

# Data Sheet for Panel Encoders

## Multiturn Rotary Potentiometer (Wirewound) with Knob

Series MD22



MD22 with clamp connection



MD22 in IP65 with soldering lugs

The manual adjusters MD22 with adjustment knob are for applications that require a precise multiturn rotary potentiometer.

- Completely pre-assembled set
- 000...999 good readability of the numbers
- Knob in grey or black - IP65 versions
- Soldering lugs or clamp connection
- With many options

These manual adjusters are delivered ready to install. They consist of a multiturn precision potentiometer series AL17 and the adjustment knob. The potentiometer is available in a 3, 5 or 10 turn version. The radial gold-plated connection pins are suitable for flat connectors (2.8 mm according to DIN 46247 Part 3).

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%	±0.15% R≥ 5k ±0.25% R< 5k (±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 1.)	1080° +10°	1800° +10°	3600° +10°
Lifetime (90% el. eff. angle half sine) 2.)	300.000 rev,	500.000 rev.	1 mio. rev.
Counter range of the adjustment knob	000..300	000..500	000..999
Bearing	Brass sleeve bearing		
Locking mechanism available in adjusting knob	no		
End stop torque 1.) 2.)	35 Ncm		
Operating temperature range standard version	-30 °C up to +60 °C		
Storage temperature range	-55 °C up to +105 °C		
Protection grade (IEC 60529)	IP40		
Protection option W Elastomer sealing cap	IP65 front		
Color adjustment knob	Black or grey (option W with black elastomer sealing cap)		
Color digit role	White with black digits		
Housing diameter knob	33 mm		
Housing depth without / with clamp connection (KA)	40 mm / 58 mm		

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Mechanical Data, Environmental Conditions, Miscellaneous	3-turn	5-turn	10-turn
Connection type	Gold plated soldering lugs or clamp		
Connection position	Radial		
Mass	app. 70 g		
Mounting of the manual adjuster	Nut SW32		
Fastening parts included in delivery	Metal fastening nut, rubber sealing washer		

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 03-turns	820	920	1270	1350	1270	1990	2570	-	-	-
Number of wire 05-turns	1240	1560	2000	2510	2400	3200	3900	4800	5500	-
Number of wire turns 10-turns	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: <b>standard=black/bold</b> , possible <i>options=grey/italic</i>								
<b>Series</b>	<b>MD22</b>								
<b>Revolutions with stop:</b> <b>3-turn with digits 000..300</b> <b>5-turn with digits 000..500</b> <b>10-turn with digits 000..999</b>		<b>03</b>							
		<b>05</b>							
		<b>10</b>							
<b>Resistance value /Option Tandem:</b> <i>Option 100 Ohm</i> <i>Option 500 Ohm</i> <b>1 kOhm</b> <i>Option 2 kOhm</i> <b>5 kOhm</b> <b>10 kOhm</b> <i>Option 20 kOhm (only 5 + 10 Turn)</i> <i>Option 50 kOhm (only 5 + 10 Turn)</i> <i>Option 100 kOhm (only 10 Turn)</i>				<i>Tandem</i> <i>R100 /100</i> <i>R500 /500</i> <b>R1k /1k</b> <i>R2k /2k</i> <b>R5k /5k</b> <b>R10k /10k</b> <i>R20K /20K</i> <i>R50K /50k</i> <i>R100K /100k</i>					
<i>Option rear shaft:</i> <i>(only version with soldering lugs possible)</i> <i>Standard Ø6,35 x 15 mm</i> <i>Shaft length in mm</i> <i>Shaft diameter in mm (≤6,35 mm)</i>									<i>RA</i> <i>RAxx,xx</i> <i>RADMX,xx</i>
<b>Electrical connection:</b> <b>Soldering lugs</b> <b>Clamp</b>									<b>- KA</b>
<b>Front panel sealing:</b> <b>Standard without</b> <i>Option IP65 front panel sealing</i>									<b>- W</b>
<b>Knob colour:</b> <b>Grey</b> <b>Black</b>									<b>G S</b>
<b>Resistance tolerance:</b> <b>±5%</b> <i>Option ±1%</i>									<b>W5%</b> <i>W1%</i>
<b>Independent linearity:</b> <b>±0,25% (3 to 5-turn / R&lt; 5k 10-turn)</b> <b>±0,15% R≥ 5k (10-turn)</b> <i>Option ±0,15% (10-turn) R &lt; 5kOhm</i> <i>Option ±0,10% (10-turn) R ≥ 5kOhm</i>									<b>L0,25%</b> <b>L0,15%</b> <i>L0,15%</i> <i>L0,1%</i>
<i>Option center tap (only 10-turn):</i>									<i>CT</i>

Note Option W: A black elastomer sealing cap is placed over the knob. The colour of the knob is only visible at the front to the aperture.

## 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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### Drawing

