



FEATURES

- Conceived and designed for 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% (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

STANDARD SPECIFICATIONS

Resistance values*:	5k to 100k
Tolerance:	± 30%
Nominal Power:	0.15 W @ 50°C
Linearity (absolute):	± 3%
Taper:	Linear
Mechanical Life**:	100,000 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 upon request

(**) 200,000 cycles version available upon request. 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

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

STANDARD WIPER POSITION

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

Technical drawing of a PCB footprint for a Piher shaft. The drawing shows a square footprint with a central circular hole. Dimensions include a 16mm square, a 12.5mm square, a 2.5mm square, and a 4.2mm square. The central hole has a diameter of 1.3mm with a tolerance of +0.10/-0.00. The footprint is labeled "Recommended PCB hole diameter when using listed Piher shafts".

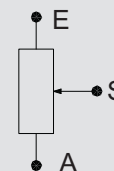
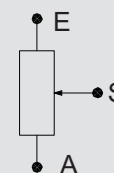
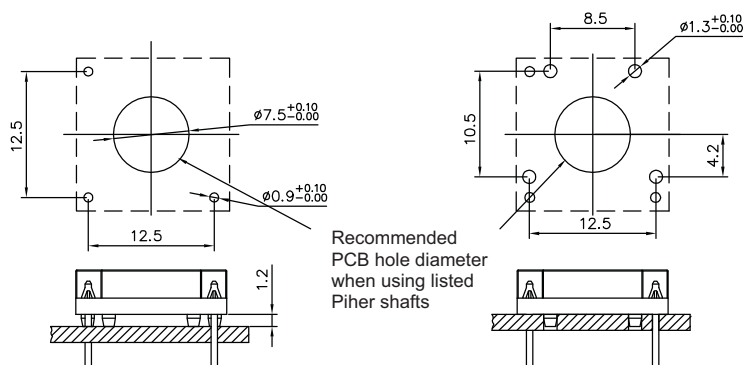


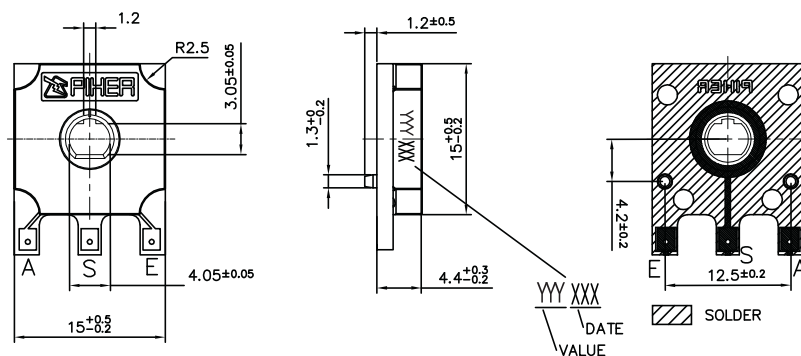
Figure 1: Mechanical drawing of the PCB layout. The drawing includes three views: a top view (left), a side view (middle), and a bottom view (right). The top view shows a square PCB with dimensions 15.0±0.20 by 15.0±0.20. It features a central circular pad with a diameter of 12.5±0.20, a smaller central pad with a diameter of 8.5±0.20, and four corner pads with a diameter of 6.29 (without solder mask). The side view shows the thickness of the PCB as 1.2±0.50. The bottom view shows the solder mask pattern, with dimensions 12.5±0.50 by 12.5±0.50. A legend indicates that the hatched area represents the solder mask. The drawing also includes a table for the PCB layout parameters.

Parameter	Value
PCB Thickness	1.2±0.50
Central Pad Diameter	12.5±0.20
Inner Pad Diameter	8.5±0.20
Corner Pad Diameter	6.29 (WITHOUT SOLDER MASK)
PCB Material	FR-4
PCB Color	Green
PCB Finish	ENIG
PCB Tolerance	±0.10
PCB Test Method	AOI
PCB Test Result	Pass

PCB HOLE LAYOUT 2



A = Initial
S = Wiper
E = Final



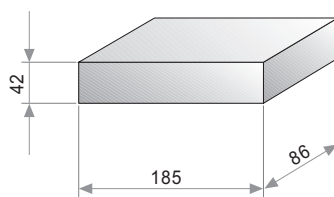
TESTS

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 %

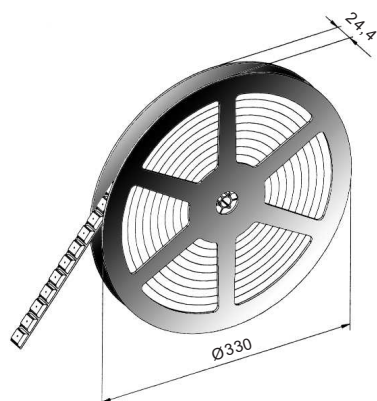
NOTE : Out of range values may not comply these results.

