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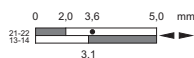
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## PAP1 type limit switches

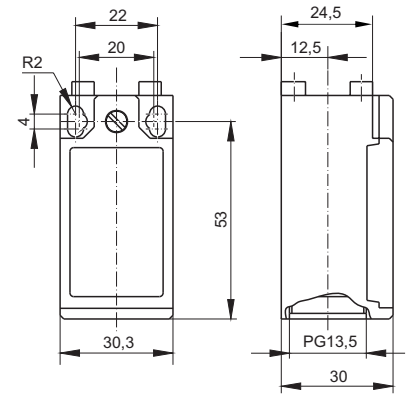
Type PAP1 limit switches are designed for work in control, monitoring and measurement circuits, e.g. in machine tools and technological equipment in the food industry, in packaging machines etc. The body is made of high quality plastic and the precise workmanship ensures good water tightness. The operating heads are exchangeable and may be installed in one of four possible positions. The operating heads enable efficient switching of the snap and slow action contact blocks.

The switches feature:

- safety symbol certificate 
- Office of Technical Inspection (UDT) type testing allowing their use in control and signalling systems for cranes and lifts
- product type approval certification allowing the use on ships granted by Polish Register of Shipping (PRS).

Technical drawings of limit switches in ".dwg" format are available at [www.pokoj.com.pl](http://www.pokoj.com.pl) in the section Offer, Design materials.

### DIMENSIONS















## Technical data

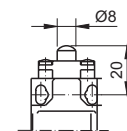
| TYPE   | PAP1  |
|--|---|
| Standards  | IEC 60947-5-1, EN 60947-5-1, EN 50047   |
| Rated switching voltage U <sub>e</sub>   | AC: 24/120/240/400V 50/60Hz<br>DC: 24/125/250V  |
| Rated switching currents I <sub>e</sub>  | AC: 10/6/3/1,8A<br>DC: 2,8/0,55/0,27A   |
| Use categories   | AC-15, DC-13  |
| Insulation rated voltage U <sub>i</sub> (IEC 60947-1)  | 500V  |
| Nominal impulse withstand voltage U <sub>imp</sub>   | A600, Q600  |
| Protection degree (IEC 60529)  | 6kV   |
| Environment pollution degree per IEC 60947-1   | IP65  |
| Short-circuiting protection<br>(type and max. values for rated data of the protective device) U <sub>e</sub> <500V a.c. Bi-Wts | 3   |
| Rated conventional air thermal current I <sub>th</sub> (IEC 60947-5-1) 0<40°C  | 10A   |
| Mechanical durability  | 10A   |
| Electric shock protection (IEC 60536)  | T11, T31+T32: 15×10 <sup>6</sup> cycles<br>T13, T41+T72: 10×10 <sup>6</sup> cycles<br>T91, T92, T98: > 5×10 <sup>6</sup> cycles |
| Ambient temperature  | Class II  |
| Max. switching cycles frequency  | -25...+70 °C  |
| Terminal resistance  | 3600 cycles/h   |
| Terminal cross-section   | 25mΩ  |
| Installation position  | 1 or 2 x 0,75+2,5mm <sup>2</sup>  |
| Casing material  | any   |
|  | plastic   |

## Accessories

| Cat. no. | Type          | Page |
|----------|---------------|------|
| 59-053□  | Gland PG 13,5 | 219  |

## PAP1 limit switches – T11 head steel plunger

| Cat. no. | Type  | Operating diagram | Connection diagram   | Description                   |
|----------|---|-------------------|--|-------------------------------|
| 37-1020  | PAP1T11PZ11  |                   | Zb  (1NO+1NC) | snap action                   |
| 37-1021  | PAP1T11PZ02  |                   | Zb  (2NC)     | snap action                   |
| 37-1022  | PAP1T11PX11  |                   | Zb  (1NO+1NC) | slow action open before close |
| 37-1023  | PAP1T11PY11  |                   | Zb  (1NO+1NC) | slow action close before open |
| 37-1024  | PAP1T11PW02  |                   | Zb  (2NC)     | slow action simultaneous      |
| 37-1025  | PAP1T11PW20  |                   | Zb  (2NO)     | slow action simultaneous      |



• - efficient opening points     efficient opening    v<sub>max</sub>=0,5 [m/s]; F<sub>min</sub>=15 [N]; F<sub>sk</sub>=30 [N]    Zb - movable contacts are insulated

# LIMIT SWITCHES

## PAP1 limit switches – T13 head steel plunger with plastic roller Ø11

| Cat. no. | Type          | Operating diagram | Connection diagram | Description                   |
|----------|---------------|-------------------|--------------------|-------------------------------|
| 37-1030  | PAP1T13PZ11 ⊕ |                   | Zb  (1NO+1NC)      | snap action                   |
| 37-1031  | PAP1T13PZ02 ⊕ |                   | Zb  (2NC)          | snap action                   |
| 37-1032  | PAP1T13PX11 ⊕ |                   | Zb  (1NO+1NC)      | slow action open before close |
| 37-1033  | PAP1T13PY11 ⊕ |                   | Zb  (1NO+1NC)      | slow action close before open |
| 37-1034  | PAP1T13PW02 ⊕ |                   | Zb  (2NC)          | slow action simultaneous      |
| 37-1035  | PAP1T13PW20   |                   | Zb  (2NO)          | slow action simultaneous      |

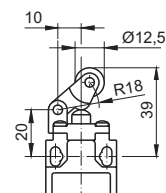
• - efficient opening points   ⊕ efficient opening    $v_{max}=0,5$  [m/s];  $F_{min}=15$  [N];  $F_{sk}=30$  [N]   Zb - movable contacts are insulated



## PAP1 limit switches – T31 head steel plunger and steel roller lever Ø12.5

| Cat. no. | Type          | Operating diagram | Connection diagram | Description                   |
|----------|---------------|-------------------|--------------------|-------------------------------|
| 37-1050  | PAP1T31PZ11 ⊕ |                   | Zb  (1NO+1NC)      | snap action                   |
| 37-1051  | PAP1T31PZ02 ⊕ |                   | Zb  (2NC)          | snap action                   |
| 37-1052  | PAP1T31PX11 ⊕ |                   | Zb  (1NO+1NC)      | slow action open before close |
| 37-1053  | PAP1T31PY11 ⊕ |                   | Zb  (1NO+1NC)      | slow action close before open |
| 37-1054  | PAP1T31PW02 ⊕ |                   | Zb  (2NC)          | slow action simultaneous      |
| 37-1055  | PAP1T31PW20   |                   | Zb  (2NO)          | slow action simultaneous      |

• - efficient opening points   ⊕ efficient opening    $v_{max}=1,0$  [m/s];  $F_{min}=7$  [N];  $F_{sk}=24$  [N]   Zb - movable contacts are insulated

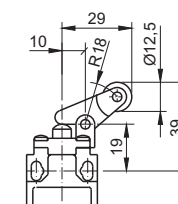


TYPE PAP1

## PAP1 limit switches – T32 head steel plunger and vertical plastic roller lever Ø12.5

| Cat. no. | Type          | Operating diagram | Connection diagram | Description                   |
|----------|---------------|-------------------|--------------------|-------------------------------|
| 37-1060  | PAP1T32PZ11 ⊕ |                   | Zb  (1NO+1NC)      | snap action                   |
| 37-1061  | PAP1T32PZ02 ⊕ |                   | Zb  (2NC)          | snap action                   |
| 37-1062  | PAP1T32PX11 ⊕ |                   | Zb  (1NO+1NC)      | slow action open before close |
| 37-1063  | PAP1T32PY11 ⊕ |                   | Zb  (1NO+1NC)      | slow action close before open |
| 37-1064  | PAP1T32PW02 ⊕ |                   | Zb  (2NC)          | slow action simultaneous      |
| 37-1065  | PAP1T32PW20   |                   | Zb  (2NO)          | slow action simultaneous      |

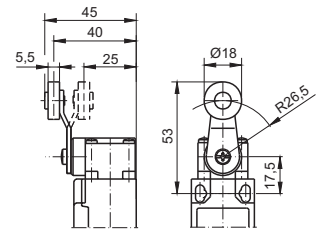
• - efficient opening points   ⊕ efficient opening    $v_{max}=1,0$  [m/s];  $F_{min}=7$  [N];  $F_{sk}=24$  [N]   Zb - movable contacts are insulated



## PAP1 limit switches – T41 head plastic roller lever Ø18

| Cat. no. | Type        | Operating diagram | Connection diagram | Description                   |
|----------|-------------|-------------------|--------------------|-------------------------------|
| 37-1080  | PAP1T41PZ11 |                   | Zb  (1NO+1NC)      | snap action                   |
| 37-1081  | PAP1T41PZ02 |                   | Zb  (2NC)          | snap action                   |
| 37-1082  | PAP1T41PX11 |                   | Zb  (1NO+1NC)      | slow action open before close |
| 37-1083  | PAP1T41PY11 |                   | Zb  (1NO+1NC)      | slow action close before open |
| 37-1084  | PAP1T41PW02 |                   | Zb  (2NC)          | slow action simultaneous      |
| 37-1085  | PAP1T41PW20 |                   | Zb  (2NO)          | slow action simultaneous      |

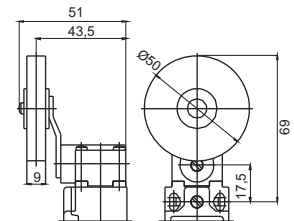
• - efficient opening points    ⊕ efficient opening     $v_{max}=1,5$  [m/s];  $M_{min}=0,1$  [Nm];  $M_{sk}=0,32$  [Nm]    Zb - movable contacts are insulated



## PAP1 limit switches – T42 head rubber roller lever Ø50

| Cat. no. | Type        | Operating diagram | Connection diagram | Description                   |
|----------|-------------|-------------------|--------------------|-------------------------------|
| 37-1090  | PAP1T42PZ11 |                   | Zb  (1NO+1NC)      | snap action                   |
| 37-1091  | PAP1T42PZ02 |                   | Zb  (2NC)          | snap action                   |
| 37-1092  | PAP1T42PX11 |                   | Zb  (1NO+1NC)      | slow action open before close |
| 37-1093  | PAP1T42PY11 |                   | Zb  (1NO+1NC)      | slow action close before open |
| 37-1094  | PAP1T42PW02 |                   | Zb  (2NC)          | slow action simultaneous      |
| 37-1095  | PAP1T42PW20 |                   | Zb  (2NO)          | slow action simultaneous      |

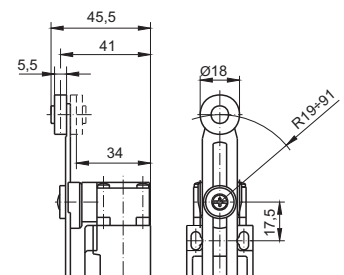
• - efficient opening points    ⊕ efficient opening     $v_{max}=1,5$  [m/s];  $M_{min}=0,1$  [Nm];  $M_{sk}=0,32$  [Nm]    Zb - movable contacts are insulated



## PAP1 limit switches – T51 head adjustable plastic roller lever Ø18

| Cat. no. | Type        | Operating diagram | Connection diagram | Description                   |
|----------|-------------|-------------------|--------------------|-------------------------------|
| 37-1110  | PAP1T51PZ11 |                   | Zb  (1NO+1NC)      | snap action                   |
| 37-1111  | PAP1T51PZ02 |                   | Zb  (2NC)          | snap action                   |
| 37-1112  | PAP1T51PX11 |                   | Zb  (1NO+1NC)      | slow action open before close |
| 37-1113  | PAP1T51PY11 |                   | Zb  (1NO+1NC)      | slow action close before open |
| 37-1114  | PAP1T51PW02 |                   | Zb  (2NC)          | slow action simultaneous      |
| 37-1115  | PAP1T51PW20 |                   | Zb  (2NO)          | slow action simultaneous      |

• - efficient opening points    ⊕ efficient opening     $v_{max}=1,5$  [m/s];  $M_{min}=0,1$  [Nm];  $M_{sk}=0,32$  [Nm]    Zb - movable contacts are insulated

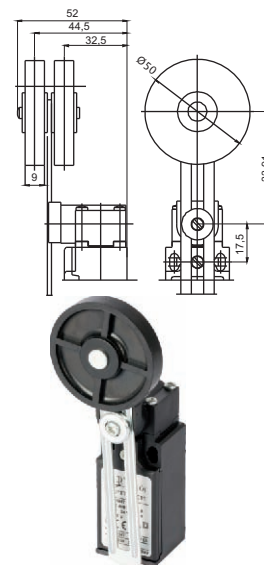


# LIMIT SWITCHES

## PAP1 limit switches – T52 head adjustable rubber roller lever Ø50

| Cat. no. | Type        | Operating diagram | Connection diagram | Description                   |
|----------|-------------|-------------------|--------------------|-------------------------------|
| 37-1120  | PAP1T52PZ11 |                   | Zb  (1NO+1NC)      | snap action                   |
| 37-1121  | PAP1T52PZ02 |                   | Zb  (2NC)          | snap action                   |
| 37-1122  | PAP1T52PX11 |                   | Zb  (1NO+1NC)      | slow action open before close |
| 37-1123  | PAP1T52PY11 |                   | Zb  (1NO+1NC)      | slow action close before open |
| 37-1124  | PAP1T52PW02 |                   | Zb  (2NC)          | slow action simultaneous      |
| 37-1125  | PAP1T52PW20 |                   | Zb  (2NO)          | slow action simultaneous      |

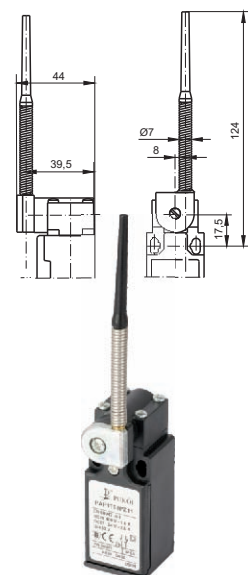
• - efficient opening points    ⊕ efficient opening     $v_{max}=1,5$  [m/s];  $M_{min}=0,1$  [Nm];  $M_{sk}=0,32$  [Nm]    Zb - movable contacts are insulated



## PAP1 limit switches – T61 head steel spring with plastic end

| Cat. no. | Type        | Operating diagram | Connection diagram | Description                   |
|----------|-------------|-------------------|--------------------|-------------------------------|
| 37-1100  | PAP1T61PZ11 |                   | Zb  (1NO+1NC)      | snap action                   |
| 37-1101  | PAP1T61PZ02 |                   | Zb  (2NC)          | snap action                   |
| 37-1102  | PAP1T61PX11 |                   | Zb  (1NO+1NC)      | slow action open before close |
| 37-1103  | PAP1T61PY11 |                   | Zb  (1NO+1NC)      | slow action close before open |
| 37-1104  | PAP1T61PW02 |                   | Zb  (2NC)          | slow action simultaneous      |
| 37-1105  | PAP1T61PW20 |                   | Zb  (2NO)          | slow action simultaneous      |

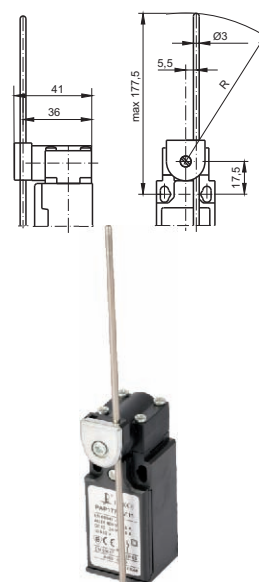
$v_{max}=1,5$  [m/s];  $M_{min}=0,1$  [Nm]    Zb - movable contacts are insulated



## PAP1 limit switch – T71 head stainless steel rod Ø3

| Cat. no. | Type        | Operating diagram | Connection diagram | Description                   |
|----------|-------------|-------------------|--------------------|-------------------------------|
| 37-1130  | PAP1T71PZ11 |                   | Zb  (1NO+1NC)      | snap action                   |
| 37-1131  | PAP1T71PZ02 |                   | Zb  (2NC)          | snap action                   |
| 37-1132  | PAP1T71PX11 |                   | Zb  (1NO+1NC)      | slow action open before close |
| 37-1133  | PAP1T71PY11 |                   | Zb  (1NO+1NC)      | slow action close before open |
| 37-1134  | PAP1T71PW02 |                   | Zb  (2NC)          | slow action simultaneous      |
| 37-1135  | PAP1T71PW20 |                   | Zb  (2NO)          | slow action simultaneous      |

• - efficient opening points    ⊕ efficient opening     $v_{max}=1,5$  [m/s];  $M_{min}=0,1$  [Nm];  $M_{sk}=0,32$  [Nm]    Zb - movable contacts are insulated

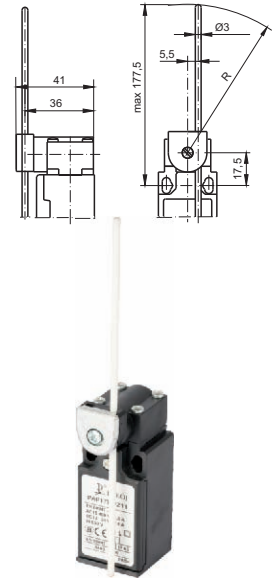


TYPE PAP1

## PAP1 limit switches – T72 head fibreglass rod Ø3

| Cat. no. | Type        | Operating diagram | Connection diagram | Description                             |
|----------|-------------|-------------------|--------------------|---|
| 37-1140  | PAP1T72PZ11 |                   | Zb                 | (1NO+1NC) snap action                   |
| 37-1141  | PAP1T72PZ02 |                   | Zb                 | (2NC) snap action                       |
| 37-1142  | PAP1T72PX11 |                   | Zb                 | (1NO+1NC) slow action open before close |
| 37-1143  | PAP1T72PY11 |                   | Zb                 | (1NO+1NC) slow action close before open |
| 37-1144  | PAP1T72PW02 |                   | Zb                 | (2NC) slow action simultaneous          |
| 37-1145  | PAP1T72PW20 |                   | Zb                 | (2NO) slow action simultaneous          |

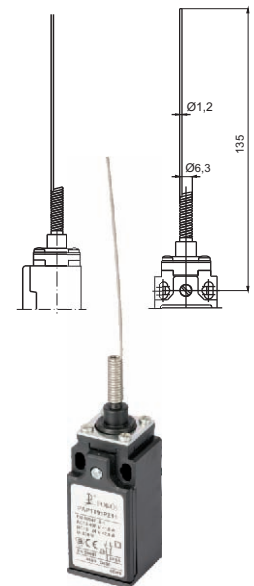
• - efficient opening points    ⊕ efficient opening     $v_{max}=1,5$  [m/s];  $M_{min}=0,1$  [Nm];  $M_{sk}=0,32$  [Nm]    Zb - movable contacts are insulated



## PAP1 limit switches – T91 head stainless steel multidirectional action spring

| Cat. no. | Type        | Operating diagram | Connection diagram | Description                             |
|----------|-------------|-------------------|--------------------|---|
| 37-1150  | PAP1T91PZ11 |                   | Zb                 | (1NO+1NC) snap action                   |
| 37-1151  | PAP1T91PZ02 |                   | Zb                 | (2NC) snap action                       |
| 37-1152  | PAP1T91PX11 |                   | Zb                 | (1NO+1NC) slow action open before close |
| 37-1153  | PAP1T91PY11 |                   | Zb                 | (1NO+1NC) slow action close before open |
| 37-1154  | PAP1T91PW02 |                   | Zb                 | (2NC) slow action simultaneous          |
| 37-1155  | PAP1T91PW20 |                   | Zb                 | (2NO) slow action simultaneous          |

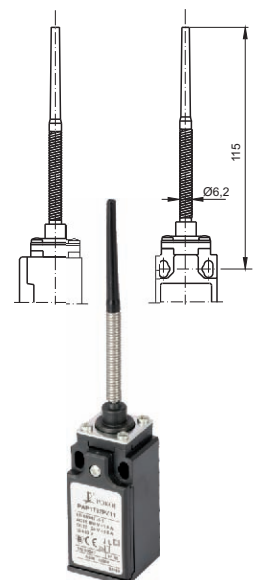
$v_{max}=1,0$  [m/s];  $M_{min}=0,12$  [Nm]    Zb - movable contacts are insulated



## PAP1 limit switches – T92 head stainless steel spring with plastic end, multidirectional action

| Cat. no. | Type        | Operating diagram | Connection diagram | Description                             |
|----------|-------------|-------------------|--------------------|---|
| 37-1160  | PAP1T92PZ11 |                   | Zb                 | (1NO+1NC) snap action                   |
| 37-1161  | PAP1T92PZ02 |                   | Zb                 | (2NC) snap action                       |
| 37-1162  | PAP1T92PX11 |                   | Zb                 | (1NO+1NC) slow action open before close |
| 37-1163  | PAP1T92PY11 |                   | Zb                 | (1NO+1NC) slow action close before open |
| 37-1164  | PAP1T92PW02 |                   | Zb                 | (2NC) slow action simultaneous          |
| 37-1165  | PAP1T92PW20 |                   | Zb                 | (2NO) slow action simultaneous          |

$v_{max}=1,0$  [m/s];  $M_{min}=0,12$  [Nm]    Zb - movable contacts are insulated



# LIMIT SWITCHES

## PAP1 limit switches – T98 head ring pull action

| Cat. no. | Type         | Operating diagram | Connection diagram | Description                   |
|----------|--------------|-------------------|--------------------|-------------------------------|
| 37-1980  | PAP1T98PZ11A |                   | Zb  (1NO+1NC)      | snap action                   |
| 37-1982  | PAP1T98PX11A |                   | Zb  (1NO+1NC)      | slow action open before close |
| 37-1983  | PAP1T98PY11A |                   | Zb  (1NO+1NC)      | slow action close before open |
| 37-1984  | PAP1T98PW02A |                   | Zb  (2NC)          | slow action simultaneous      |
| 37-1985  | PAP1T98PW20A |                   | Zb  (2NO)          | slow action simultaneous      |

$v_{max}=0,5$  [m/s];  $F_{min}=30$  [N]      Zb - movable contacts are insulated



## PAP1 limit switches – R11 head steel plunger with reset function

| Cat. no. | Type          | Connection diagram | Description                   |
|----------|---------------|--------------------|-------------------------------|
| 37-1R10  | PAP1R11PZ11 ⊕ | Zb  (1NO+1NC)      | snap action                   |
| 37-1R11  | PAP1R11PZ02 ⊕ | Zb  (2NC)          | snap action                   |
| 37-1R12  | PAP1R11PX11 ⊕ | Zb  (1NO+1NC)      | slow action open before close |
| 37-1R14  | PAP1R11PW02 ⊕ | Zb  (2NC)          | slow action simultaneous      |

⊕ efficient opening      Zb - movable contacts are insulated



## PAP1 limit switches – R13 head steel plunger with plastic roller Ø10.5, with reset function

| Cat. no. | Type          | Connection diagram | Description                   |
|----------|---------------|--------------------|-------------------------------|
| 37-1R20  | PAP1R13PZ11 ⊕ | Zb  (1NO+1NC)      | snap action                   |
| 37-1R21  | PAP1R13PZ02 ⊕ | Zb  (2NC)          | snap action                   |
| 37-1R22  | PAP1R13PX11 ⊕ | Zb  (1NO+1NC)      | slow action open before close |
| 37-1R24  | PAP1R13PW02 ⊕ | Zb  (2NC)          | slow action simultaneous      |

⊕ efficient opening      Zb - movable contacts are insulated







## PAP1 limit switches – R31 head steel plunger and horizontal plastic roller lever Ø12.5, with reset function

| Cat. no. | Type          | Connection diagram | Description                   |
|----------|---------------|--------------------|-------------------------------|
| 37-1R30  | PAP1R31PZ11 ⊕ | Zb  (1NO+1NC)      | snap action                   |
| 37-1R31  | PAP1R31PZ02 ⊕ | Zb  (2NC)          | snap action                   |
| 37-1R32  | PAP1R31PX11 ⊕ | Zb  (1NO+1NC)      | slow action open before close |
| 37-1R34  | PAP1R31PW02 ⊕ | Zb  (2NC)          | slow action simultaneous      |

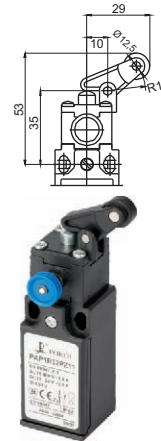
⊕ efficient opening      Zb - movable contacts are insulated







## PAP1 limit switches – R32 head steel plunger and vertical plastic roller lever Ø12.5, with reset function

| Cat. no. | Type          | Connection diagram   | Description                   |
|----------|---------------|--|-------------------------------|
| 37-1R40  | PAP1R32PZ11 ⊕ | Zb  (1NO+1NC) | snap action                   |
| 37-1R41  | PAP1R32PZ02 ⊕ | Zb  (2NC)     | snap action                   |
| 37-1R42  | PAP1R32PX11 ⊕ | Zb  (1NO+1NC) | slow action open before close |
| 37-1R44  | PAP1R32PW02 ⊕ | Zb  (2NC)     | slow action simultaneous      |

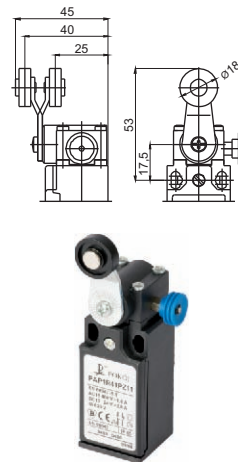
⊕ efficient opening      Zb - movable contacts are insulated



## PAP1 limit switches – R41 head plastic roller lever Ø18, with reset function

| Cat. no. | Type          | Connection diagram   | Description                   |
|----------|---------------|--|-------------------------------|
| 37-1R60  | PAP1R41PZ11 ⊕ | Zb  (1NO+1NC) | snap action                   |
| 37-1R61  | PAP1R41PZ02 ⊕ | Zb  (2NC)     | snap action                   |
| 37-1R62  | PAP1R41PX11 ⊕ | Zb  (1NO+1NC) | slow action open before close |
| 37-1R64  | PAP1R41PW02 ⊕ | Zb  (2NC)   | slow action simultaneous      |

⊕ efficient opening      Zb - movable contacts are insulated





# LIMIT SWITCHES


## PSP1 type limit switches

Type PSP1 emergency stop limit switches for use in control, monitoring and measurement circuits. They can be installed on tangent balance, sliding, and removable machine covers. Opening of the machine cover turns off the power. The limit switch design prevents uncontrolled switching of contacts using simple tools. The casing is made of red and black plastic and the precise workmanship ensures good tightness. The operating heads can be installed in one of four possible positions (K1...) in continuous 360 degree range (K8...). They enable efficient switching of the snap and slow action contact blocks.

