Automotive / Appliance control

# 15 mm panel mount potentiometer SM/SMC-15

## Main features

-Excellent low price control potentiometer.
-Available in Carbon (SM-15) and Cermet (SMC-15).
-Based on the PT-15 / PTC-15 series.
-Enclosed in plastic housing.
-IP54 protection according to IEC 60529.

## Description

The SMC-15 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, small engines, robotics, motion controllers, and medical equipment control panels.

This datasheet shows you the basics of the SMC-15 potentiometer that is quite versatile and easy to taylor. Do not hesitate to contact Piher for advice.

## Mechanical specifications

| | | |
|---|---|---|
| Mechanical rotation angle | | 265° ± 5° |
| Electrical rotation angle | | 240° ± 20° |
| Torque | rotational | 0.5 to 2.5 Ncm. (0.70 to 3.4 in - oz) |
| Stop torque | | > 10Ncm.( 14 in-oz) |
| Life*** | | > 10K cycles |

## Electrical specifications

| | | |
|---|---|---|
| Range of values * | | 100Ω ≤ Rn ≤ 5M (Decad. 1.0 - 2.0 - 2.2 - 2.5 - 4.7 - 5.0) |
| Tolerance * | 100Ω ≤ Rn ≤ 1MΩ<br>1MΩ ≤ Rn ≤ 5MΩ | ± 20%<br>± 30% |
| Max. voltage | | 250 VDC (lin) 125 VDC (no lin) |
| Nominal power | Carbon SM<br>Cermet SMC-15 | (50ºC-122ºF):0.25W(lin),0.12W (no lin)<br>(70ºC-158ºF): 0.5W (lin),0.25W (no lin) |
| Taper ** | | Lin;Log;Alog. |
| Residual resistance* | | ≤ 0.5% Rn (5Ω min.) |
| Equivalent noise resistance | | ≤ 3% Rn (3Ω min.) |
| Operating temperature | Carbon SM-15<br>Cermet SMC-15 | -25ºC to +70ºC ***(-13ºF to + 158ºF) carbon<br>-40ºC to +90ºC (-40ºF to + 194ºF) cermet |

* Check availability

** Others tapers: check availability

*** Up to 85ºC depending on application.

**** For ohmic values > 1K Ω - lower values check availability.

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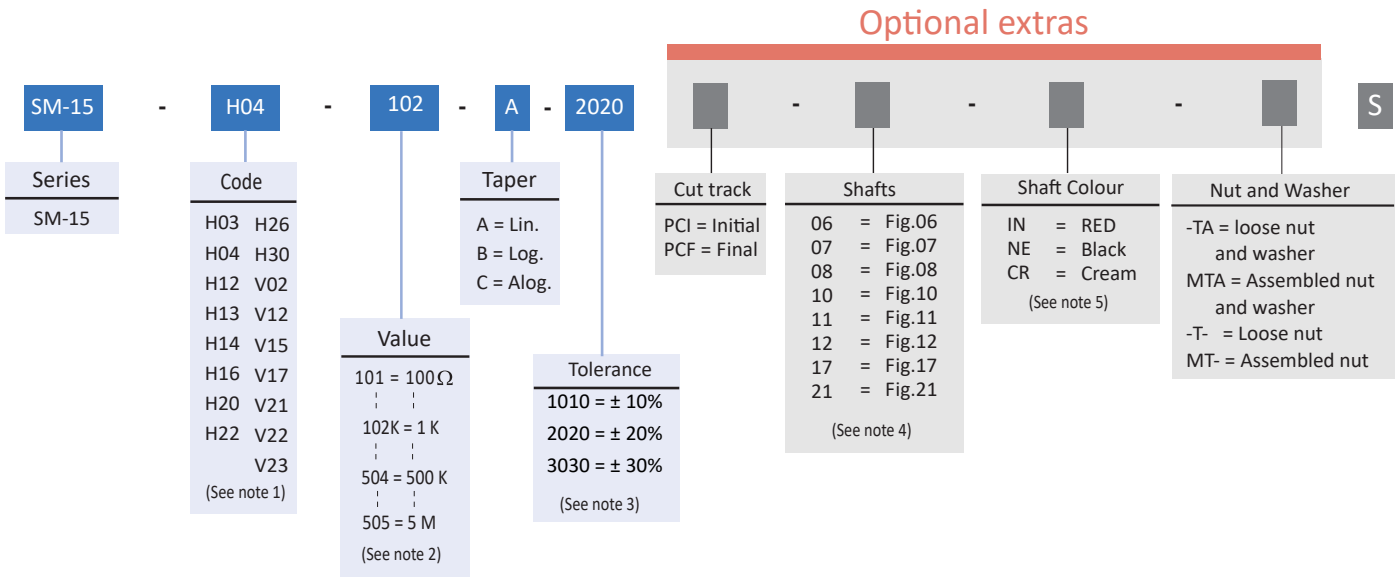
## How to order




