

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 of reinforced UL-V0 thermoplastic fiber-glass, offer double insulation and a degree of protection of IP65.

The casing come in 3 dimension: – AP... 30 mm. width – BP... 40 mm. width – DP... 50 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

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

Contact Block:

- Contact configuration: NO + NC, 2 NO, 2 NC, 2NO + 1NC, 1NO + 2NC, 3NC, 3NO (only for BP series)
- 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 ø 3 screws for 30 and 50 mm width.
Assembled using 4 x ø 4 screws for 40 mm width.

Cover:

- Closed using ø 3 screw for 30 and 50 mm width.
- Self clipping closure for 40 mm width.

One piece sealing gasket to ensure tightness.

Electrical connection:

- 1 x cable gland for AP series
- 1 x cable gland for BP series
- 2 x cable gland for DP series

Symbols

Example:

A	P	1	T	41	Z	1	1
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Structure:

	P						
--	---	--	--	--	--	--	--

Casing width: A = 30 mm width + 1 cable inlet B = 40 mm width + 1 cable inlet D = 50 mm width + 2 cable inlets		
Plastic 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 AP and DP series) 4: cable inlets for M16 x 1,5 cable gland (only for AP and DP series) 5: cable inlets for M20 x 1,5 cable gland		
Plastic heads T: for AP and DP series H: for BP series only		
Operating heads: codes 10 - 9999		
	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: Snap action W: Slow action (contact dependent) X: Slow action non-overlapping late make Y: Slow action overlapping early make	

* In AP... and DP... series, the 1/2" NPT thread is obtained by the use of a plastic adapter (delivered not mounted).

General Technical Data

Standards		Plastic Casing	
		Devices conform with international IEC 60947-5-1 and European EN 60947-5-1 standards	
Certifications - Approvals			
Air temperature near the device			
- during operation	°C	- 25 ... + 70	
- for storage	°C	- 30 ... + 80	
Climatic withstand		According to IEC 60068-2-3 and salty mist according to IEC 60068-2-11	
Mounting positions		All positions are authorised	
Shock withstand (according to IEC 60068-2-27 and EN 60068-2-27)		50g* (1/2 sinusoidal shock for 11 ms) no change in contact position	
Resistance to vibrations (acc. to IEC 60068-2-6 and EN 60068-2-6)		25g (10 ... 500 Hz) no change in position of contacts greater than 100 µs	
Protection against electrical shocks (acc. to IEC 60536)		Class II	
Degree of protection (according to IEC 60529 and EN 60529)		IP 65	
Consistency (measured over 1 million operations)		0.1 mm (upon closing point)	
Minimum actuation speed		Slow action contacts 0.060 / Snap action contacts 0.001	

