



## FEATURES

- Specifically designed for leadfree reflow soldering processes (excellent performance)
- 10k cycles mechanical life.
- IP54 protection according to IEC 60529.
- Carbon resistive element.
- Self extinguishable plastic UL 94V-0.
- 10mm version available (PS-10)
- Also upon request:
  - Wiper positioned at 50% or fully clockwise.
  - Mechanical detents
  - Centering pins

## MECHANICAL SPECIFICATIONS

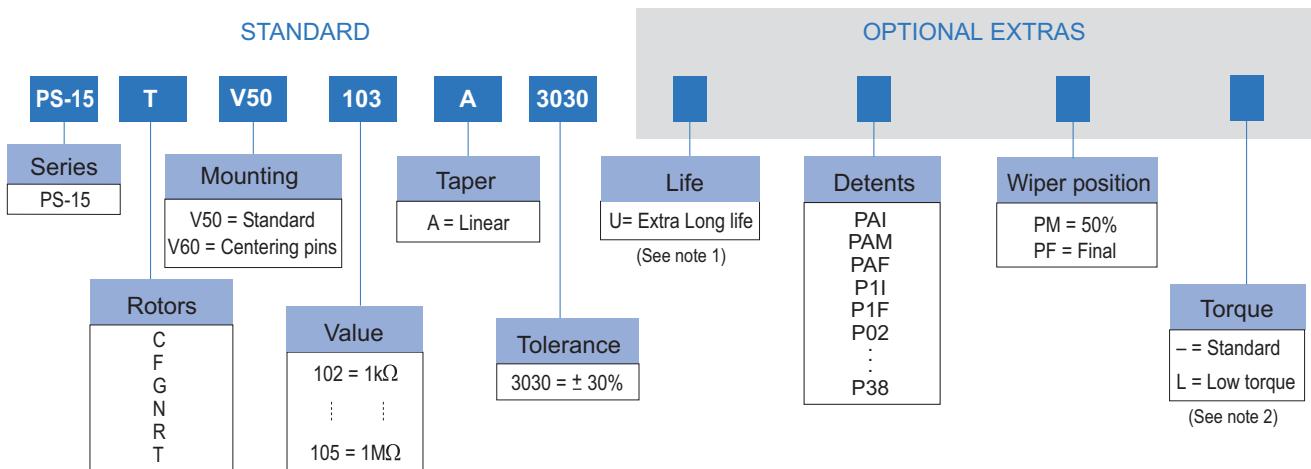
- Mechanical rotation angle:  $265^\circ \pm 5^\circ$
- Electrical rotation angle:  $240^\circ \pm 20^\circ$
- Torque: 0.5 to 2.5 Ncm. (0.7 to 3.4 in-oz)
- Stop torque:  $> 10$  Ncm. ( $> 14$  in-oz)
- Mechanical life\*: 10K cycles

## ELECTRICAL SPECIFICATIONS

- Value\*:  $1k\Omega$  to  $1M\Omega$
- Tolerance\*:  $\pm 30\%$
- Taper\*: Linear
- Nominal Power:  $0.25W$  @  $50^\circ C$  ( $122^\circ F$ )
- Operating temperature:  $-40^\circ C$  to  $85^\circ C$
- Residual resistance:  $\leq 0.5\% R_n$
- Equivalent Noise Resistance:  $\leq 3\% R_n$

\* Others upon request

## HOW TO ORDER



## NOTES:

(1) • Standard = 10K cycles  
• Extra long life: 100k cycles (to be studied case by case)

(2) Low Torque:  $\leq 1.5$  Ncm. No detent option available for low torque models

Shafts are not available mounted to the potentiometer and should be ordered separately



## HOW TO ORDER CUSTOM DRAWING

PS-15 TV50 + DRAWING NUMBER (Max. 16 digits)

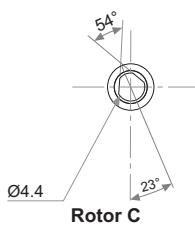
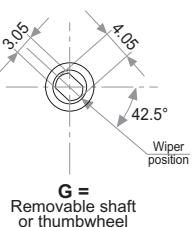
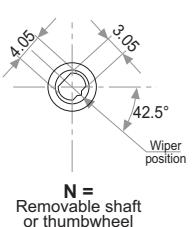
This way of ordering should be used for options which are not included in the "How to order" standard and optional extras.