NOTES:

(1) Mount.Method • Position with "P" will be with crimped terminals

(2) Value Example: Code: 10 1 → 100 Ω
Numb of zeros
First two digits of the value

- Standars values:Decades of 10,20,22,25,47,50. Other values check

(3) Tolerance (non standard). Example: +7% -5% Code: 07 05
negative tolerance
positive

(4) Shafts: These figures coincide with the PT15 references (Standard material)

(5) Colour: Only applicable to the shaft.

### How to order example

SM-15H04-102A2020
SM-15 model, H04 mounting method, 102 resistive value, taper linear and 20% resistive tolerance

### Standard default options

Cut track = Non cut track
Shaft = Fig.9
Shaft colour = Black
Nut and washer = Without nut & washer

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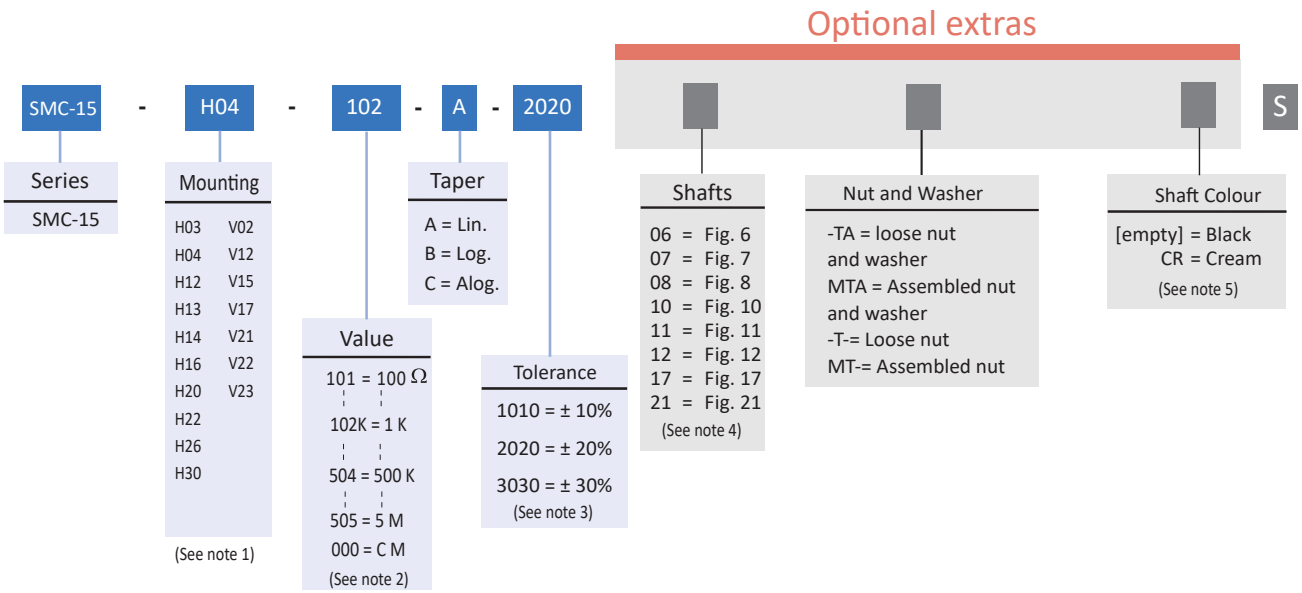
## How to order




NOTES:

(1) Mount.Method
- Position with "P" will be with crimped terminals

(2) Value Example: Code: 10 1 → 100 Ω
Numb of zeros
First two digits of the value
- Standars values:Decades of 10,20,22,25,47,50. Other values check
- 000 = CM = Switch 45° ( see PTC-15)

(3) Tolerance (non standard). check Example: +7% -5% Code: 07 05 → negative tolerance positive

(4) Shafts: These figures coincide with the PT15 references (Standard material)

(5) Colour: Only applicable to the shaft.

