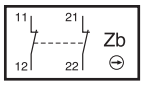
COMEPI

LIMIT SWITCHES
FOOT SWITCHES

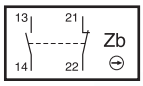
COMEPI

SUMMARY LIMIT SWITCHES

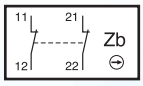
Z02: Snap action 2NC



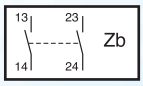
Z11: Snap action 1NO+1NC



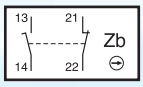
W02: Simultaneous slow action 2NC



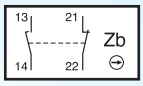
W20: Simultaneous slow action 2NO



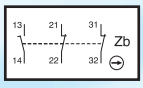
X11: Slow action break before make 1NO+1NC



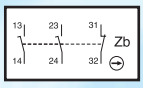
Y11: Slow action make before break 1NO+1NC



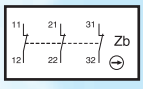
X12P: Slow action break before make 1NO+2NC



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

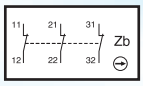


W03P: Simultaneous slow action 3NC

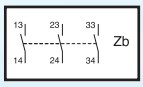


Contact blocks
Zb type: double break, electrically separated
Approvals: UL 508 / CSA C22-2 n. 14

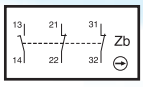
W03: Simultaneous slow action 3NC



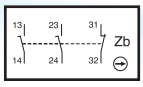
W30: Simultaneous slow action 3NO



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)

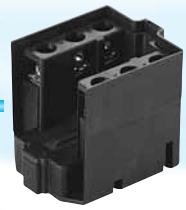
F head type (Metal)
T head type (Plastic)

BP series (Plastic)

H head type (Plastic)

BM series (Aluminium)

E head type (Aluminium)



Serie CM (alluminio)

E head type (Aluminium)

Double Insulation ⧈

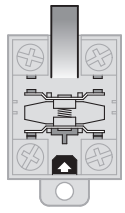
Class II materials, according to IEC 536, are designed with double insulation. This measure consists in doubling the functional insulation with an additional layer of insulation so as to eliminate the risk of electric shock and thus not having to protect elsewhere. No conductive part of "double insulated"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

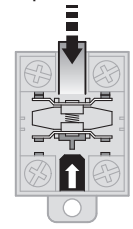
Positive Opening Operation ⊖

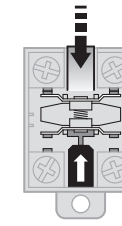
A control switch, with one or more break-contact elements, has a positive opening operation when the switch actuator ensures full contact opening of the break-contact. For the part of travel that separates the contacts, there must be a positive drive, with no resilient member (e.g. springs), between 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.

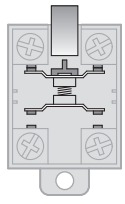

State of rest

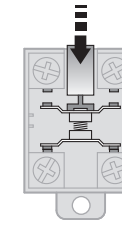

Contact change


Positive opening

Slow Action

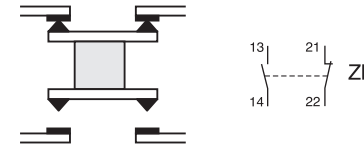
Slow action contacts are characterised by a release position that is the same as the operating position. The switch actuator's speed directly conditions the travel speed of contacts.


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.

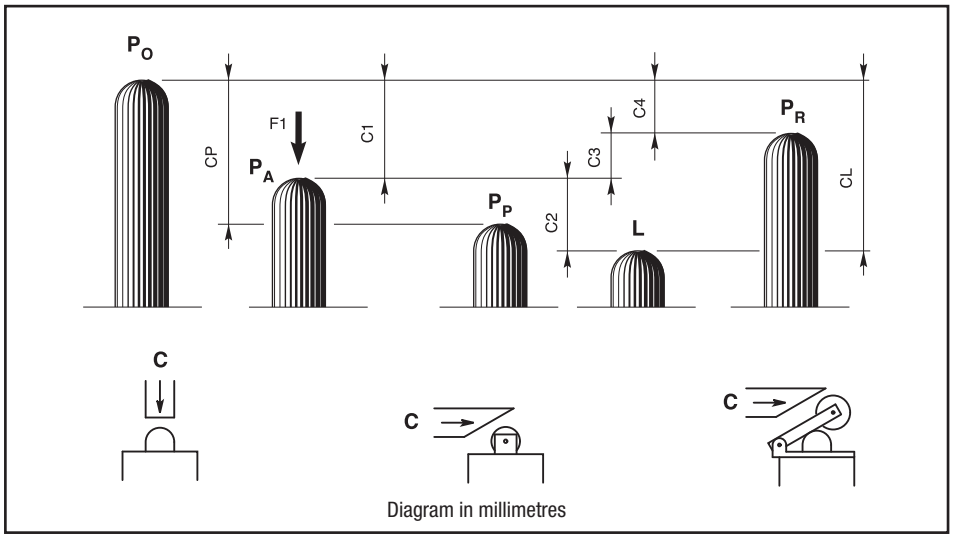


Diagram in millimetres

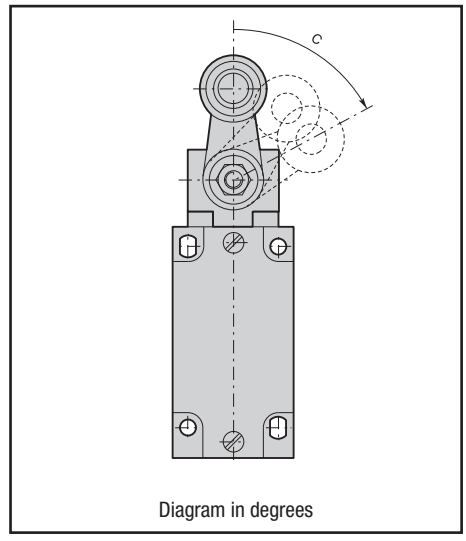


Diagram in degrees

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:

