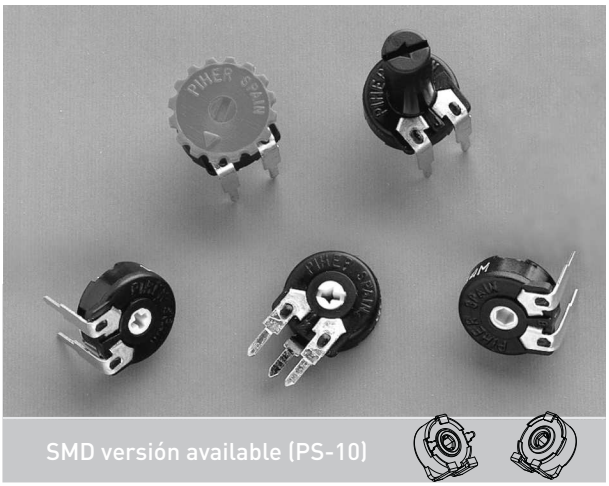
PIHER

PT-10 10 mm Carbon Potentiometer



FEATURES

- Carbon resistive element
- IP54 protection according to IEC 60529
- Polyester substrate
- Also upon request:
  - Wiper positioned at 50% or fully clockwise.
  - Supplied in magazines for automatic insertion.
  - Long life model for low cost control potentiometer applications
  - Self extinguishable plastic UL 94V-0
  - Cut track option
  - Special tapers
  - Mechanical detents
  - Low torque version
  - Special switch option
  - 3% Linearity and 100K cycles mechanical life

MECHANICAL SPECIFICATIONS

– Mechanical rotation angle:	235° ± 5°
– Electrical rotation angle:	220° ± 20°
– Torque:	0.4 to 2 Ncm. (0.6 to 2.7 in-oz)
– Stop torque:	> 5 Ncm. (>7 in-oz)
– Life(*):	Up to 10K cycles

ELECTRICAL SPECIFICATIONS

– Range of values (*)
100Ω ≤ Rn ≤ 5 M (Decad. 1.0 - 2.0 - 2.2 - 2.5 - 4.7 - 5.0)

– Tolerance (*): 100Ω ≤ Rn ≤ 1M Ω ------ ± 20%
1MΩ < Rn ≤ 5M Ω ------ ± 30%

– Max. Voltage: 200 VDC (lin) 100 VDC (no lin)

– Nominal Power 50°C (122°F) (see power rating curve)
0.15 W (lin) 0.07 W (no lin)

– Taper (*) (Log. & Alog. only Rn ≥ 1K) Lin ; Log; Alog.

– Residual resistance(*): ≤ 0.5 % Rn (5Ω min.)

– Equivalent Noise Resistance: ≤ 3% Rn (3 Ω min.)

– Operating temperature(**): -25°C + 70°C (-13°F + 158°F)

(*) Others upon request (**) Up to 85°C depending on application

HOW TO ORDER

PT 10 | L | H01 | 101 | A | 2020 | | | | | | | | | | S

Series
PT-10

Rotors
B G K L M R W X Y Z
(See note 1)

Code / Mounting Method

Code	Mounting Method
H01	H2.5
H05	H5
H02	H2.5P
H10	H5P
V05	V5
V10	V
V11	VP
V13	VJ

(See note 2 / **SMD** version available: see product PS-10)

Value
101 = 100Ω
504 = 500 K
505 = 5 M
000 = CM
(See note 3)

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

Tolerance
2020 = ± 20%
3030 = ± 30%
(See note 4)

OPTIONAL EXTRAS

Life
E= Long life
(See note 5)

Detents
PAI
PAM
PAF
P1I
P1F
P02
⋮
P16

Cut track
PCI = Initial
PCF = Final

Magazine
T
(See note 6)

Shaft/Thum.
01 = Fig. 1
02 = Fig. 2
⋮
17 = Fig. 17
(See note 10)

Flammability
I = Non flammable
(See note 7)

Shaft/rotor colour
RO = Red
NE = Black
VE = Green
AM = Yellow
AZ = Blue
MA = Brown
GR = Grey
NA = Orange
CR = Cream
(See note 8)

Wiper position
PM = 50%
PF = Final

Torque
– = Standard
L= Low Torque
(See note 9)

NOTES:

(1) "Z" adjustment only available on "H" versions. Rotor "G" only available in purple (shaft/rotor colour "VI").

