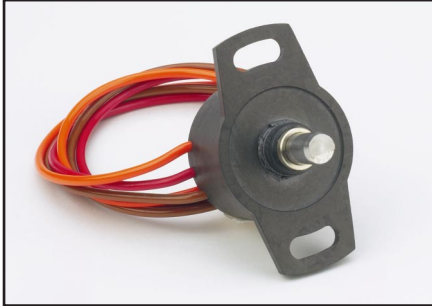


Sensor Potentiometers

Series SP 2800



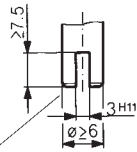
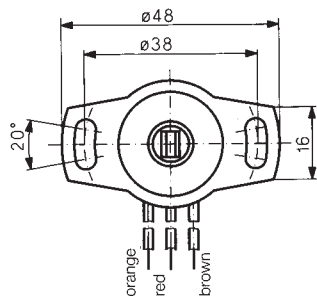
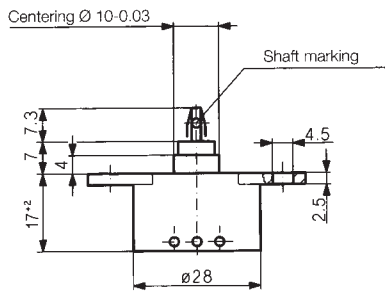
Special features

- available with push-on coupling or marked shaft
- Simple mounting
- Protection class IP 54 or IP 65
- long life
- good price/performance ratio

Designed to convert rotary movement into a proportional voltage, these position transducers utilize conductive plastic technology on both the resistance and collector tracks.

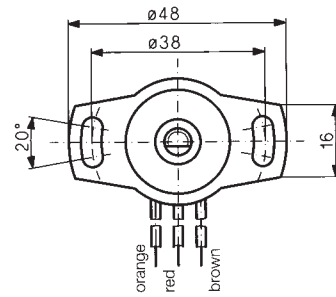
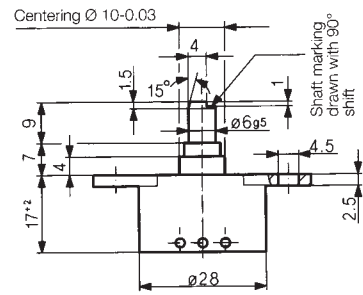
The housing and bearings are produced in a special high-grade temperature-resistant plastic material. Fixings are in the form of elongated slots which allow simplicity in mounting together with ease of mechanical adjustment. The special backlash-free push-on coupling ensures extremely quick and simple installation. The transducer is not sensitive to either dirt or dampness. Electrical connections are made via conductors which are sealed into the housing. They are suitable for use with any of the termination methods currently in use. The use of elastomer-damped precious metal multi-finger wiper ensures reliable contact even under the severest of working conditions.

Special models with different electrical travels and shaft dimensions are available.

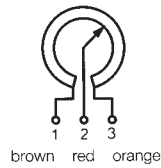


Dimensions of driving side
parallel offset < 0.05 mm

When the shaft marking is pointing to terminal 2 (red),
the wiper is located in an electrical center position.



When the shaft marking is pointing to terminal 2 (red),
the wiper is located in an electrical center position.



Schematic
view on the shaft

Description	
Case	high-grade, temperature-resistant plastic
Shaft	stainless steel
Bearings	plastic friction bearings
Resistance element	conductive plastic
Wiper assembly	precious metal multi-finger wiper
Mounting position	any optional position
Electrical connections	three conductors, PTE-PEE-insulation

Mechanical Data		
Dimensions	see drawing	
Mounting	with 2 M4 fillister-head screws + washer	
Mechanical travel	360, continuous	°
Torque	0.5 (IP65) 0.15 (IP54)	Ncm
Maximum operational speed	120	min ⁻¹
Weight	32	g
Electrical Data		
Actual electrical travel	308 ± 2	°
Nominal resistance	5	kΩ
Resistance tolerance	±20	%
Repeatability	≤0.01 (Δ 0.03°)	%
Effective temperature coefficient of the output-to-applied voltage ratio	typical 5	ppm/°C
Independent linearity	±0.3	%
Max. permissible applied voltage	42	V
Recommended operating wiper current	<1	μA
Max. wiper current in case of malfunction	10	mA
Insulation resistance (500 VDC, 1 bar, 2 s)	≥10	MΩ
Dielectric strength (50 Hz, 2 s, 1 bar, 500 VAC)	≤100	μA
Conductor length, bared, tinned	approx. 300	mm
Conductor diameter	approx. 1	mm ²