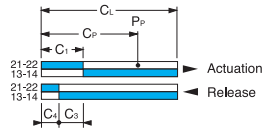
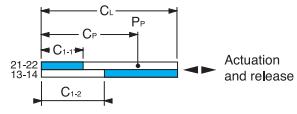


Diagram for non-overlapping slow action contacts:



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)

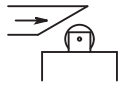
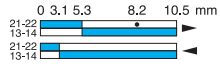


Diagram in millimetres/cam travel



BM1E41Z11
(snap action contacts)

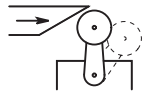
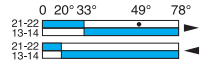


Diagram in degrees/lever rotation



BM1E11X11
(non-overlapping slow action contacts)

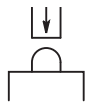
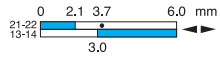


Diagram in millimetres/plunger travel



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.

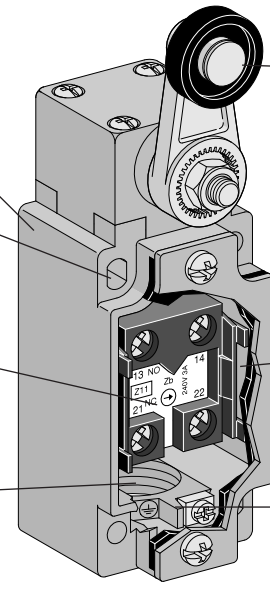
The casing come in 4 dimension: – AM... 30 mm. width – BM... 40 mm. width – DM... 50 mm. width – CM... 60 mm. width

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

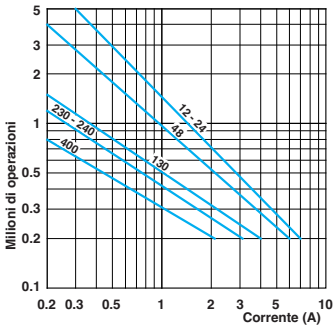
Rated insulation voltage U_i			500 V (degree of pollution 3) (400 V for contacts type X12P, X21P, W03P)
- according to IEC 947-1 and EN 60-947-1			A 600, Q 600 (A 300, Q 300 for AM... and DM... series and contacts type X12P, X21P, W03P)
- according to UL 508 and CSA C22-2 n° 14			
Rated impulse withstand 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) $\theta < 40$ °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

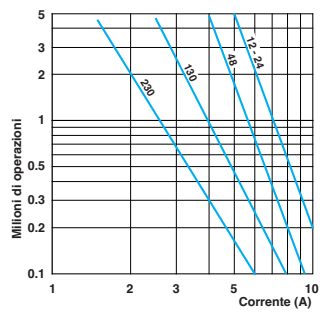
IMQ listed values

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

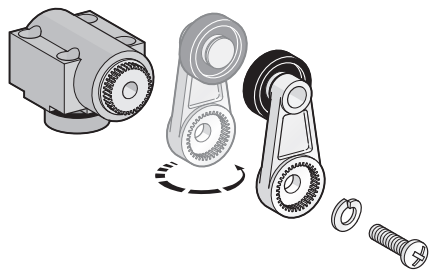
AC-15 - Snap action



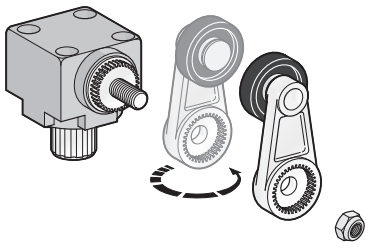
AC-15 - Slow action



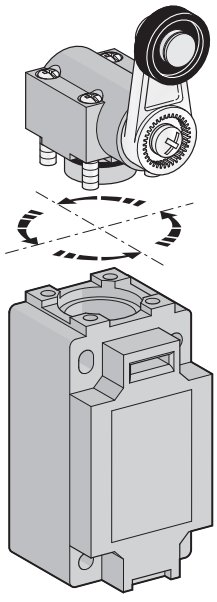
DC-13		Snap action	Slow action
		Power breaking for a durability of 5 million operating cycles	
Voltage	24 V	9.5 W	12 W
Voltage	48 V	6.8 W	9 W
Voltage	110 V	3.6 W	6 W



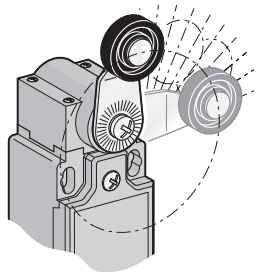
Lever round turning: AP...; BP...; DP...; AM...; DM...; EP...; EM...



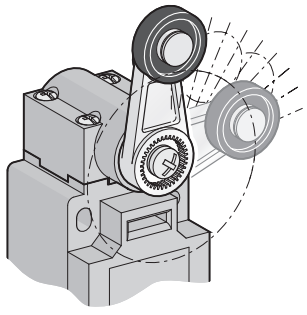
Lever roiund turning: BM...; CM...



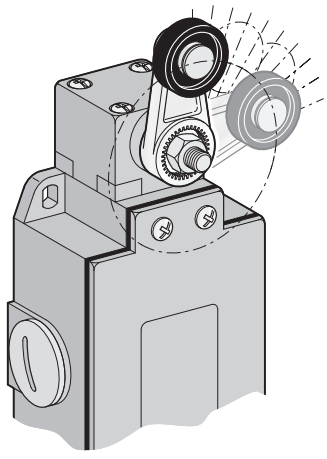
Head orientation: all series
(EP and EM series: 180° only)



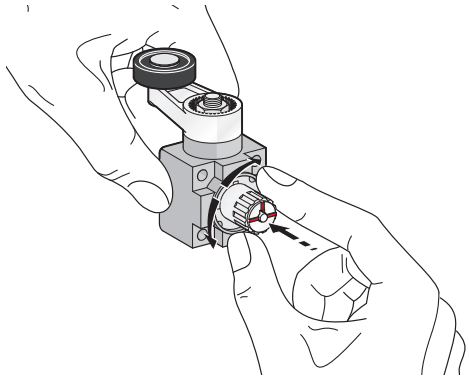
Free position adjustment 10 in 10° of lever:
AP...; DP...; AM...; DM...; EP...; EM...

