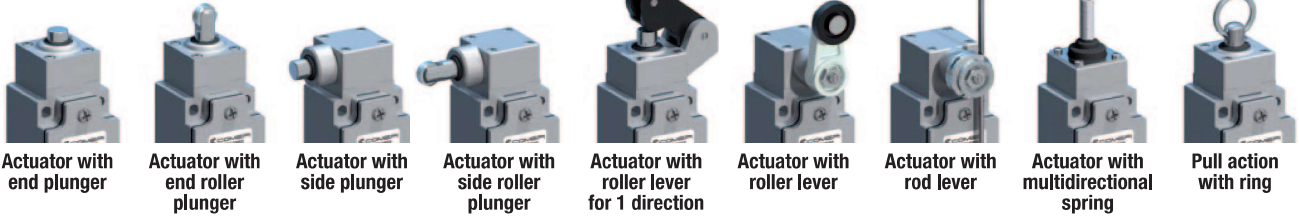


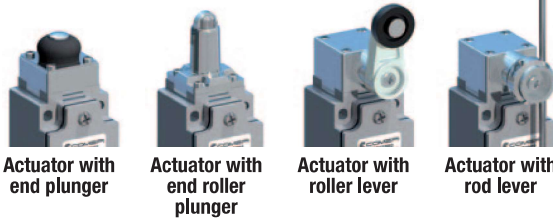
BM Limit Switches - Summary

BM_E Aluminium operating heads



Actuator with end plunger Actuator with end roller plunger Actuator with side plunger Actuator with side roller plunger Actuator with roller lever for 1 direction Actuator with roller lever Actuator with rod lever Actuator with multidirectional spring Pull action with ring

BM_M Metal operating heads

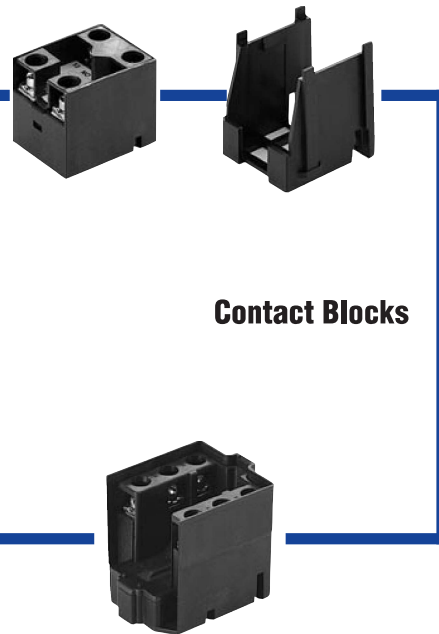
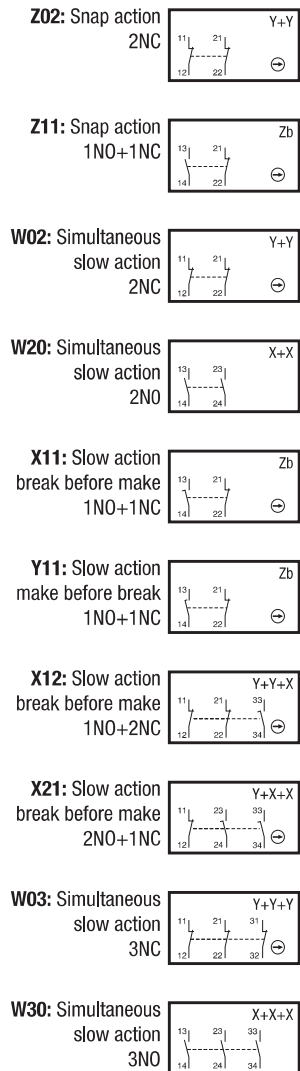


Actuator with end plunger Actuator with end roller plunger Actuator with roller lever Actuator with rod lever Actuator with end plunger Actuator with multidirectional spring

BM_P Thermoplastic operating heads



Actuator with end plunger Actuator with multidirectional spring



Actuators

Contact Blocks

Cable Entries



One cable inlet for:
PG 13,5 Cable Gland
1/2" NPT Cable Gland
M20 x 1,5 Cable Gland



M12x1 Connector

Contact blocks

Type: double break, electrically separated

Approvals: UL 508 / CSA C22-2 n. 14



BM Limit Switches - Description

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

Limit switches, which are made aluminium, are mechanically more resistant and three times lighter than the ones in zinc alloy and they offer a degree of protection of IP66.

They comply with the requirements of European Directives (Low Voltage and RoHS) and are conform to European and International Standards.