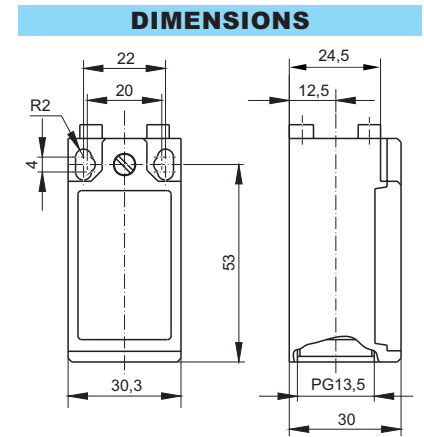
Depending on the use, the emergency limit switches are divided into three groups:

- with key - opening the machine cover pulls out the key from the socket and switches over the contacts. Wide range of keys allows the use of the connectors for all possible applications ,
- with lever or shaft to monitor small covers or big tangent balance doors. Installed in the rotation axis, directly to the movable element (switch with lever) or to hinge (switch with roller).
- with cord for use in machines and on production lines where it is impossible to install covers. They can be switched from any location along the cord run. A machine is switched off after pulling the cord and when the cord is broken.

Certificates:

- safety symbol certificate 
- Office of Technical Inspection (UDT) type testing allowing their use in control and signalling systems for cranes and lifts.
- product type approval certification allowing the use on ships granted by Polish Register of Shipping (PRS).

Technical drawings of limit switches in ".dwg" format are available at [www.pokoj.com.pl](http://www.pokoj.com.pl) in the section Offer, Design materials.



## Technical data






| TYPE   | PSP1   |
|--|--|
| Standards  | IEC 60947-5-1, EN 60947-5-1, EN 50047          |
| Rated switching voltage $U_e$  | AC: 24/120/240/400V 50/60Hz<br>DC: 24/125/250V |
| Rated switching currents $I_e$   | AC: 10/6/3/1,8A<br>DC: 2,8/0,55/0,27A          |
| Use categories   | AC-15, DC-13                                   |
| Insulation rated voltage $U_i$ (IEC 60947-1)   | 690V   |
| Nominal impulse withstand voltage $U_{imp}$  | A600, Q600                                     |
| Protection degree (IEC 60529)  | IP65   |
| Environment pollution degree per IEC 60947-1   | 3  |
| Short-circuiting protection<br>(type and max. values for rated data of the protective device) $U_e < 500V$ a.c. Bi-Wts | 10A  |
| Rated conventional air thermal current $I_{th}$ (IEC 60947-5-1) $0 < 40^\circ C$                                       | 10A  |
| Electric shock protection (IEC 60536)  | Class II                                       |
| Ambient temperature  | -25...+70 °C                                   |
| Max. switching cycles frequency  | 3600 cycles/h                                  |
| Terminal resistance  | 25mΩ   |
| Terminal cross-section   | 1 or 2 x 0,75±2,5mm <sup>2</sup>               |
| Installation position  | any  |
| Casing material  | plastic  |

## Accessories

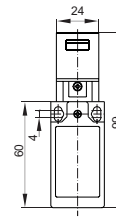
| Cat. no. | Type          | Page |
|----------|---------------|------|
| 59-053□  | Gland PG 13,5 | 219  |

Connection diagrams for limit switches with key describes zero position of contacts (key is plugged in).






## PSP1 limit switches – K83 head Head with bent narrow key no. 3, continuous 360° turn

| Cat. no. | Type          | Connection diagram   | Description                   |
|----------|---------------|--|-------------------------------|
| 37-2180  | PSP1K83PZ11 ⊕ | Zb  (1NO+1NC) | snap action                   |
| 37-2181  | PSP1K83PZ02 ⊕ | Zb  (2NC)     | snap action                   |
| 37-2182  | PSP1K83PX11 ⊕ | Zb  (1NO+1NC) | slow action open before close |
| 37-2183  | PSP1K83PY11 ⊕ | Zb  (1NO+1NC) | slow action close before open |
| 37-2184  | PSP1K83PW02 ⊕ | Zb  (2NC)     | slow action simultaneous      |

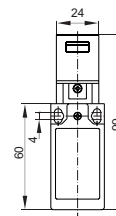
⊕ efficient opening      Zb - movable contacts are insulated








## PSP1 limit switches – K84 head head with flat narrow key no. 4, continuous 360° turn

| Cat. no. | Type          | Connection diagram   | Description                   |
|----------|---------------|--|-------------------------------|
| 37-2190  | PSP1K84PZ11 ⊕ | Zb  (1NO+1NC)   | snap action                   |
| 37-2191  | PSP1K84PZ02 ⊕ | Zb  (2NC)      | snap action                   |
| 37-2192  | PSP1K84PX11 ⊕ | Zb  (1NO+1NC) | slow action open before close |
| 37-2193  | PSP1K84PY11 ⊕ | Zb  (1NO+1NC) | slow action close before open |
| 37-2194  | PSP1K84PW02 ⊕ | Zb  (2NC)     | slow action simultaneous      |

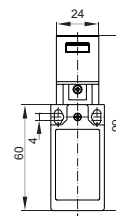
⊕ efficient opening      Zb - movable contacts are insulated



## PSP1 limit switches – K85 head head with bent wide key no. 5, continuous 360° turn






| Cat. no. | Type          | Connection diagram   | Description                   |
|----------|---------------|--|-------------------------------|
| 37-2210  | PSP1K85PZ11 ⊕ | Zb  (1NO+1NC) | snap action                   |
| 37-2211  | PSP1K85PZ02 ⊕ | Zb  (2NC)     | snap action                   |
| 37-2212  | PSP1K85PX11 ⊕ | Zb  (1NO+1NC) | slow action open before close |
| 37-2213  | PSP1K85PY11 ⊕ | Zb  (1NO+1NC) | slow action close before open |
| 37-2214  | PSP1K85PW02 ⊕ | Zb  (2NC)     | slow action simultaneous      |

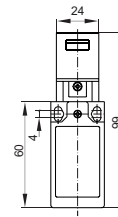
⊕ efficient opening      Zb - movable contacts are insulated








# LIMIT SWITCHES

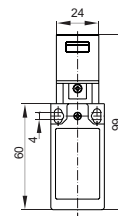
## PSP1 limit switches – K86 head head with flat wide key no. 6, continuous 360° turn

| Cat. no.            | Type          | Connection diagram   | Description                   |
|---------------------|---------------|--|-------------------------------|
| 37-2220             | PSP1K86PZ11 ⊕ | Zb  (1NO+1NC) | snap action                   |
| 37-2221             | PSP1K86PZ02 ⊕ | Zb  (2NC)     | snap action                   |
| 37-2222             | PSP1K86PX11 ⊕ | Zb  (1NO+1NC) | slow action open before close |
| 37-2223             | PSP1K86PY11 ⊕ | Zb  (1NO+1NC) | slow action close before open |
| 37-2224             | PSP1K86PW02 ⊕ | Zb  (2NC)     | slow action simultaneous      |
| ⊕ efficient opening |               | Zb - movable contacts are insulated  |                               |








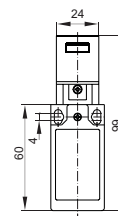
## PSP1 limit switches – K87 head head with bent shock-absorbing key no. 7, continuous 360° turn

| Cat. no.            | Type          | Connection diagram   | Description                   |
|---------------------|---------------|--|-------------------------------|
| 37-2230             | PSP1K87PZ11 ⊕ | Zb  (1NO+1NC)   | snap action                   |
| 37-2231             | PSP1K87PZ02 ⊕ | Zb  (2NC)     | snap action                   |
| 37-2232             | PSP1K87PX11 ⊕ | Zb  (1NO+1NC) | slow action open before close |
| 37-2233             | PSP1K87PY11 ⊕ | Zb  (1NO+1NC) | slow action close before open |
| 37-2234             | PSP1K87PW02 ⊕ | Zb  (2NC)     | slow action simultaneous      |
| ⊕ efficient opening |               | Zb - movable contacts are insulated  |                               |








## PSP1 limit switches – K88 head head with flat shock-absorbing key no. 8, continuous 360° turn

| Cat. no.            | Type          | Connection diagram   | Description                   |
|---------------------|---------------|--|-------------------------------|
| 37-2240             | PSP1K88PZ11 ⊕ | Zb  (1NO+1NC) | snap action                   |
| 37-2241             | PSP1K88PZ02 ⊕ | Zb  (2NC)     | snap action                   |
| 37-2242             | PSP1K88PX11 ⊕ | Zb  (1NO+1NC) | slow action open before close |
| 37-2243             | PSP1K88PY11 ⊕ | Zb  (1NO+1NC) | slow action close before open |
| 37-2244             | PSP1K88PW02 ⊕ | Zb  (2NC)     | slow action simultaneous      |
| ⊕ efficient opening |               | Zb - movable contacts are insulated  |                               |








## PSP1 limit switches – K89 head head with adjustable key no. 9, continuous 360° turn

| Cat. no. | Type          | Connection diagram   | Description                   |
|----------|---------------|--|-------------------------------|
| 37-2250  | PSP1K89PZ11 ⊕ | Zb  (1NO+1NC) | snap action                   |
| 37-2251  | PSP1K89PZ02 ⊕ | Zb  (2NC)     | snap action                   |
| 37-2252  | PSP1K89PX11 ⊕ | Zb  (1NO+1NC) | slow action open before close |
| 37-2253  | PSP1K89PY11 ⊕ | Zb  (1NO+1NC) | slow action close before open |
| 37-2254  | PSP1K89PW02 ⊕ | Zb  (2NC)     | slow action simultaneous      |

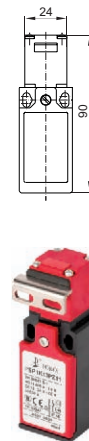
⊕ efficient opening      Zb - movable contacts are insulated








## PSP1 limit switches – K13 head head with bent narrow key no. 3, 90° adjustable

| Cat. no. | Type          | Connection diagram   | Description                   |
|----------|---------------|--|-------------------------------|
| 37-2270  | PSP1K13PZ11 ⊕ | Zb  (1NO+1NC)   | snap action                   |
| 37-2271  | PSP1K13PZ02 ⊕ | Zb  (2NC)     | snap action                   |
| 37-2272  | PSP1K13PX11 ⊕ | Zb  (1NO+1NC) | slow action open before close |
| 37-2273  | PSP1K13PY11 ⊕ | Zb  (1NO+1NC) | slow action close before open |
| 37-2274  | PSP1K13PW02 ⊕ | Zb  (2NC)     | slow action simultaneous      |

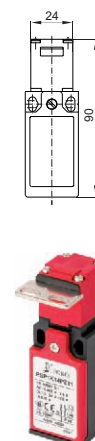
⊕ efficient opening      Zb - movable contacts are insulated



## PSP1 limit switches – K14 head head with flat narrow key no. 4, 90° adjustable

| Cat. no. | Type          | Connection diagram   | Description                   |
|----------|---------------|--|-------------------------------|
| 37-2280  | PSP1K14PZ11 ⊕ | Zb  (1NO+1NC) | snap action                   |
| 37-2281  | PSP1K14PZ02 ⊕ | Zb  (2NC)     | snap action                   |
| 37-2282  | PSP1K14PX11 ⊕ | Zb  (1NO+1NC) | slow action open before close |
| 37-2283  | PSP1K14PY11 ⊕ | Zb  (1NO+1NC) | slow action close before open |
| 37-2284  | PSP1K14PW02 ⊕ | Zb  (2NC)     | slow action simultaneous      |

⊕ efficient opening      Zb - movable contacts are insulated

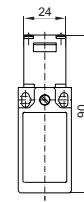


# LIMIT SWITCHES

## PSP1 limit switches – K15 head head with bent wide key no. 5, 90° adjustable

| Cat. no. | Type          | Connection diagram | Description                   |
|----------|---------------|--------------------|-------------------------------|
| 37-2290  | PSP1K15PZ11 ⊕ | Zb  (1NO+1NC)      | snap action                   |
| 37-2291  | PSP1K15PZ02 ⊕ | Zb  (2NC)          | snap action                   |
| 37-2292  | PSP1K15PX11 ⊕ | Zb  (1NO+1NC)      | slow action open before close |
| 37-2293  | PSP1K15PY11 ⊕ | Zb  (1NO+1NC)      | slow action close before open |
| 37-2294  | PSP1K15PW02 ⊕ | Zb  (2NC)          | slow action simultaneous      |

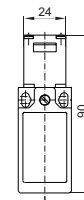
⊕ efficient opening      Zb - movable contacts are insulated



## PSP1 limit switches – K16 head head with flat wide key no. 6, 90° adjustable

| Cat. no. | Type          | Connection diagram | Description                   |
|----------|---------------|--------------------|-------------------------------|
| 37-2300  | PSP1K16PZ11 ⊕ | Zb  (1NO+1NC)      | snap action                   |
| 37-2301  | PSP1K16PZ02 ⊕ | Zb  (2NC)          | snap action                   |
| 37-2302  | PSP1K16PX11 ⊕ | Zb  (1NO+1NC)      | slow action open before close |
| 37-2303  | PSP1K16PY11 ⊕ | Zb  (1NO+1NC)      | slow action close before open |
| 37-2304  | PSP1K16PW02 ⊕ | Zb  (2NC)          | slow action simultaneous      |

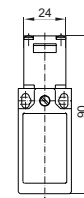
⊕ efficient opening      Zb - movable contacts are insulated








## PSP1 limit switches – K17 head head with bent shock absorbing key no. 7, 90° adjustable

| Cat. no. | Type          | Connection diagram | Description                   |
|----------|---------------|--------------------|-------------------------------|
| 37-2310  | PSP1K17PZ11 ⊕ | Zb  (1NO+1NC)      | snap action                   |
| 37-2311  | PSP1K17PZ02 ⊕ | Zb  (2NC)          | snap action                   |
| 37-2312  | PSP1K17PX11 ⊕ | Zb  (1NO+1NC)      | slow action open before close |
| 37-2313  | PSP1K17PY11 ⊕ | Zb  (1NO+1NC)      | slow action close before open |
| 37-2314  | PSP1K17PW02 ⊕ | Zb  (2NC)          | slow action simultaneous      |

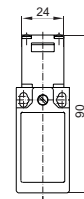
⊕ efficient opening      Zb - movable contacts are insulated








## PSP1 limit switches – K18 head head with flat shock absorbing key no. 8, 90° adjustable

| Cat. no. | Type          | Connection diagram   | Description                   |
|----------|---------------|--|-------------------------------|
| 37-2320  | PSP1K18PZ11 ⊕ | Zb  (1NO+1NC) | snap action                   |
| 37-2321  | PSP1K18PZ02 ⊕ | Zb  (2NC)     | snap action                   |
| 37-2322  | PSP1K18PX11 ⊕ | Zb  (1NO+1NC) | slow action open before close |
| 37-2323  | PSP1K18PY11 ⊕ | Zb  (1NO+1NC) | slow action close before open |
| 37-2324  | PSP1K18PW02 ⊕ | Zb  (2NC)     | slow action simultaneous      |

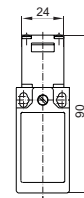
⊕ efficient opening      Zb - movable contacts are insulated



## PSP1 limit switches – K19 head head with adjustable key no. 9, 90° adjustable

| Cat. no. | Type          | Connection diagram   | Description                   |
|----------|---------------|--|-------------------------------|
| 37-2330  | PSP1K19PZ11 ⊕ | Zb  (1NO+1NC)   | snap action                   |
| 37-2331  | PSP1K19PZ02 ⊕ | Zb  (2NC)      | snap action                   |
| 37-2332  | PSP1K19PX11 ⊕ | Zb  (1NO+1NC) | slow action open before close |
| 37-2333  | PSP1K19PY11 ⊕ | Zb  (1NO+1NC) | slow action close before open |
| 37-2334  | PSP1K19PW02 ⊕ | Zb  (2NC)     | slow action simultaneous      |

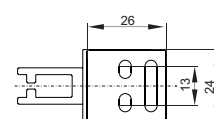
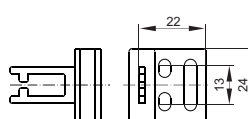
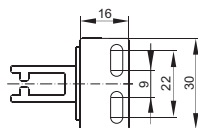
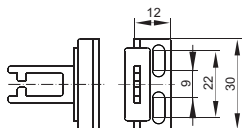
⊕ efficient opening      Zb - movable contacts are insulated



TYPE PSP1

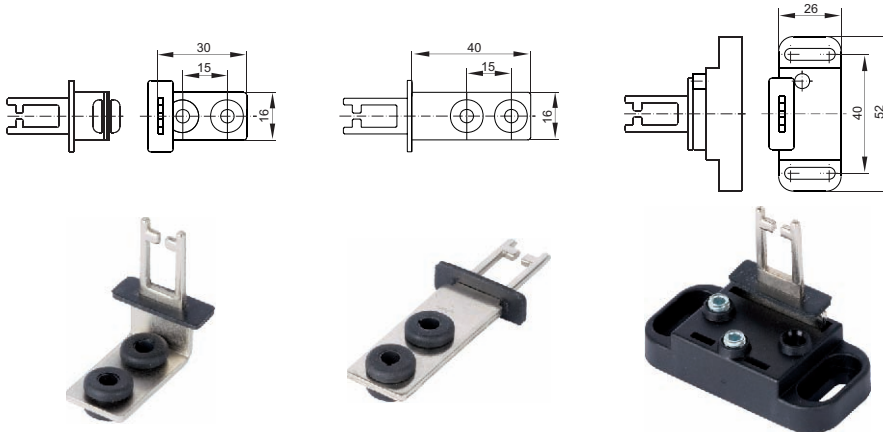
### Keys

| Cat. no. | Type  | Cat. no. | Type  | Cat. no. | Type  | Cat. no. | Type  |
|----------|-------|----------|-------|----------|-------|----------|-------|
| 37-8503  | Key 3 | 37-8504  | Key 4 | 37-8505  | Key 5 | 37-8506  | Key 6 |



# LIMIT SWITCHES

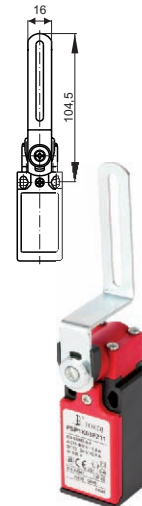
| Cat. no. | Type  | Cat. no. | Type  | Cat. no. | Type  |
|----------|-------|----------|-------|----------|-------|
| 37-8507  | Key 7 | 37-8508  | Key 8 | 37-8509  | Key 9 |



## PSP1 limit switches – K61 head head with galvanized steel lever, 90° adjustable

| Cat. no. | Type          | Connection diagram | Description                   |
|----------|---------------|--------------------|-------------------------------|
| 37-2360  | PSP1K61PZ11 ⊕ | Zb  (1NO+1NC)      | snap action                   |
| 37-2361  | PSP1K61PZ02 ⊕ | Zb  (2NC)          | snap action                   |
| 37-2362  | PSP1K61PX11 ⊕ | Zb  (1NO+1NC)      | slow action open before close |
| 37-2363  | PSP1K61PY11 ⊕ | Zb  (1NO+1NC)      | slow action close before open |
| 37-2364  | PSP1K61PW02 ⊕ | Zb  (2NC)          | slow action simultaneous      |

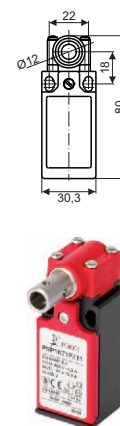
⊕ efficient opening      Zb - movable contacts are insulated



## PSP1 limit switches – K71 head head with galvanized steel roller, 90° adjustable

| Cat. no. | Type          | Connection diagram | Description                   |
|----------|---------------|--------------------|-------------------------------|
| 37-2340  | PSP1K71PZ11 ⊕ | Zb  (1NO+1NC)      | snap action                   |
| 37-2341  | PSP1K71PZ02 ⊕ | Zb  (2NC)          | snap action                   |
| 37-2342  | PSP1K71PX11 ⊕ | Zb  (1NO+1NC)      | slow action open before close |
| 37-2343  | PSP1K71PY11 ⊕ | Zb  (1NO+1NC)      | slow action close before open |
| 37-2344  | PSP1K71PW02 ⊕ | Zb  (2NC)          | slow action simultaneous      |

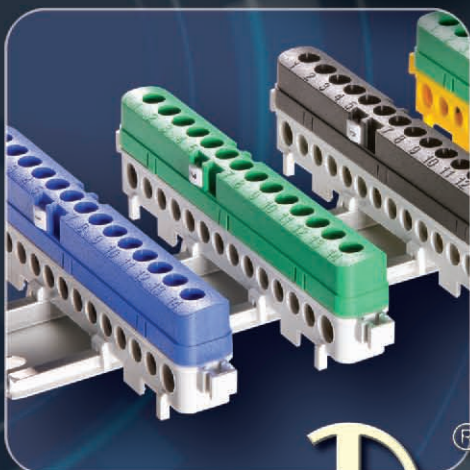
⊕ efficient opening      Zb - movable contacts are insulated



Contacts are switched on every 360°



"POKÓJ" S. E.  
ul. Warecka 1  
91-202 Łódź  
tel.: +48 42 254 79 00  
fax: +48 42 254 79 09  
e-mail:  
market@pokojs.com.pl  
www.pokojs.com.pl



# POKÓJ

Rok zał. 1951




# LIMIT SWITCHES

## PAM1 type limit switches

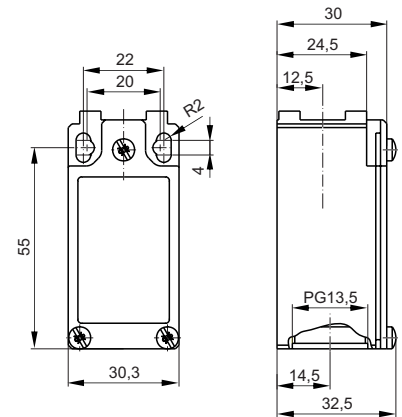
Type PAM1 limit switches are designed for work in control, monitoring and measurement circuits, e.g. in machine tools and technological equipment in the food industry, in packaging machines etc. The body is made of metal and the precise workmanship ensures good water tightness. The operating heads are exchangeable and may be installed in one of four possible positions. The operating heads enable efficient switching of the snap and slow action contact blocks.

The switches feature:

- safety symbol certificate 
- Office of Technical Inspection (UDT) type testing allowing their use in control and signalling systems for cranes and lifts
- product type approval certification allowing the use on ships granted by Polish Register of Shipping (PRS).

Technical drawings of limit switches in ".dwg" format are available at [www.pokoj.com.pl](http://www.pokoj.com.pl) in the section Offer, Design materials.

