Automotive / Appliance control

# 6 mm carbon trimmer potentiometer PT6

## Main features

- Carbon resistive element.
- IP54 protection according to IEC 60529.
- Polyester substrate.
-SMD version available (see PS-6 datasheet).
-Wiper positioned at initial, 50% or fully clockwise.

- Also upon request:
  - Supplied in magazines for automatic insertion.
  - Long life model (10K cycles).
  - Housing available in self extinguishable plastic (UL94V0).
  - Mechanical detents.

## Description

The PT-6 potentiometer offers control where frequent adjustment is required. The shaftless design allows for employment of different engagement mechanisms, such as a customized shaft, a motor control or a human interface adjustment.

This potentiometer can also control variable outputs including frequency, change in motor speed or volume.

Typical applications include test and measurement equipment, consumer electronics, appliances, timer relays, robotics, motion controllers, home and building automation and medical equipment control panels.

This datasheet shows you the basics of the PT-6 potentiometer that is quite versatile and easy to taylor. Do not hesitate to contact Piher for advice.

## Mechanical specifications

| | | |
|---|---|---|
| Mechanical rotation angle | | 235° ± 5° |
| Electrical rotation angle | | 200° ± 20° |
| Torque | Rotational | 0.2 to 2 Ncm . (0.3 to 2.7 in - oz) |
| | Stop | > 4 Ncm.(>5.6 in-oz) |
| Life* | | Up to 10K cycles |

## Electrical specifications

| | | |
|---|---|---|
| Range of values * | | 220Ω ≤ Rn ≤ 5MΩ (Decad. 1.0 - 2.0 - 2.2 - 2.5 - 4.7 - 5.0) |
| Tolerance * | 220Ω ≤ Rn ≤ 1MΩ | ± 20% |
| | 1MΩ ≤ Rn ≤ 5MΩ | ± 30% |
| Max. voltage | | 100 VDC (lin) 50 VDC (no lin) |
| Nominal power 50°C (122°F) (see power rating curve) | | 0.1 W (lin) 0.05 W (no lin) |
| Taper * | | Lin; Log; Alog (Log. & Alog. only Rn > 1K) |
| Residual resistance* | | ≤ 0.5% Rn (5Ω min.) |
| Equivalent noise resistance | | ≤ 3% Rn (3Ω min.) |
| Operating temperature ** | | -25°C to +70°C (-13°F to + 158°F) |

* Others: check availability.
** Up to 85°C depending on application.

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## How to order

Optional extras

**PT-6 K V - 221 A 2020 - [ ] [ ] [ ] - [ ] - [ ] [ ]**

**Series**
PT-6

**Rotors**
A
K
M
Q
W
X
(See note 1)

**Mounting method**
H = Horizontal adjust
V = Vertical adjust

**Value**
221 = 220Ω
505 = 5M
000 = CM
(See note 2)

**Taper**
A = Lin.
B = Log.
C = Alog.

**Tolerance**
3030 = ± 30%
2020 = ± 20%
1010 = ± 10%
0505 = ± 5%
(See note 3)

**Life**
- = 1K cycles
E= 10 K cycles
(See note 4)

**Detents**
- = None
P04
P05
P06
P07
P08
P10

**Packaging**
- = Bulk
T = Magazines
(See note 5)

**Shaft/Knob**
- - = Fig.1
02 = Fig. 2
03 = Fig. 3
04 = Fig. 4
05 = Fig. 5
(Use this option for rotors W or X only)

**Knob/rotor colour**
- = White
AM = Yellow
AZ = Blue
CR = Cream
GR = Grey
IN = Not coloured
NE = Black
RO = Red
VE = Green
(See note 6)

**Wiper position**
- = Initial
PM = 50%
PF = Final

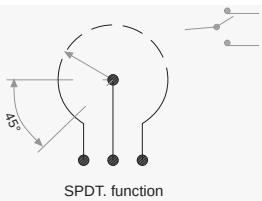
**Crimping**
- = Crimped terminals
SC = Not crimped

NOTES:

(1) Adjust. type: «X» is only available with horizontal adjusting method.