Electrical Data

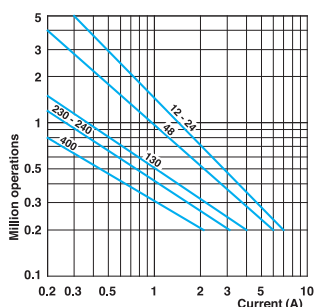
Rated insulation voltage U_i		500 V (degree of pollution 3) (400 V for contacts type Z02, X12P, X21P, W03P)										
- according to IEC 60947-1 and EN 60947-1		A 600, Q 600 (A 300, Q 300 for contacts type X12P, X21P, W03P)										
- according to UL 508 and CSA C22-2 n° 14												
Rated impulse withstand voltage U_{imp}		6 (4kV for contacts type X12P, X21P, W03P)										
(according to IEC 60947-1 and EN 60947-1)												
Conventional free air thermal current I_{th}		10										
(according to IEC 60947-5-1) $\theta < 40$ °C												
Short-circuit protection		10										
$U_e < 500$ V a.c. - gG (gl) type fuses												
Rated operational current												
I_e / AC-15 (according to IEC 60947-5-1)	24 V - 50/60 Hz	A	10									
	120 V - 50/60 Hz	A	6									
	400 V - 50/60 Hz	A	4									
I_e / DC-13 (according to IEC 60947-5-1)	24 V - d.c.	A	6									
	125 V - d.c.	A	0.55									
	250 V - d.c.	A	0.4									
Switching frequency		3600										
Cycles/h												
Load factor		0.5										
Resistance between contacts		25										
mΩ												
Connecting terminals		M3.5 (+, -) pozidriv 2 screw with cable clamp (M3 for 3 poles contacts type)										
Terminal for protective conductor		-										
Connecting capacity		0.75 ... 2.5 (0.34... 1.5 for 3 poles contacts type)										
1 or 2 x mm ²												
Terminal marking		According to IEC 60947-5-1										
Mechanical durability		<table border="0"> <tr> <td>Millions of operations</td> <td>15 } AP•T { 10...12; 30...34; 38</td> <td>30 } BP•H { 11...13; 31...33</td> </tr> <tr> <td></td> <td>10 } DP•T { 13; 41...48; 51...55; 61...75</td> <td>25 } { 41...44; 51...54; 61...75</td> </tr> <tr> <td></td> <td>>5 } { 14; 35; 36; 39; 91...93; 98</td> <td>10 } { 14; 19; 35...37; 91...93</td> </tr> </table>		Millions of operations	15 } AP•T { 10...12; 30...34; 38	30 } BP•H { 11...13; 31...33		10 } DP•T { 13; 41...48; 51...55; 61...75	25 } { 41...44; 51...54; 61...75		>5 } { 14; 35; 36; 39; 91...93; 98	10 } { 14; 19; 35...37; 91...93
Millions of operations	15 } AP•T { 10...12; 30...34; 38	30 } BP•H { 11...13; 31...33										
	10 } DP•T { 13; 41...48; 51...55; 61...75	25 } { 41...44; 51...54; 61...75										
	>5 } { 14; 35; 36; 39; 91...93; 98	10 } { 14; 19; 35...37; 91...93										
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 AP/DP•T42, T52, T5200, T55 and T5500: 25 g.

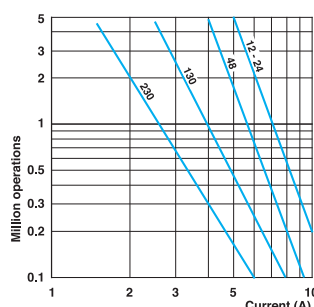
IMQ listed values

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

Electrical Connection

BP1: one cable inlet for PG 13,5 Cable Gland

BP2: one cable inlet for 1/2" NPT Cable Gland

BP5: one cable inlet for M20 x 1,5 Cable Gland



Operating Head Type

H11 - Plain steel plunger

H12 - Steel ball plunger

H13 - Steel roller plunger

Conformity / (N.C. contact with positive opening operation)
 Max actuation speed [m/s]
 Min. force [N] or torque [Nm]: actuation / positive opening operation