## How to order examples

SM15H20 -102A3030

15mm potentiometer ", H50 mounting method, 1K resistive value, 30% resistive tolerance and crimped terminals.

SM15V23 -102A2020

15mm potentiometer ", V23 mounting method, 1K resistive value, 20% resistive tolerance and crimped terminals.

## Standard default options

Shaft = Fig.9

Shaft colour = Black

Nut and washer = Without nut & washer

Life= 10 K cycles

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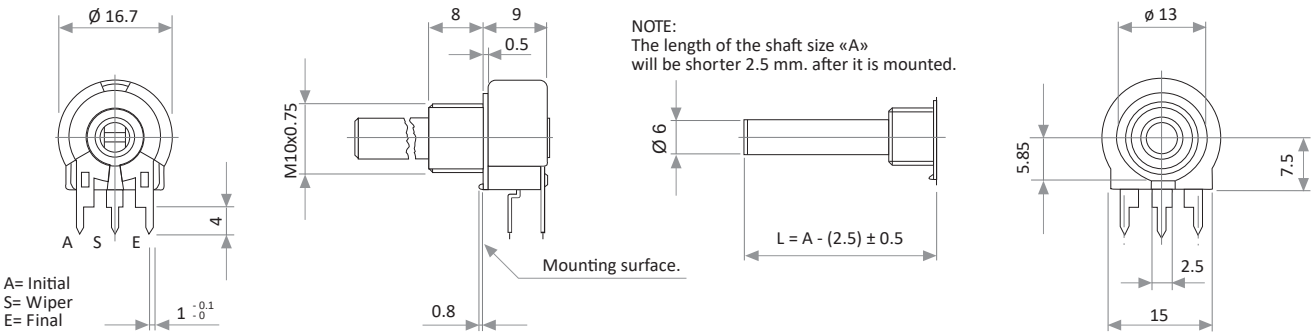
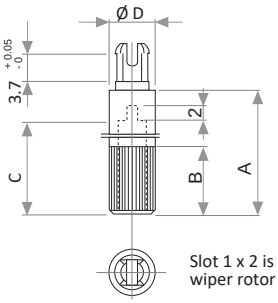
## Common dimensions



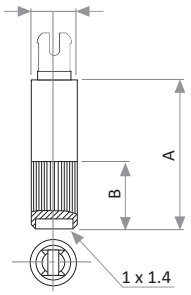

## Shafts

Shafts are delivered at random position. Custom positioning available.




### Hollow model shafts

| FIG. | A | B | C | D | Ref. |
|---|---|---|---|---|---|
| 9 | 35 | 9 | 31 | 6 | 5216 |
| 10 | 37.8 | 9 | 33.8 | 6 | 5218 |
| 11 | 35 | 25 | 15 | 6 | 5209 |




### Solid model shafts

| FIG. | A | B | C | 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) perpen to wiper position
Fig. 12 slot is on line with wiper pos.

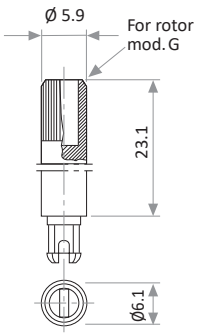



Fig. 17 - 5210

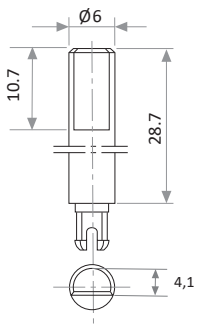



Fig. 19 * - 6032

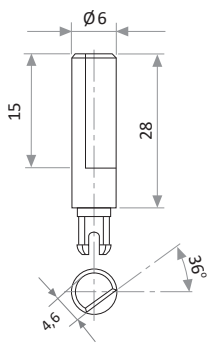



Fig. 20 * - 5369 (E)

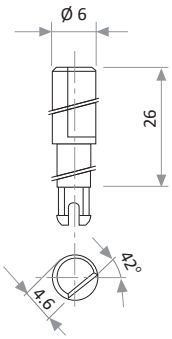



Fig. 25 * - 6059

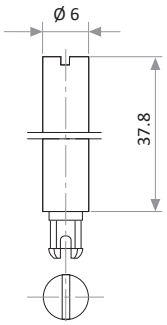
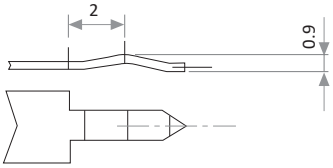



Fig. 21- 6031

(*) Only available under drawing.