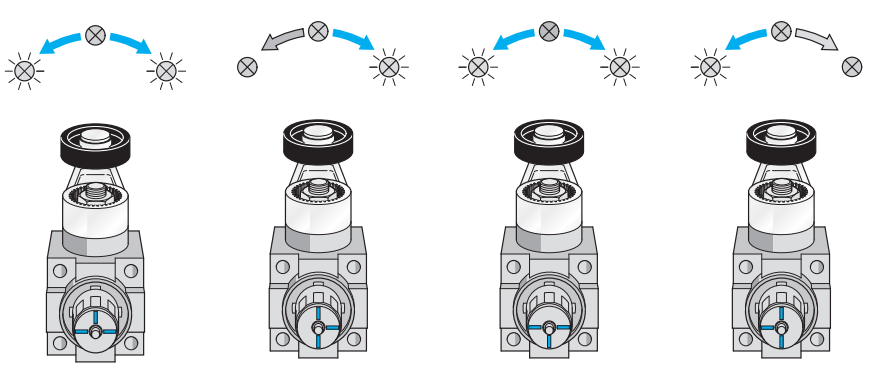


Free position adjustment 9 in 9° of lever:
BP...



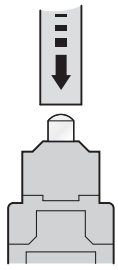
Free position adjustment 9 in 9° of lever:
BM...; CM...