### DIMENSIONS




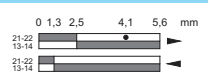
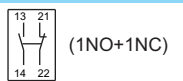

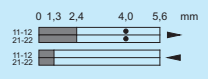
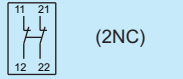

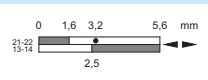
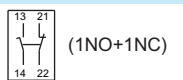

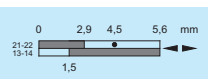
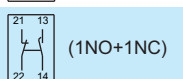

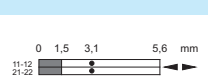
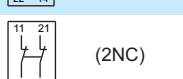
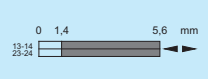
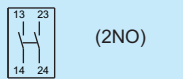
## Technical data

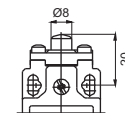
| TYPE   | PAM1  |
|--|---|
| Standards  | IEC 60947-5-1, EN 60947-5-1, EN 50047   |
| Rated switching voltage U <sub>e</sub>   | AC: 24/120/240V 50/60Hz<br>DC: 24/125/250V  |
| Rated switching currents I <sub>e</sub>  | AC: 10/6/3/1,8A<br>DC: 2,8/0,55/0,27A   |
| Use categories   | AC-15, DC-13  |
| Insulation rated voltage U <sub>i</sub> (IEC 60947-1)  | 500V  |
| Nominal impulse withstand voltage U <sub>imp</sub>   | A300, Q300  |
| Protection degree (IEC 60529)  | 6kV   |
| Environment pollution degree per IEC 60947-1   | IP66, IP65 (for F52)  |
| Short-circuiting protection<br>(type and max. values for rated data of the protective device) U <sub>e</sub> <500V a.c. Bi-Wts | 3   |
| Rated conventional air thermal current I <sub>th</sub> (IEC 60947-5-1) 0<40°C  | 10A   |
| Mechanical durability  | 10A   |
| Electric shock protection (IEC 60536)  | F11, F12: 15×10 <sup>6</sup> cycles<br>F41, F42, F45: 10×10 <sup>6</sup> cycles<br>F51, F52, F71: 10×10 <sup>6</sup> cycles |
| Ambient temperature  | Class II  |
| Max. switching cycles frequency  | -25...+70 °C  |
| Terminal resistance  | 3600 cycles/h   |
| Terminal cross-section   | 25mΩ  |
| Installation position  | 1 or 2 x 0,75+2,5mm <sup>2</sup>  |
| Casing material  | any   |
|  | metal   |


## Accessories

| Cat. no. | Type          | Page |
|----------|---------------|------|
| 59-053□  | Gland PG 13,5 | 219  |

## PAM limit switches – F11 head steel plunger

| Cat. no. | Type  | Operating diagram   | Connection diagram   | Description                   |
|----------|---|---|--|-------------------------------|
| 37-4650  | PAM1F11PZ11  |  | Zb  | snap action                   |
| 37-4651  | PAM1F11PZ02  |  | Zb  | snap action                   |
| 37-4652  | PAM1F11PX11  |  | Zb  | slow action open before close |
| 37-4653  | PAM1F11PY11  |  | Zb  | slow action close before open |
| 37-4654  | PAM1F11PW02  |  | Zb  | slow action simultaneous      |
| 37-4655  | PAM1F11PW20   |  | Zb  | slow action simultaneous      |

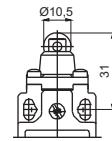


• - efficient opening points  efficient opening v<sub>max</sub>=0,5 [m/s]; F<sub>min</sub>=15 [N]; F<sub>sk</sub>=30 [N] Zb - movable contacts are insulated

## PAM1 limit switches – F12 head steel plunger with steel roller Ø10.5

| Cat. no. | Type        | Operating diagram | Connection diagram | Description                   |
|----------|-------------|-------------------|--------------------|-------------------------------|
| 37-4660  | PAM1F12PZ11 |                   | Zb                 | snap action                   |
| 37-4661  | PAM1F12PZ02 |                   | Zb                 | snap action                   |
| 37-4662  | PAM1F12PX11 |                   | Zb                 | slow action open before close |
| 37-4663  | PAM1F12PY11 |                   | Zb                 | slow action close before open |
| 37-4664  | PAM1F12PW02 |                   | Zb                 | slow action simultaneous      |
| 37-4665  | PAM1F12PW20 |                   | Zb                 | slow action simultaneous      |

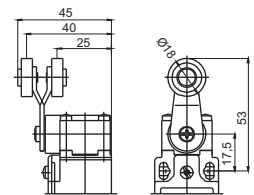
• - efficient opening points    ⊕ efficient opening     $v_{max}=0,5$  [m/s];  $F_{min}=15$  [N];  $F_{sk}=30$  [N]    Zb - movable contacts are insulated



## PAM1 limit switches – F41 head plastic roller lever Ø18

| Cat. no. | Type        | Operating diagram | Connection diagram | Description                   |
|----------|-------------|-------------------|--------------------|-------------------------------|
| 37-4670  | PAM1F41PZ11 |                   | Zb                 | snap action                   |
| 37-4671  | PAM1F41PZ02 |                   | Zb                 | snap action                   |
| 37-4672  | PAM1F41PX11 |                   | Zb                 | slow action open before close |
| 37-4673  | PAM1F41PY11 |                   | Zb                 | slow action close before open |
| 37-4674  | PAM1F41PW02 |                   | Zb                 | slow action simultaneous      |
| 37-4675  | PAM1F41PW20 |                   | Zb                 | slow action simultaneous      |

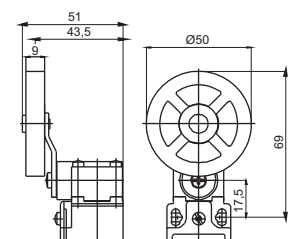
• - efficient opening points    ⊕ efficient opening     $v_{max}=1,5$  [m/s];  $M_{min}=0,1$  [Nm];  $M_{sk}=0,32$  [Nm]    Zb - movable contacts are insulated



## PAM1 limit switches – F42 head rubber roller lever Ø50

| Cat. no. | Type        | Operating diagram | Connection diagram | Description                   |
|----------|-------------|-------------------|--------------------|-------------------------------|
| 37-4680  | PAM1F42PZ11 |                   | Zb                 | snap action                   |
| 37-4681  | PAM1F42PZ02 |                   | Zb                 | snap action                   |
| 37-4682  | PAM1F42PX11 |                   | Zb                 | slow action open before close |
| 37-4683  | PAM1F42PY11 |                   | Zb                 | slow action close before open |
| 37-4684  | PAM1F42PW02 |                   | Zb                 | slow action simultaneous      |
| 37-4685  | PAM1F42PW20 |                   | Zb                 | slow action simultaneous      |

• - efficient opening points    ⊕ efficient opening     $v_{max}=1,5$  [m/s];  $M_{min}=0,1$  [Nm];  $M_{sk}=0,32$  [Nm]    Zb - movable contacts are insulated

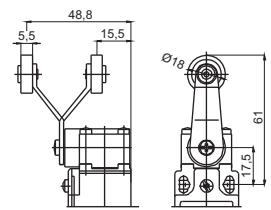


# LIMIT SWITCHES

## PAM1 limit switches – F45 head plastic roller lever Ø18

| Cat. no. | Type        | Operating diagram | Connection diagram | Description                              |
|----------|-------------|-------------------|--------------------|--|
| 37-4710  | PAM1F45PZ11 |                   | Zb                 | 1NO+1NC<br>snap action                   |
| 37-4711  | PAM1F45PZ02 |                   | Zb                 | 2NC<br>snap action                       |
| 37-4712  | PAM1F45PX11 |                   | Zb                 | 1NO+1NC<br>slow action open before close |
| 37-4713  | PAM1F45PY11 |                   | Zb                 | 1NO+1NC<br>slow action close before open |
| 37-4714  | PAM1F45PW02 |                   | Zb                 | 2NC<br>slow action simultaneous          |
| 37-4715  | PAM1F45PW20 |                   | Zb                 | 2NO<br>slow action simultaneous          |

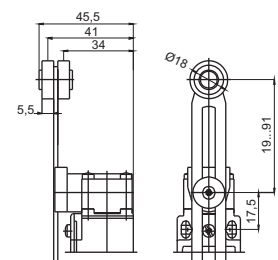
• - efficient opening points    ⊕ efficient opening     $v_{max}=1,5$  [m/s];  $M_{min}=0,1$  [Nm];  $M_{sk}=0,32$  [Nm]    Zb - movable contacts are insulated



## PAM1 limit switches – F51 head adjustable plastic roller lever Ø18

| Cat. no. | Type        | Operating diagram | Connection diagram | Description                              |
|----------|-------------|-------------------|--------------------|--|
| 37-4740  | PAM1F51PZ11 |                   | Zb                 | 1NO+1NC<br>snap action                   |
| 37-4741  | PAM1F51PZ02 |                   | Zb                 | 2NC<br>snap action                       |
| 37-4742  | PAM1F51PX11 |                   | Zb                 | 1NO+1NC<br>slow action open before close |
| 37-4743  | PAM1F51PY11 |                   | Zb                 | 1NO+1NC<br>slow action close before open |
| 37-4744  | PAM1F51PW02 |                   | Zb                 | 2NC<br>slow action simultaneous          |
| 37-4745  | PAM1F51PW20 |                   | Zb                 | 2NO<br>slow action simultaneous          |

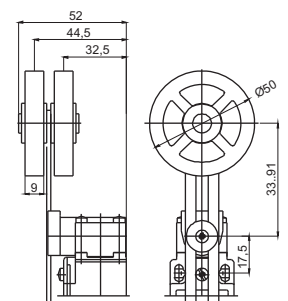
• - efficient opening points    ⊕ efficient opening     $v_{max}=1,5$  [m/s];  $M_{min}=0,1$  [Nm];  $M_{sk}=0,32$  [Nm]    Zb - movable contacts are insulated



## PAM1 limit switches – F52 head adjustable rubber roller lever Ø50

| Cat. no. | Type        | Operating diagram | Connection diagram | Description                              |
|----------|-------------|-------------------|--------------------|--|
| 37-4750  | PAM1F52PZ11 |                   | Zb                 | 1NO+1NC<br>snap action                   |
| 37-4751  | PAM1F52PZ02 |                   | Zb                 | 2NC<br>snap action                       |
| 37-4752  | PAM1F52PX11 |                   | Zb                 | 1NO+1NC<br>slow action open before close |
| 37-4753  | PAM1F52PY11 |                   | Zb                 | 1NO+1NC<br>slow action close before open |
| 37-4754  | PAM1F52PW02 |                   | Zb                 | 2NC<br>slow action simultaneous          |
| 37-4755  | PAM1F52PW20 |                   | Zb                 | 2NO<br>slow action simultaneous          |

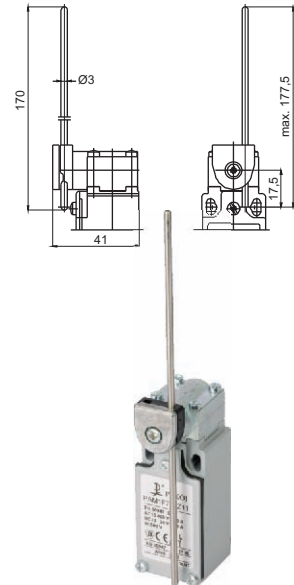
• - efficient opening points    ⊕ efficient opening     $v_{max}=1,5$  [m/s];  $M_{min}=0,1$  [Nm];  $M_{sk}=0,32$  [Nm]    Zb - movable contacts are insulated



## PAM1 limit switch – F71 head stainless steel rod Ø3

| Cat. no. | Type          | Operating diagram | Connection diagram | Description                   |
|----------|---------------|-------------------|--------------------|-------------------------------|
| 37-4770  | PAM1F71PZ11 ⊕ |                   | Zb  (1NO+1NC)      | snap action                   |
| 37-4771  | PAM1F71PZ02 ⊕ |                   | Zb  (2NC)          | snap action                   |
| 37-4772  | PAM1F71PX11 ⊕ |                   | Zb  (1NO+1NC)      | slow action open before close |
| 37-4773  | PAM1F71PY11 ⊕ |                   | Zb  (1NO+1NC)      | slow action close before open |
| 37-4774  | PAM1F71PW02 ⊕ |                   | Zb  (2NC)          | slow action simultaneous      |
| 37-4775  | PAM1F71PW20   |                   | Zb  (2NO)          | slow action simultaneous      |

• - efficient opening points ⊕ efficient opening  $v_{max}=1,5$  [m/s];  $M_{min}=0,1$  [Nm];  $M_{sk}=0,32$  [Nm] Zb - movable contacts are insulated



## PAM1 limit switches – R11 head steel plunger with reset function

| Cat. no. | Type          | Connection diagram | Description                   |
|----------|---------------|--------------------|-------------------------------|
| 37-4R10  | PAM1R11PZ11 ⊕ | Zb  (1NO+1NC)      | snap action                   |
| 37-4R11  | PAM1R11PZ02 ⊕ | Zb  (2NC)          | snap action                   |
| 37-4R12  | PAM1R11PX11 ⊕ | Zb  (1NO+1NC)      | slow action open before close |
| 37-4R14  | PAM1R11PW02 ⊕ | Zb  (2NC)          | slow action simultaneous      |

⊕ efficient opening Zb - movable contacts are insulated



## PAM1 limit switches – R13 head steel plunger with plastic roller Ø10.5 and reset function





| Cat. no. | Type          | Connection diagram | Description                   |
|----------|---------------|--------------------|-------------------------------|
| 37-4R20  | PAM1R13PZ11 ⊕ | Zb  (1NO+1NC)      | snap action                   |
| 37-4R21  | PAM1R13PZ02 ⊕ | Zb  (2NC)          | snap action                   |
| 37-4R22  | PAM1R13PX11 ⊕ | Zb  (1NO+1NC)      | slow action open before close |
| 37-4R24  | PAM1R13PW02 ⊕ | Zb  (2NC)          | slow action simultaneous      |

⊕ efficient opening Zb - movable contacts are insulated



# LIMIT SWITCHES





## PAM1 limit switches – R31 head steel plunger and horizontal plastic roller lever Ø12.5, with reset function

| Cat. no. | Type          | Connection diagram   | Description                   |
|----------|---------------|--|-------------------------------|
| 37-4R30  | PAM1R31PZ11 ⊕ | Zb  (1NO+1NC) | snap action                   |
| 37-4R31  | PAM1R31PZ02 ⊕ | Zb  (2NC)     | snap action                   |
| 37-4R32  | PAM1R31PX11 ⊕ | Zb  (1NO+1NC) | slow action open before close |
| 37-4R34  | PAM1R31PW02 ⊕ | Zb  (2NC)     | slow action simultaneous      |

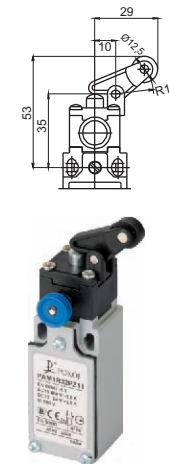
⊕ efficient opening      Zb - movable contacts are insulated







## PAM1 limit switches – R32 head steel plunger and vertical plastic roller lever Ø12.5, with reset function

| Cat. no. | Type          | Connection diagram   | Description                   |
|----------|---------------|--|-------------------------------|
| 37-4R40  | PAM1R32PZ11 ⊕ | Zb  (1NO+1NC)   | snap action                   |
| 37-4R41  | PAM1R32PZ02 ⊕ | Zb  (2NC)      | snap action                   |
| 37-4R42  | PAM1R32PX11 ⊕ | Zb  (1NO+1NC) | slow action open before close |
| 37-4R44  | PAM1R32PW02 ⊕ | Zb  (2NC)     | slow action simultaneous      |

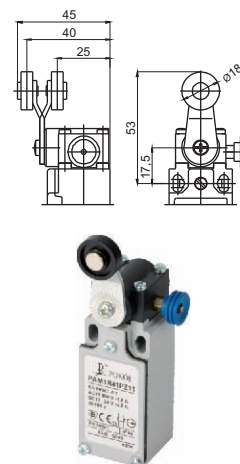
⊕ efficient opening      Zb - movable contacts are insulated



## PAM1 limit switches – R41 head plastic roller lever Ø18 with reset function

| Cat. no. | Type          | Connection diagram   | Description                   |
|----------|---------------|--|-------------------------------|
| 37-4R60  | PAM1R41PZ11 ⊕ | Zb  (1NO+1NC) | snap action                   |
| 37-4R61  | PAM1R41PZ02 ⊕ | Zb  (2NC)     | snap action                   |
| 37-4R62  | PAM1R41PX11 ⊕ | Zb  (1NO+1NC) | slow action open before close |
| 37-4R64  | PAM1R41PW02 ⊕ | Zb  (2NC)     | slow action simultaneous      |


⊕ efficient opening      Zb - movable contacts are insulated



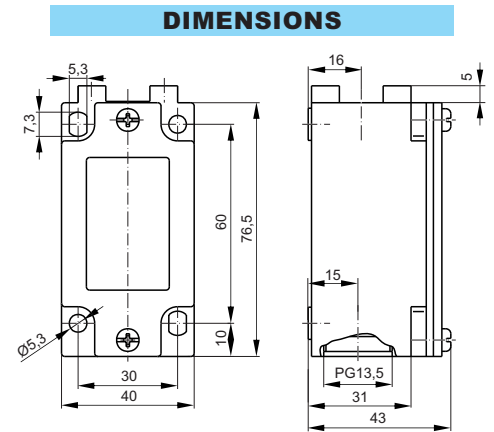
## PBM1 type limit switches

Type PBM1 limit switches are designed for work in control, monitoring and measurement circuits, e.g. in machine tools and technological equipment in the food industry, in packaging machines etc. The body is made of metal and the precise workmanship ensures good water tightness. The operating heads are exchangeable and may be installed in one of four possible positions. The operating heads enable efficient switching of the snap and slow action contact blocks.

The switches feature:

- safety symbol certificate 
- Office of Technical Inspection (UDT) type testing allowing their use in control and signalling systems for cranes and lifts
- product type approval certification allowing the use on ships granted by Polish Register of Shipping (PRS).

Technical drawings of limit switches in ".dwg" format are available at [www.pokoj.com.pl](http://www.pokoj.com.pl) in the section Offer, Design materials.



## Technical data

| TYPE   | PBM1   |
|--|--|
| Standards  | IEC 60947-5-1, EN 60947-5-1, EN 50047  |
| Rated switching voltage $U_e$  | AC: 24/120/240V 50/60Hz<br>DC: 24/125/250V   |
| Rated switching currents $I_e$   | AC: 10/6/3/1,8A<br>DC: 2,8/0,55/0,27A  |
| Use categories   | AC-15, DC-13   |
| Insulation rated voltage $U_i$ (IEC 60947-1)   | 500V   |
| Nominal impulse withstand voltage $U_{imp}$  | A300, Q300   |
| Protection degree (IEC 60529)  | 6kV  |
| Environment pollution degree per IEC 60947-1   | IP66, IP65 (for E54, E92, E93)   |
| Short-circuiting protection<br>(type and max. values for rated data of the protective device) $U_e < 500V$ a.c. Bi-Wts | 3  |
| Rated conventional air thermal current $I_{th}$ (IEC 60947-5-1) $0 < 40^\circ C$                                       | 10A  |
| Mechanical durability  | 10A  |
| Electric shock protection (IEC 60536)  | E11+E32: $30 \times 10^6$ cycles<br>E41+E72: $25 \times 10^6$ cycles<br>E91+E99: $10 \times 10^6$ cycles |
| Ambient temperature  | Class II   |
| Max. switching cycles frequency  | -25...+70 °C   |
| Terminal resistance  | 3600 cycles/h  |
| Terminal cross-section   | 25mΩ   |
| Installation position  | 1 or 2 x 0,75±2,5mm <sup>2</sup>   |
| Casing material  | any  |
|  | metal  |

## Accessories

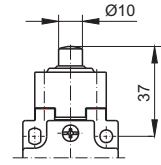
| Cat. no. | Type          | Page |
|----------|---------------|------|
| 59-053□  | Gland PG 13,5 | 219  |

# LIMIT SWITCHES

## PBM1 limit switches – E11 head steel plunger

| Cat. no. | Type          | Operating diagram | Connection diagram | Description                   |
|----------|---------------|-------------------|--------------------|-------------------------------|
| 37-3370  | PBM1E11PZ11 ⊕ |                   | Zb  (1NO+1NC)      | snap action                   |
| 37-3371  | PBM1E11PZ02 ⊕ |                   | Zb  (2NC)          | snap action                   |
| 37-3372  | PBM1E11PX11 ⊕ |                   | Zb  (1NO+1NC)      | slow action open before close |
| 37-3373  | PBM1E11PY11 ⊕ |                   | Zb  (1NO+1NC)      | slow action close before open |
| 37-3374  | PBM1E11PW02 ⊕ |                   | Zb  (2NC)          | slow action simultaneous      |
| 37-3375  | PBM1E11PW20   |                   | Zb  (2NO)          | slow action simultaneous      |
| 37-3376  | PBM1E11PX21 ⊕ |                   | Zb  (1NC+2NO)      | slow action close before open |
| 37-3377  | PBM1E11PX12 ⊕ |                   | Zb  (2NC+1NO)      | slow action open before close |
| 37-3378  | PBM1E11PW03 ⊕ |                   | Zb  (3NC)          | slow action simultaneous      |
| 37-3379  | PBM1E11PW30   |                   | Zb  (3NO)          | slow action simultaneous      |

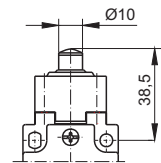
• - efficient opening points   ⊕ efficient opening    $v_{max}=0,5$  [m/s];  $F_{min}=30$  [N];  $F_{sk}=45$  [N]   Zb - movable contacts are insulated



## PBM1 limit switches – E12 head steel plunger with ball tip

| Cat. no. | Type          | Operating diagram | Connection diagram | Description                   |
|----------|---------------|-------------------|--------------------|-------------------------------|
| 37-3390  | PBM1E12PZ11 ⊕ |                   | Zb  (1NO+1NC)      | snap action                   |
| 37-3391  | PBM1E12PZ02 ⊕ |                   | Zb  (2NC)          | snap action                   |
| 37-3392  | PBM1E12PX11 ⊕ |                   | Zb  (1NO+1NC)      | slow action open before close |
| 37-3393  | PBM1E12PY11 ⊕ |                   | Zb  (1NO+1NC)      | slow action close before open |
| 37-3394  | PBM1E12PW02 ⊕ |                   | Zb  (2NC)          | slow action simultaneous      |
| 37-3395  | PBM1E12PW20   |                   | Zb  (2NO)          | slow action simultaneous      |
| 37-3396  | PBM1E12PX21 ⊕ |                   | Zb  (1NC+2NO)      | slow action close before open |
| 37-3397  | PBM1E12PX12 ⊕ |                   | Zb  (2NC+1NO)      | slow action open before close |
| 37-3398  | PBM1E12PW03 ⊕ |                   | Zb  (3NC)          | slow action simultaneous      |
| 37-3399  | PBM1E12PW30   |                   | Zb  (3NO)          | slow action simultaneous      |

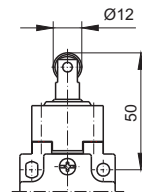
• - efficient opening points   ⊕ efficient opening    $v_{max}=0,5$  [m/s];  $F_{min}=15$  [N];  $F_{sk}=30$  [N]   Zb - movable contacts are insulated



## PBM1 limit switches – E13 head steel plunger with steel roller Ø12

| Cat. no. | Type          | Operating diagram | Connection diagram | Description                   |
|----------|---------------|-------------------|--------------------|-------------------------------|
| 37-3400  | PBM1E13PZ11 ⊕ |                   | Zb                 | snap action                   |
| 37-3401  | PBM1E13PZ02 ⊕ |                   | Zb                 | snap action                   |
| 37-3402  | PBM1E13PX11 ⊕ |                   | Zb                 | slow action open before close |
| 37-3403  | PBM1E13PY11 ⊕ |                   | Zb                 | slow action close before open |
| 37-3404  | PBM1E13PW02 ⊕ |                   | Zb                 | slow action simultaneous      |
| 37-3405  | PBM1E13PW20   |                   | Zb                 | slow action simultaneous      |
| 37-3406  | PBM1E13PX21 ⊕ |                   | Zb                 | slow action close before open |
| 37-3407  | PBM1E13PX12 ⊕ |                   | Zb                 | slow action open before close |
| 37-3408  | PBM1E13PW03 ⊕ |                   | Zb                 | slow action simultaneous      |
| 37-3409  | PBM1E13PW30   |                   | Zb                 | slow action simultaneous      |

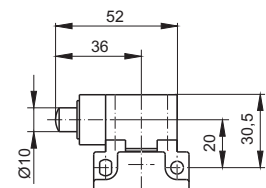
• - efficient opening points   ⊕ efficient opening    $v_{max}=0,5$  [m/s];  $F_{min}=22$  [N];  $F_{sk}=40$  [N]   Zb - movable contacts are insulated



## PBM1 limit switches – E21 head side steel plunger

| Cat. no. | Type          | Operating diagram | Connection diagram | Description                   |
|----------|---------------|-------------------|--------------------|-------------------------------|
| 37-3420  | PBM1E21PZ11 ⊕ |                   | Zb                 | snap action                   |
| 37-3421  | PBM1E21PZ02 ⊕ |                   | Zb                 | snap action                   |
| 37-3422  | PBM1E21PX11 ⊕ |                   | Zb                 | slow action open before close |
| 37-3423  | PBM1E21PY11 ⊕ |                   | Zb                 | slow action close before open |
| 37-3424  | PBM1E21PW02 ⊕ |                   | Zb                 | slow action simultaneous      |
| 37-3425  | PBM1E21PW20   |                   | Zb                 | slow action simultaneous      |
| 37-3426  | PBM1E21PX21 ⊕ |                   | Zb                 | slow action close before open |
| 37-3427  | PBM1E21PX12 ⊕ |                   | Zb                 | slow action open before close |
| 37-3428  | PBM1E21PW03 ⊕ |                   | Zb                 | slow action simultaneous      |
| 37-3429  | PBM1E21PW30   |                   | Zb                 | slow action simultaneous      |

• - efficient opening points   ⊕ efficient opening    $v_{max}=0,5$  [m/s];  $F_{min}=30$  [N];  $F_{sk}=50$  [N]   Zb - movable contacts are insulated



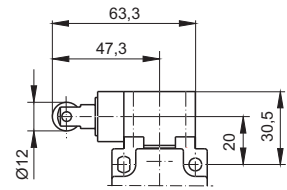


# LIMIT SWITCHES

## PBM1 limit switches – E22 head side steel plunger with vertical steel roller Ø12

| Cat. no. | Type        | Operating diagram | Connection diagram | Description                   |
|----------|-------------|-------------------|--------------------|-------------------------------|
| 37-3430  | PBM1E22PZ11 |                   | Zb  (1NO+1NC)      | snap action                   |
| 37-3431  | PBM1E22PZ02 |                   | Zb  (2NC)          | snap action                   |
| 37-3432  | PBM1E22PX11 |                   | Zb  (1NO+1NC)      | slow action open before close |
| 37-3433  | PBM1E22PY11 |                   | Zb  (1NO+1NC)      | slow action close before open |
| 37-3434  | PBM1E22PW02 |                   | Zb  (2NC)          | slow action simultaneous      |
| 37-3435  | PBM1E22PW20 |                   | Zb  (2NO)          | slow action simultaneous      |
| 37-3436  | PBM1E22PX21 |                   | Zb  (1NC+2NO)      | slow action close before open |
| 37-3437  | PBM1E22PX12 |                   | Zb  (2NC+1NO)      | slow action open before close |
| 37-3438  | PBM1E22PW03 |                   | Zb  (3NC)          | slow action simultaneous      |
| 37-3439  | PBM1E22PW30 |                   | Zb  (3NO)          | slow action simultaneous      |