(2) Value: – Code: 22 1 = 220 Ω
- 22 → First two digits.
- 1 → Number of zeros

– 000 = CM = switch SPDT version (contact us por further information)



SPDT. function

| Resistance Ω | 100 | 200 | 220 | 250 | 470 | 500 | 1K | 2K | 2.2K | 2.5K | 4.7K | 5K | 10K | 20K | 22K | 25K | 47K | 50K | 100K | 200K | 220K | 250K | 470K | 500K | 1M | 2M | 2.5M | 4.7M | 5M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| How to order code | 101 | 201 | 221 | 251 | 471 | 501 | 102 | 202 | 222 | 252 | 472 | 502 | 103 | 203 | 223 | 253 | 473 | 503 | 104 | 204 | 224 | 254 | 474 | 504 | 105 | 205 | 255 | 475 | 505 |
| Standard tolerance | 30% | | 20% | | | | | | | | | | | | | | | | | | | | | | | 30% | | | |

(3) Tolerance (non standard, custom): check availability..... Code eg.: +7 –5 = 07 05
- 07 → Negative tolerance
- 05 → Positive tolerance

(4) Life: • Standard = 1000 cycles • Long = 10K cycles (non-detented models)

(5) Only for "V" mounting method. "W" rotor with shaft Fig. 2 is not available in magazines .

(6) Potentiometer without knob or shaft, only the rotor. Potentiometer with knob or shaft, only the knob/shaft. The default colour for the knob and rotor is white.

Online product configurator: https://piher.net/configurator/pt6-6-configurator-potentiometer/

## How to order examples

**PT6KH-103A2020**
6mm potentiometer with rotor "K" (cross shape), H mounting method (horizontal adjustment), 10K resistive value, linear taper, 20% resistive tolerance and crimped terminals.

**PT6WV-104A1010-5NE-SC**
6mm potentiometer with factory pre-inserted knob, V mounting method (vertical adjustment), 100K resistive value, linear taper, 10% resistive tolerance, black knob ref. 6148 and straight terminals (not crimped).

## Standard default options

| | |
|---|---|
| Mechanical life | 1000 cycles |
| Crimping | Yes |
| Packing | Bulk |
| Rotor colour | White |
| Wiper send position | Initial |
| Knob colour | White |
| Detents | None |

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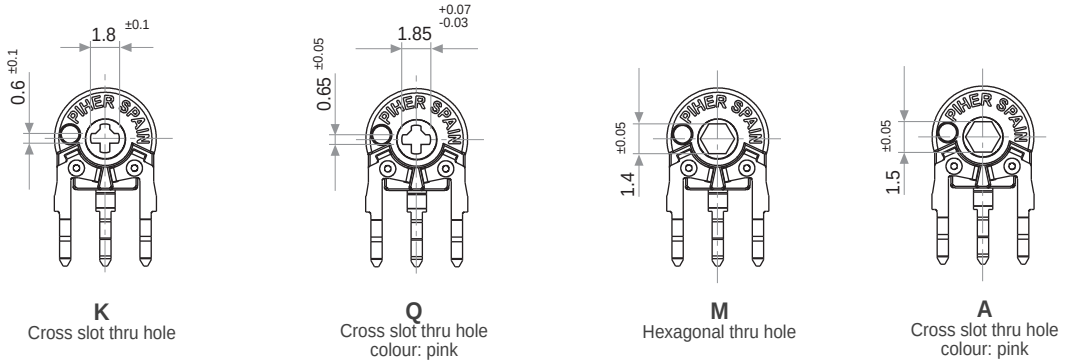
## Rotors



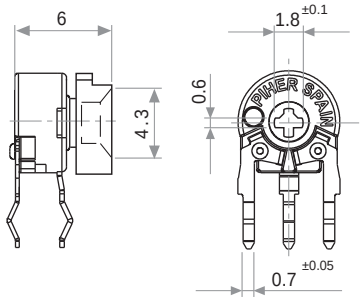

**K**
Cross slot thru hole

**Q**
Cross slot thru hole
colour: pink

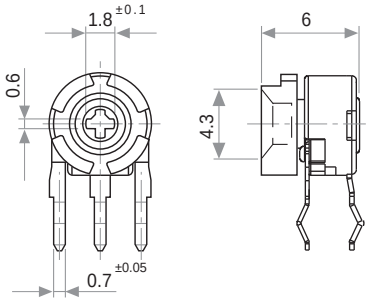
**M**
Hexagonal thru hole

**A**
Cross slot thru hole
colour: pink

Default delivery is at initial position. Wipers are shown positioned at 50% for the picture.