PACKAGING



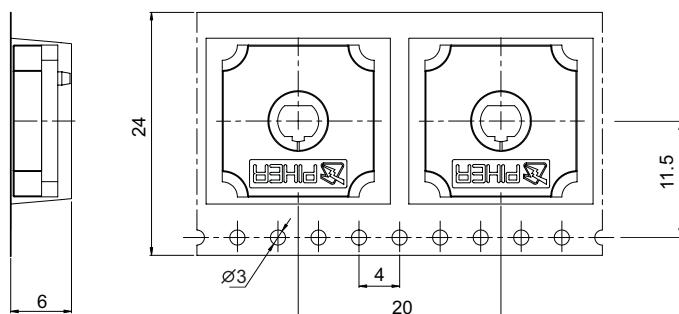
BULK

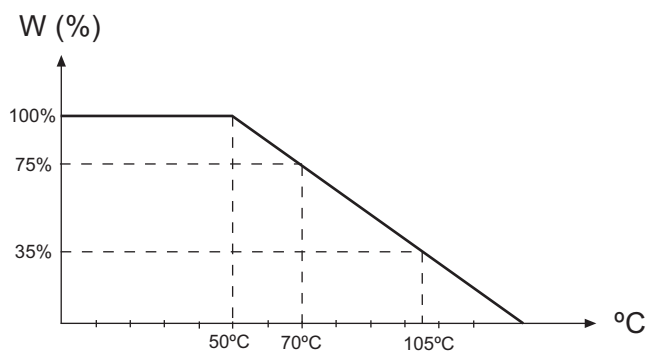
150 Units per box.
Through hole version only



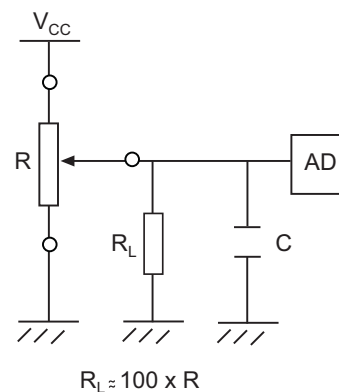
EMBOSSSED TAPE

500 Units per Reel
SMD version only





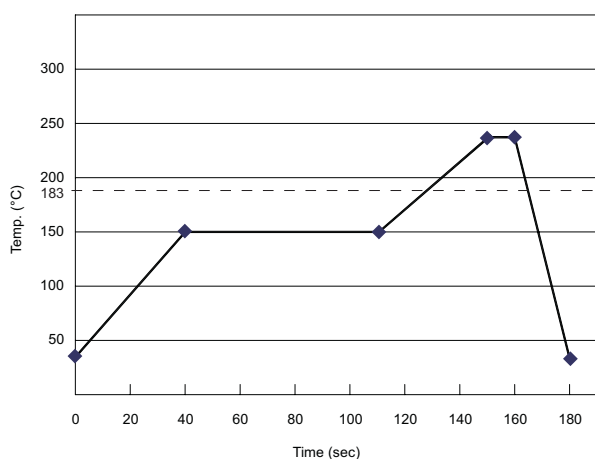
Recommended connection scheme for Piher's position sensors (voltage divider)



