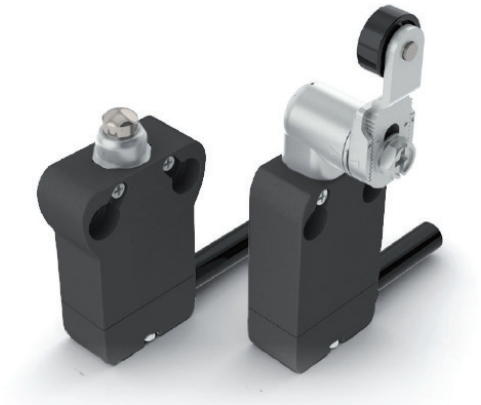
MA-MB-PA Modular Prewired Switches

- Metal housing, coated with baked UV resistant powder, cable output from right or bottom
- Saline smoke resistance: ≥ 300 hours in NSS according to ISO 9227
- 3 integrated cable types available
- Version with M12 connector from right or bottom, suitable for safety applications
- Protection degree IP67 & IP69K
- 14 contact blocks available
- 36 actuators available



CE cULus Approval UL: E146236

Always consistent with its innovation and the company quality targets, IMO Precision Controls Ltd introduces three new prewired switches series provided with innovative and unique characteristics. These products series are the result of four years research, development and testing; they fulfil new solutions requested by the market and they include more than twenty years company experience in the position switches sector. That's why we are proud to introduce the new MA, MB and PA in the IMO Precision Controls range.

Options & Ordering Codes

Note: The feasibility of a code number does not mean the effective availability of a product

MA S11 0 A2 – R B 2 G D7 H6 AT

Housing

metal, 20mm holes interaxes	**MA**
metal, 25mm holes interaxes	**MB**

Contact Blocks

1NO+1NC, snap action	**S11**
2NC, snap action	**S02**
1NO+2NC, snap action	**S12**
2NO+2NC, snap action	**S22**
1NO+1NC, slow action	**D11**
2NC, slow action	**D02**
1NO+2NC, slow action	**D12**
2NO+2NC, slow action	**D22**
1NO+1NC, slow action overlapped	**M11**
1NO+2NC, slow action overlapped	**M12**
2NO+2NC, slow action overlapped	**M22**
1NO+1NC, slow action closer	**C11**
1NO+2NC, slow action closer	**C12**
2NO+2NC, slow action closer	**C22**

Other Contact Blocks available on request

Actuation Heads

without head	**0**
head for revolving level actuators	**H**

Actuators

with short plunger	**A1**
with plunger	**A2**

Connection Output Direction

cable or connector from right	**R**
connector from bottom	**B**

Type of Cable

B	cable PVC IEC 60332-1 black (standard)
G	cable CEI 20-22 II grey
P	cable PUR halogen free grey
H	M12 connector

Cable Length

2	cable length 2 m (standard)
5	cable length 5 m
C	with connector

Other lengths available upon request

Contacts Type

	silver contacts (standard)
G	silver contacts gold plated 1 μm

Roller

	with Ø 18 mm plastic roller
D7	with Ø 14 mm plastic roller
D18	with Ø 18 mm plastic roller
D19	with Ø 22 mm plastic roller
D22	with Ø 20 mm plastic roller
D23	with Ø 14 mm stainless steel roller
D24	with Ø 20 mm stainless steel roller
D25	with Ø 35 mm plastic roller

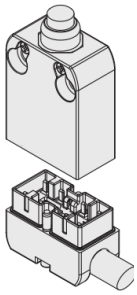
Utilisation Temperatures

	-25 °C ... +80 °C
H6	-40 °C ... +80 °C

Transmission Block

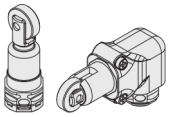
	without transmission block
AT	90° transmission block

Switches with connectors



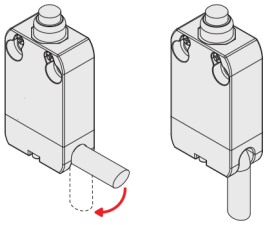
The main new characteristic of the IMO prewired switches is the capability of separating the switch body from the wiring thereby allowing the user to change a product without having to remove the field wiring. Moreover, this way it is easier to assemble and use products with different cable types and lengths.

New actuators



New actuators have been created for the MA, MB and PA, switch series which were not previously available from IMO.

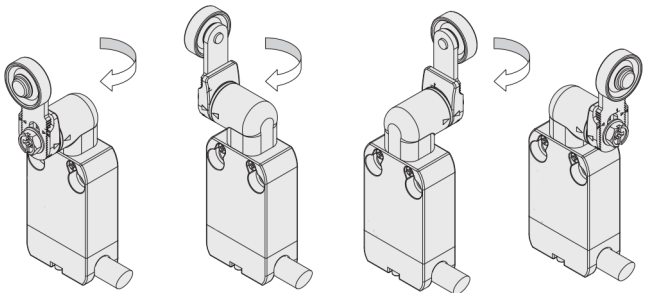
Adjustable cable output



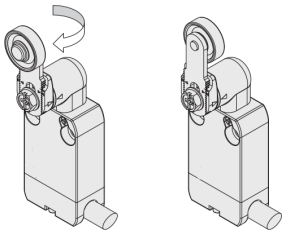
The wired connector is provided with the capability to allow cable bending to 90°, therefore allowing for installation very close to walls.

Rotating heads

All the heads can rotate in 90° steps. When using the revolving lever actuators, they have been designed with dimensions that allow the lever to be positioned such that it is possible to install these switches by a wall.



Rotating levers



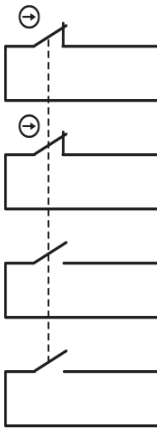
The levers on switches can be placed in “straight” or “reverse side”, whilst still maintaining the positive coupling, this way it is possible to obtain two further working positions of the lever.

Protection degree IP67 and IP69K

IP67
IP69K

These IMO MA, MB and PA series switches are all IP67 and IP69K rated.

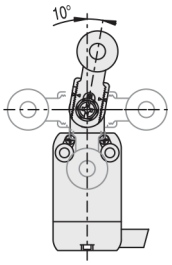
Positive opening contact blocks with 1-2-3-4 poles



The IMO contact blocks used within the MA, MB and PA switches are versatile and compact, and whilst occupying the same space as previous versions, it is now possible to have up to 4 different contacts, galvanically separated and provided with positive opening (NC contacts). Standard contact combinations available are 1NO+1NC, 2NC, 1NO+2NC and 2NO+2NC although other combinations are available upon request.

The contact blocks are designed so that they maintain the same connection positions in the connector independently of the type of action (slow, snap) and the number of contacts, therefore allowing the use of the same cable connector both for slow action and snap action contacts without crossing wires. Additionally, the above IMO design allows the use of cabled connectors to fit both, more contacts (e.g. 2NO+2NC) or fewer contacts (e.g. 1NO+1NC).

Adjustable levers



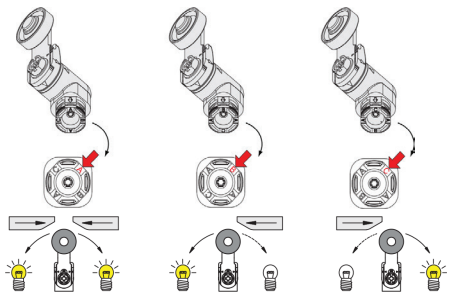
In switch models with a revolving lever actuator it is possible to adjust the lever in 10° steps for the whole 360° rotational range.

The positive movement transmission is always guaranteed thanks to the geometrical coupling between the lever and the revolving shaft which is designed to meet the safety requirements of the German standard BG-GS-ET-15.

Unidirectional heads

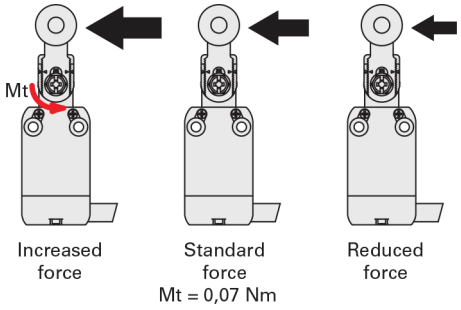
All the switches with revolving levers are supplied with a selector which allows the installer to choose the lever operating direction.

The following operations are possible: right-left (industrial standard set up), only from right or only from left. Selection at the directional operation is achieved by revolving a special ring nut inside this type of head.

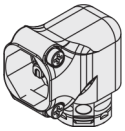


Increased or reduced actuating force

Based on the chosen actuator, many product variants are available, of these actuators with revolving levers are available upon request, with the ability to increase or decrease the actuating force. This feature allows for selection of a switch perfectly tailored for the application. For further information contact the IMO technical support team.

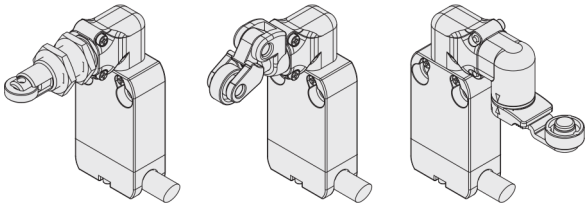


90° transmission block for actuators



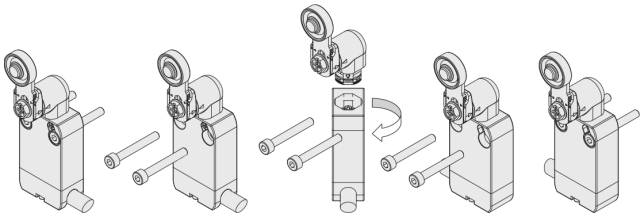
This component largely increases the new product's application possibilities. Actuators that can be attached directly to the switch body can also be fitted via the Transmission Block (PPH00-RA) increasing the positioning options and therefore the application possibilities. The Transmission Block can also be used with revolving lever heads as well as plunger heads

N.B. Even though it is possible with some actuators, it is not advisable to connect more than one Transmission Block to the same switch.



Reversible housing

The fixing holes and switch body design, added with the flexibility of the rotating head, make this switch perfectly symmetrical. If it is necessary to have the switch with cable output from left (the connector cannot be rotated), as opposed to the standard right exit, then it is possible to rotate the device completely, maintaining the unchanged actuator position.

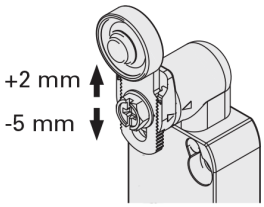


Extended temperature range

-40°C

The IMO MA, MB and PA range of switches are also available in a special version with an extended ambient operating temperature range of -40ºC to +80ºC. This is particularly useful for applications in cold stores, sterilisers and other low temperature environments.

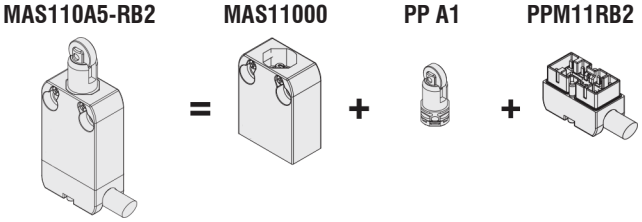
Adjustable levers with anti-vibration washer



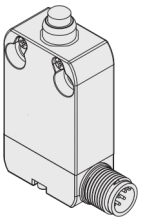
Even once mounted, installation tolerances sometimes require slight variation of the actuator positioning
The majority of revolving levers for MA, MB and PA switches can be adjusted for extension at 1mm intervals.
This feature, in conjunction with the the radial adjusting actuators provide unique flexibility of alignment whilst still maintaining the geometrical coupling between the lever and the revolving shaft as prescribed for in safety applications.

Switch components available separately

The IMO MA, MB and PA products are designed in a modular format, allowing the individual parts to be purchased separately giving stock flexibility for customers requiring spare parts, on-site changes or even new combinations.



