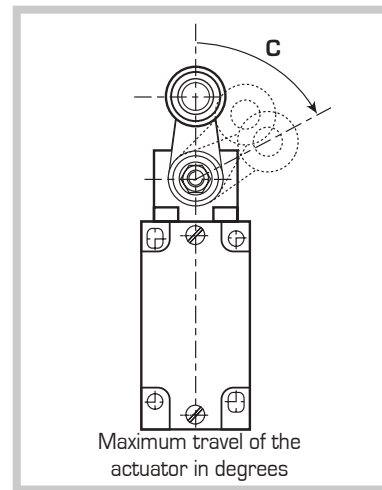
## MINIMUM POSITIVE OPENING FORCE/MOMENTUM

It is the minimum force/momentum that must be applied by the actuator to guarantee the positive opening of NC contacts.

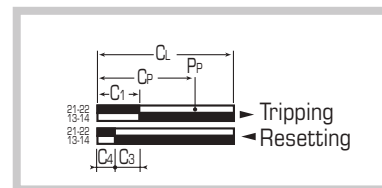


- P<sub>o</sub>** Rest position  
Position of the actuator when no external force is applied.
- P<sub>A</sub>** Tripping point of contact  
Position of the actuator, with force F<sub>1</sub> applied, in which the contacts leave the stand-by position.
- P<sub>p</sub>** Positive opening position  
Position of the actuator when there is positive opening.
- L** Maximum travel position  
Maximum travel of the actuator when the force F<sub>1</sub> is applied.
- P<sub>R</sub>** Resetting position  
Position of the actuator when the contacts are back in their non actuated position.

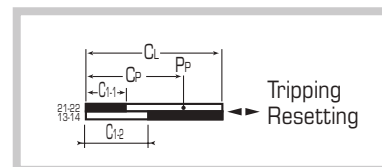
- C<sub>1</sub>** Tripping travel  
Distance between the P<sub>o</sub> and P<sub>A</sub> positions.
- C<sub>p</sub>** Positive opening tripping travel  
Minimum travel of the actuator from the P<sub>o</sub> position to guarantee positive opening of NC contacts.
- C<sub>2</sub>** Extra tripping travel  
Distance between P<sub>A</sub> and the maximum travel L.
- C<sub>3</sub>** Maximum travel  
Distance between P<sub>o</sub> and the maximum travel L.
- C<sub>4</sub>** Differential travel (C<sub>1</sub>-C<sub>4</sub>)  
Distance between P<sub>A</sub> and P<sub>R</sub>
- C<sub>4</sub>** Resetting travel  
Distance between P<sub>R</sub> and P<sub>o</sub>



Maximum travel of the actuator in degrees  
**Tripping travel for snap-action contacts**



**Tripping travel for slow-break contacts**



NOTE: for slow-break contacts, C3=01, C1-1=Tripping and resetting travel of contacts 21-22, C1-2= Tripping and resetting travel of contacts 13-14

### Examples

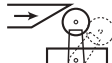
**FA134Z11**  
(snap-action contacts)



Tripping travel in mm/  
cam linear movement



**FA138Z11**  
(snap-action contacts)



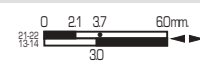
Tripping travel in degrees/  
lever rotary movement



**FA131X11**  
(slow break contacts)



Tripping travel in mm/  
plunger linear movement



# Limit Switches

## FA1 Series

IP66 die-cast aluminium type

1 cable entry  
M16x1.5



FA131



FA134



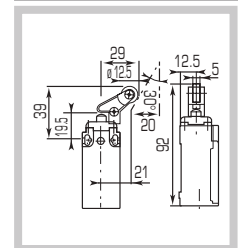
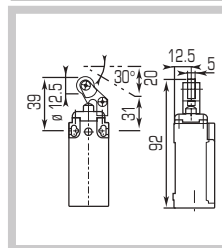
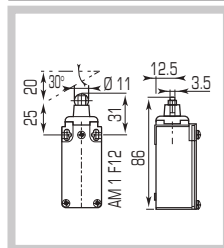
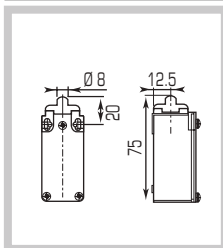
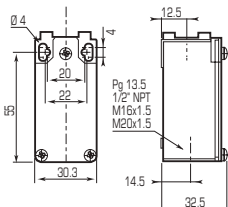
FA132



FA133

| TYPE OF OPERATOR   | SHORT STEEL END PLUNGER              | STEEL ROLLER PLUNGER                | ROLLER LEVER PLUNGER HORIZONTAL ACTUATION | ROLLER LEVER PLUNGER VERTICAL ACTUATION |
|--|--------------------------------------|-------------------------------------|---|---|
| Standard - Positive opening NC contacts                      | EN50047                              | EN50047                             | -   | -                                       |
| Minimum tripping force                                       | 15                                   | 12                                  | 7   | 7                                       |
| Minimum positive opening force                               | 30                                   | 30                                  | 24  | 24                                      |
| <b>Z11</b><br>1NC-1NO<br>Snap action<br><br>Zb               | FA131Z11<br><br>0 13 25 41 56 mm     | FA134Z11<br><br>0 25 47 76 96 mm    | FA132Z11<br><br>0 49 90 145 210 mm        | FA133Z11<br><br>0 49 90 145 210 mm      |
| <b>X11</b><br>1NC-1NO<br>Slow break<br><br>Zb                | FA131X11<br><br>0 16 32 56 mm<br>2.5 | FA134X11<br><br>0 32 60 96 mm<br>46 | FA132X11<br><br>0 60 105 210 mm<br>86     | FA133X11<br><br>0 60 105 210 mm<br>86   |
| <b>Y11</b><br>1NC-1NO<br>Slow break<br>overlapping<br><br>Zb | FA131Y11<br><br>0 29 45 56 mm<br>15  | FA134Y11<br><br>0 53 82 96 mm<br>30 | FA132Y11<br><br>0 102 146 210 mm<br>54    | FA133Y11<br><br>0 102 146 210 mm<br>54  |
| <b>Z02</b><br>2NC<br>Snap action<br><br>Zb                   | FA131Z02<br><br>0 13 24 40 56 mm     | FA134Z02<br><br>0 25 45 74 96 mm    | FA132Z02<br><br>0 51 86 131 210 mm        | FA133Z02<br><br>0 51 86 131 210 mm      |
| <b>W02</b><br>2NC<br>Slow break<br><br>Zb                    | FA131W02<br><br>0 15 31 56 mm        | FA134W02<br><br>0 30 59 96 mm       | FA132W02<br><br>0 57 102 210 mm           | FA133W02<br><br>0 57 102 210 mm         |
| <b>W20</b><br>2NO<br>Slow break<br><br>Zb                    | FA131W20<br><br>0 14 56 mm           | FA134W20<br><br>0 28 96 mm          | FA132W20<br><br>0 5.3 210 mm              | FA133W20<br><br>0 5.3 210 mm            |
| <b>WEIGHT gr - MIN. PACK QTY.</b>                            | 168 gr 1 pcs                         | 175 gr 1 pcs                        | 186 gr 1 pcs                              | 186 gr 1 pcs                            |

### DIMENSIONS



# Limit Switches

## FA1 Series

IP66 die-cast aluminium type



AUTOMATION TECHNOLOGIES

1 cable entry  
M16x1.5



FA138



FA141



FA139



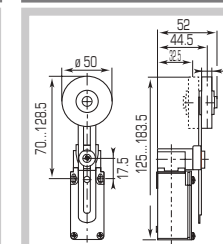
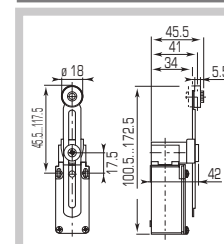
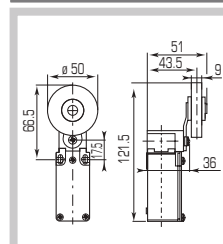
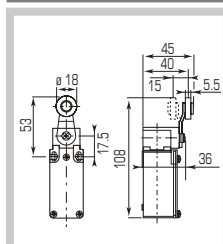
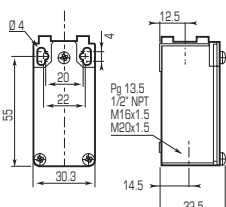
FA140

| TYPE OF OPERATOR                        | ROLLER LEVER Ø 18 | RUBBER ROLLER LEVER Ø 50 | VARIABLE LENGTH ROLLER LEVER Ø 18 | VARIABLE LENGTH RUBBER ROLLER LEVER Ø 50 |
|---|-------------------|--------------------------|-----------------------------------|--|
| Standard - Positive opening NC contacts | -                 | -                        | -                                 | -  |
| Minimum tripping force                  | 0.10              | 0.10                     | 0.10                              | 0.10                                     |
| Minimum positive opening force          | 0.32              | -                        | -                                 | -  |
| <b>Z11</b><br>1NC-1NO<br>Zb             | FA138Z11<br>      | FA141Z11<br>             | FA139Z11<br>                      | FA140Z11<br>                             |
| <b>X11</b><br>1NC-1NO<br>Zb             | FA138X11<br>      | FA141X11<br>             | FA139X11<br>                      | FA140X11<br>                             |
| <b>Y11</b><br>1NC-1NO overlapping<br>Zb | FA138Y11<br>      | FA141Y11<br>             | FA139Y11<br>                      | FA140Y11<br>                             |
| <b>Z02</b><br>2NC<br>Zb                 | FA138Z02<br>      | FA141Z02<br>             | FA139Z02<br>                      | FA140Z02<br>                             |
| <b>W02</b><br>2NC<br>Zb                 | FA138W02<br>      | FA141W02<br>             | FA139W02<br>                      | FA140W02<br>                             |
| <b>W20</b><br>2NO<br>Zb                 | FA138W20<br>      | FA141W20<br>             | FA139W20<br>                      | FA140W20<br>                             |

WEIGHT gr - MIN. PACK QTY.

235 gr 1 pcs 255 gr 1 pcs 245 gr 1 pcs 265 gr 1 pcs

DIMENSIONS



# Limit Switches

## FA1 Series

IP66 die-cast aluminium type

1 cable entry  
M16x1.5



FA135



FA136



FA137

| TYPE OF OPERATOR                                      | SPRING LEVER WITH TIP IN PA | "CAT'S WHISKER" | STEEL ROD LEVER Ø 3 |
|---|-----------------------------|-----------------|---------------------|
| Standard - Positive opening NC contacts               | -                           | -               | -                   |
| Minimum tripping force                                | 0.10                        | 0.10            | 0.10                |
| Minimum positive opening force                        | -                           | -               | -                   |
| <b>Z11</b><br>1NC-1NO<br>Snap action<br>Zb            | FA135Z11<br>                | FA136Z11<br>    | FA137Z11<br>        |
| <b>X11</b><br>1NC-1NO<br>Slow break<br>Zb             | FA135X11<br>                | FA136X11<br>    | FA137X11<br>        |
| <b>Y11</b><br>1NC-1NO<br>Slow break overlapping<br>Zb | FA135Y11<br>                | FA136Y11<br>    | FA137Y11<br>        |
| <b>Z02</b><br>2NC<br>Snap action<br>Zb                | FA135Z02<br>                | FA136Z02<br>    | FA137Z02<br>        |
| <b>W02</b><br>2NC<br>Slow break<br>Zb                 | FA135W02<br>                | FA136W02<br>    | FA137W02<br>        |
| <b>W20</b><br>2NO<br>Slow break<br>Zb                 | FA135W20<br>                | FA136W20<br>    | FA137W20<br>        |

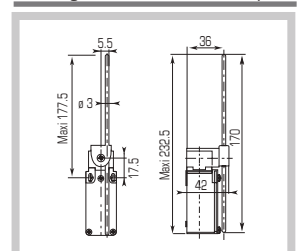
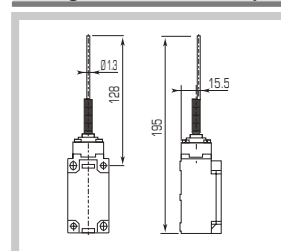
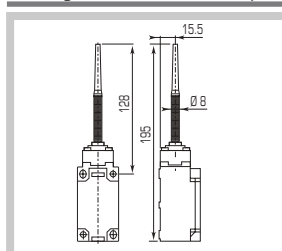
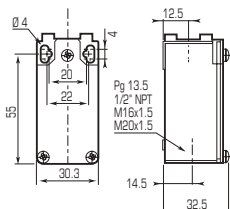
WEIGHT gr - MIN. PACK QTY.