The CE declaration of these products are available in the download section of website www.comepi.it or by writing to the following email address: tecnico@comepi.it DDC02 - Limit Switches.

Casing

- 40 mm. width with standardized dimensions acc. to EN 50041

Mounting the casing


- 2 or 4 x M5 screws

Contact Block:

- Contact configuration: NO + NC, 2 NO, 2 NC, 2NO + 1NC, 1NO + 2NC, 3NC, 3NO
- Positive opening operation
- Snap action or slow action
- 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 60947-1, IEC 60947-5-1 standards



A variety of operating heads:

- Plain plunger
- Roller plunger
- Roller lever, adjustable or not, etc.

Assembled using 4 x M4 screws

Cover:

- Closed using 2 x ø 4 screw.

One piece sealing gasket to ensure tightness.

Electrical connection:

- 1 x cable gland

Symbols

Casing width:
B = 40 mm width + 1 cable inlet

Metal casing

Electrical connection
1: cable inlets for PG13.5 cable gland
2: cable inlets for 1/2 NPT cable gland
5: cable inlets for M20 x 1,5 cable gland
BM1_M: M12 connector 5 poles

Operating heads:
P: thermoplastic M: metal E: aluminium

Operating heads: codes 10 - 9999

Example: B M 1 E 11 Z 1 1

Structure: B M [] [] [] [] [] []

Contact block

11: 1 NO + 1 NC contacts
20: 2 NO contacts
02: 2 NC contacts
12: 1 NO + 2 NC contacts
21: 2 NO + 1 NC contacts
03: 3 NC contacts
30: 3 NO contacts

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

BM Limit Switches - Technical Data

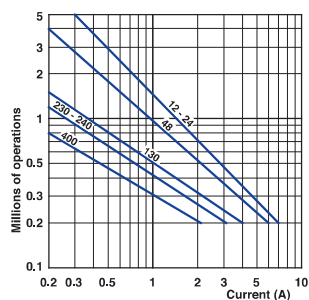
Standards		BM Series
Standards		IEC 60947-5-1 EN 60947-5-1
Certifications - Approvals		UL - CSA - IMQ - EAC - CCC
Air temperature near the device		
- during operation	°C	- 25 ... + 70
- for storage	°C	- 30 ... + 80
Mounting positions		All positions are authorised
Protection against electrical shocks (acc. to IEC 61140)		Class I
Degree of protection (according to IEC 60529 and EN 60529)		IP 66*

Electrical Data

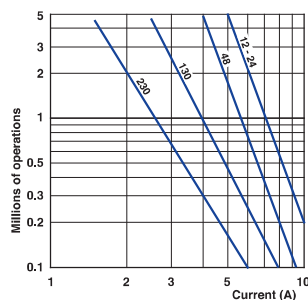
Rated insulation voltage U_i - according to IEC 60947-1 and EN 60947-1 - according to UL 508 and CSA C22-2 n° 14		500 V (degree of pollution 3) (400 V for contacts type Z02) A 600, Q 600
Rated impulse withstand voltage U_{imp} (according to IEC 60947-1 and EN 60947-1)	kV	6
Conventional free air thermal current I_{th} (according to IEC 60947-5-1) $\theta < 40$ °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 60947-5-1)	24 V - 50/60 Hz A 120 V - 50/60 Hz A 400 V - 50/60 Hz A	10 6 4 (1.8A for contacts type X12, X21, W03, W30)
I_e / DC-13 (according to IEC 60947-5-1)	24 V - d.c. A 125 V - d.c. A 250 V - d.c. A	6 (2.8A for contacts type X12, X21, W03, W30) 0.55 0.4 (0.27A for contacts type X12, X21, W03, W30)
Switching frequency	Cycles/h	3600
Load factor		0.5
Resistance between contacts	m Ω	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 mm ²	0.34 ... 2.5 (0.34... 1.5 for 3 poles contacts type)
Terminal marking		According to IEC 60947-5-1
Mechanical durability		30 millions of operations P11; M13; E11...13; E21...23; E31...33 25 millions of operations M41...75; E41...75 10 millions of operations P91...93; M14; M19; E91...93; E99
Electrical durability (according to IEC 60947-5-1)		Utilization categories AC-15 and DC-13 (Load factor of 0.5 according to curves below)