4-8 poles M12 safety connectors ⊖



IMO Precision Controls Ltd experience in these switches has led to the development of the first 4-8 pole connector, integrated in a safety switch that complies with the requirements of EN 60947-5-1. The high insulation voltage (Ui 250 Vac) of the device allows these MA, MB and PA parts to be marked as suitable for safety applications with the ⊖ symbol (direct opening action).

Applications requiring personal protection

Only switches with ⊖ should be used in applications requiring personal protection. The safety circuit must always be connected to the NC contacts as stipulated in the standard EN 60947-5-1 annex K, para 2. The switch must be actuated by operational movement at least up to the positive travel indicated in the travel diagram; and actuated with a positive opening force (shown in the brackets underneath each part) that is on the line Min. force. All relevant standards to the application must be considered.

IMO

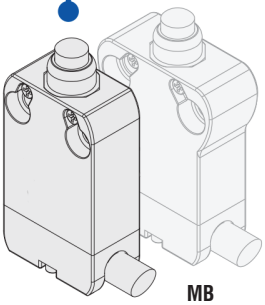
Selection diagram for articles MA-MB series sold assembled

ACTUATORS

0A1 Short plunger
0A2 Plunger
0A3 Long plunger
0A4 Plunger with external rubber gasket
0A5 Roller plunger
0A6 Roller plunger with external rubber gasket
0A7 Roller lever
0A8 Offset roller lever

0A2-AT Plunger
0A5-H0AT Roller plunger
0A5-AT Roller plunger
0B6-AT Spring rod with plastic pin
0B7-AT Spring rod
0B8-AT Spring rod with cat's whisker

HB9 Straight plastic revolving lever Ø 18 mm roller
HC1 Adjustable straight metal revolving lever Ø 18 mm roller
HC2 Adjustable shaped metal revolving lever Ø 14 mm roller
HC3 Adjustable shaped metal revolving lever Ø 14 mm roller
HC4 Adjustable shaped metal revolving lever Ø 20 mm roller
HC5 Adjustable straight metal revolving lever Ø 20 mm roller
HC6 Adjustable shaped metal revolving lever Ø 20 mm roller
HC7 Adjustable shaped metal revolving lever Ø 20 mm roller
HC8 Adjustable-length straight metal revolving lever Ø 20 mm roller



MA MB

CONTACT BLOCKS

on request

S11 1NO+1NC snap action
D11 1NO+1NC slow action
M11 1NO+1NC slow action overlapped
C11 1NO+1NC slow action closer

S02 2NC snap action
D02 2NC slow action

S12 1NO+2NC snap action
D12 1NO+2NC slow action
M12 1NO+2NC slow action overlapped
C12 1NO+2NC slow action closer

S22 2NO+2NC snap action
D22 2NO+2NC slow action
M22 2NO+2NC slow action overlapped
C22 2NO+2NC slow action closer

CONNECTORS

RHC M12 connector from right
BHC M12 connector from bottom

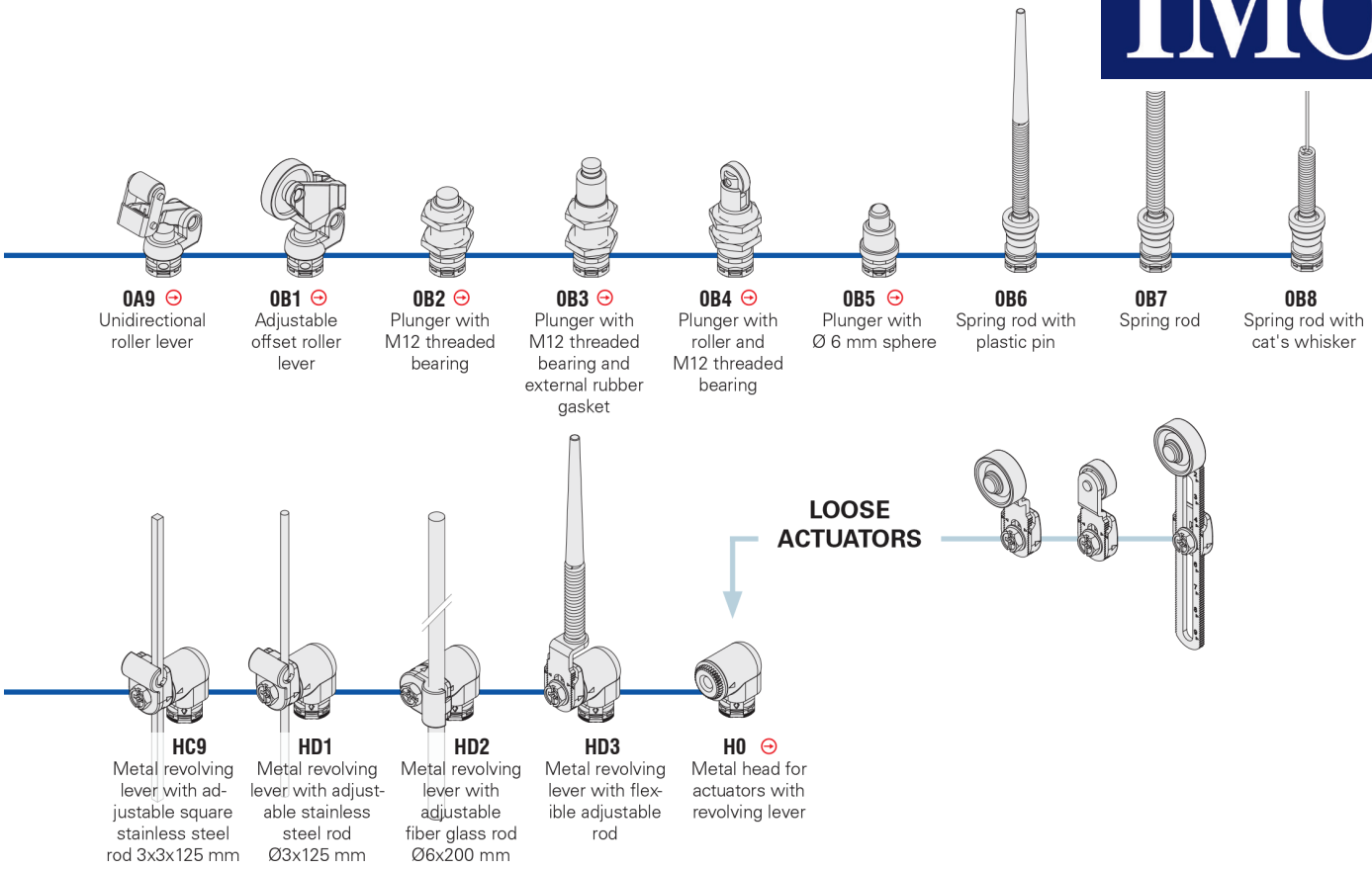
CABLES

connector with cable

RB	cable PVC IEC 60332-1 black (standard)
RG	cable CEI 20-22 II grey
RP	cable PUR halogen free grey

product option

accessory sold separately



General Data

Utilisation temperatures:	See table on next page
Max. operating frequency	3600 operations cycles*/hour
Mechanical endurance	20 million operation cycles*
Assembling position:	any

* One operation cycle means two movements, one to close and one to open contacts, as foreseen by EN 60947- 5-1 standard.

Data type approved by UL

Utilization categories: R300 pilot duty (28 VA, 125-250 Vdc), B300 pilot duty (360 VA, 120-240 Vac)

Data of the housing type 1, 4X “indoor use only”, 12

In conformity with standard: UL 508

In conformity with standards:

IEC 60947-5-1, EN 60947-5-1, IEC 60204-1, EN 60204-1, EN 1088, EN ISO 12100-1, EN ISO 12100-2, IEC 529, EN 60529, NFC 63-140, VDE 0660-200, VDE 0113

In conformity with requirements requested by:

Low Voltage Directive 2006/95/EC, Machinery Directive 2006/42/EC and Electromagnetic Compatibility 2004/108/EC.

Positive contact opening in conformity with standards:

IEC 60947-5-1, EN 60947-5-1, VDE 0660-206.

⚠ Installation for persons protection applications:

Use only switches marked with the symbol ⊖. The safety circuit must always be connected with the contacts NC as stated in the standard EN 60947-5-1, encl. K, par. 2. The switch must be actuated with at least up to the positive opening travel indicated in the travel diagrams. The switch must be actuated at least with the positive opening force, shown in brackets, underneath each article, near the value of the min. force. All enforceable standards must be respected.

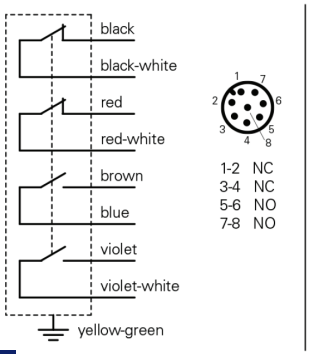
⚠ Attention: switch off the circuit voltage before disconnecting the connector from the switch. The connector is not suitable for sectioning of electrical loads. According to EN 60204-1, versions with 8 poles M12 connector can be used only in circuits PELV.

Utilisation temperatures and electrical data:

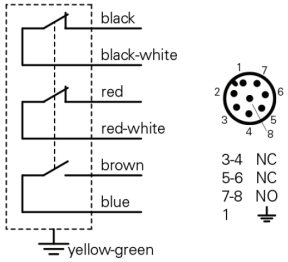
			output with cable								output with connector M12		Output with AMP connector
			2 contacts versions				3 contacts versions		4 contacts versions		2 contacts versions	3/4 contacts versions	2 contacts versions
			Cable type B 5x0,75 mm², Sheath PVC H05VV-F, Not flame-spreading IEC 60332-1-2 IEC 60332-1-3	Cable type G 5x0,75 mm², Sheath PVC S05VV-F, Not flame-spreading IEC 60332-1-2 IEC 60332-1-3 IEC 60332-3 CEI 20-22 II	Cable type P 5x0,75 mm², Max Speed 100 m/min Max Acceleration 2 m/s², Sheath PUR HALO-GEN FREE Not flame-spreading IEC 60332-1-2 IEC 60332-1-3	Cable type R 5x0,5mm², Cable for railway applications EN50306-4 1E-300V-5x0,5 mm² MM-90, According to: EN 50306-4 EN 45555 Not flame-spreading: IEC 60332-1 EN 50305 EN 50306-1	Cable type B 7x0,5 mm², Sheath PVC H05VV-F, Not flame-spreading IEC 60332-1-2 IEC 60332-1-3	Cable type P 7x0,5 mm², Max Speed 300 m/min Max Acceleration 25 m/s², Sheath PUR HALO-GEN FREE Not flame-spreading IEC 60332-1-2 IEC 60332-1-3	Cable type B 9x0,34 mm², Sheath PVC H05VV-F, Not flame-spreading IEC 60332-1-2 IEC 60332-1-3	Cable type R 9x0,5mm², Cable for railway applications EN50306-4 1P-300V-9x0,5 mm² MM-90, According to: EN 50306-4 EN 45555 Not flame-spreading: IEC 60332-1 EN 50305 EN 50306-1	5 poles M12 connector	8 poles M12 connector	AMP super seal 1,5 connector
			Min. bend radius: 72 mm	Min. bend radius: 72 mm	Min. bend radius: 70 mm Without halogens Oil-resistant IEC 60811-2-1	Min. bend radius: 60 mm	Min. bend radius 108 mm	Min. bend radius: 108 mm Without halogens Oil-resistant IEC 60811-2-1	Min. bend radius: 94 mm	Min. bend radius: 60 mm			
			Copper class 5 IEC 60228	Copper class 5 IEC 60228	Copper class 6 IEC 60228	Copper class 5 IEC 60228	Copper class 5 IEC 60228	Copper class 6 IEC 60228	Copper class 5 IEC 60228	Copper class 5 IEC 60228			
Utilization temperatures Standard		Fixed laying cable	-25°C ... +70°C	-25°C ... +70°C	-25°C ... +80°C	-25°C +80°C	-25°C ... +80°C	-25°C ... +80°C	-25°C ... +80°C	-25°C +80°C			
		Flexible laying cable	+5°C ... +70°C	+5°C ... +70°C	-25°C ... +80°C	-25°C +80°C	-5°C ... +80°C	-25°C ... +80°C	-5°C ... +80°C	-25°C +80°C	-25°C ... +80°C		
		Dynamic laying cable	/	/	-25°C ... +80°C	/	/	-25°C ... +80°C	/	/			
Utilization temperatures Extended -T6		Fixed laying cable	/	/	-40°C ... +80°C	-40°C ... +80°C	/	-40°C ... +80°C	/	-40°C +80°C			
		Flexible laying cable	/	/	-40°C ... +80°C	-40°C ... +80°C	/	-30°C ... +80°C	/	-40°C +80°C	-40°C ... +80°C		
		Dynamic laying cable	/	/	-40°C ... +80°C	/	/	-30°C ... +80°C	/	/			
Electrical data		Thermal current Ith	10 A	10 A	10 A	6 A	6 A	6 A	3 A	4 A	4 A	2 A	10 A
		Rated insulation Voltage Ui	250 Vac	250 Vac	250 Vac	250 Vac	250 Vac	250 Vac	250 Vac	250 Vac	250 Vac 300 Vdc	30 Vac 36 Vdc	250 Vac 300 Vdc
		Protection against short circuits (fuse)	10 A 500 V type gG	10 A 500 V type gG	10 A 500 V type gG	6 A 500 V type gG	6 A 500 V type gG	6 A 500 V type gG	3 A 500 V type gG	4 A 500 V type gG	4 A 500 V type gG	2 A 500V type gG	10 A 500 V type gG
	Utilization categories DC13	24 V	2 A	2 A	2 A	2 A	2 A	2 A	2 A	2 A	2 A	2 A	2 A
		125 V	0,4 A	0,4 A	0,4 A	0,4 A	0,4 A	0,4 A	0,4 A	0,4 A	0,4 A	/	0,4 A
		250 V	0,3 A	0,3 A	0,3 A	0,3 A	0,3 A	0,3 A	0,3 A	0,3 A	0,3 A	/	0,3 A
	Utilization categories AC15	24 V	4 A	4 A	4 A	4 A	4 A	4 A	3 A	4 A	4 A	2 A	4 A
		120 V	4 A	4 A	4 A	4 A	4 A	4 A	3 A	4 A	4 A	/	4 A
		250 V	4 A	4 A	4 A	4 A	4 A	4 A	3 A	4 A	4 A	/	4 A
Approvals of switches with integrated cable			CE cULus	CE	CE cULus	CE	CE cULus	CE cULus	CE cULus	CE	CE cULus	CE cULus	CE cULus