235 gr 1 pcs

255 gr 1 pcs

245 gr 1 pcs

**DIMENSIONS**



# Limit Switches

## FA3 Series

IP66 die-cast aluminium type



AUTOMATION TECHNOLOGIES

3 cable entries  
M16x1.5



FA331



FA334



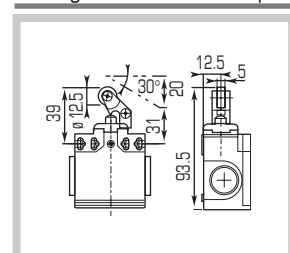
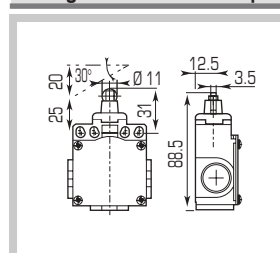
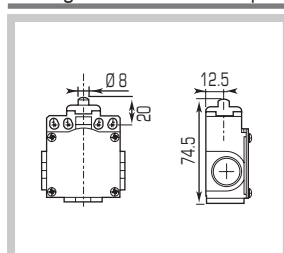
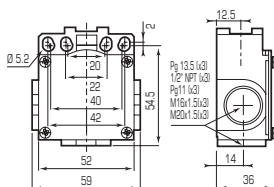
FA332

| TYPE OF OPERATOR                                      | SHORT STEEL END PLUNGER | SHORT STEEL ROLLER PLUNGER | ROLLER LEVER PLUNGER HORIZONTAL ACTUATION |
|---|-------------------------|----------------------------|---|
| Standard - Positive opening NC contacts               | -                       | -                          | -   |
| Minimum tripping force                                | 15                      | 12                         | 7   |
| Minimum positive opening force                        | 30                      | 30                         | 24  |
| <b>Z11</b><br>1NC-1NO<br>Snap action<br>Zb            | <b>FA331Z11</b><br>     | <b>FA334Z11</b><br>        | <b>FA332Z11</b><br>                       |
| <b>X11</b><br>1NC-1NO<br>Slow break<br>Zb             | <b>FA331X11</b><br>     | <b>FA334X11</b><br>        | <b>FA332X11</b><br>                       |
| <b>Y11</b><br>1NC-1NO<br>Slow break overlapping<br>Zb | <b>FA331Y11</b><br>     | <b>FA334Y11</b><br>        | <b>FA332Y11</b><br>                       |
| <b>Z02</b><br>2NC<br>Snap action<br>Zb                | <b>FA331Z02</b><br>     | <b>FA334Z02</b><br>        | <b>FA332Z02</b><br>                       |
| <b>W02</b><br>2NC<br>Slow break<br>Zb                 | <b>FA331W02</b><br>     | <b>FA334W02</b><br>        | <b>FA332W02</b><br>                       |
| <b>W20</b><br>2NO<br>Slow break<br>Zb                 | <b>FA331W20</b><br>     | <b>FA334W20</b><br>        | <b>FA332W20</b><br>                       |

WEIGHT gr - MIN. PACK QTY.

270 gr 1 pcs 280 gr 1 pcs 290 gr 1 pcs

### DIMENSIONS



# Limit Switches

## FA3 Series

IP66 die-cast aluminium type

3 cable entries  
M16x1.5



FA338



FA341



FA339



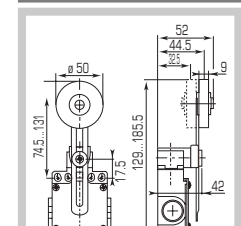
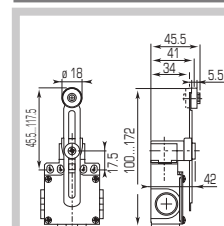
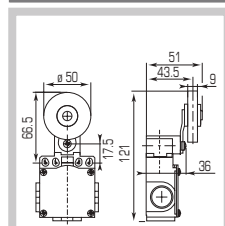
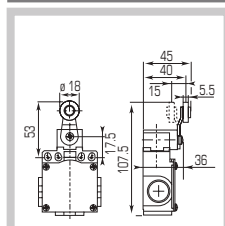
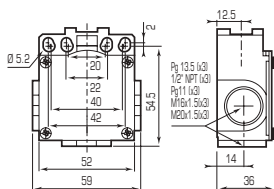
FA340

| TYPE OF OPERATOR   | ROLLER LEVER Ø 18 | RUBBER ROLLER LEVER Ø 50 | VARIABLE LENGTH ROLLER LEVER Ø 18 | VARIABLE LENGTH RUBBER ROLLER LEVER Ø 50 |
|--|-------------------|--------------------------|-----------------------------------|--|
| Standard - Positive opening NC contacts                  | -                 | -                        | -                                 | -  |
| Minimum tripping force                                   | 0.10              | 0.10                     | 0.10                              | 0.10                                     |
| Minimum positive opening force                           | 0.32              | -                        | -                                 | -  |
| <b>Z11</b><br>1NC-1NO<br>Snap action<br>Zb               | FA338Z11<br>      | FA341Z11<br>             | FA339Z11<br>                      | FA340Z11<br>                             |
| <b>X11</b><br>1NC-1NO<br>Slow break<br>Zb                | FA338X11<br>      | FA341X11<br>             | FA339X11<br>                      | FA340X11<br>                             |
| <b>Y11</b><br>1NC-1NO<br>Slow break<br>overlapping<br>Zb | FA338Y11<br>      | FA341Y11<br>             | FA339Y11<br>                      | FA340Y11<br>                             |
| <b>Z02</b><br>2NC<br>Snap action<br>Zb                   | FA338Z02<br>      | FA341Z02<br>             | FA339Z02<br>                      | FA340Z02<br>                             |
| <b>W02</b><br>2NC<br>Slow break<br>Zb                    | FA338W02<br>      | FA341W02<br>             | FA339W02<br>                      | FA340W02<br>                             |
| <b>W20</b><br>2NO<br>Slow break<br>Zb                    | FA338W20<br>      | FA341W20<br>             | FA339W20<br>                      | FA340W20<br>                             |

WEIGHT gr - MIN. PACK QTY.

325 gr 1 pcs 345 gr 1 pcs 335 gr 1 pcs 355 gr 1 pz

### DIMENSIONS





# Limit Switches

## FA3 Series

IP66 die-cast aluminium type



AUTOMATION TECHNOLOGIES

3 cable entries  
M16x1.5



FA335



FA336



FA337

| TYPE OF OPERATOR   | SPRING LEVER WITH TIP IN PA | "CAT'S WHISKER" | VARIABLE LENGTH STEEL ROD LEVER Ø 3 |
|--|-----------------------------|-----------------|-------------------------------------|
| Standard - Positive opening NC contacts                      | -                           | -               | -                                   |
| Minimum tripping force                                       | 0.10                        | 0.10            | 0.10                                |
| Minimum positive opening force                               | -                           | -               | -                                   |
| <b>Z11</b><br>1NC-1NO<br>Snap action<br><br>Zb               | FA335Z11<br>                | FA336Z11<br>    | FA337Z11<br>                        |
| <b>X11</b><br>1NC-1NO<br>Slow break<br><br>Zb                | FA335X11<br>                | FA336X11<br>    | FA337X11<br>                        |
| <b>Y11</b><br>1NC-1NO<br>Slow break<br>overlapping<br><br>Zb | FA335Y11<br>                | FA336Y11<br>    | FA337Y11<br>                        |
| <b>Z02</b><br>2NC<br>Snap action<br><br>Zb                   | FA335Z02<br>                | FA336Z02<br>    | FA337Z02<br>                        |
| <b>W02</b><br>2NC<br>Slow break<br><br>Zb                    | FA335W02<br>                | FA336W02<br>    | FA337W02<br>                        |
| <b>W20</b><br>2NO<br>Slow break<br><br>Zb                    | FA335W20<br>                | FA336W20<br>    | FA337W20<br>                        |

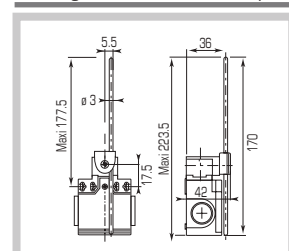
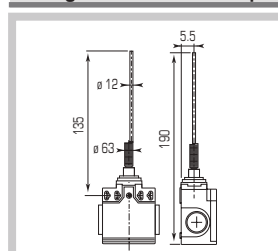
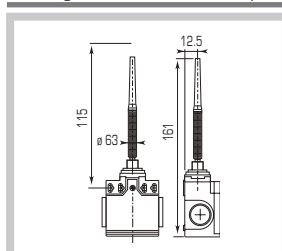
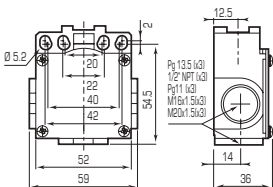
WEIGHT gr - MIN. PACK QTY.

305 gr 1 pcs

320 gr 1 pcs

380 gr 1 pcs

DIMENSIONS



# Limit Switches

## FT1 Series

IP65 □ thermoplastic type

1 cable entry  
M16x1.5



FT131



FT1P31



FT134



FT132

| TYPE OF OPERATOR                                      | SHORT STEEL END PLUNGER | SHORT STEEL END PLUNGER WITH PROTECTIVE BOOT | ROLLER LEVER PLUNGER | ROLLER LEVER PLUNGER HORIZONTAL ACTUATION |
|---|-------------------------|--|----------------------|---|
| Standard - Positive opening NC contacts               | EN50047                 | EN50047                                      | EN50047              | EN50047                                   |
| Minimum tripping force                                | 15                      | 15   | 12                   | 7   |
| Minimum positive opening force                        | 30                      | 30   | 30                   | 24  |
| <b>Z11</b><br>Snap action<br>1NC-1NO<br>Zb            | FT131Z11<br>            | FT1P31Z11<br>                                | FT134Z11<br>         | FT132Z11<br>                              |
| <b>X11</b><br>Slow break<br>1NC-1NO<br>Zb             | FT131X11<br>            | FT1P31X11<br>                                | FT134X11<br>         | FT132X11<br>                              |
| <b>Y11</b><br>Slow break<br>1NC-1NO overlapping<br>Zb | FT131Y11<br>            | FT1P31Y11<br>                                | FT134Y11<br>         | FT132Y11<br>                              |
| <b>Z02</b><br>Snap action<br>2NC<br>Zb                | FT131Z02<br>            | FT1P31Z02<br>                                | FT134Z02<br>         | FT132Z02<br>                              |
| <b>W02</b><br>Slow break<br>2NC<br>Zb                 | FT131W02<br>            | FT1P31W02<br>                                | FT134W02<br>         | FT132W02<br>                              |
| <b>W20</b><br>Slow break<br>2NO<br>Zb                 | FT131W20<br>            | FT1P31W20<br>                                | FT134W20<br>         | FT132W20<br>                              |

WEIGHT gr - MIN. PACK QTY.