* except for E54, E92, E93, P92, P93, M54: the degree of protection is IP65

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

BM Limit Switches - Technical Data

Technical data approved by IMQ

Standards	Devices conform with international IEC 60947-5-1 and European EN 60947-5-1 standards	
Degree of protection	IP 66*	
Rated insulation voltage U_i	500 V (degree of pollution 3) (400V for type Z02)	
Rated impulse withstand voltage U_{imp}	6 kV	
Conventional free air thermal current I_{th}	10 A	
Short-circuit protection - gG (gl) type fuses	10 A	
Rated operational current	10 A	
I_e / AC-15	24 V - 50/60 Hz	10 A
	400 V - 50/60 Hz	4 A (1,8A for contacts type X12, X21, W03, W30)
I_e / DC-13	24 V - d.c.	6 A (2,8A for contacts type X12, X21, W03, W30)
	125 V - d.c.	0,55 A
	250 V - d.c.	0,4 A (0,27A for contacts type X12, X21, W03, W30)

* except for E54, E92, E93, P92, P93, M54: the degree of protection is IP65

Technical data approved by UL

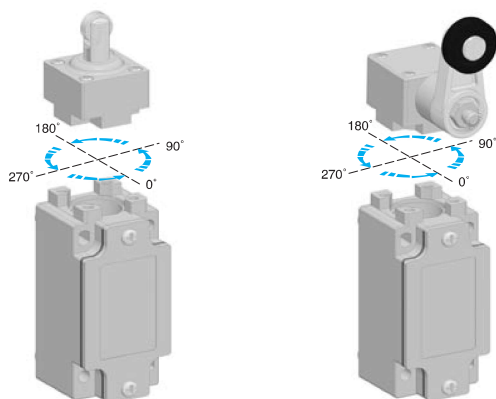
Standards	Devices conform with UL 508	
Contact blocks type Z11, X11, Y11, W02 and Z02	A600, Q600	
Contact blocks type X12, X21, W03 and W30	A600, Q600	
Utilization categories	A600, Q600	
Use 60/75°C copper (Cu) conductor only. Wire rages 14-18 AWG stranded or solid. The terminal tightening torque of 7 lbs-in / 0,78 Nm. Suitable for conduit connection only with use of adapter sleeve optionally provided or recommended by the manufacturer.		

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

Implementation

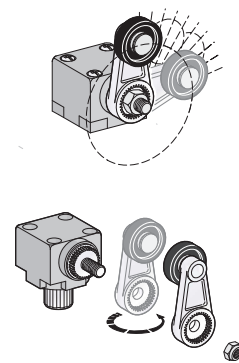
Operating head orientation

The head can be rotated each 90°. Recommended tightening torque 0,5 Nm (max 0,8 Nm).

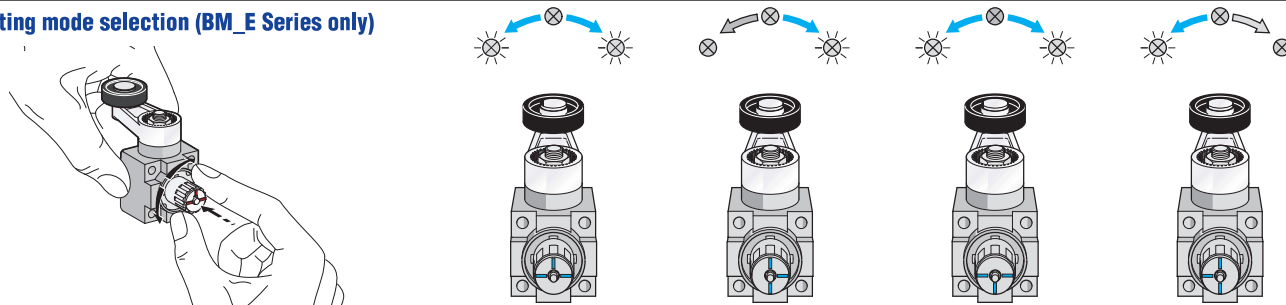


Lever adjustment

The lever of the angular actuators can be adjusted every 9° and round turned in order to obtain the maximum flexibility on the working plan. Recommended tightening torque 0,5 Nm (max 0,8 Nm).



Operating mode selection (BM_E Series only)



Special Versions

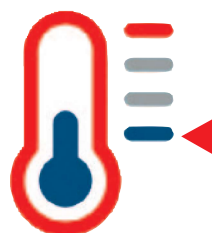


M12 connector

All BM models with bipolar microswitch (Z11-X11-Y11-W02-W20-Z02) are now available in the pre-wired version with M12 connector.

To order the pre-wired different types of limit switches, add the digit "M" at the end of the desired part number.

For example: BM1E11Z11M



Low Temperature

The limit switches for low temperature applications are useful for refrigerated cells or equipments where the air operational temperature is very low.