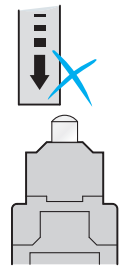


BP...; BM...; CM... operating mode selection only

Plain Plunger

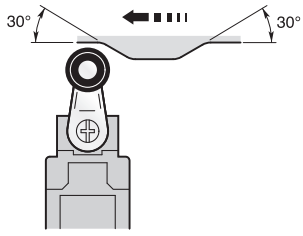


Correct

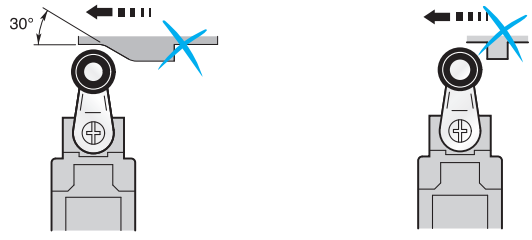


Incorrect

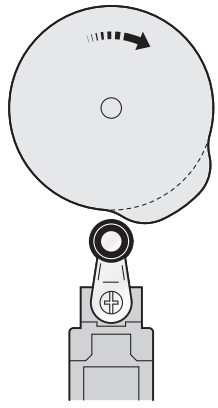
Roller Plunger or Roller Lever



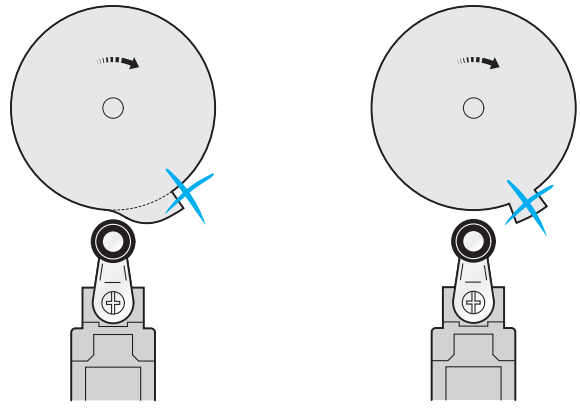
Correct



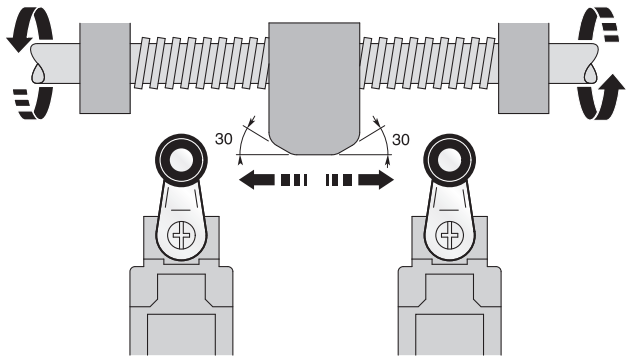
Incorrect



Correct



Incorrect



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

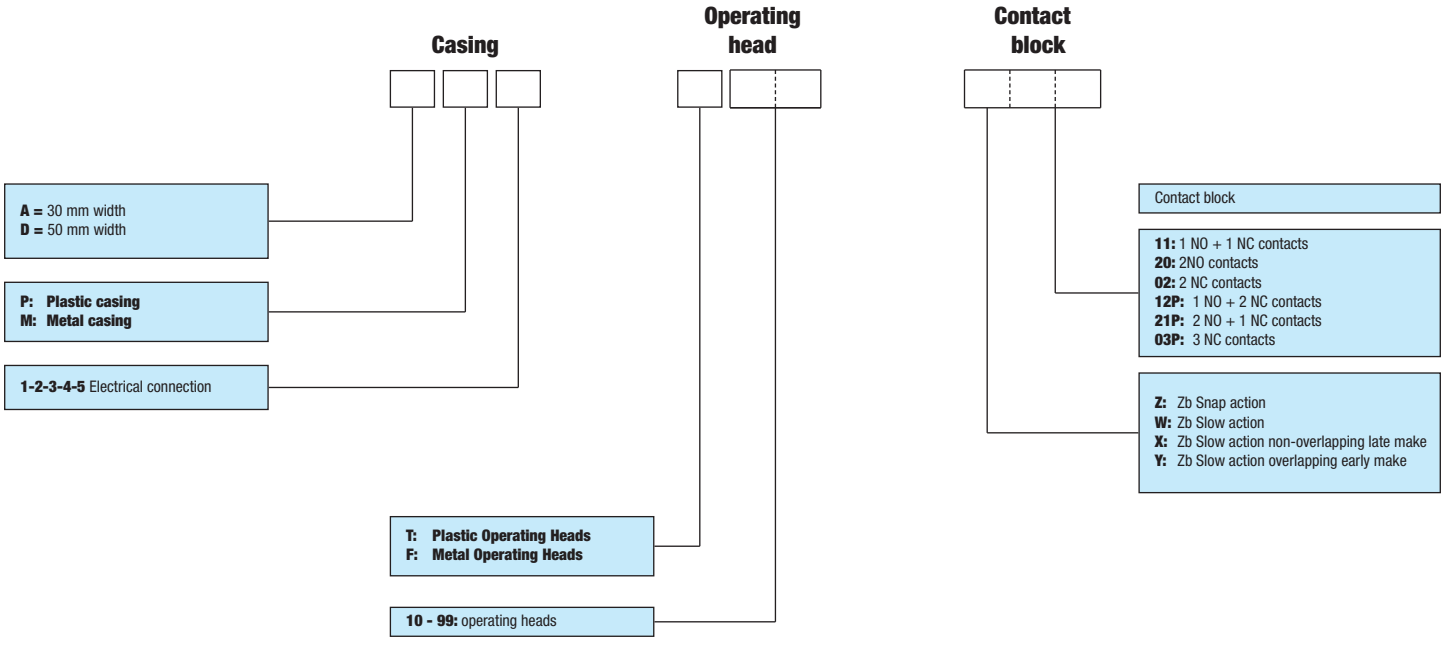
AP... / AM... / DP... / DM... special versions

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:

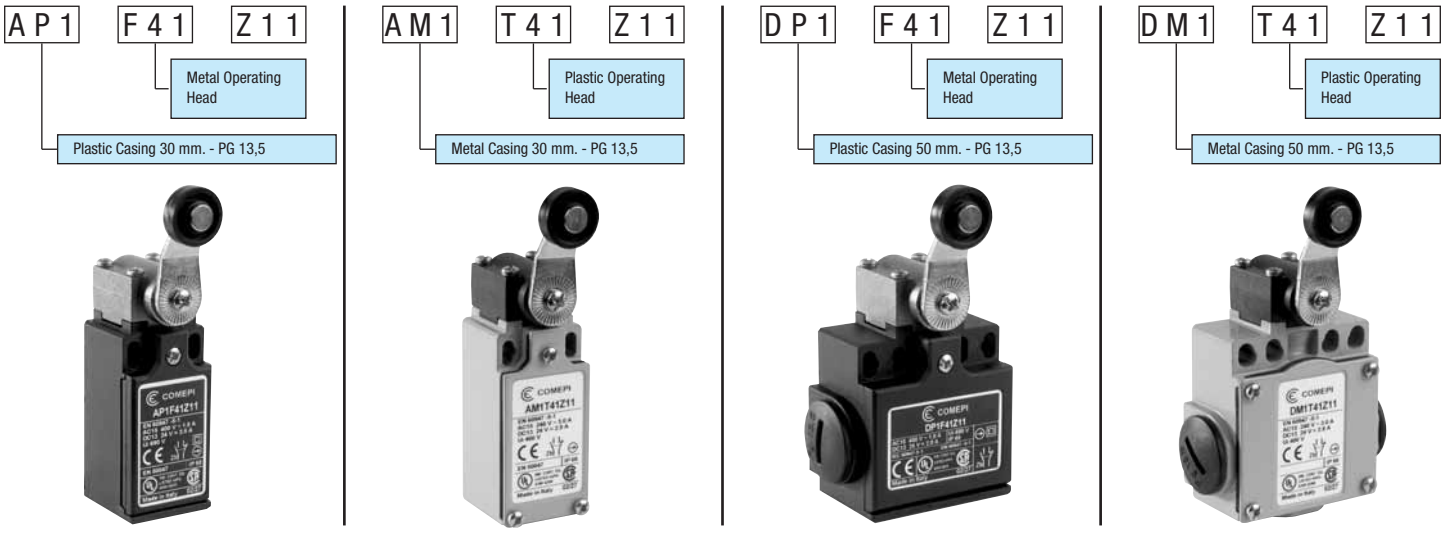
- plastic operating head on metal casing

- metal operating head on plastic casing

These "mixed" versions can be demanded as follows



Esempi:



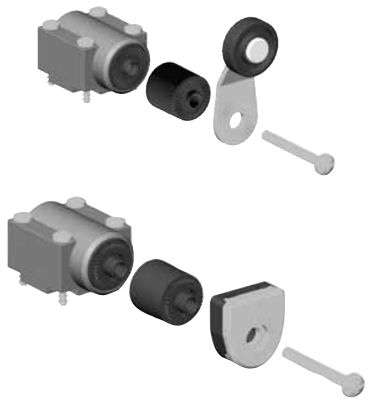
For further information, please contact our technical department.

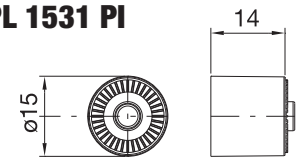
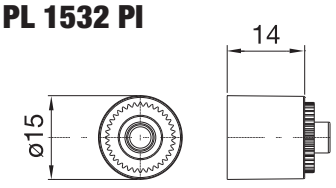
Spare parts

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.