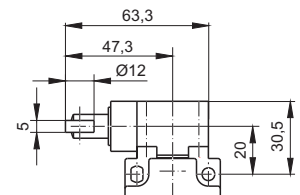
• - efficient opening points    ⊕ efficient opening     $v_{max}=0,5$  [m/s];  $F_{min}=30$  [N];  $F_{sk}=50$  [N]    Zb - movable contacts are insulated



## PBM1 limit switches – E23 head side steel plunger with horizontal steel roller Ø12

| Cat. no. | Type        | Operating diagram | Connection diagram | Description                   |
|----------|-------------|-------------------|--------------------|-------------------------------|
| 37-3440  | PBM1E23PZ11 |                   | Zb  (1NO+1NC)      | snap action                   |
| 37-3441  | PBM1E23PZ02 |                   | Zb  (2NC)          | snap action                   |
| 37-3442  | PBM1E23PX11 |                   | Zb  (1NO+1NC)      | slow action open before close |
| 37-3443  | PBM1E23PY11 |                   | Zb  (1NO+1NC)      | slow action close before open |
| 37-3444  | PBM1E23PW02 |                   | Zb  (2NC)          | slow action simultaneous      |
| 37-3445  | PBM1E23PW20 |                   | Zb  (2NO)          | slow action simultaneous      |
| 37-3446  | PBM1E23PX21 |                   | Zb  (1NC+2NO)      | slow action close before open |
| 37-3447  | PBM1E23PX12 |                   | Zb  (2NC+1NO)      | slow action open before close |
| 37-3448  | PBM1E23PW03 |                   | Zb  (3NC)          | slow action simultaneous      |
| 37-3449  | PBM1E23PW30 |                   | Zb  (3NO)          | slow action simultaneous      |

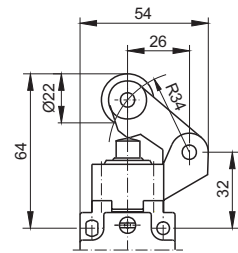
• - efficient opening points    ⊕ efficient opening     $v_{max}=0,5$  [m/s];  $F_{min}=30$  [N];  $F_{sk}=50$  [N]    Zb - movable contacts are insulated



## PBM1 limit switches – E32 head steel plunger and steel roller lever Ø22

| Cat. no. | Type        | Operating diagram | Connection diagram | Description                             |
|----------|-------------|-------------------|--------------------|---|
| 37-3460  | PBM1E32PZ11 |                   | Zb                 | (1NO+1NC) snap action                   |
| 37-3461  | PBM1E32PZ02 |                   | Zb                 | (2NC) snap action                       |
| 37-3462  | PBM1E32PX11 |                   | Zb                 | (1NO+1NC) slow action open before close |
| 37-3463  | PBM1E32PY11 |                   | Zb                 | (1NO+1NC) slow action close before open |
| 37-3464  | PBM1E32PW02 |                   | Zb                 | (2NC) slow action simultaneous          |
| 37-3465  | PBM1E32PW20 |                   | Zb                 | (2NO) slow action simultaneous          |
| 37-3466  | PBM1E32PX21 |                   | Zb                 | (1NC+2NO) slow action close before open |
| 37-3467  | PBM1E32PX12 |                   | Zb                 | (2NC+1NO) slow action open before close |
| 37-3468  | PBM1E32PW03 |                   | Zb                 | (3NC) slow action simultaneous          |
| 37-3469  | PBM1E32PW30 |                   | Zb                 | (3NO) slow action simultaneous          |

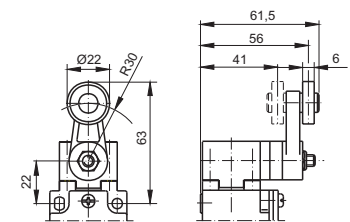
• - efficient opening points    ⊕ efficient opening     $v_{max}=1,5$  [m/s];  $F_{min}=12$  [N];  $F_{sk}=40$  [N]    Zb - movable contacts are insulated



## PBM1 limit switches – E41 head plastic roller lever Ø22

| Cat. no. | Type        | Operating diagram | Connection diagram | Description                             |
|----------|-------------|-------------------|--------------------|---|
| 37-3480  | PBM1E41PZ11 |                   | Zb                 | (1NO+1NC) snap action                   |
| 37-3481  | PBM1E41PZ02 |                   | Zb                 | (2NC) snap action                       |
| 37-3482  | PBM1E41PX11 |                   | Zb                 | (1NO+1NC) slow action open before close |
| 37-3483  | PBM1E41PY11 |                   | Zb                 | (1NO+1NC) slow action close before open |
| 37-3484  | PBM1E41PW02 |                   | Zb                 | (2NC) slow action simultaneous          |
| 37-3485  | PBM1E41PW20 |                   | Zb                 | (2NO) slow action simultaneous          |
| 37-3486  | PBM1E41PX21 |                   | Zb                 | (1NC+2NO) slow action close before open |
| 37-3487  | PBM1E41PX12 |                   | Zb                 | (2NC+1NO) slow action open before close |
| 37-3488  | PBM1E41PW03 |                   | Zb                 | (3NC) slow action simultaneous          |
| 37-3489  | PBM1E41PW30 |                   | Zb                 | (3NO) slow action simultaneous          |

• - efficient opening points    ⊕ efficient opening     $v_{max}=1,5$  [m/s];  $M_{min}=0,15$  [Nm];  $M_{sk}=0,30$  [Nm]    Zb - movable contacts are insulated

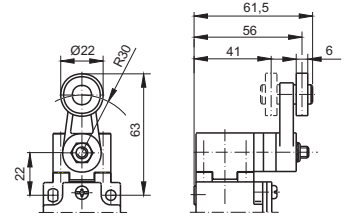


# LIMIT SWITCHES

## PBM1 limit switches – E42 head steel roller lever Ø22

| Cat. no. | Type          | Operating diagram | Connection diagram | Description                              |
|----------|---------------|-------------------|--------------------|--|
| 37-3490  | PBM1E42PZ11 ⊕ |                   | Zb                 | 1NO+1NC<br>snap action                   |
| 37-3491  | PBM1E42PZ02 ⊕ |                   | Zb                 | 2NC<br>snap action                       |
| 37-3492  | PBM1E42PX11 ⊕ |                   | Zb                 | 1NO+1NC<br>slow action open before close |
| 37-3493  | PBM1E42PY11 ⊕ |                   | Zb                 | 1NO+1NC<br>slow action close before open |
| 37-3494  | PBM1E42PW02 ⊕ |                   | Zb                 | 2NC<br>slow action simultaneous          |
| 37-3495  | PBM1E42PW20   |                   | Zb                 | 2NO<br>slow action simultaneous          |
| 37-3496  | PBM1E42PX21 ⊕ |                   | Zb                 | 1NC+2NO<br>slow action close before open |
| 37-3497  | PBM1E42PX12 ⊕ |                   | Zb                 | 2NC+1NO<br>slow action open before close |
| 37-3498  | PBM1E42PW03 ⊕ |                   | Zb                 | 3NC<br>slow action simultaneous          |
| 37-3499  | PBM1E42PW30   |                   | Zb                 | 3NO<br>slow action simultaneous          |

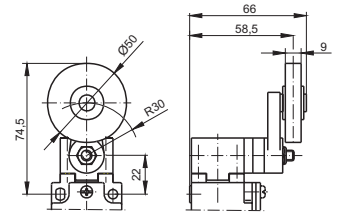
• - efficient opening points ⊕ efficient opening  $v_{max}=1,5$  [m/s];  $M_{min}=0,15$  [Nm];  $M_{sk}=0,30$  [Nm] Zb - movable contacts are insulated



## PBM1 limit switches – E44 head rubber roller lever Ø50

| Cat. no. | Type          | Operating diagram | Connection diagram | Description                              |
|----------|---------------|-------------------|--------------------|--|
| 37-3510  | PBM1E44PZ11 ⊕ |                   | Zb                 | 1NO+1NC<br>snap action                   |
| 37-3511  | PBM1E44PZ02 ⊕ |                   | Zb                 | 2NC<br>snap action                       |
| 37-3512  | PBM1E44PX11 ⊕ |                   | Zb                 | 1NO+1NC<br>slow action open before close |
| 37-3513  | PBM1E44PY11 ⊕ |                   | Zb                 | 1NO+1NC<br>slow action close before open |
| 37-3514  | PBM1E44PW02 ⊕ |                   | Zb                 | 2NC<br>slow action simultaneous          |
| 37-3515  | PBM1E44PW20   |                   | Zb                 | 2NO<br>slow action simultaneous          |
| 37-3516  | PBM1E44PX21 ⊕ |                   | Zb                 | 1NC+2NO<br>slow action close before open |
| 37-3517  | PBM1E44PX12 ⊕ |                   | Zb                 | 2NC+1NO<br>slow action open before close |
| 37-3518  | PBM1E44PW03 ⊕ |                   | Zb                 | 3NC<br>slow action simultaneous          |
| 37-3519  | PBM1E44PW30   |                   | Zb                 | 3NO<br>slow action simultaneous          |

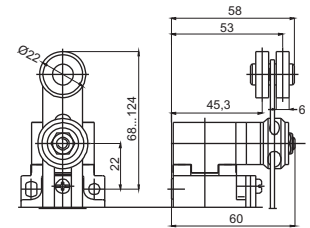
• - efficient opening points ⊕ efficient opening  $v_{max}=1,5$  [m/s];  $M_{min}=0,15$  [Nm];  $M_{sk}=0,30$  [Nm] Zb - movable contacts are insulated



## PBM1 limit switches – E51 head adjustable plastic roller lever Ø22

| Cat. no. | Type          | Operating diagram | Connection diagram | Description                   |
|----------|---------------|-------------------|--------------------|-------------------------------|
| 37-3520  | PBM1E51PZ11 ⊕ |                   | Zb  (1NO+1NC)      | snap action                   |
| 37-3521  | PBM1E51PZ02 ⊕ |                   | Zb  (2NC)          | snap action                   |
| 37-3522  | PBM1E51PX11 ⊕ |                   | Zb  (1NO+1NC)      | slow action open before close |
| 37-3523  | PBM1E51PY11 ⊕ |                   | Zb  (1NO+1NC)      | slow action close before open |
| 37-3524  | PBM1E51PW02 ⊕ |                   | Zb  (2NC)          | slow action simultaneous      |
| 37-3525  | PBM1E51PW20   |                   | Zb  (2NO)          | slow action simultaneous      |
| 37-3526  | PBM1E51PX21 ⊕ |                   | Zb  (1NC+2NO)      | slow action close before open |
| 37-3527  | PBM1E51PX12 ⊕ |                   | Zb  (2NC+1NO)      | slow action open before close |
| 37-3528  | PBM1E51PW03 ⊕ |                   | Zb  (3NC)          | slow action simultaneous      |
| 37-3529  | PBM1E51PW30   |                   | Zb  (3NO)          | slow action simultaneous      |

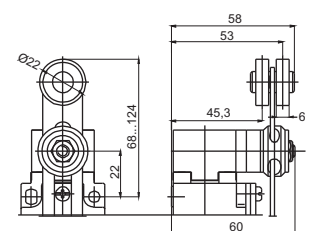
• - efficient opening points ⊕ efficient opening  $v_{max}=1,5$  [m/s];  $M_{min}=0,15$  [Nm];  $M_{sk}=0,30$  [Nm] Zb - movable contacts are insulated



## PBM1 limit switches – E52 head adjustable steel roller lever Ø22

| Cat. no. | Type          | Operating diagram | Connection diagram | Description                   |
|----------|---------------|-------------------|--------------------|-------------------------------|
| 37-3530  | PBM1E52PZ11 ⊕ |                   | Zb  (1NO+1NC)      | snap action                   |
| 37-3531  | PBM1E52PZ02 ⊕ |                   | Zb  (2NC)          | snap action                   |
| 37-3532  | PBM1E52PX11 ⊕ |                   | Zb  (1NO+1NC)      | slow action open before close |
| 37-3533  | PBM1E52PY11 ⊕ |                   | Zb  (1NO+1NC)      | slow action close before open |
| 37-3534  | PBM1E52PW02 ⊕ |                   | Zb  (2NC)          | slow action simultaneous      |
| 37-3535  | PBM1E52PW20   |                   | Zb  (2NO)          | slow action simultaneous      |
| 37-3536  | PBM1E52PX21 ⊕ |                   | Zb  (1NC+2NO)      | slow action close before open |
| 37-3537  | PBM1E52PX12 ⊕ |                   | Zb  (2NC+1NO)      | slow action open before close |
| 37-3538  | PBM1E52PW03 ⊕ |                   | Zb  (3NC)          | slow action simultaneous      |
| 37-3539  | PBM1E52PW30   |                   | Zb  (3NO)          | slow action simultaneous      |

• - efficient opening points ⊕ efficient opening  $v_{max}=1,5$  [m/s];  $M_{min}=0,15$  [Nm];  $M_{sk}=0,30$  [Nm] Zb - movable contacts are insulated

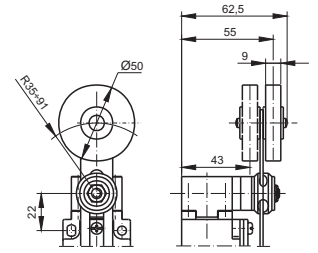


# LIMIT SWITCHES

## PBM1 limit switches – E54 head adjustable rubber roller lever Ø50

| Cat. no. | Type        | Operating diagram | Connection diagram | Description                             |
|----------|-------------|-------------------|--------------------|---|
| 37-3550  | PBM1E54PZ11 |                   | Zb                 | (1NO+1NC) snap action                   |
| 37-3551  | PBM1E54PZ02 |                   | Zb                 | (2NC) snap action                       |
| 37-3552  | PBM1E54PX11 |                   | Zb                 | (1NO+1NC) slow action open before close |
| 37-3553  | PBM1E54PY11 |                   | Zb                 | (1NO+1NC) slow action close before open |
| 37-3554  | PBM1E54PW02 |                   | Zb                 | (2NC) slow action simultaneous          |
| 37-3555  | PBM1E54PW20 |                   | Zb                 | (2NO) slow action simultaneous          |
| 37-3556  | PBM1E54PX21 |                   | Zb                 | (1NC+2NO) slow action close before open |
| 37-3557  | PBM1E54PX12 |                   | Zb                 | (2NC+1NO) slow action open before close |
| 37-3558  | PBM1E54PW03 |                   | Zb                 | (3NC) slow action simultaneous          |
| 37-3559  | PBM1E54PW30 |                   | Zb                 | (3NO) slow action simultaneous          |

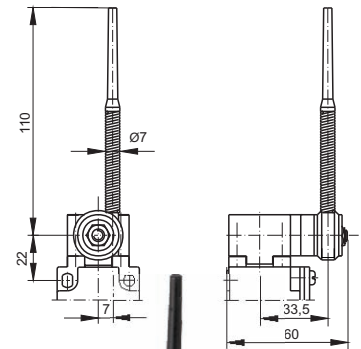
• - efficient opening points ⊕ efficient opening  $v_{max}=1,5$  [m/s];  $M_{min}=0,15$  [Nm];  $M_{sk}=0,30$  [Nm] Zb - movable contacts are insulated



## PBM1 limit switches – E61 head steel spring with plastic end

| Cat. no. | Type        | Operating diagram | Connection diagram | Description                             |
|----------|-------------|-------------------|--------------------|---|
| 37-3560  | PBM1E61PZ11 |                   | Zb                 | (1NO+1NC) snap action                   |
| 37-3561  | PBM1E61PZ02 |                   | Zb                 | (2NC) snap action                       |
| 37-3562  | PBM1E61PX11 |                   | Zb                 | (1NO+1NC) slow action open before close |
| 37-3563  | PBM1E61PY11 |                   | Zb                 | (1NO+1NC) slow action close before open |
| 37-3564  | PBM1E61PW02 |                   | Zb                 | (2NC) slow action simultaneous          |
| 37-3565  | PBM1E61PW20 |                   | Zb                 | (2NO) slow action simultaneous          |
| 37-3566  | PBM1E61PX21 |                   | Zb                 | (1NC+2NO) slow action close before open |
| 37-3567  | PBM1E61PX12 |                   | Zb                 | (2NC+1NO) slow action open before close |
| 37-3568  | PBM1E61PW03 |                   | Zb                 | (3NC) slow action simultaneous          |
| 37-3569  | PBM1E61PW30 |                   | Zb                 | (3NO) slow action simultaneous          |

$v_{max}=1,5$  [m/s];  $M_{min}=0,15$  [Nm] Zb - movable contacts are insulated

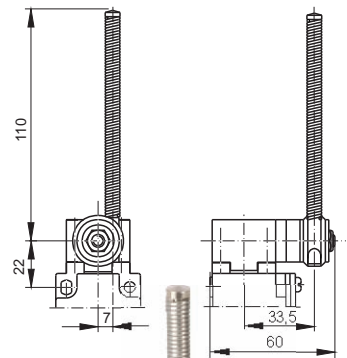


TYPE PBM1

## Switch type PBM1 – E62 head steel spring

| Cat. no. | Type        | Operating diagram | Connection diagram | Description                   |
|----------|-------------|-------------------|--------------------|-------------------------------|
| 37-3570  | PBM1E62PZ11 |                   | Zb                 | snap action                   |
| 37-3571  | PBM1E62PZ02 |                   | Zb                 | snap action                   |
| 37-3572  | PBM1E62PX11 |                   | Zb                 | slow action open before close |
| 37-3573  | PBM1E62PY11 |                   | Zb                 | slow action close before open |
| 37-3574  | PBM1E62PW02 |                   | Zb                 | slow action simultaneous      |
| 37-3575  | PBM1E62PW20 |                   | Zb                 | slow action simultaneous      |
| 37-3576  | PBM1E62PX21 |                   | Zb                 | slow action close before open |
| 37-3577  | PBM1E62PX12 |                   | Zb                 | slow action open before close |
| 37-3578  | PBM1E62PW03 |                   | Zb                 | slow action simultaneous      |
| 37-3579  | PBM1E62PW30 |                   | Zb                 | slow action simultaneous      |

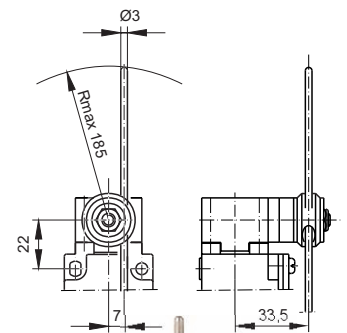
$v_{max}=1,5$  [m/s];  $M_{min}=0,15$  [Nm]      Zb - movable contacts are insulated



## PBM1 limit switches – E71 head stainless steel rod Ø3

| Cat. no. | Type          | Operating diagram | Connection diagram | Description                   |
|----------|---------------|-------------------|--------------------|-------------------------------|
| 37-3580  | PBM1E71PZ11 ⊕ |                   | Zb                 | snap action                   |
| 37-3581  | PBM1E71PZ02 ⊕ |                   | Zb                 | snap action                   |
| 37-3582  | PBM1E71PX11 ⊕ |                   | Zb                 | slow action open before close |
| 37-3583  | PBM1E71PY11 ⊕ |                   | Zb                 | slow action close before open |
| 37-3584  | PBM1E71PW02 ⊕ |                   | Zb                 | slow action simultaneous      |
| 37-3585  | PBM1E71PW20   |                   | Zb                 | slow action simultaneous      |
| 37-3586  | PBM1E71PX21 ⊕ |                   | Zb                 | slow action close before open |
| 37-3587  | PBM1E71PX12 ⊕ |                   | Zb                 | slow action open before close |
| 37-3588  | PBM1E71PW03 ⊕ |                   | Zb                 | slow action simultaneous      |
| 37-3589  | PBM1E71PW30   |                   | Zb                 | slow action simultaneous      |

• - efficient opening points    ⊕ efficient opening     $v_{max}=1,5$  [m/s];  $M_{min}=0,15$  [Nm];  $M_{sk}=0,30$  [Nm]    Zb - movable contacts are insulated

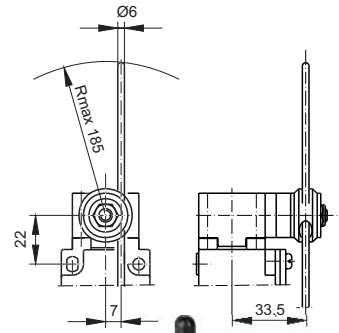


# LIMIT SWITCHES

## PBM1 limit switches – E72 head plastic rod Ø6

| Cat. no. | Type        | Operating diagram | Connection diagram | Description                   |
|----------|-------------|-------------------|--------------------|-------------------------------|
| 37-3590  | PBM1E72PZ11 |                   | Zb                 | snap action                   |
| 37-3591  | PBM1E72PZ02 |                   | Zb                 | snap action                   |
| 37-3592  | PBM1E72PX11 |                   | Zb                 | slow action open before close |
| 37-3593  | PBM1E72PY11 |                   | Zb                 | slow action close before open |
| 37-3594  | PBM1E72PW02 |                   | Zb                 | slow action simultaneous      |
| 37-3595  | PBM1E72PW20 |                   | Zb                 | slow action simultaneous      |
| 37-3596  | PBM1E72PX21 |                   | Zb                 | slow action close before open |
| 37-3597  | PBM1E72PX12 |                   | Zb                 | slow action open before close |
| 37-3598  | PBM1E72PW03 |                   | Zb                 | slow action simultaneous      |
| 37-3599  | PBM1E72PW30 |                   | Zb                 | slow action simultaneous      |

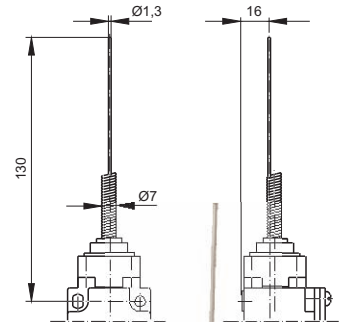
• - efficient opening points ⊕ efficient opening  $v_{max}=1,5$  [m/s];  $M_{min}=0,15$  [Nm];  $M_{sk}=0,30$  [Nm] Zb - movable contacts are insulated



## PBM1 limit switches – E91 head steel multidirectional acting spring

| Cat. no. | Type        | Operating diagram | Connection diagram | Description                   |
|----------|-------------|-------------------|--------------------|-------------------------------|
| 37-3600  | PBM1E91PZ11 |                   | Zb                 | snap action                   |
| 37-3601  | PBM1E91PZ02 |                   | Zb                 | snap action                   |
| 37-3602  | PBM1E91PX11 |                   | Zb                 | slow action open before close |
| 37-3603  | PBM1E91PY11 |                   | Zb                 | slow action close before open |
| 37-3604  | PBM1E91PW02 |                   | Zb                 | slow action simultaneous      |
| 37-3605  | PBM1E91PW20 |                   | Zb                 | slow action simultaneous      |
| 37-3606  | PBM1E91PX21 |                   | Zb                 | slow action close before open |
| 37-3607  | PBM1E91PX12 |                   | Zb                 | slow action open before close |
| 37-3608  | PBM1E91PW03 |                   | Zb                 | slow action simultaneous      |
| 37-3609  | PBM1E91PW30 |                   | Zb                 | slow action simultaneous      |

$v_{max}=1,0$  [m/s];  $M_{min}=0,18$  [Nm] Zb - movable contacts are insulated

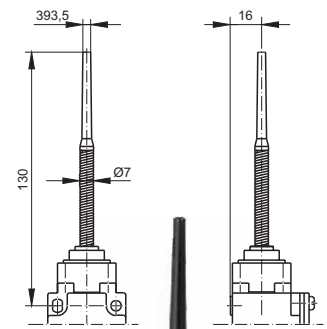


TYPE PBM1

## PBM1 limit switches – E92 head steel multidirectional acting spring with plastic end

| Cat. no. | Type        | Operating diagram | Connection diagram | Description                   |
|----------|-------------|-------------------|--------------------|-------------------------------|
| 37-3610  | PBM1E92PZ11 |                   | Zb  (1NO+1NC)      | snap action                   |
| 37-3611  | PBM1E92PZ02 |                   | Zb  (2NC)          | snap action                   |
| 37-3612  | PBM1E92PX11 |                   | Zb  (1NO+1NC)      | slow action open before close |
| 37-3613  | PBM1E92PY11 |                   | Zb  (1NO+1NC)      | slow action close before open |
| 37-3614  | PBM1E92PW02 |                   | Zb  (2NC)          | slow action simultaneous      |
| 37-3615  | PBM1E92PW20 |                   | Zb  (2NO)          | slow action simultaneous      |
| 37-3616  | PBM1E92PX21 |                   | Zb  (1NC+2NO)      | slow action close before open |
| 37-3617  | PBM1E92PX12 |                   | Zb  (2NC+1NO)      | slow action open before close |
| 37-3618  | PBM1E92PW03 |                   | Zb  (3NC)          | slow action simultaneous      |
| 37-3619  | PBM1E92PW30 |                   | Zb  (3NO)          | slow action simultaneous      |