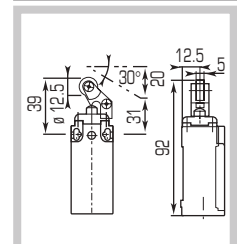
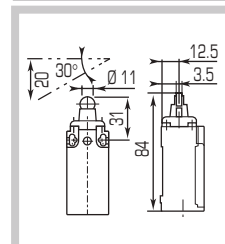
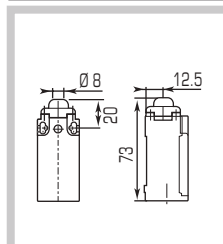
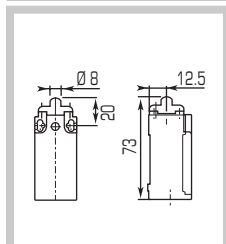
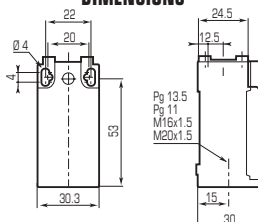
60 gr 1 pcs

60 gr 1 pcs

62 gr 1 pcs

65 gr 1 pcs

### DIMENSIONS



# Limit Switches

## FT1 Series

IP65 □ thermoplastic type



AUTOMATION TECHNOLOGIES

1 cable entry  
M16x1.5



FT1P32



FT133



FT1P33



FT138

| TYPE OF OPERATOR                                | ROLLER LEVER PLUNGER WITH PROTECTIVE BOOT HORIZONTAL ACTUATION | ROLLER LEVER PLUNGER VERTICAL ACTUATION   | ROLLER LEVER PLUNGER WITH PROTECTIVE BOOT VERTICAL ACTUATION | ROLLER LEVER Ø 18                       |
|---|--|---|--|---|
| Standard - Positive opening NC contacts (→)     | EN50047 (→)  | EN50047 (→)                               | EN50047 (→)  | EN50047 (→)                             |
| Minimum tripping force N                        | 7  | 7   | 7  | 0.10                                    |
| Minimum positive opening force N                | 24   | 24  | 24   | 0.32                                    |
| <b>Z11</b><br>Snap action<br>1NC-1NO            | <b>FT1P32Z11</b><br>0 49 90 145 210 mm                         | <b>FT133Z11</b><br>0 49 90 145 210 mm     | <b>FT1P33Z11</b><br>0 49 90 145 210 mm                       | <b>FT138Z11</b><br>0 17Y 31Y 47Y 74Y    |
| <b>X11</b><br>Slow break<br>1NC-1NO             | <b>FT1P32X11</b><br>0 60 105 210 mm<br>86                      | <b>FT133X11</b><br>0 60 105 210 mm<br>86  | <b>FT1P33X11</b><br>0 60 105 210 mm<br>86                    | <b>FT138X11</b><br>0 21Y 37Y 74Y<br>30Y |
| <b>Y11</b><br>Slow break<br>1NC-1NO overlapping | <b>FT1P32Y11</b><br>0 102 146 210 mm<br>54                     | <b>FT133Y11</b><br>0 102 146 210 mm<br>54 | <b>FT1P33Y11</b><br>0 102 146 210 mm<br>54                   | <b>FT138Y11</b><br>0 35° 51° 74°<br>18° |
| <b>Z02</b><br>Snap action<br>2NC                | <b>FT1P32Z02</b><br>0 51 86 131 210 mm                         | <b>FT133Z02</b><br>0 51 86 131 210 mm     | <b>FT1P33Z02</b><br>0 51 86 131 210 mm                       | <b>FT138Z02</b><br>0 17 30 46 74        |
| <b>W02</b><br>Slow break<br>2NC                 | <b>FT1P32W02</b><br>0 57 102 210 mm                            | <b>FT133W02</b><br>0 57 102 210 mm        | <b>FT1P33W02</b><br>0 57 102 210 mm                          | <b>FT138W02</b><br>0 19 37 74           |
| <b>W20</b><br>Slow break<br>2NO                 | <b>FT1P32W20</b><br>0 5.3 210 mm                               | <b>FT133W20</b><br>0 5.3 210 mm           | <b>FT1P33W20</b><br>0 5.3 210 mm                             | <b>FT138W20</b><br>0 18Y 74Y            |

WEIGHT gr - MIN. PACK QTY.

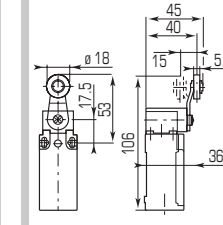
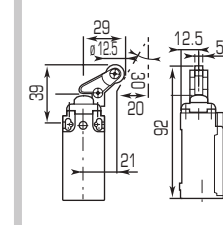
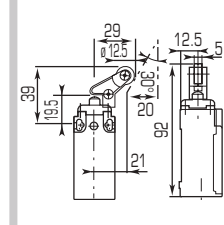
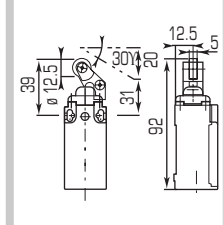
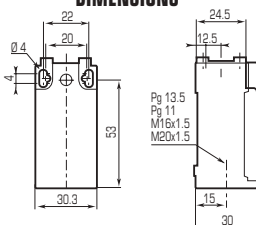
65 gr 1 pcs

65 gr 1 pcs

65 gr 1 pcs

80 gr 1 pcs

### DIMENSIONS



# Limit Switches

## FT1 Series

IP65 □ thermoplastic type

1 cable entry  
M16x1.5



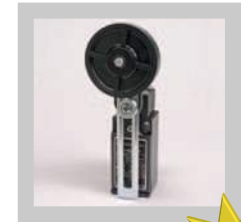
FT141



FT139



FT140



FT140R



| TYPE OF OPERATOR                            | RUBBER ROLLER LEVER Ø 50 | VARIABLE LENGTH ROLLER LEVER Ø 18 | VARIABLE LENGTH RUBBER ROLLER LEVER Ø 50 | VARIABLE LENGTH AND RUBBER ROLLER LEVER Ø 50 |
|---|--------------------------|-----------------------------------|--|--|
| Standard - Positive opening NC contacts (→) | -                        | -                                 | -  | -  |
| Minimum tripping force                      | 0,10                     | 0,10                              | 0,10                                     | 0,10   |
| Minimum positive opening force              | -                        | -                                 | -  | -  |

|   |                     |                     |                     |                      |
|---|---------------------|---------------------|---------------------|----------------------|
| <b>Z11</b><br><b>1NC-1NO</b><br>Snap action<br> | <b>FT141Z11</b><br> | <b>FT139Z11</b><br> | <b>FT140Z11</b><br> | <b>FT140Z11R</b><br> |
|---|---------------------|---------------------|---------------------|----------------------|

|  |                     |                     |                     |                      |
|--|---------------------|---------------------|---------------------|----------------------|
| <b>X11</b><br><b>1NC-1NO</b><br>Slow break<br> | <b>FT141X11</b><br> | <b>FT139X11</b><br> | <b>FT140X11</b><br> | <b>FT140X11R</b><br> |
|--|---------------------|---------------------|---------------------|----------------------|

|   |                     |                     |                     |                      |
|---|---------------------|---------------------|---------------------|----------------------|
| <b>Y11</b><br><b>1NC-1NO</b><br>Slow break<br>overlapping<br> | <b>FT141Y11</b><br> | <b>FT139Y11</b><br> | <b>FT140Y11</b><br> | <b>FT140Y11R</b><br> |
|---|---------------------|---------------------|---------------------|----------------------|

|   |                     |                     |                     |                      |
|---|---------------------|---------------------|---------------------|----------------------|
| <b>Z02</b><br><b>2NC</b><br>Snap action<br> | <b>FT141Z02</b><br> | <b>FT139Z02</b><br> | <b>FT140Z02</b><br> | <b>FT140Z02R</b><br> |
|---|---------------------|---------------------|---------------------|----------------------|

|  |                     |                     |                     |                      |
|--|---------------------|---------------------|---------------------|----------------------|
| <b>W02</b><br><b>2NC</b><br>Slow break<br> | <b>FT141W02</b><br> | <b>FT139W02</b><br> | <b>FT140W02</b><br> | <b>FT140W02R</b><br> |
|--|---------------------|---------------------|---------------------|----------------------|

|  |                     |                     |                     |                      |
|--|---------------------|---------------------|---------------------|----------------------|
| <b>W20</b><br><b>2NO</b><br>Slow break<br> | <b>FT141W20</b><br> | <b>FT139W20</b><br> | <b>FT140W20</b><br> | <b>FT140W20R</b><br> |
|--|---------------------|---------------------|---------------------|----------------------|

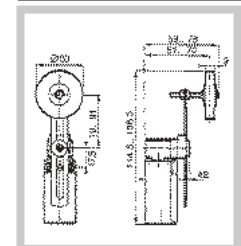
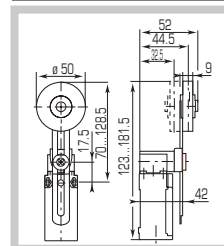
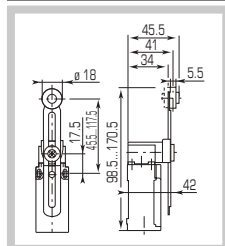
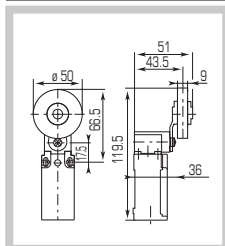
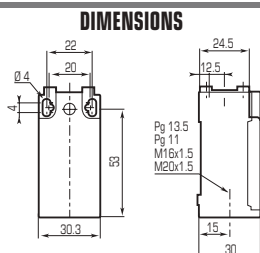
WEIGHT gr - MIN. PACK QTY.

