COMEPI

LIMIT SWITCHES
FOOT SWITCHES

Quality certifications

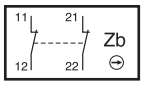
As ever watchful for quality, since 1998, Comepi is qualified ISO 9002 thus offering its domestic and foreign interlocutors a deeper warranty of its ability to adequately answer the ever increasing need of effective and fruitful relationship.

The update to ISO 9001:2008, made in 2009, confirms the Comepi quality politics. The control of full application of ISO 9000 norms and its timely updating is guaranteed by well tested procedures ranging from control of the process up to the use of statistic techniques.

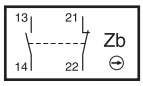
Comepi personnel, at any given level, is involved in this process in order to achieve the highest end-user satisfaction besides growth of image, competitiveness and profits for the firm.

SUMMARY LIMIT SWITCHES

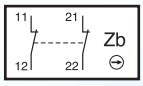
Z02: Snap action 2NC



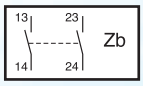
Z11: Snap action 1NO+1NC



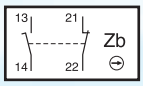
W02: Simultaneous slow action 2NC



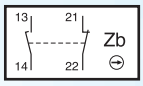
W20: Simultaneous slow action 2NO



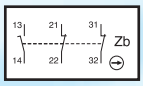
X11: Slow action break before make 1NO+1NC



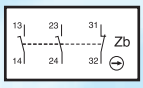
Y11: Slow action make before break 1NO+1NC



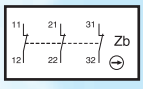
X12P: Slow action break before make 1NO+2NC



X21P: Slow action break before make 2NO+1NC

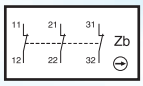


W03P: Simultaneous slow action 3NC

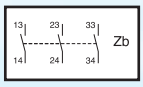


Contact blocks
Zb type: double break, electrically separated
Approvals: UL 508 / CSA C22-2 n. 14

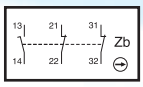
W03: Simultaneous slow action 3NC



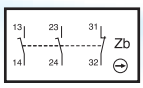
W30: Simultaneous slow action 3NO



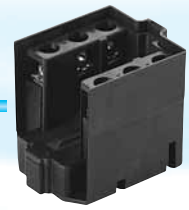
X12: Slow action break before make 1NO+2NC



X21: Slow action break before make 2NO+1NC



Adapter G Type



AP series (Plastic)

T head type (Plastic)

DP series (Plastic)

T head type (Plastic)

AM series (Metal)

F head type (Metal)
T head type (Plastic)

DM series (Metal)

F head type (Metal)
T head type (Plastic)

BP series (Plastic)

H head type (Plastic)

BM series (Aluminium)

E head type (Aluminium)

Serie CM (alluminio)

E head type (Aluminium)

The **Comepi** products listed in this catalogue are developed and manufactured according to the rules set out in IEC international publications and EN European standard.

Specifications

- **International Specifications**
  The International Electrotechnical Commission, IEC, which is part of the International Standards Organization, ISO, publishes IEC publications which act as a basis for the world market.
- **European Specifications**
  The European Committee for Electrotechnical Standardisation (CENELEC), grouping 18 European countries, publishes EN standards for low voltage industrial apparatus.
  These European standards differ very little from IEC international standards and use a similar numbering system. The same is true of national standards. Contradicting national standards are withdrawn.
- **Harmonised European Specifications**
  The European Committees for Standardisation (CEN and CENELEC), grouping 18 European countries, publish EN standards relating to safety of machinery.
- **Specifications in Canada and the USA**
  These are equivalent, but differ markedly from IEC, UTE, VDE and BS specifications.
  UL Underwriters Laboratories (USA)
  CSA Canadian Standards Association (Canada)

Remark concerning the label issued by the UL (USA). Two levels of acceptance between devices must be distinguished.

"Recognized" Authorised to be included in equipment, if the equipment in question has been entirely mounted and wired by qualified personnel. They are not valid for use as "General purpose products" as their possibilities are limited.
They bear the mark: 

"Listed" Authorised to be included in equipment and for separate sale are "General purpose products" components in the USA.
They bear the mark: 

European Directives

The guarantee of free movement of goods within the European Community assumes elimination of any regulatory differences between the member states. European Directives set up common rules that are included in the legislation of each state while contracditory regulations are cancelled.

There are three main directives:

- **Low Voltage Directive 2006/95/CE** concerning electrical equipment from 50 to 1000 V a.c. and from 75 to 1500 V d.c.
  This specifies that compliance with the requirements that is sets out **is acquired** once the equipment conforms to the standards harmonised at European level: EN 60947-1 and EN-60947-5-1 for **limit switches.**
- **Machines Directives - 2006/42/CE** defining main safety and health requirements concerning design and manufacture of the machines and other equipment including safety components in European Union countries.
- **Electromegnetic Compatibility Directive 2004/108/CE** concerning all electrical devices likely to create electromagnetic disturbances.

Signification of CE marking:

CE marking must not be confused with a quality label.
CE marking placed on a product is proof of conformity with the European Devices concerning the product.
CE marking is part of an administrative procedure and guarantees free movement of the product within the European Community.

Standards

- **International Standards**

IEC 947-1	Low-voltage switchgear and controlgear - Part 1: General Rules (CEI EN 60947-1).
IEC 947-5-1	Low-voltage switchgear and controlgear - Part 5: Control circuit devices and switching elements - Section 1: Electromechanical control circuit devices (CEI EN 60947-5-1) - Chapter 3: Special requirements for control switches with positive opening operation.
IEC 204-1	Electrical equipment on industrial machines - Part 1: General requirements (CEI EN 60204-1).
IEC 204-2	Electrical equipment on industrial machines - Part 2: Item designation and examples of drawings, diagrams, tables and instructions.
IEC 529	Degrees of protection provided by enclosure (IP code) (CEI EN 60529).

- **European Standards**

EN 50005	Low-voltage switchgear and controlgear for industrial use - Terminal marking and distinctive number: General rules (CEI 17-17).
EN 50013	Low-voltage switchgear and controlgear for industrial use - Terminal marking and distinctive number for particular control swithches (CEI 17-17).
EN 50041	Low-voltage switchgear and controlgear for industrial use - Control switches - Position switches 42,5 x 80 - Dimensions and characteristics.
EN 50047	Low-voltage switchgear and controlgear for industrial use - Control switches - Position switches 30 x 55 - Dimensions and characteristics.
EN 60947-1	Low-voltage switchgear and controlgear for industrial use - Part 1: General rules (CEI EN 60947-1).
EN 60947-5-1	Low-voltage switchgear and controlgear for industrial use - Part 5: Control circuit devices and switching elements - Section 1: Electromechanical control circuit devices (CEI EN 60947-5-1) - Chapter 3: Special requirements for control switches with positive opening operation.
EN 60529	Degrees of protection provided by enclosures (IP code).
EN 61058-1	Switches for appliances. Part. 1: general requirements.

- **American Standards**

UL 508	Standard for safety. Industrial control equipment.
CSA - C22.2 No. 14-95	Industrial control equipment. Industrial products.

Double Insulation ⧈

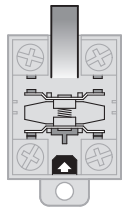
Class II materials, according to IEC 536, are designed with double insulation. This measure consists in doubling the functional insulation with an additional layer of insulation so as to eliminate the risk of electric shock and thus not having to protect elsewhere. No conductive part of "double insulated" material should be connected to a protective conductor.

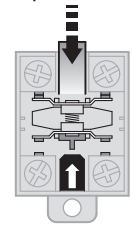
Positive Opening Operation ⊖

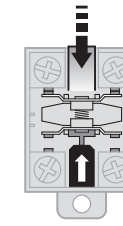
A control switch, with one or more break-contact elements, has a positive opening operation when the switch actuator ensures full contact opening of the break-contact. For the part of travel that separates the contacts, there must be a positive drive, with no resilient member (e.g. springs), between the moving contacts and the point of the actuator to which the actuating force is applied.
The positive opening operation does not deal with N.O. contacts.
Control switches with positive opening operation may be provided with either snap action or slow action contact elements. To use several contacts on the same control switch with positive opening operation, they must be electrically separated from each other, if not, only one may be used.
Every control switch with positive opening operation must be indelibly marked on the outside with the symbol: ⊖ .