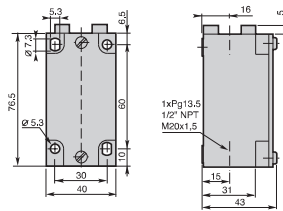
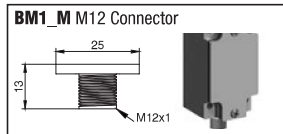
These devices, made in special materials, are able to extend the operational temperature range down to -40°C, maintaining mechanical performances intact. To order add the digits "40" following the operating head indication in part number.

For example: BM1E11Z11 → BM1E1140Z11

Metal Casing IP66 - 40 mm. width

Electrical connection:

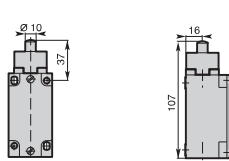
- BM1:** one cable inlet for PG 13,5 Cable Gland
- BM2:** one cable inlet for 1/2" NPT Cable Gland
- BM5:** one cable inlet for M20 x 1,5 Cable Gland



Contact Blocks

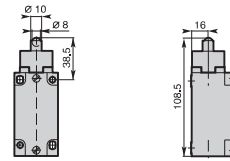
Z11 (1NO + 1NC)	BM•E11Z11	BM•E12Z11	BM•E13Z11
X11 (1NO + 1NC)	BM•E11X11	BM•E12X11	BM•E13X11
Y11 (1NO + 1NC)	BM•E11Y11	BM•E12Y11	BM•E13Y11
W02 (2NC)	BM•E11W02	BM•E12W02	BM•E13W02
W20 (2NO)	BM•E11W20	BM•E12W20	BM•E13W20
Z02 (2NC)	BM•E11Z02	BM•E12Z02	BM•E13Z02
X12 (1NO + 2NC)	BM•E11X12	BM•E12X12	BM•E13X12
X21 (2NO + 1NC)	BM•E11X21	BM•E12X21	BM•E13X21
W03 (3NC)	BM•E11W03	BM•E12W03	BM•E13W03
W30 (3NO)	BM•E11W30	BM•E12W30	BM•E13W30

E11 - Stainless steel plain plunger



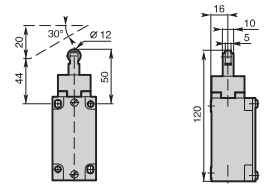
Conformity EN50041
Min. actuating force 30N (45N ⇄)
Weight 240 g

E12 - Stainless steel ball plunger



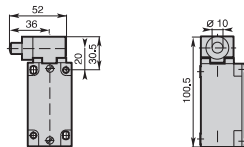
Conformity EN50041
Min. actuating force 30N (45N ⇄)
Weight 240 g

E13 - Stainless steel Ø12 roller plunger



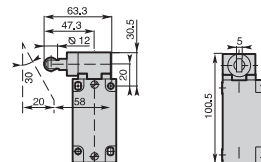
Conformity EN50041
Min. actuating force 22N (40N ⇄)
Weight 245 g

E21 - Stainless steel lateral plain plunger



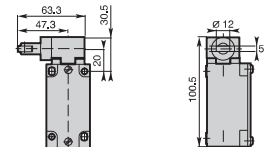
Conformity EN50041
Min. actuating force 30N (50N ⇄)
Weight 260 g

E22 - Stainless steel lateral plunger with Ø12 vertical roller



Conformity EN50041
Min. actuating force 30N (50N ⇄)
Weight 265 g

E23 - Stainless steel lateral plunger with Ø12 horizontal roller



Conformity EN50041
Min. actuating force 30N (50N ⇄)
Weight 265 g

Contact Blocks

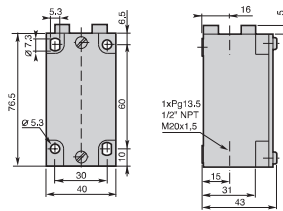
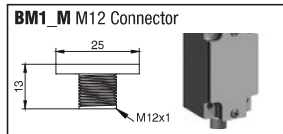
Z11 (1NO + 1NC)	BM•E21Z11	BM•E22Z11	BM•E23Z11
X11 (1NO + 1NC)	BM•E21X11	BM•E22X11	BM•E23X11
Y11 (1NO + 1NC)	BM•E21Y11	BM•E22Y11	BM•E23Y11
W02 (2NC)	BM•E21W02	BM•E22W02	BM•E23W02
W20 (2NO)	BM•E21W20	BM•E22W20	BM•E23W20
Z02 (2NC)	BM•E21Z02	BM•E22Z02	BM•E23Z02
X12 (1NO + 2NC)	BM•E21X12	BM•E22X12	BM•E23X12
X21 (2NO + 1NC)	BM•E21X21	BM•E22X21	BM•E23X21
W03 (3NC)	BM•E21W03	BM•E22W03	BM•E23W03
W30 (3NO)	BM•E21W30	BM•E22W30	BM•E23W30