EN 50041

0,5
14 / 40



EN 50041

0,5
14 / 40



EN 50041

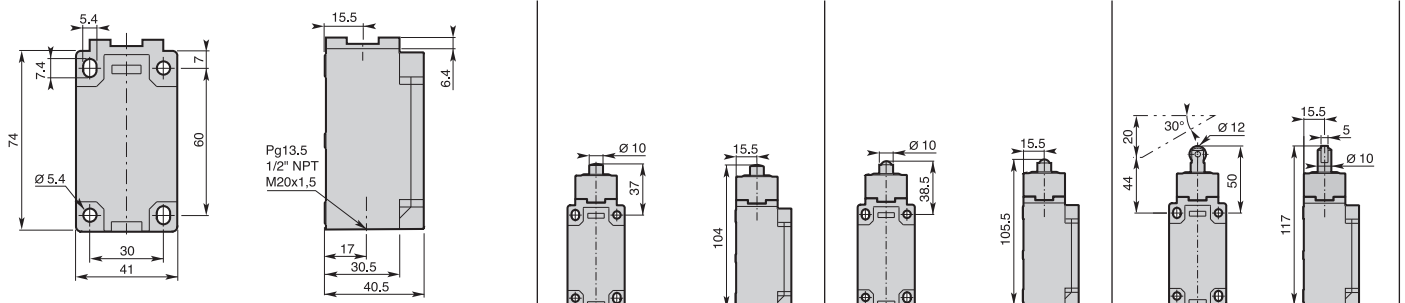
0,5
14 / 40



Additional Technical Datas

Z11 Snap Action Contacts (1NO + 1NC)		Order Code Operation Diagram						
X11 Non overlapping Slow Action Contacts (1NO + 1NC)		Order Code Operation Diagram						
Y11 Overlapping Slow Action Contacts (1NO + 1NC)		Order Code Operation Diagram						
W02 Slow Action Contacts (2NC)		Order Code Operation Diagram						
W20 Slow Action Contacts (2NO)		Order Code Operation Diagram						
Z02 Snap Action Contacts (2NC)		Order Code Operation Diagram						
X12 Non overlapping Slow Action Contacts (1NO + 2NC)		Order Code Operation Diagram						
X21 Non overlapping Slow Action Contacts (2NO + 1NC)		Order Code Operation Diagram						
W03 Simultaneous Slow Action Contacts (3NC)		Order Code Operation Diagram						
W30 Simultaneous Slow Action Contacts (3NO)		Order Code Operation Diagram						
Weight (packing per unit)		[kg]	0,145	0,145	0,150			

Dimensions (in mm)





H14 - Plain steel plunger with dust protection cup

H19 - Steel roller plunger with dust protection cup

H3• - One way lever

H3• - One way lever with dust protection cup

H4• - Ø 22 roller lever

H31: Ø22 nylon roller
H32: Ø22 stainless steel roller
H33: Ø22 steel ball bearing

H35: Ø22 nylon roller
H36: Ø22 stainless steel roller
H37: Ø22 steel ball bearing