Snap Action

Snap action contacts are characterised by a release position that is distinct from the operating position (differential travel). Snap breaking of moving contacts is independent of the switch actuator's speed and contributes to regular electric performance even for slow switch actuator speeds.

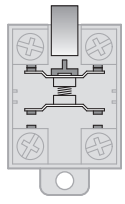

State of rest

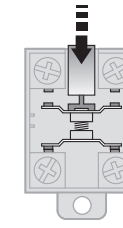

Contact change


Positive opening

Slow Action

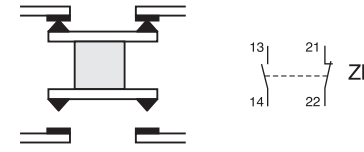
Slow action contacts are characterised by a release position that is the same as the operating position. The switch actuator's speed directly conditions the travel speed of contacts.


State of rest


Completely closed

Contact shape according to IEC 947-5-1.
Change-over contact elements with 4 terminals must be indelibly marked with the corresponding Za or Zb symbol as in the diagrams below.

Contacts with the same polarity



The 2 moving contacts are electrically separated

Utilization Category

AC-15: switching of electromagnetic loads of electromagnets using an alternating current (>72 VA).
DC-13: switching of electromagnets using a direct current.

Terminals

Limit switches with metal casings must have a terminal, for a protective conductor, that is placed inside the casing very close to the cable inlet and must be indelibly marked.

Minimum Actuation Force/Torque

The minimum amount of force/torque that is to be applied to the switch actuator to produce a change in contact position.

Minimum Force/Torque to achieve Positive Opening Operation

The minimum amount of force/torque that is to be applied to the switch actuator to ensure positive opening operation of the N.C. contact.

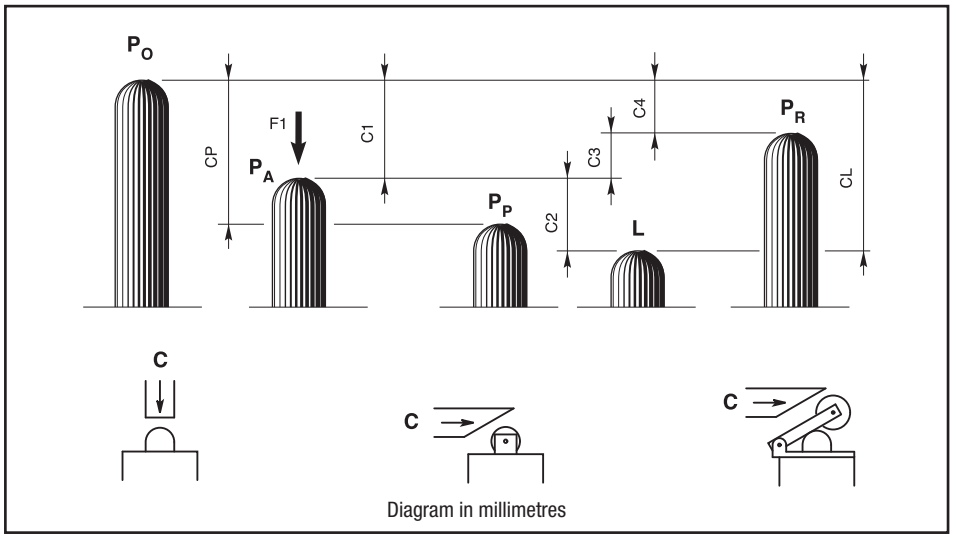


Diagram in millimetres

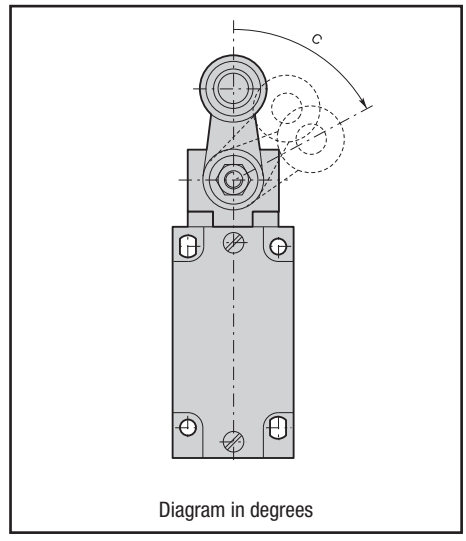


Diagram in degrees

P_0 Free position:
position of the switch actuator when no external force is exerted on it.

P_A Operating position:
position of the switch actuator, under the effect of force F1, when the contacts leave their initial free position.

P_P Positive opening position:
position of the switch actuator from which positive opening is ensured.

L Max. travel position:
maximum acceptable travel position of the switch actuator under the effect of a force F1.

P_R Release position:
position of the switch actuator when the contacts return to their initial free position.

C_1 Pre-travel:
distance between the free position P_0 and the operating position P_A.

C_P Positive opening travel:
minimum travel of the switch actuator, from the free position, to ensure positive opening operation of the normally closed contact.

C_2 Over-travel:
distance between the operating position P_A and the max. travel position L.

C_L Max. travel:
distance between the free position P_0 and the max. travel position L.

C_3 Differential travel (C1-C4):
travel difference of the switch actuator between the operating position P_A and the release position P_R.

C_4 Release travel:
distance between the release position P_R and the free position P_0.

Diagram for snap action contacts:

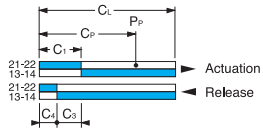
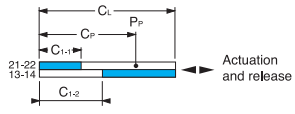


Diagram for non-overlapping slow action contacts:



Note: for slow action contacts, $C_3 = 0$, C_{1-1} = pre-travel of contact 21-22, C_{1-2} = pre-travel of contact 13-14

Examples:

BM1E13Z11
(snap action contacts)

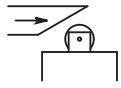
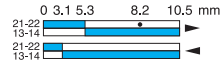


Diagram in millimetres/cam travel



BM1E41Z11
(snap action contacts)

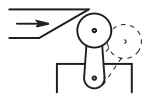
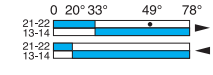


Diagram in degrees/lever rotation



BM1E11X11
(non-overlapping slow action contacts)

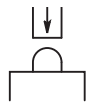
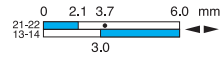


Diagram in millimetres/plunger travel



• **Technical data** ..... page 8 to 13
• **Additional technical data and ordering details** ..... page 18 to 74
• **Standards** ..... page 4
• **Terminology** ..... page 6

Applications

Easy to use, electromechanical limit switches offer specific qualities:

- Visible operation.
- Able to switch strong currents (10 A conventional thermal current).
- Electrically separated contacts.
- Precise operating points (consistency).
- Immune to electromagnetic disturbances.

They are purpose-built detection devices thanks to these characteristics:

- Presence/absence.
- Positioning and travel limit.
- Objects passing/counting.

Description

The AM... and DM... series are made of zinc alloy (Zamack). The limit switches BM... and CM... series are realized in aluminium material, therefore they are mechanically more resistant and three times lighter than the ones in zinc alloy. All metal limit switches have a degree protection of IP 66.