## STANDARD OPTIONS

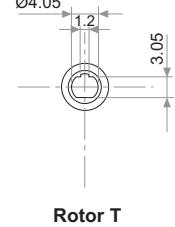
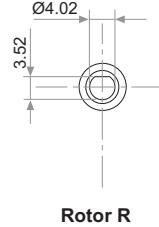
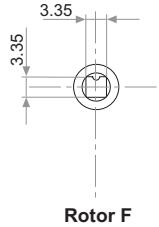
Detents	.....	None
Rotor colour	.....	Dark grey
Housing colour	.....	Dark grey
Wiper position	.....	Initial
Torque	.....	Standard
Packaging	.....	Reel
Mechanical Life	.....	10K cycles

## ROTORS (collector side view)

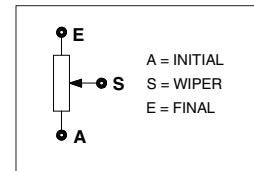
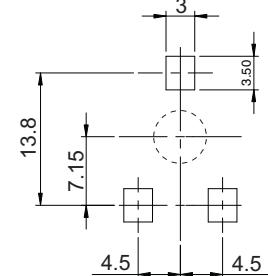
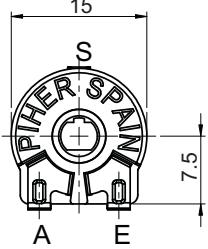
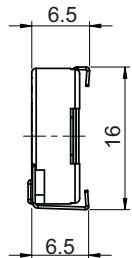
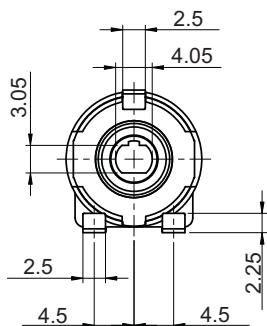
Wipers positioned at initial



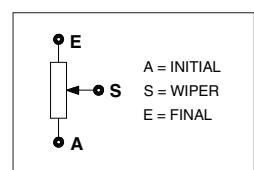
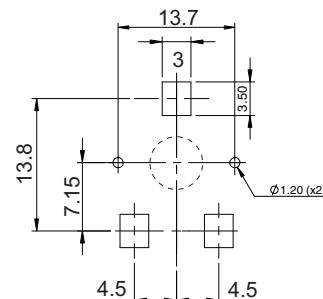
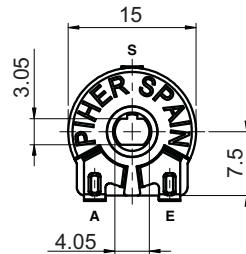
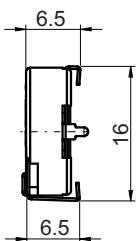
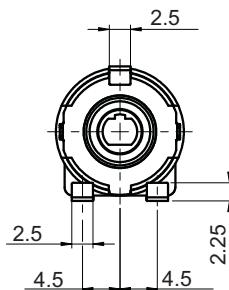
Wipers positioned at 50%



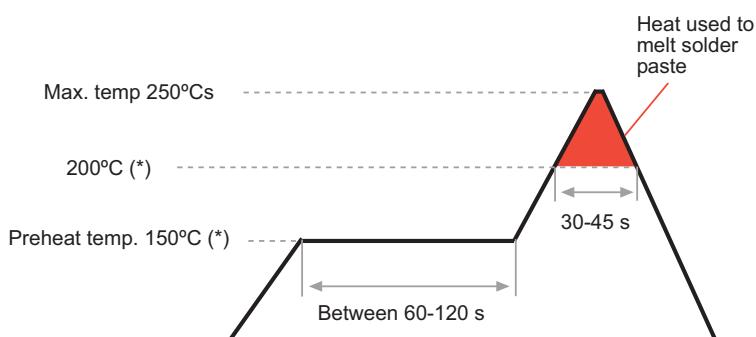
## DIMENSIONS



## DIMENSIONS (V60 version - with centering pins)



## RECOMMENDED REFLOW PROFILE



(\*) Melting point temp. depends on solder properties

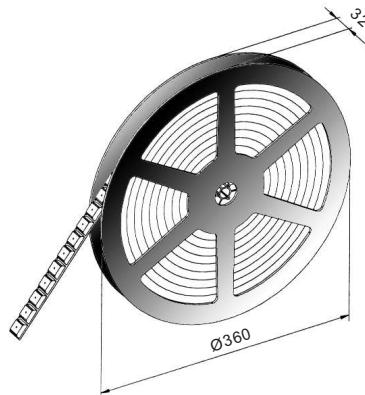
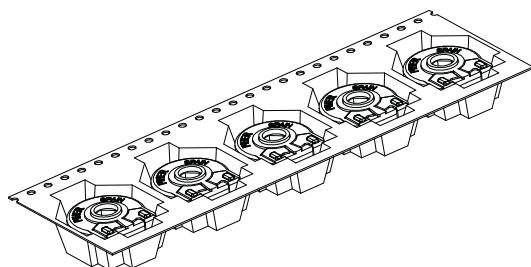
## TESTS

