# N-15

## 15mm Carbon Position Sensor/ Potentiometer

## FEATURES

Conceived and designed for easy customisation.
SMD or Through-hole Mount.
Endless Rotation (360º).
Wide Electrical Angle (340º ± 10º).
Extended Mechanical Life (100k cycles).
Working Temperature Range (-40ºC to +120ºC).
Low Profile (4.4 mm).
Linearity ± 3% (standard).
Embossed Tape or Bulk packaging.
Reflow Soldering capability.
Shaft insertable from both sides.
Polarised "T" rotor (European Home Appliance standard).
All PT/ PTC 15 shafts compatible.
IP54 protection according to IEC 60529.

## STANDARD SPECIFICATIONS

| | |
|---|---|
| Resistance values*: | 5k to 100k |
| Tolerance: | ± 30% |
| Nominal Power: | 0.15 W @ 50ºC |
| Linearity (absolute): | ± 3% |
| Taper: | Linear |
| Mechanical Life**: | 100K cycles |
| Temperature Range: | -40ºC to +120ºC |
| Mechanical Angle: | 360º |
| Electrical Angle: | 340º ± 10º |
| Rotational Torque: | ≤ 20 mN.m |
| Max. Voltage: | 250 VDC |

* Others check availability

** 200K cycles version available check availability. For higher mechanical life see the Z15 product.

## TYPICAL APPLICATIONS

The N15 series offers an SMD and Through Hole mount solution for the majority of **Position/Rotary Sensor** and **multi-purpose Control** applications such as:

- Automotive HVAC, Seat, Rear-view mirror actuator feedback sensors and HVAC Controls

-Temperature Control for Boilers, Wall Heaters, Showers, Radiators, Conventional and Microwave Ovens, Freezers...

- Timer & Function/Programme Select for Washing Machines, Dishwashers and all White Goods in general.
- Size and Position detectors

## HOW TO ORDER

| N15 | T | S | - | 502 | A | 3030 |
|---|---|---|---|---|---|---|
| Series | Rotors | Mounting Method | | Value | Taper | Tolerance |
| N-15 | T | V =Through Hole<br>S = SMD<br>H = Horizontal Adjust | | 502 = 5 K<br>.<br>.<br>104 = 100 K | A = Lin. | 3030 = ± 30% |
| (See note 1) | | (See note 4) | | (See note 5) | (See note 2) | (See note 3) |

NOTES:

(1) A wide variety of custom substrates available
(2) Availability of a wide range of customised tapers and step curves
(3) Optional precision laser-trimmed voltage divider calibration
(4) Horizontal adjust versions will be studied case by case
(5) Value Example: Code: 50 2 5K Ω
Numb of zeros
First two digits of the value.

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

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

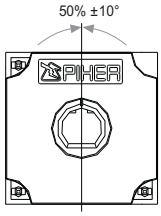
## HOW TO ORDER CUSTOM DRAWING

N-15 T S + DRAWING NUMBER (Max. 16 digits)

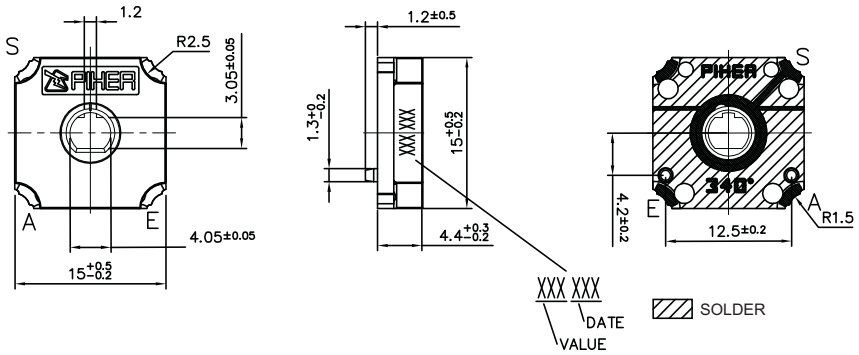
This way of ordering should be used for options which are not included in the "How to order" standard and optional extras.