Operation diagrams: page 113 - All dimensions are in mm

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

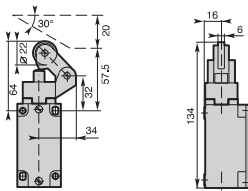


Contact Blocks

Z11 (1NO + 1NC)	BM•E31Z11	BM•E32Z11	BM•E33Z11	BM•E41Z11	BM•E42Z11
X11 (1NO + 1NC)	BM•E31X11	BM•E32X11	BM•E33X11	BM•E41X11	BM•E42X11
Y11 (1NO + 1NC)	BM•E31Y11	BM•E32Y11	BM•E33Y11	BM•E41Y11	BM•E42Y11
W02 (2NC)	BM•E31W02	BM•E32W02	BM•E33W02	BM•E41W02	BM•E42W02
W20 (2NO)	BM•E31W20	BM•E32W20	BM•E33W20	BM•E41W20	BM•E42W20
Z02 (2NC)	BM•E31Z02	BM•E32Z02	BM•E33Z02	BM•E41Z02	BM•E42Z02
X12 (1NO + 2NC)	BM•E31X12	BM•E32X12	BM•E33X12	BM•E41X12	BM•E42X12
X21 (2NO + 1NC)	BM•E31X21	BM•E32X21	BM•E33X21	BM•E41X21	BM•E42X21
W03 (3NC)	BM•E31W03	BM•E32W03	BM•E33W03	BM•E41W03	BM•E42W03
W30 (3NO)	BM•E31W30	BM•E32W30	BM•E33W30	BM•E41W30	BM•E42W30

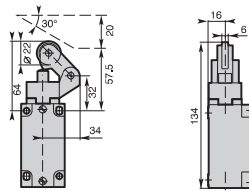
E3• - One way lever

E31: Ø22 nylon roller E32: Ø22 stainless steel roller



Min. actuating force **12N (40N ⇄)**
Weight **280 g**

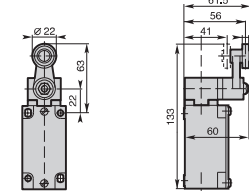
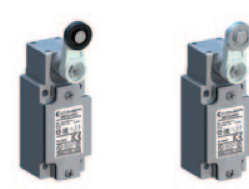
E33 - One way lever Ø22 steel ball bearing



Min. actuating force **12N (40N ⇄)**
Weight **280 g**

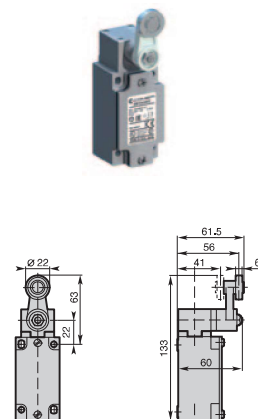
E4• - Ø22 roller lever

E41: Ø22 nylon roller E42: Ø22 stainless steel roller



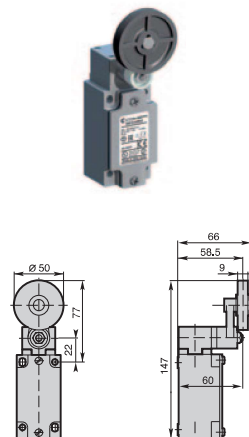
Conformity **EN50041**
Min. actuating torque **0,15Nm (0,30Nm ⇄)**
Weight **300 g**

E43 - Ø22 roller lever steel ball bearing



Conformity **EN50041**
Min. actuating torque **0,15Nm (0,30Nm ⇄)**
Weight **300 g**