95 gr 1 pcs

105 gr 1 pcs

125 gr 1 pcs

125 gr 1 pcs



# Limit Switches

## FT1 Series

IP65  thermoplastic type



AUTOMATION TECHNOLOGIES

1 cable entry  
M16x1.5



FT135



FT136



FT137

| TYPE OF OPERATOR                                | SPRING LEVER WITH TIP IN PA | "CAT'S WHISKER"     | VARIABLE LENGTH STEEL ROD LEVER Ø 3 |
|---|-----------------------------|---------------------|-------------------------------------|
| Standard - Positive opening NC contacts         | EN50047                     | -                   | -                                   |
| Minimum tripping force                          | 0.12                        | 0.12                | 0.12                                |
| Minimum positive opening force                  | -                           | -                   | -                                   |
| <b>Z11</b><br>Snap action<br>1NC-1NO            | <b>FT135Z11</b><br>         | <b>FT136Z11</b><br> | <b>FT137Z11</b><br>                 |
| <b>X11</b><br>Slow break<br>1NC-1NO             | <b>FT135X11</b><br>         | <b>FT136X11</b><br> | <b>FT137X11</b><br>                 |
| <b>Y11</b><br>Slow break<br>1NC-1NO overlapping | <b>FT135Y11</b><br>         | <b>FT136Y11</b><br> | <b>FT137Y11</b><br>                 |
| <b>Z02</b><br>Snap action<br>2NC                | <b>FT135Z02</b><br>         | <b>FT136Z02</b><br> | <b>FT137Z02</b><br>                 |
| <b>W02</b><br>Slow break<br>2NC                 | <b>FT135W02</b><br>         | <b>FT136W02</b><br> | <b>FT137W02</b><br>                 |
| <b>W20</b><br>Slow break<br>2NO                 | <b>FT135W20</b><br>         | <b>FT136W20</b><br> | <b>FT137W20</b><br>                 |

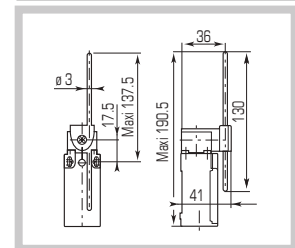
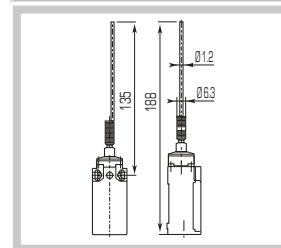
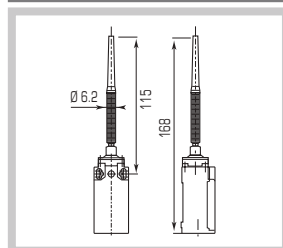
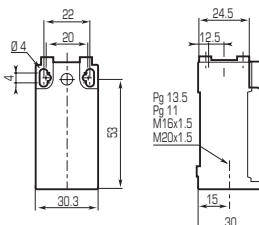
WEIGHT gr - MIN. PACK QTY.

70 gr 1 pcs

80 gr 1 pcs

105 gr 1 pcs

DIMENSIONS



# Limit Switches

## FT2 Series

IP65 □ thermoplastic type

2 cable entry  
M16x1.5



FT231



FT2P31



FT234



FT232

| TYPE OF OPERATOR                                | SHORT STEEL END PLUNGE           | SHORT STEEL END PLUNGER WITH PROTECTIVE BOOT | ROLLER LEVER PLUNGER            | ROLLER LEVER PLUNGER HORIZONTAL ACTUATION |
|---|----------------------------------|--|---------------------------------|---|
| Standard - Positive opening NC contacts (→)     | - (→)                            | - (→)  | - (→)                           | - (→)                                     |
| Minimum tripping force N                        | 15                               | 15   | 12                              | 7   |
| Minimum positive opening force N                | 30                               | 30   | 30                              | 24  |
| <b>Z11</b><br>Snap action<br>1NC-1NO            | FT231Z11<br>0 13 25 41 56 mm     | FT2P31Z11<br>0 13 25 41 56 mm                | FT234Z11<br>0 25 47 76 96 mm    | FT232Z11<br>0 49 90 145 210 mm            |
| <b>X11</b><br>Slow break<br>1NC-1NO             | FT231X11<br>0 16 32 56 mm<br>2.5 | FT2P31X11<br>0 16 32 56 mm<br>2.5            | FT234X11<br>0 32 60 96 mm<br>46 | FT232X11<br>0 60 105 210 mm<br>86         |
| <b>Y11</b><br>Slow break<br>1NC-1NO overlapping | FT231Y11<br>0 29 45 56 mm<br>1.5 | FT2P31Y11<br>0 29 45 56 mm<br>1.5            | FT234Y11<br>0 53 82 96 mm<br>30 | FT232Y11<br>0 102 146 210 mm<br>54        |
| <b>Z02</b><br>Snap action<br>2NC                | FT231Z02<br>0 13 24 40 56 mm     | FT2P31Z02<br>0 13 24 40 56 mm                | FT234Z02<br>0 25 45 74 96 mm    | FT232Z02<br>0 51 86 131 210 mm            |
| <b>W02</b><br>Slow break<br>2NC                 | FT231W02<br>0 15 31 56 mm        | FT2P31W02<br>0 15 31 56 mm                   | FT234W02<br>0 30 59 96 mm       | FT232W02<br>0 57 102 210 mm               |
| <b>W20</b><br>Slow break<br>2NO                 | FT231W20<br>0 14 56 mm           | FT2P31W20<br>0 14 56 mm                      | FT234W20<br>0 28 96 mm          | FT232W20<br>0 5.3 210 mm                  |

WEIGHT gr - MIN. PACK QTY.

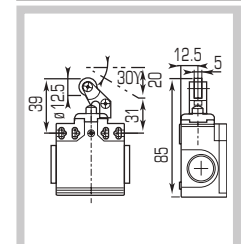
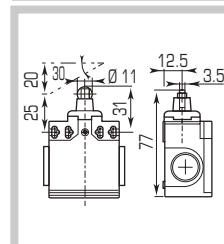
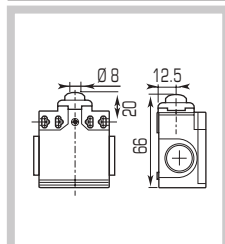
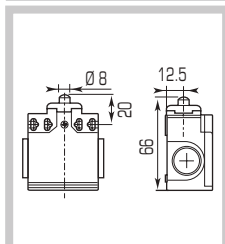
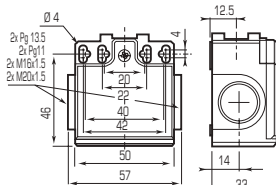
100 gr 1 pcs

100 gr 1 pcs

105 gr 1 pcs

105 gr 1 pcs

### DIMENSIONS



# Limit Switches

## FT2 Series

IP65 □ thermoplastic type



AUTOMATION TECHNOLOGIES

2 cable entry  
M16x1.5



FT2P32



FT238



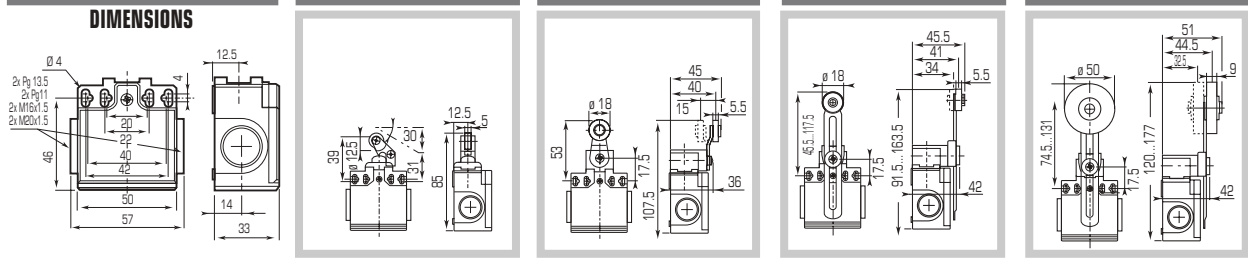
FT239



FT240

| TYPE OF OPERATOR                                | ROLLER LEVER PLUNGER WITH PROTECTIVE BOOT HORIZONTAL ACTUATION | ROLLER LEVER Ø 18 | VARIABLE LENGTH ROLLER LEVER Ø 18 | VARIABLE LENGTH Ø 50 RUBBER ROLLER LEVER |
|---|--|-------------------|-----------------------------------|--|
| Standard - Positive opening NC contacts (→)     | - (→)  | - (→)             | -                                 | -  |
| Minimum tripping force N                        | 7  | 0.10              | 0.10                              | 0.10                                     |
| Minimum positive opening force N                | 24   | 0.32              | -                                 | -  |
| <b>Z11</b><br>Snap action<br>1NC-1NO            | FT2P32Z11<br>  | FT238Z11<br>      | FT239Z11<br>                      | FT240Z11<br>                             |
| <b>X11</b><br>Slow break<br>1NC-1NO             | FT2P32X11<br>  | FT238X11<br>      | FT239X11<br>                      | FT240X11<br>                             |
| <b>Y11</b><br>Slow break<br>1NC-1NO overlapping | FT2P32Y11<br>  | FT238Y11<br>      | FT239Y11<br>                      | FT240Y11<br>                             |
| <b>Z02</b><br>Snap action<br>2NC                | FT2P32Z02<br>  | FT238Z02<br>      | FT239Z02<br>                      | FT240Z02<br>                             |
| <b>W02</b><br>Slow break<br>2NC                 | FT2P32W02<br>  | FT238W02<br>      | FT239W02<br>                      | FT240W02<br>                             |
| <b>W20</b><br>Slow break<br>2NO                 | FT2P32W20<br>  | FT238W20<br>      | FT239W20<br>                      | FT240W20<br>                             |

**WEIGHT gr - MIN. PACK QTY.**    105 gr    1 pcs    125 gr    1 pcs    125 gr    1 pcs    155 gr    1 pcs



# Limit Switches

## Serie FT2

IP65 □ thermoplastic type

2 cable entries  
M16x1.5



FT241



FT235



FT236



FT237

| TYPE OF OPERATOR                                | Ø 50 RUBBER ROLLER LEVER | SPRING LEVER WITH TIP IN PA | "CAT'S WHISKER" | VARIABLE LENGTH Ø 3 STEEL ROD LEVER |
|---|--------------------------|-----------------------------|-----------------|-------------------------------------|
| Standard - Positive opening NC contacts (→)     | -                        | -                           | -               | -                                   |
| Minimum tripping force N                        | 0.10                     | 0.10                        | 0.10            | 0.10                                |
| Minimum positive opening force N                | -                        | 0.32                        | -               | -                                   |
| <b>Z11</b><br>Snap action<br>1NC-1NO            | FT241Z11<br>             | FT235Z11<br>                | FT236Z11<br>    | FT237Z11<br>                        |
| <b>X11</b><br>Slow break<br>1NC-1NO             | FT241X11<br>             | FT235X11<br>                | FT236X11<br>    | FT237X11<br>                        |
| <b>Y11</b><br>Slow break<br>1NC-1NO overlapping | FT241ZY11<br>            | FT235Y11<br>                | FT236Y11<br>    | FT237Y11<br>                        |
| <b>Z02</b><br>Snap action<br>2NC                | FT241Z02<br>             | FT235Z02<br>                | FT236Z02<br>    | FT237Z02<br>                        |
| <b>W02</b><br>Slow break<br>2NC                 | FT241W02<br>             | FT235W02<br>                | FT236W02<br>    | FT237W02<br>                        |
| <b>W20</b><br>Slow break<br>2NO                 | FT241W20<br>             | FT235W20<br>                | FT236W20<br>    | FT237W20<br>                        |

WEIGHT gr - MIN. PACK QTY.

