N-15
15mm Carbon Position Sensor/Potentiometer

FEATURES
Conceived and designed for easy customisation.
SMD or Through-hole Mount.
Endless Rotation (360°).
Wide Electrical Angle (340° ± 10°).
Extended Mechanical Life (100k cycles).
Working Temperature Range (-40°C to +120°C).
Low Profile (4.4 mm).
Linearity: ± 3% (default).
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.

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

STANDARD SPECIFICATIONS
Resistance values*: 5k to 100k
Tolerance: ± 30%
Nominal Power: 0.15 W @ 50°C
Linearity (absolute): ± 3%
Taper: Linear
Mechanical Life**: 100K cycles
Temperature Range: -40°C to +120°C
Mechanical Angle: 360°
Electrical Angle: 340° ± 10°
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 with 2M cycles.

HOW TO ORDER

N15
Series N-15
(See note 1)

T
Rotors T

S
Mounting Method
V =Through Hole
S = SMD
H = Horizontal Adjust
(See note 4)

502
Value
502 = 5 K
104 = 100 K
(See note 5)

A
Taper
A = Lin.
(See note 2)

3030
Tolerance
3030 ± 30%
(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) Others: check availability. 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.
Recommended PCB hole diameter when using listed Piher shafts

**SMD MOUNT**

**THROUGH HOLE MOUNT**

Download the STEP file here: [https://piher.net/piher/?p=924](https://piher.net/piher/?p=924)
BULK
150 Units per box.
This is the default packaging for through-hole models.
If you want SMD models to be delivered with bulk packaging please contact Piher before ordering.

EMBOSSED TAPE
500 Units per reel.
For SMD models only.

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<th>TESTS</th>
<th>TYPICAL VARIATIONS</th>
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<tr>
<td>ELECTRICAL LIFE</td>
<td>1,000 h. @ 50°C; 0.15 W</td>
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<tr>
<td>MECHANICAL LIFE (CYCLES)</td>
<td>100,000 @ 20 CPM</td>
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<tr>
<td>TEMPERATURE COEFFICIENT</td>
<td>–40°C to +120°C</td>
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<tr>
<td>THERMAL CYCLING</td>
<td>10h. @ 120°C; 10h. @ -40°C</td>
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<tr>
<td>DAMP HEAT</td>
<td>500 h. @ 40°C @ 95% HR</td>
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NOTE: Out of range values may not comply these results.
Recommended connection scheme for Pihers position sensors (voltage divider)

![Recommended reflow profile](image)

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 Pihers if you require additional support.

### SHAFTS

<table>
<thead>
<tr>
<th>Hollow model shafts</th>
<th>Solid model shafts</th>
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<td><img src="image" alt="Hollow model shafts" /></td>
<td><img src="image" alt="Solid model shafts" /></td>
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<tr>
<th>FIG.</th>
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<th>B</th>
<th>C</th>
<th>D</th>
<th>Ref.</th>
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A = Length (FRS); B=Knurling length; C=Hollow depth; D=Shaft diameter; FRS=From rotor surface
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