## STANDARD WIPER POSITION

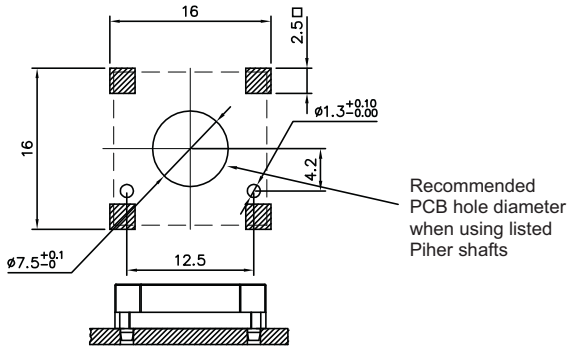
Wiper positioned at 50 % of the electrical angle.

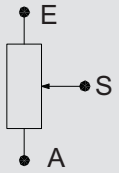



## SMD MOUNT



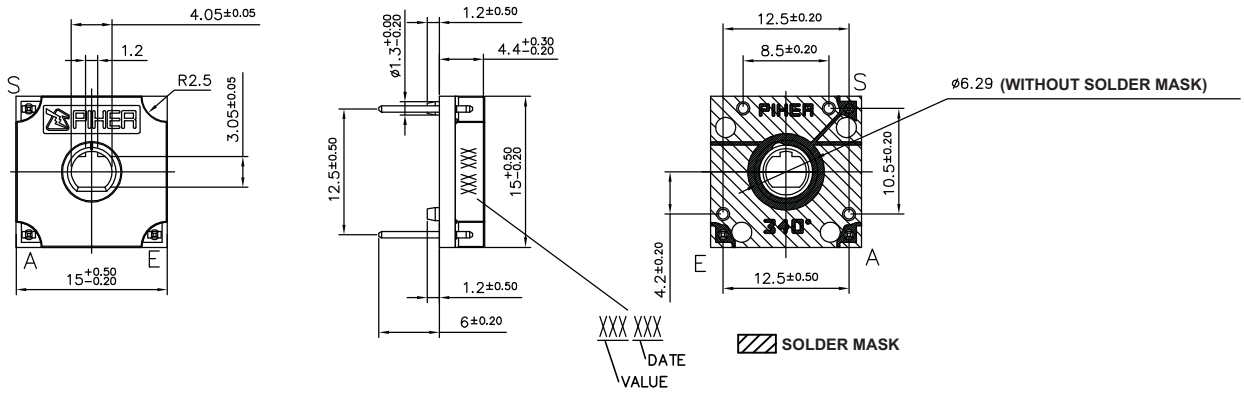

**FOOT - PRINT**



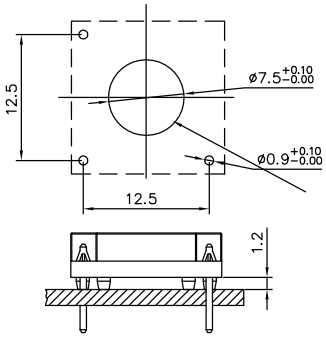




A = Initial
S = Wiper
E = Final

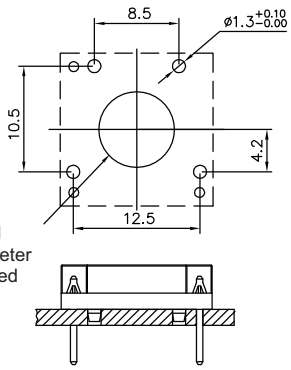
## THROUGH HOLE MOUNT



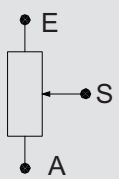

**PCB HOLE LAYOUT 1**




**PCB HOLE LAYOUT 2**

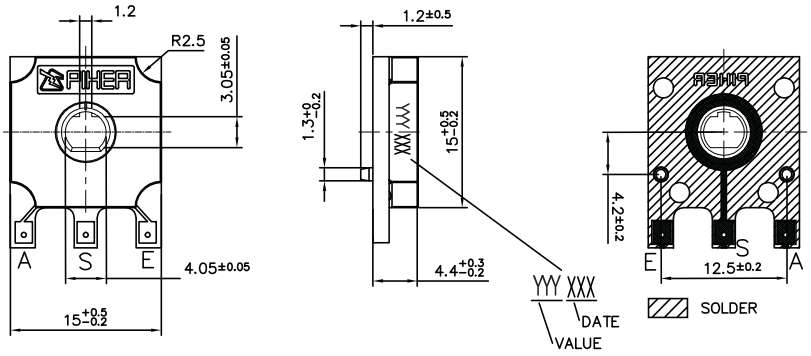



Recommended
PCB hole diameter
when using listed