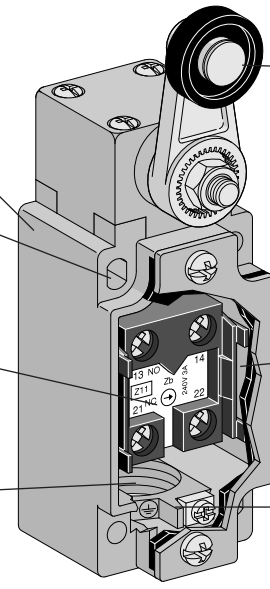
The casing come in 4 dimension: – AM... 30 mm. width – BM... 40 mm. width – DM... 50 mm. width – CM... 60 mm. width

Casing
- 30 mm. width with standardized dimensions acc. to EN 50047
- 40 mm. width with standardized dimensions acc. to EN 50041
- 50 mm. width
- 60 mm. width

Mounting the casing
- 2 x M4 screws on top part for 30 mm. width
- 2 or 4 x M5 screws for 40 mm. width
- 2 or 4 x M4 screws on top part for 50 mm. width
- 2 x M5 screws on top part for 60 mm. width

Contact Block:
- Contact configuration: NO + NC, 2 NO, 2 NC, 2NO + 1NC, 1NO + 2NC, 3NC, 3NO (only for BM and CM series)
- Positive opening operation
- Snap action or slow action
- Zb shape: the 2 contacts are electrically separated

Connecting terminals:
- Block of 2 contacts: M3.5 (+, –) pozidriv 2 screw
- Block of 3 contacts: M3 (+, –) screw
- Screw head with captive cable clamp
- Markings conform with IEC 947-1, IEC 947-5-1 EN 50005 and 50013 standards



A variety of operating heads:
- Plain plunger
- Roller plunger
- Roller lever, adjustable or not, etc.

Assembled using 4 x M3 screws for 30 and 50 mm width.
Assembled using 4 x M4 screws for 40 and 50 mm width.

Cover:
- Closed using 3 x ø 3 screws for 30 mm width.
- Closed using 4 x ø 3 screws for 50 mm width.
- Closed using 2 x ø 4 screws for 40 mm width.
- Closed using 4 x ø 4 screws for 60 mm width.

One piece sealing gasket to ensure tightness.

Electrical connection:
- 1 x cable gland for AM series
- 1 x cable gland for BM series
- 3 x cable gland for CM series
- 3 x cable gland for DM series

Symbols

Example:	B	M	1	E	41	Z	1	1
Structure:		M						

Casing width:
A = 30 mm width + 1 cable inlet
B = 40 mm width + 1 cable inlet
D = 50 mm width + 3 cable inlets
C = 60 mm width + 3 cable inlets

Metal casing

Electrical connection
1: cable inlets for PG13.5 cable gland
2: cable inlets for 1/2 NPT cable gland
3: cable inlets for PG11 cable gland (only for AM and DM series)
4: cable inlets for M16 x 1,5 cable gland (only for AM and DM series)
5: cable inlets for M20 x 1,5 cable gland

Operating heads
T: plastic heads **F:** metal heads . . (AM and DM series)
P: plastic heads **E:** metal heads . . (BM and CM series)

Operating heads: codes 10 - 99

Contact block

11: 1 NO + 1 NC contacts
20: 2 NO contacts
02: 2 NC contacts
12P: 1 NO + 2 NC contacts
21P: 2 NO + 1 NC contacts
03P: 3 NC contacts

Only for BP series:
12: 1 NO + 2NC contacts
21: 2 NO + 1 NC contacts
03: 3 NC contacts
30: 3 NO contacts

Z: Zb Snap action
W: Zb Slow action (contact dependent)
X: Zb Slow action non-overlapping late make
Y: Zb Slow action overlapping early make

• **Ordering details** . . . . . page 30 to 57
• **Standards** . . . . . page 4
• **Terminology** . . . . . page 6

General Technical Data

		Metal Casing
Standards		Devices conform with international IEC 947-5-1 and European EN 60 947-5-1 standards
Certifications - Approvals		UL - CSA - IMQ
Air temperature near the device		
– during operation	°C	– 25 ... + 70
– for storage	°C	– 30 ... + 80
Climatic withstand		According to IEC 68-2-3 and salty mist according to IEC 68-2-11
Mounting positions		All positions are authorised
Shock withstand (according to IEC 68-2-27 and EN 60 068-2-27)		50g* (1/2 sinusoidal shock for 11 ms) no change in contact position
Resistance to vibrations (acc. to IEC 68-2-6 and EN 60 068-2-6)		25g (10 ... 500 Hz) no change in position of contacts greater than 100 µs
Protection against electrical shocks (acc. to IEC 536)		Class I
Degree of protection (according to IEC 529 and EN 60 529)		IP 66**
Consistency (measured over 1 million operations)		0.05 mm (upon closing point)
Minimum actuation speed	m/s	Slow action contacts 0.060 / Snap action contacts 0.001

Electrical Data

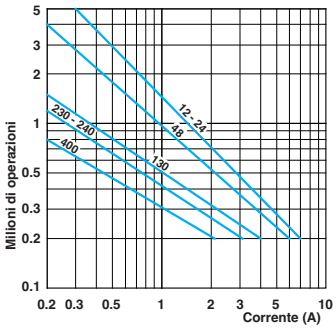
Rated insulation voltage U_i			500 V (degree of pollution 3) (400 V for contacts type X12P, X21P, W03P)
- according to IEC 947-1 and EN 60-947-1			A 600, Q 600 (A 300, Q 300 for AM... and DM... series and contacts type X12P, X21P, W03P)
- according to UL 508 and CSA C22-2 n° 14			
Rated impulse withstand voltage U_{imp} (according to IEC 947-1 and EN 60 947-1)		kV	6
Conventional free air thermal current I_{th} (according to IEC 947-5-1) θ < 40 °C		A	10
Short-circuit protection U_e < 500 V a.c. - gG (gl) type fuses		A	10
Rated operational current			
I_e / AC-15 (according to IEC 947-5-1)	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	1.8
I_e / DC-13 (according to IEC 947-5-1)	24 V - d.c.	A	2.8
	125 V - d.c.	A	0.55
	250 V - d.c.	A	0.27
Switching frequency		Cycles/h	3600
Load factor			0.5
Resistance between contacts		mΩ	25
Connecting terminals			M3.5 (+, –) pozidriv 2 screw with cable clamp (M3 for 3 poles contacts type)
Terminal for protective conductor			M3.5 (+, –) pozidriv 2 screw with cable clamp
Connecting capacity		1 or 2 x mm²	0.75 ... 2.5 (0.34... 1.5 for 3 poles contact type)
Terminal marking			According to EN 50 013
Mechanical durability		Millions of operations	15 AM•F/T 11; 12; 30...34; 38 — 10 DM•F/T 41...46; 51...55; 61...75 — >5 14; 35; 36; 39; 91...93; 98 — 30 BM•E 11...13; 21...23; 31...33 — 25 CM•E 41...44; 51...54; 61...75 — 10 91...93; 99
Electrical durability (according to IEC 947-5-1)			Utilization categories AC-15 and DC-13 (Load factor of 0.5 according to curves below)

* except for AM/DM•F42, F52, F55: 25 g. - ** except for AM/DM•F52, F55, F73, F74 and BM/CM•E54, P92, P93, E92, E93: the degree of protection is IP65

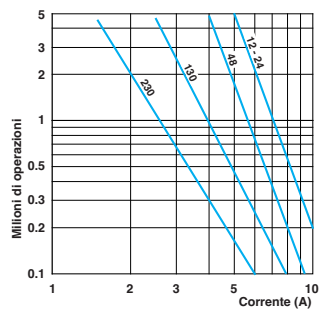
IMQ listed values

For the complete list of approved products, contact our technical department

AC-15 - Snap action

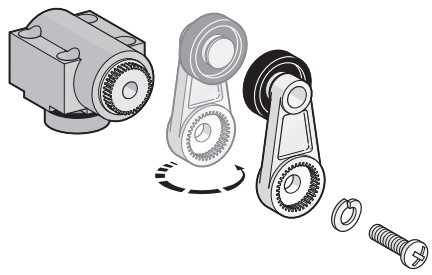


AC-15 - Slow action

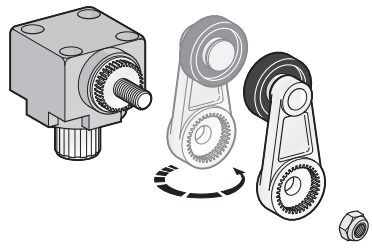


DC-13		Snap action	Slow action
		Power breaking for a durability of 5 million operating cycles	
Voltage	24 V	9.5 W	12 W
Voltage	48 V	6.8 W	9 W
Voltage	110 V	3.6 W	6 W

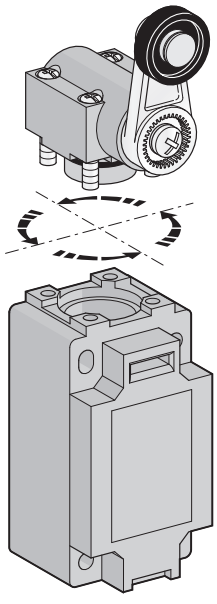
• **Ordering details** ..... page 30 to 57



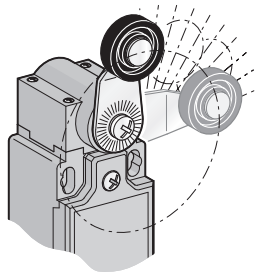
Lever round turning: AP...; BP...; DP...; AM...; DM...; EP...; EM...