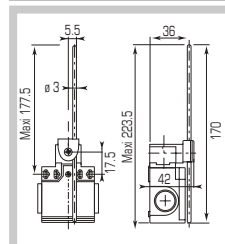
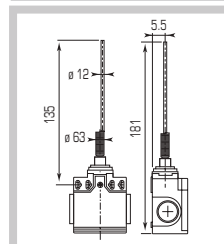
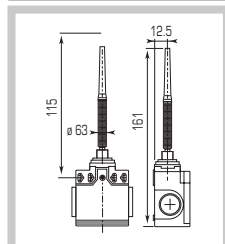
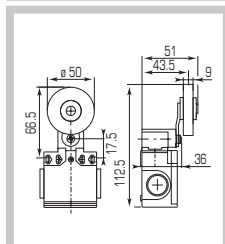
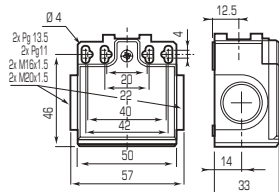
145 gr 1 pcs

135 gr 1 pcs

110 gr 1 pcs

130 gr 1 pcs

**DIMENSIONS**





# Limit Switches

## FT1R Series with reset

IP65 □ thermoplastic type



AUTOMATION TECHNOLOGIES

1 cable entry  
M16x1.5



FT1R31



FT1R34



FT1R32



FT1R33

| TYPE OF OPERATOR                                | SHORT STEEL END PLUNGER           | PA ROLLER PLUNGER                | PA ROLLER LEVER PLUNGER HORIZONTAL ACTUATION | PA ROLLER LEVER PLUNGER VERTICAL ACTUATION |
|---|-----------------------------------|----------------------------------|--|--|
| Standard - Positive opening NC contacts (→)     | - (→)                             | - (→)                            | - (→)  | - (→)                                      |
| Minimum tripping force N                        | 15                                | 12                               | 7  | 7  |
| Minimum positive opening force N                | 30                                | 30                               | 24   | 24   |
| <b>Z11</b><br>Snap action<br>1NC-1NO            | FT1R31Z11<br>0 13 25 41 56 mm     | FT1R34Z11<br>0 25 47 76 96 mm    | FT1R32Z11<br>0 49 90 145 210 mm              | FT1R33Z11<br>0 49 90 145 210 mm            |
| <b>X11</b><br>Slow break<br>1NC-1NO             | FT1R31X11<br>0 16 32 56 mm<br>2.5 | FT1R34X11<br>0 32 60 96 mm<br>46 | FT1R32X11<br>0 60 105 210 mm<br>86           | FT1R33X11<br>0 60 105 210 mm<br>86         |
| <b>Y11</b><br>Slow break<br>1NC-1NO overlapping | FT1R31Y11<br>0 29 45 56 mm<br>15  | FT1R34Y11<br>0 53 82 96 mm<br>30 | FT1R32Y11<br>0 102 146 210 mm<br>54          | FT1R33Y11<br>0 102 146 210 mm<br>54        |
| <b>Z02</b><br>Snap action<br>2NC                | FT1R31Z02<br>0 13 24 40 56 mm     | FT1R34Z02<br>0 25 45 74 96 mm    | FT1R32Z02<br>0 51 86 131 210 mm              | FT1R33Z02<br>0 51 86 131 210 mm            |
| <b>W02</b><br>Slow break<br>2NC                 | FT1R31W02<br>0 15 31 56 mm        | FT1R34W02<br>0 30 59 96 mm       | FT1R32W02<br>0 57 102 210 mm                 | FT1R33W02<br>0 57 102 210 mm               |

WEIGHT gr - MIN. PACK QTY.

75 gr

1 pcs

78 gr

1 pcs

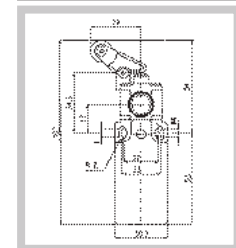
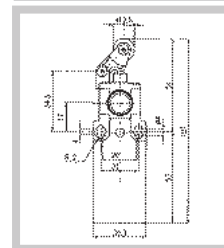
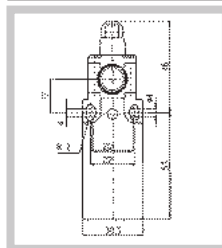
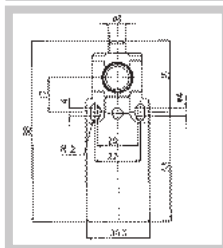
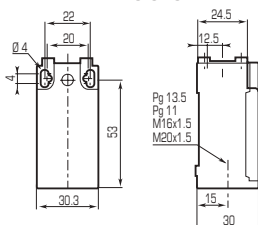
80 gr

1 pcs

80 gr

1 pcs

**DIMENSIONS**



# Limit Switches

## FT1R Series with reset

IP65 □ thermoplastic type

1 cable entry  
M16x1.5



FT1R38



FT1R41



FT1R39



FT1R40

| TYPE OF OPERATOR                            | ROLLER LEVER Ø 18 | Ø 50 RUBBER ROLLER LEVER | VARIABLE LENGTH ROLLER LEVER Ø 18 | VARIABLE LENGTH Ø 50 RUBBER ROLLER LEVER |
|---|-------------------|--------------------------|-----------------------------------|--|
| Standard - Positive opening NC contacts (→) | - (→)             | -                        | -                                 | -  |
| Minimum tripping force N                    | 0.10              | 0.10                     | 0.10                              | 0.10                                     |
| Minimum positive opening force N            | 0.32              | -                        | -                                 | -  |
| Snap action<br>Z11<br>1NC-1NO               | FT1R38Z11<br>     | FT1R41Z11<br>            | FT1R39Z11<br>                     | FT1R40Z11<br>                            |
| Slow break<br>X11<br>1NC-1NO                | FT1R38X11<br>     | FT1R41X11<br>            | FT1R39X11<br>                     | FT1R40X11<br>                            |
| Slow break<br>Y11<br>1NC-1NO overlapping    | FT1R38Y11<br>     | FT1R41Y11<br>            | FT1R39Y11<br>                     | FT1R40Y11<br>                            |
| Snap action<br>Z02<br>2NC                   | FT1R38Z02<br>     | FT1R41Z02<br>            | FT1R39Z02<br>                     | FT1R40Z02<br>                            |
| Slow break<br>W02<br>2NC                    | FT1R38W02<br>     | FT1R41W02<br>            | FT1R39W02<br>                     | FT1R40W02<br>                            |

WEIGHT gr - MIN. PACK QTY.

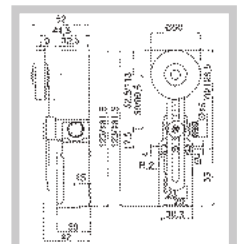
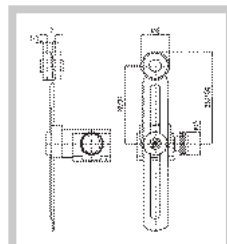
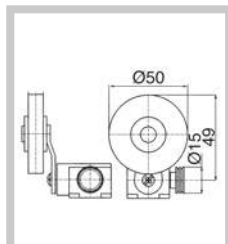
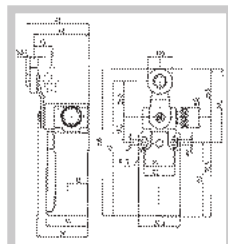
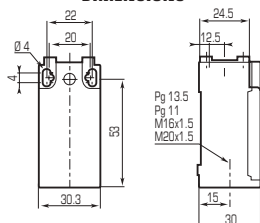
95 gr 1 pcs

110 gr 1 pcs

120 gr 1 pcs

145 gr 1 pcs

### DIMENSIONS



# Safety Limit Switches

## Safety Series - Limit Switches

IP65 □ thermoplastic type



AUTOMATION TECHNOLOGIES

1 cable entry  
M16x1.5



ST1K1



ST1K61



ST1K71 Zinc Plated Steel Spindle  
ST1K72 Stainless Steel Spindle



ST1K8

| TYPE OF OPERATOR                             | 90° ADJUSTABLE TURRET HEAD WITH ACTUATOR | ADJUSTABLE STEEL ROTARY LEVER | STEEL SPINDLE                                  | 360° ADJUSTABLE TURRET HEAD WITH ACTUATOR |
|--|--|-------------------------------|--|---|
| Standard - Positive opening NC contacts (→)  | - (→)                                    | - (→)                         | - (→)  | -   |
| Minimum tripping force N                     | -  | -                             | -  | -   |
| Minimum positive opening force N             | -  | -                             | -  | -   |
| <b>Z11</b><br><b>1NC-1NO</b><br>             | ST1K1 * Z11                              | ST1K61 Z11                    | Zinc Plated ST1K71 Z11<br>Stainless ST1K72 Z11 | ST1K8 * Z11                               |
| <b>X11</b><br><b>1NC-1NO</b><br>             | ST1K1 * X11                              | ST1K61 X11                    | Zinc Plated ST1K71 X11<br>Stainless ST1K72 X11 | ST1K8 * X11                               |
| <b>Y11</b><br><b>1NC-1NO overlapping</b><br> | ST1K1 * Y11                              | ST1K61 Y11                    | Zinc Plated ST1K71 Y11<br>Stainless ST1K72 Y11 | ST1K8 * Y11                               |
| <b>Z02</b><br><b>2NC</b><br>                 | ST1K1 * Z02                              | ST1K61 Z02                    | Zinc Plated ST1K71 Z02<br>Stainless ST1K72 Z02 | ST1K8 * Z02                               |
| <b>W02</b><br><b>2NC</b><br>                 | ST1K1 * W02                              | ST1K61 W02                    | Zinc Plated ST1K71 W02<br>Stainless ST1K72 W02 | ST1K8 * W02                               |

|                                   |                  |                  |                  |                  |
|-----------------------------------|------------------|------------------|------------------|------------------|
| <b>WEIGHT gr - MIN. PACK QTY.</b> | 83 gr      1 pcs | 96 gr      1 pcs | 80 gr      1 pcs | 90 gr      1 pcs |
|-----------------------------------|------------------|------------------|------------------|------------------|

| DIMENSIONS | 83 gr | 96 gr | 80 gr | 90 gr |
|------------|-------|-------|-------|-------|
|            |       |       |       |       |

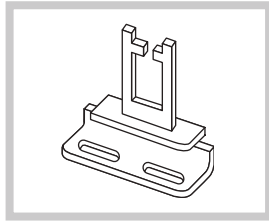
\* Include actuator type reference number i.e.: ST1K13Z11

# Safety Limit Switches

## Safety Series - Limit Switches

IP65 □ thermoplastic type

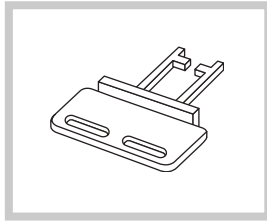
### ACTUATORS



22MM RIGHT-ANGLED ACTUATOR

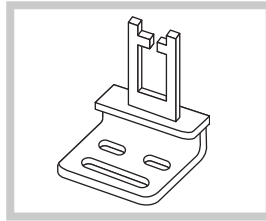
CODE

3



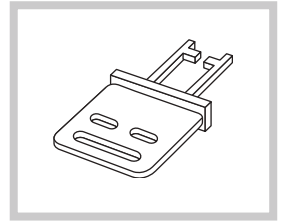
22MM STRAIGHT ACTUATOR

4



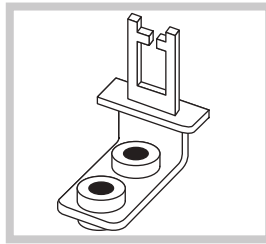
13MM RIGHT-ANGLED ACTUATOR

5



13MM STRAIGHT ACTUATOR

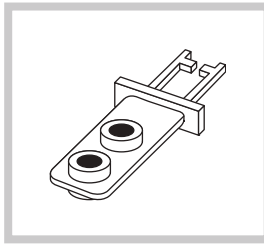
6



SHOCK ABSORBING RIGHT-ANGLED ACTUATOR

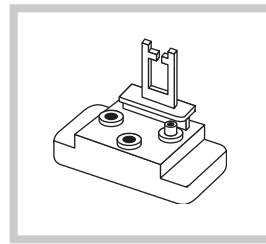
CODE

7



SHOCK ABSORBING STRAIGHT ACTUATOR

8



JOINTED KEY ACTUATOR

9

### GENERAL CHARACTERISTICS

Safety limit switches are suitable for stopping dangerous machinery movements on opening of machine guards or protective covers. Available with different type of actuators and controls and with adjustable turret heads which can be rotated through 360° in 90° steps, they can be installed with a wide variety of opening mechanisms.