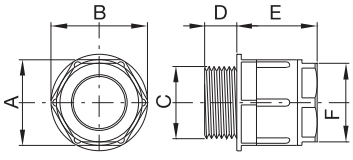
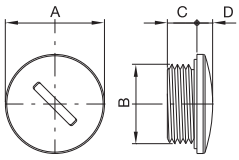
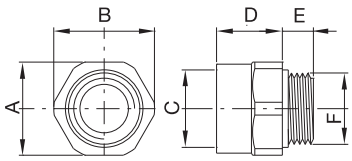
Order Code	Compatible Heads
PL 1531 PI 	T41 ÷ T46 F41 ÷ F46 G41 ÷ G45
PL 1532 PI 	T51 ÷ T75 F51 ÷ F75 G51 ÷ G75

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

BM_E Limit Switches

Metal Casing IP66 - 40 mm. width

Electrical Connection

BM1: one cable inlet for PG 13,5 Cable Gland

BM2: one cable inlet for 1/2" NPT Cable Gland

BM5: one cable inlet for M20 x 1,5 Cable Gland

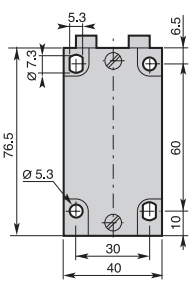
Operating Head Type

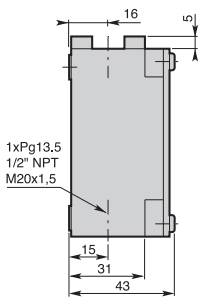
	E11 - Stainless steel plain plunger	E12 - Stainless steel ball plunger	E13 - Stainless steel Ø 12 roller plunger
Conformity / ⊕ (N.C. contact with positive opening operation)	EN 50041 ⊕	EN 50041 ⊕	EN 50041 ⊕
Max actuation speed [m/s]	0,5	0,5	0,5
Min. force [N] or torque [Nm]: actuation / positive opening operation	30 / 45	30 / 45	22 / 40

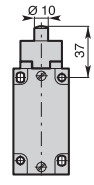
Additional Technical Datas

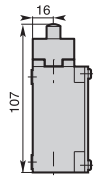
		E11	E12	E13
Z11 Snap Action Contacts (1NO + 1NC)	Order Code	BM•E11Z11	BM•E12Z11	BM•E13Z11
	Operation Diagram	0 1.8 3.0 4.6 6.0 mm	0 1.8 3.0 4.6 6.0 mm	0 3.1 5.3 8.2 10.5 mm
X11 Non overlapping Slow Action Contacts (1NO + 1NC)	Order Code	BM•E11X11	BM•E12X11	BM•E13X11
	Operation Diagram	0 2.1 3.7 6.0 mm, 3.0	0 2.1 3.7 6.0 mm, 3.0	0 4.0 6.9 10.5 mm, 5.4
Y11 Overlapping Slow Action Contacts (1NO + 1NC)	Order Code	BM•E11Y11	BM•E12Y11	BM•E13Y11
	Operation Diagram	0 3.4 5.0 6.0 mm, 2.0	0 3.4 5.0 6.0 mm, 2.0	0 6.0 8.9 10.5 mm, 3.7
W02 Slow Action Contacts (2NC)	Order Code	BM•E11W02	BM•E12W02	BM•E13W02
	Operation Diagram	0 2.0 3.6 6.0 mm	0 2.0 3.6 6.0 mm	0 3.7 6.6 10.5 mm
W20 Slow Action Contacts (2NO) ⊗	Order Code	BM•E11W20	BM•E12W20	BM•E13W20
	Operation Diagram	0 1.9 6.0 mm	0 1.9 6.0 mm	0 3.5 10.5 mm
Z02 Snap Action Contacts (2NC)	Order Code	BM•E11Z02	BM•E12Z02	BM•E13Z02
	Operation Diagram	0 1.8 2.9 4.5 6.0 mm	0 1.8 2.9 4.5 6.0 mm	0 3.1 5.1 8.0 10.5 mm
X12 Non overlapping Slow Action Contacts (1NO + 2NC)	Order Code	BM•E11X12	BM•E12X12	BM•E13X12
	Operation Diagram	0 2.0 3.5 6.0 mm, 3.7	0 2.0 3.5 6.0 mm, 3.7	0 3.8 6.3 10.5 mm, 6.5
X21 Non overlapping Slow Action Contacts (2NO + 1NC)	Order Code	BM•E11X21	BM•E12X21	BM•E13X21
	Operation Diagram	0 2.1 3.6 6.0 mm, 3.7	0 2.1 3.6 6.0 mm, 3.7	0 3.9 6.4 10.5 mm, 6.5
W03 Simultaneous Slow Action Contacts (3NC)	Order Code	BM•E11W03	BM•E12W03	BM•E13W03
	Operation Diagram	0 2.0 3.5 6.0 mm	0 2.0 3.5 6.0 mm	0 3.8 6.3 10.5 mm
W30 Simultaneous Slow Action Contacts (3NO) ⊗	Order Code	BM•E11W30	BM•E12W30	BM•E13W30
	Operation Diagram	0 2.3 6.0 mm	0 2.3 6.0 mm	0 4.3 10.5 mm
Weight (packing per unit)	[kg]	0,240	0,240	0,245

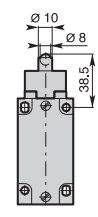
Dimensions (in mm)