## TYPICAL VARIATIONS

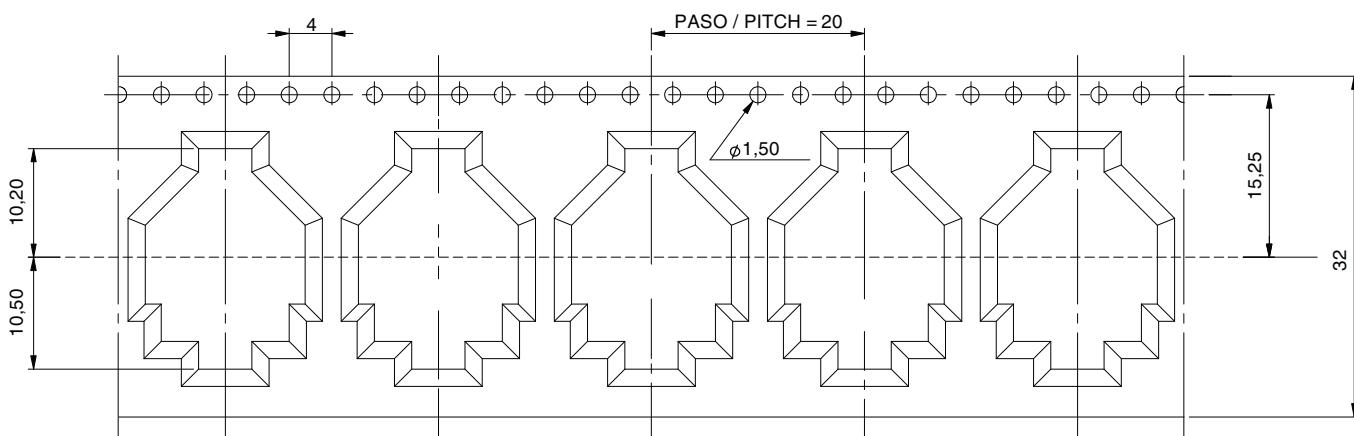
ELECTRICAL LIFE	1k h. @ 50°C; 0.25 W	±10 %
MECHANICAL LIFE	10k @ 10 CPM ... 15 CPM	±10 %
TEMPERATURE COEFFICIENT	-40°C; +85°C	±1000 ppm
THERMAL CYCLING	16 h. @ 90°C; 2h. @ -40°C	±5 %
DAMP HEAT	500 h. @ 40°C @ 95% HR	±10 %
VIBRATION (for each plane X,Y,Z)	2 h. @ 10 Hz ... 55 Hz.	±2 %

## PACKAGING

**Bulk:** 500pcs / per Box (80 x 85 x 185 mm.)

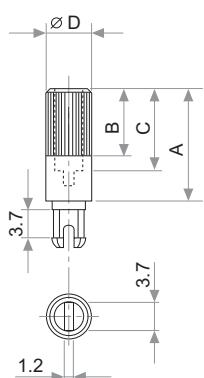


**EMBORESSED TAPE**  
400 Units per Reel



## SHAFTS

Hollow model shafts



Solid model shafts

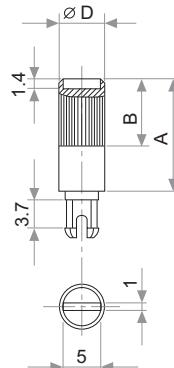


FIG.	A	B	C	D	Ref.
1	12	9	8	6	5272
2	19	9	15	6	5214
5	9.5	6.5	5.5	6	5208
9	35	9	31	6	5216
10	37.8	9	33.8	6	5218
11	35	25	15	6	5209
13	7.8	4.8	3.8	6	5265

A = Length (FRS)  
B = Knurling length  
C = Hollow depth  
D = Shaft diameter  
FRS = From rotor surface

FIG.	A	B	D	Ref.
6	15	9	6	5219
7	16.8	9	6	5220
8	25.3	9	6	5207
12	46	5	6	5227

Slot (1 x 1.4) perpendicular to wiper position. Fig. 12 slot is in line with wiper position.