|   |    |                        |      |     |
|---|----|------------------------|------|-----|
| ■ Comply with                               |    | IEC/EN60947-5-1, UL508 |      |     |
| ■ Rated insulation voltage $U_i$            | V  | 690                    |      |     |
| ■ Rated impulse withstand voltage $U_{imp}$ | kV | 6                      |      |     |
| ■ Operating frequency                       | Hz | 50                     |      |     |
| ■ Rated thermal current $I_{th}$            | A  | 10                     |      |     |
| ■ Rated operating current $I_e$ :           |    |                        |      |     |
|   | V  | 24                     | 230  | 380 |
| AC15: alternate current                     | A  | 10                     | 3.1  | 1.9 |
|   | V  | 24                     | 250  | -   |
| DC13: direct current                        | A  | 2.8                    | 0.27 | -   |
| ■ Conditional short circuit withstand       |    | 10A gG fuse rating     |      |     |
| ■ Electrical shocks withstand IEC 536       |    | class II               |      |     |
| ■ Protection rating IEC/EN 60529            |    | IP65                   |      |     |
| ■ Operating temperature                     | °C | -25 +70                |      |     |
| ■ Category of use UL 508                    |    | A600 - Q600            |      |     |
| ■ Certifications                            |    | UL                     |      |     |

# Limit Switches

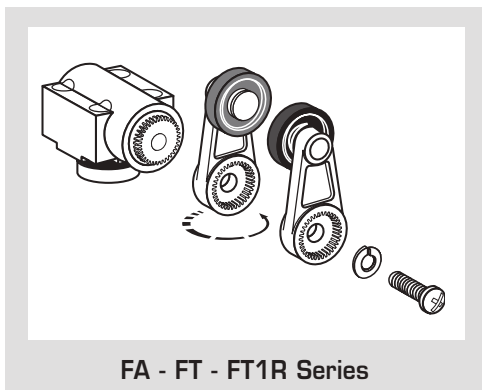
## FA - FT - FT1R Series

Installation and use

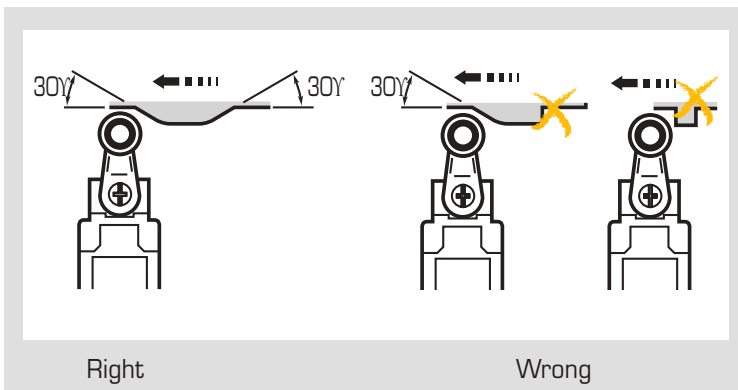


AUTOMATION TECHNOLOGIES

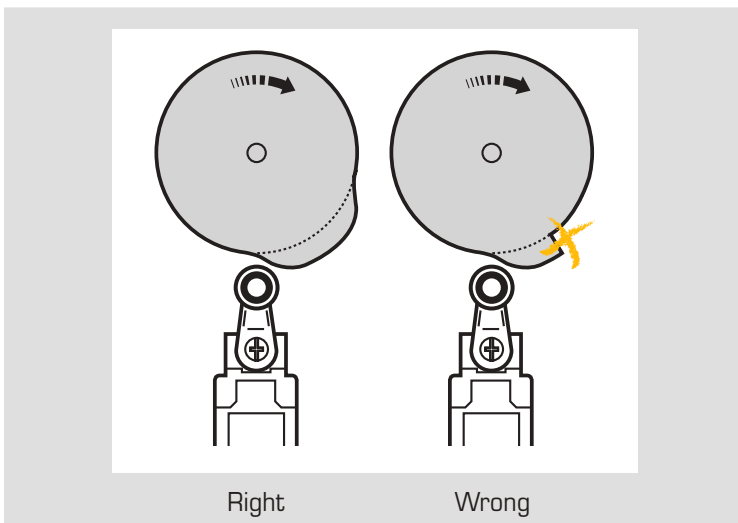
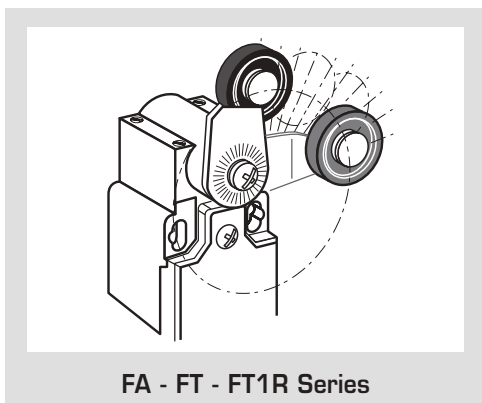
### REVERSE MOUNTING OF THE OPERATING LEVER



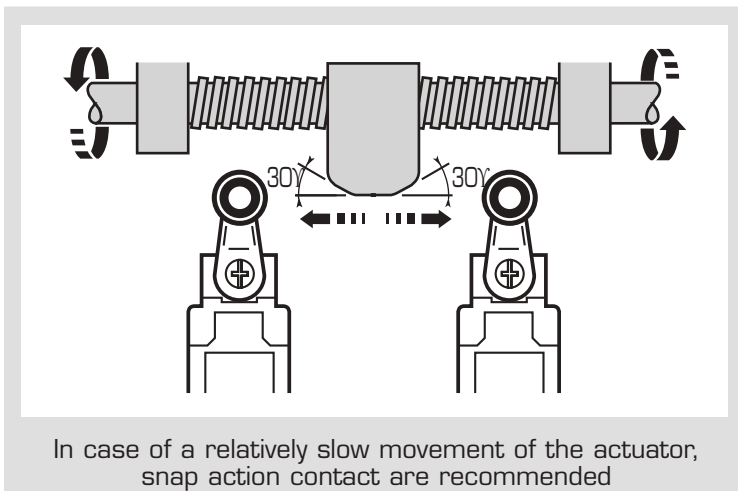
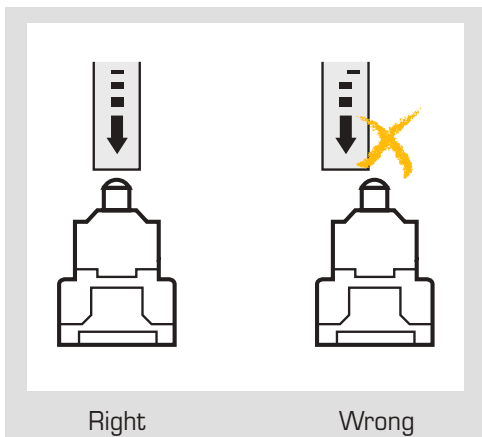
### PLUNGER OR ROLLER LEVER



### REST POSITION SETTING THROUGH 10° STEPS



### STEEL PLUNGER



# Limit Switches

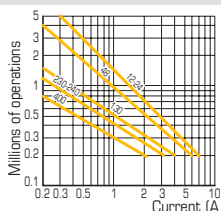
## FA - FT - FT1R Series

Technical data

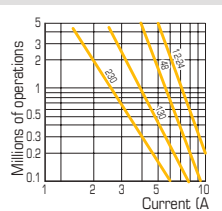
### GENERAL CHARACTERISTICS

|   |   |  |      |
|---|---|--|------|
| Comply with   | IEC947-5-1, EN60947-5-1, UL508, CSA 22.2 n° 14                                      |  |      |
| Certifications  | cUL   |  |      |
| Ambient temperature                                       | °C  | Operating -25 +70  |      |
|   | °C  | Storage -30 +80  |      |
| Climate protection  | IEC68 part 2-3  | Hot damp   |      |
|   | IEC68 part 2-11   | Saline fog   |      |
| Installation positions                                    | All positions   |  |      |
| Impact resistance   | IEC68 part 2-27   | 50g* (1/2 sinusoidal shock for 11 msec) without replacing contacts |      |
| Vibration resistance                                      | IEC68 part 2-6  | 25g (10...500 Hz) without replacing contacts >100 msec             |      |
| Electrical shocks withstand                               | IEC536  | Class II for FT series - Class I for FA series                     |      |
| Protection rating   | EN60529   | IP65 FT series - IP66 - FA series                                  |      |
| Accuracy (measured after 1 million operations)            | 0.05 FA series - 0.1 FT series (on the making point)                                |  |      |
| 0.05 Minimum tripping force                               | m/s   | Slow break 0.06 - snap action 0.001                                |      |
| Rated insulation voltage Ui (IEC/EN60947-1)               | V   | 690 FT series - 400 FA series                                      |      |
| according to UL508 and CSA C22-2 No. 14                   | V   | (3 pollution grade)  |      |
| Rated impulse withstand voltage Uimp (IEC/EN60947-1)      | kV  | 600 (designation A600 - Q600)                                      |      |
| Rated thermal current Ith (IEC/EN60947-1)                 | A   | 6  |      |
| Short circuit protection <500 Va.c. - fuses type gG (gl7) | A   | 10   |      |
| Rated operating current Ie:<br>AC-15 (IEC/EN60947-5-1)    | 24 V - 50/60 Hz   | A  | 10   |
|   | 120 V - 50/60 Hz  | A  | 6    |
|   | 230 V - 50/60 Hz  | A  | 3.1  |
|   | 240 V - 50/60 Hz  | A  | 3    |
|   | 400 V - 50/60 Hz  | A  | 1.9  |
|   | DC-13 (IEC/EN60947-5-1)   | 24 V - 50/60 Hz  | A    |
|   | 125 V - 50/60 Hz  | A  | 0.55 |
|   | 250 V - 50/60 Hz  | A  | 0.27 |
| Changeover frequency                                      | cycles/hour   | 3600   |      |
| Load factor   |   | 0.5  |      |
| Contact insulation resistance                             | m Ω   | 25   |      |
| Termination type  | M3.5 screw clamp terminals (+/-) pozidriv 2   |  |      |
| Earth terminal (FA series only)                           | M3.5 screw clamp terminals (+/-) pozidriv 2   |  |      |
| Terminal capacity solid/flexible conductor                | n.1 o 2 x mm <sup>2</sup>   | 0.75...2.5   |      |
| Terminal referencing                                      | according to EN50013  |  |      |
| Mechanical life   | milions of operations   | 15   FA.   31; 32; 33  |      |
|   |   | 10   FT.   34; 37; 38...41   |      |
|   |   | >5   FT.   P31...P33; 35; 36                                       |      |
| Electrical life (according to IEC/EN60947-5-1)            | AC-15 and DC-13 categories of use (0.5 load factor according to the diagrams below) |  |      |

**AC-15  
Snap  
action**



**AC-15  
Slow  
break**



**DC-13    Snap action    Slow break**

Breaking capacity for a duration of 5 millions cycles

|               |       |      |
|---------------|-------|------|
| Voltage 24 V  | 9.5 W | 12 W |
| Voltage 48 V  | 6.8 W | 9 W  |
| Voltage 110 V | 3.6 W | 6 W  |

# Limit Switches

## Pre-wired FCT series

IP67 □ thermoplastic type



AUTOMATION TECHNOLOGIES

Cable: PVC UL  
5x0.75 mm<sup>2</sup>  
2 m length  
Outlet: horizontal .L.  
vertical .V.



