

Data Sheet for Precision Potentiometer

Multiturn Wirewound Potentiometer

Series AL17/19



The AL(R)17/19 potentiometers in 22 mm housing are suitable for applications where a precise and economical multiturn potentiometer is important.

- Economical and precise multiturn sensor with numerous options
- Simplified installation due to connector version
- Version ALR17/19 with integrated slipping clutch

The shaft diameters Ø6,35 AL(R)17 and AL(R)19 Ø6,00 mm are equipped with a screwdriver slot. In addition, an optional integrated slipping clutch protects the potentiometer from damage by overrunning the end stops and facilitates the zero point adjustment. The potentiometer is available in 3, 5 or 10 turn version (optional in 1, 2, 4, 6, 7 or 8 turn). The radial gold-plated connection pins are suitable for flat connectors (2.8 mm according to DIN 46247 part 3) and the connector version simplifies the mounting.

Electrical Data	3-turn	5-turn	10-turn
Effective electrical angle of rotation 1.)	1080° ±5°	1800° ±5°	3600° ±5°
Total resistance 1.)	0,1..10 kOhm	0,1..50 kOhm	0,1..100 kOhm
Resistance tolerance	±5% (±1%)		
Independent linearity (best straight line) 1.)	±0,25%	±0,25%	±0,25% (±0,1% R≥ 5k / ±0,15% R< 5k)
Theoretical resolution 1.)	Depends on resistance value (see table below)		
Backlash (Hysteresis) 1.)	≤ 2°		
Rotational noise (ENR) 1.) (Method C)	100 Ohm		
Max. / recommended wiper current 1.)	35 mA / 2 µA		
Power rating @ 70°C (0W @ 105°C)	0,5 W	1 W	2 W
Insulation Voltage 1.)	1000 VAC, 1min		
Insulation Resistance 1.)	1000 MOhm @ 500 VDC		

Mechanical Data, Environmental Conditions, Miscellaneous	3-turn	5-turn	10-turn
Mechanical angle of rotation	1080° +10°	1800° +10°	3600° +10°
Lifetime (90% el. eff. angle half sine) 2.)	300.000 rotations	500.000 rotations	1 Mio. rotations
Max. operational speed	40 rev. / min.		
Bearing	Brass bearing		
Operational torque @ ambient temperature 1.) 2.)	10 Nmm		
End stop torque 1.) 2.)	35 Ncm		
Operating temperature range	-20..+105°C		
Storage temperature range	-55..+105°C		
Protection grade (IEC 60529)	IP40		
Protection option D shaft sealing (IEC 60529)	IP65 optional		
Vibration (IEC 68-2-6, Test Fc)	15g 10..2000Hz x 12h		
Shock (IEC 68-2-27, Test Ea)	49g @ 11 ms x 18		
Housing diameter	22 mm		
Housing depth	19 mm		
Shaft diameter (AL17/19)	6,35 mm / 6,00 mm		
Shaft type	Solid shaft		

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Mechanical Data, Environmental Conditions, Miscellaneous	3-turn	5-turn	10-turn
Max. radial load		≤1 N	
Max. axial load		≤1 N	
Connection type	Gold plated soldering lugs, optional with integrated connector		
Connection position		Radial	
Sensor mounting		Bushing	
Mass		app. 20 g	
Fastening parts included in delivery		Nut, toothed washer	
Fastening torque mounting nut		< 150 Ncm	
Material shaft		Stainless steel	
Material housing		Reinforced fibreglass PA66	

1.) According IEC 60393

2.) Determined by climatic conditions according to IEC 68-1, para. 5.3.1 without load collectives

Please note: Max. permissible supply voltage <75 VDC respectively <50 VAC in addition the max. power rating must be observed

Number of wire turns / resolution										
Resistance value Ohm	100	200	500	1k	2k	5k	10k	20k	50k	100k
Number of wire turns (AL(R)1703/AL(R)1903)	820	920	1270	1350	1270	1990	2570	-	-	-
Number of wire turns (AL(R)1705/AL(R)1905)	1240	1560	2000	2510	2400	3200	3900	4800	5500	-
Number of wire turns (AL(R)1710/AL(R)1910)	2100	2480	3300	4000	5020	5000	6400	7800	10100	11000

Resolution in degree E.g. R5k 5-turn = $1800^\circ / 3200 = 0,563^\circ$ per winding resistive wire