**X** = Adjustable from collector side



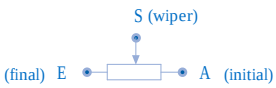

**W** = Adjustable from terminal side

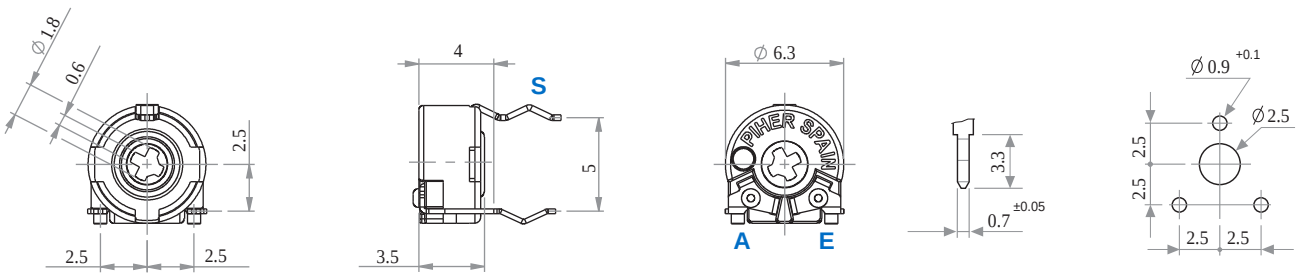
With inserted knob / shaft.

Default knob is ref. 5155 white.

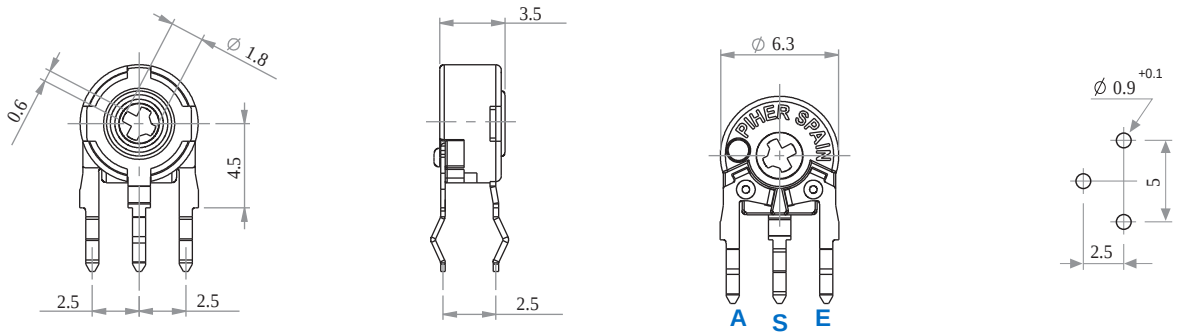
## Mounting methods. Dimensions

V = horizontal mounting – vertical adjustment




H = vertical mounting – horizontal adjustment



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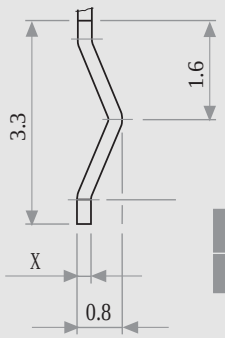
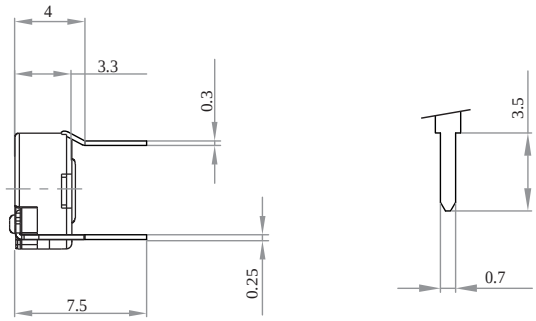
## Crimped terminals (detail A)




| | X |
|---|---|
| Terminals | 0.25 |
| Collector (S) | 0.30 |

This is the default terminals type.

## Not-crimped terminals dimensions

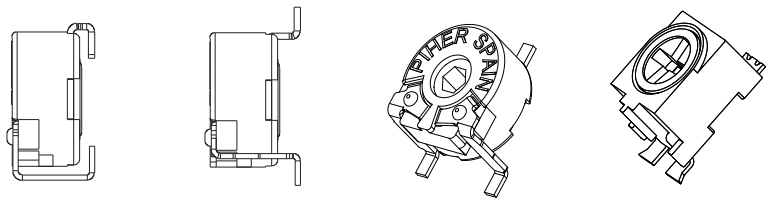



Please indicate “SC” at the end of the part number for this version.