Internal connections

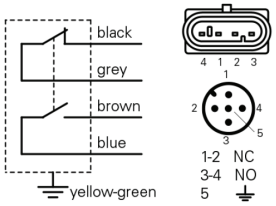
2NO+2NC



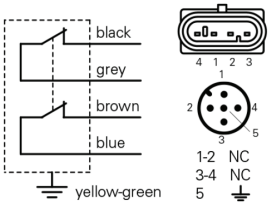
1NO+2NC



1NO+1NC

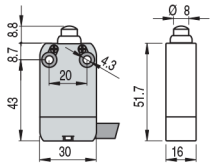
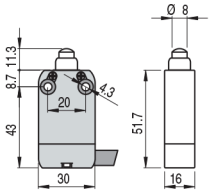
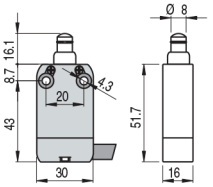
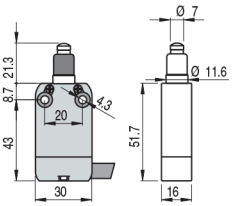


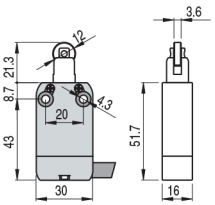
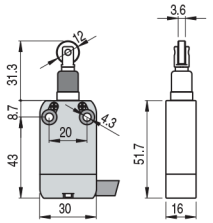
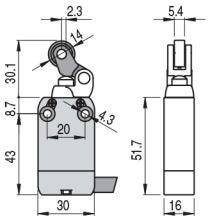
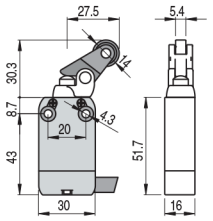
2NC



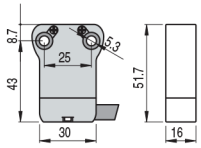
Contacts type:

R = snap action
L = slow action

Contact blocks									
								With external rubber gallet 	
S11	R	MAS110A1-RB2	1NO+1NC	MAS110A2-RB2	1NO+1NC	MAS110A3-RB2	1NO+1NC	MAS110A4-RB2	1NO+1NC
S02	R	MAS020A1-RB2	2NC	MAS020A2-RB2	2NC	MAS020A3-RB2	2NC	MAS020A4-RB2	2NC
S12	R	MAS120A1-RB2	1NO+2NC	MAS120A2-RB2	1NO+2NC	MAS120A3-RB2	1NO+2NC	MAS120A4-RB2	1NO+2NC
S22	R	MAS220A1-RB2	2NO+2NC	MAS220A2-RB2	2NO+2NC	MAS220A3-RB2	2NO+2NC	MAS220A4-RB2	2NO+2NC
D11	L	MAD110A1-RB2	1NO+1NC	MAD110A2-RB2	1NO+1NC	MAD110A3-RB2	1NO+1NC	MAD110A4-RB2	1NO+1NC
D02	L	MAD020A1-RB2	2NC	MAD020A2-RB2	2NC	MAD020A3-RB2	2NC	MAD020A4-RB2	2NC
D12	L	MAD120A1-RB2	1NO+2NC	MAD120A2-RB2	1NO+2NC	MAD120A3-RB2	1NO+2NC	MAD120A4-RB2	1NO+2NC
D22	L	MAD220A1-RB2	2NO+2NC	MAD220A2-RB2	2NO+2NC	MAD220A3-RB2	2NO+2NC	MAD220A4-RB2	2NO+2NC
Max speed		type 4		type 4		type 4		type 4	
Min. force		7 N (25 N ⊖)		7 N (25 N ⊖)		7 N (25 N ⊖)		7 N (25 N ⊖)	
Travel diagrams		group 1		group 1		group 1		group 1	

Contact blocks				With external rubber gasket		With stainless steel roller on request		With stainless steel roller on request	
									
S11	R	MAS110A5-RB2	1NO+1NC	MAS110A6-RB2	1NO+1NC	MAS110A7-RB2	1NO+1NC	MAS110A8-RB2	1NO+1NC
S02	R	MAS020A5-RB2	2NC	MAS020A6-RB2	2NC	MAS020A7-RB2	2NC	MAS020A8-RB2	2NC
S12	R	MAS120A5-RB2	1NO+2NC	MAS120A6-RB2	1NO+2NC	MAS120A7-RB2	1NO+2NC	MAS120A8-RB2	1NO+2NC
S22	R	MAS220A5-RB2	2NO+2NC	MAS220A6-RB2	2NO+2NC	MAS220A7-RB2	2NO+2NC	MAS220A8-RB2	2NO+2NC
D11	L	MAD110A5-RB2	1NO+1NC	MAD110A6-RB2	1NO+1NC	MAD110A7-RB2	1NO+1NC	MAD110A8-RB2	1NO+1NC
D02	L	MAD020A5-RB2	2NC	MAD020A6-RB2	2NC	MAD020A7-RB2	2NC	MAD020A8-RB2	2NC
D12	L	MAD120A5-RB2	1NO+2NC	MAD120A6-RB2	1NO+2NC	MAD120A7-RB2	1NO+2NC	MAD120A8-RB2	1NO+2NC
D22	L	MAD220A5-RB2	2NO+2NC	MAD220A6-RB2	2NO+2NC	MAD220A7-RB2	2NO+2NC	MAD220A8-RB2	2NO+2NC
Max speed		type 2		type 5		type 3		type 3	
Min. force		7 N (25 N ⊖)		7 N (25 N ⊖)		5 N (25 N ⊖)		5 N (25 N ⊖)	
Travel diagrams		group 1		group 1		group 2		group 2	

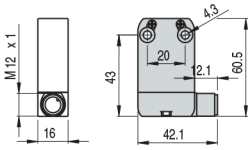
Housing MB series



In order to buy a MB series product:
substitute on above mentioned codes MA with MB.
Example:
MAS110A1-RB2 → **MB**S110A1-RB2

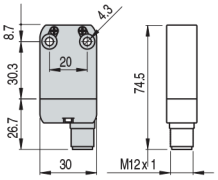
All measures in the drawings are in mm

M12 connector output from right



In order to buy a product with M12 connector output from right substitute on above mentioned codes RB2 with RHK. Example:
MAS110A1-**RB2** → MAS110A1-**RHK**

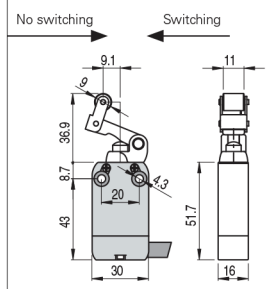
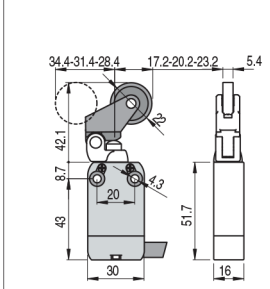
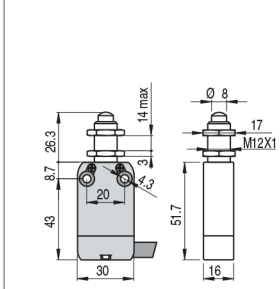
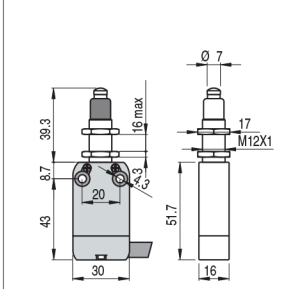
M12 connector output from bottom

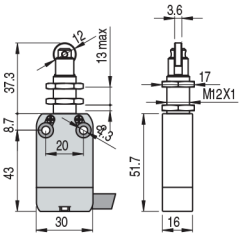
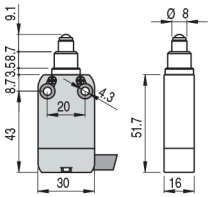
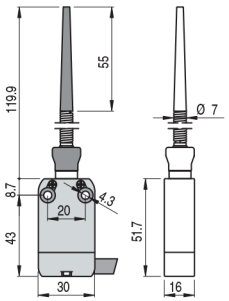
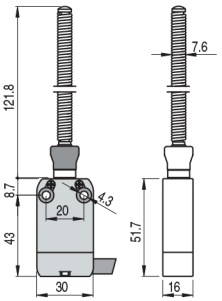


In order to buy a product with M12 connector output from bottom substitute on above mentioned codes RB2 with BHC. Example:
MAS110A1-**RB2** → MAS110A1-**BHC**

Contacts type:

R = snap action
L = slow action

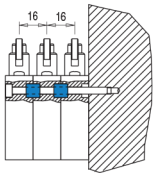
Contact blocks									
						Fixed only by threadled head 		Fixed only by threadled head With external rubber gasket 	
S11	R	MAS110A9-RB2	1NO+1NC	MAS110B1-RB2	1NO+1NC	MAS110B2-RB2	1NO+1NC	MAS110B3-RB2	1NO+1NC
S02	R	MAS020A9-RB2	2NC	MAS020B1-RB2	2NC	MAS020B2-RB2	2NC	MAS020B3-RB2	2NC
S12	R	MAS120A9-RB2	1NO+2NC	MAS120B1-RB2	1NO+2NC	MAS120B2-RB2	1NO+2NC	MAS120B3-RB2	1NO+2NC
S22	R	MAS220A9-RB2	2NO+2NC	MAS220B1-RB2	2NO+2NC	MAS220B2-RB2	2NO+2NC	MAS220B3-RB2	2NO+2NC
D11	L	MAD110A9-RB2	1NO+1NC	MAD110B1-RB2	1NO+1NC	MAD110B2-RB2	1NO+1NC	MAD110B3-RB2	1NO+1NC
D02	L	MAD020A9-RB2	2NC	MAD020B1-RB2	2NC	MAD020B2-RB2	2NC	MAD020B3-RB2	2NC
D12	L	MAD120A9-RB2	1NO+2NC	MAD120B1-RB2	1NO+2NC	MAD120B2-RB2	1NO+2NC	MAD120B3-RB2	1NO+2NC
D22	L	MAD220A9-RB2	2NO+2NC	MAD220B1-RB2	2NO+2NC	MAD220B2-RB2	2NO+2NC	MAD220B3-RB2	2NO+2NC
Max speed		type 3		type 3		type 4		type 4	
Min. force		3 N (25 N ⊕)		3 N (25 N ⊕)		7 N (25 N ⊕)		7 N (25 N ⊕)	
Travel diagrams		group 6		group 3		group 1		group 1	

