Switches And Data Input Units.
Quality And A Wide Range.
Custom Components According To Your Requirements.
Our series is laid out for professional technology with modern assembly processes. They have solid PCB terminals outline the contact fingers are goldplated and the contact paths have an abrasion-resistant gold overlay.
The contact resistance is low and stable.

These types are available with 10- or 16-positions in BCD, BCD complement, hexadecimal and hexadecimal complement. On request our PT65 can be delivered in 4, 6 and 8 position types as well.

P36 and P60A are available also in SMT.

Besides the “3+3” pin configuration with two common connections Hartmann offer the P60A in a “4+1” pin configuration.
This system has on one side common connection and on the opposite side 4 outgoing connections.

For all series different actuators are available. Therefore solutions for most applications can be met. Figures are clearly visible and detention mechanism is precise.

The switches of our PRINTHART series are quality products.
Hartmann is approved to ISO 9001. All switches are subject to electronic final check.

Note

All dimensions are given in mm. Mounting hole patterns and layouts are drawn from component side.
The tolerance range, in most cases, is in accordance with “DIN 7168 medium”.
We reserve the right to undertake modifications in the interest of technical progress. The catalogue represents the latest level of technology on the day it was published.

Hartmann PCB code switches can be found in all electronic fields.

Not every demand can be fulfilled with standard switches. More and more special executions are required. We are ready and – due to our expertise, and the vertically integrated manufacture – we are in the position to respond to your wishes. Please contact us also, if you don’t find the optimum switch for your requirements.
We will find a solution.
Standard Types

<table>
<thead>
<tr>
<th>Series/types</th>
<th>P36</th>
<th>P36S</th>
<th>P60A</th>
<th>P60AS</th>
<th>PT65</th>
<th>PT65 .31</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions W/D/H</td>
<td>7,4/7,4/3,65</td>
<td>7,4/7,4/3,85</td>
<td>10/10/6,0</td>
<td>10/10/6,2</td>
<td>10/10/6,75</td>
<td>10/10/6,75</td>
<td>10/10/8,8</td>
</tr>
<tr>
<td>Catalogue page</td>
<td>8</td>
<td>8</td>
<td>10</td>
<td>10</td>
<td>12</td>
<td>14</td>
<td>15</td>
</tr>
</tbody>
</table>

**Standard actuation**

- Arrow-shaped slot
- Rectangular-shaped slot
- Spindle
- Segment wheel
- Cross-shaped slot
- Slotted spindle

**Connection type**

- 3+3
- 4+1

**Terminals**

- Straight
- Crimped
- Angular L2,54
- Angular L5,08
- SMT

**Standard-Codes**

- BCD
- BCD Complement
- Hexadecimal
- Hexadecimal Compl.
- Pulse generator

* only to be fitted after the soldering process

**Order description**

P36101L254

- Series: P36, P36S, P60A, P60AS, PT65, P
- Standard actuators: 1 = arrow-shaped slot, 2 = rectangular-shaped slot, 3 = spindle, 5 = segment wheel, 7 = cross-shaped slot, 8 = slotted spindle
- Codes: 01 = BCD, 02 = BCD Compl., 03 = Hexadecimal, 06 = Hexa. Compl., 31 = Pulse generator
- Terminals: V = crimped, L254 = left angular 2,54mm, L508 = left angular 5,08mm
Types P36.../P36S...

Height: 3,65mm (SMT: 3,85mm)
Pin connection: 3 + 3
All standard codes
Available with spindle or slotted spindle
Straight, crimped, angular and SMT pins

**Mechanical Data**
- Permiss. ambient temp.: –30°C – +90°C
- Torque: min. 0,7Ncm
- Expected life: min. 10⁴ steps
- Positions per rotation: 10, 16

**Electrical Data**
- Operating voltage: ≤ 24V
- Contact load, static: ≤ 0,4A
- Contact load, dynamic: ≤ 0,10A
- Test voltage: 250V 50Hz/1min
- Contact resistance: < 100 mOhm
- Insulation resistance: > 100 MOhm

**Solder recommendations**
(EN 61760-1; DIN IEC 60068-2-20)
- Solder reflow: max. 40s/215°C
- Solder iron: max. 2s/340°C
- Solder bath: max. 10s/260°C