(2) Terminals styles: "P" & "J" are crimped. V=Vertical adjust; H=Horizontal Adjust

(3) Value Example: Code: 10 1 → 100 Ω (10 = First two digits of the value; 1 = Numb of zeros) 000 = CM = Switch version (contact us)

(4) Non standard tolerance, upon request. Example: +7% -5% Code: 07 05 (07 = positive tolerance; 05 = negative tolerance)

(5) • Standard = 500 cycles • Long = 10K cycles Others upon request.

(6) Magazines: not available with the H10, V05 and V13 models, nor with adjustment types X, W, Y, Z.

(7) Non flammable: housing, rotor and shaft. According to UL 94V-0

(8) Colour shaft/rotor: • Potentiometer without shaft: only rotor • Potentiometer with shaft: only shaft
• Cream colour only available in standard plastic.

(9) Low Torque: ≤ 1 Ncm
No detent option available for low torque models.

(10) If you wish to use your own custom plastic shaft/knob/actuator please contact Piher for advice about compatible materials.

NOTE: The information contained here should be used for reference purposes only.

HOW TO ORDER CUSTOM DRAWING

PT-10 LH 01 + DRAWING NUMBER (Max. 16 characters)

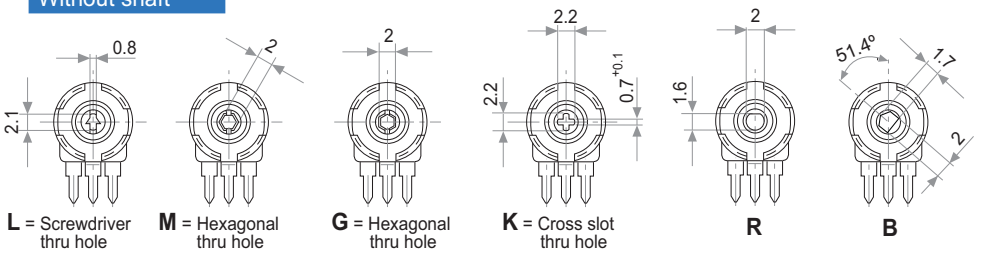
This way of ordering should be used for options which are not included in the "How to order" standard and optional extras.

STANDARD OPTIONS

Cut track	No
Detents	None
Packing	Bulk
Non flammable	No
Rotor colour	White
Shaft colour	Natural
Wiper position	Initial
Torque	Standard
Life	500 cycles