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Order code

Description	Selection: standard=black/bold, possible options=grey/cursive									
Series:	AL									
Slipping clutch: Without additional mechanics With integrated slipping clutch										
Shaft diameter: Ø 6,35 mm Ø 6,00 mm										
Revolutions with stop: <i>Option 1-turn</i> <i>Option 2-turn</i> 3-turn <i>Option 4-turn</i> 5-turn <i>Option 6-turn</i> <i>Option 7-turn</i> <i>Option 8-turn - on request</i> 10-turn										
Resistance value /Option Tandem: <i>Option 100 Ohm</i> <i>Option 500 Ohm</i> 1 kOhm <i>Option 2 kOhm</i> 5 kOhm 10 kOhm <i>Option 20 kOhm (only 5 to 10 Turn)</i> <i>Option 50 kOhm (only 5 to 10 Turn)</i> <i>Option 100 kOhm (only 10 Turn)</i>										
<i>Option rear shaft:</i> AL(R)17 = Ø6,35 x 15 mm AL(R)19 = Ø6,00 x 15 mm Shaft length in mm Shaft diameter in mm (≤6,35 mm)										
Resistance tolerance: ±5% <i>Option ±1%</i>										
Independent linearity: ±0,25% (3 to 10-turn) <i>Option ±0,15% (10-turn) R < 5kOhm</i> <i>Option ±0,10% (10-turn) R ≥ 5kOhm</i>										
Electrical connection: With soldering lugs With connector										
<i>Option center tap:</i> <i>(only 10-turn / not with connector)</i>										
Front shaft: AL(R)17 = Ø6,35 x 20,6 mm AL(R)19 = Ø6,00 x 20,6 mm <i>Option shaft length in mm</i> <i>Option shaft diameter in mm (≤6,35 in mm)</i>										
Screwdriver slot standard:										
Shaft sealing: Standard is without sealing <i>Option D with shaft sealing</i>										

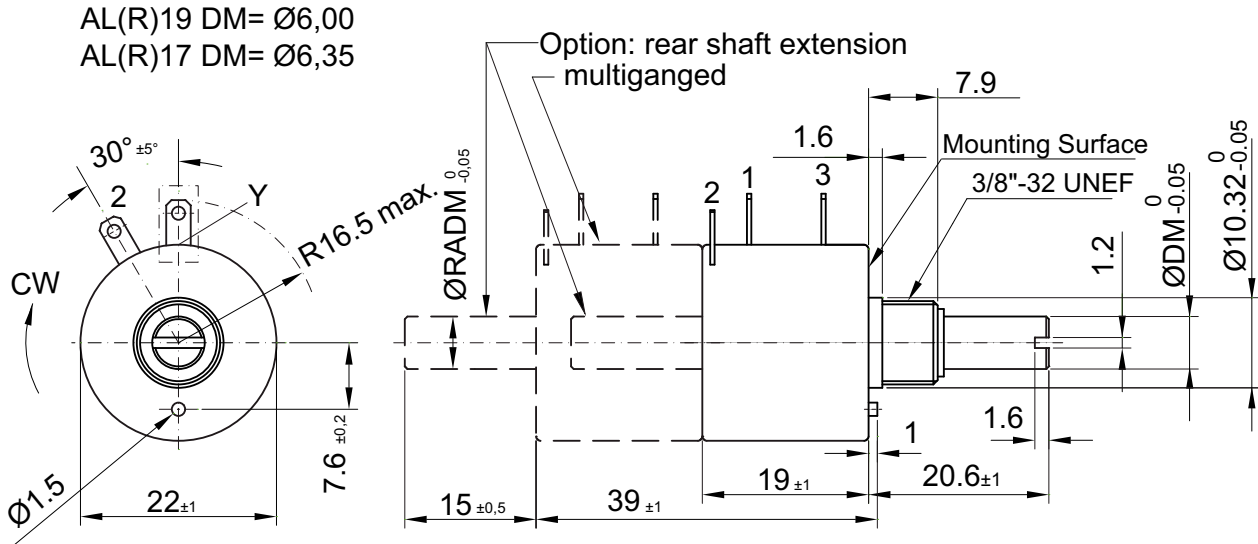
For higher quantities or on-going demand, additional options are available as described below on request
 For Example: Multi ganged potentiometers (max. 10), high torque version, sealed housing case, special electrical and mechanical angles of rotation, and special resistance and linearity tolerances. Furthermore we can mount gear wheels or attach cable assemblies with or without connectors and much more.
 Note 1: For versions as manual adjuster - the potentiometer is available on request with plastic bushing (versions without "M" = metal @description "revolutions with stop").
 Note 2: If you choose the slipping clutch (R) and your application is with the shaft directed downwards, we strongly recommend to order the bearing in the rear lid too - please choose the series AL17/19.

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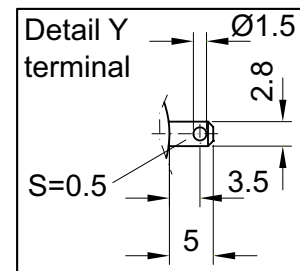
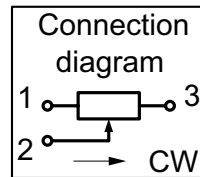
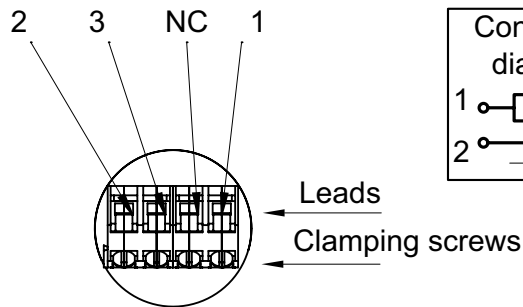
Series AL17/19