Contact blocks									
		Fixed only by threadled head 				With external rubber gasket 		With external rubber gasket 	
S11	R	MAS110B4-RB2	1NO+1NC	MAS110B5-RB2	1NO+1NC	MAS110B6-RB2	1NO+1NC	MAS110B7-RB2	1NO+1NC
S02	R	MAS020B4-RB2	2NC	MAS020B5-RB2	2NC	MAS020B6-RB2	2NC	MAS020B7-RB2	2NC
S12	R	MAS120B4-RB2	1NO+2NC	MAS120B5-RB2	1NO+2NC	MAS120B6-RB2	1NO+2NC	MAS120B7-RB2	1NO+2NC
S22	R	MAS220B4-RB2	2NO+2NC	MAS220B5-RB2	2NO+2NC	MAS220B6-RB2	2NO+2NC	MAS220B7-RB2	2NO+2NC
D11	L	MAD110B4-RB2	1NO+1NC	MAD110B5-RB2	1NO+1NC	MAD110B6-RB2	1NO+1NC	MAD110B7-RB2	1NO+1NC
D02	L	MAD020B4-RB2	2NC	MAD020B5-RB2	2NC	MAD020B6-RB2	2NC	MAD020B7-RB2	2NC
D12	L	MAD120B4-RB2	1NO+2NC	MAD120B5-RB2	1NO+2NC	MAD120B6-RB2	1NO+2NC	MAD120B7-RB2	1NO+2NC
D22	L	MAD220B4-RB2	2NO+2NC	MAD220B5-RB2	2NO+2NC	MAD220B6-RB2	2NO+2NC	MAD220B7-RB2	2NO+2NC
Max speed		type 2		type 2		1 m/s		1 m/s	
Min. force		7 N (25 N ⊕)		7 N (25 N ⊕)		0,03 Nm		0,07 Nm	
Travel diagrams		group 1		group 1		group 4		group 4	

Accessories

Article	Description
AC DT1F	Spacers for MA-PA series
VF D16B	Spacers for MB series

By interposing spacers between the switches, it is possible to join two or more prewired switches, preventing them from moving one against the other.
10 pcs packs

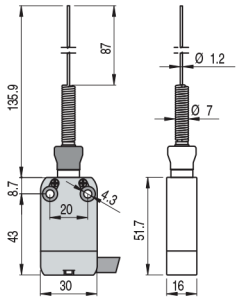
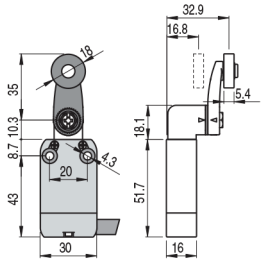
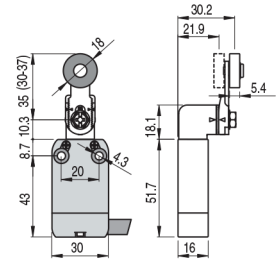
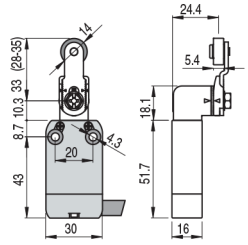


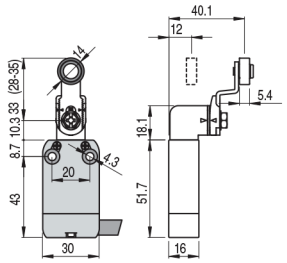
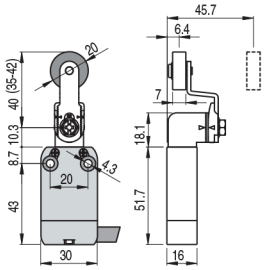
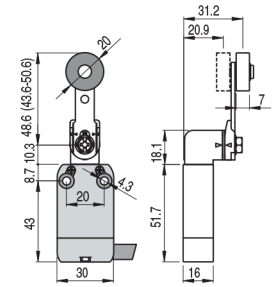
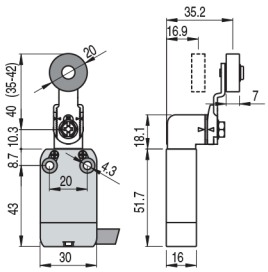
Article	Description
M12F0xx	Female wired connectors

General data:
- Please refer to http://www.imopc.com/products/FAMILY76750000

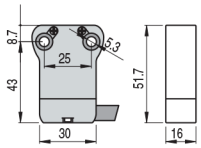
Contacts type:

R = snap action
L = slow action

Contact blocks		With external rubber gasket		With stainless steel roller on request		With stainless steel roller on request		With stainless steel roller on request	
									
S11	R	MAS110B8-RB2	1NO+1NC	MAS11HB9-RB2	1NO+1NC	MAS11HC1-RB2	1NO+1NC	MAS11HC2-RB2	1NO+1NC
S02	R	MAS020B8-RB2	2NC	MAS02HB9-RB2	2NC	MAS02HC1-RB2	2NC	MAS02HC2-RB2	2NC
S12	R	MAS120B8-RB2	1NO+2NC	MAS12HB9-RB2	1NO+2NC	MAS12HC1-RB2	1NO+2NC	MAS12HC2-RB2	1NO+2NC
S22	R	MAS220B8-RB2	2NO+2NC	MAS22HB9-RB2	2NO+2NC	MAS22HC1-RB2	2NO+2NC	MAS22HC2-RB2	2NO+2NC
D11	L	MAD110B8-RB2	1NO+1NC	MAD11HB9-RB2	1NO+1NC	MAD11HC1-RB2	1NO+1NC	MAD11HC2-RB2	1NO+1NC
D02	L	MAD020B8-RB2	2NC	MAD02HB9-RB2	2NC	MAD02HC1-RB2	2NC	MAD02HC2-RB2	2NC
D12	L	MAD120B8-RB2	1NO+2NC	MAD12HB9-RB2	1NO+2NC	MAD12HC1-RB2	1NO+2NC	MAD12HC2-RB2	1NO+2NC
D22	L	MAD220B8-RB2	2NO+2NC	MAD22HB9-RB2	2NO+2NC	MAD22HC1-RB2	2NO+2NC	MAD22HC2-RB2	2NO+2NC
Max speed		1 m/s		type 1		type 1		type 1	
Min. force		0,03 Nm		0,07 Nm (0,25 Nm→)		0,07 Nm (0,25 Nm→)		0,07 Nm (0,25 Nm→)	
Travel diagrams		group 4		group 5		group 5		group 5	

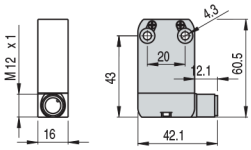
Contact blocks		With stainless steel roller on request		With stainless steel roller on request		With stainless steel roller on request		With stainless steel roller on request	
									
S11	R	MAS11HC3-RB2	1NO+1NC	MAS11HC4-RB2	1NO+1NC	MAS11HC5-RB2	1NO+1NC	MAS11HC6-RB2	1NO+1NC
S02	R	MAS02HC3-RB2	2NC	MAS02HC4-RB2	2NC	MAS02HC5-RB2	2NC	MAS02HC6-RB2	2NC
S12	R	MAS12HC3-RB2	1NO+2NC	MAS12HC4-RB2	1NO+2NC	MAS12HC5-RB2	1NO+2NC	MAS12HC6-RB2	1NO+2NC
S22	R	MAS22HC3-RB2	2NO+2NC	MAS22HC4-RB2	2NO+2NC	MAS22HC5-RB2	2NO+2NC	MAS22HC6-RB2	2NO+2NC
D11	L	MAD11HC3-RB2	1NO+1NC	MAD11HC4-RB2	1NO+1NC	MAD11HC5-RB2	1NO+1NC	MAD11HC6-RB2	1NO+1NC
D02	L	MAD02HC3-RB2	2NC	MAD02HC4-RB2	2NC	MAD02HC5-RB2	2NC	MAD02HC6-RB2	2NC
D12	L	MAD12HC3-RB2	1NO+2NC	MAD12HC4-RB2	1NO+2NC	MAD12HC5-RB2	1NO+2NC	MAD12HC6-RB2	1NO+2NC
D22	L	MAD22HC3-RB2	2NO+2NC	MAD22HC4-RB2	2NO+2NC	MAD22HC5-RB2	2NO+2NC	MAD22HC6-RB2	2NO+2NC
Max speed		type 1		type 1		type 1		type 1	
Min. force		0,07 Nm (0,25 Nm→)		0,07 Nm (0,25 Nm→)		0,07 Nm (0,25 Nm→)		0,07 Nm (0,25 Nm→)	
Travel diagrams		group 5		group 5		group 5		group 5	

Housing MB series



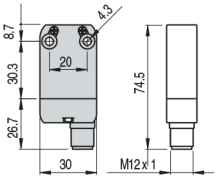
In order to buy a MB series product:
substitute on above mentioned codes MA with MB.
Example:
MAS110A1-RB2 → **MB**S110A1-RB2

M12 connector output from right



In order to buy a product with M12 connector output from right substitute on above mentioned codes RB2 with RHC. Example:
MAS110A1-**RB2** → MAS110A1-**RHC**

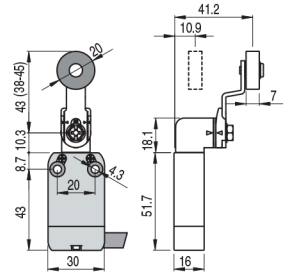
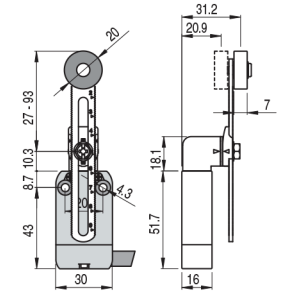
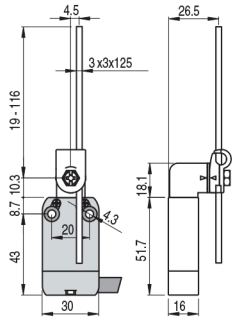
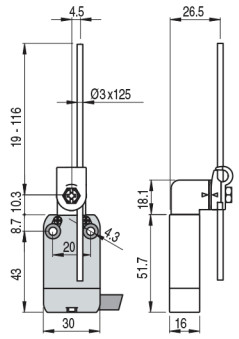
M12 connector output from bottom

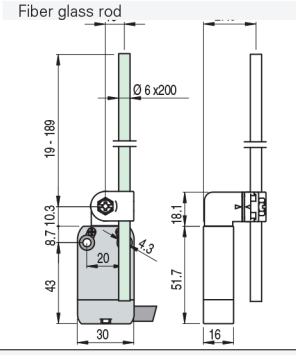
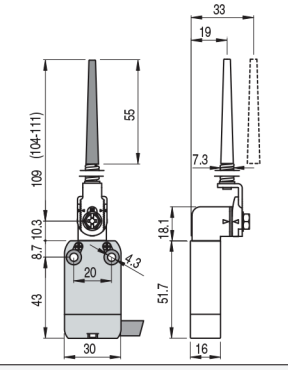


In order to buy a product with M12 connector output from bottom substitute on above mentioned codes RB2 with BHC. Example:
MAS110A1-**RB2** → MAS110A1-**BHC**

Contacts type:

R = snap action
L = slow action

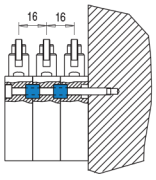
Contact blocks		With stainless steel roller on request		With stainless steel roller on request		Stainless steel 3x3 mm square rod		Ø 3 mm stainless steel round rod	
									
S11	R	MAS11HC7-RB2	1NO+1NC	MAS11HC8-RB2	1NO+1NC	MAS11HC9-RB2	1NO+1NC	MAS11HD1-RB2	1NO+1NC
S02	R	MAS02HC7-RB2	2NC	MAS02HC8-RB2	2NC	MAS02HC9-RB2	2NC	MAS02HD1-RB2	2NC
S12	R	MAS12HC7-RB2	1NO+2NC	MAS12HC8-RB2	1NO+2NC	MAS12HC9-RB2	1NO+2NC	MAS12HD1-RB2	1NO+2NC
S22	R	MAS22HC7-RB2	2NO+2NC	MAS22HC8-RB2	2NO+2NC	MAS22HC9-RB2	2NO+2NC	MAS22HD1-RB2	2NO+2NC
D11	L	MAD11HC7-RB2	1NO+1NC	MAD11HC8-RB2	1NO+1NC	MAD11HC9-RB2	1NO+1NC	MAD11HD1-RB2	1NO+1NC
D02	L	MAD02HC7-RB2	2NC	MAD02HC8-RB2	2NC	MAD02HC9-RB2	2NC	MAD02HD1-RB2	2NC
D12	L	MAD12HC7-RB2	1NO+2NC	MAD12HC8-RB2	1NO+2NC	MAD12HC9-RB2	1NO+2NC	MAD12HD1-RB2	1NO+2NC
D22	L	MAD22HC7-RB2	2NO+2NC	MAD22HC8-RB2	2NO+2NC	MAD22HC9-RB2	2NO+2NC	MAD22HD1-RB2	2NO+2NC
Max speed		type 1		type 1		1,5 m/s		1,5 m/s	
Min. force		0,07 Nm (0,25 Nm ⊖)		0,07 Nm (0,25 Nm ⊖)		0,07 Nm		0,07 Nm	
Travel diagrams		group 5		group 5		group 5		group 5	

Contact blocks		Fiber glass rod			
					
S11	R	MAS11HD2-RB2	1NO+1NC	MAS11HD3-RB2	1NO+1NC
S02	R	MAS02HD2-RB2	2NC	MAS02HD3-RB2	2NC
S12	R	MAS12HD2-RB2	1NO+2NC	MAS12HD3-RB2	1NO+2NC
S22	R	MAS22HD2-RB2	2NO+2NC	MAS22HD3-RB2	2NO+2NC
D11	L	MAD11HD2-RB2	1NO+1NC	MAD11HD3-RB2	1NO+1NC
D02	L	MAD02HD2-RB2	2NC	MAD02HD3-RB2	2NC
D12	L	MAD12HD2-RB2	1NO+2NC	MAD12HD3-RB2	1NO+2NC
D22	L	MAD22HD2-RB2	2NO+2NC	MAD22HD3-RB2	2NO+2NC
Max speed		1,5 m/s		1,5 m/s	
Min. force		0,07 Nm		0,07 Nm	
Travel diagrams		group 5		group 5	

Accessories

Article	Description
AC DT1F	Spacers for MA-PA series
VF D16B	Spacers for MB series

By interposing spacers between the switches, it is possible to join two or more prewired switches, preventing them from moving one against the other.
10 pcs packs



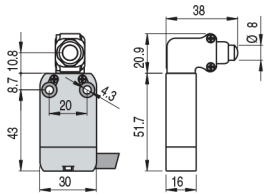
Article	Description
M12F0xx	Female wired connectors

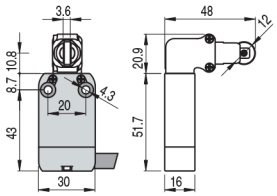
General data:
- Please refer to http://www.imopc.com/products/FAMILY76750000

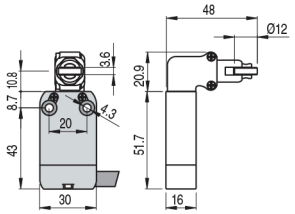
Contacts type:

R = snap action
L = slow action

Contact blocks



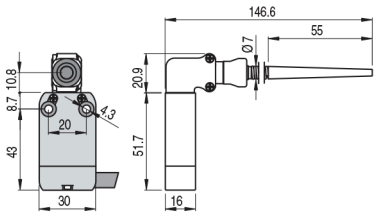




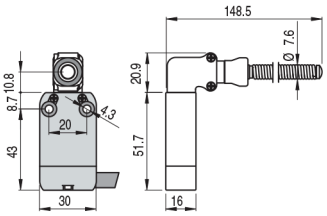
S11	R	MAS110A2-RB2AT	1NO+1NC	MAS110A5-RB2H0AT	1NO+1NC	MAS110A5-RB2AT	1NO+1NC
S02	R	MAS020A2-RB2AT	2NC	MAS020A5-RB2H0AT	2NC	MAS020A5-RB2AT	2NC
S12	R	MAS120A2-RB2AT	1NO+2NC	MAS120A5-RB2H0AT	1NO+2NC	MAS120A5-RB2AT	1NO+2NC
S22	R	MAS220A2-RB2AT	2NO+2NC	MAS220A5-RB2H0AT	2NO+2NC	MAS220A5-RB2AT	2NO+2NC
D11	L	MAD110A2-RB2AT	1NO+1NC	MAD110A5-RB2H0AT	1NO+1NC	MAD110A5-RB2AT	1NO+1NC
D02	L	MAD020A2-RB2AT	2NC	MAD020A5-RB2H0AT	2NC	MAD020A5-RB2AT	2NC
D12	L	MAD120A2-RB2AT	1NO+2NC	MAD120A5-RB2H0AT	1NO+2NC	MAD120A5-RB2AT	1NO+2NC
D22	L	MAD220A2-RB2AT	2NO+2NC	MAD220A5-RB2H0AT	2NO+2NC	MAD220A5-RB2AT	2NO+2NC
Max speed		type 4		type 2		type 2	
Min. force		9,5 N (25 N ⟶)		9,5 N (25 N ⟶)		9,5 N (25 N ⟶)	
Travel diagrams		group 1		group 1		group 1	

With external rubber gasket

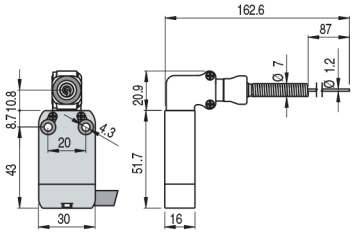
Contact blocks



With external rubber gasket

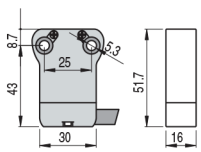


With external rubber gasket



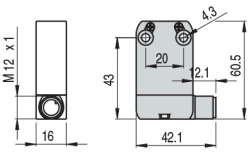
S11	R	MAS110B6-RB2AT	1NO+1NC	MAS110B7-RB2AT	1NO+1NC	MAS110B8-RB2AT	1NO+1NC
S02	R	MAS020B6-RB2AT	2NC	MAS020B7-RB2AT	2NC	MAS020B8-RB2AT	2NC
S12	R	MAS120B6-RB2AT	1NO+2NC	MAS120B7-RB2AT	1NO+2NC	MAS120B8-RB2AT	1NO+2NC
S22	R	MAS220B6-RB2AT	2NO+2NC	MAS220B7-RB2AT	2NO+2NC	MAS220B8-RB2AT	2NO+2NC
D11	L	MAD110B6-RB2AT	1NO+1NC	MAD110B7-RB2AT	1NO+1NC	MAD110B8-RB2AT	1NO+1NC
D02	L	MAD020B6-RB2AT	2NC	MAD020B7-RB2AT	2NC	MAD020B8-RB2AT	2NC
D12	L	MAD120B6-RB2AT	1NO+2NC	MAD120B7-RB2AT	1NO+2NC	MAD120B8-RB2AT	1NO+2NC
D22	L	MAD220B6-RB2AT	2NO+2NC	MAD220B7-RB2AT	2NO+2NC	MAD220B8-RB2AT	2NO+2NC
Max speed		1 m/s		1 m/s		1 m/s	
Min. force		0,08 Nm		0,12 Nm		0,08 Nm	
Travel diagrams		group 4		group 4		group 4	

Housing MB series



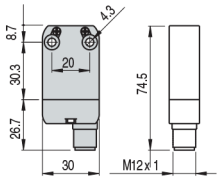
In order to buy a MB series product:
substitute on above mentioned codes MA with MB.
Example:
MAS110A1-RB2 → **MB**S110A1-RB2

M12 connector output from right



In order to buy a product with M12 connector output from right substitute on above mentioned codes RB2 with RHC. Example:
MAS110A1-**RB2** → MAS110A1-**RHC**

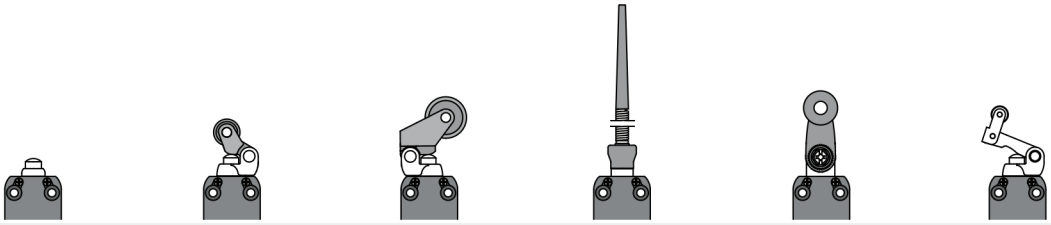
M12 connector output from bottom



In order to buy a product with M12 connector output from bottom substitute on above mentioned codes RB2 with BHC. Example:
MAS110A1-**RB2** → MAS110A1-**BHC**

IMO

Diagrams Table



Contact block	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
S11 1NO+1NC	0 1.5 ⊖4 5 / 0.9	0 2.1 ⊖5.6 7 / 1.5	0 3.5 ⊖9.6 11 / 2.5	0 13° / 8°	0 20° ⊖50° 75° / 11°	0 4.6 ⊖11.2 14 / 3.1
S02 2NC	0 1.5 ⊖4 5 / 0.9	0 2.1 ⊖5.6 7 / 1.5	0 3.5 ⊖9.6 11 / 2.5	0 13° / 8°	0 20° ⊖50° 75° / 11°	0 4.6 ⊖11.2 14 / 3.1
S12 1NO+2NC	0 1.5 ⊖4 5 / 0.9	0 2.1 ⊖5.6 7 / 1.5	0 3.5 ⊖9.6 11 / 2.5	0 13° / 8°	0 20° ⊖50° 75° / 11°	0 4.6 ⊖11.2 14 / 3.1
S22 2NO+2NC	0 1.5 ⊖4 5 / 0.9	0 2.1 ⊖5.6 7 / 1.5	0 3.5 ⊖9.6 11 / 2.5	0 13° / 8°	0 20° ⊖50° 75° / 11°	0 4.6 ⊖11.2 14 / 3.1
D11 1NO+1NC	0 1.4 ⊖2.9 5 / 3.1	0 2 ⊖4.1 7 / 4.5	0 3.3 ⊖7 11 / 7.3	/	0 18° ⊖38° 75° / 41°	0 4.1 ⊖8.1 14 / 9.5
D02 2NC	0 1.4 ⊖2.9 5	0 2 ⊖4.1 7	0 3.3 ⊖7 11	0 12°	0 18° ⊖38° 75°	0 4.1 ⊖8.1 14
D12 1NO+2NC	0 1.4 ⊖2.9 5 / 3.1	0 2 ⊖4.1 7 / 4.5	0 3.3 ⊖7 11 / 7.3	/	0 18° ⊖38° 75° / 41°	0 4.1 ⊖8.1 14 / 9.5
D22 2NO+2NC	0 1.4 ⊖2.9 5 / 3.1	0 2 ⊖4.1 7 / 4.5	0 3.3 ⊖7 11 / 7.3	/	0 18° ⊖38° 75° / 41°	0 4.1 ⊖8.1 14 / 9.5
M11 1NO+1NC	0 1.4 ⊖2.9 5 / 1	0 2 ⊖4.1 7 / 1.4	0 3.3 ⊖7 11 / 2.3	0 12° / 7°	0 18° ⊖38° 75° / 10°	0 4.4 ⊖8.1 14 / 2.8
M12 1NO+2NC	0 1.4 ⊖2.9 5 / 1	0 2 ⊖4.1 7 / 1.4	0 3.3 ⊖7 11 / 2.3	0 12° / 7°	0 18° ⊖38° 75° / 10°	0 4.4 ⊖8.1 14 / 2.8
M22 2NO+2NC	0 1.4 ⊖2.9 5 / 1	0 2 ⊖4.1 7 / 1.4	0 3.3 ⊖7 11 / 2.3	0 12° / 7°	0 18° ⊖38° 75° / 10°	0 4.4 ⊖8.1 14 / 2.8
C11 1NO+1NC	0 1.4 ⊖2.9 5 / 1.8	0 2 ⊖4.1 7 / 2.6	0 3.3 ⊖7 11 / 4.2	0 12° / 15°	0 18° ⊖38° 75° / 23°	0 3.8 ⊖8.1 14 / 5.2
C12 1NO+2NC	0 1.4 ⊖2.9 5 / 1.8	0 2 ⊖4.1 7 / 2.6	0 3.3 ⊖7 11 / 4.2	0 12° / 15°	0 18° ⊖38° 75° / 23°	0 3.8 ⊖8.1 14 / 5.2
C22 2NO+2NC	0 1.4 ⊖2.9 5 / 1.8	0 2 ⊖4.1 7 / 2.6	0 3.3 ⊖7 11 / 4.2	0 12° / 15°	0 18° ⊖38° 75° / 23°	0 3.8 ⊖8.1 14 / 5.2