## Snap in terminal

P



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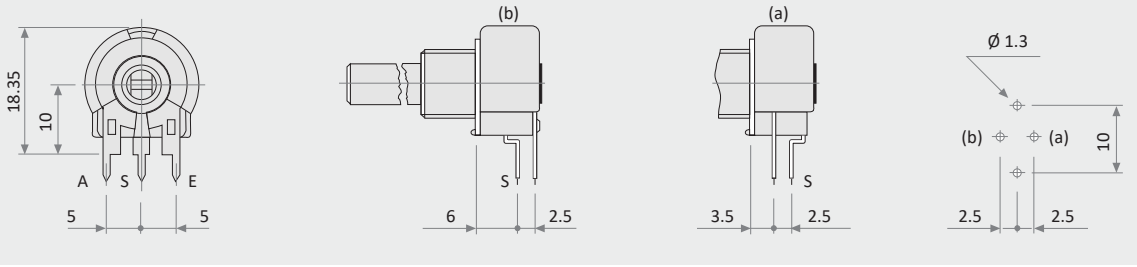
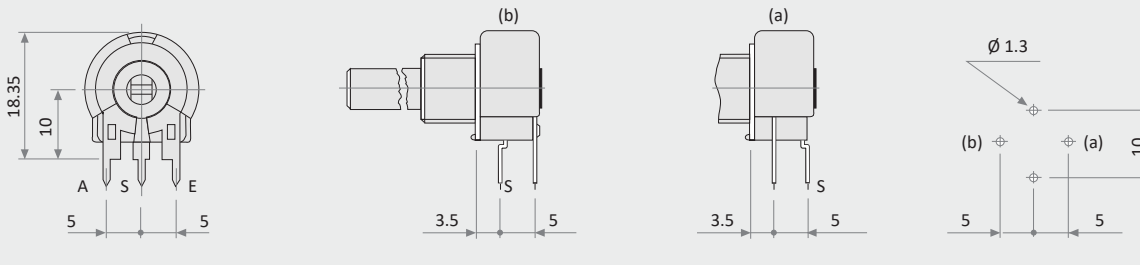
## Terminal styles