ROTORS

Without shaft



L = Screwdriver thru hole

M = Hexagonal thru hole

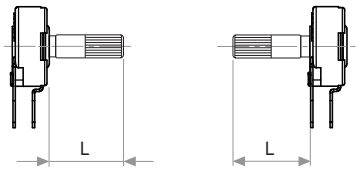
G = Hexagonal thru hole

K = Cross slot thru hole

R

B

With shaft

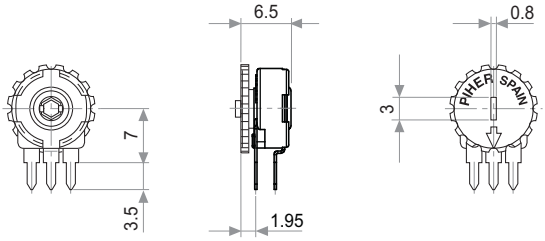


X = Adjustable from collector side

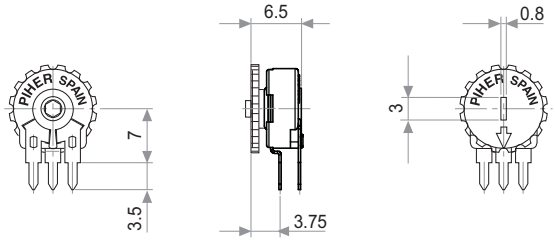
W = Adjustable from terminal side

Wipers positioned at 50%

With thumbwheel



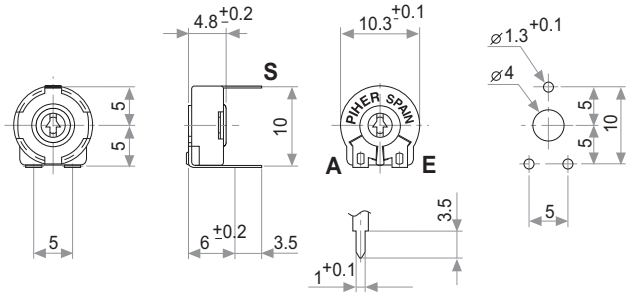
Y = Adjustable from terminal side



Z = Adjustable from collector side

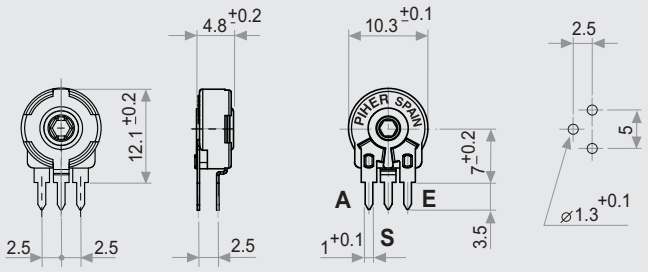
MOUNTING METHODS

v = horizontal mount – vertical adjust

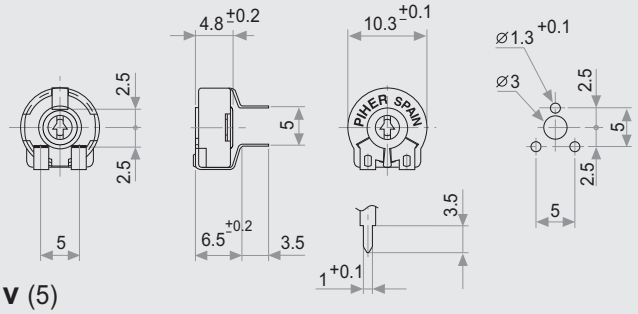


v (10) **A** = Initial **S** = Wiper **E** = Final

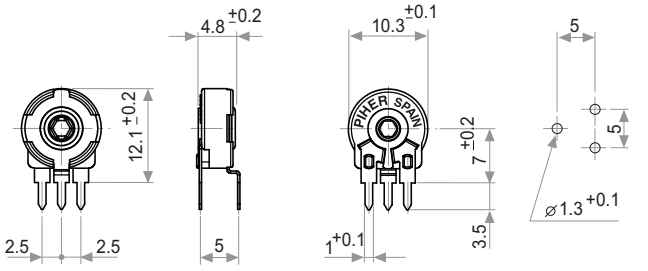
h = vertical mount – horizontal adjust



h (2.5) **A** = Initial **S** = Wiper **E** = Final



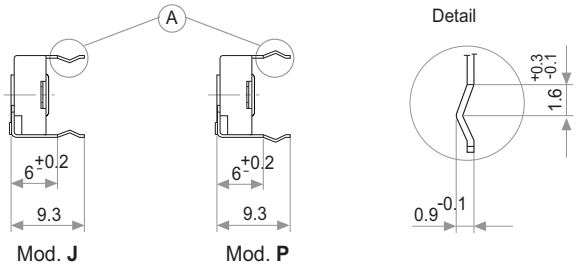
v (5)



h (5)

NOTE = Please note relative terminal positions when ordering non linear tapers.

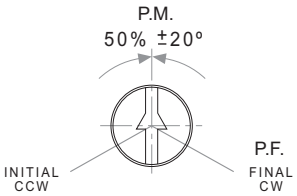
Crimped terminals

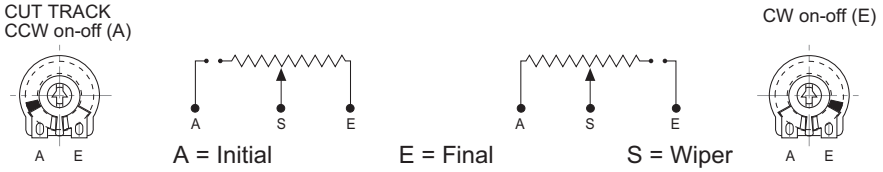


Mod. **J** Mod. **P**

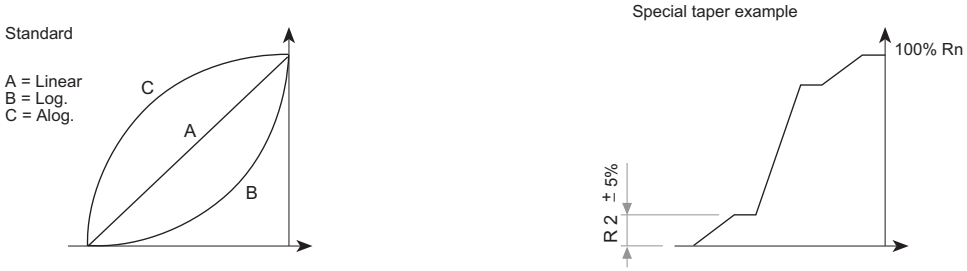
OPTIONS

Positioning (Std. Position = CCW)





TAPERS



NOTE = Please note relative terminal positions when ordering non linear tapers.