Piher shafts




A = Initial
S = Wiper
E = Final

## HORIZONTAL ADJUST - VERTICAL MOUNT

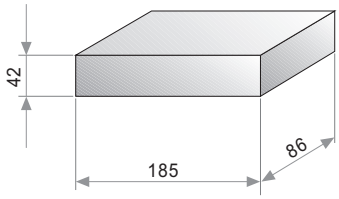



## TESTS — TYPICAL VARIATIONS

| | | |
|---|---|---|
| ELECTRICAL LIFE | 1.000 h. @ 50°C; 0.15 W | ±40 % |
| MECHANICAL LIFE (CYCLES) | 100,000 @ 20 CPM | ±40 % (Rn < 100 K ) |
| TEMPERATURE COEFFICIENT | –40°C to +120°C | ±300 ppm (Rn <100 K) |
| THERMAL CYCLING | 10h. @ 120°C; 10h. @ -40°C | ±40 % |
| DAMP HEAT | 500 h. @ 40°C @ 95% HR | ±40 % |

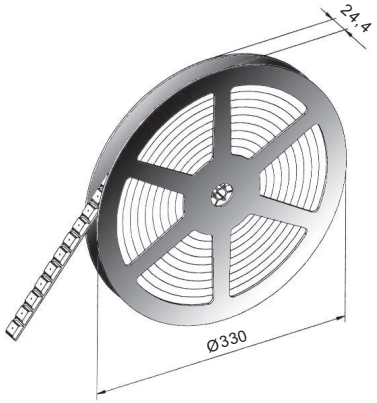
NOTE : Out of range values may not comply these results.