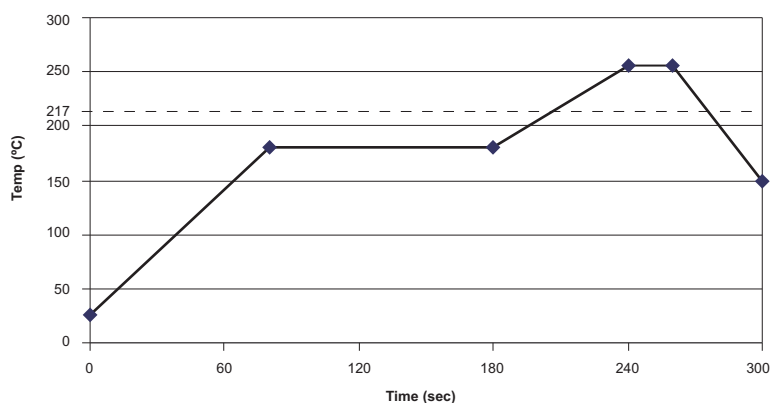
RECOMMENDED REFLOW PROFILE

SMD Types

SnPb Reflow Profile



Lead Free Reflow Profile



SHAFTS

Hollow model shafts

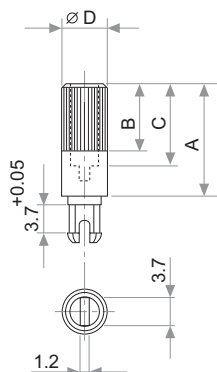


FIG.	A	B	C	D	Ref.
1	12	9	8	6	5272
2	19	9	15	6	5214
5	9.5	6.5	5.5	6	5208
9	35	9	15	6	5216
10	37.8	9	33.8	6	5218
11	35	25	15	6	5209
13	7.8	4.8	3.8	6	5265

Solid model shafts

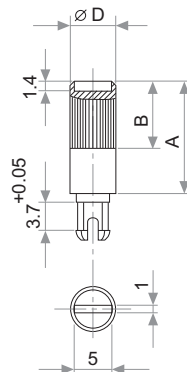


FIG.	A	B	D	Ref.
6	15	9	6	5219
7	16.8	9	6	5220
8	25.3	9	6	5207
12	46	5	6	5227

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

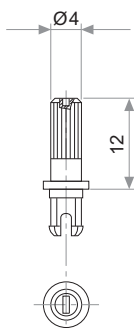


Fig. 3 / Ref. 5372

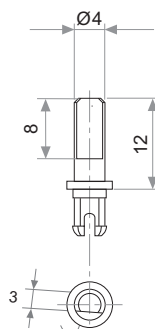


Fig. 15 / Ref. 5217

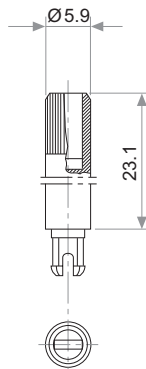


Fig. 17 / Ref. 5210

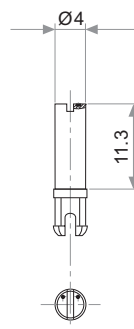


Fig. 18 / Ref. 5271

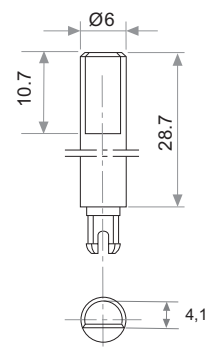


Fig. 19 / Ref. 6032*

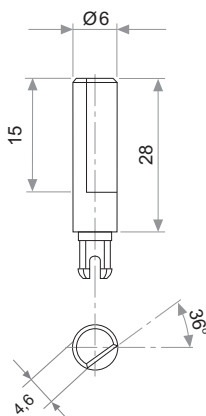


Fig. 20 / Ref. 5369*

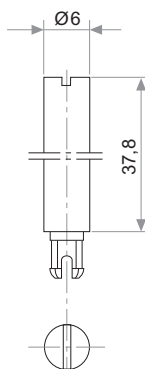


Fig. 21 / Ref. 6031*

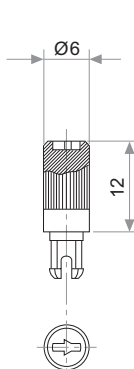


Fig. 22 / Ref. 6029

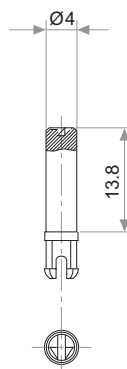


Fig. 23 / Ref. 6022

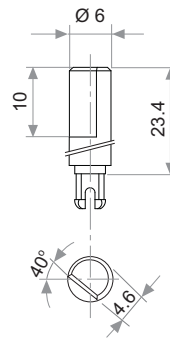


Fig. 29 / Ref. 6162

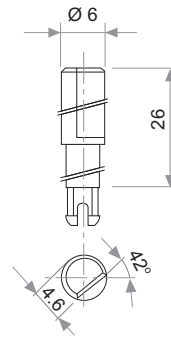


Fig. 25 / Ref. 6059

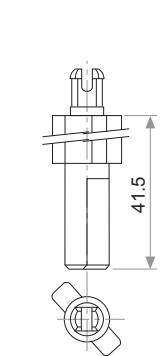


Fig. 27 / Ref. 5268*

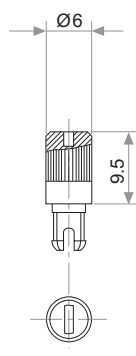


Fig. 28 / Ref. 6055

* Not available in self extinguishable plastic

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