Data Sheet for Precision Potentiometer

Multiturn Wirewound Potentiometer — Series AL20

The robust AL20 potentiometers in 20 mm housing are suitable for applications where a precise and economical multiturn potentiometer is important.

- Economical and precise multiturn sensor with numerous options
- Completely encapsulated housing with 2 x sleeve bearings
- Without pilot ring - with Ø6,00 x 25 mm shaft
- With many options

The sintered bearing in the back cover gives the shaft improved stability. The completely encapsulated housing increases the robustness in addition. The potentiometer is available in a 3, 5 or 10 turn version.

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..50 kOhm	0,1..100 kOhm	0,2..150 kOhm
Resistance tolerance		±5% (±1%)	
Independent linearity (best straight line) 1.)	±0,25%	±0,25%	±0,25% (±0,1%@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.)	600.000 rotations	1 Mio. rotations	2 Mio. rotations
Max. operational speed		40 rev. / min.	
Bearing		2 x sleeve bearing	
Operational torque @ ambient temperature 1.) 2.)		5 Nmm	
End stop torque 1.) 2.)		90 Ncm	
Operating temperature range		-55..+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		20 mm	
Housing depth	18 mm	18 mm	25,5 mm
Shaft diameter		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	
Connection position		Radial	
Sensor mounting		Bushing	
Mass	app. 20 g	app. 20 g	app. 25 g
Fastening parts included in delivery AC / ACP		Nut, toothed washer / nut, toothed washer, support plate	
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	10	20	50	100	200	500	1k	2k	5k	10k	20k	50k	100k	150k
Number of wire turns (AL20 03)	720	970	750	970	980	1180	1500	1990	2000	3050	3500	4500	-	-
Number of wire turns (AL20 05)	980	1220	980	1100	1500	2000	2500	2400	3200	3900	4800	5500	6500	-
Number of wire turns (AL20 10)	-	1850	2550	1800	2200	3200	4000	5000	5000	6400	7800	10000	11000	N/A

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

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Order code

Description	Selection: standard=black/bold, possible options=grey/cursive										
Series	**AL20**										
Revolutions with stop:											
3-turn		**03**									
5-turn		**05**									
10-turn		**10**									
Resistance value / *Option Tandem:*				*Tandem*							
Option 10 Ohm (only 3 + 5 Turn)			*R10*	*/10*							
Option 20 Ohm			*R20*	*/20*							
Option 50 Ohm			*R50*	*/50*							
Option 100 Ohm			*R100*	*/100*							
Option 200 Ohm			*R200*	*/200*							
Option 500 Ohm			*R500*	*/500*							
1 kOhm			**R1k**	*/1k*							
Option 2 kOhm			*R2k*	*/2k*							
5 kOhm			**R5k**	*/5K*							
10 kOhm			**R10k**	*/10k*							
Option 20 kOhm			*R20k*	*/20k*							
Option 50 kOhm			*R50k*	*/50k*							
Option 100 kOhm (only 5 + 10 Turn)			*R100k*	*/100k*							
Option 150 kOhm (only 10 Turn)			*R150k*	*/150k*							
Option rear shaft:											
Standard Ø2 x 10 mm					*RA*						
Shaft length in mm					*RAxx,xx*						
Shaft diameter in mm *(≤2 mm)*					*RADMx,xx*						
Resistance tolerance:											
±3%						**W3%**					
Option ±1%						*W1%*					
Independent linearity:											
±0,25%							**L0,25%**				
Option ±0,1% (only 10-turn @R ≥ 5k)							*L0,1%*				
Front shaft:											
Standard Ø6,00 x 25 mm								-			
Option shaft length in mm								*Ax,xx*			
Option shaft diameter in mm *(≤6,35 mm)*								*DMx,xx*			
Option center tap:									*CT*		
Option screwdriver slot:										*B*	
Shaft sealing:											
Standard is without sealing											-
Option D with shaft sealing											*D*

For higher quantities or on-going demand, additional options are available as described below on request

For Example: Tandem- or multi ganged potentiometers, 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.