## PACKAGING



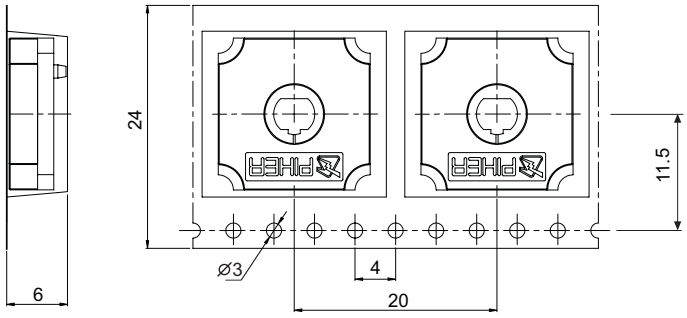

### BULK

150 Units per box.
Through hole version only

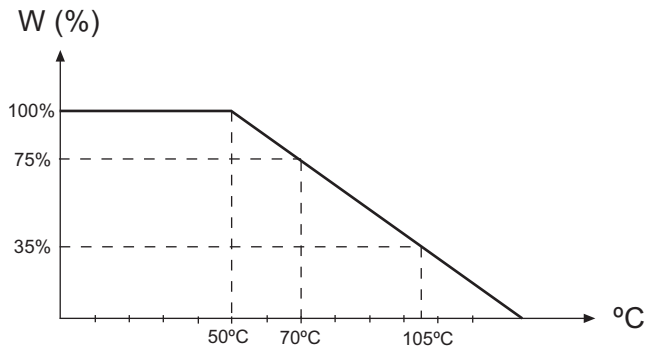



### EMBOSSED TAPE

500 Units per Reel
SMD version only

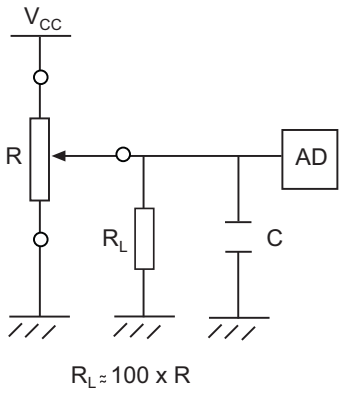


## POWER RATING CURVE




## RECOMMENDED CONNECTIONS

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

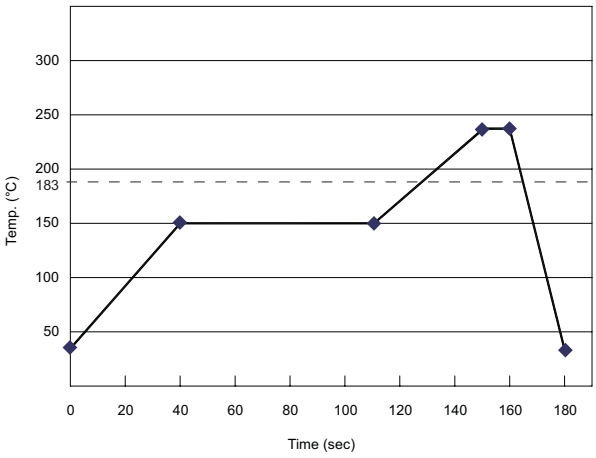



$R_L \simeq 100 \times R$

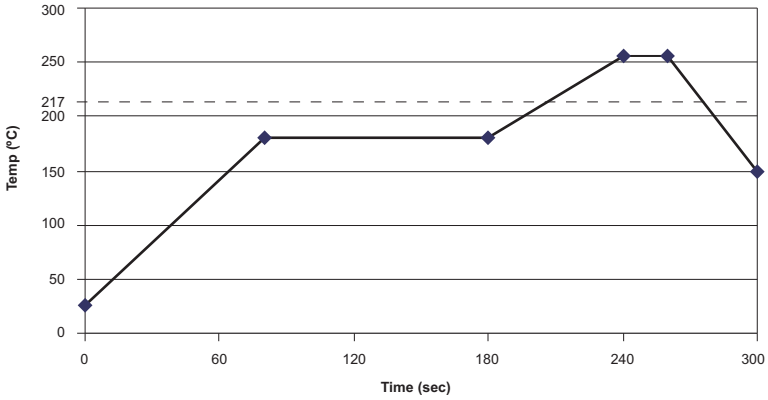
## RECOMMENDED REFLOW PROFILE

SMD Types

SnPb Reflow Profile



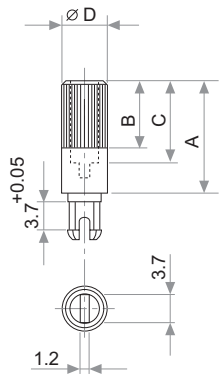

Lead Free Reflow Profile




The recommended reflow profile is provided as a guideline. Optimal profile may differ due to oven type, assembly layout or other design or process variables. Customers should verify actual device performance in their specific application and reflow process. Please contact Piher if you require additional support.

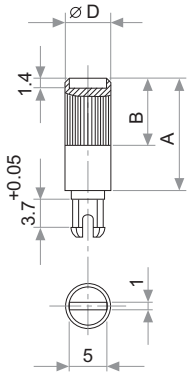
## SHAFTS

Hollow 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 | 15 | 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 |

Solid model shafts




| 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 on line with wiper position.