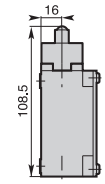


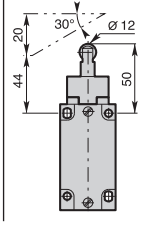


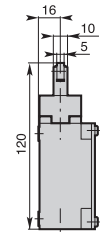












• Travel, operation diagrams and technical data . . . . pages 7, 11

Utilization precautions . . . . . pages 14, 15

BM_E Limit Switches

Metal Casing IP66 - 40 mm. width

Electrical Connection

BM1: one cable inlet for PG 13,5 Cable Gland

BM2: one cable inlet for 1/2" NPT Cable Gland

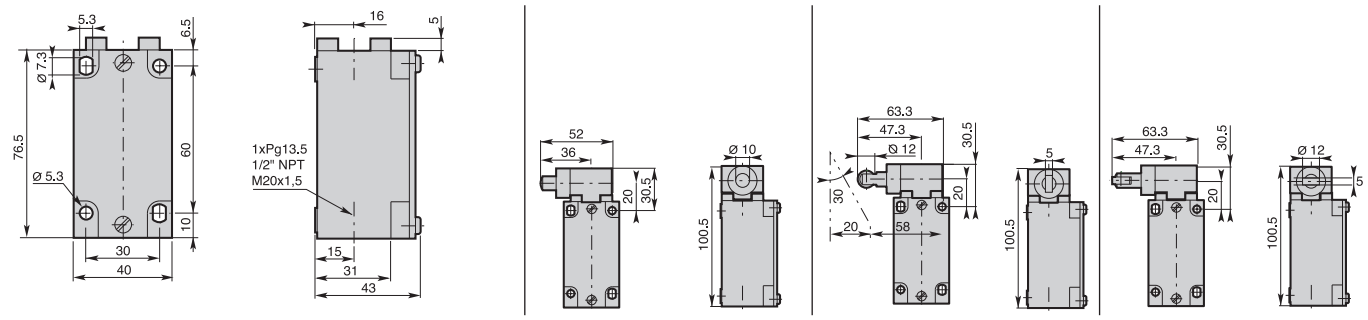
BM5: one cable inlet for M20 x 1,5 Cable Gland

Operating Head Type	E21 - Stainless steel lateral plain plunger	E22 - Stainless steel lateral plunger with Ø 12 vertical roller	E23 - Stainless steel lateral plunger with Ø 12 horizontal roller
Conformity / ⊕ (N.C. contact with positive opening operation)	EN 50041 ⊕	EN 50041 ⊕	EN 50041 ⊕
Max actuation speed [m/s]	0,5	0,5	0,5
Min. force [N] or torque [Nm]: actuation / positive opening operation	30 / 50	30 / 50	30 / 50

Additional Technical Datas

		E21	E22	E23
Z11 Snap Action Contacts (1NO + 1NC)	Order Code	**BM•E21Z11**	**BM•E22Z11**	**BM•E23Z11**
	Operation Diagram	0 2.0 3.2 4.8 6.0 mm	0 3.7 5.9 8.8 10.2 mm	0 3.7 5.9 8.8 10.2 mm
X11 Non overlapping Slow Action Contacts (1NO + 1NC)	Order Code	**BM•E21X11**	**BM•E22X11**	**BM•E23X11**
	Operation Diagram	0 2.3 3.9 6.0 mm (3.2)	0 4.6 7.5 10.2 mm (6.0)	0 4.6 7.5 10.2 mm (6.0)
Y11 Overlapping Slow Action Contacts (1NO + 1NC)	Order Code	**BM•E21Y11**	**BM•E22Y11**	**BM•E23Y11**
	Operation Diagram	0 3.6 5.2 6.0 mm (2.2)	0 6.6 9.5 10.2 mm (4.3)	0 6.6 9.5 10.2 mm (4.3)
W02 Slow Action Contacts (2NC)	Order Code	**BM•E21W02**	**BM•E22W02**	**BM•E23W02**
	Operation Diagram	0 2.2 3.8 6.0 mm	0 4.3 7.2 10.2 mm	0 4.3 7.2 10.2 mm
W20 Slow Action Contacts (2NO) ⊗	Order Code	**BM•E21W20**	**BM•E22W20**	**BM•E23W20**
	Operation Diagram	0 2.1 6.0 mm	0 4.1 10.2 mm	0 4.1 10.2 mm
Z02 Snap Action Contacts (2NC)	Order Code	**BM•E21Z02**	**BM•E22Z02**	**BM•E23Z02**
	Operation Diagram	0 2.0 3.1 4.7 6.0 mm	0 3.7 5.7 8.6 10.2 mm	0 3.7 5.7 8.6 10.2 mm
X12 Non overlapping Slow Action Contacts (1NO + 2NC)	Order Code	**BM•E21X12**	**BM•E22X12**	**BM•E23X12**
	Operation Diagram	0 1.4 2.9 6.0 mm (3.1)	0 3.5 6.1 10.2 mm (6.2)	0 3.5 6.1 10.2 mm (6.2)
X21 Non overlapping Slow Action Contacts (2NO + 1NC)	Order Code	**BM•E21X21**	**BM•E22X21**	**BM•E23X21**
	Operation Diagram	0 1.5 3.0 6.0 mm (3.1)	0 3.6 6.2 10.2 mm (6.2)	0 3.6 6.2 10.2 mm (6.2)
W03 Simultaneous Slow Action Contacts (3NC)	Order Code	**BM•E21W03**	**BM•E22W03**	**BM•E23W03**
	Operation Diagram	0 1.4 2.9 6.0 mm	0 3.5 6.1 10.2 mm	0 3.5 6.1 10.2 mm
W30 Simultaneous Slow Action Contacts (3NO) ⊗	Order Code	**BM•E21W30**	**BM•E22W30**	**BM•E23W30**
	Operation Diagram	0 1.9 6.0 mm	0 4.0 10.2 mm	0 4.0 10.2 mm
Weight (packing per unit)	[kg]	**0,260**	**0,265**	**0,265**

Dimensions (in mm)



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Utilization precautions . . . . . pages 14, 15

BM_E Limit Switches

Metal Casing IP66 - 40 mm. width

E3• - One way lever

E31: Ø22 nylon roller
E32: Ø22 stainless steel roller
E33: Ø22 steel ball bearing