Legend

Closed contact ! Opened contact | ⊖ Positive opening travel | ► Pushing the switch / ◄ Releasing the switch

PA Modular Prewired Switches

- Glass reinforced polymer housing, self exstinguishing, shockproof thermoplastic resin
- Saline smoke resistance: ≥ 300 hours in NSS according to ISO 9227
- 3 integrated cable types available
- Version with M12 connector from right or bottom, suitable for safety applications
- Protection degree IP67
- 14 contact blocks avilable
- 23 actuators available

CE cULus Approval UL: E146236

Always consistent with its innovation and the company quality targets, IMO Precision Controls Ltd introduces three new prewired switches series provided with innovative and unique characteristics. These products series are the result of four years research, development and testing; they fulfil new solutions requested by the market and they include more than twenty years company experience in the position switches sector. That's why we are proud to introduce the new MA, MB and PA in the IMO Precision Controls range.

Options & Ordering Codes

Note: The feasibility of a code number does not mean the effective availability of a product

PA	S11	0	A2	–	R	B	2	G	D7	AT

Housing

Polymer, 20mm holes interaxes	PA

Contact Blocks

1NO+1NC, snap action	S11
2NC, snap action	S02
1NO+2NC, snap action	S12
2NO+2NC, snap action	S22
1NO+1NC, slow action	D11
2NC, slow action	D02
1NO+2NC, slow action	D12
2NO+2NC, slow action	D22
1NO+1NC, slow action overlapped	M11
1NO+2NC, slow action overlapped	M12
2NO+2NC, slow action overlapped	M22
1NO+1NC, slow action closer	C11
1NO+2NC, slow action closer	C12
2NO+2NC, slow action closer	C22

Other Contact Blocks available on request

Actuation Heads

without head	0
head for revolving level actuators	2

Actuators

with short plunger	A1
with plunger	A2

Connection Output Direction

cable or connector from right	R
connector from bottom	B

Type of Cable

B	cable PVC IEC 60332-1 black (standard)
G	cable CEI 20-22 II grey
P	cable PUR halogen free grey
H	M12 connector

Cable Length

2	cable length 2 m (standard)
5	cable length 5 m
C	with connector

Other lengths available upon request

Contacts Type

	silver contacts (standard)
G	silver contacts gold plated 1 μm

Roller

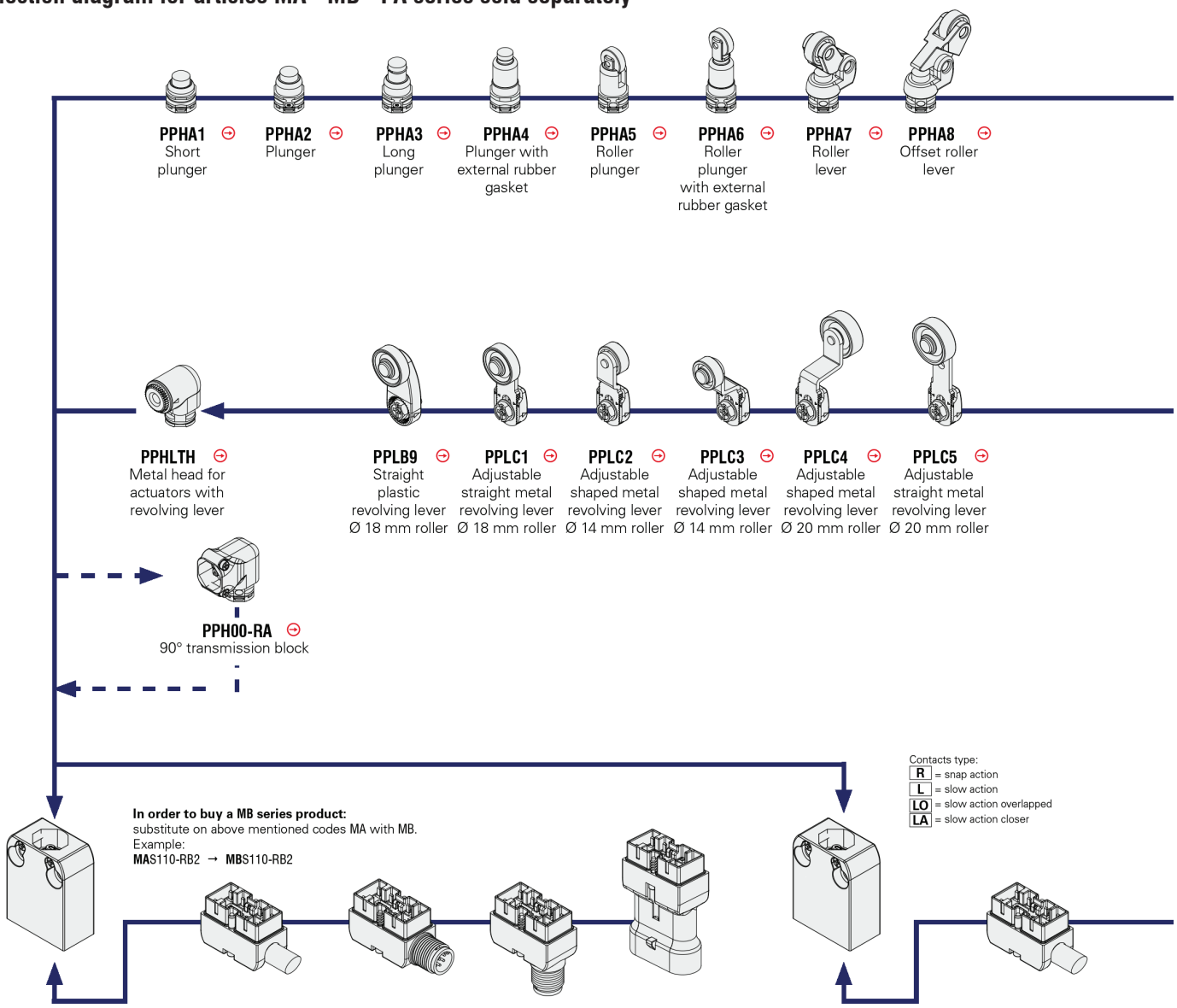
	with Ø 18 mm plastic roller
D7	with Ø 14 mm plastic roller
D18	with Ø 18 mm plastic roller
D19	with Ø 22 mm plastic roller
D22	with Ø 20 mm plastic roller
D23	with Ø 14 mm stainless steel roller
D24	with Ø 20 mm stainless steel roller
D25	with Ø 35 mm plastic roller

Transmission Block

	without transmission block
AT	90° transmission block

MA-MB-PA Modular Prewired Switches

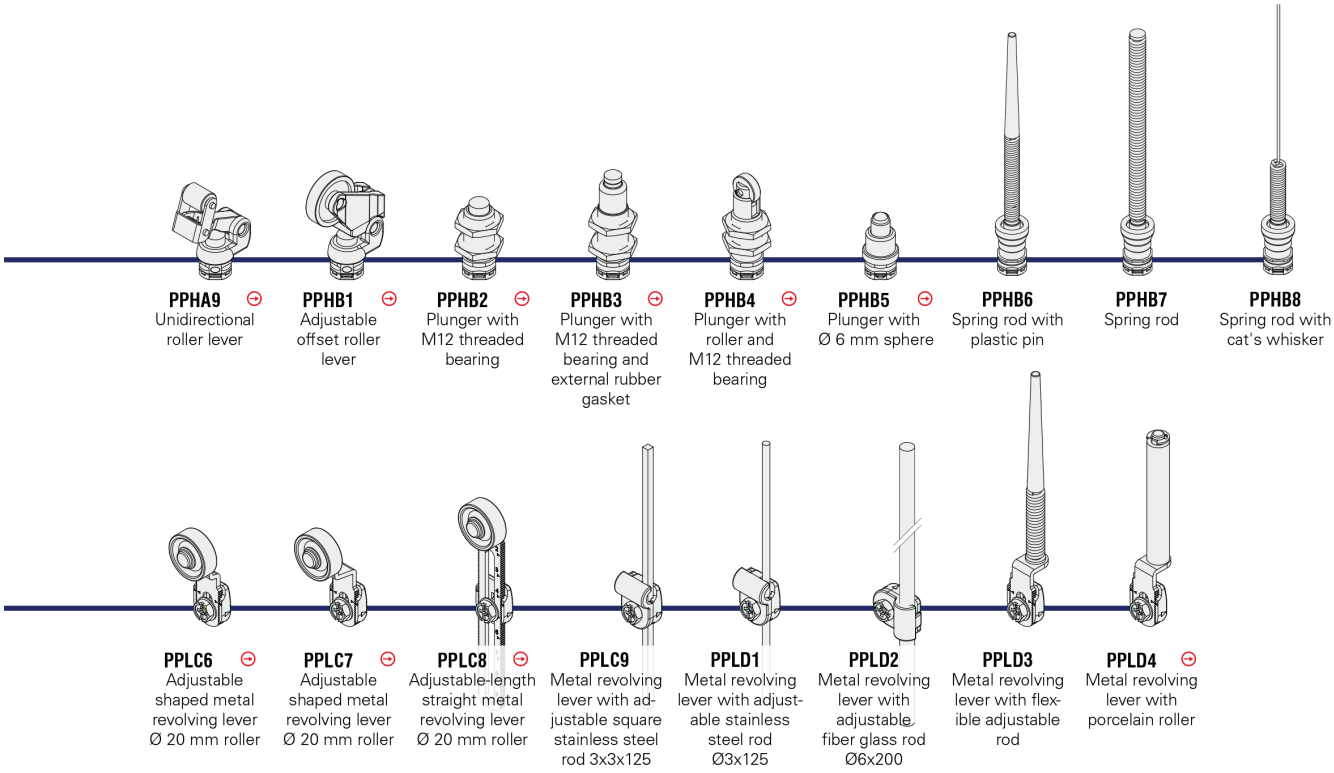
Selection diagram for articles MA - MB - PA series sold separately