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

## Other shafts

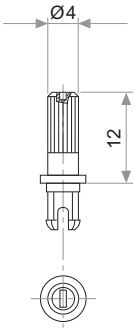



Fig. 3 / Ref. 5372

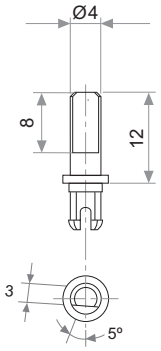



Fig. 15 / Ref. 5217

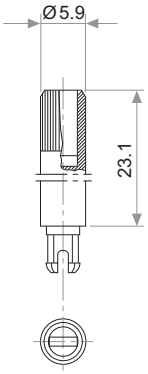



Fig. 17 / Ref. 5210

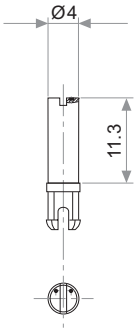



Fig. 18 / Ref. 5271

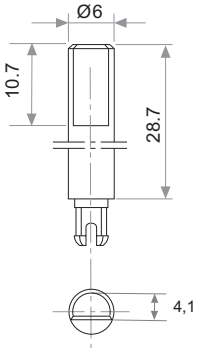



Fig. 19 / Ref. 6032*

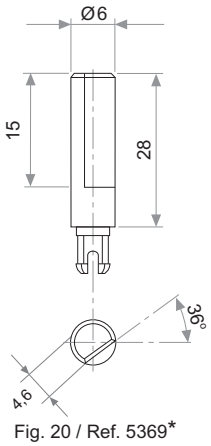



Fig. 20 / Ref. 5369*

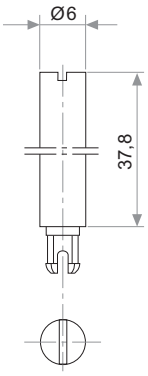



Fig. 21 / Ref. 6031*

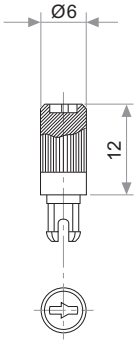



Fig. 22 / Ref. 6029

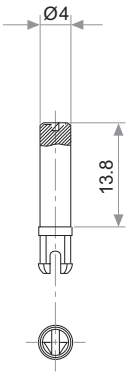



Fig. 23 / Ref. 6022

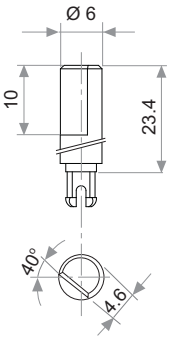



Fig. 29 / Ref.6162

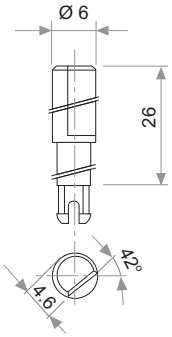



Fig. 25 / Ref. 6059

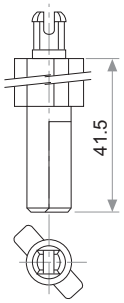



Fig. 27 / Ref. 5268*

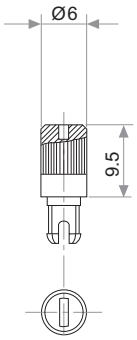



Fig. 28 / Ref. 6055

* Not available in self extinguishable plastic

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Piher:

XEJPL5220CR N15TS-502A3030 N15TV-502A3030 N15TS-104A3030 N15TV-104A3030 N15TS-103A3030 N15TV-103A3030 XEJPL5207CR XEJPL5272CR XEJPL5214CR XEJPL5208CR JPEPL5227IN 5219NE JPEPL5220CR JPEPL5214IN JPEPL5272INI JPEPL6022NE XEJPL5219NE