TESTS — TYPICAL VARIATIONS

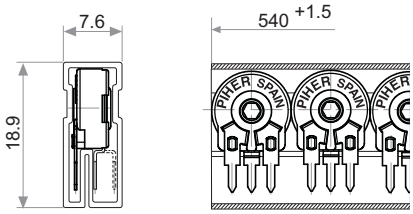
ELECTRICAL LIFE	1.000 h. @ 50°C; 0.15 W	±5 %
MECHANICAL LIFE (CYCLES)	500 @ 10 CPM ...15 CPM	±3 % (Rn < 1 MΩ)
TEMPERATURE COEFFICIENT	–25°C; +70°C	±300 ppm (Rn <100 K)
THERMAL CYCLING	16 h. @ 85°C; 2h. @ –25°C	±2.5 %
DAMP HEAT	500 h. @ 40°C @ 95% HR	±5 %
VIBRATION (for each plane X,Y,Z)	2 h. @ 10 Hz. ... 55 Hz.	±2 %

NOTE: Out of range values may not comply these results.

PACKAGING

BOXES

Model	Units
Without shaft	1000 (80 x 85 x 185 mm.)
With thumbwheel	800 (80 x 85 x 185 mm.)
With shaft	400 (80 x 85 x 185 mm.)

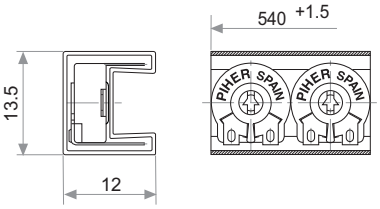


Magazines for PT-10 h 2.5; h 5

Also crimped term. h 2.5 P

AUTOMATIC INSERTION

Magazines	Units per magazine
PT-10H & PT-10V	50 Pieces

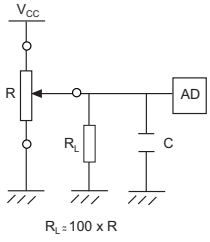


Magazines for PT-10 V

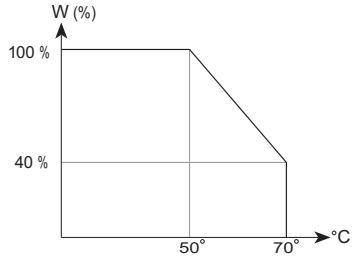
Also crimped term. VP

RECOMMENDED CONNECTION

Recommended connection scheme for Piher´s position sensors (voltage divider)



POWER RATING CURVE



SHAFTS (for G and M rotor types, top view)

Shafts, knobs & thumbweels are delivered at random position. Positioning available upon request.