## SHAFTS

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

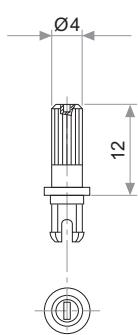


Fig. 3 / Ref. 5372

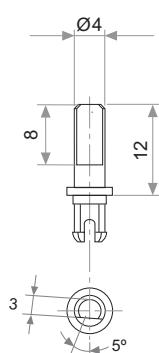


Fig. 15 / Ref. 5217

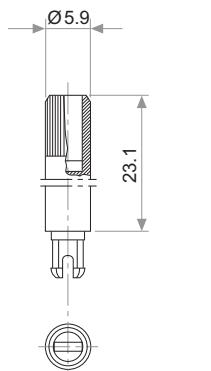


Fig. 17 / Ref. 5210

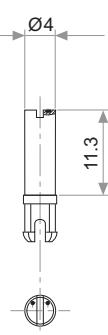


Fig. 18 / Ref. 5271

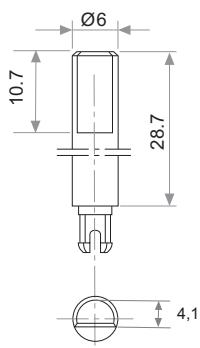


Fig. 19 / Ref. 6032\*

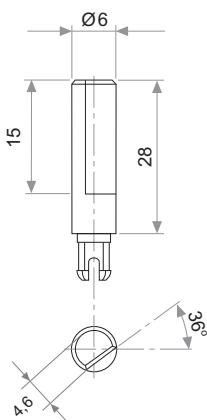


Fig. 20 / Ref. 5369\*

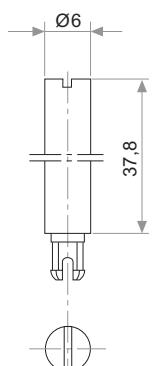


Fig. 21 / Ref. 6031\*

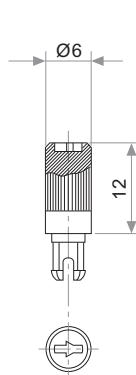


Fig. 22 / Ref. 6029

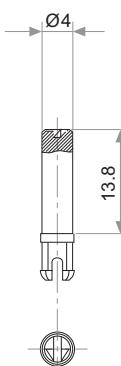


Fig. 23 / Ref. 6022

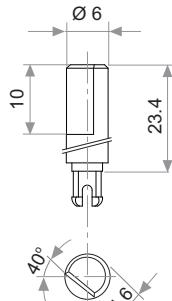


Fig. 29 / Ref. 6162

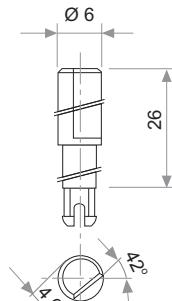


Fig. 25 / Ref. 6059

\* Not available in self extinguishable plastic

## THUMBWHEEL

By default shafts, knobs & & thumwheels are delivered unassembled.

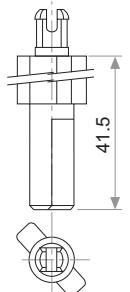


Fig. 27 / Ref. 5268\*

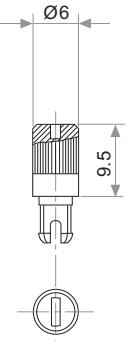


Fig. 28 / Ref. 6055

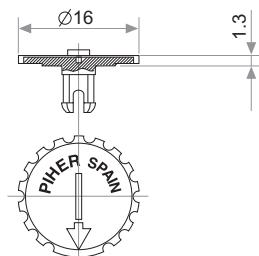
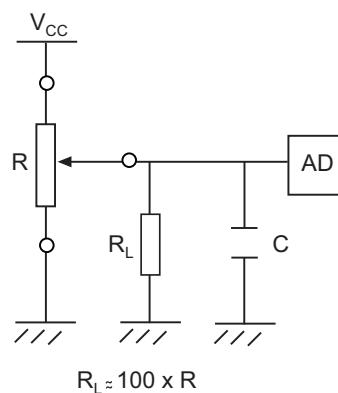


Fig. 4 / Ref. 5371

\* Not available in self extinguishable plastic

## RECOMMENDED CONNECTIONS

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



## 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 potentiometer thus allowing a high range of configurations: special tapers, torque, tolerances, linearity, cut track, etc.