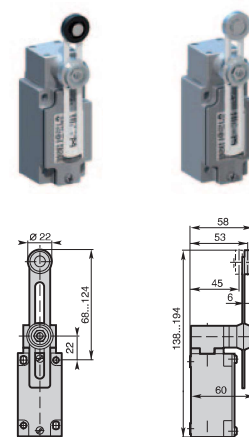
E44 - Ø50 rubber roller lever



Min. actuating torque **0,15Nm (0,30Nm ⇄)**
Weight **315 g**

E5• - Adjustable Ø22 roller lever

E51: nylon roller E52: stainless steel roller



Min. actuating torque **0,15Nm (0,30Nm ⇄)**
Weight **320 g**

Contact Blocks

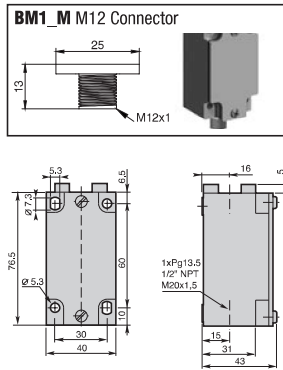
Z11 (1NO + 1NC)	BM•E43Z11	BM•E44Z11	BM•E51Z11	BM•E52Z11
X11 (1NO + 1NC)	BM•E43X11	BM•E44X11	BM•E51X11	BM•E52X11
Y11 (1NO + 1NC)	BM•E43Y11	BM•E44Y11	BM•E51Y11	BM•E52Y11
W02 (2NC)	BM•E43W02	BM•E44W02	BM•E51W02	BM•E52W02
W20 (2NO)	BM•E43W20	BM•E44W20	BM•E51W20	BM•E52W20
Z02 (2NC)	BM•E43Z02	BM•E44Z02	BM•E51Z02	BM•E52Z02
X12 (1NO + 2NC)	BM•E43X12	BM•E44X12	BM•E51X12	BM•E52X12
X21 (2NO + 1NC)	BM•E43X21	BM•E44X21	BM•E51X21	BM•E52X21
W03 (3NC)	BM•E43W03	BM•E44W03	BM•E51W03	BM•E52W03
W30 (3NO)	BM•E43W30	BM•E44W30	BM•E51W30	BM•E52W30

Operation diagrams: page 113 - All dimensions are in mm

Metal Casing IP66 - 40 mm. width

Electrical connection:

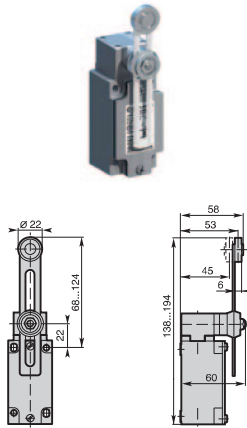
- BM1:** one cable inlet for PG 13,5 Cable Gland
- BM2:** one cable inlet for 1/2" NPT Cable Gland
- BM5:** one cable inlet for M20 x 1,5 Cable Gland



Contact Blocks

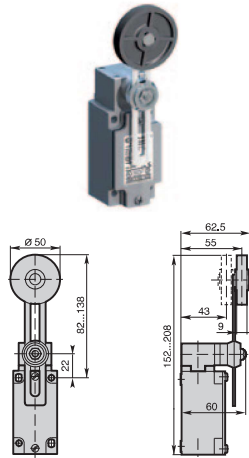
Z11 (1NO + 1NC)	BM•E53Z11	BM•E54Z11	BM•E61Z11
X11 (1NO + 1NC)	BM•E53X11	BM•E54X11	BM•E61X11
Y11 (1NO + 1NC)	BM•E53Y11	BM•E54Y11	BM•E61Y11
W02 (2NC)	BM•E53W02	BM•E54W02	BM•E61W02
W20 (2NO)	BM•E53W20	BM•E54W20	BM•E61W20
Z02 (2NC)	BM•E53Z02	BM•E54Z02	BM•E61Z02
X12 (1NO + 2NC)	BM•E53X12	BM•E54X12	BM•E61X12
X21 (2NO + 1NC)	BM•E53X21	BM•E54X21	BM•E61X21
W03 (3NC)	BM•E53W03	BM•E54W03	BM•E61W03
W30 (3NO)	BM•E53W30	BM•E54W30	BM•E61W30

E53 - Adjustable Ø22 roller lever with steel ball bearing



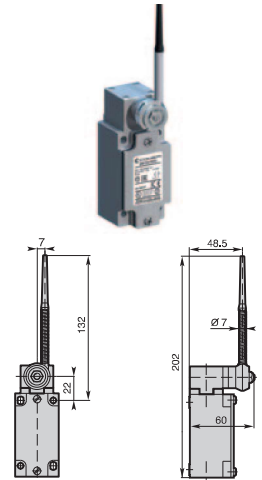
Min. actuating torque **0,15Nm (0,30Nm ⇄)**
Weight **320 g**