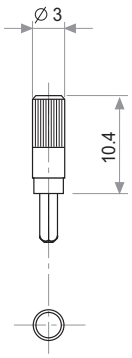


Fig. 1 / Ref. 5016

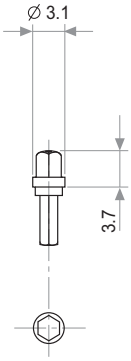


Fig. 2 / Ref. 5053

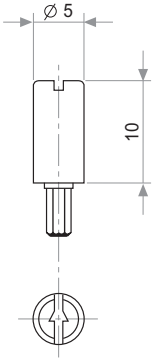


Fig. 3 / Ref. 5012

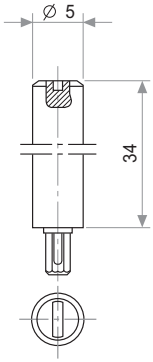


Fig. 4 / Ref. 6053

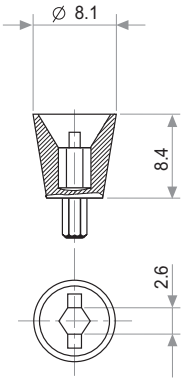


Fig. 6 / Ref. 5035

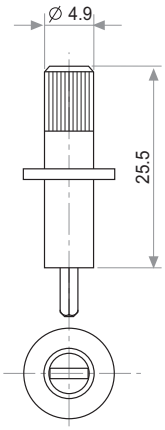


Fig. 7 / Ref. 5115

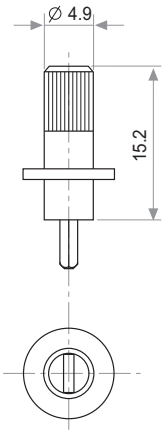


Fig. 8 / Ref. 5116

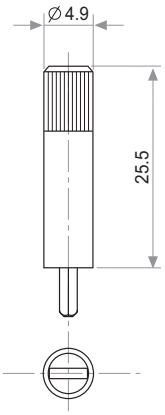


Fig. 9 / Ref. 5119

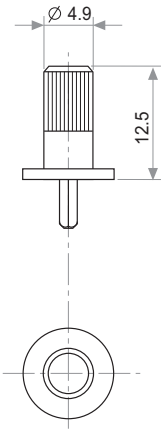


Fig. 10 / Ref. 5120

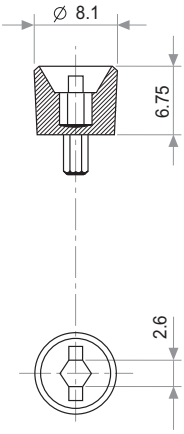


Fig. 11 / Ref. 5027

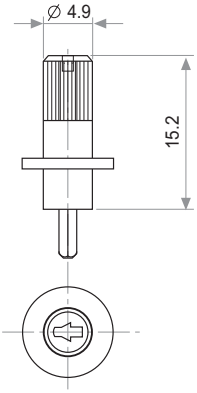


Fig. 12 / Ref. 6052

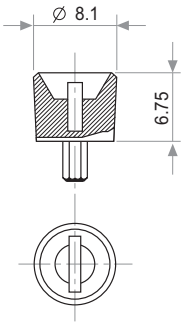


Fig. 13 / Ref. 5121

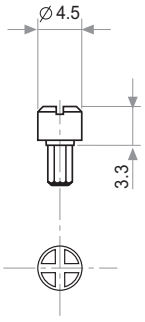


Fig. 14 / Ref. 5055

2- GANG Plastic Knob/ Plastic Shaft*

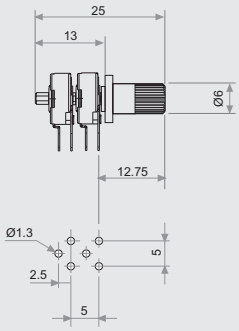


Fig. 18 / Ref. 6064

* Delivered unassembled
(For assembled contact your nearest PIHER supplier)

THUMBWHEELS (for G and M rotor types, top view)

Shafts, knobs & thumbweels are delivered at random position. Positioning available upon request.

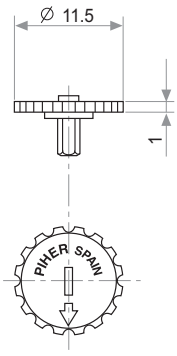


Fig. 5 / Ref. 5034

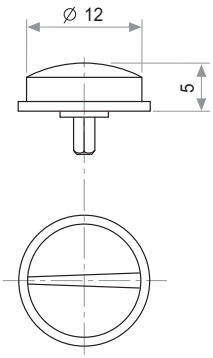


Fig. 15 / Ref. 6008

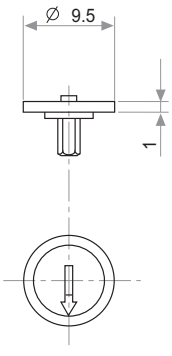


Fig. 16 / Ref. 5039

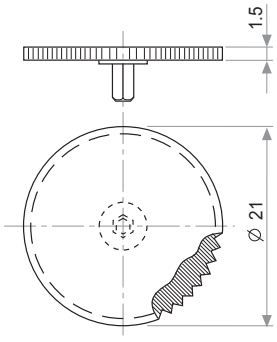
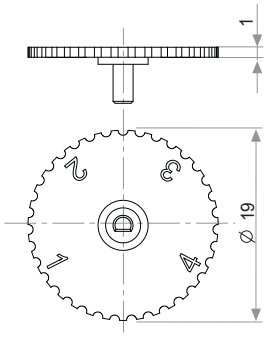


Fig. 17 / Ref. 5062

THUMBWHEEL For R rotor type only

Marking: configurable number of positions.