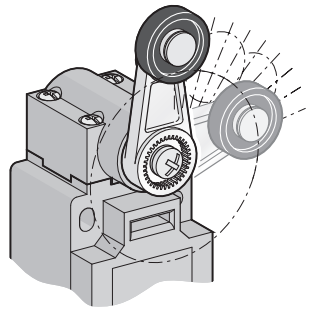
Lever roiund turning: BM...; CM...



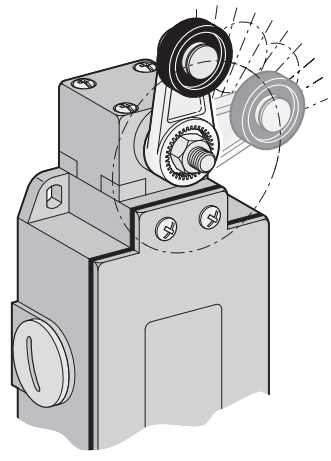
Head orientation: all series
(EP and EM series: 180° only)



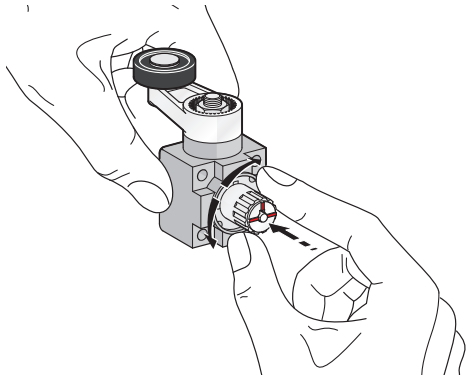
Free position adjustment 10 in 10° of lever:
AP...; DP...; AM...; DM...; EP...; EM...

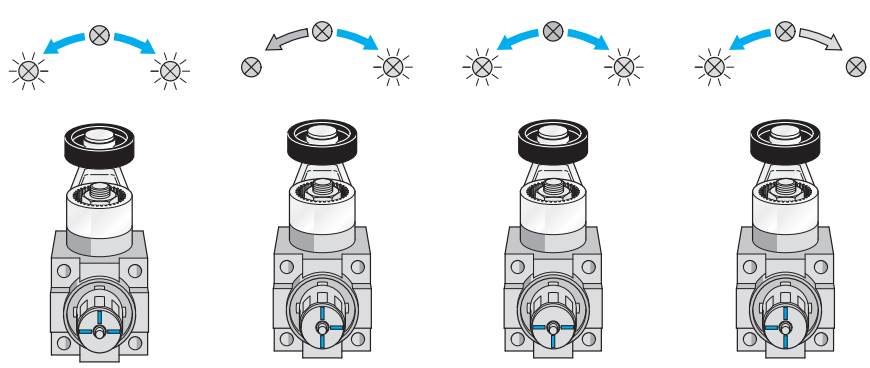


Free position adjustment 9 in 9° of lever:
BP...



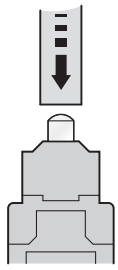
Free position adjustment 9 in 9° of lever:
BM...; CM...



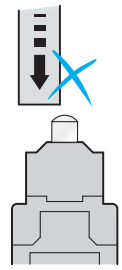


BP...; BM...; CM... operating mode selection only

Plain Plunger

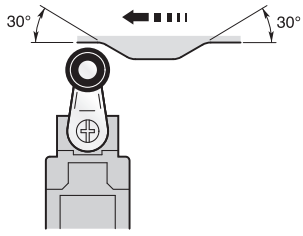


Correct

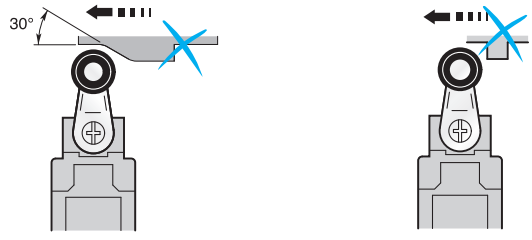


Incorrect

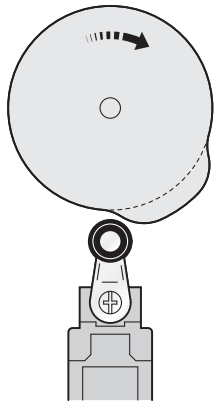
Roller Plunger or Roller Lever



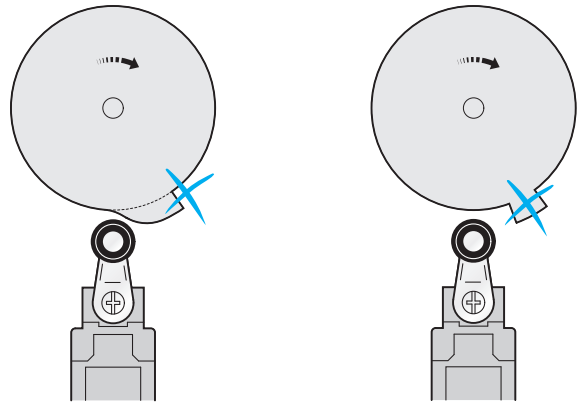
Correct



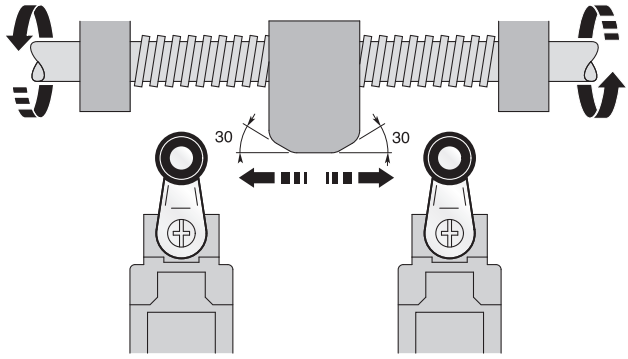
Incorrect



Correct



Incorrect



For a relatively slow movement of the switch actuator, a limit switch with a snap action contact block is preferred.