.01.



.02.



.03.



.04.

**TYPE OF OPERATOR**

Slow break

X11  
1NC-1NO

black brown  
black blue

**CABLE OUTLET**

.L.  
.V.

**STEEL END PLUNGER**

FCT2L01X11  
FCT2V01X11

0 1.8 2.6 5 mm

75 gr 1 pz

**ROLLER PLUNGER**

FCT2L02X11  
FCT2V02X11

0 1.8 2.6 5 mm

78 gr 1 pz

**90° ROLLER PLUNGER**

FCT2L03X11  
FCT2V03X11

0 1.8 2.6 5 mm

80 gr 1 pz

**ROLLER LEVER**  
Ø 14

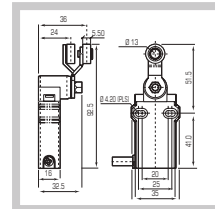
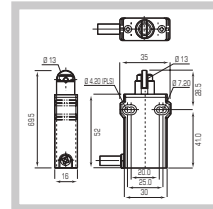
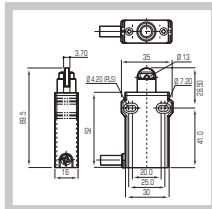
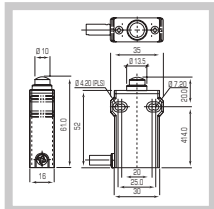
FCT2L04X11  
FCT2V04X11

0 27 38 60

80 gr 1 pz

**WEIGHT gr. - MIN. PACK QTY.**

**DIMENSIONS**



Cable: PVC UL  
5x0.75 mm<sup>2</sup>  
2 m length  
Outlet: horizontal .L.  
vertical .V.



.06.



.07.



.08.

**TYPE OF OPERATOR**

Slow break

X11  
1NC-1NO

black brown  
black blue

**CABLE OUTLET**

.L.  
.V.

**STEEL END PLUNGER WITH THREADED FLANGE**

FCT2L06X11  
FCT2V06X11

0 1.8 2.6 5 mm

75 gr 1 pz

**ROLLER PLUNGER WITH THREADED FLANGE**

FCT2L07X11  
FCT2V07X11

0 1.8 2.6 5 mm

78 gr 1 pz

**90° ROLLER PLUNGER WITH THREADED FLANGE**

FCT2L08X11  
FCT2V08X11

0 1.8 2.6 5 mm

80 gr 1 pz

**CHARACTERISTICS**

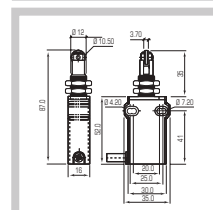
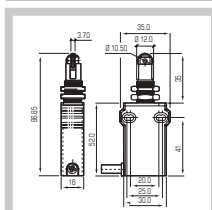
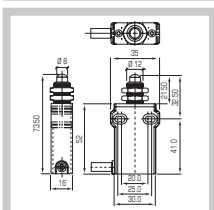
IEC/EN60947-5-1  
Rated insulation voltage  
U<sub>i</sub>/500V  
Rated thermal current I<sub>th</sub> 10A  
Rated operating current I<sub>e</sub>:

|      |                  |     |      |      |
|------|------------------|-----|------|------|
| AC15 | U <sub>e</sub> V | 120 | 250  | 400  |
|      | I <sub>e</sub> A | 6   | 4    | 3    |
| DC13 | U <sub>e</sub> V | 24  | 125  | 250  |
|      | I <sub>e</sub> A | 2,5 | 0,55 | 0,27 |

UL508  
General use  
Designation A300-Q300  
Operating temperature -25 +70 °C  
Self extinguishing body VO

**WEIGHT gr - MIN. PACK QTY.**

**DIMENSIONS**



# Limit Switches

## Pre-wired FCM series

IP67  Metal type



Cable: PVC UL  
5x0.75 mm<sup>2</sup>  
2 m length  
Outlet: horizontal .L.



.01.



.02.

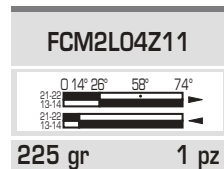
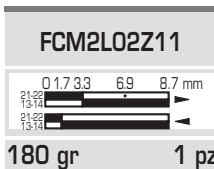
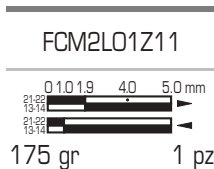
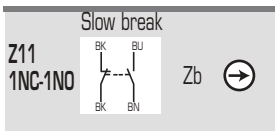


.03.

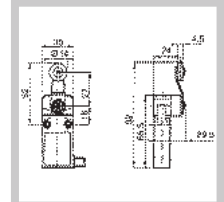
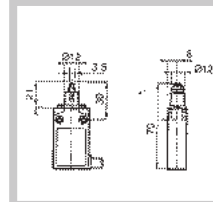
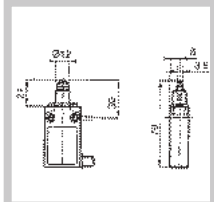
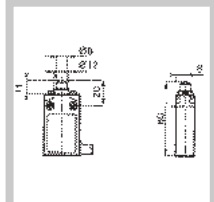
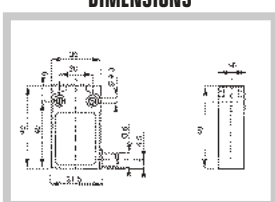


.04.

| TYPE OF OPERATOR | STEEL END PLUNGER | ROLLER PLUNGER | 90° ROLLER PLUNGER | 14 Ø POM ROLLER LEVER |
|------------------|-------------------|----------------|--------------------|-----------------------|
|------------------|-------------------|----------------|--------------------|-----------------------|



WEIGHT gr - MIN. PACK QTY.



Cable: PVC UL  
5x0.75 mm<sup>2</sup>  
2 m length  
Outlet: horizontal .L.



.06.

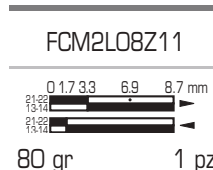
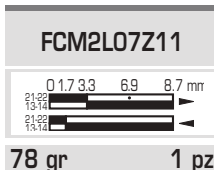
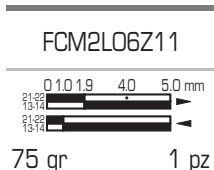
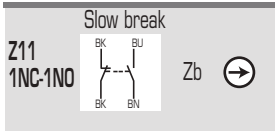


.07.

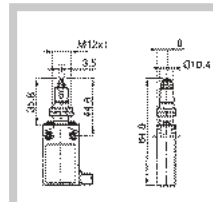
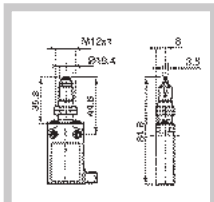
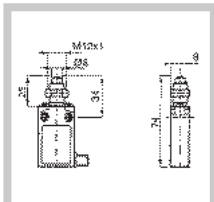
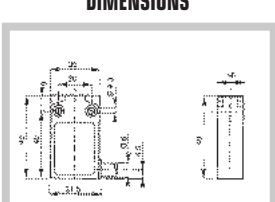


.08.

| TYPE OF OPERATOR | STEEL END PLUNGER WITH THREADED FLANGE | ROLLER PLUNGER WITH THREADED FLANGE | 90° ROLLER PLUNGER WITH THREADED FLANGE | CHARACTERISTICS |
|------------------|--|-------------------------------------|---|-----------------|
|------------------|--|-------------------------------------|---|-----------------|



WEIGHT gr - MIN. PACK QTY.



IEC/EN60947-5-1  
Rated insulation voltage  
U<sub>i</sub>/500V  
Rated thermal current I<sub>th</sub> 5A  
Rated operating current I<sub>e</sub>:

|      |                  |    |      |     |
|------|------------------|----|------|-----|
| AC15 | U <sub>e</sub> V | 24 | 120  | 240 |
|      | I <sub>e</sub> A | 5  | 3    | 1,5 |
| DC13 | U <sub>e</sub> V | 24 | 125  | 250 |
|      | I <sub>e</sub> A | 1  | 0,22 | 0,1 |

Pollution class | 3  
Material group | I  
Operating temperatures | -25 +70 °C



# Limit Switches

## Astra Series IP54 universal type



AUTOMATION TECHNOLOGIES

2 cable entries  
with cable gland



| TYPE OF OPERATOR                             | STEEL ROLLER PLUNGER | ROLLER LEVER Ø 20 | ROLLER LEVER Ø 35 | ROLLER PLUNGER AND LEVER WITH RESET |
|--|----------------------|-------------------|-------------------|-------------------------------------|
| <b>1NC-1NO</b><br>Slow break<br>             | 30303061<br>         | 30303073<br>      | 30303025<br>      | 30303092<br>lever<br>               |
| <b>1NC-1NO overlapping</b><br>Slow break<br> | 30303062<br>         | 30303074<br>      | 30303026<br>      | 30303098<br>with plunger<br>        |
| <b>WEIGHT gr - MIN. PACK QTY.</b>            | 130 gr      1 pz     | 160 gr      1 pz  | 200 gr      1 pz  | 180 gr      1 pz                    |
| <b>DIMENSIONS</b>                            |                      |                   |                   |                                     |