H41: nylon roller
H42: stainless steel roller
H43: steel ball bearing

EN 50041

0,5
14 / 40



EN 50041

0,5
14 / 40



1,0
8 / 30



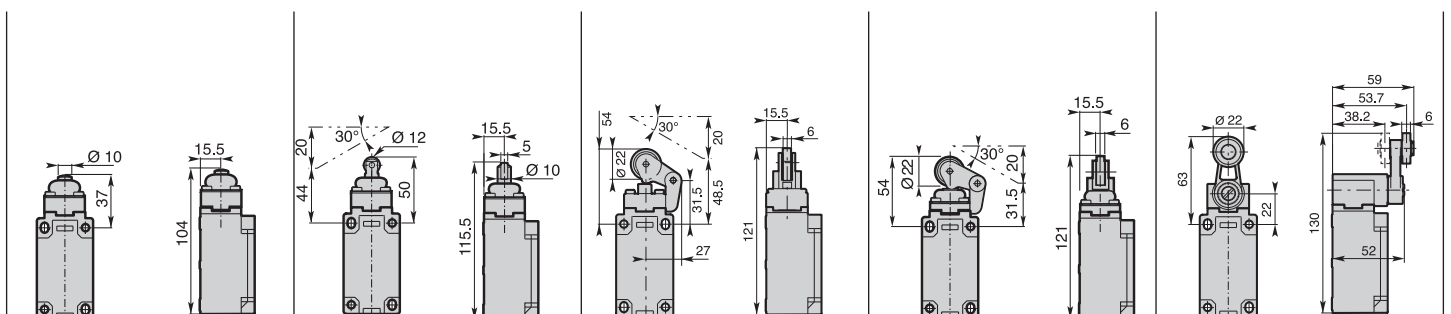
1,0
8 / 30



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



<p>BP•H14Z11</p>	<p>BP•H19Z11</p>	<p>BP•H3•Z11</p>	<p>BP•H3•Z11</p>	<p>BP•H4•Z11</p>
<p>BP•H14X11</p>	<p>BP•H19X11</p>	<p>BP•H3•X11</p>	<p>BP•H3•X11</p>	<p>BP•H4•X11</p>
<p>BP•H14Y11</p>	<p>BP•H19Y11</p>	<p>BP•H3•Y11</p>	<p>BP•H3•Y11</p>	<p>BP•H4•Y11</p>
<p>BP•H14W02</p>	<p>BP•H19W02</p>	<p>BP•H3•W02</p>	<p>BP•H3•W02</p>	<p>BP•H4•W02</p>
<p>BP•H14W20</p>	<p>BP•H19W20</p>	<p>BP•H3•W20</p>	<p>BP•H3•W20</p>	<p>BP•H4•W20</p>
<p>BP•H14Z02</p>	<p>BP•H19Z02</p>	<p>BP•H3•Z02</p>	<p>BP•H3•Z02</p>	<p>BP•H4•Z02</p>
<p>BP•H14X12</p>	<p>BP•H19X12</p>	<p>BP•H3•X12</p>	<p>BP•H3•X12</p>	<p>BP•H4•X12</p>
<p>BP•H14X21</p>	<p>BP•H19X21</p>	<p>BP•H3•X21</p>	<p>BP•H3•X21</p>	<p>BP•H4•X21</p>
<p>BP•H14W03</p>	<p>BP•H19W03</p>	<p>BP•H3•W03</p>	<p>BP•H3•W03</p>	<p>BP•H4•W03</p>
<p>BP•H14W30</p>	<p>BP•H19W30</p>	<p>BP•H3•W30</p>	<p>BP•H3•W30</p>	<p>BP•H4•W30</p>
0,145	0,150	0,185	0,180	0,200



Electrical Connection

BP1: one cable inlet for PG 13,5 Cable Gland

BP2: one cable inlet for 1/2" NPT Cable Gland

BP5: one cable inlet for M20 x 1,5 Cable Gland



Operating Head Type

H44 - Ø 50 rubber roller lever

H5 - Adjustable Ø 22 roller lever

H54 - Adjustable Ø 50 rubber roller lever

H51: nylon roller
H52: stainless steel roller
H53: steel ball bearing

Conformity / (N.C. contact with positive opening operation)
Max actuation speed [m/s]
Min. force [N] or torque [Nm]: actuation / positive opening operation

1,5
0,15 / 0,30

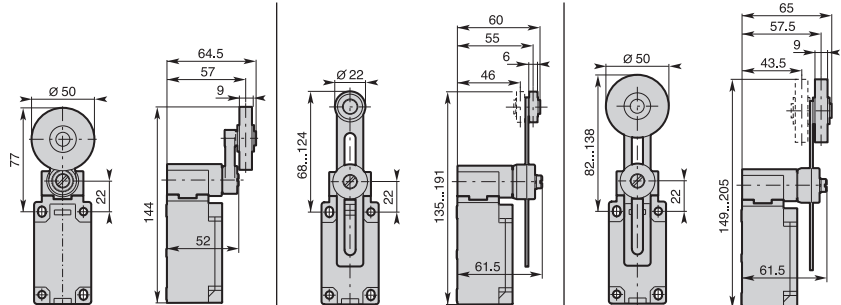
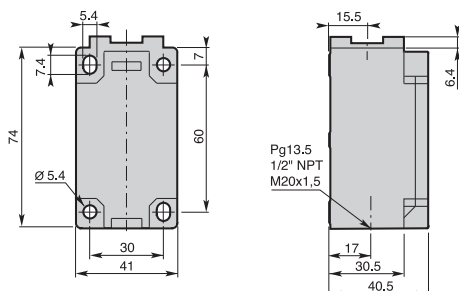
1,5
0,15 / 0,30