1,5
12 / 40

E4• - Ø 22 roller lever

E41: nylon roller
E42: stainless steel roller
E43: steel ball bearing

EN 50041
1,5
0,15 / 0,30

E44 - Ø 50 rubber roller lever

1,5
0,15 / 0,30

E5• - Adjustable Ø 22 roller lever

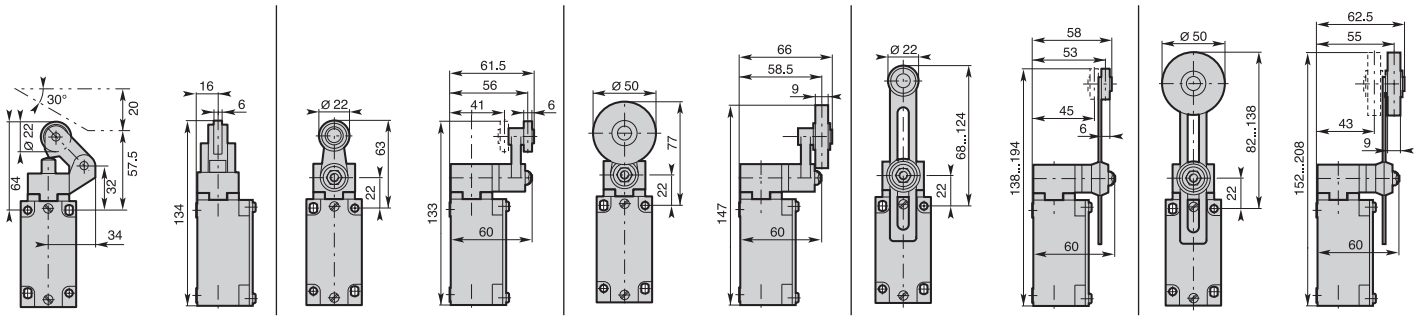
E51: nylon roller
E52: stainless steel roller
E53: steel ball bearing

1,5
0,15 / 0,30

E54 - Adjustable Ø 50 rubber roller lever

1,5
0,15 / 0,30

BM•E3•Z11	**BM•E4•Z11**	**BM•E44Z11**	**BM•E5•Z11**	**BM•E54Z11**
BM•E3•X11	**BM•E4•X11**	**BM•E44X11**	**BM•E5•X11**	**BM•E54X11**
BM•E3•Y11	**BM•E4•Y11**	**BM•E44Y11**	**BM•E5•Y11**	**BM•E54Y11**
BM•E3•W02	**BM•E4•W02**	**BM•E44W02**	**BM•E5•W02**	**BM•E54W02**
BM•E3•W20	**BM•E4•W20**	**BM•E44W20**	**BM•E5•W20**	**BM•E54W20**
BM•E3•Z02	**BM•E4•Z02**	**BM•E44Z02**	**BM•E5•Z02**	**BM•E54Z02**
BM•E3•X12	**BM•E4•X12**	**BM•E44X12**	**BM•E5•X12**	**BM•E54X12**
BM•E3•X21	**BM•E4•X21**	**BM•E44X21**	**BM•E5•X21**	**BM•E54X21**
BM•E3•W03	**BM•E4•W03**	**BM•E44W03**	**BM•E5•W03**	**BM•E54W03**
BM•E3•W30	**BM•E4•W30**	**BM•E44W30**	**BM•E5•W30**	**BM•E54W30**
0,280	**0,300**	**0,315**	**0,320**	**0,325**



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

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BM_E Limit Switches

Metal Casing IP66 - 40 mm. width

Electrical Connection

BM1: one cable inlet for PG 13,5 Cable Gland

BM2: one cable inlet for 1/2" NPT Cable Gland

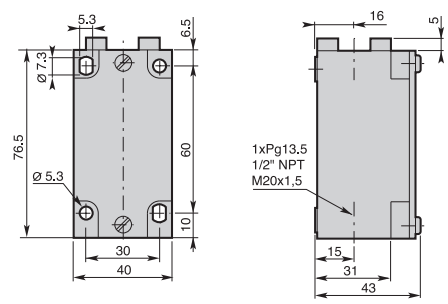
BM5: one cable inlet for M20 x 1,5 Cable Gland

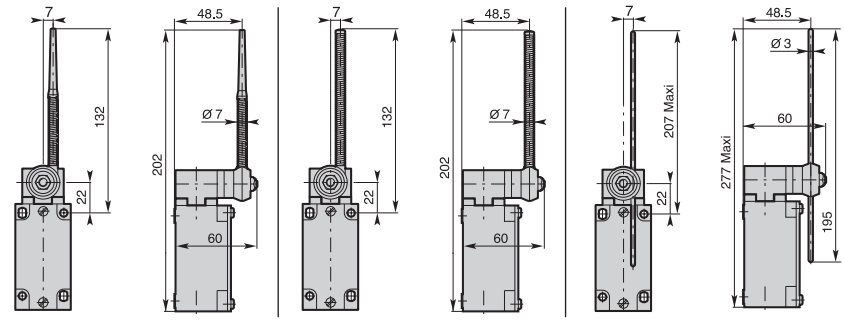
Operating Head Type	E61 - Nylon actuator with stainless steel spring	E62 - Stainless steel spring actuator	E7• - Adjustable rod lever E71: stainless steel rod Ø3 E73: fiberglass rod Ø3 E75: square steel rod 3x3
Conformity / ⊖ (N.C. contact with positive opening operation)			EN50041 ⊖
Max actuation speed [m/s]	1,5	1,5	1,5
Min. force [N] or torque [Nm]: actuation / positive opening operation	0,15 / –	0,15 / –	0,15 / 0,30