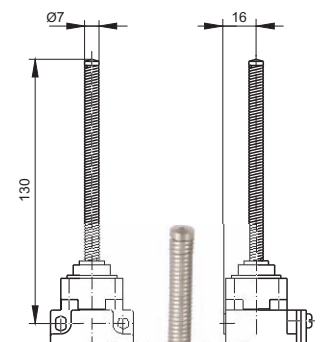
$v_{max}=1,0$  [m/s];  $M_{min}=0,18$  [Nm]      Zb - movable contacts are insulated



## PBM1 limit switches – E93 head steel multidirectional acting long spring

| Cat. no. | Type        | Operating diagram | Connection diagram | Description                   |
|----------|-------------|-------------------|--------------------|-------------------------------|
| 37-3620  | PBM1E93PZ11 |                   | Zb  (1NO+1NC)      | snap action                   |
| 37-3621  | PBM1E93PZ02 |                   | Zb  (2NC)          | snap action                   |
| 37-3622  | PBM1E93PX11 |                   | Zb  (1NO+1NC)      | slow action open before close |
| 37-3623  | PBM1E93PY11 |                   | Zb  (1NO+1NC)      | slow action close before open |
| 37-3624  | PBM1E93PW02 |                   | Zb  (2NC)          | slow action simultaneous      |
| 37-3625  | PBM1E93PW20 |                   | Zb  (2NO)          | slow action simultaneous      |
| 37-3626  | PBM1E93PX21 |                   | Zb  (1NC+2NO)      | slow action close before open |
| 37-3627  | PBM1E93PX12 |                   | Zb  (2NC+1NO)      | slow action open before close |
| 37-3628  | PBM1E93PW03 |                   | Zb  (3NC)          | slow action simultaneous      |
| 37-3629  | PBM1E93PW30 |                   | Zb  (3NO)          | slow action simultaneous      |

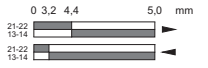
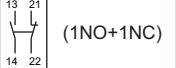
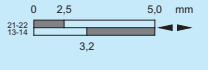
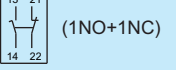

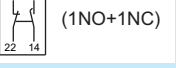
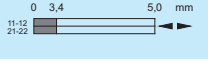
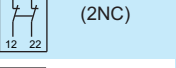

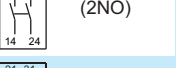
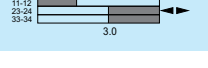
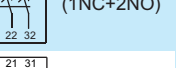
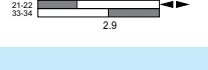
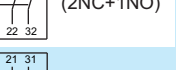

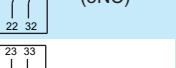
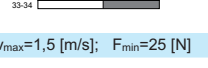
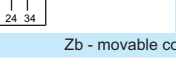
$v_{max}=1,0$  [m/s];  $M_{min}=0,18$  [Nm]      Zb - movable contacts are insulated





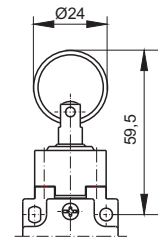
# LIMIT SWITCHES

## PBM1 limit switches – E99 head activated by pulling the ring

| Cat. no. | Type         | Operating diagram  | Connection diagram   | Description                   |
|----------|--------------|--|--|-------------------------------|
| 37-3990  | PBM1E99PZ11A |   | Zb  (1NO+1NC) | snap action                   |
| 37-3992  | PBM1E99PX11A |   | Zb  (1NO+1NC) | slow action open before close |
| 37-3993  | PBM1E99PY11A |   | Zb  (1NO+1NC) | slow action close before open |
| 37-3994  | PBM1E99PW02A |   | Zb  (2NC)     | slow action simultaneous      |
| 37-3995  | PBM1E99PW20A |   | Zb  (2NO)     | slow action simultaneous      |
| 37-3996  | PBM1E99PX21A |   | Zb  (1NC+2NO) | slow action close before open |
| 37-3997  | PBM1E99PX12A |   | Zb  (2NC+1NO) | slow action open before close |
| 37-3998  | PBM1E99PW03A |   | Zb  (3NC)     | slow action simultaneous      |
| 37-3999  | PBM1E99PW30A |  | Zb  (3NO)    | slow action simultaneous      |

$v_{max}=1,5$  [m/s];  $F_{min}=25$  [N]

Zb - movable contacts are insulated




## PSBM1 type limit switches

Type PSBM emergency stop limit switches for use in control, monitoring and measurement circuits. They can be installed on tilt, slide or removable machine covers to prevent opening when the machine is energized. The limit switch design prevents uncontrolled switching of contacts using simple tools. Metal body manufactured with attention to details guarantees good tightness. The operating heads can be installed in one of four possible positions. They enable efficient switching of the snap and slow action contact blocks.

Depending on the use, the emergency limit switches are divided into two groups:

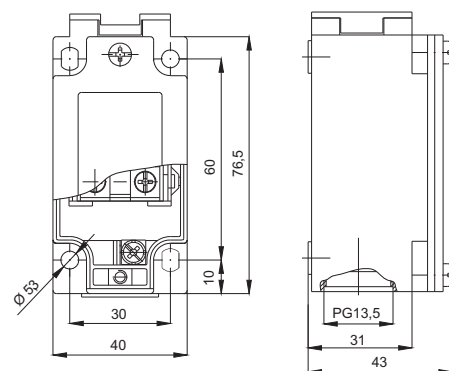
- with key – when the machine's cover is removed, the key associated with the switch is removed, and the contacts are switched. Wide range of keys allows the use of the connectors for all possible applications.
- with cord for use in machines and on production lines where it is impossible to install covers. They can be switched from any location along the cord run. A machine is switched off after pulling the cord and when the cord is broken.

The switches feature:

- safety symbol certificate 
- Office of Technical Inspection (UDT) type testing allowing their use in control and signalling systems for cranes and lifts.
- product type approval certification allowing the use on ships granted by Polish Register of Shipping (PRS).

Technical drawings of limit switches in ".dwg" format are available at [www.pokoj.com.pl](http://www.pokoj.com.pl) in the section Offer, Design materials.

### DIMENSIONS



## Technical data

| TYPE   | PSBM1  |
|--|--|
| Standards  | IEC 60947-5-1, EN 60947-5-1, EN 50047          |
| Rated switching voltage $U_e$  | AC: 24/120/240/400V 50/60Hz<br>DC: 24/125/250V |
| Rated switching currents $I_e$   | AC: 10/6/3/1,8A<br>DC: 2,8/0,55/0,27A          |
| Use categories   | AC-15, DC-13                                   |
| Insulation rated voltage $U_i$ (IEC 60947-1)   | 690V<br>A600, Q600                             |
| Nominal impulse withstand voltage $U_{imp}$  | 6kV  |
| Protection degree (IEC 60529)  | IP65   |
| Environment pollution degree per IEC 60947-1   | 3  |
| Short-circuiting protection<br>(type and max. values for rated data of the protective device) $U_e < 500V$ a.c. Bi-Wts | 10A  |
| Rated conventional air thermal current $I_{th}$ (IEC 60947-5-1) $0 < 40^\circ C$                                       | 10A  |
| Electric shock protection (IEC 60536)  | Class II                                       |
| Ambient temperature  | -25...+70 °C                                   |
| Max. switching cycles frequency  | 3600 cycles/h                                  |
| Terminal resistance  | 25mΩ   |
| Terminal cross-section   | 1 lub 2 x 0,75±2,5mm <sup>2</sup>              |
| Installation position  | any  |
| Casing material  | metal  |

## Accessories

| Cat. no. | Type          | Page |
|----------|---------------|------|
| 59-053□  | Gland PG 13,5 | 219  |

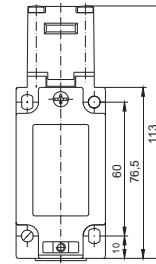
Connection diagrams for limit switches with key describes zero position of contacts (key is plugged in).

# LIMIT SWITCHES

## PSBM1 limit switches – K435 head head with bent key, 90° adjustable

| Cat. no. | Type            | Connection diagram | Description                   |
|----------|-----------------|--------------------|-------------------------------|
| 37-CAH0  | PSBM1K435PZ11 ⊕ | Zb  (1NO+1NC)      | snap action                   |
| 37-CAH1  | PSBM1K435PZ02 ⊕ | Zb  (2NC)          | snap action                   |
| 37-CAH2  | PSBM1K435PX11 ⊕ | Zb  (1NO+1NC)      | slow action open before close |
| 37-CAH3  | PSBM1K435PY11 ⊕ | Zb  (1NO+1NC)      | slow action close before open |
| 37-CAH4  | PSBM1K435PW02 ⊕ | Zb  (2NC)          | slow action simultaneous      |
| 37-CAH6  | PSBM1K435PX21 ⊕ | Zb  (1NC+2NO)      | slow action close before open |
| 37-CAH7  | PSBM1K435PX12 ⊕ | Zb  (2NC+1NO)      | slow action open before close |
| 37-CAH8  | PSBM1K435PW03 ⊕ | Zb  (3NC)          | slow action simultaneous      |

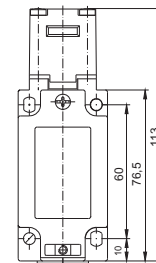
⊕ efficient opening      Zb - movable contacts are insulated



## PSBM1 limit switches – K436 head head with narrow key, 90° adjustable









| Cat. no. | Type            | Connection diagram | Description                   |
|----------|-----------------|--------------------|-------------------------------|
| 37-CAK0  | PSBM1K436PZ11 ⊕ | Zb  (1NO+1NC)      | snap action                   |
| 37-CAK1  | PSBM1K436PZ02 ⊕ | Zb  (2NC)          | snap action                   |
| 37-CAK2  | PSBM1K436PX11 ⊕ | Zb  (1NO+1NC)      | slow action open before close |
| 37-CAK3  | PSBM1K436PY11 ⊕ | Zb  (1NO+1NC)      | slow action close before open |
| 37-CAK4  | PSBM1K436PW02 ⊕ | Zb  (2NC)          | slow action simultaneous      |
| 37-CAK6  | PSBM1K436PX21 ⊕ | Zb  (1NC+2NO)      | slow action close before open |
| 37-CAK7  | PSBM1K436PX12 ⊕ | Zb  (2NC+1NO)      | slow action open before close |
| 37-CAK8  | PSBM1K436PW03 ⊕ | Zb  (3NC)          | slow action simultaneous      |

⊕ efficient opening      Zb - movable contacts are insulated

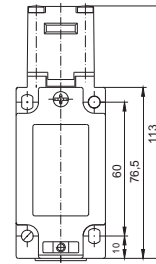


TYPE PSBM1

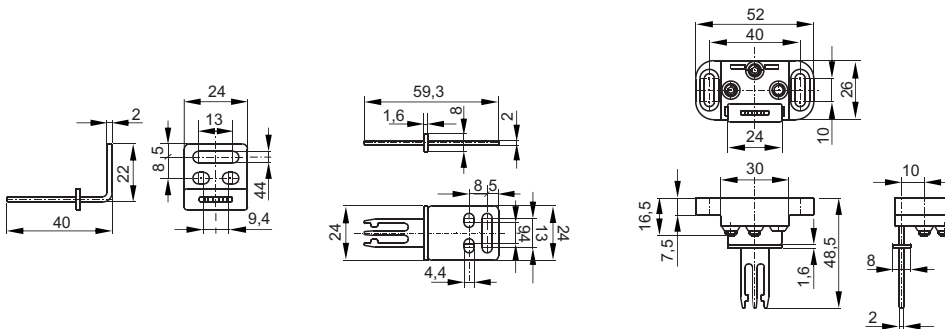
## PSBM1 limit switches – K439 head head with adjustable joint key, 90° adjustable

| Cat. no. | Type          | Connection diagram   | Description                   |
|----------|---------------|--|-------------------------------|
| 37-CAL0  | PSBM1K439PZ11 | Zb  (1NO+1NC) | snap action                   |
| 37-CAL1  | PSBM1K439PZ02 | Zb  (2NC)     | snap action                   |
| 37-CAL2  | PSBM1K439PX11 | Zb  (1NO+1NC) | slow action open before close |
| 37-CAL3  | PSBM1K439PY11 | Zb  (1NO+1NC) | slow action close before open |
| 37-CAL4  | PSBM1K439PW02 | Zb  (2NC)     | slow action simultaneous      |
| 37-CAL6  | PSBM1K439PX21 | Zb  (1NC+2NO) | slow action close before open |
| 37-CAL7  | PSBM1K439PX12 | Zb  (2NC+1NO) | slow action open before close |
| 37-CAL8  | PSBM1K439PW03 | Zb  (3NC)     | slow action simultaneous      |

⊕ efficient opening      Zb - movable contacts are insulated










| Cat. no. | Type   | Cat. no. | Type   | Cat. no. | Type   |
|----------|--------|----------|--------|----------|--------|
| 37-8535  | Key 35 | 37-8536  | Key 36 | 37-8539  | Key 39 |



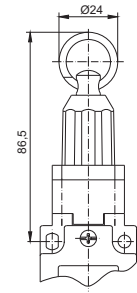
# LIMIT SWITCHES

## PSBM1 limit switches – K97 head ring pull action







| Cat. no. | Type   | Operating diagram | Connection diagram | Description                   |
|----------|--|-------------------|--------------------|-------------------------------|
| 37-CAC2  | PSBM1K97PX11  |                   | Zb                 | slow action open before close |
| 37-CAC3  | PSBM1K97PY11  |                   | Zb                 | slow action close before open |
| 37-CAC4  | PSBM1K97PW02  |                   | Zb                 | slow action simultaneous      |
| 37-CAC6  | PSBM1K97PX21  |                   | Zb                 | slow action close before open |
| 37-CAC7  | PSBM1K97PX12  |                   | Zb                 | slow action open before close |
| 37-CAC8  | PSBM1K97PW03  |                   | Zb                 | slow action simultaneous      |


 efficient opening

Zb - movable contacts are insulated

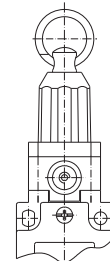


## PSBM1 limit switches – K99 head ring pull action with reset

| Cat. no. | Type   | Operating diagram | Connection diagram | Description                   |
|----------|--|-------------------|--------------------|-------------------------------|
| 37-C642  | PSBM1K99PX11  |                   | Zb                 | slow action open before close |
| 37-C643  | PSBM1K99PY11  |                   | Zb                 | slow action close before open |
| 37-C644  | PSBM1K99PW02  |                   | Zb                 | slow action simultaneous      |
| 37-C646  | PSBM1K99PX21  |                   | Zb                 | slow action close before open |
| 37-C647  | PSBM1K99PX12  |                   | Zb                 | slow action open before close |
| 37-C648  | PSBM1K99PW03  |                   | Zb                 | slow action simultaneous      |

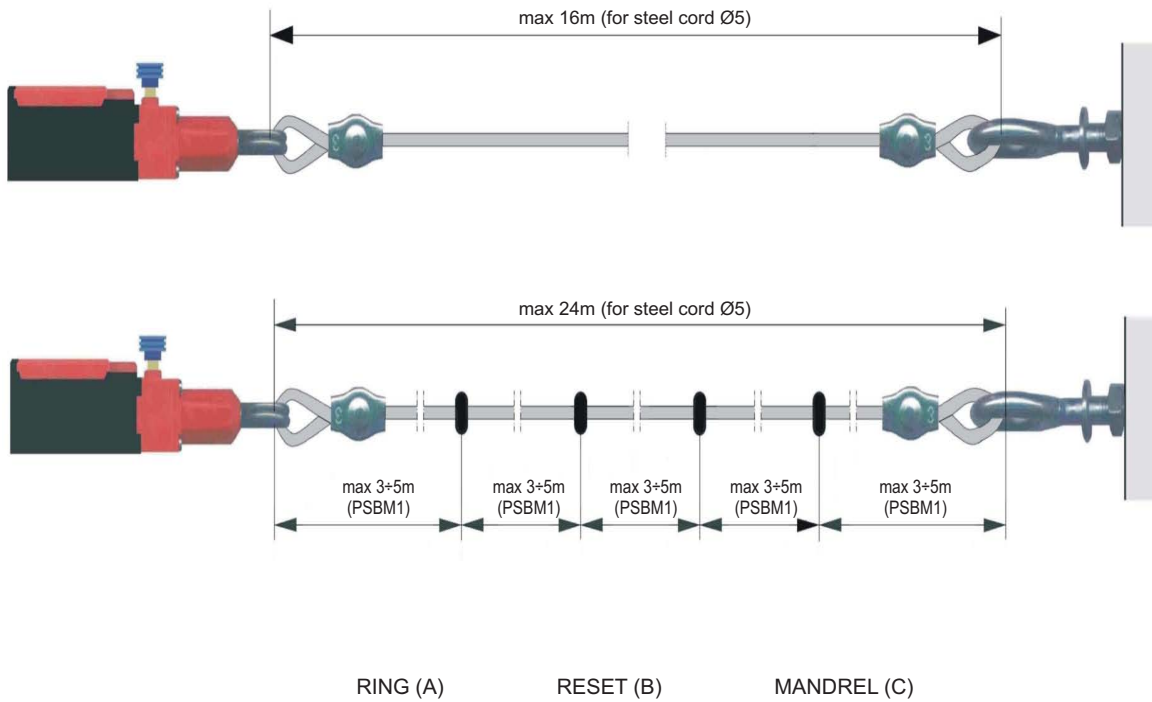
 efficient opening

Zb - movable contacts are insulated



TYPE PSBM1

## EMERGENCY STOP LIMIT SWITCHES INSTALLATION DIAGRAM FOR PSBM1 K97...PSBM1 K99...




1. **working position** – the mandrel of limit switch is pulled out up to the green ring (A) and reset button is raised (B).
2. **emergency switch off** – pulling the to activate reset (B) results in permanent switch of contacts.
3. **breaking the cord** – backward movement of the mandrel (C) will result in reset action (B) and switching the contacts.

# LIMIT SWITCHES

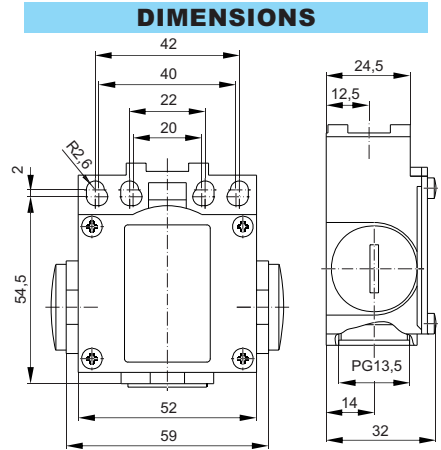
## PDM1 type limit switches

Type PDM1 limit switches are designed for work in control, monitoring and measurement circuits, e.g. in machine tools and technological equipment in the food industry, in packaging machines etc. The body is made of metal and the precise workmanship ensures good water tightness. The operating heads are interchangeable and may be installed in one of four possible positions. This does not apply to the following heads: F51, 52, 71 which may be used in one of the possible positions. The operating heads enable efficient switching of the snap and slow action contact blocks.

The switches feature:

- safety symbol certificate 
- Office of Technical Inspection (UDT) type testing allowing their use in control and signalling systems for cranes and lifts.
- product type approval certification allowing the use on ships granted by Polish Register of Shipping (PRS).

Technical drawings of limit switches in ".dwg" format are available at [www.pokoj.com.pl](http://www.pokoj.com.pl) in the section Offer, Design materials.















## Technical data

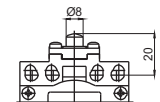
| TYPE   | PDM1  |
|--|---|
| Standards  | IEC 60947-5-1, EN 60947-5-1, EN 50047   |
| Rated switching voltage U <sub>e</sub>   | AC: 24/120/240V 50/60Hz<br>DC: 24/125/250V  |
| Rated switching currents I <sub>e</sub>  | AC: 10/6/3/1,8A<br>DC: 2,8/0,55/0,27A   |
| Use categories   | AC-15, DC-13  |
| Insulation rated voltage U <sub>i</sub> (IEC 60947-1)  | 500V  |
| Nominal impulse withstand voltage U <sub>imp</sub>   | A300, Q300  |
| Protection degree (IEC 60529)  | 6kV   |
| Environment pollution degree per IEC 60947-1   | IP66, IP65 (for F52)  |
| Short-circuiting protection<br>(type and max. values for rated data of the protective device) U <sub>e</sub> <500V a.c. Bi-Wts | 3   |
| Rated conventional air thermal current I <sub>th</sub> (IEC 60947-5-1) 0<40°C  | 10A   |
| Mechanical durability  | 10A   |
| Electric shock protection (IEC 60536)  | F11, F12: 15×10 <sup>6</sup> cycles<br>F41, F42, F45: 10×10 <sup>6</sup> cycles<br>F51, F52, F71: 10×10 <sup>6</sup> cycles |
| Ambient temperature  | Class II  |
| Max. switching cycles frequency  | -25...+70 °C  |
| Terminal resistance  | 3600 cycles/h   |
| Terminal cross-section   | 25mΩ  |
| Installation position  | 1 or 2 x 0,75±2,5mm <sup>2</sup>  |
| Casing material  | any   |
|  | metal   |

## Accessories

| Cat. no. | Type          | Page |
|----------|---------------|------|
| 59-053□  | Gland PG 13,5 | 219  |

## PDM1 limit switches – F11 head steel plunger

| Cat. no. | Type  | Operating diagram | Connection diagram   | Description                   |
|----------|---|-------------------|--|-------------------------------|
| 37-5650  | PDM1F11PZ11  |                   | Zb  (1NO+1NC) | snap action                   |
| 37-5651  | PDM1F11PZ02  |                   | Zb  (2NC)     | snap action                   |
| 37-5652  | PDM1F11PX11  |                   | Zb  (1NO+1NC) | slow action open before close |
| 37-5653  | PDM1F11PY11  |                   | Zb  (1NO+1NC) | slow action close before open |
| 37-5654  | PDM1F11PW02  |                   | Zb  (2NC)     | slow action simultaneous      |
| 37-5655  | PDM1F11PW20  |                   | Zb  (2NO)     | slow action simultaneous      |



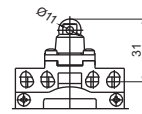
• - efficient opening points  efficient opening v<sub>max</sub>=0,5 [m/s]; F<sub>min</sub>=15 [N]; F<sub>sk</sub>=30 [N] Zb - movable contacts are insulated

TYPE PDM1

## PDM1 limit switches – F12 head steel plunger with steel roller Ø11

| Cat. no. | Type        | Operating diagram | Connection diagram | Description                   |
|----------|-------------|-------------------|--------------------|-------------------------------|
| 37-5660  | PDM1F12PZ11 |                   | Zb                 | snap action                   |
| 37-5661  | PDM1F12PZ02 |                   | Zb                 | snap action                   |
| 37-5662  | PDM1F12PX11 |                   | Zb                 | slow action open before close |
| 37-5663  | PDM1F12PY11 |                   | Zb                 | slow action close before open |
| 37-5664  | PDM1F12PW02 |                   | Zb                 | slow action simultaneous      |
| 37-5665  | PDM1F12PW20 |                   | Zb                 | slow action simultaneous      |

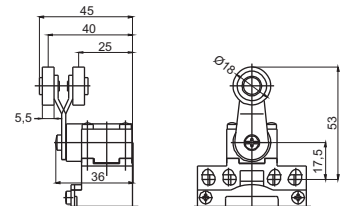
• - efficient opening points    ⊕ efficient opening     $v_{max}=0,5$  [m/s];  $F_{min}=12$  [N];  $F_{sk}=30$  [N]    Zb - movable contacts are insulated



## PDM1 limit switches – F41 head plastic roller lever Ø18

| Cat. no. | Type        | Operating diagram | Connection diagram | Description                   |
|----------|-------------|-------------------|--------------------|-------------------------------|
| 37-5670  | PDM1F41PZ11 |                   | Zb                 | snap action                   |
| 37-5671  | PDM1F41PZ02 |                   | Zb                 | snap action                   |
| 37-5672  | PDM1F41PX11 |                   | Zb                 | slow action open before close |
| 37-5673  | PDM1F41PY11 |                   | Zb                 | slow action close before open |
| 37-5674  | PDM1F41PW02 |                   | Zb                 | slow action simultaneous      |
| 37-5675  | PDM1F41PW20 |                   | Zb                 | slow action simultaneous      |

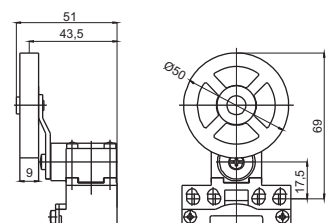
• - efficient opening points    ⊕ efficient opening     $v_{max}=1,5$  [m/s];  $M_{min}=0,10$  [Nm];  $M_{sk}=0,32$  [Nm]    Zb - movable contacts are insulated



## PDM1 limit switches – F42 head rubber roller lever Ø50

| Cat. no. | Type        | Operating diagram | Connection diagram | Description                   |
|----------|-------------|-------------------|--------------------|-------------------------------|
| 37-5680  | PDM1F42PZ11 |                   | Zb                 | snap action                   |
| 37-5681  | PDM1F42PZ02 |                   | Zb                 | snap action                   |
| 37-5682  | PDM1F42PX11 |                   | Zb                 | slow action open before close |
| 37-5683  | PDM1F42PY11 |                   | Zb                 | slow action close before open |
| 37-5684  | PDM1F42PW02 |                   | Zb                 | slow action simultaneous      |
| 37-5685  | PDM1F42PW20 |                   | Zb                 | slow action simultaneous      |

• - efficient opening points    ⊕ efficient opening     $v_{max}=1,5$  [m/s];  $M_{min}=0,10$  [Nm];  $M_{sk}=0,32$  [Nm]    Zb - movable contacts are insulated