1,5
0,15 / 0,30

Additional Technical Datas

Order Code	Operation Diagram	BP•H44Z11	BP•H5•Z11	BP•H54Z11
Z11 Snap Action Contacts (1NO + 1NC)				
X11 Non overlapping Slow Action Contacts (1NO + 1NC)				
Y11 Overlapping Slow Action Contacts (1NO + 1NC)				
W02 Slow Action Contacts (2NC)				
W20 Slow Action Contacts (2NO)				
Z02 Snap Action Contacts (2NC)				
X12 Non overlapping Slow Action Contacts (1NO + 2NC)				
X21 Non overlapping Slow Action Contacts (2NO + 1NC)				
W03 Simultaneous Slow Action Contacts (3NC)				
W30 Simultaneous Slow Action Contacts (3NO)				
Weight (packing per unit)	[kg]	0,205	0,195	0,205

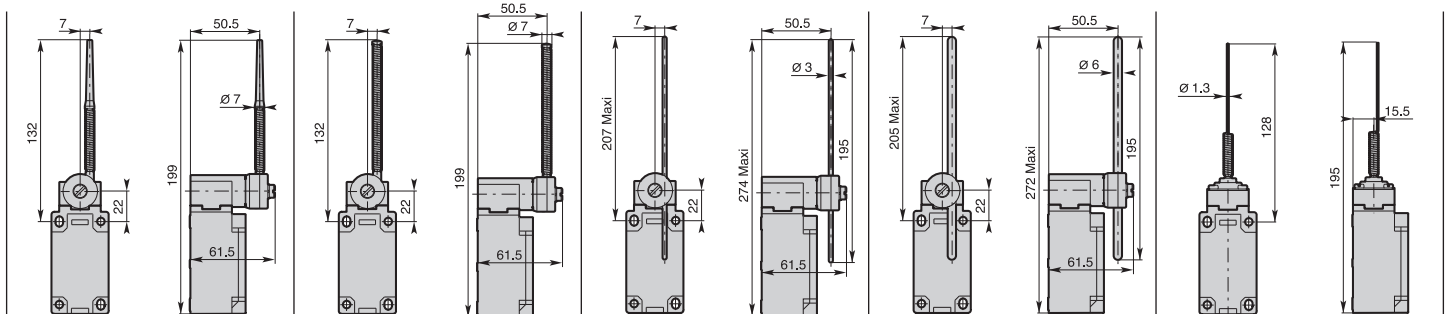
Dimensions (in mm)





H61 - Nylon actuator with stainless steel spring	H62 - Stainless steel spring actuator	H7 - Adjustable rod lever H71: stainless steel rod Ø3 H73: fiberglass rod Ø3 H75: square steel rod 3x3	H7 - Adjustable Ø 6 rod lever H72: nylon rod H74: fiberglass rod	H91 - Stainless steel spring multidirectional actuator
1,5 0,15 / -	1,5 0,15 / -	EN 50041 1,5 0,15 / 0,30	EN 50041 1,5 0,15 / 0,30	1,0 0,18 / -