Example of four positions marking:



Upon request

DETENT CONFIGURATIONS EXAMPLES

This innovative PT´s with detents family has been specifically developed to allow the integration of otherwise large and expensive external mechanisms into the body of the majority of the 10 & 15 mm. PS/PT/PTC potentiometer series thus allowing a high range of configurations: special tapers, torque, tolerances, linearity, cut track, etc.

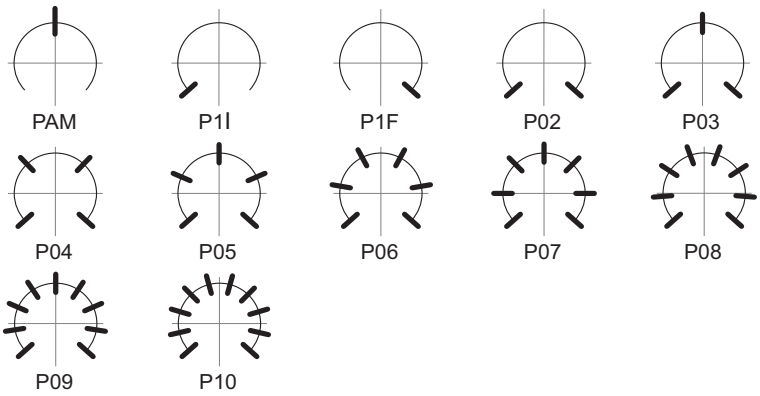
This detent design not only adds a "click" sensation of position, but also offers enormous savings in both cost and space for any given application.

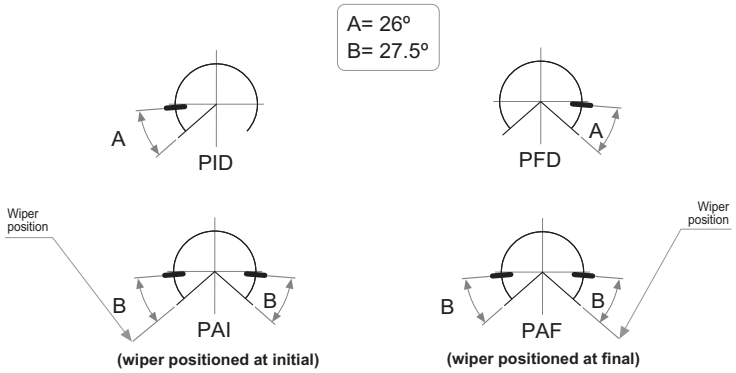
Strong and weak detents can be mixed as per customer´s request.

Detent number and positions can be made or fitted to the customer needs or preferences.

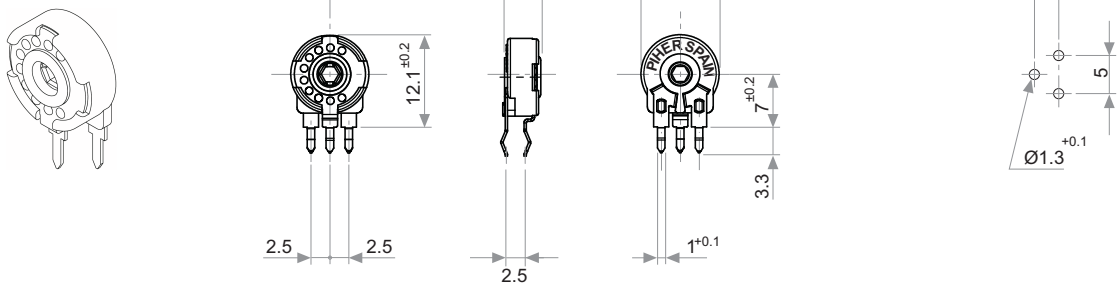
Relative detent positions along the total mechanical travel. Unless otherwise specified the detents are evenly spaced (using the end points as reference)

*For more than 10 detents versions please contact your nearest PIHER distributor. Mechanical and/or electrical features may be affected by detents. Please see our separate PTs with detents datasheet at www.piher.net