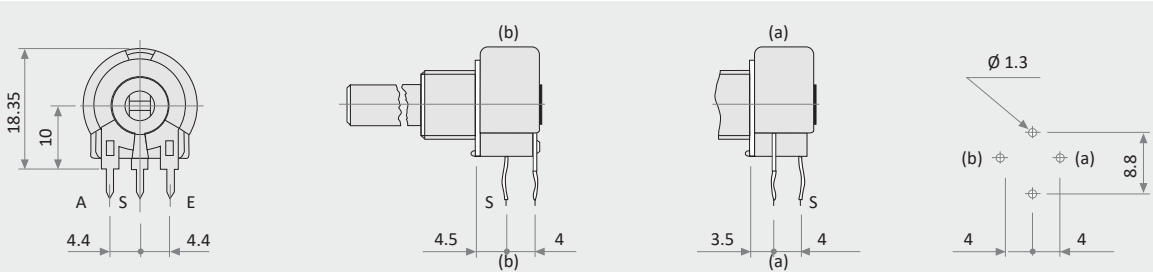
h 2.5




h 5




B



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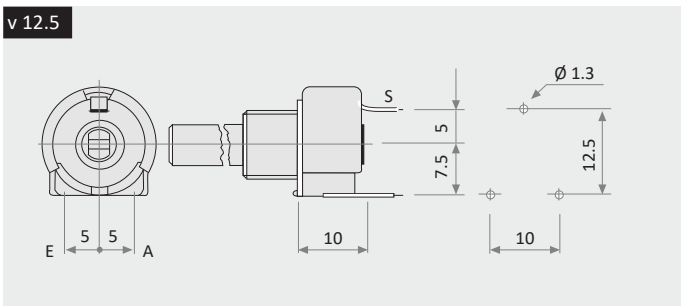
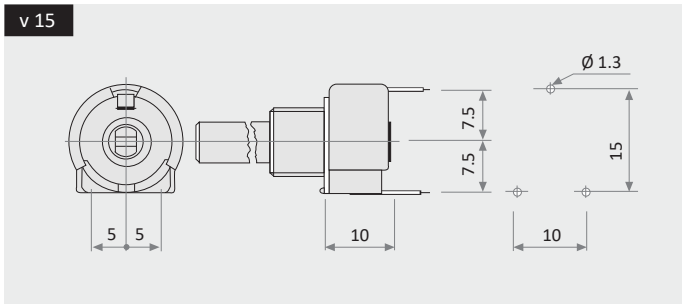
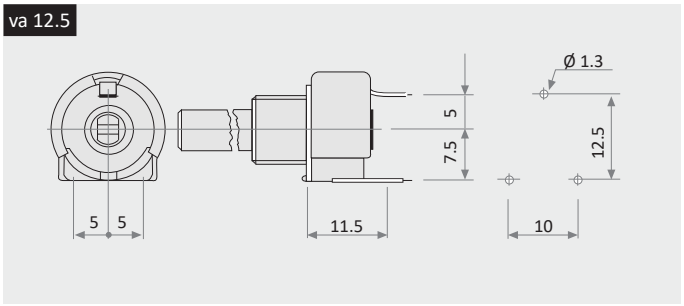
v 12.5



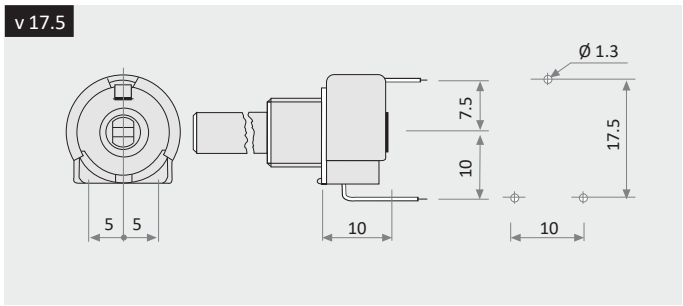

v 15




va 12.5




v 17.5




## Standard - values tolerances

| Resistance Ω | 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 | 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% | | | | | | | | | | | | | | | | | | | | | | |

## Packaging

QUANTITY : 100 units

Default packaging is bulk (boxes).

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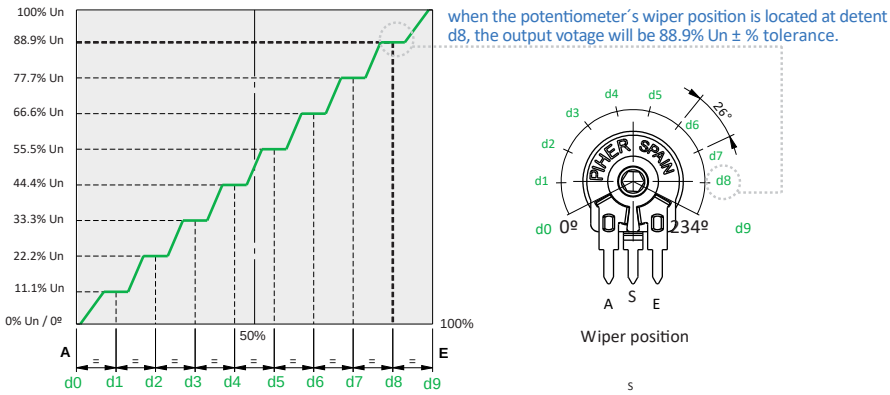
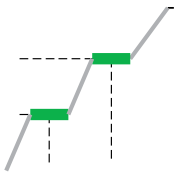
## Stepped outputs

Constant value zones can be combined with strategically located stops matching the flat areas of the output.
If you require this feature, please, send us your requirements to sales@piher.net

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.

## Stepped outputs

PIHER´s potentiometers may feature special stepped outputs or 'constant voltage zones' for the 6, 10 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 potentiometers series are well suited for many consumer, industrial and automotive applications such as ovens, ranges, dishwashers, lighting (dimmers), power hand tools, washing machines and HVAC systems.

**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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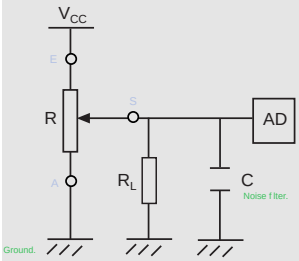
## Recommended connections

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




$R_L \geq 100 \times R$

## Contact

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