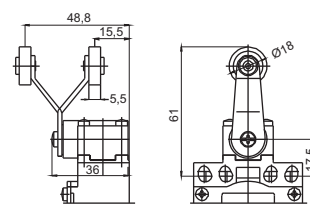


# LIMIT SWITCHES

## PDM1 limit switches – F45 head long plastic roller lever Ø18

| Cat. no. | Type        | Operating diagram | Connection diagram | Description                   |
|----------|-------------|-------------------|--------------------|-------------------------------|
| 37-5710  | PDM1F45PZ11 |                   | Zb  (1NO+1NC)      | snap action                   |
| 37-5711  | PDM1F45PZ02 |                   | Zb  (2NC)          | snap action                   |
| 37-5712  | PDM1F45PX11 |                   | Zb  (1NO+1NC)      | slow action open before close |
| 37-5713  | PDM1F45PY11 |                   | Zb  (1NO+1NC)      | slow action close before open |
| 37-5714  | PDM1F45PW02 |                   | Zb  (2NC)          | slow action simultaneous      |
| 37-5715  | PDM1F45PW20 |                   | Zb  (2NO)          | slow action simultaneous      |

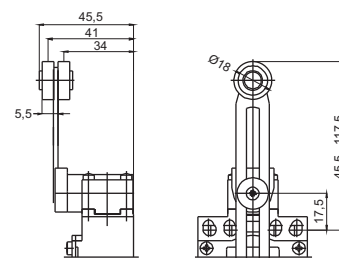
• - efficient opening points    ⊕ efficient opening     $v_{max}=1,5$  [m/s];  $M_{min}=0,10$  [Nm];  $M_{sk}=0,32$  [Nm]    Zb - movable contacts are insulated



## PDM1 limit switches – F51 head adjustable plastic roller lever Ø18

| Cat. no. | Type        | Operating diagram | Connection diagram | Description                   |
|----------|-------------|-------------------|--------------------|-------------------------------|
| 37-5740  | PDM1F51PZ11 |                   | Zb  (1NO+1NC)      | snap action                   |
| 37-5741  | PDM1F51PZ02 |                   | Zb  (2NC)          | snap action                   |
| 37-5742  | PDM1F51PX11 |                   | Zb  (1NO+1NC)      | slow action open before close |
| 37-5743  | PDM1F51PY11 |                   | Zb  (1NO+1NC)      | slow action close before open |
| 37-5744  | PDM1F51PW02 |                   | Zb  (2NC)          | slow action simultaneous      |
| 37-5745  | PDM1F51PW20 |                   | Zb  (2NO)          | slow action simultaneous      |

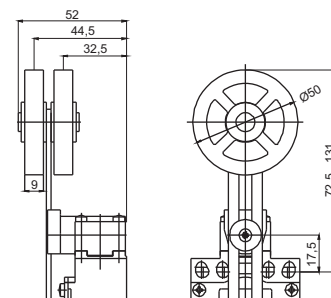
• - efficient opening points    ⊕ efficient opening     $v_{max}=1,5$  [m/s];  $M_{min}=0,10$  [Nm];  $M_{sk}=0,32$  [Nm]    Zb - movable contacts are insulated



## PDM1 limit switches – F52 head adjustable rubber roller lever Ø50

| Cat. no. | Type        | Operating diagram | Connection diagram | Description                   |
|----------|-------------|-------------------|--------------------|-------------------------------|
| 37-5750  | PDM1F52PZ11 |                   | Zb  (1NO+1NC)      | snap action                   |
| 37-5751  | PDM1F52PZ02 |                   | Zb  (2NC)          | snap action                   |
| 37-5752  | PDM1F52PX11 |                   | Zb  (1NO+1NC)      | slow action open before close |
| 37-5753  | PDM1F52PY11 |                   | Zb  (1NO+1NC)      | slow action close before open |
| 37-5754  | PDM1F52PW02 |                   | Zb  (2NC)          | slow action simultaneous      |
| 37-5755  | PDM1F52PW20 |                   | Zb  (2NO)          | slow action simultaneous      |

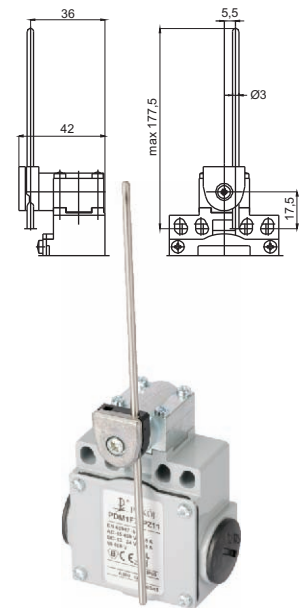
• - efficient opening points    ⊕ efficient opening     $v_{max}=1,5$  [m/s];  $M_{min}=0,10$  [Nm];  $M_{sk}=0,32$  [Nm]    Zb - movable contacts are insulated



## PDM1 limit switches – F71 head stainless steel rod Ø3

| Cat. no. | Type          | Operating diagram | Connection diagram | Description                   |
|----------|---------------|-------------------|--------------------|-------------------------------|
| 37-5770  | PDM1F71PZ11 ⊕ |                   | Zb  (1NO+1NC)      | snap action                   |
| 37-5771  | PDM1F71PZ02 ⊕ |                   | Zb  (2NC)          | snap action                   |
| 37-5772  | PDM1F71PX11 ⊕ |                   | Zb  (1NO+1NC)      | slow action open before close |
| 37-5773  | PDM1F71PY11 ⊕ |                   | Zb  (1NO+1NC)      | slow action close before open |
| 37-5774  | PDM1F71PW02 ⊕ |                   | Zb  (2NC)          | slow action simultaneous      |
| 37-5775  | PDM1F71PW20   |                   | Zb  (2NO)          | slow action simultaneous      |

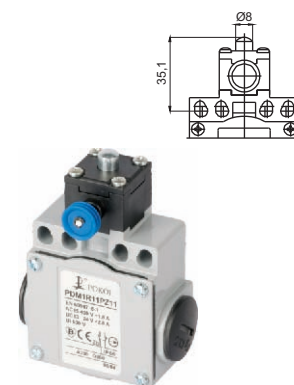
• - efficient opening points ⊕ efficient opening  $v_{max}=1,5$  [m/s];  $M_{min}=0,10$  [Nm];  $M_{sk}=0,32$  [Nm] Zb - movable contacts are insulated



## PDM1 limit switches – R11 head steel plunger with reset function

| Cat. no. | Type          | Connection diagram | Description                   |
|----------|---------------|--------------------|-------------------------------|
| 37-5R10  | PDM1R11PZ11 ⊕ | Zb  (1NO+1NC)      | snap action                   |
| 37-5R11  | PDM1R11PZ02 ⊕ | Zb  (2NC)          | snap action                   |
| 37-5R12  | PDM1R11PX11 ⊕ | Zb  (1NO+1NC)      | slow action open before close |
| 37-5R14  | PDM1R11PW02 ⊕ | Zb  (2NC)          | slow action simultaneous      |

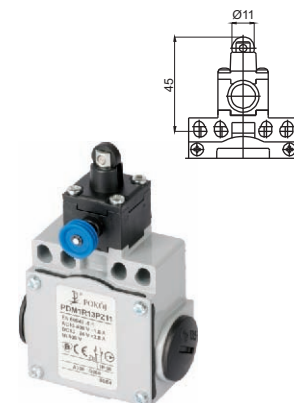
⊕ efficient opening Zb - movable contacts are insulated



## PDM1 limit switches – R13 head steel plunger with plastic roller Ø10.5, with reset function





| Cat. no. | Type          | Connection diagram | Description              |
|----------|---------------|--------------------|--------------------------|
| 37-5R20  | PDM1R13PZ11 ⊕ | Zb  (1NO+1NC)      | snap action              |
| 37-5R21  | PDM1R13PZ02 ⊕ | Zb  (2NC)          | snap action              |
| 37-5R22  | PDM1R13PX11 ⊕ | Zb  (1NO+1NC)      | slow action simultaneous |
| 37-5R24  | PDM1R13PW02 ⊕ | Zb  (2NC)          | slow action simultaneous |

⊕ efficient opening Zb - movable contacts are insulated

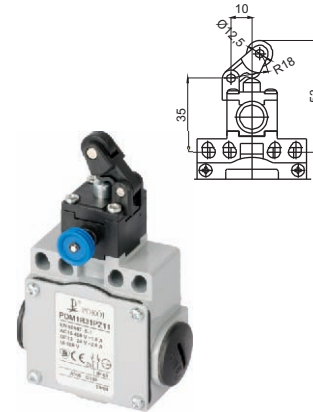


# LIMIT SWITCHES





## PDM1 limit switches – R31 head steel plunger and horizontal plastic roller lever Ø12.5, with reset function

| Cat. no. | Type          | Connection diagram   | Description                   |
|----------|---------------|--|-------------------------------|
| 37-5R30  | PDM1R31PZ11 ⊕ | Zb  (1NO+1NC) | snap action                   |
| 37-5R31  | PDM1R31PZ02 ⊕ | Zb  (2NC)     | snap action                   |
| 37-5R32  | PDM1R31PX11 ⊕ | Zb  (1NO+1NC) | slow action open before close |
| 37-5R34  | PDM1R31PW02 ⊕ | Zb  (2NC)     | slow action simultaneous      |

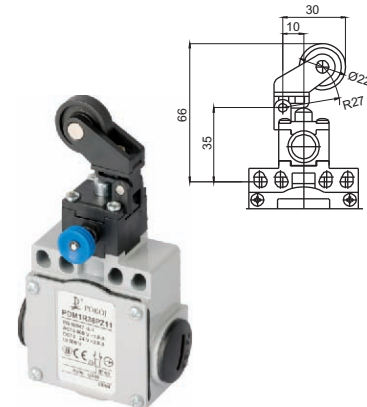
⊕ efficient opening      Zb - movable contacts are insulated







## PDM1 limit switches – R38 head steel plunger and plastic roller lever Ø22, with reset function

| Cat. no. | Type          | Connection diagram   | Description                   |
|----------|---------------|--|-------------------------------|
| 37-5R50  | PDM1R38PZ11 ⊕ | Zb  (1NO+1NC)   | snap action                   |
| 37-5R51  | PDM1R38PZ02 ⊕ | Zb  (2NC)      | snap action                   |
| 37-5R52  | PDM1R38PX11 ⊕ | Zb  (1NO+1NC) | slow action open before close |
| 37-5R54  | PDM1R38PW02 ⊕ | Zb  (2NC)     | slow action simultaneous      |

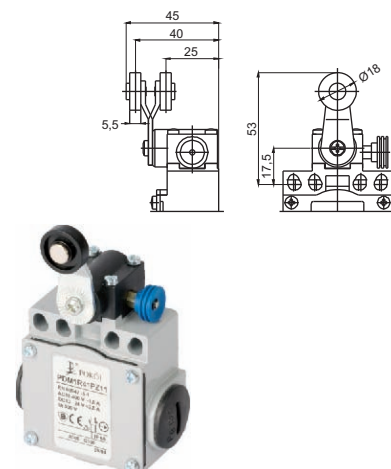
⊕ efficient opening      Zb - movable contacts are insulated



## PDM1 limit switches – R41 head plastic roller lever Ø18, with reset function

| Cat. no. | Type          | Connection diagram   | Description                   |
|----------|---------------|--|-------------------------------|
| 37-5R60  | PDM1R41PZ11 ⊕ | Zb  (1NO+1NC) | snap action                   |
| 37-5R61  | PDM1R41PZ02 ⊕ | Zb  (2NC)     | snap action                   |
| 37-5R62  | PDM1R41PX11 ⊕ | Zb  (1NO+1NC) | slow action open before close |
| 37-5R64  | PDM1R41PW02 ⊕ | Zb  (2NC)     | slow action simultaneous      |


⊕ efficient opening      Zb - movable contacts are insulated



## PDP1 type limit switches

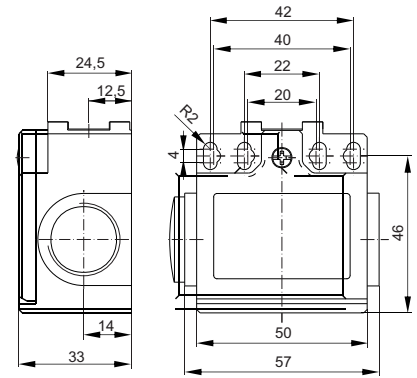
Type PDP1 limit switches are designed for work in control, monitoring and measurement circuits, e.g. in machine tools and technological equipment in the food industry, in packaging machines etc. The body is made of high quality plastic and the precise workmanship ensures good water tightness. The operating heads are interchangeable and may be installed in one of four possible positions. The operating heads enable efficient switching of the snap and slow action contact blocks.

The switches feature:

- safety symbol certificate 
- Office of Technical Inspection (UDT) type testing allowing their use in control and signalling systems for cranes and lifts
- product type approval certification allowing the use on ships granted by Polish Register of Shipping (PRS).

Technical drawings of limit switches in ".dwg" format are available at [www.pokoj.com.pl](http://www.pokoj.com.pl) in the section Offer, Design materials.

### DIMENSIONS









## Technical data

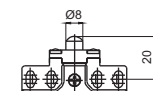
| TYPE   | PDP1   |
|--|--|
| Standards  | IEC 60947-5-1, EN 60947-5-1, EN 50047  |
| Rated switching voltage U <sub>e</sub>   | AC: 24/120/240/400V 50/60Hz<br>DC: 24/125/250V   |
| Rated switching currents I <sub>e</sub>  | AC: 10/6/3/1,8A<br>DC: 2,8/0,55/0,27A  |
| Use categories   | AC-15, DC-13   |
| Insulation rated voltage U <sub>i</sub> (IEC 60947-1)  | 500V   |
| Nominal impulse withstand voltage U <sub>imp</sub>   | A600, Q600   |
| Protection degree (IEC 60529)  | IP65   |
| Environment pollution degree per IEC 60947-1   | 3  |
| Short-circuiting protection<br>(type and max. values for rated data of the protective device) U <sub>e</sub> <500V a.c. Bi-Wts | 10A  |
| Rated conventional air thermal current I <sub>th</sub> (IEC 60947-5-1) 0<40°C  | 10A  |
| Mechanical durability  | T11, T31, T38: 15×10 <sup>6</sup> cycles<br>T41: 10×10 <sup>6</sup> cycles<br>T91, T98: > 5×10 <sup>6</sup> cycles |
| Electric shock protection (IEC 60536)  | Class II   |
| Ambient temperature  | -25..+70 °C  |
| Max. switching cycles frequency  | 3600 cycles/h  |
| Terminal resistance  | 25mΩ   |
| Terminal cross-section   | 1 or 2 x 0,75+2,5mm <sup>2</sup>   |
| Installation position  | any  |
| Casing material  | plastic  |

## Accessories

| Cat. no. | Type          | Page |
|----------|---------------|------|
| 59-053□  | Gland PG 13,5 | 219  |

## PDP1 limit switches – T11 head steel plunger

| Cat. no. | Type  | Operating diagram | Connection diagram | Description                   |
|----------|---|-------------------|--------------------|-------------------------------|
| 37-6020  | PDP1T11PZ11  |                   | Zb                 | snap action                   |
| 37-6021  | PDP1T11PZ02  |                   | Zb                 | snap action                   |
| 37-6022  | PDP1T11PX11  |                   | Zb                 | slow action open before close |
| 37-6023  | PDP1T11PY11  |                   | Zb                 | slow action close before open |
| 37-6024  | PDP1T11PW02  |                   | Zb                 | slow action simultaneous      |
| 37-6025  | PDP1T11PW20  |                   | Zb                 | slow action simultaneous      |



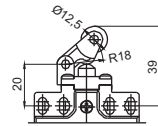
• - efficient opening points  efficient opening v<sub>max</sub>=0,5 [m/s]; F<sub>min</sub>=15 [N]; F<sub>sk</sub>=30 [N] Zb - movable contacts are insulated

# LIMIT SWITCHES

## PDP1 limit switches – T31 head steel plunger and horizontal plastic roller lever Ø12.5

| Cat. no. | Type        | Operating diagram | Connection diagram | Description                                |
|----------|-------------|-------------------|--------------------|--|
| 37-6050  | PDP1T31PZ11 |                   | Zb                 | (1NO+1NC)<br>snap action                   |
| 37-6051  | PDP1T31PZ02 |                   | Zb                 | (2NC)<br>snap action                       |
| 37-6052  | PDP1T31PX11 |                   | Zb                 | (1NO+1NC)<br>slow action open before close |
| 37-6053  | PDP1T31PY11 |                   | Zb                 | (1NO+1NC)<br>slow action close before open |
| 37-6054  | PDP1T31PW02 |                   | Zb                 | (2NC)<br>slow action simultaneous          |
| 37-6055  | PDP1T31PW20 |                   | Zb                 | (2NO)<br>slow action simultaneous          |

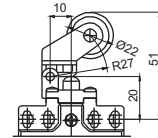
• - efficient opening points    ⊕ efficient opening     $v_{max}=1.0$  [m/s];  $F_{min}=7$  [N];  $F_{sk}=24$  [N]    Zb - movable contacts are insulated



## PDP1 limit switches – T38 head steel plunger and plastic roller lever Ø22

| Cat. no. | Type        | Operating diagram | Connection diagram | Description                                |
|----------|-------------|-------------------|--------------------|--|
| 37-6970  | PDP1T38PZ11 |                   | Zb                 | (1NO+1NC)<br>snap action                   |
| 37-6971  | PDP1T38PZ02 |                   | Zb                 | (2NC)<br>snap action                       |
| 37-6972  | PDP1T38PX11 |                   | Zb                 | (1NO+1NC)<br>slow action open before close |
| 37-6973  | PDP1T38PY11 |                   | Zb                 | (1NO+1NC)<br>slow action close before open |
| 37-6974  | PDP1T38PW02 |                   | Zb                 | (2NC)<br>slow action simultaneous          |
| 37-6975  | PDP1T38PW20 |                   | Zb                 | (2NO)<br>slow action simultaneous          |

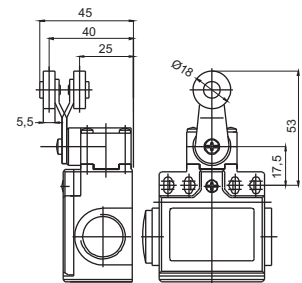
• - efficient opening points    ⊕ efficient opening     $v_{max}=1.0$  [m/s];  $F_{min}=7$  [N];  $F_{sk}=24$  [N]    Zb - movable contacts are insulated



## PDP1 limit switches – T41 head plastic roller lever Ø18

| Cat. no. | Type        | Operating diagram | Connection diagram | Description                                |
|----------|-------------|-------------------|--------------------|--|
| 37-6080  | PDP1T41PZ11 |                   | Zb                 | (1NO+1NC)<br>snap action                   |
| 37-6081  | PDP1T41PZ02 |                   | Zb                 | (2NC)<br>snap action                       |
| 37-6082  | PDP1T41PX11 |                   | Zb                 | (1NO+1NC)<br>slow action open before close |
| 37-6083  | PDP1T41PY11 |                   | Zb                 | (1NO+1NC)<br>slow action close before open |
| 37-6084  | PDP1T41PW02 |                   | Zb                 | (2NC)<br>slow action simultaneous          |
| 37-6085  | PDP1T41PW20 |                   | Zb                 | (2NO)<br>slow action simultaneous          |

• - efficient opening points    ⊕ efficient opening     $v_{max}=1.5$  [m/s];  $M_{min}=0.1$  [Nm];  $M_{sk}=0.32$  [Nm]    Zb - movable contacts are insulated

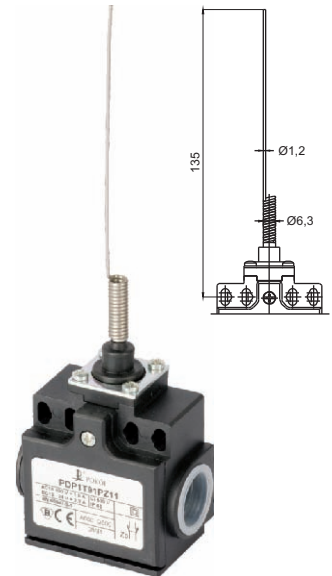


TYPE PDP1

## PDP1 limit switches – T91 head stainless steel multidirectional action spring

| Cat. no. | Type        | Operating diagram | Connection diagram | Description                   |
|----------|-------------|-------------------|--------------------|-------------------------------|
| 37-6150  | PDP1T91PZ11 |                   | Zb                 | snap action                   |
| 37-6151  | PDP1T91PZ02 |                   | Zb                 | snap action                   |
| 37-6152  | PDP1T91PX11 |                   | Zb                 | slow action open before close |
| 37-6153  | PDP1T91PY11 |                   | Zb                 | slow action close before open |
| 37-6154  | PDP1T91PW02 |                   | Zb                 | slow action simultaneous      |
| 37-6155  | PDP1T91PW20 |                   | Zb                 | slow action simultaneous      |

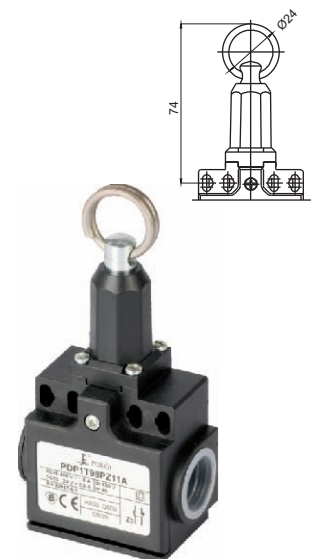
$v_{max}=1,0$  [m/s];  $M_{min}=0,12$  [Nm]      Zb - movable contacts are insulated



## PDP1 limit switches – T98 head ring pull action

| Cat. no. | Type         | Operating diagram | Connection diagram | Description                   |
|----------|--------------|-------------------|--------------------|-------------------------------|
| 37-6980  | PDP1T98PZ11A |                   | Zb                 | snap action                   |
| 37-6982  | PDP1T98PX11A |                   | Zb                 | slow action open before close |
| 37-6983  | PDP1T98PY11A |                   | Zb                 | slow action close before open |
| 37-6984  | PDP1T98PW02A |                   | Zb                 | slow action simultaneous      |
| 37-6985  | PDP1T98PW20A |                   | Zb                 | slow action simultaneous      |

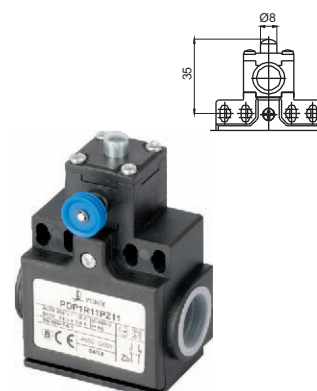
$v_{max}=0,5$  [m/s];  $F_{min}=30$  [N]      Zb - movable contacts are insulated



## PDP1 limit switches – R11 head steel plunger with reset function





| Cat. no. | Type          | Connection diagram | Description                   |
|----------|---------------|--------------------|-------------------------------|
| 37-6R10  | PDP1R11PZ11 ⊕ | Zb                 | snap action                   |
| 37-6R11  | PDP1R11PZ02 ⊕ | Zb                 | snap action                   |
| 37-6R12  | PDP1R11PX11 ⊕ | Zb                 | slow action open before close |
| 37-6R14  | PDP1R11PW02 ⊕ | Zb                 | slow action simultaneous      |

⊕ efficient opening      Zb - movable contacts are insulated

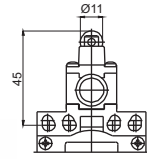


# LIMIT SWITCHES





## PDP1 limit switches – R13 head steel plunger with plastic roller $\varnothing 10.5$ , with reset function

| Cat. no. | Type                  | Connection diagram   | Description                   |
|----------|-----------------------|--|-------------------------------|
| 37-6R20  | PDP1R13PZ11 $\ominus$ | Zb  (1NO+1NC) | snap action                   |
| 37-6R21  | PDP1R13PZ02 $\ominus$ | Zb  (2NC)     | snap action                   |
| 37-6R22  | PDP1R13PX11 $\ominus$ | Zb  (1NO+1NC) | slow action open before close |
| 37-6R24  | PDP1R13PW02 $\ominus$ | Zb  (2NC)     | slow action simultaneous      |

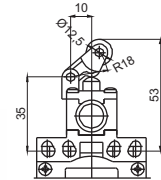
$\ominus$  efficient opening      Zb - movable contacts are insulated







## PDP1 limit switches – R31 head steel plunger and horizontal plastic roller lever $\varnothing 12.5$ , with reset function

| Cat. no. | Type                  | Connection diagram   | Description                   |
|----------|-----------------------|--|-------------------------------|
| 37-6R30  | PDP1R31PZ11 $\ominus$ | Zb  (1NO+1NC)   | snap action                   |
| 37-6R31  | PDP1R31PZ02 $\ominus$ | Zb  (2NC)      | snap action                   |
| 37-6R32  | PDP1R31PX11 $\ominus$ | Zb  (1NO+1NC) | slow action open before close |
| 37-6R34  | PDP1R31PW02 $\ominus$ | Zb  (2NC)     | slow action simultaneous      |

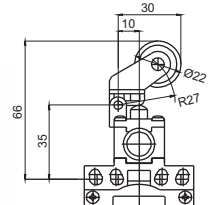
$\ominus$  efficient opening      Zb - movable contacts are insulated











## PDP1 limit switches – R38 head steel plunger and plastic roller lever $\varnothing 22$ , with reset function


| Cat. no. | Type                  | Connection diagram   | Description                   |
|----------|-----------------------|--|-------------------------------|
| 37-6R50  | PDP1R38PZ11 $\ominus$ | Zb  (1NO+1NC) | snap action                   |
| 37-6R51  | PDP1R38PZ02 $\ominus$ | Zb  (2NC)     | snap action                   |
| 37-6R52  | PDP1R38PX11 $\ominus$ | Zb  (1NO+1NC) | slow action open before close |
| 37-6R54  | PDP1R38PW02 $\ominus$ | Zb  (2NC)     | slow action simultaneous      |

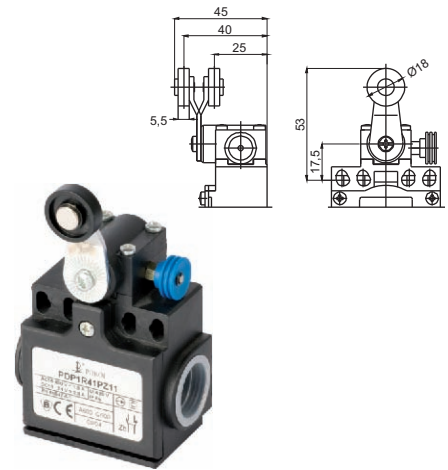
$\ominus$  efficient opening      Zb - movable contacts are insulated



## PDP1 limit switches – R41 head plastic roller lever Ø18, with reset function

| Cat. no. | Type  | Connection diagram   | Description                   |
|----------|---|--|-------------------------------|
| 37-6R60  | PDP1R41PZ11  | Zb  (1NO+1NC) | snap action                   |
| 37-6R61  | PDP1R41PZ02  | Zb  (2NC)     | snap action                   |
| 37-6R62  | PDP1R41PX11  | Zb  (1NO+1NC) | slow action open before close |
| 37-6R64  | PDP1R41PW02  | Zb  (2NC)     | slow action simultaneous      |

 efficient opening      Zb - movable contacts are insulated





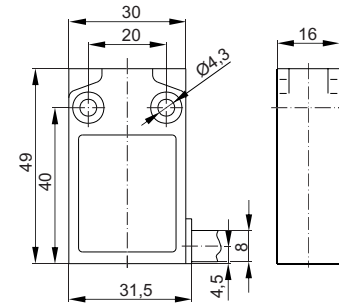
# LIMIT SWITCHES

## PEM1 type limit switches

Type PEM1 limit switches are designed for work in control, monitoring and measurement circuits, e.g. in machine tools and technological equipment in the food industry, in packaging machines etc. The body is made of metal and the precise workmanship ensures good water tightness. They enable efficient switching of the snap and slow action contact blocks. The conductor is permanently fixed which guarantees durable and very good tightness. Small dimensions enable installation in all places with limited installation area.