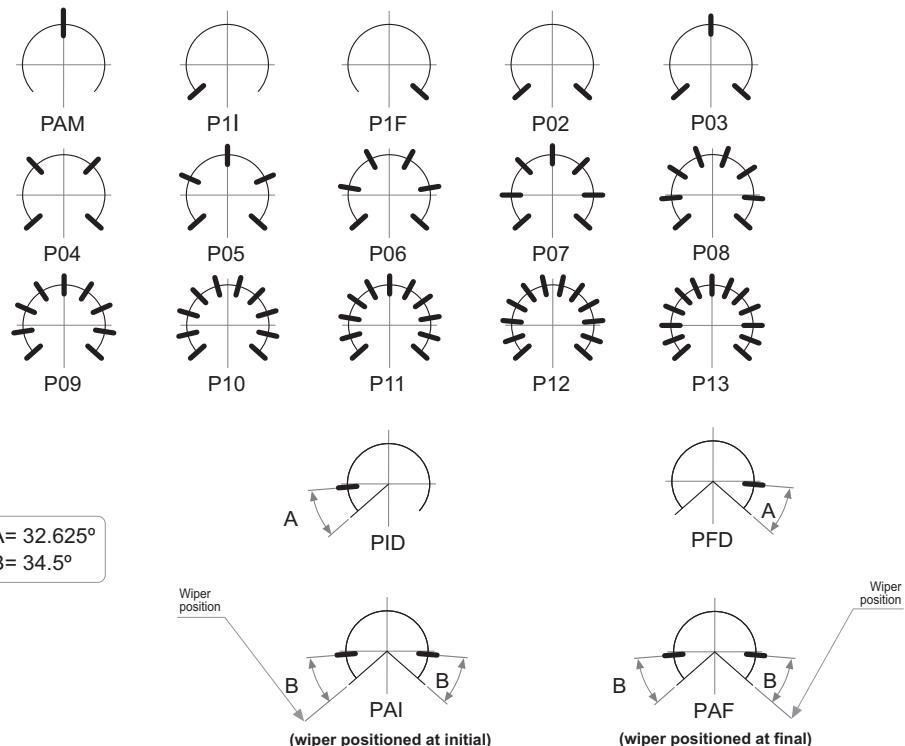
This detent design not only adds a "click" sensation of position, but also offers enormous savings in both cost and space for any given application.

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 13 detents versions please contact your nearest PIHER distributor. Mechanical and/or electrical features may be affected by detents. Detents may not be available for all mounting methods. Please see our separate PTs with detents datasheet at [www.piher.net](http://www.piher.net)



## DETENTS WITH CONSTANT VALUE ZONES

application notes

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

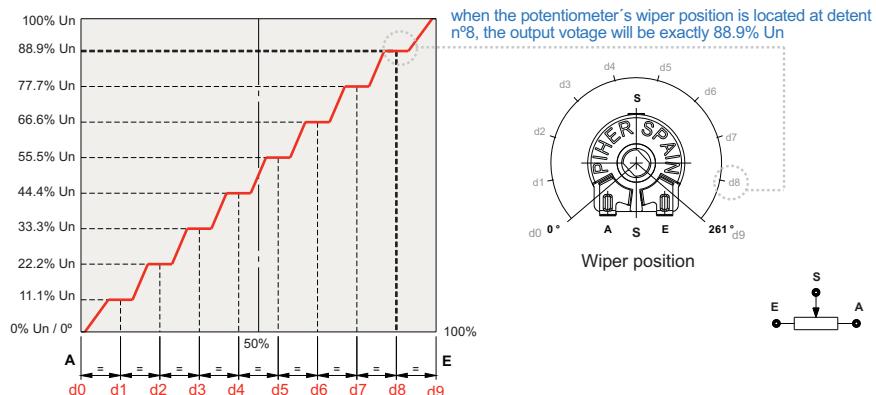
These constant voltage zones can be combined with PIHER's mechanical detents to provide exact alignment between the electrical output (flat areas) and the mechanical detent's positions. The result is a higher level of precision in controlling lighting, temperature, motor or other electronic control systems.

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.

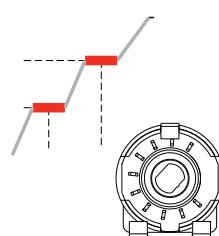
With its exacting control capabilities, our 10mm and 15mm potentiometers series are well suited for many consumer applications such as ovens, ranges, dishwashers, lighting (dimmers), power hand tools, washing machines and HVAC systems.

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

## Disclaimer

The product information in this catalogue is for reference purposes. Please consult for the most up to date and accurate design information.

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