E54 - Adjustable Ø50 rubber roller lever



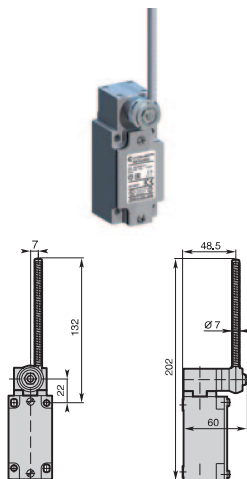
Min. actuating torque **0,15Nm (0,30Nm ⇄)**
Weight **325 g**

E61 - Nylon actuator with stainless steel spring



Min. actuating torque **0,15Nm**
Weight **305 g**

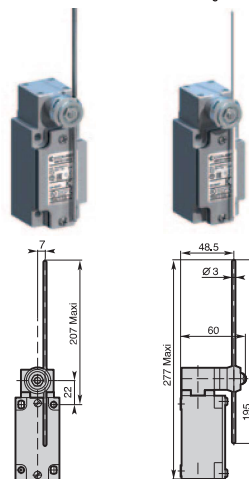
E62 - Stainless steel spring actuator



Min. actuating torque **0,15Nm**
Weight **310 g**

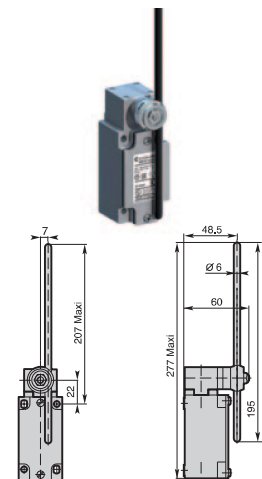
E7 - Adjustable Ø3 rod lever

E71: stainless steel rod E73: fiberglass rod



Conformity EN50041
Min. actuating torque **0,15Nm (0,30Nm ⇄)**
Weight **305 g**

E72 - Adjustable Ø6 nylon rod lever



Conformity EN50041
Min. actuating torque **0,15Nm (0,30Nm ⇄)**
Weight **300 g**

Contact Blocks

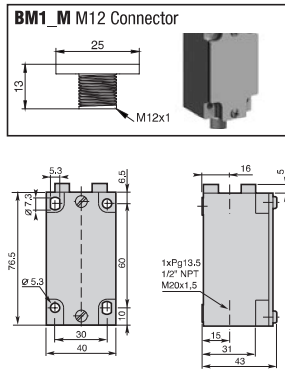
Z11 (1NO + 1NC)	BM•E62Z11	BM•E71Z11	BM•E73Z11	BM•E72Z11
X11 (1NO + 1NC)	BM•E62X11	BM•E71X11	BM•E73X11	BM•E72X11
Y11 (1NO + 1NC)	BM•E62Y11	BM•E71Y11	BM•E73Y11	BM•E72Y11
W02 (2NC)	BM•E62W02	BM•E71W02	BM•E73W02	BM•E72W02
W20 (2NO)	BM•E62W20	BM•E71W20	BM•E73W20	BM•E72W20
Z02 (2NC)	BM•E62Z02	BM•E71Z02	BM•E73Z02	BM•E72Z02
X12 (1NO + 2NC)	BM•E62X12	BM•E71X12	BM•E73X12	BM•E72X12
X21 (2NO + 1NC)	BM•E62X21	BM•E71X21	BM•E73X21	BM•E72X21
W03 (3NC)	BM•E62W03	BM•E71W03	BM•E73W03	BM•E72W03
W30 (3NO)	BM•E62W30	BM•E71W30	BM•E73W30	BM•E72W30

Operation diagrams: page 113 - All dimensions are in mm

Metal Casing IP66 - 40 mm. width

Electrical connection:

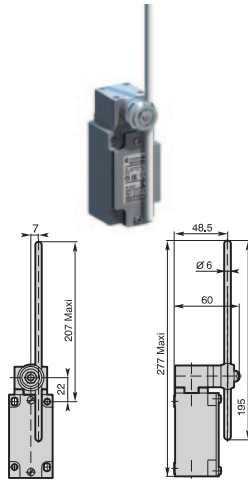
- BM1:** one cable inlet for PG 13,5 Cable Gland
- BM2:** one cable inlet for 1/2" NPT Cable Gland
- BM5:** one cable inlet for M20 x 1,5 Cable Gland