Technical drawings of limit switches in ".dwg" format are available at [www.pokoj.com.pl](http://www.pokoj.com.pl) in the section Offer, Design materials.

### DIMENSIONS



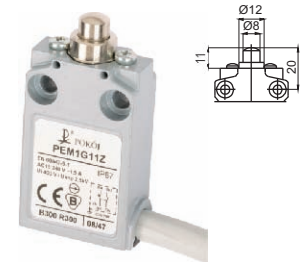
## Technical data

| TYPE   | PEM1                                       |
|--|--|
| Standards  | IEC 60947-5-1, EN 60947-5-1                |
| Rated switching voltage U <sub>e</sub>   | AC: 24/120/240V 50/60Hz<br>DC: 24/125/250V |
| Rated switching currents I <sub>e</sub>  | AC: 5/3/1,5A<br>DC: 1,1/0,22/0,1A          |
| Use categories   | AC-15, DC-13                               |
| Insulation rated voltage U <sub>i</sub> (IEC 60947-1)  | 400V                                       |
| Nominal impulse withstand voltage U <sub>imp</sub>   | B300, R300                                 |
| Protection degree (IEC 60529)  | 4kV  |
| Environment pollution degree per IEC 60947-1   | IP67                                       |
| Short-circuiting protection<br>(type and max. values for rated data of the protective device) U <sub>e</sub> <500V a.c. Bi-Wts | 3  |
| Rated conventional air thermal current I <sub>th</sub> (IEC 60947-5-1) 0<40°C  | 6A   |
| Mechanical durability  | 5A   |
| Electric shock protection (IEC 60536)  | 10×10 <sup>6</sup> cycles                  |
| Ambient temperature  | Class I                                    |
| Max. switching cycles frequency  | -25...+70 °C                               |
| Terminal resistance  | 3600 cycles/h                              |
| Connectors marking   | 25mΩ                                       |
| Length of terminals  | IEC 60445                                  |
| Terminal cross-section   | 1m   |
| Casing material  | 5 x 0,75mm <sup>2</sup><br>metal           |

## PEM1 limit switches – G11 head metal plunger

| Cat. no. | Type     | Operating diagram | Connection diagram | Description |
|----------|----------|-------------------|--------------------|-------------|
| 37-A82Z  | PEM1G11Z |                   |                    | snap action |
| 37-A82X  | PEM1G11X |                   |                    | slow action |

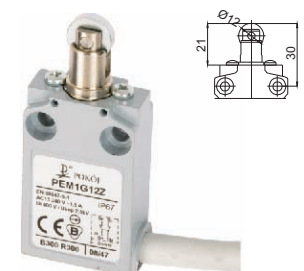
• - efficient opening points    ⊕ efficient opening    v<sub>max</sub>=0,5 [m/s]; F<sub>min</sub>=15 [N]; F<sub>sk</sub>=30 [N]    Zb - movable contacts are insulated



## PEM1 limit switches – G12 head metal plunger with parallel steel roller Ø12

| Cat. no. | Type     | Operating diagram | Connection diagram | Description |
|----------|----------|-------------------|--------------------|-------------|
| 37-A83Z  | PEM1G12Z |                   |                    | snap action |
| 37-A83X  | PEM1G12X |                   |                    | slow action |

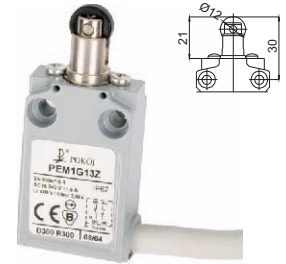
• - efficient opening points    ⊕ efficient opening    v<sub>max</sub>=0,1 [m/s]; F<sub>min</sub>=10 [N]; F<sub>sk</sub>=30 [N]    Zb - movable contacts are insulated



## PEM1 limit switches – G13 head metal plunger with parallel plastic roller Ø12

| Cat. no. | Type     | Operating diagram | Connection diagram | Description |
|----------|----------|-------------------|--------------------|-------------|
| 37-A84Z  | PEM1G13Z |                   |                    | snap action |
| 37-A84X  | PEM1G13X |                   |                    | slow action |

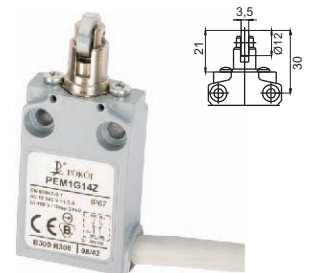
• - efficient opening points    ⊕ efficient opening     $v_{max}=0,1$  [m/s];  $F_{min}=10$  [N];  $F_{sk}=30$  [N]    Zb - movable contacts are insulated



## PEM1 limit switches – G14 head metal plunger with perpendicular steel roller Ø12

| Cat. no. | Type     | Operating diagram | Connection diagram | Description |
|----------|----------|-------------------|--------------------|-------------|
| 37-A85Z  | PEM1G14Z |                   |                    | snap action |
| 37-A85X  | PEM1G14X |                   |                    | slow action |

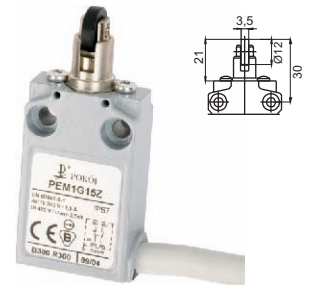
• - efficient opening points    ⊕ efficient opening     $v_{max}=0,1$  [m/s];  $F_{min}=10$  [N];  $F_{sk}=30$  [N]    Zb - movable contacts are insulated



## PEM1 limit switches – G15 head metal plunger with perpendicular plastic roller Ø12

| Cat. no. | Type     | Operating diagram | Connection diagram | Description |
|----------|----------|-------------------|--------------------|-------------|
| 37-A86Z  | PEM1G15Z |                   |                    | snap action |
| 37-A86X  | PEM1G15X |                   |                    | slow action |

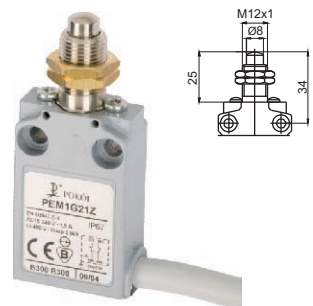
• - efficient opening points    ⊕ efficient opening     $v_{max}=0,1$  [m/s];  $F_{min}=10$  [N];  $F_{sk}=30$  [N]    Zb - movable contacts are insulated



## PEM1 limit switches – G21 head metal plunger with additional fitting on threaded head

| Cat. no. | Type     | Operating diagram | Connection diagram | Description |
|----------|----------|-------------------|--------------------|-------------|
| 37-A87Z  | PEM1G21Z |                   |                    | snap action |
| 37-A87X  | PEM1G21X |                   |                    | slow action |

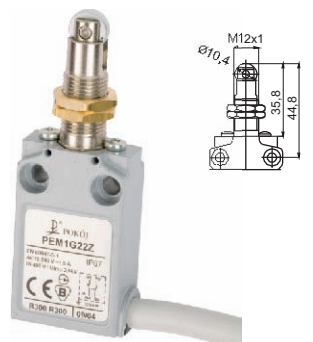
• - efficient opening points    ⊕ efficient opening     $v_{max}=0,5$  [m/s];  $F_{min}=15$  [N];  $F_{sk}=30$  [N]    Zb - movable contacts are insulated



## PEM1 limit switches – G22 head parallel steel roller Ø10.4 with additional fitting on threaded head

| Cat. no. | Type     | Operating diagram | Connection diagram | Description |
|----------|----------|-------------------|--------------------|-------------|
| 37-A88Z  | PEM1G22Z |                   |                    | snap action |
| 37-A88X  | PEM1G22X |                   |                    | slow action |

• - efficient opening points    ⊕ efficient opening     $v_{max}=0,1$  [m/s];  $F_{min}=10$  [N];  $F_{sk}=30$  [N]    Zb - movable contacts are insulated



## PEM1 limit switches – G23 head parallel plastic roller Ø10.7 with additional fitting on threaded head

| Cat. no. | Type     | Operating diagram | Connection diagram | Description |
|----------|----------|-------------------|--------------------|-------------|
| 37-A89Z  | PEM1G23Z |                   |                    | snap action |
| 37-A89X  | PEM1G23X |                   |                    | slow action |

• - efficient opening points    ⊕ efficient opening     $v_{max}=0,1$  [m/s];  $F_{min}=10$  [N];  $F_{sk}=30$  [N]    Zb - movable contacts are insulated

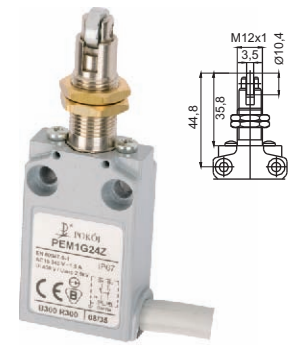


# LIMIT SWITCHES

## PEM1 limit switches – G24 head perpendicular steel roller Ø10.4 with additional fitting on threaded head

| Cat. no. | Type     | Operating diagram | Connection diagram | Description |
|----------|----------|-------------------|--------------------|-------------|
| 37-A90Z  | PEM1G24Z |                   |                    | snap action |
| 37-A90X  | PEM1G24X |                   |                    | slow action |

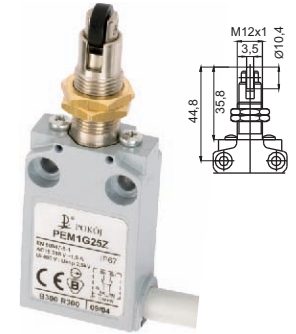
• - efficient opening points    ⊕ efficient opening     $v_{max}=0,1$  [m/s];  $F_{min}=10$  [N];  $F_{sk}=30$  [N]    Zb - movable contacts are insulated



## PEM1 limit switches – G25 head parallel plastic roller Ø10.7 with additional fitting on threaded head

| Cat. no. | Type     | Operating diagram | Connection diagram | Description |
|----------|----------|-------------------|--------------------|-------------|
| 37-A91Z  | PEM1G25Z |                   |                    | snap action |
| 37-A91X  | PEM1G25X |                   |                    | slow action |

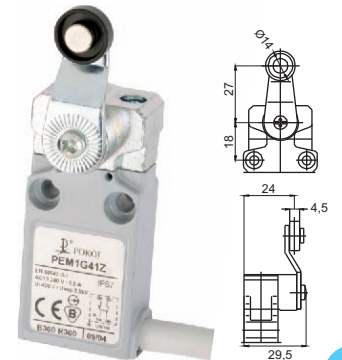
• - efficient opening points    ⊕ efficient opening     $v_{max}=0,1$  [m/s];  $F_{min}=10$  [N];  $F_{sk}=30$  [N]    Zb - movable contacts are insulated



## PEM1 limit switches – G41 head plastic roller lever Ø14

| Cat. no. | Type     | Operating diagram | Connection diagram | Description |
|----------|----------|-------------------|--------------------|-------------|
| 37-A92Z  | PEM1G41Z |                   |                    | snap action |
| 37-A92X  | PEM1G41X |                   |                    | slow action |

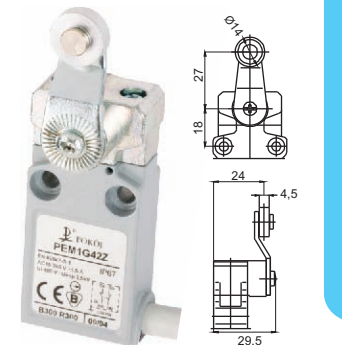
• - efficient opening points    ⊕ efficient opening     $v_{max}=1,5$  [m/s];  $M_{min}=0,08$  [Nm];  $M_{sk}=0,28$  [Nm]    Zb - movable contacts are insulated



## PEM1 limit switches – G42 head metal roller lever Ø14

| Cat. no. | Type     | Operating diagram | Connection diagram | Description |
|----------|----------|-------------------|--------------------|-------------|
| 37-A93Z  | PEM1G42Z |                   |                    | snap action |
| 37-A93X  | PEM1G42X |                   |                    | slow action |

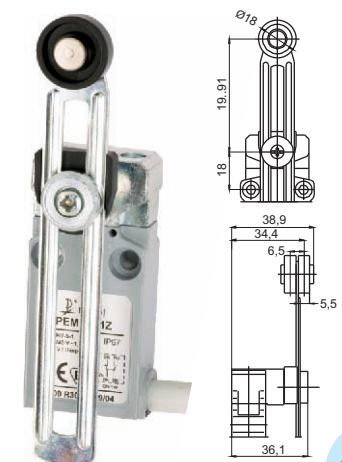
• - efficient opening points    ⊕ efficient opening     $v_{max}=1,5$  [m/s];  $M_{min}=0,08$  [Nm];  $M_{sk}=0,28$  [Nm]    Zb - movable contacts are insulated



## PEM1 limit switches – G51 head adjustable plastic roller lever Ø18

| Cat. no. | Type     | Operating diagram | Connection diagram | Description |
|----------|----------|-------------------|--------------------|-------------|
| 37-A95Z  | PEM1G51Z |                   |                    | snap action |
| 37-A95X  | PEM1G51X |                   |                    | slow action |

• - efficient opening points    ⊕ efficient opening     $v_{max}=1,5$  [m/s];  $M_{min}=0,08$  [Nm];  $M_{sk}=0,28$  [Nm]    Zb - movable contacts are insulated



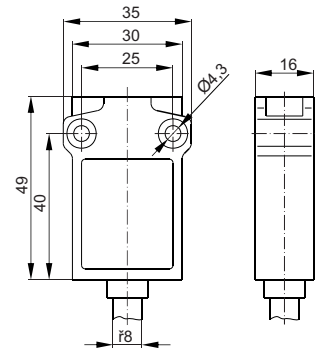
TYPE PEM1

## PEM2 type limit switches

Type PEM2 limit switches are designed for work in control, monitoring and measurement circuits, e.g. in machine tools and technological equipment in the food industry, in packaging machines etc. The body is made of metal and the precise workmanship ensures good water tightness. They enable efficient switching of the snap and slow action contact blocks. The conductor is permanently fixed which guarantees durable and very good tightness. Small dimensions enable installation in all places with limited installation area.

Technical drawings of limit switches in ".dwg" format are available at [www.pokoj.com.pl](http://www.pokoj.com.pl) in the section Offer, Design materials.

### DIMENSIONS



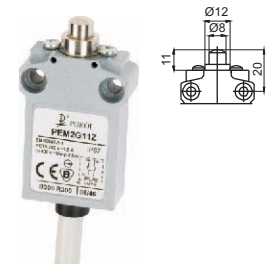
## Technical data

| TYPE   | PEM2                                       |
|--|--|
| Standards  | IEC 60947-5-1, EN 60947-5-1                |
| Rated switching voltage U <sub>e</sub>   | AC: 24/120/240V 50/60Hz<br>DC: 24/125/250V |
| Rated switching currents I <sub>e</sub>  | AC: 5/3/1,5A<br>DC: 1,1/0,22/0,1A          |
| Use categories   | AC-15, DC-13                               |
| Insulation rated voltage U <sub>i</sub> (IEC 60947-1)  | 400V                                       |
| Nominal impulse withstand voltage U <sub>imp</sub>   | B300, R300                                 |
| Protection degree (IEC 60529)  | 4kV  |
| Environment pollution degree per IEC 60947-1   | IP67                                       |
| Short-circuiting protection<br>(type and max. values for rated data of the protective device) U <sub>e</sub> <500V a.c. Bi-Wts | 3  |
| Rated conventional air thermal current I <sub>th</sub> (IEC 60947-5-1) 0<40°C  | 6A   |
| Mechanical durability  | 5A   |
| Electric shock protection (IEC 60536)  | 10×10 <sup>6</sup> cycles                  |
| Ambient temperature  | Class I                                    |
| Max. switching cycles frequency  | -25...+70 °C                               |
| Terminal resistance  | 3600 cycles/h                              |
| Connectors marking   | 25mΩ                                       |
| Length of terminals  | IEC 60445                                  |
| Terminal cross-section   | 1m   |
| Casing material  | 5 x 0,75mm <sup>2</sup>                    |
|  | metal                                      |

## PEM2 limit switches – G11 head metal plunger

| Cat. no. | Type     | Operating diagram | Connection diagram | Description |
|----------|----------|-------------------|--------------------|-------------|
| 37-B82Z  | PEM2G11Z |                   |                    | snap action |
| 37-B82X  | PEM2G11X |                   |                    | slow action |

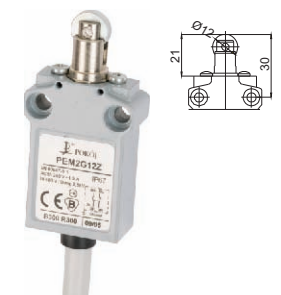
• - efficient opening points    ⊕ efficient opening    v<sub>max</sub>=0,5 [m/s]; F<sub>min</sub>=15 [N]; F<sub>sk</sub>=30 [N]    Zb - movable contacts are insulated



## PEM2 limit switches – G12 head metal plunger with parallel steel roller Ø12

| Cat. no. | Type     | Operating diagram | Connection diagram | Description |
|----------|----------|-------------------|--------------------|-------------|
| 37-B83Z  | PEM2G12Z |                   |                    | snap action |
| 37-B83X  | PEM2G12X |                   |                    | slow action |

• - efficient opening points    ⊕ efficient opening    v<sub>max</sub>=0,1 [m/s]; F<sub>min</sub>=10 [N]; F<sub>sk</sub>=30 [N]    Zb - movable contacts are insulated

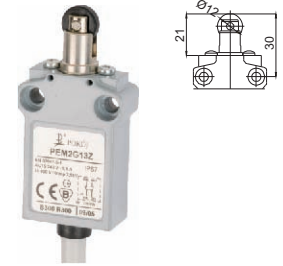


# LIMIT SWITCHES

## PEM2 limit switches – G13 head metal plunger with parallel plastic roller Ø12

| Cat. no. | Type     | Operating diagram | Connection diagram | Description |
|----------|----------|-------------------|--------------------|-------------|
| 37-B84Z  | PEM2G13Z |                   |                    | snap action |
| 37-B84X  | PEM2G13X |                   |                    | slow action |

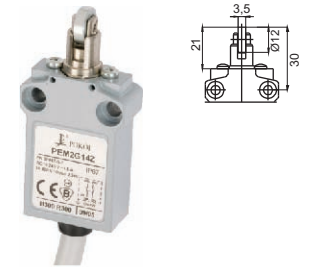
• - efficient opening points    ⊕ efficient opening     $v_{max}=0,1$  [m/s];  $F_{min}=10$  [N];  $F_{sk}=30$  [N]    Zb - movable contacts are insulated



## PEM2 limit switches – G14 head metal plunger with perpendicular steel roller Ø12

| Cat. no. | Type     | Operating diagram | Connection diagram | Description |
|----------|----------|-------------------|--------------------|-------------|
| 37-B85Z  | PEM2G14Z |                   |                    | snap action |
| 37-B85X  | PEM2G14X |                   |                    | slow action |

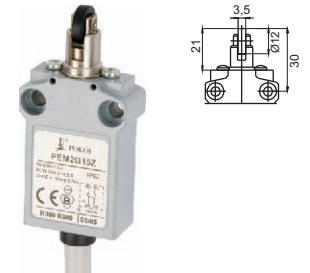
• - efficient opening points    ⊕ efficient opening     $v_{max}=0,1$  [m/s];  $F_{min}=10$  [N];  $F_{sk}=30$  [N]    Zb - movable contacts are insulated



## PEM2 limit switches – G15 head metal plunger with perpendicular plastic roller Ø12

| Cat. no. | Type     | Operating diagram | Connection diagram | Description |
|----------|----------|-------------------|--------------------|-------------|
| 37-B86Z  | PEM2G15Z |                   |                    | snap action |
| 37-B86X  | PEM2G15X |                   |                    | slow action |

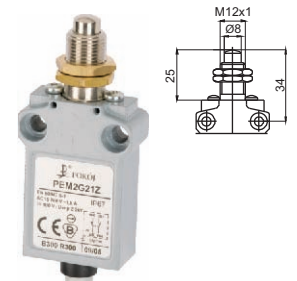
• - efficient opening points    ⊕ efficient opening     $v_{max}=0,1$  [m/s];  $F_{min}=10$  [N];  $F_{sk}=30$  [N]    Zb - movable contacts are insulated



## PEM2 limit switches – G21 head metal plunger with additional fitting on threaded head

| Cat. no. | Type     | Operating diagram | Connection diagram | Description |
|----------|----------|-------------------|--------------------|-------------|
| 37-B87Z  | PEM2G21Z |                   |                    | snap action |
| 37-B87X  | PEM2G21X |                   |                    | slow action |

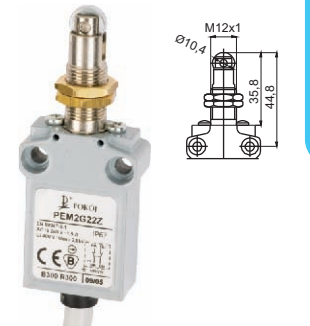
• - efficient opening points    ⊕ efficient opening     $v_{max}=0,5$  [m/s];  $F_{min}=15$  [N];  $F_{sk}=30$  [N]    Zb - movable contacts are insulated



## PEM2 limit switches – G22 head parallel steel roller Ø10.4 with additional fitting on threaded head

| Cat. no. | Type     | Operating diagram | Connection diagram | Description |
|----------|----------|-------------------|--------------------|-------------|
| 37-B88Z  | PEM2G22Z |                   |                    | snap action |
| 37-B88X  | PEM2G22X |                   |                    | slow action |

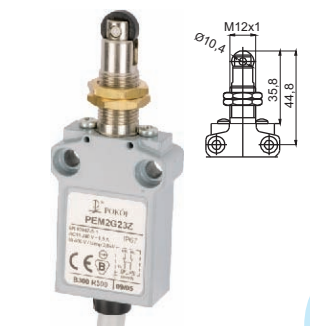
• - efficient opening points    ⊕ efficient opening     $v_{max}=0,1$  [m/s];  $F_{min}=10$  [N];  $F_{sk}=30$  [N]    Zb - movable contacts are insulated



## PEM2 limit switches – G23 head perpendicular steel roller Ø10.4 with additional fitting on threaded head

| Cat. no. | Type     | Operating diagram | Connection diagram | Description |
|----------|----------|-------------------|--------------------|-------------|
| 37-B89Z  | PEM2G23Z |                   |                    | snap action |
| 37-B89X  | PEM2G23X |                   |                    | slow action |

• - efficient opening points    ⊕ efficient opening     $v_{max}=0,1$  [m/s];  $F_{min}=10$  [N];  $F_{sk}=30$  [N]    Zb - movable contacts are insulated

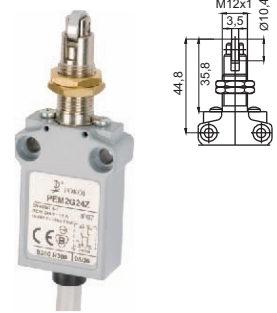


TYPE PEM2

## PEM2 limit switches – G24 head perpendicular steel roller Ø10.4 with additional fitting on threaded head

| Cat. no. | Type     | Operating diagram | Connection diagram | Description |
|----------|----------|-------------------|--------------------|-------------|
| 37-B90Z  | PEM2G24Z |                   |                    | snap action |
| 37-B90X  | PEM2G24X |                   |                    | slow action |