Drawing

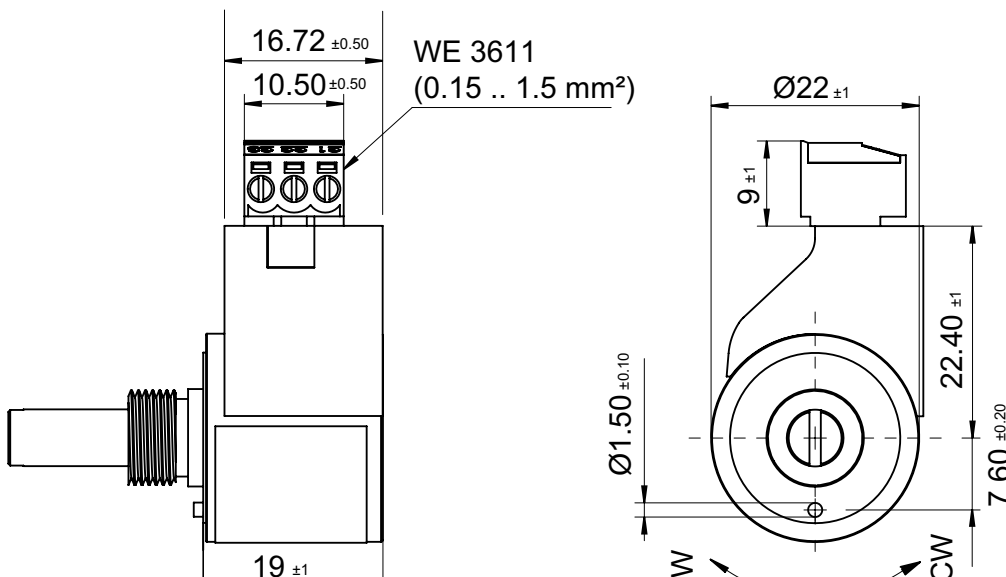


Option KA (on request) pin Assignment (rear view)

Dimensions in mm

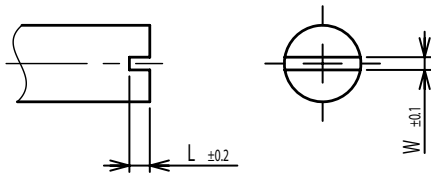


Option Connector ST

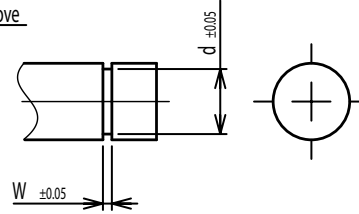


On Request: Special machining on shaft

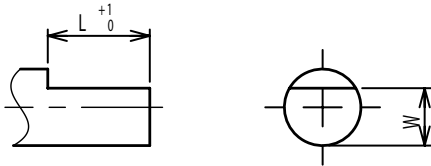
Slot



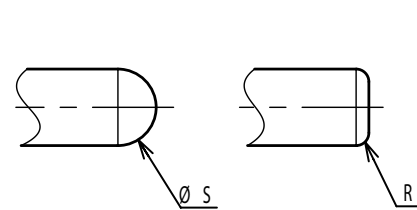
Groove



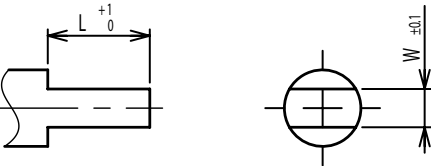
Flat



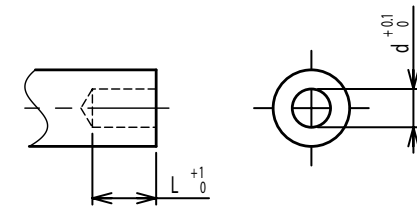
Round top



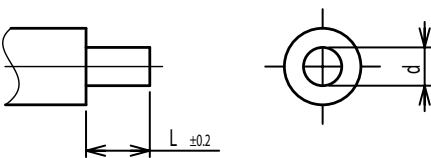
Double side flat



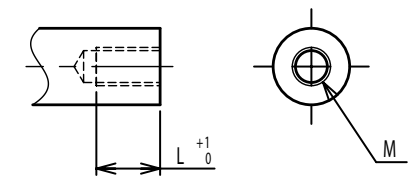
Counterbore hole



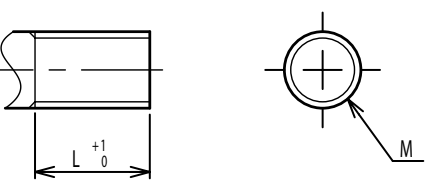
Step



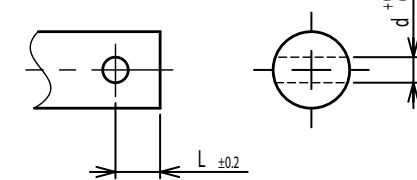
Counterbore screw hole



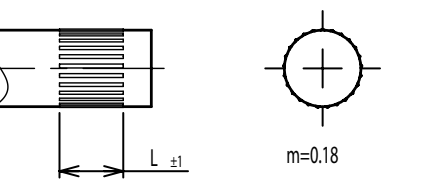
Screw Thread



Pin hole



Knurled(Parallel)



Screw thread inside hole