**Standard actuators**
See page 18

**Colour of rotor**
- BCD: red
- BCD Complement: orange
- Hexadecimal: grey
- Hexadecimal Complement: white

**Order description see page 9.**
Tape and Reel Packing Series P36S...

**Tape And Reel Dimensions**

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>P36S 1..</td>
<td>max. 22.4</td>
<td>max. 16.4*2</td>
</tr>
<tr>
<td>P36S 3..</td>
<td>max. 30.4</td>
<td>max. 24.4*2</td>
</tr>
<tr>
<td>P36S 8..</td>
<td>max. 30.4</td>
<td>max. 24.4*2</td>
</tr>
</tbody>
</table>

**advance and end section**

end (empty)      components       start (empty)    tape only

min. 160mm end section  direction of feed  min. 100mm

**peel strength, cover tape**

0.1N ... 1.3N (10g ... 130g)

direction of feed

opening direction of cover tape

removal angle of cover tape: 165°-180°
removal speed: 300 ±10 mm/Minute
Typen P60A.../P60AS...

Height: 6,0mm (SMT: 6,2mm)
Pin connection: 4 + 1
All standard codes
Individual operating elements
Straight, crimped, angular and SMT pins

Mechanical Data
Permiss. ambient temp. –20°C – +85°C
Torque min. 0,7Ncm
Expected life min. 10⁴ steps
Positions per rotation 10, 16

Electrical Data
Operating voltage ≤ 24V
Contact load, static ≤ 0,4A
Contact load, dynamic ≤ 0,15A
Test voltage 250V 50Hz/1min
Contact resistance < 100mOhm
Insulation resistance > 100MOhm

Solder recommendations
(EN 61760-1; DIN IEC 60068-2-20)
Solder reflow max. 40s/215°C
Solder iron max. 2s/340°C
Solder bath max. 10s/260°C

Standard actuators
See page 18

Individual operating elements
See page 15

Order description see page 9.
Tape and Reel Packing Series P60AS...

Diameter of reel 329mm
Core diameter 100mm

Advance and end section

Peel strength, cover tape
0.1N ... 1.3N (10g ... 130g)

Opening direction of cover tape

Removal angle of cover tape: 165°–180°
Removal speed: 300 ± 10 mm/Minute
Type PT65...

Height: 6.5mm
Pin connection: 3 + 3
Screwdriver and cross-shaped slot types
All standard codes
Straight, crimped and angular pins
Available with spindle or segment wheel
Extra sealed Design

Mechanical Data
Permiss. ambient temp. -20°C – +70°C
Torque min. 0.7Ncm
Expected life min. 10⁴ steps
Positions per rotation 10, 16

Electrical Data
Operating voltage ≤ 24V
Contact load, static ≤ 0.4A
Contact load, dynamic ≤ 0.15A
Test voltage 250V 50Hz/1min
Contact resistance < 80 mOhm
Insulation resistance > 100 MOhm

Solder recommendations
(DIN IEC 60068-2-20)
Solder iron max. 2s/340°C
Solder bath max. 10s/260°C

Standard actuators
See page 18

Order description see page 9.

Dimensions/Mounting hole patterns

* excess dimension to prevent movement during processing
Both types PT65 and P60A are available with cross-shaped slots and can be fitted either by the factory or afterwards with the actuators. Elements are available individually under the following order description. The required colour must be added to the text.

<table>
<thead>
<tr>
<th>Operating elements for cross-shaped slot-types</th>
</tr>
</thead>
<tbody>
<tr>
<td>Segment wheel *</td>
</tr>
<tr>
<td><img src="image" alt="Segment wheel image" /></td>
</tr>
<tr>
<td>Order description</td>
</tr>
<tr>
<td>SR-PT65 9,5/4,4</td>
</tr>
<tr>
<td>Colours: yellow, red, green, blue, grey or black</td>
</tr>
</tbody>
</table>

| Spindle *                                      |
| ![Spindle image](image)                       |
| Order description                             |
| SA-PT65 4/x (x = 7,3; 11,6; 13,3)             |
| Colours: grey, red, black                     |

| Wheel (only PT65)                             |
| ![Wheel image](image)                        |
| Order description                             |
| DR-PT65 17                                    |
| Colour: white (number printing on request)    |

| Knob *                                         |
| ![Knob image](image)                          |
| Order description                             |
| DK-PT65 10,5/5,3                              |
| DK-PT65 10,5/x (x = 15,7; 29,1; 34,4)         |
| Colour: red                                   |