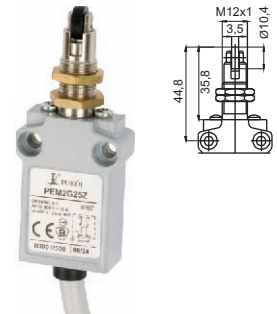
• - efficient opening points    efficient opening     $v_{max}=0,1$  [m/s];  $F_{min}=10$  [N];  $F_{sk}=30$  [N]    Zb - movable contacts are insulated



## PEM2 limit switches – G25 head perpendicular plastic roller Ø10.7 with additional fitting on threaded head

| Cat. no. | Type     | Operating diagram | Connection diagram | Description |
|----------|----------|-------------------|--------------------|-------------|
| 37-B91Z  | PEM2G25Z |                   |                    | snap action |
| 37-B91X  | PEM2G25X |                   |                    | slow action |

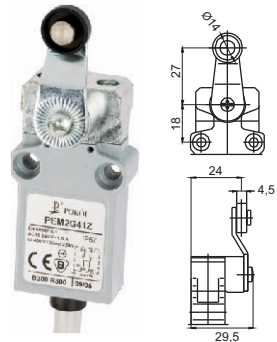
• - efficient opening points    efficient opening     $v_{max}=0,1$  [m/s];  $F_{min}=10$  [N];  $F_{sk}=30$  [N]    Zb - movable contacts are insulated



## PEM2 limit switches – G41 head plastic roller lever Ø14

| Cat. no. | Type     | Operating diagram | Connection diagram | Description |
|----------|----------|-------------------|--------------------|-------------|
| 37-B92Z  | PEM2G41Z |                   |                    | snap action |
| 37-B92X  | PEM2G41X |                   |                    | slow action |

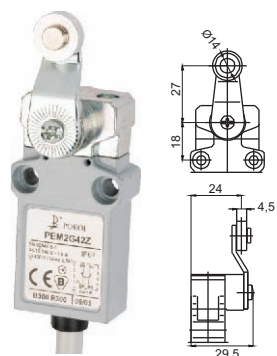
• - efficient opening points    efficient opening     $v_{max}=1,5$  [m/s];  $M_{min}=0,08$  [Nm];  $M_{sk}=0,28$  [Nm]    Zb - movable contacts are insulated



## PEM2 limit switches – G42 head metal roller lever Ø14

| Cat. no. | Type     | Operating diagram | Connection diagram | Description |
|----------|----------|-------------------|--------------------|-------------|
| 37-B93Z  | PEM2G42Z |                   |                    | snap action |
| 37-B93X  | PEM2G42X |                   |                    | slow action |

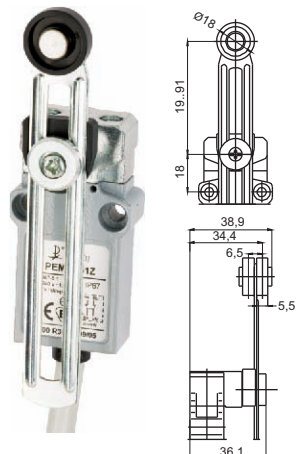
• - efficient opening points    efficient opening     $v_{max}=1,5$  [m/s];  $M_{min}=0,08$  [Nm];  $M_{sk}=0,28$  [Nm]    Zb - movable contacts are insulated



## PEM2 limit switches – G51 head adjustable plastic roller lever Ø18

| Cat. no. | Type     | Operating diagram | Connection diagram | Description |
|----------|----------|-------------------|--------------------|-------------|
| 37-B95Z  | PEM2G51Z |                   |                    | snap action |
| 37-B95X  | PEM2G51X |                   |                    | slow action |

• - efficient opening points    efficient opening     $v_{max}=1,5$  [m/s];  $M_{min}=0,08$  [Nm];  $M_{sk}=0,28$  [Nm]    Zb - movable contacts are insulated



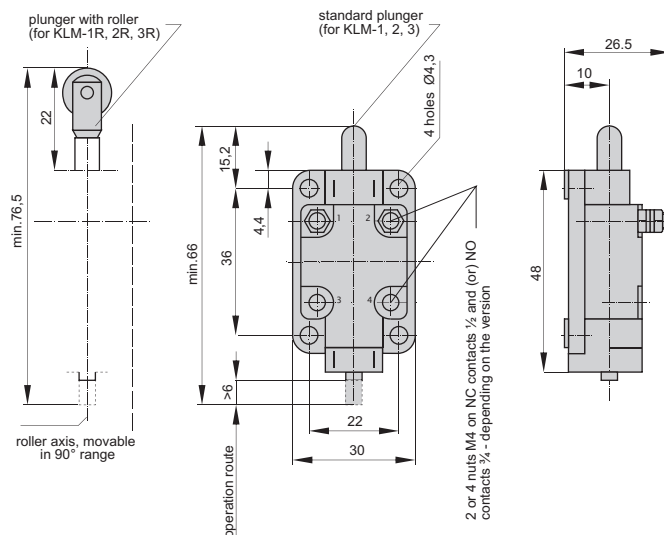
# LIMIT SWITCHES

## KLM type limit switches

KLM type limit switches are designed for use in signalling, protection and monitoring circuits. The limit switch is activated by a driving device. The force applied to the plunger lever switches the movable contacts. When the driving force ceases, the spring force causes movable contacts to return to the starting position.

Technical drawings of limit switches in ".dwg" format are available at [www.pokoj.com.pl](http://www.pokoj.com.pl) in the section Offer, Design materials.

### DIMENSIONS

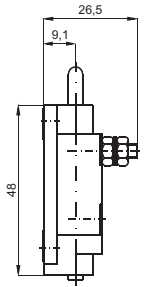


## Technical data

| TYPE   | KLM                                   |
|--|---------------------------------------|
| Standards  | IEC 60947-5-1                         |
| Rated switching voltage Ue   | AC: 230/400/500 V<br>DC: 48/110/220 V |
| Rated switching currents Ie  | AC: 4/4/2,5 A<br>DC: 1,6/0,6/0,25 A   |
| Use categories   | AC-15<br>DC-15                        |
| Nominal voltage of insulation Ui   | 500 V                                 |
| Nominal impulse withstand voltage Uimp   | 4 kV                                  |
| Protection class   | IP 00                                 |
| Environmental pollution level  | 3                                     |
| Short-circuiting protection  | Bi-Wts 25 A                           |
| Max. force to apply to the drive unit  | 50N                                   |
| Movement parameters of the element activating the switch:<br>The direction of driving force should match the direction of movement plunger but deviations of the force direction are allowed:<br>a) by 15 degrees in all directions in relation to the plunger axis<br>b) by 30 degrees in relation to the plunger axis with the roller operating in perpendicular to the axis of plunger roller |                                       |
| Speed of the drive unit  | 0,1...5m/s                            |
| Drive unit stroke  | 6±0,5mm                               |
| Terminal cross-section   | 0,75...4 mm <sup>2</sup>              |
| Ambient temperature  | -20...+40°C                           |
| Force required to change the position of the contact's terminals   | 9,8N                                  |
| Working position   | any                                   |
| The allowed degree of increase of mechanical stresses is:<br>a) 2 <sub>gn</sub> for continuous acceleration and harmonic vibration 5...50 Hz<br>b) 10 <sub>gn</sub> for shocks   |                                       |
| gn - gravitational acceleration  |                                       |

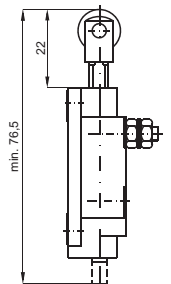
## KLM switches straight plunger

| Cat. no. | Type | Operating diagram | Connection diagram | Description                        |
|----------|------|-------------------|--------------------|------------------------------------|
| 36-1000  | KLM1 |                   |                    | normally open                      |
| 36-2000  | KLM2 |                   |                    | normally closed                    |
| 36-3000  | KLM3 |                   |                    | normally open -<br>normally closed |



## KLM...R switches plunger with roller

| Cat. no. | Type  | Operating diagram | Connection diagram | Description                        |
|----------|-------|-------------------|--------------------|------------------------------------|
| 36-1100  | KLM1R |                   |                    | normally open                      |
| 36-2100  | KLM2R |                   |                    | normally closed                    |
| 36-3100  | KLM3R |                   |                    | normally open -<br>normally closed |





# LIMIT SWITCHES

## D type limit switches

D type limit switches are designed for use in signalling and protective circuits.

The limit switch is activated by a driving device. The force applied to the plunger lever switches the movable contacts. When the driving force ceases, the spring force causes movable contacts to return to the starting position.

The switch bodies are made of metal and plastic and have a ground terminal.

Conformity:

The switches are made in conformance with the IEC 60947-5-1 standard.

Technical drawings of limit switches in ".dwg" format are available at [www.pokoj.com.pl](http://www.pokoj.com.pl) in the section Offer, Design materials.

## CLASSIFICATION AND MARKING

The switches are classified into three types on the basis of drive type:

- type **D-429** limit switches (a plunger with end is used),
- roller limit switches **429r** (plunger with roller and plunger clamping ring),
- Foot switches type **D-443** (the plunger is longer and ends with a knob, angle is used for fixing).

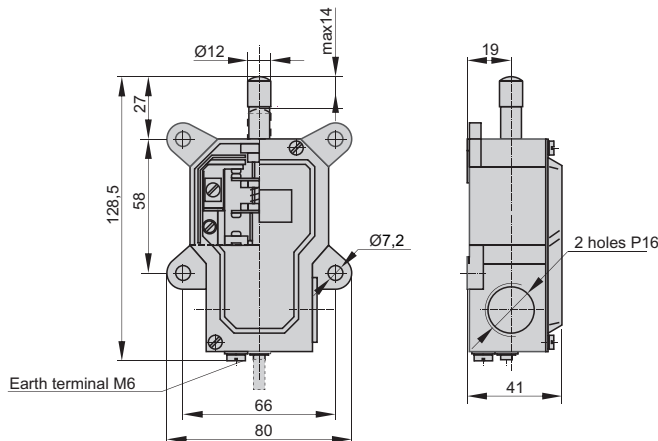
## Technical data

| TYPE   | D                            |
|--|------------------------------|
| Conformity   | IEC 60947-5-1                |
| Use categories   | AC-15, AC-13                 |
| Rated switching voltage Ue   | AC: 400V<br>DC: 48V          |
| Rated switching currents Ie  | AC: 2,5A<br>DC: 2A           |
| Nominal voltage of insulation Ui   | 500 V                        |
| Nominal impulse withstand voltage Uimp   | 2,5 kV                       |
| Switching overvoltage  | < 2,5 kV                     |
| Protection class   | IP40                         |
| Environmental pollution level  | 3                            |
| Type and highest values of rated data of the protective device used for preventing the effects of short-circuit currents | 25A gG                       |
| Cut-off withstand current  | 6000A                        |
| Number of switching cycles   | 120h <sup>-1</sup>           |
| Terminal cross-section   | 0,75...4mm <sup>2</sup>      |
| Change-over, double break-before-make contact with four terminals  | type Zb                      |
|  |                              |
| Min. driving force   | 25N                          |
| Installation altitude  | below 2000 m above sea level |
| Ambient temperature  | -25...+70 °C                 |
| Working position   | any                          |

## D-429 switches

Cat. no.

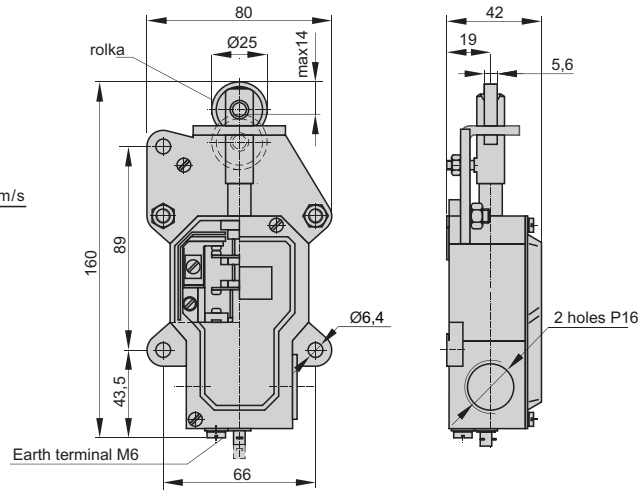
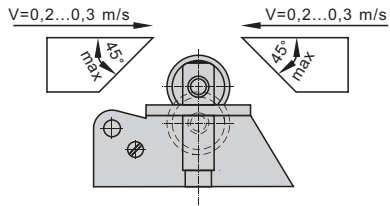
37-0000



## D-429r switches

**Cat. no.**

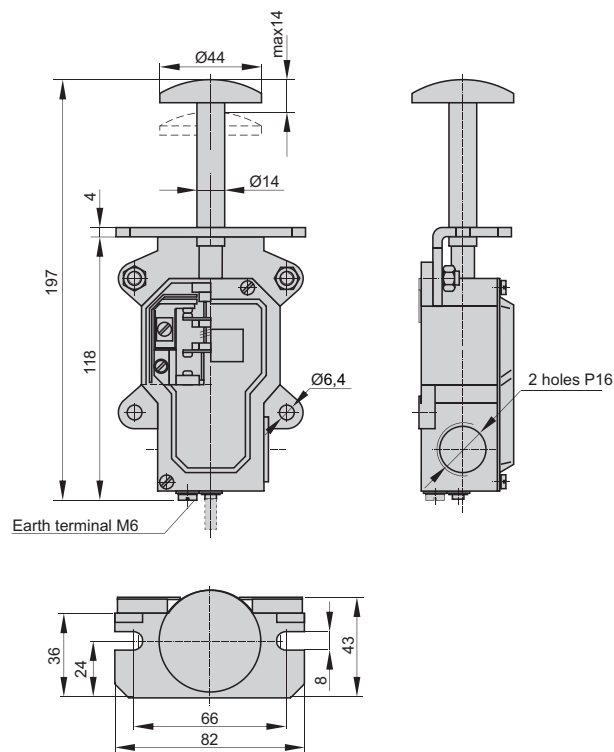
37-0100



## D-443 switches

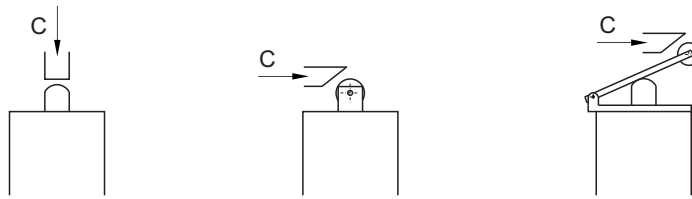
**Cat. no.**

37-0200

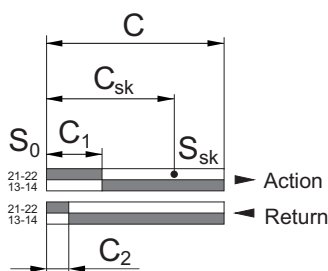


# LIMIT SWITCHES

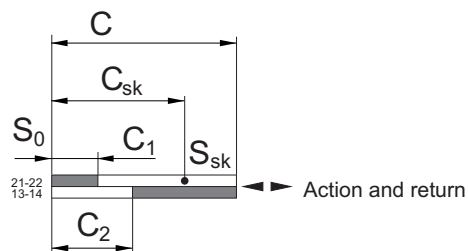
## HOW TO READ OPERATING DIAGRAMS



### Operating diagram for a switch with snap action contact



### Operating diagram for a switch with slow contact



$C_1$  - distance of the driving element from point 0 to the start of switching of contacts

$C_2$  - the distance of the driving element from switching the contacts to the point  $S_0$

$C_{sk}$  - the distance of the driving element from  $S_0$  to the efficient opening point

$C$  - maximum distance of the driving element

$S_{sk}$  - efficient opening point

$S_0$  - starting point - switch in a free state

## SHORTENINGS USED IN THE DIAGRAMS

$v_{max}$  - max. speed of the driving element

$F_{sk}$  - min. force for the efficient opening

$M_{sk}$  - min. torque for the efficient opening

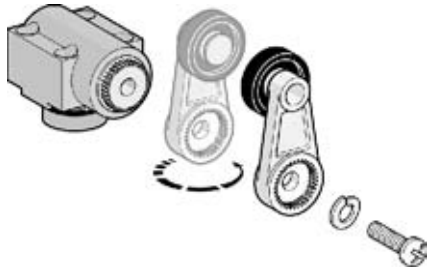
$F_{min}$  - minimum operating force

$M_{min}$  - minimum operating torque

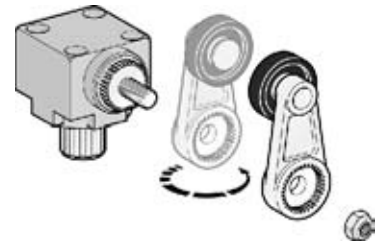
• - efficient opening

R - reset position

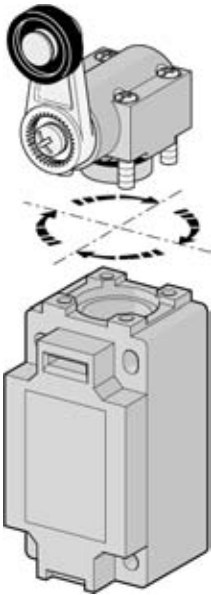
## HEAD ADJUSTMENT



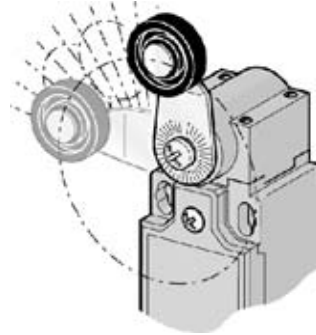
The plastic roller lever can be turned 180° in switch types PAP1, PDP1, PAM1, PDM1 and PEM.



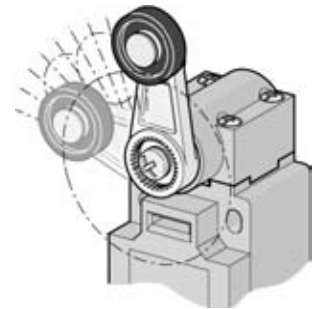
The plastic roller lever can be turned 180° in switch type PBM1.



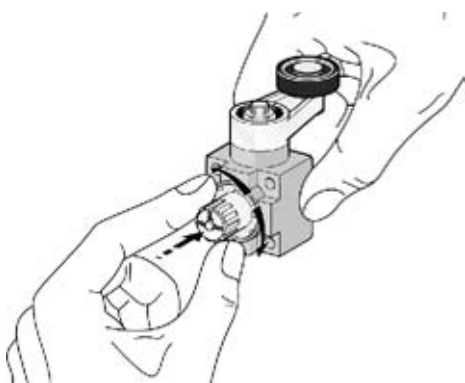
The head can be installed in 4 positions every 90° (for PEM - 2 positions every 180°).



Free position of the lever in 10° steps for the switch types: PAP1, PDP1, PAM1, PDM1, PEM.



Free position of lever in 90° steps for switch type PBM1.



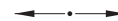
Selecting the lever operating mode for switches PBM1.



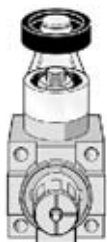
Two-way operation



Clockwise operation



Two-way operation

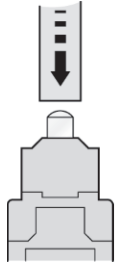


Counter clockwise operation

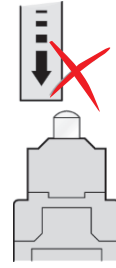
# LIMIT SWITCHES

## SAFETY PRECAUTIONS WHEN USING SWITCHES

### Switches with plunger

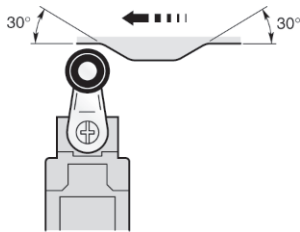


Correct operation

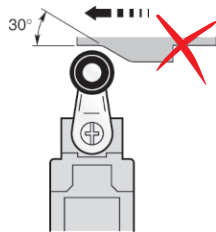


Incorrect operation

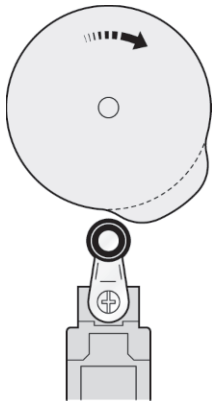
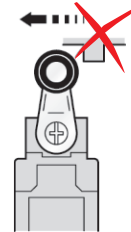
### Switches with roller levers



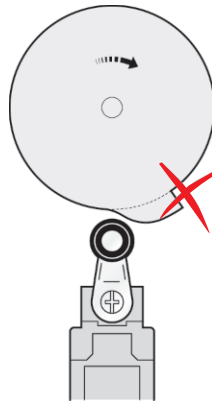
Correct operation



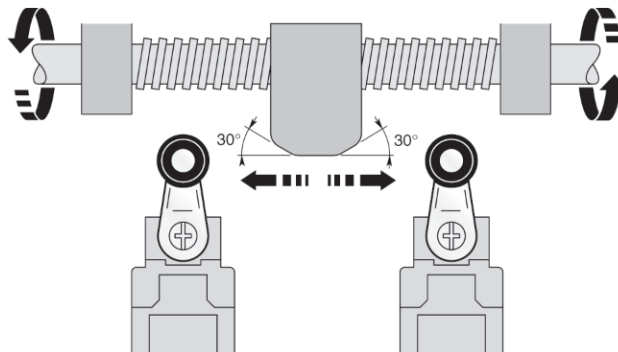
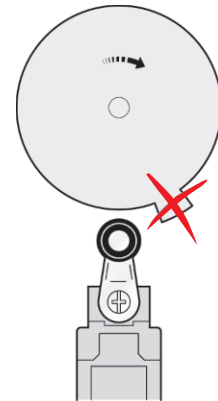
Incorrect operation



Correct operation



Incorrect operation

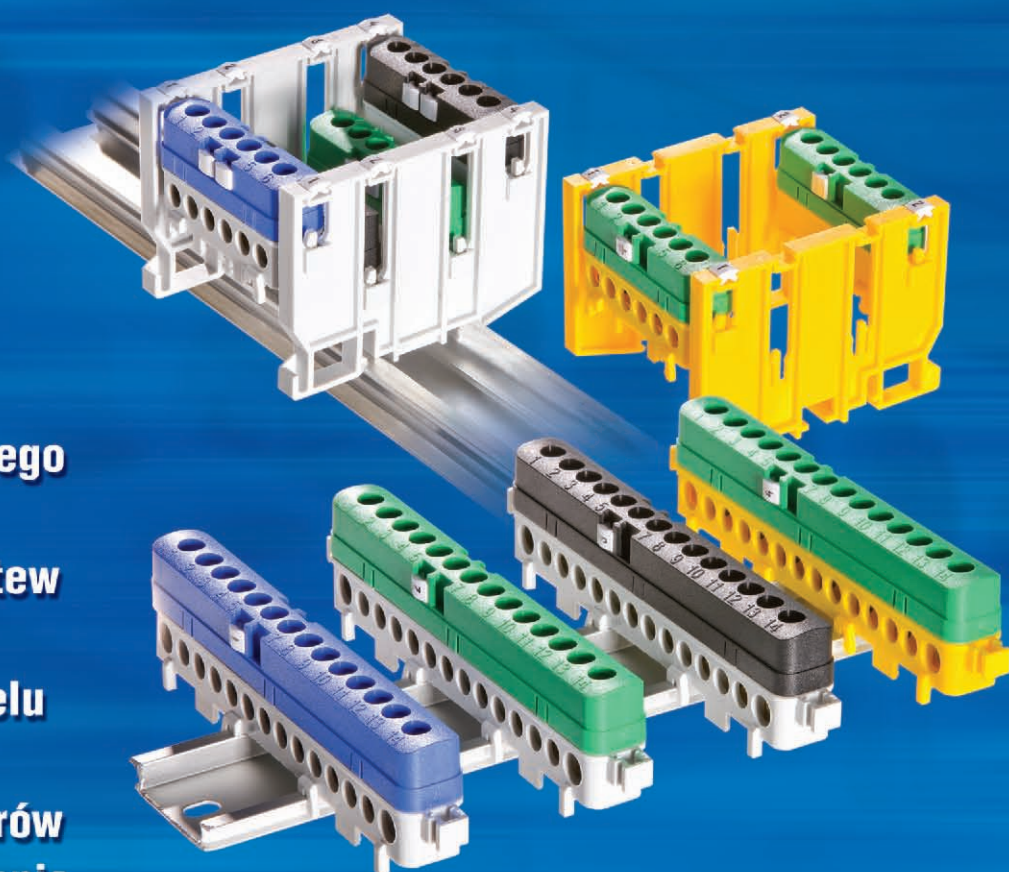


If the operation of switching element is slow, a limit switch with snap action contact is preferred PZ11, PZ02.

# Listwy Przyłączeniowe Izolowane



- Łatwy montaż na szynie TS 35 i do podłoża
- Możliwość dowolnego tworzenia bloków z pojedynczych listew
- Cztery odmiany kolorystyczne w celu wyróżnienia poszczególnych torów
- Możliwość oznaczania za pomocą znaczników DK



POKÓJ S.E. 91-202 Łódź, ul. Warecka 1, tel. 42 25 47 850 - 856, [www.pokoj.com.pl](http://www.pokoj.com.pl)