Additional Technical Datas

Z11 Snap Action Contacts (1NO + 1NC)	13 21 14 22	**Order Code**	**BM•E61Z11**	**BM•E62Z11**	**BM•E7•Z11**
		Operation Diagram	0 20° 33° 78°	0 20° 33° 78°	0 20° 33° 49° 78°
X11 Non overlapping Slow Action Contacts (1NO + 1NC)	13 21 14 22	**Order Code**	**BM•E61X11**	**BM•E62X11**	**BM•E7•X11**
		Operation Diagram	0 22° 78° 33°	0 22° 78° 33°	0 22° 38° 78° 33°
Y11 Overlapping Slow Action Contacts (1NO + 1NC)	13 21 14 22	**Order Code**	**BM•E61Y11**	**BM•E62Y11**	**BM•E7•Y11**
		Operation Diagram	0 37° 78° 21°	0 37° 78° 21°	0 37° 53° 78° 21°
W02 Slow Action Contacts (2NC)	11 21 12 22	**Order Code**	**BM•E61W02**	**BM•E62W02**	**BM•E7•W02**
		Operation Diagram	0 21° 78°	0 21° 78°	0 21° 37° 78°
W20 Slow Action Contacts (2NO) ⊗	13 23 14 24	**Order Code**	**BM•E61W20**	**BM•E62W20**	**BM•E7•W20**
		Operation Diagram	0 20° 78°	0 20° 78°	0 20° 78°
Z02 Snap Action Contacts (2NC)	11 21 12 22	**Order Code**	**BM•E61Z02**	**BM•E62Z02**	**BM•E7•Z02**
		Operation Diagram	0 20° 32° 78°	0 20° 32° 78°	0 20° 32° 48° 78°
X12 Non overlapping Slow Action Contacts (1NO + 2NC)	13 21 31 14 22 32	**Order Code**	**BM•E61X12**	**BM•E62X12**	**BM•E7•X12**
		Operation Diagram	0 18° 78° 37°	0 18° 78° 37°	0 18° 35° 78° 37°
X21 Non overlapping Slow Action Contacts (2NO + 1NC)	13 23 31 14 24 32	**Order Code**	**BM•E61X21**	**BM•E62X21**	**BM•E7•X21**
		Operation Diagram	0 19° 78° 37°	0 19° 78° 37°	0 19° 36° 78° 37°
W03 Simultaneous Slow Action Contacts (3NC)	11 21 31 12 22 32	**Order Code**	**BM•E61W03**	**BM•E62W03**	**BM.E7•W03**
		Operation Diagram	0 18° 78°	0 18° 78°	0 18° 35° 78°
W30 Simultaneous Slow Action Contacts (3NO) ⊗	13 23 33 14 24 34	**Order Code**	**BM•E61W30**	**BM•E62W30**	**BM•E7•W30**
		Operation Diagram	0 23° 78°	0 23° 78°	0 23° 78°
Weight (packing per unit)		**[kg]**	**0,305**	**0,310**	**0,305**

Dimensions (in mm)





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Utilization precautions . . . . . pages 14, 15

BM_E Limit Switches

Metal Casing IP66 - 40 mm. width

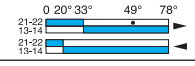
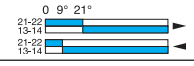
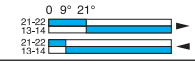
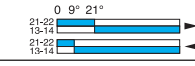
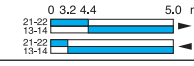
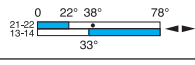
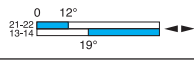
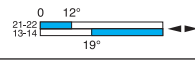
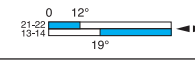
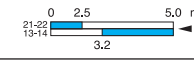
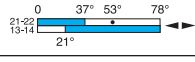
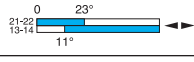
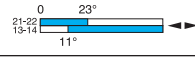
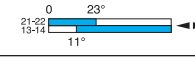
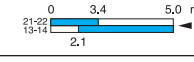
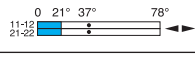
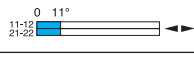
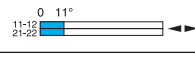
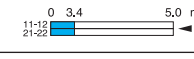
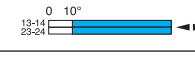
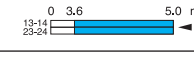
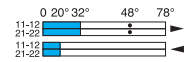
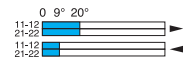
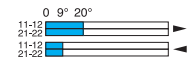
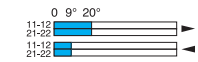
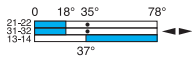
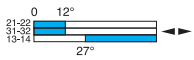
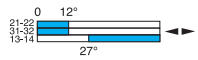
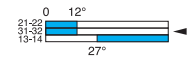
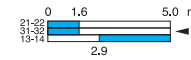
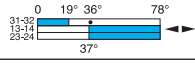
E7• - Adjustable rod lever
E72: nylon rod
E74: fiberglass rod

E91 - Stainless steel spring multidirectional actuator

E92 - Multidirectional nylon actuator with stainless steel spring

E93 - Stainless steel spring multidirectional actuator

E99 - Pull action with ring

EN 50041 ⊕ 1,5 0,15 / 0,30	1,0 0,18 / –	1,0 0,18 / –	1,0 0,18 / –	0,5 25 / –
BM•E7•Z11 	**BM•E91Z11** 	**BM•E92Z11** 	**BM•E93Z11** 	**BM•E99Z11A** 
BM•E7•X11 	**BM•E91X11** 	**BM•E92X11** 	**BM•E93X11** 	**BM•E99X11A** 
BM•E7•Y11 	**BM•E91Y11** 	**BM•E92Y11** 	**BM•E93Y11** 	**BM•E99Y11A** 
BM•E7•W02 	**BM•E91W02** 	**BM•E92W02** 	**BM•E93W02** 	**BM•E99W02A** 
BM•E7•W20 	**BM•E91W20** 	**BM•E92W20** 	**BM•E93W20** 	**BM•E99W20A** 
BM•E7•Z02 	**BM•E91Z02** 	**BM•E92Z02** 	**BM•E93Z02** 	
BM•E7•X12 	**BM•E91X12** 	**BM•E92X12** 	**BM•E93X12** 	**BM•E99X12A** 
BM•E7•X21 	**BM•E91X21** 	**BM•E92X21** 	**BM•E93X21** 	**BM•E99X21A**
BM•E7•W03 	**BM•E91W03** 	**BM•E92W03** 	**BM•E93W03** 	**BM•E99W03A**
BM•E7•W30 	**BM•E91W30** 	**BM•E92W30** 	**BM•E93W30** 	**BM•E99W30A**
0,300	**0,230**	**0,230**	**0,235**	**0,245**

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