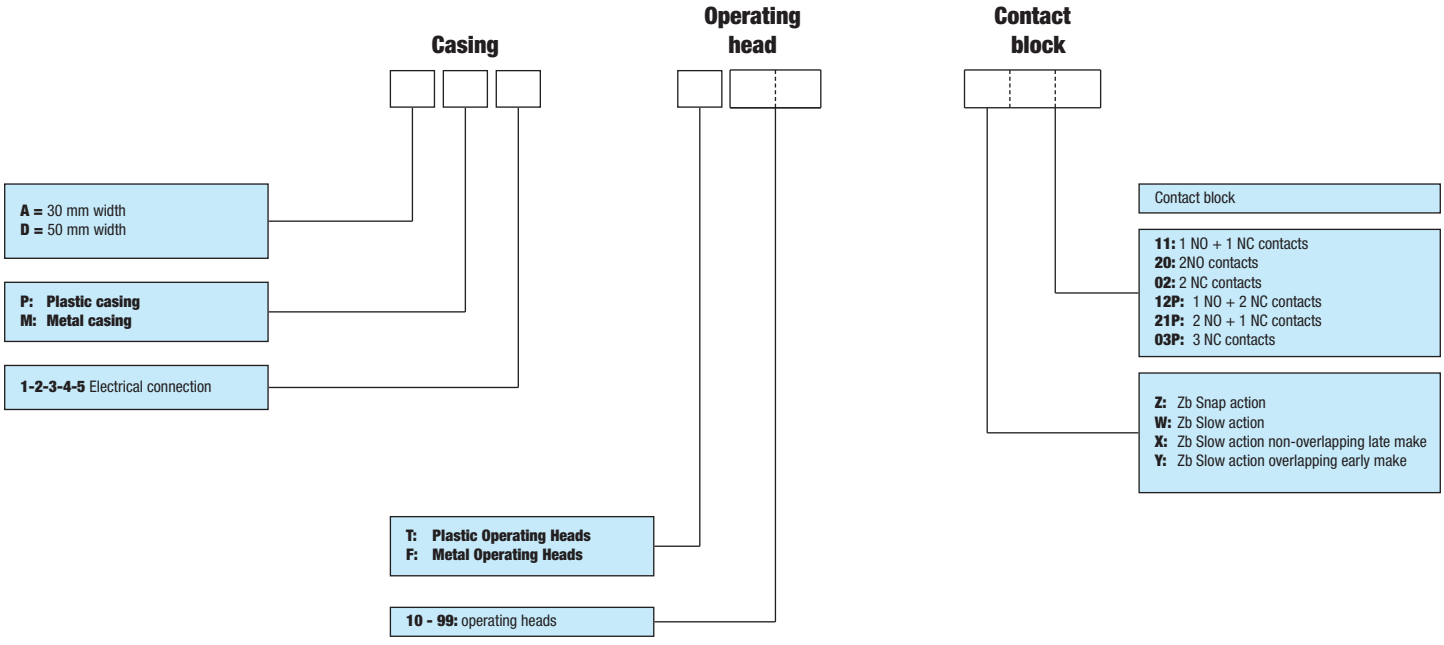
AP... / AM... / DP... / DM... special versions

The operating heads used in plastic limit switches AP and DP series have nthe same dimensions of the ones used in the corresponding metal AM and DM series. It is therefore possible to supply "mixed" versions, that is:

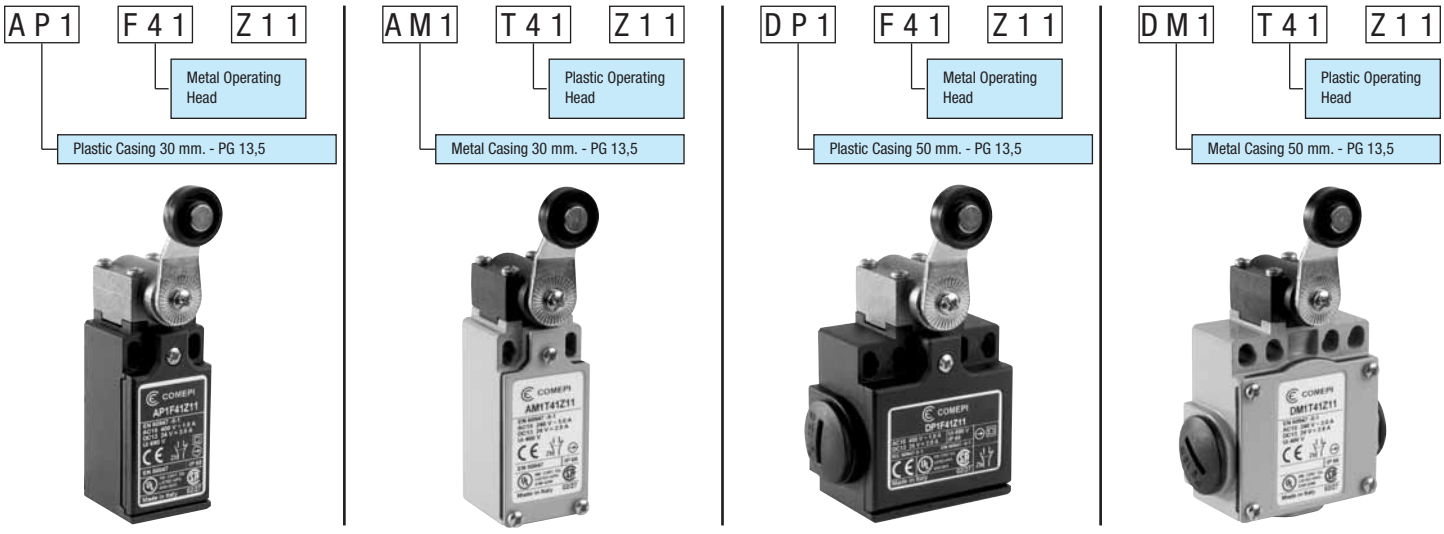
- plastic operating head on metal casing

- metal operating head on plastic casing

These "mixed" versions can be demanded as follows



Esempi:



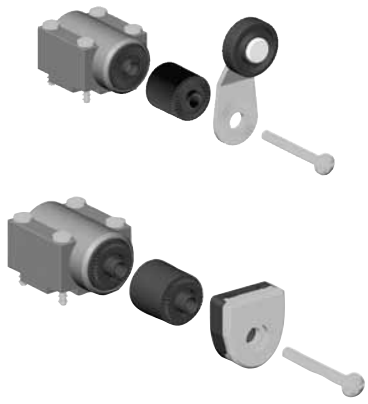
For further information, please contact our technical department.

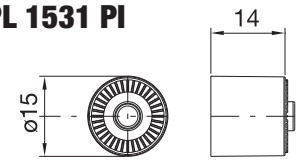
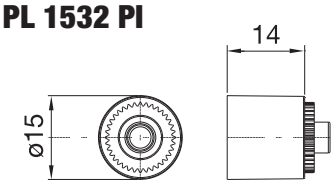
Spare parts

Spare components can be supplied upon request.

Spacers

This accessory, made of polymer glass-reinforced resin,allows the lever to operate with a different offset.



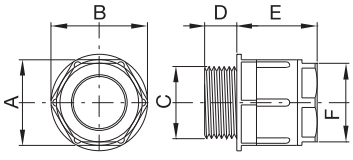
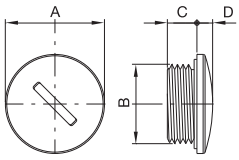
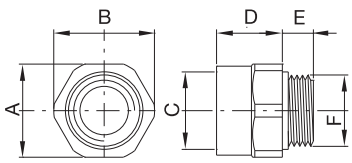
Order Code	Compatible Heads
PL 1531 PI 	T41 ÷ T46 F41 ÷ F46 G41 ÷ G45
PL 1532 PI 	T51 ÷ T75 F51 ÷ F75 G51 ÷ G75

In order to install this accessory a longer screw is needed (delivered along with ther spacer).

Cable glands - Blanking plugs - Thread adapters



The use of correct clable gland (or blanking plug in case of unused cable inlets) is recommended if the product is installed in an environmental place in which a protection degree against water or dust is needed. Comepi's cable glands and blanking plugs are realized to guarantee protection degree of IP 66.
Thread adapters are available in order to reach the customers' request. The adapters must always be used in case a conduit connection directly on the limit switch is needed. Different adapters can be supplied upon request.