Download the STEP file here:
https://piher.net/piher/?p=894

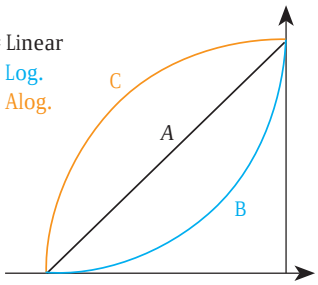
## SMD versions

SMD / SMT version available. See PS-6 and N-6 datasheets at: www.piher.net

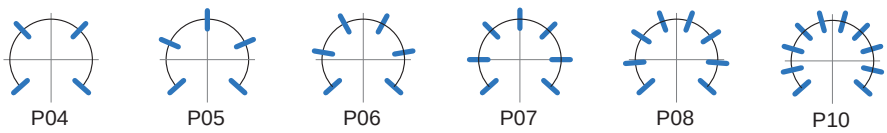


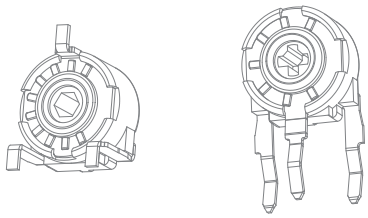
## Standard Tapers

A = Linear
B = Log.
C = Alog.




## Detents / Stop positions



Relative detent positions along the total mechanical travel.

NOTES FOR DETENTED VERSIONS

(1) All detented versions will be studied case by case. Contact Piher for leadtimes and availability.

(2) Others: check availability. Unless otherwise specified the detents are evenly spaced (using the end points as reference).

For more than 10 detents versions please contact Piher for more information.

(3) Standard mechanical life: 100 cycles.

(4) Long life versions are available under request. Contact Piher for more information.

(5) Detent torque can vary from 1.2 to 2.5 times the standard potentiometer torque.

(6) The colour of the rotor will be violet.

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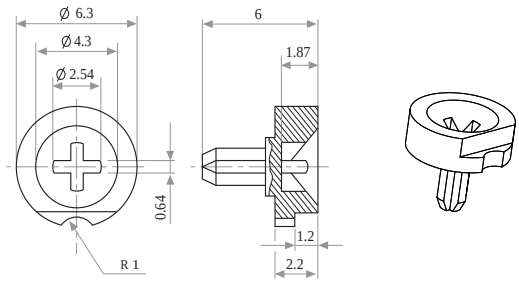
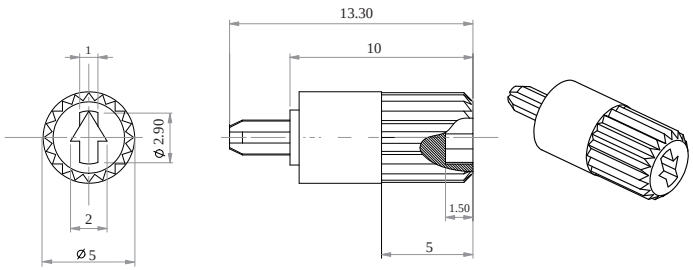
## Knobs/Shafts

By default shafts, knobs & thumweels are delivered unassembled.
Mounted shafts, knobs & thumbweels are delivered at random position. Custom positioning available.
If you wish to use your own plastic shaft/knob/actuator please contact Piher for advice about compatible materials.

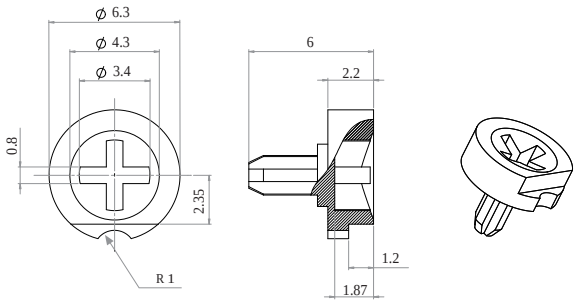
Ref.: 5155 / Fig. 1
Default knob. Standard colour: white.