BP•H61Z11 0 19° 31° 90°	BP•H62Z11 0 19° 31° 90°	BP•H7•Z11 0 19° 31° 47° 90°	BP•H7•Z11 0 19° 31° 47° 90°	BP•H91Z11 0 15° 27°
BP•H61X11 0 21° 90° 30°	BP•H62X11 0 21° 90° 30°	BP•H7•X11 0 21° 37° 90° 30°	BP•H7•X11 0 21° 37° 90° 30°	BP•H91X11 0 18° 25°
BP•H61Y11 0 34° 90° 19°	BP•H62Y11 0 34° 90° 19°	BP•H7•Y11 0 34° 50° 90° 19°	BP•H7•Y11 0 34° 50° 90° 19°	BP•H91Y11 0 30° 17°
BP•H61W02 0 19° 90° 11-12 21-22 13-14	BP•H62W02 0 19° 90° 11-12 21-22 13-14	BP•H7•W02 0 19° 35° 90° 11-12 21-22 13-14	BP•H7•W02 0 19° 35° 90° 11-12 21-22 13-14	BP•H91W02 0 17° 11-12
BP•H61W20 0 18° 90° 13-14 23-24	BP•H62W20 0 18° 90° 13-14 23-24	BP•H7•W20 0 18° 90° 13-14 23-24	BP•H7•W20 0 18° 90° 13-14 23-24	BP•H91W20 0 16° 13-14 23-24
BP•H61Z02 0 19° 30° 90° 11-12 21-22 13-14	BP•H62Z02 0 19° 30° 90° 11-12 21-22 13-14	BP•H7•Z02 0 19° 30° 46° 90° 11-12 21-22 13-14	BP•H7•Z02 0 19° 30° 46° 90° 11-12 21-22 13-14	BP•H91Z02 0 15° 26° 11-12 21-22 13-14
BP•H61X12 0 16° 90° 21-22 31-32 13-14	BP•H62X12 0 16° 90° 21-22 31-32 13-14	BP•H7•X12 0 16° 33° 90° 21-22 31-32 13-14	BP•H7•X12 0 16° 33° 90° 21-22 31-32 13-14	BP•H91X12 0 15° 21-22 31-32 13-14
BP•H61X21 0 17° 90° 31-32 23-24 13-14	BP•H62X21 0 17° 90° 31-32 23-24 13-14	BP•H7•X21 0 17° 34° 90° 31-32 23-24 13-14	BP•H7•X21 0 17° 34° 90° 31-32 23-24 13-14	BP•H91X21 0 16° 31-32 13-14 23-24
BP•H61W03 0 16° 90° 31-32 13-14 23-24	BP•H62W03 0 16° 90° 31-32 13-14 23-24	BP•H7•W03 0 16° 33° 90° 31-32 13-14 23-24	BP•H7•W03 0 16° 33° 90° 31-32 13-14 23-24	BP•H91W03 0 15° 11-12 21-22 31-32
BP•H61W30 0 21° 90° 13-14 23-24 33-34	BP•H62W30 0 21° 90° 13-14 23-24 33-34	BP•H7•W30 0 21° 90° 13-14 23-24 33-34	BP•H7•W30 0 21° 90° 13-14 23-24 33-34	BP•H91W30 0 19° 13-14 23-24 33-34
0,190	0,195	0,185	0,185	0,150



Electrical Connection

BP1: one cable inlet for PG 13,5 Cable Gland

BP2: one cable inlet for 1/2" NPT Cable Gland

BP5: one cable inlet for M20 x 1,5 Cable Gland

Operating Head Type



H92 - Multidirectional nylon actuator with stainless steel spring



H93 - Stainless steel spring multidirectional actuator

Conformity / (N.C. contact with positive opening operation)
 Max actuation speed [m/s]
 Min. force [N] or torque [Nm]: actuation / positive opening operation

1,0
0,18 / -

1,0
0,18 / -

Additional Technical Datas

Z11 Snap Action Contacts (1NO + 1NC)		Order Code Operation Diagram	BP•H92Z11 	BP•H93Z11
X11 Non overlapping Slow Action Contacts (1NO + 1NC)		Order Code Operation Diagram	BP•H92X11 	BP•H93X11
Y11 Overlapping Slow Action Contacts (1NO + 1NC)		Order Code Operation Diagram	BP•H92Y11 	BP•H93Y11
W02 Slow Action Contacts (2NC)		Order Code Operation Diagram	BP•H92W02 	BP•H93W02
W20 Slow Action Contacts (2NO)		Order Code Operation Diagram	BP•H92W20 	BP•H93W20
Z02 Snap Action Contacts (2NC)		Order Code Operation Diagram	BP•H92Z02 	BP•H93Z02
X12 Non overlapping Slow Action Contacts (1NO + 2NC)		Order Code Operation Diagram	BP•H92X12 	BP•H93X12
X21 Non overlapping Slow Action Contacts (2NO + 1NC)		Order Code Operation Diagram	P•H92X21 	BP•H93X21
W03 Simultaneous Slow Action Contacts (3NC)		Order Code Operation Diagram	BP•H92W03 	BP•H93W03
W30 Simultaneous Slow Action Contacts (3NO)		Order Code Operation Diagram	BP•H92W30 	BP•H93W30
Weight (packing per unit)		[kg]	0,155	0,160

Dimensions (in mm)