	Order Code		Description	Dimensions A	B	C	D	E	F
Cable Gland 	**XX 1029 C0**	PG 13.5	Plastic Cable Gland	24	–	PG 13.5	10	24-29	ø 7-12
	XX 1028 C0	PG 11	Plastic Cable Gland	22	–	PG 11	10	23-28	ø 5-10
	XX 1032 C0	M 16 x 1,5	Plastic Cable Gland	19	–	M 16 x 1,5	8	23-28	ø 7-10
	XX 1033 C0	M20 x 1,5	Plastic Cable Gland	25	–	M 20 x 1,5	9	24-29	ø 8-13
	XX 1020 C0	PG 16	Plastic Cable Gland	27	–	PG 16	10	26-31	ø 10-14
Blanking Plug 	**PL 2029 PI**	PG 13.5	Plastic Blanking Plug	25	PG 13.5	6	3.5	–	–
	XT 007	PG 11	Plastic Blanking Plug	22	PG 11	6	3	–	–
	XX 1030 C0	M 16 x 1,5	Plastic Blanking Plug	20	M 16 x 1,5	6	3	–	–
	XX 1031 C0	M 20 x 1,5	Plastic Blanking Plug	24	M 20 x 1,5	6	3,5	–	–
	XX 1019 C0	PG 16	Plastic Blanking Plug	27	PG 16	6	3,5	–	–
Thread Adapters 	**PL 2000 PI**	PG 11	1/2" NPT Plastic Adapter	24	26	1/2" NPT	17	8	PG 11
	T0 2000 PE	Brass Intermediary Connection 1/2" NPT - 1/2" NPT		24	26	1/2" NPT	17	6	1/2" NPT

Electrical Connection

AM1: one cable inlet for PG 13,5 Cable Gland

AM2: one cable inlet for 1/2" NPT Cable Gland

AM3: one cable inlet for PG11 Cable Gland

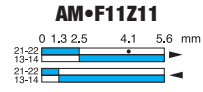
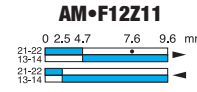
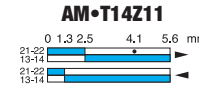
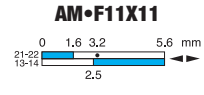
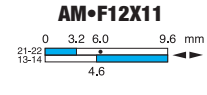
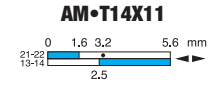
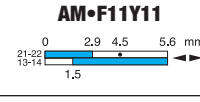
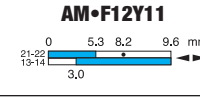
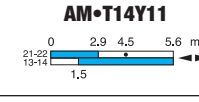
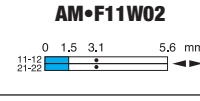
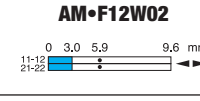
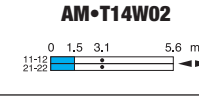
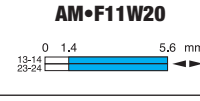
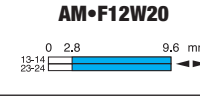
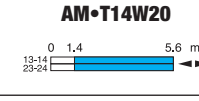
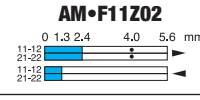
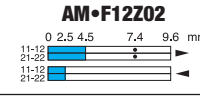
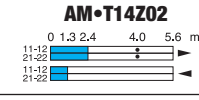
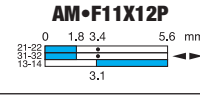
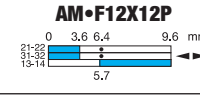
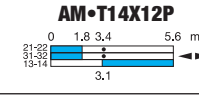
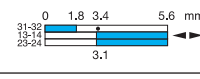
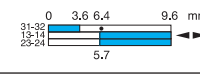
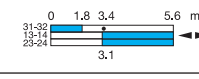
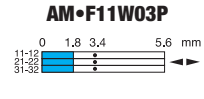
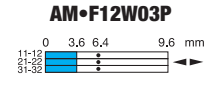
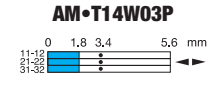
AM4: one cable inlet for M16 x 1,5 Cable Gland

AM5: one cable inlet for M20 x 1,5 Cable Gland

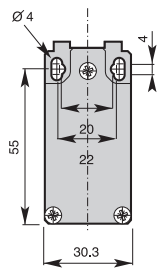
Operating Head Type

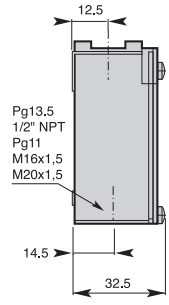
	F11 - Plain Metal plunger	F12 - Metal roller plunger	T14 - Metal plunger with dust protection cup
Conformity / ⊕ (N.C. contact with positive opening operation)	EN 50047 ⊕	EN 50047 ⊕	EN 50047 ⊕
Max actuation speed [m/s]	0,5	0,3	0,5
Min. force [N] or torque [Nm]: actuation / positive opening operation	15 / 30	12 / 30	15 / 30

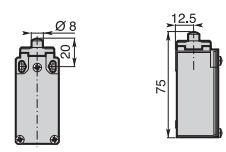
Additional Technical Datas

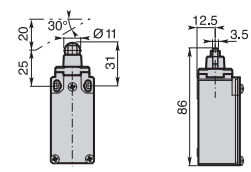
		AM•F11Z11	AM•F12Z11	AM•T14Z11
Z11 Snap Action Contacts (1NO + 1NC)	Order Code			
	Operation Diagram			
X11 Non overlapping Slow Action Contacts (1NO + 1NC)	Order Code	AM•F11X11	AM•F12X11	AM•T14X11
	Operation Diagram			
Y11 Overlapping Slow Action Contacts (1NO + 1NC)	Order Code	AM•F11Y11	AM•F12Y11	AM•T14Y11
	Operation Diagram			
W02 Slow Action Contacts (2NC)	Order Code	AM•F11W02	AM•F12W02	AM•T14W02
	Operation Diagram			
W20 Slow Action Contacts (2NO) ⊗	Order Code	AM•F11W20	AM•F12W20	AM•T14W20
	Operation Diagram			
Z02 Snap Action Contacts (2NC)	Order Code	AM•F11Z02	AM•F12Z02	AM•T14Z02
	Operation Diagram			
X12P Non overlapping Slow Action Contacts (1NO + 2NC)	Order Code	AM•F11X12P	AM•F12X12P	AM•T14X12P
	Operation Diagram			
X21P Non overlapping Slow Action Contacts (2NO + 1NC)	Order Code	AM•F11X21P	AM•F12X21P	AM•T14X21P
	Operation Diagram			
W03P Slow Action Contacts (3NC)	Order Code	AM•F11W03P	AM•F12W03P	AM•T14W03P
	Operation Diagram			
Weight (packing per unit)	**[kg]**	**0,180**	**0,190**	**0,165**

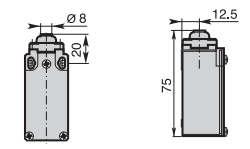
Dimensions (in mm)











• Travel, operation diagrams and technical data .... pages 7, 11

Utilization precautions ..... pages 14, 15

T3• - Plastic roller lever
T30: on plastic plunger
T31: on metal plunger

EN 50047
1,0
7/24

T3• - Plastic roller lever
T32: on metal plunger
T34: on plastic plunger

1,0
7/24

T38 - Adjustable plastic roller lever on metal plunger
T39 - Same as above with dust protection cup

EN 50047
1,0
7/24

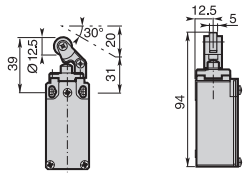
F4• - Ø 18 roller lever
F41: nylon roller
F43: metal roller