Contact Blocks

Z11 (1NO + 1NC)	BM•E74Z11	BM•E75Z11	BM•E91Z11
X11 (1NO + 1NC)	BM•E74X11	BM•E75X11	BM•E91X11
Y11 (1NO + 1NC)	BM•E74Y11	BM•E75Y11	BM•E91Y11
W02 (2NC)	BM•E74W02	BM•E75W02	BM•E91W02
W20 (2NO)	BM•E74W20	BM•E75W20	BM•E91W20
Z02 (2NC)	BM•E74Z02	BM•E75Z02	BM•E91Z02
X12 (1NO + 2NC)	BM•E74X12	BM•E75X12	BM•E91X12
X21 (2NO + 1NC)	BM•E74X21	BM•E75X21	BM•E91X21
W03 (3NC)	BM•E74W03	BM•E75W03	BM•E91W03
W30 (3NO)	BM•E74W30	BM•E75W30	BM•E91W30

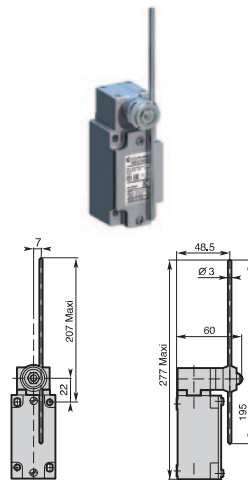
E74 - Adjustable Ø6 fiberglass rod lever



Conformity EN50041

Min. actuating torque 0,15Nm (0,30Nm ⇄)
Weight 300 g

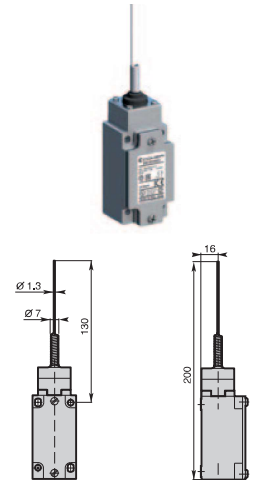
E75 - Adjustable 3x3 square steel rod lever



Conformity EN50041

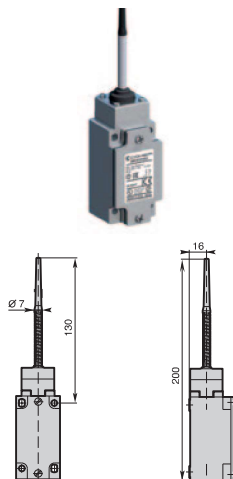
Min. actuating torque 0,15Nm (0,30Nm ⇄)
Weight 305 g

E91 - Stainless steel spring multidirectional actuator



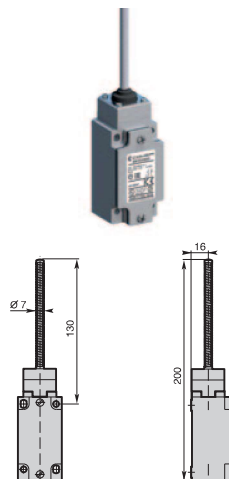
Min. actuating torque 0,18Nm
Weight 230 g

E92 - Multidirectional nylon actuator with stainless steel spring



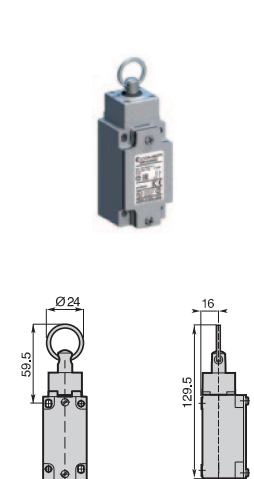
Min. actuating torque 0,18Nm
Weight 230 g

E93 - Stainless steel spring multidirectional actuator



Min. actuating torque 0,18Nm
Weight 235 g

E99 - Pull action with ring



Min. actuating force 25N
Weight 245 g

Contact Blocks

Z11 (1NO + 1NC)	BM•E92Z11	BM•E93Z11	BM•E99Z11A
X11 (1NO + 1NC)	BM•E92X11	BM•E93X11	BM•E99X11A
Y11 (1NO + 1NC)	BM•E92Y11	BM•E93Y11	BM•E99Y11A
W02 (2NC)	BM•E92W02	BM•E93W02	BM•E99W02A
W20 (2NO)	BM•E92W20	BM•E93W20	BM•E99W20A
Z02 (2NC)	BM•E92Z02	BM•E93Z02	
X12 (1NO + 2NC)	BM•E92X12	BM•E93X12	BM•E99X12A
X21 (2NO + 1NC)	BM•E92X21	BM•E93X21	BM•E99X21A
W03 (3NC)	BM•E92W03	BM•E93W03	BM•E99W03A
W30 (3NO)	BM•E92W30	BM•E93W30	BM•E99W30A

Operation diagrams: page 113 - All dimensions are in mm