* In case of P60 AS to be fitted after soldering.
Type PT65.31

The pulse generator is a mechanical rotary switch connecting input C to outputs 1 and 2 after another in a retarded manner. In the mechanical detent position input C is galvanically separated from the outputs 1 and 2. Depending on the rotational direction of the axis, the switching sequence is:
- Rotation to right (clockwise) C+1, C+1+2, C+2
- Rotation to left (counterclockwise) C+2, C+2+1, C+1

Hereby, the rotational direction is recognized electrically. Typical applications are to be found wherever adding or substracting instructions are read into digital electronics (dimmer, volume control).

**Mechanical Data**
- Permiss. ambient temp.: –20°C – +70°C
- Torque: min. 0.7 Ncm
- Expected life: min. 10⁴ steps
- Positions per rotation: 10

**Electrical Data**
- Operating voltage: ≤ 24V
- Contact load, static: ≤ 0.4 A
- Contact load, dynamic: ≤ 0.15 A
- Test voltage: 250V 50Hz/1min
- Contact resistance: < 80 mΩ
- Insulation resistance: > 100 MΩ
- Contact bounce: < 10 ms*
- Pulse duration:
  - C + Pin 1: > 50 ms*
  - C + Pin 1 + Pin 2: > 100 ms*
  - C + Pin 2: > 50 ms*

* Data valid at 15 rpm

**Solder recommendations**
(DIN IEC 60068-2-20)
- Solder iron: max. 2s/340°C
- Solder bath: max. 10s/260°C

**Order description see page 9.**
Type P...

Height: 8.6mm
Pin connection: 3 + 3
All standard codes
Available with spindle or rectangular shaped slot
Straight, crimped and angular pins

Mechanical Data
Permiss. ambient temp. –20°C – +70°C
Torque min. 0.7Ncm
Expected life min. 104 steps
Positions per rotation 10, 16

Electrical Data
Operating voltage \(\leq 24V\)
Contact load, static \(\leq 0.4A\)
Contact load, dynamic \(\leq 0.15A\)
Test voltage 250V 50Hz/1min
Contact resistance \(< 80 \text{ mOhm}\)
Insulation resistance \(> 100 \text{ MOhm}\)

Solder recommendations (DIN IEC 60068-2-20)
Solder iron max. 2s/340°C
Solder bath max. 5s/260°C

Knob
Order description
DK-P 10.5/ x (x = 3.3; 6.9; 12.9); colour: red

Standard actuators
See page 18

Order description see page 9.
Standard actuators

<table>
<thead>
<tr>
<th>Series/Types</th>
<th>Operation</th>
<th>Arrow-shaped slot</th>
<th>Rectangular-shaped slot</th>
<th>Spindle</th>
<th>Segment wheel</th>
<th>Cross-shaped slot</th>
<th>Slotted spindle</th>
</tr>
</thead>
<tbody>
<tr>
<td>P36</td>
<td>Order-No. 1</td>
<td>1.05</td>
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<td>0.7</td>
<td>1.05</td>
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<td>P36S</td>
<td>Order-No. 2</td>
<td>2.75</td>
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<td>4.5</td>
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<td>Colour: according to code</td>
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<td>PT65</td>
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<td>P60A</td>
<td>Order-No. 5</td>
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<td>P60AS</td>
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</table>
Codes

Standard

<table>
<thead>
<tr>
<th>Type</th>
<th>BCD</th>
<th>BCD Complement</th>
<th>Hexadecimal</th>
<th>Hexadecimal Compl.</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>1248</td>
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<td>1248</td>
<td>0124</td>
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<td>06</td>
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On Request

<table>
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<tr>
<th>Type</th>
<th>BCD</th>
<th>Gray Code</th>
<th>Hexadecimal Compl.</th>
<th>Off/On</th>
<th>BCD</th>
<th>Special Code</th>
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<tbody>
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<td>1248</td>
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</tbody>
</table>

* = mounting hole pattern (component side)