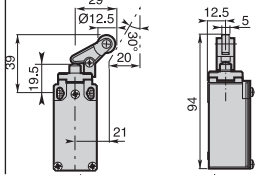
EN 50047
1,5
0,10 / 0,32

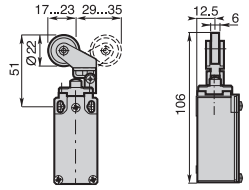
F42 - Ø 50 rubber roller lever

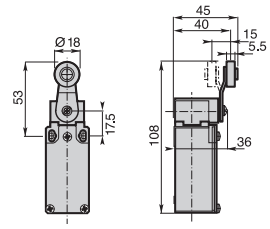
1,5
0,10 / 0,32

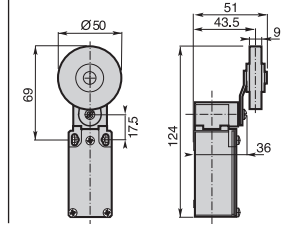
AM•T3•Z11	**AM•T3•Z11**	**AM•T3•Z11**	**AM•F4•Z11**	**AM•F42Z11**
AM•T3•X11	**AM•T3•X11**	**AM•T3•X11**	**AM•F4•X11**	**AM•F42X11**
AM•T3•Y11	**AM•T3•Y11**	**AM•T3•Y11**	**AM•F4•Y11**	**AM•F42Y11**
AM•T3•W02	**AM•T3•W02**	**AM•T3•W02**	**AM•F4•W02**	**AM•F42W02**
AM•T3•W20	**AM•T3•W20**	**AM•T3•W20**	**AM•F4•W20**	**AM•F42W20**
AM•T3•Z02	**AM•T3•Z02**	**AM•T3•Z02**	**AM•F4•Z02**	**AM•F42Z02**
AM•T3•X12P	**AM•T3•X12P**	**AM•T3•X12P**	**AM•F4•X12P**	**AM•F42X12P**
AM•T3•X21P	**AM•T3•X21P**	**AM•T3•X21P**	**AM•F4•X21P**	**AM•F42X21P**
AM•T3•W03P	**AM•T3•W03P**	**AM•T3•W03P**	**AM•F4•W03P**	**AM•F42W03P**
0,170	**0,175**	**0,175**	**0,235**	**0,255**











• Travel, operation diagrams and technical data .... pages 7, 11

Utilization precautions ..... pages 14, 15

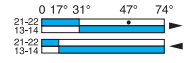
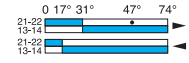
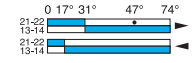
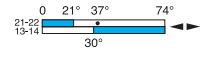
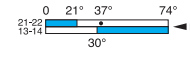
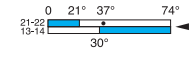
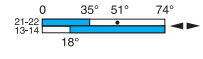
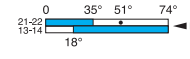
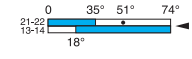
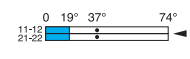
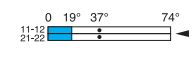
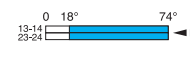
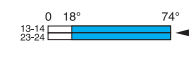
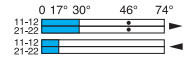
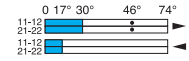
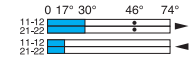
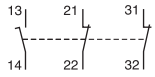
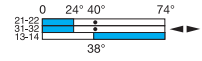
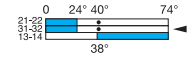
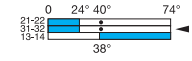
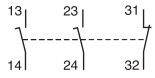
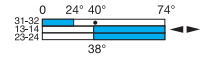
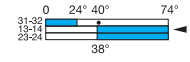
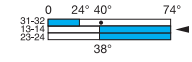
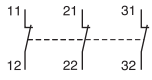
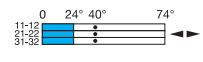
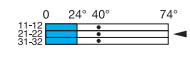
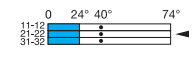
Electrical Connection

AM1: one cable inlet for PG 13,5 Cable Gland
AM2: one cable inlet for 1/2" NPT Cable Gland
AM3: one cable inlet for PG11 Cable Gland
AM4: one cable inlet for M16 x 1,5 Cable Gland
AM5: one cable inlet for M20 x 1,5 Cable Gland

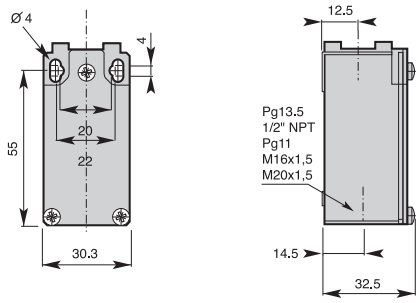
Operating Head Type

	F4• - Ø 18 roller lever F45: nylon roller F46: metal roller	**F5• - Adjustable lever with Ø 18 roller** F51: nylon roller F53: metal roller	**F52 - Adjustable Ø 50 rubber roller lever**
Conformity / ⊕ (N.C. contact with positive opening operation)	⊕	⊕	⊕
Max actuation speed [m/s]	1,5	1,5	1,5
Min. force [N] or torque [Nm]: actuation / positive opening operation	0,10 / 0,32	0,10 / 0,32	0,10 / 0,32

Additional Technical Datas

		F4• - Ø 18 roller lever	**F5• - Adjustable lever with Ø 18 roller**	**F52 - Adjustable Ø 50 rubber roller lever**
Z11 Snap Action Contacts (1NO + 1NC)	Order Code	**AM•F4•Z11**	**AM•F5•Z11**	**AM•F52Z11**
	Operation Diagram			
X11 Non overlapping Slow Action Contacts (1NO + 1NC)	Order Code	**AM•F4•X11**	**AM•F5•X11**	**AM•F52X11**
	Operation Diagram			
Y11 Overlapping Slow Action Contacts (1NO + 1NC)	Order Code	**AM•F4•Y11**	**AM•F5•Y11**	**AM•F52Y11**
	Operation Diagram			
W02 Slow Action Contacts (2NC)	Order Code	**AM•F4•W02**	**AM•F5•W02**	**AM•F52W02**
	Operation Diagram			
W20 Slow Action Contacts (2NO) ⊛	Order Code	**AM•F4•W20**	**AM•F5•W20**	**AM•F52W20**
	Operation Diagram			
Z02 Snap Action Contacts (2NC)	Order Code	**AM•F4•Z02**	**AM•F5•Z02**	**AM•F52Z02**
	Operation Diagram			
X12P Non overlapping Slow Action Contacts (1NO + 2NC)	Order Code	**AM•F4•X12P**	**AM•F5•X12P**	**AM•F52X12P**
	Operation Diagram			
X21P Non overlapping Slow Action Contacts (2NO + 1NC)	Order Code	**AM•F4•X21P**	**AM•F5•X21P**	**AM•F52X21P**
	Operation Diagram			
W03P Slow Action Contacts (3NC)	Order Code	**AM•F4•W03P**	**AM•F5•W03P**	**AM•F52W03P**
	Operation Diagram			
Weight (packing per unit)	**[kg]**	**0,250**	**0,250**	**0,265**

Dimensions (in mm)



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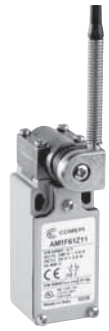
F55 - Adjustable lever with adjustable Ø 50 rubber roller