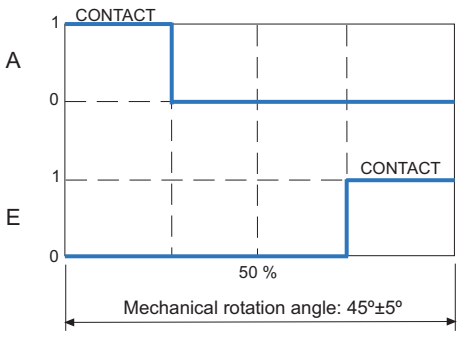




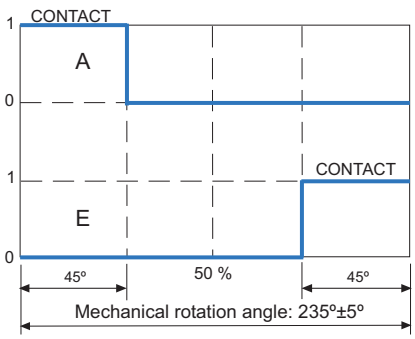
DETENT DETAILS



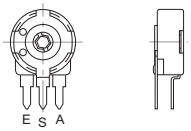
STANDARD SWITCH VERSIONS



D48 Switch code (Housing colour: green)



A80 Switch code



SW Standard specs.

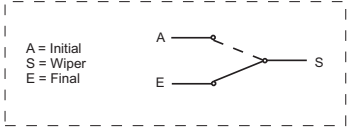
Power Rating: 24V / 15mA

ON position resistance: ≤ 5 Ω

Insulation Resistance: ≥ 30 MΩ

Please contact Piher for ordering information.

(Rotor at Final Position)



DETENTS WITH CONSTANT VALUE ZONES

PIHER´s potentiometers may feature special stepped outputs or 'constant voltage zones' for the 10mm and 15mm product families.

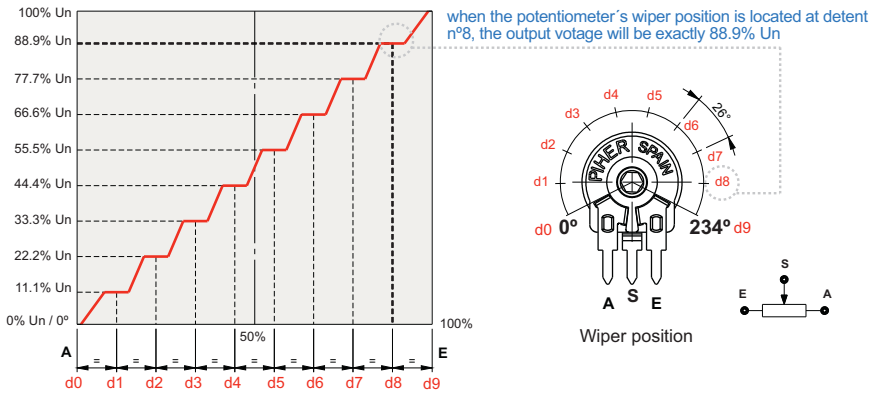
These constant voltage zones can be combined with PIHER's mechanical detents to provide exact alignment between the electrical output (flat areas) and the mechanical detent's positions. The result is a higher level of precision in controlling lighting, temperature, motor or other electronic control systems.

In addition to established catalogue detent configurations, we will design and manufacture any other configuration on our tried-and-tested carbon/cermet & THM/SMD potentiometer technology and processes.

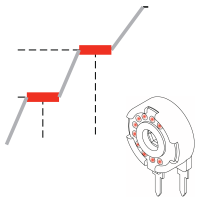
With its exacting control capabilities, our 10mm and 15mm potentiometers series are well suited for many consumer applications such as ovens, ranges, dishwashers, lighting (dimmers), power hand tools, washing machines and HVAC systems.

Constant value zones can be combined with strategically located stops matching the flat areas of the output.

10 stepped outputs version example:



Improved repeatability



By combining the constant value zones with the detents, engineers can align the same voltage values with each of the detent stops when rotating the control both forward and backward.

This provides clear mechanical positions that are not only repeatable, but perfectly aligned electrical outputs at each of the (detent) angles.

Piher´s detents also prevent output values from changing due to vibration or accidental rotor movements, furthering reliable control consistency.

Design tip. Cost-effectiveness

Absolute encoders can easily be replaced connecting the potentiometer to the microprocessor´s analogue input.

Main advantages

- ✓ Unique, non-overlapping values at each stop (detent position)
- ✓ Prevents output value change due to light vibration or accidental rotor micro-movements
- ✓ Fully customisable according to customer´s needs
- ✓ Cost effective replacement for absolute encoders

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