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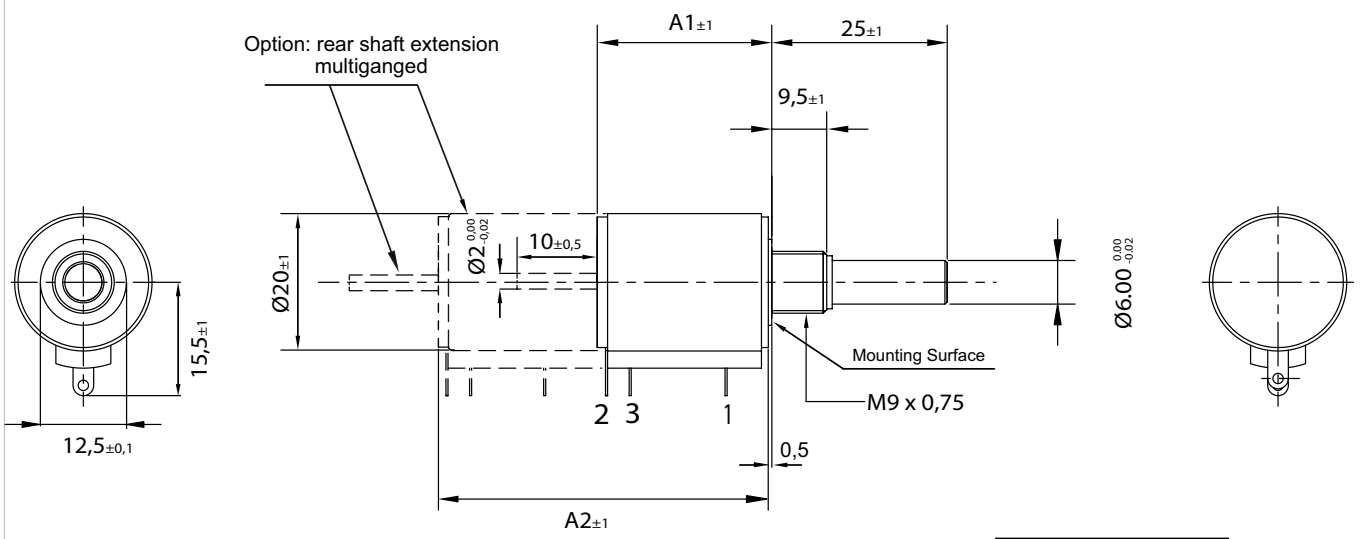
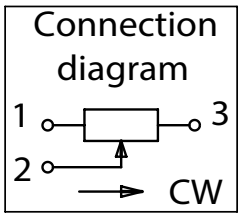
Multiturn Wirewound Potentiometer — Series AL20

Drawing





Dimensions	AL2003	AL2005	AL2010
A1	18	18	25,5
A2	38	38	53

Dimensions in mm

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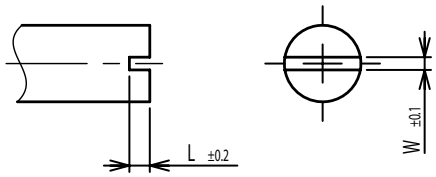
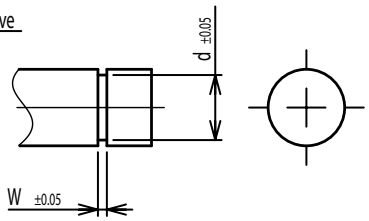
On Request: Special machining on shaft

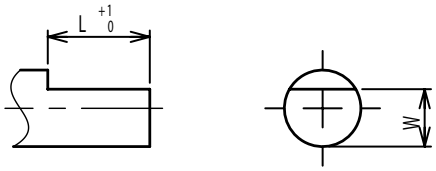
Slot



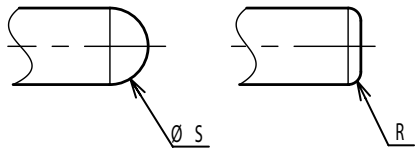
Groove



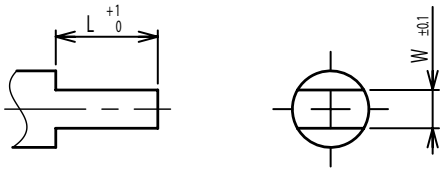
Flat



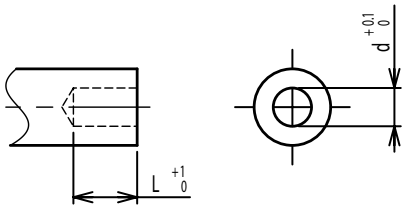
Round top



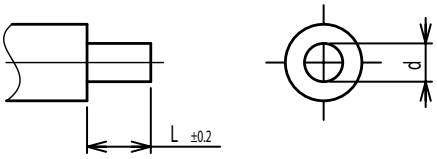
Double side flat



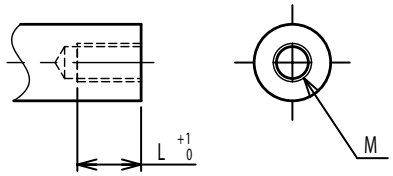
Counterbore hole



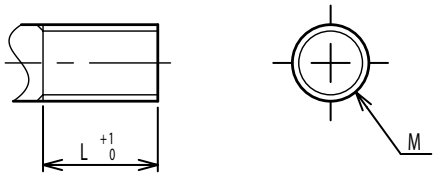
Step



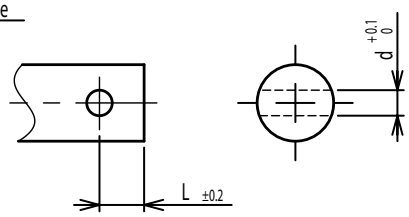
Counterbore screw hole



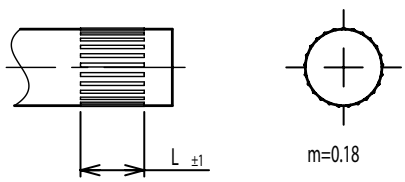
Screw Thread



Pin hole



Knurled(Parallel)



Screw thread inside hole