Environmental Data

Temperature range	-40...+100 (+150°C on request)	°C
Vibration	5...2000 $A_{max} = 0.75$ $a_{max} = 20$	Hz mm g
Life	>50 x 10 ⁶	rev.
Protection class	IP 54 or IP 65 (DIN 400 50 / IEC 529)	

Recommended accessories

Processor controlled indicators MAP... with display, Signal conditioner MUP.../ MUK ... for standardized output signals

Order designations

Type	Art.no.	
SP2801 a502	019120	6 mm shaft, IP 54
SP2821 a502	019140	Push-on coupling, IP 54
SP2831 a502	019121	6 mm shaft, IP 65
SP2841 a502	019141	Push-on coupling, IP 65
SP2801 s0002	019122	6 mm shaft, IP 54, $\pm 100^\circ$, $R = 3 \text{ k}\Omega$ independent linearity $\pm 1 \%$
SP2841 s0002	019142	Push-on coupling, IP 65, $\pm 100^\circ$, $R = 3 \text{ k}\Omega$ independent linearity $\pm 1 \%$

Important

All the values given in this data sheet for linearity, lifetime, micro-linearity, resistance to external disturbances and temperature coefficient in the voltage dividing mode are quoted for the device operating with the wiper voltage driving on operational amplifier working as a voltage follower, where virtually no load is applied to the wiper ($I_e \leq 1 \mu\text{A}$).

Rotary Sensor Potentiometer

Series SP2800



The SP2800 potentiometer converts angular position into a proportional analog voltage. They utilize Novotechnik's highly robust conductive plastic technology.

The housing is special high-grade temperature-resistant plastic material. The precious metal wipers are elastomer-damped for reliable contact under severe working conditions.

The SP2800 is sealed to as high as IP65, making it insensitive to dirt and moisture.

Electrical connections are via independent wires, which are sealed into the housing.

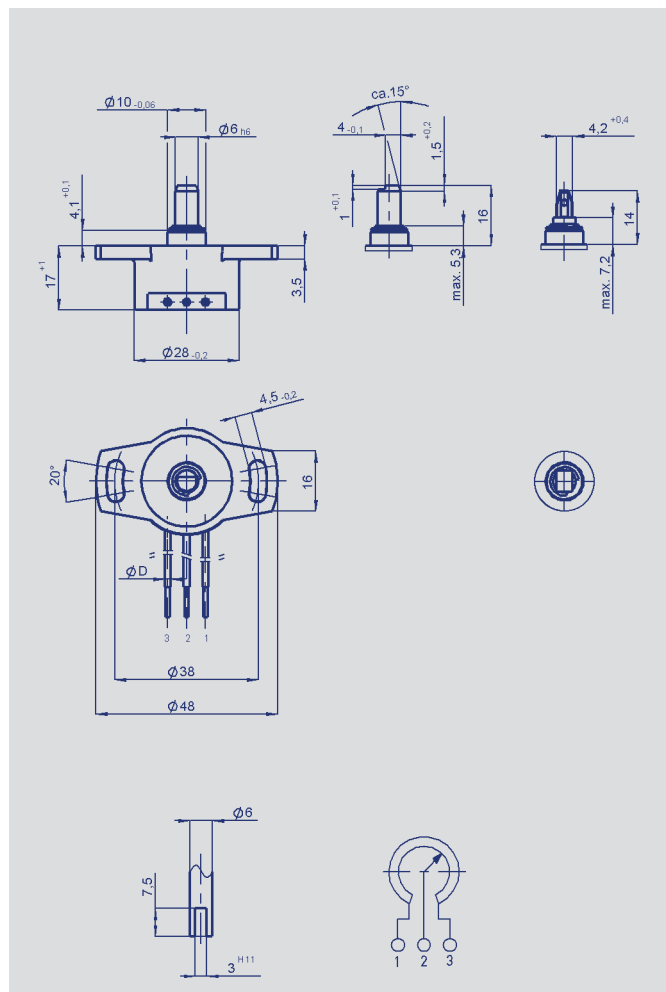
The sensor is mounted via slots which allow easy mounting and mechanical adjustment.