METAL housing MA 20 mm holes interaxes		Metal connector with cable	cable length(m)	M12 metal connector from right	M12 metal connector from bottom,	AMP type polymer connector from bottom	POLYMER housing PA 20 mm holes interaxes		Polymer connectors with cable	cable length(m)
MAS11000	1NO+1NC R	PPM11RB2	2	PPM11RH	PPM11BH	PPM11BA	PAS11000	1NO+1NC R	PPP11RB2	2
MAD11000	1NO+1NC L						PAD11000	1NO+1NC L		
MAC11000	1NO+1NC LA	PPM11RB5	5				PAL11000	1NO+1NC LA	PPP11RB5	5
MAM11000	1NO+1NC LO						PAM11000	1NO+1NC LO		
MAS02000	2NC R	PPM02RB2	2	PPM02RH	PPM02BH	PPM02BA	PAS02000	2NC R	PPP02RB2	2
MAD02000	2NC L	PPM02RB5	5				PAD02000	2NC L	PPP02RB5	5
MAS20000	2NO R	/		PPM20RH	PPM20BH	PPM20BA	PAS20000	2NO R	/	
MAD20000	2NO L	/					PAD20000	2NO L	/	
MAS12000	1NO+2NC R	PPM12RB2	2	PPM12RH	PPM12BH		PAS12000	1NO+2NC R	PPP12RB2	2
MAD12000	1NO+2NC L						PAD12000	1NO+2NC L		
MAC12000	1NO+2NC LA	PPM12RB5	5				PAC12000	1NO+2NC LA	PPP12RB5	5
MAM12000	1NO+2NC LO						PAM12000	1NO+2NC LO		
MAS22000	2NO+2NC R	PPM22RB2	2	PPM22RH	PPM22BH		PAS22000	2NO+2NC R	PPP22RB2	2
MAD22000	2NO+2NC L						PAD22000	2NO+2NC L		
MAC22000	2NO+2NC LA	PPM22RB5	5				PAC22000	2NO+2NC LA	PPP22RB5	5
MAM22000	2NO+2NC LO						PAM22000	2NO+2NC LO		

⚠ Forbidden to install PPM••••• connector on polymer housing

⚠ Forbidden to install PPP••••• connector on metal housing



PPHA9 ⊖
Unidirectional roller lever

PPHB1 ⊖
Adjustable offset roller lever

PPHB2 ⊖
Plunger with M12 threaded bearing

PPHB3 ⊖
Plunger with M12 threaded bearing and external rubber gasket

PPHB4 ⊖
Plunger with roller and M12 threaded bearing

PPHB5 ⊖
Plunger with Ø 6 mm sphere

PPHB6
Spring rod with plastic pin

PPHB7
Spring rod

PPHB8
Spring rod with cat's whisker

PPLC6 ⊖
Adjustable shaped metal revolving lever Ø 20 mm roller

PPLC7 ⊖
Adjustable shaped metal revolving lever Ø 20 mm roller

PPLC8 ⊖
Adjustable-length straight metal revolving lever Ø 20 mm roller

PPLC9
Metal revolving lever with adjustable square stainless steel rod 3x3x125

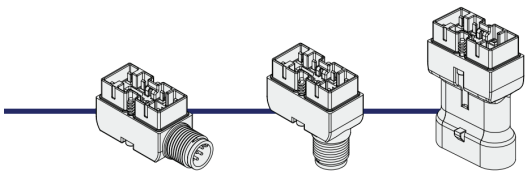
PPLD1
Metal revolving lever with adjustable stainless steel rod Ø3x125

PPLD2
Metal revolving lever with adjustable fiber glass rod Ø6x200

PPLD3
Metal revolving lever with flexible adjustable rod

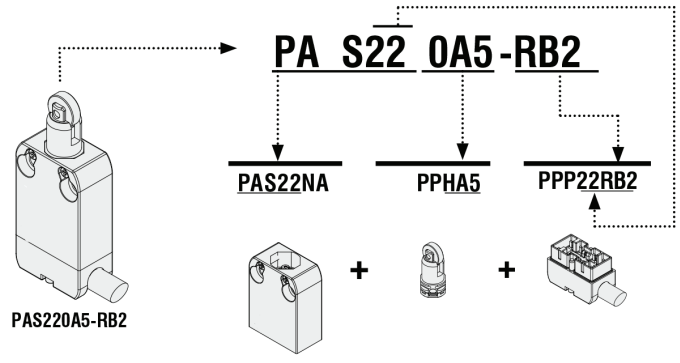
PPLD4 ⊖
Metal revolving lever with porcelain roller

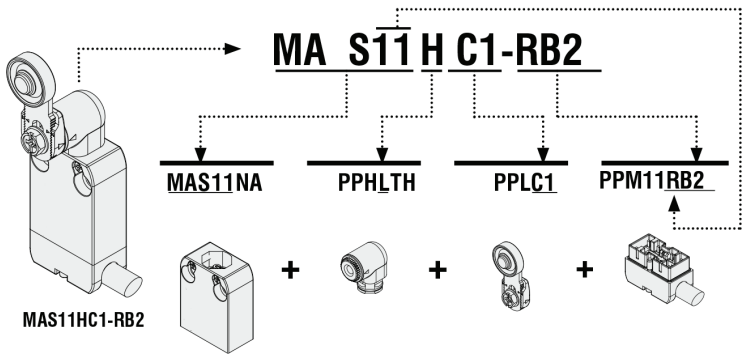
⚠ **Installation for persons protection applications:**
In order to obtain a safety switch with positive opening ⊖, assemble housings having the positive opening symbol next to the code ⊖ with actuators having the positive opening symbol next to the code ⊖.
Example: **PPLC1** ⊖ **+ PPHLTH** ⊖ **+ MAS110NA** ⊖



M12 polymer connector from right	M12 polymer connector from bottom	AMP type polymer connector from bottom
PPP11RH	PPP11BH	PPP11BA
PPP02RH	PPP02BH	PPP02BA
PPP20RH	PPP20BH	PPP20BA
PPP22RH	PPP22BH	

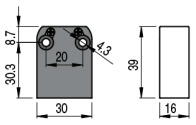
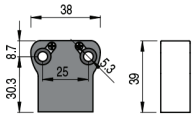
Examples of article code composition

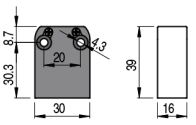




Housings

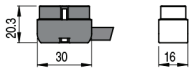
Contacts type:
R = snap action
L = slow action
LO = slow action overlapped
LA = slow action closer

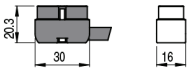
metal housing MA		metal housing MB	
			
MA S11000	1NO+1NC R	MB S11000	1NO+1NC R
MA D11000	1NO+1NC L	MB D11000	1NO+1NC L
MA S12000	1NO+2NC R	MB S12000	1NO+2NC R
MA D12000	1NO+2NC L	MB D12000	1NO+2NC L
MA C12000	1NO+2NC LA	MB C12000	1NO+2NC LA
MA S22000	2NO+2NC R	MB S22000	2NO+2NC R
MA D22000	2NO+2NC L	MB D22000	2NO+2NC L
MA C22000	2NO+2NC LA	MB C22000	2NO+2NC LA
MA M22000	2NO+2NC LO	MB M22000	2NO+2NC LO

polymer housing PA	
	
PA S110NA	1NO+1NC R
PA D110NA	1NO+1NC L
PA S120NA	1NO+2NC R
PA D120NA	1NO+2NC L
PA C120NA	1NO+2NC LA
PA S220NA	2NO+2NC R
PA D220NA	2NO+2NC L
PA C220NA	2NO+2NC LA
PA M220NA	2NO+2NC LO

Connector with cable

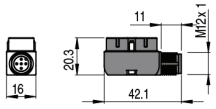
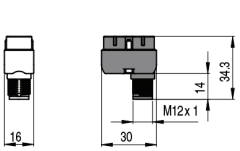
Other cable lengths on request

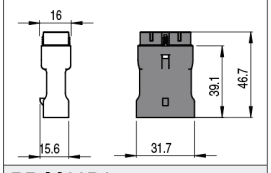
metal connectors for MA and MB housing			
		Cable length(m)	Cable type B = PVC Fixed laying cable H = PUR HALOGEN FREE Dynamic laying cable
PP M11RB2	1NO+1NC	2	B
PP M11RB5	1NO+1NC	5	
PP M12RB2	1NO+2NC	2	
PP M12RB5	1NO+2NC	5	
PP M22RB2	2NO+2NC	2	
PP M22RB5	2NO+2NC	5	
PP M11RH2	1NO+1NC	2	H
PP M11RH5	1NO+1NC	5	
PP M12RH2	1NO+2NC	2	
PP M12RH5	1NO+2NC	5	

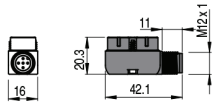
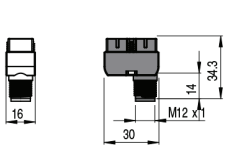
polymer connectors for PA housing			
		Cable length(m)	Cable type B = PVC Fixed laying cable
PP P11RB2	1NO+1NC	2	B
PP P11RB5	1NO+1NC	5	
PP P12RB2	1NO+2NC	2	
PP P12RB5	1NO+2NC	5	
PP P22RB2	2NO+2NC	2	
PP P22RB5	2NO+2NC	5	

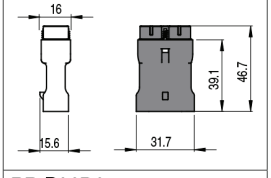
M12 or AMP connector

⚠**Attention: Always check that the electric load used respects the voltage and current limits for the connectors.**

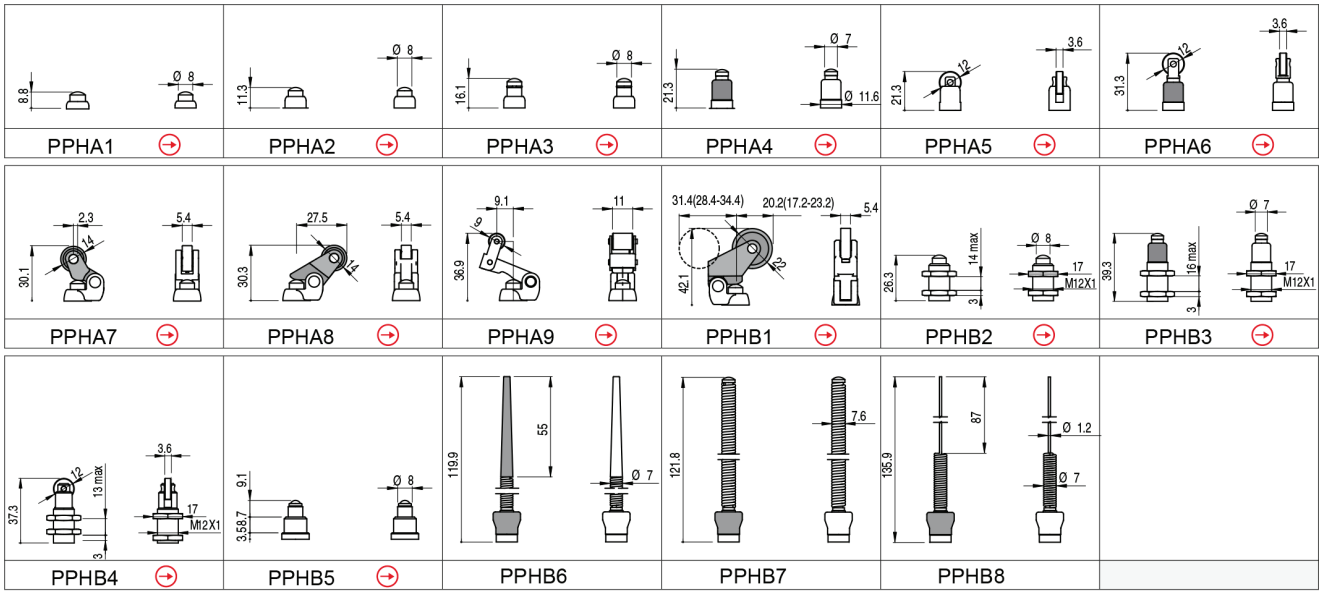
metal connectors for MA and MB housing			
M12 connector from right		M12 connector from bottom	
			