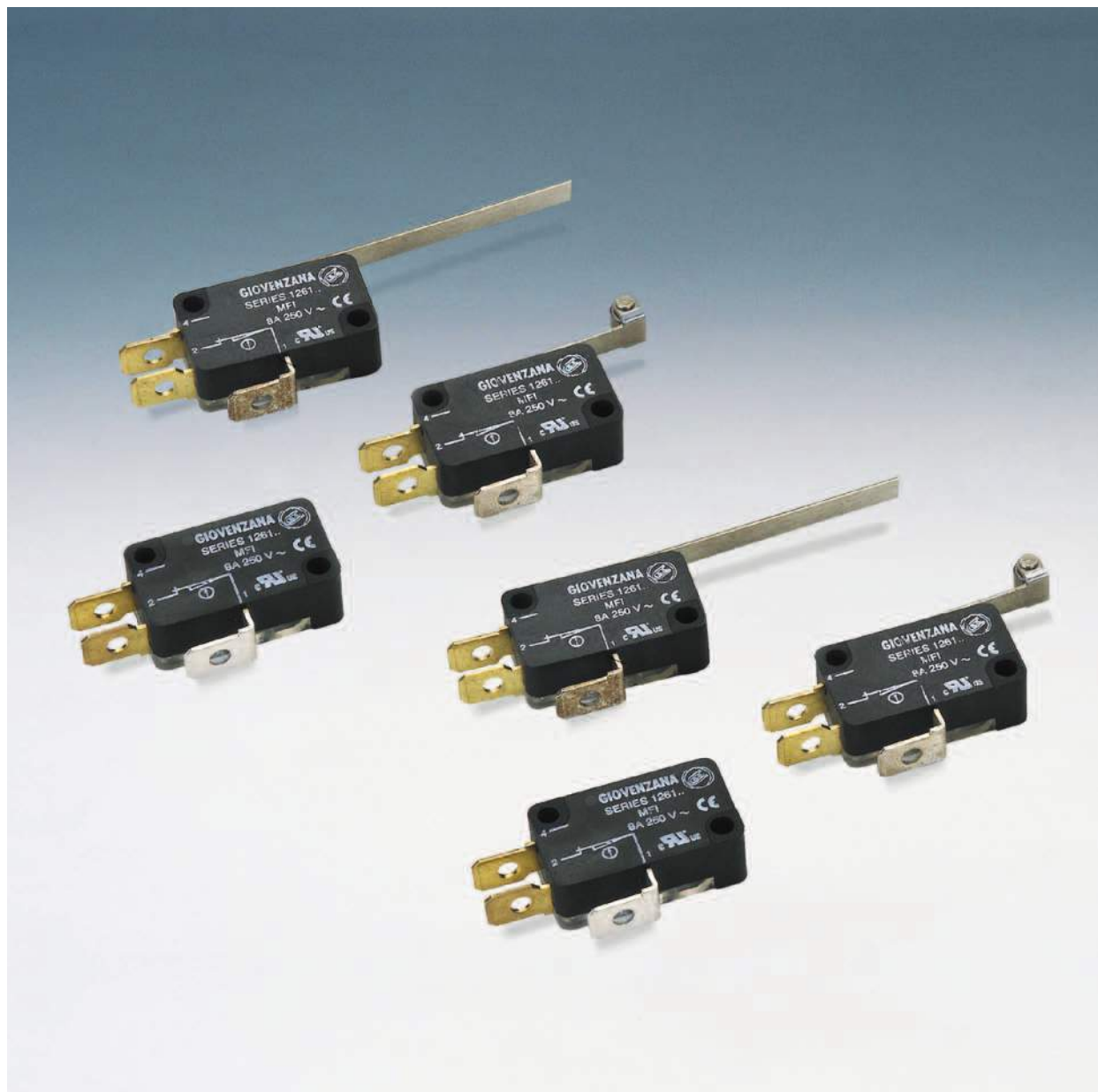
### GENERAL CHARACTERISTICS

|  |   |     |     |     |   |   |   |
|--|---|-----|-----|-----|---|---|---|
| Comply with  | IEC/EN60947-5-1   |     |     |     |   |   |   |
| Rated insulation voltage $U_i$                             | 500 (pollution class 3)   |     |     |     |   |   |   |
| Rated impulse withstand voltage $U_{imp}$                  | 4   |     |     |     |   |   |   |
| Operating frequency  | 50/60   |     |     |     |   |   |   |
| Rated thermal current $I_{th}$                             | 10  |     |     |     |   |   |   |
| Rated operating current $I_e$ :<br>AC-15 alterante current | <table border="1"> <tr> <td>110</td> <td>230</td> <td>380</td> </tr> <tr> <td>8</td> <td>8</td> <td>6</td> </tr> </table> | 110 | 230 | 380 | 8 | 8 | 6 |
| 110  | 230   | 380 |     |     |   |   |   |
| 8  | 8   | 6   |     |     |   |   |   |
| Contact type   | Slow break double gap contacts  |     |     |     |   |   |   |
| Protection rating  | IP54  |     |     |     |   |   |   |
| Ambient temperature  | Operating -25 +55<br>Storage -30 +70  |     |     |     |   |   |   |
| Termination type   | Screw clamp terminals   |     |     |     |   |   |   |
| Materials  | Housing in reinforced PA - PC lid<br>Nickel brass plunger - Reinforced PC lever   |     |     |     |   |   |   |

# Micro Switches

## MFI Series

Table of contents



Standard micro switches with self cleaning contacts  
Supplied with operator.

### TABLE OF CONTENTS

- MFI Series

pag.125

# Micro Switches

## MFI Series

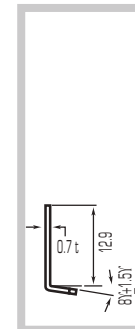
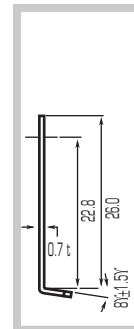
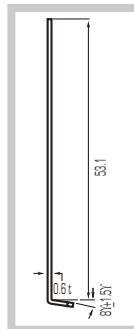
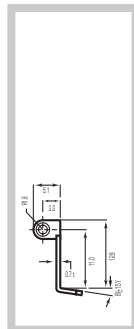
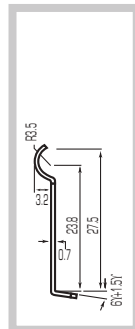
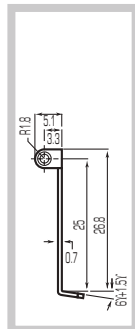
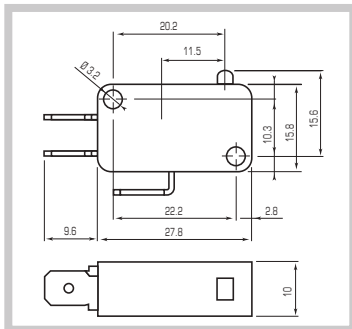
DIN 41635A - 6.3x0.8 connectors



AUTOMATION TECHNOLOGIES



- Changeover contacts
- High reliability snap action contacts
- Silver alloy self cleaning contacts
- Positive opening NC contact  $\odot$
- 7 versions available
- Certifications:



PIN PLUNGER

LONG ROLLER LEVER

SIMULATED ROLLER LEVER

ROLLER LEVER

LONG LEVER

LEVER

SHORT LEVER



MFI

MFI.1

MFI.2

MFI.3

MFI.4

MFI.5

MFI.6

|                      |    |          |          |          |        |          |          |          |
|----------------------|----|----------|----------|----------|--------|----------|----------|----------|
| Operating force      | N  | 4,5      | 3,2      | 3,2      | 4,5    | 1,3      | 3,2      | 4,5      |
| Resetting force      | N  | 1,9      | 1,2      | 1,2      | 1,9    | 0,15     | 1,2      | 1,9      |
| Max pre travel PT    | mm | 1,4      | 3,3      | 3,3      | 1,4    | 7,6      | 3,3      | 1,4      |
| Min over travel      | mm | 0,8      | 0,8      | 0,8      | 0,6    | 2,2      | 0,8      | 0,6      |
| Tripping position OP | mm | 14,4±0,4 | 21,8±1,2 | 18,9±1,2 | 20±0,6 | 15,2±1,2 | 15,2±1,2 | 15,1±0,5 |

### GENERAL CHARACTERISTICS

|   |  |
|---|--|
| ■ Comply with                               | IEC/EN61058, UL1054                                |
| ■ Rated insulation voltage $U_i$            | 250V   |
| ■ Rated impulse withstand voltage $U_{imp}$ | 1500   |
| ■ Rated thermal current $I_{th}$            | 8  |
| ■ Rated operating current $I_e$ :           | 8A - 250V resistive load, 3A - 250V inductive load |
| ■ Ambient temperature                       | -25 +85  |
| ■ Electric shock protection                 | Class II   |
| ■ Pollution class                           | 2  |
| ■ Life                                      | Mechanical $10^6$ , electrical $5 \times 10^5$     |
| ■ Termination type                          | 6.3x0.8 faston terminal                            |

# Foot switches

## IP Series

Table of contents



Single or double foot switches with the EN ISO 13850 emergency stop option.  
Available with electric or pneumatic controls.

### TABLE OF CONTENTS

|                        |          |   |          |
|------------------------|----------|---|----------|
| ■ Single foot switches | pag. 127 | ■ Double foot switches – Technical data | pag. 128 |
|------------------------|----------|---|----------|

# Foot switches

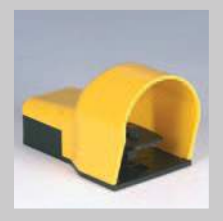
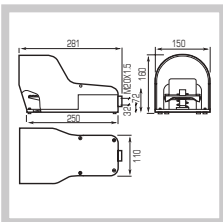
## IP Series

IP54 □ thermoplastic type - Single

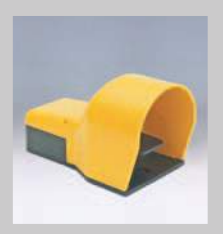
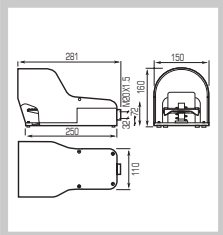



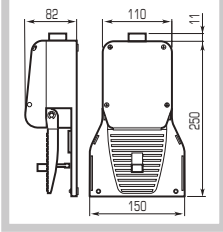
AUTOMATION TECHNOLOGIES


### SAFETY FOOT SWITCHES


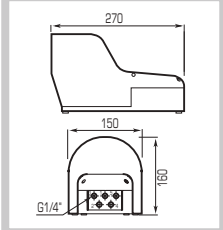
| DESCRIPTION  | CONTACTS     | CODE   | WEIGHT gr | MIN. PACK QTY. | DIMENSIONS  |
|--|--------------|--------|-----------|----------------|---|
|  <p>With trigger mechanism requiring positive action to allow pedal operation</p> | Slow break * | IP7007 | 1.400     | 1              |  |
|  | 1NO          |        |           |                |   |
|  | 2NO          | IP7008 |           |                |   |

### FOOT SWITCHES

| DESCRIPTION   | CONTACTS     | CODE    | WEIGHT gr | MIN. PACK QTY. | DIMENSIONS  |
|---|--------------|---------|-----------|----------------|---|
|  <p>With pedal latching device and without trigger mechanism</p> | Slow break * | IP 7011 | 1.400     | 1              |  |
|   | 1NO          |         |           |                |   |

|  |              |         |         |       |   |   |
|--|--------------|---------|---------|-------|---|---|
|  <p>Without rest position trigger mechanism</p> | Slow break * | 1NC+1NO | IP7006I | 1.300 | 1 |  |
|--|--------------|---------|---------|-------|---|---|

|   |                            |     |          |       |   |   |
|---|----------------------------|-----|----------|-------|---|---|
|  <p>With trigger mechanism and EN ISO 13850 emergency stop</p> | Slow break *               | 1NO | IP7007EM | 3.900 | 1 |  |
|   | Slow break *<br>Two speeds | 2NO | IP7015EM | 3.910 |   |   |

|   |  |                        |        |       |   |   |
|---|--|------------------------|--------|-------|---|---|
|  <p>Pneumatic with trigger mechanism</p> |  |                        | IP7023 | 1.600 | 1 |  |
|   | Pneumatic with pedal latching device and without trigger mechanism | With 1/4" 5 ways valve | IP7024 |       | 1 |   |

(\*) On request can be supplied with snap action contacts