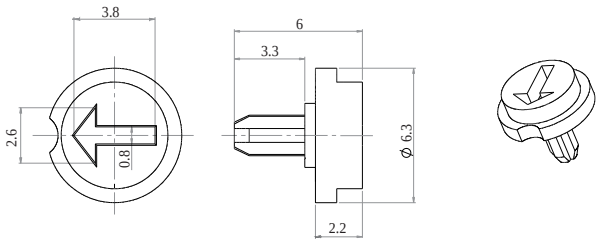

Ref.: 6132 / Fig. 2
Shaft. Not suitable for magazine packaging



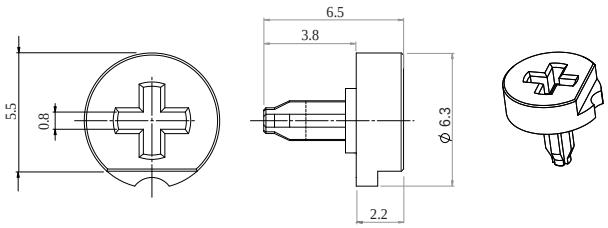

Ref.: 5141 / Fig. 3
Colour: grey. For other colours check availability.



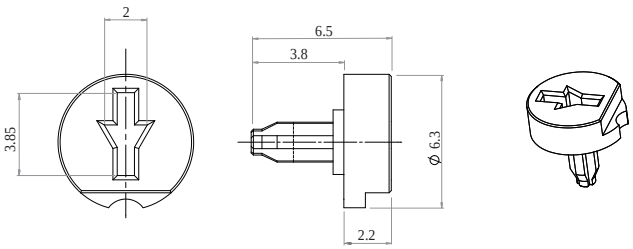

Ref.: 6172 / Fig. 4
Colour: grey. For other colours check availability.




Ref.: 6148 / Fig. 5

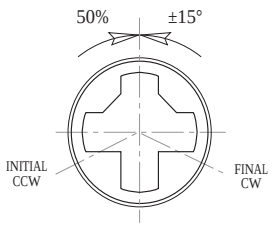


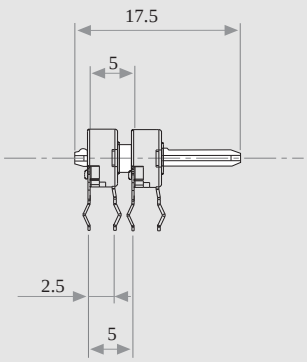

Ref.: 6160 / Fig. 6




## Positioning

Default position = CCW




Dual gang version . Ref 6060

# 6 mm carbon trimmer potentiometer PT6

## Packaging

BOXES / BULK

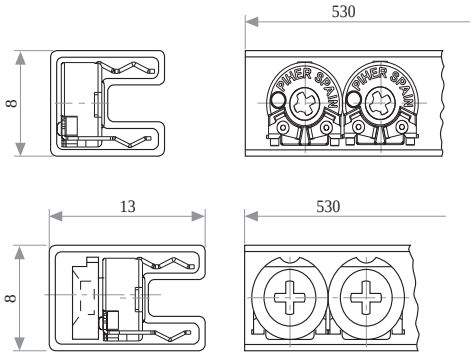
| Model | Units per box |
|---|---|
| All | 1.000 |

Box dimensions (mm):
185x85x40

AUTOMATIC INSERTION

| Magazines | Units per magazine |
|---|---|
| PT-6 V & PT-6 WV | 80 Pieces |

Magazines for PT-6 V with or without crimping.



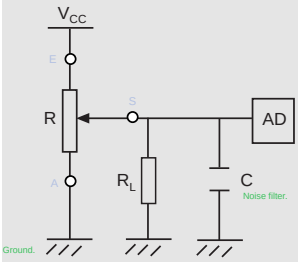

## Tests

| | | Typical variations |
|---|---|---|
| Electrical life | 1.000 h. @ 50° C; 0.25 W | ±5 % |
| Mechanical life (cycles) | 1000 @ 10 CPM ...15 CPM | ±3 % (Rn < 1 M ) |
| Temperature coefficient | –25° C; +70° C | ±300 ppm (Rn <100 K) |
| Thermal cycling | 16 h. @ 85° C; 2h. @ -25° C | ±2.5 % |
| Damp heat | 500 h. @ 40° C @ 95% HR | ±5 % |
| Vibration (for each plane,X,Y,Z) | 2 h. @ 10 Hz. ... 55 Hz. | ±2 % |

Out of range values may not comply these results

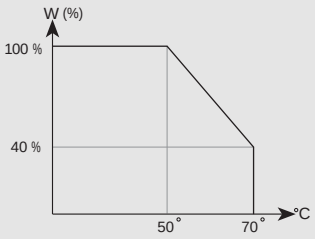
## Recommended connections

Piher potentiometer's recommended connection circuit for a position sensor or control application.
(voltage divider circuit electronic design)




$R_L \approx 100 \times R$

## Power rating curve

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