1,5
0,10 / 0,32



F61 - Nylon actuator with stainless steel spring

1,5
0,10 / –

F7• - Adjustable rod lever

F71: stainless steel rod Ø3
F72: fiberglass rod Ø3
F75: square steel rod 3x3

1,5
0,10 / 0,32

F7• - Adjustable Ø 6 rod lever

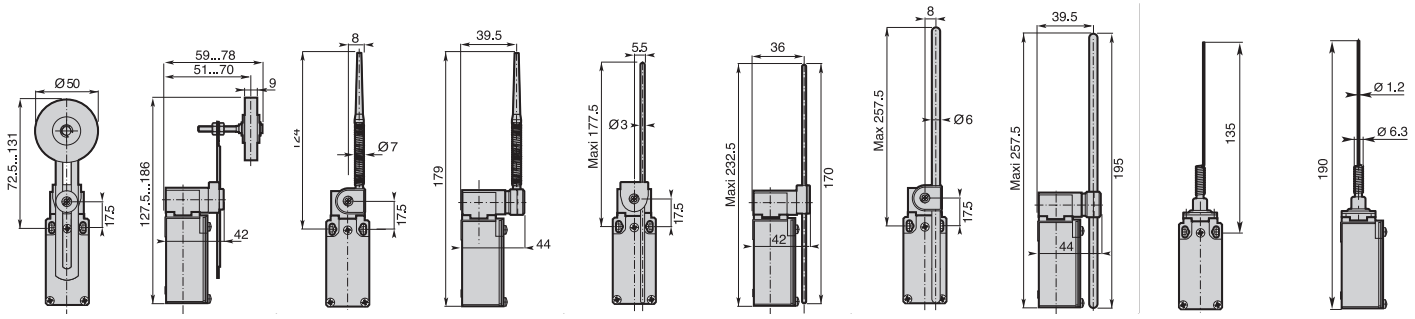
F73: nylon rod
F74: fiberglass rod

1,5
0,10 / 0,32

T91: Stainless steel spring multidirectional actuator

1,0
0,12 / –

AM•F55Z11	**AM•F61Z11**	**AM•F7•Z11**	**AM•F7•Z11**	**AM•F91Z11**
AM•F55X11	**AM•F61X11**	**AM•F7•X11**	**AM•F7•X11**	**AM•F91X11**
AM•F55Y11	**AM•F61Y11**	**AM•F7•Y11**	**AM•F7•Y11**	**AM•F91Y11**
AM•F55W02	**AM•F61W02**	**AM•F7•W02**	**AM•F7•W02**	**AM•F91W02**
AM•F55W20	**AM•F61W20**	**AM•F7•W20**	**AM•F7•W20**	**AM•F91W20**
AM•F55Z02	**AM•F61Z02**	**AM•F7•Z02**	**AM•F7•Z02**	**AM•F91Z02**
AM•F55X12P	**AM•F61X12P**	**AM•F7•X12P**	**AM•F7•X12P**	**AM•F91X12P**
AM•F55X21P	**AM•F61X21P**	**AM•F7•X21P**	**AM•F7•X21P**	**AM•F91X21P**
AM•F55W03P	**AM•F61W03P**	**AM•F7•W03P**	**AM•F7•W03P**	**AM•F91W03P**
0,265	**0,245**	**0,245**	**0,255**	**0,175**



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Electrical Connection

AM1: one cable inlet for PG 13,5 Cable Gland

AM2: one cable inlet for 1/2" NPT Cable Gland

AM3: one cable inlet for PG11 Cable Gland

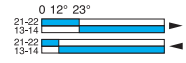
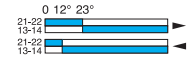
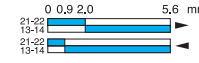
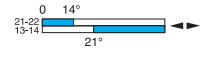
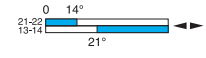
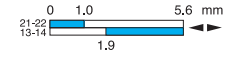
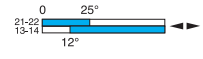
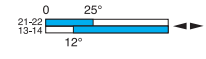
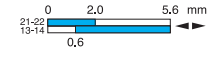
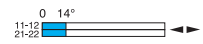
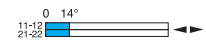
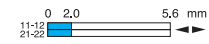
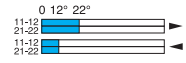
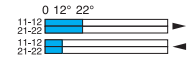
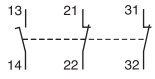
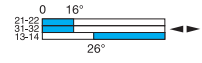
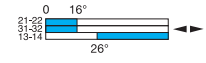
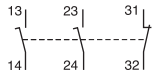
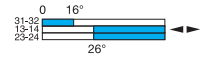
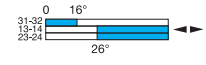
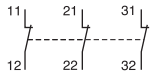
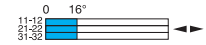
AM4: one cable inlet for M16 x 1,5 Cable Gland

AM5: one cable inlet for M20 x 1,5 Cable Gland

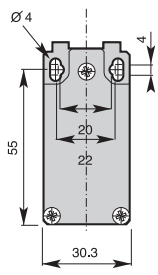
Operating Head Type

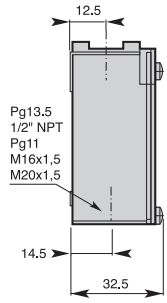
	T92: Multidirectional nylon actuator with stainless steel spring	T93: Stainless steel spring multidirectional actuator	T98: Pull action with ring
Conformity / ⊖ (N.C. contact with positive opening operation)			
Max actuation speed [m/s]	1,0	1,0	0,5
Min. force [N] or torque [Nm]: actuation / positive opening operation	0,12 / –	0,12 / –	30 / –

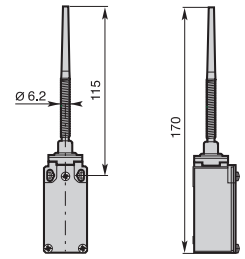
Additional Technical Datas

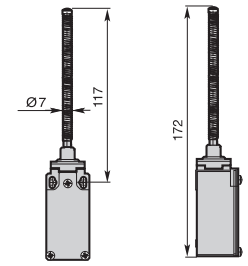
		T92: Multidirectional nylon actuator with stainless steel spring	T93: Stainless steel spring multidirectional actuator	T98: Pull action with ring
Z11 Snap Action Contacts (1NO + 1NC) 	**Order Code**	**AM•T92Z11**	**AM•T93Z11**	**AM•T98Z11A**
	Operation Diagram			
X11 Non overlapping Slow Action Contacts (1NO + 1NC) 	**Order Code**	**AM•T92X11**	**AM•T93X11**	**AM•T98X11A**
	Operation Diagram			
Y11 Overlapping Slow Action Contacts (1NO + 1NC) 	**Order Code**	**AM•T92Y11**	**AM•T93Y11**	**AM•T98Y11A**
	Operation Diagram			
W02 Slow Action Contacts (2NC) 	**Order Code**	**AM•T92W02**	**AM•T93W02**	**AM•T98W02A**
	Operation Diagram			
W20 Slow Action Contacts (2NO)  	**Order Code**	**AM•T92W20**	**AM•T93W20**	**AM•T98W20A**
	Operation Diagram			
Z02 Snap Action Contacts (2NC) 	**Order Code**	**AM•T92Z02**	**AM•T93Z02**	
	Operation Diagram			
X12P Non overlapping Slow Action Contacts (1NO + 2NC) 	**Order Code**	**AM•T92X12P**	**AM•T93X12P**	
	Operation Diagram			
X21P Non overlapping Slow Action Contacts (2NO + 1NC) 	**Order Code**	**AM•T92X21P**	**AM•T93X21P**	
	Operation Diagram			
W03P Slow Action Contacts (3NC) 	**Order Code**	**AM•T92W03P**	**AM•T93W03P**	
	Operation Diagram			
Weight (packing per unit)	**[kg]**	**0,180**	**0,185**	**0,210**

Dimensions (in mm)









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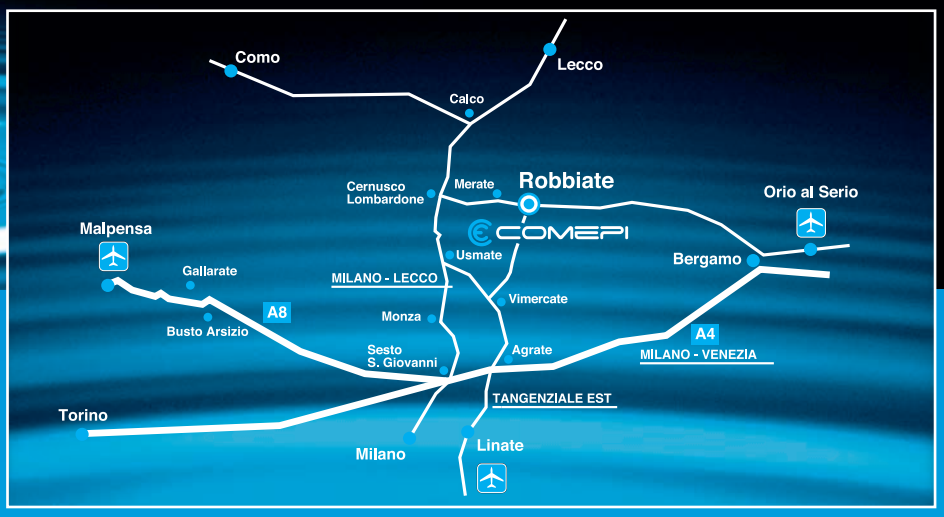

COMEPI srl
23899 Robbiate (Lecco) Italy
Via Novarino 9/L
Tel. +39 039 990 6408
Fax +39 039 990 6203
www.comepi.it
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