PP M11RH	1NO+1NC	PP M11BH	1NO+1NC
PP M02RH	2NC	PP M02BH	2NC
PP M22RH	2NO+2NC	PP M22BH	2NO+2NC

polymer connectors for MA and MB housing	
AMP super seal 1,5 connector	
	
PP M11BA	1NO+1NC
PP M02BA	2NC
PP M20BA	2NO

polymer connectors for PA housing			
M12 connector from right		M12 connector from bottom	
			
PP P11RH	1NO+1NC	PP P11BH	1NO+1NC
PP P02RH	2NC	PP P02BH	2NC
PP P22RH	2NO+2NC	PP P22BH	2NO+2NC

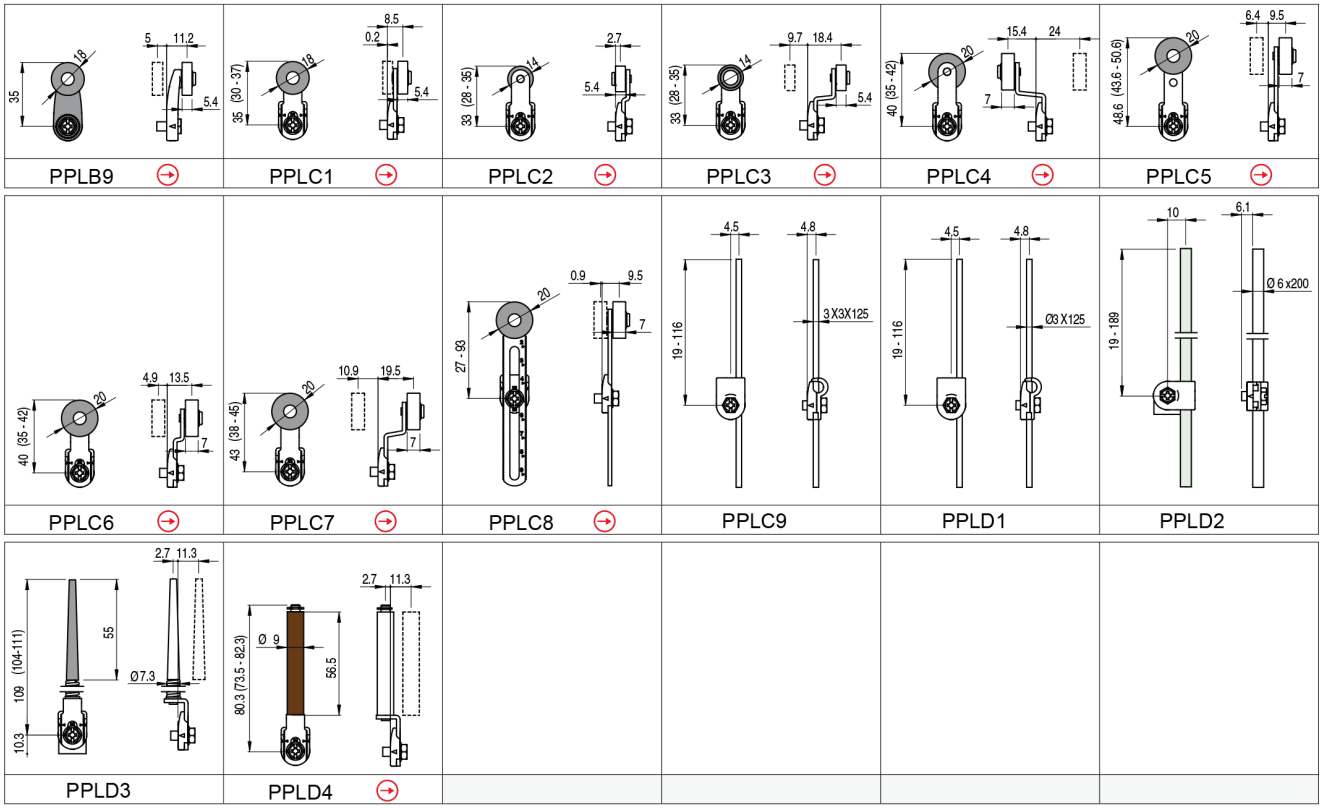
AMP super seal 1,5 connector	
	
PP P11BA	1NO+1NC
PP P02BA	2NC
PP P20BA	2NO

Actuators

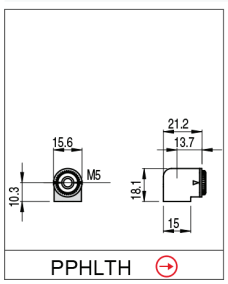


Revolving levers

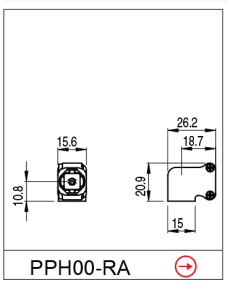
ATTENTION: These loose actuators can be used with products of series MA, MB and PA only.



Head



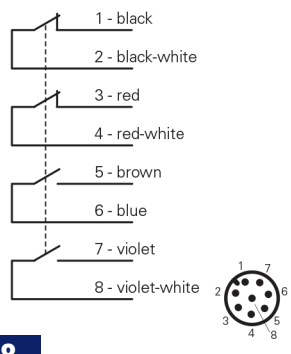
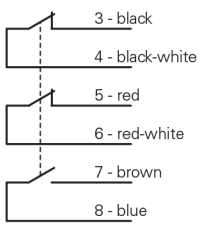
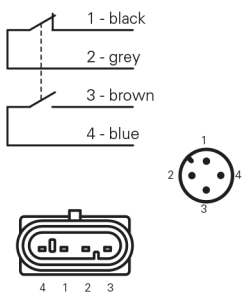
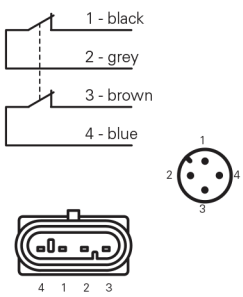
Transmission block



Utilisation temperatures and electrical data:

			Output with cable				Output with M12 connector		Output with connector AMP
			2 contacts versions		3 contacts versions	4 contacts versions	2 contacts versions	3/4 contacts versions	2 contacts versions
			Cable type B 4x0,75 mm², Sheath PVC H05VV-F, Not flame-spreading IEC 60332-1-2 IEC 60332-1-3 Min. bend radius: 72 mm Copper class 5 IEC 60228	Cable type G 4x0,75 mm², Sheath PVC S05VV-F, Not flame-spreading IEC 60332-1-2 IEC 60332-1-3 IEC 60332-3 CEI 20-22 II Min. bend radius: 72 mm Copper class 5 IEC 60228	Cable type B 6x0,5 mm² Sheath PVC H05VV-F, Not flame-spreading IEC 60332-1-2 IEC 60332-1-3 Min. bend radius: 108 mm Copper class 5 IEC 60228	Cable type B 8x0,34 mm² Sheath PVC H05VV-F, Not flame-spreading IEC 60332-1-2 IEC 60332-1-3 Min. bend radius: 94 mm Copper class 5 IEC 60228	4 poles M12 connector	8 poles M12 connector	AMP super seal 1,5 connector
Utilization temperatures	Standard temperature	Fixed laying cable	-25°C ... +70°C	-25°C ... +70°C	-25°C ... +80°C	-25°C ... +80°C	-25°C ... +80°C		
		Flexible laying cable	+5°C ... +70°C	+5°C ... +70°C	+5°C ... +80°C	-5°C ... +80°C			
		Dynamic laying cable	/	/	/	/			
	Extended temperature -T6	Fixed laying cable	/	/	/	/	-40°C ... +80°C		
		Flexible laying cable	/	/	/	/			
		Dynamic laying cable	/	/	/	/			
Electrical data		Thermal current Ith	10 A	10 A	6 A	3 A	4 A	2 A	10 A
		Rated insulation Voltage Ui	250 Vac	250 Vac	250 Vac	250 Vac	250 Vac 300 Vdc	30 Vac 36 Vdc	250 Vac 300 Vdc
		Protection against short circuits (fuse)	10 A 500 V type gG	10 A 500 V type gG	6 A 500 V type gG	3 A 500 V type gG	4 A 500 V type gG	2 A 500V type gG	10 A 500 V type gG
		Conditional shot circuit current according with EN 60947-5-1	1000 A	1000 A	1000 A	1000 A	1000 A	1000 A	1000 A
	Utilization categories DC13	24 V	2 A	2 A	2 A	2 A	2 A	2 A	2 A
		125 V	0,4 A	0,4 A	0,4 A	0,4 A	0,4 A	/	0,4 A
		250 V	0,3 A	0,3 A	0,3 A	0,3 A	0,3 A	/	0,3 A
	Utilization categories AC15	24 V	4 A	4 A	4 A	4 A	4 A	2 A	4 A
		120 V	4 A	4 A	4 A	4 A	4 A	/	4 A
		250 V	4 A	4 A	4 A	4 A	4 A	/	4 A
Approvals of switches with integrated cable			CE, cULus	CE	CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus

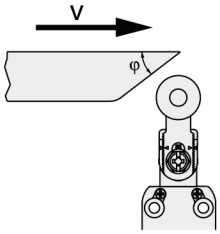
Internal connections

2NO+2NC	1NO+2NC	1NO+1NC	2NC
			

Maximum and minimum actuation speed

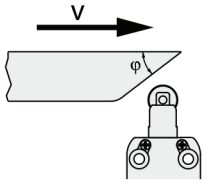
Roller lever - Type 1

φ	Vmax (m/s)	Vmin (mm/s) L	Vmin (mm/s) R
15°	2,5	9	0,07
30°	1,5	8	
45°	1	7	
60°	0,75	7	



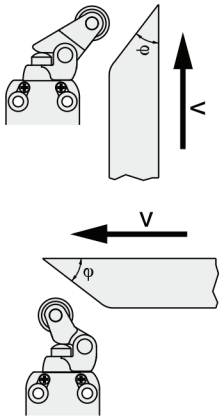
Plunger with roller - Type 2

φ	Vmax (m/s)	Vmin (mm/s) L	Vmin (mm/s) R
15°	1	4	0,04
30°	0,5	2	0,02
45°	0,3	1	0,01



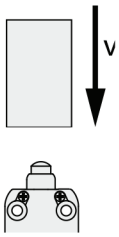
Roller lever - Type 3

φ	Vmax (m/s)	Vmin (mm/s) L	Vmin (mm/s) R
15°	1	5	0,05
30°	0,5	2,5	0,025
45°	0,3	1,5	0,015



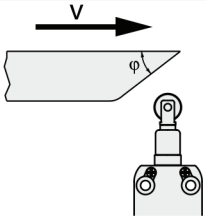
Plunger - Type 4

Vmax (m/s)	Vmin (mm/s) L	Vmin (mm/s) R
0,5	1	0,01



Plunger with roller - Type 5

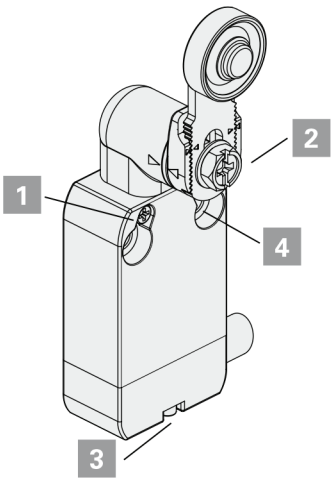
φ	Vmax (m/s)	Vmin (mm/s) L	Vmin (mm/s) R
15°	0,3	4	0,04



Contacts type:

R = snap action
L = slow action

Driving torques:



MA-MB Series

Head screws 1	**0,5 ... 0,7 Nm**
Lever screws 2	**0,8 ... 1,2 Nm**
Connectors screws 3	**0,3 ... 0,6 Nm**
M4 housing fastening screws 4	**2... 3 Nm**

PA Series

Head screws 1	**0,3 ... 0,4 Nm**
Lever screws 2	**0,8 ... 1,2 Nm**
Connectors screws 3	**0,2 ... 0,3 Nm**
M4 housing fastening screws 4	**2... 3 Nm**