An optional backlash-free „push-on“ shaft coupling provides fast and easy installation.

Special models with different electrical travels and shaft dimensions are available.

Special features

- highly robust potentiometer for demanding industrial and mobile applications
- excellent lifetime - in excess of 50 million movements
- single channel or fully electrically redundant
- sealed to IP 65 or IP54
- easy mounting and mechanical adjustment
- two shaft styles, including easy „push-on“ coupling
- excellent price/performance ratio



Description

Housing and bearing	high-grade, temperature-resistant plastic
Shaft	stainless steel
Resistance element	conductive plastic
Wiper assembly	precious metal multi-finger wiper
Mounting position	any orientation
Electrical connections (standard)	conductors, TPE-PEE-insulation, l = 300 mm 1-channel: 3 conductors, diameter = 2.1 mm 1 = brown, 2 = red, 3 = orange 2-channel: 6 conductors, diameter = 1.6 mm 1 = brown, 2 = red, 3 = orange 4 = brown, 5 = red, 6 = orange

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Mechanical Data				
Dimensions	see drawing			
Mounting	2 fillister head screws M4 with washers			
Maximum torque for mounting screws (with washer)	180			Ncm
Mechanical angles	360, continuous			°
Maximum shaft loading (axial and radial) static or dynamic force	20			N
Torque	0.2 (IP54), 0.5 (IP65)			Ncm
Maximum operational speed	120			RPM
Weight	30			g
Electrical Data				
Defined electrical angle	100	08	345	° ± 2°
Nominal resistance	3	5	5	kΩ
Resistance tolerance	±20			%
Repeatability (dependent on mounting tolerances)	with 6 mm round shaft (shabe B) ≤ 0.03 wit push-on coupling (shape D) ≤ 0.06			° °
Effective temperature coefficient of the output-to-applied voltage ratio	typical 5			ppm/K
Independent linearity	1.0	0.3	0.3	±%
Max. permissible applied voltage	42			V
Recommended operating wiper current	≤ 1			μA
Max. allowed wiper current (in case of malfunction)	10			mA
Insulation resistance (500 VDC, 1 bar, 2 s)	≥ 10			MΩ
Dielectric strength (50 Hz, 2 s, 1 bar, 500 VAC)	≤ 100			μA
Conductor length	approx. 300			mm
Conductor diameter	approx. 1			mm ²
Environmental Data				
Temperature range	-40 ... +120 (temporary 150°C, max. 1 h)			°C
Vibration	5...2000 Amax = 0.75 amax = 20			Hz mm g
Life	50 x 10 ⁶			movements
Protection class	IP 54 or IP 65 (DIN 400 50 / IEC 529)			
Order designations				
Type	Art. No.			
SP2801 308 000 001	019520	↯ 308°, 6 mm shaft, IP 54		
SP2821 308 000 001	019540	↯ 308°, push-on coupling, IP 54		
SP2831 308 000 001	019521	↯ 308°, 6 mm shaft, IP 65		
SP2841 308 000 001	019541	↯ 308°, push-on coupling, IP 65		
SP2801 100 002 001	019522	↯ 100°, 6 mm shaft, IP 54,		
SP2831 100 002 001	019527	↯ 100°, 6 mm shaft, IP 65,		
SP2841 100 002 001	019542	↯ 100°, push-on coupling, IP 65		
SP2841 345 065 001	019564	↯ 345°, push-on coupling, IP 65		
SP2841 100 067 006	019565	2 channel (electrically redundant, drawing on request), push-on coupling, IP65 per track: ↯ 100° ±2°, 3 kΩ ±20 %, indepen. linearity ±1.0 %		

Important

All values given for linearity, lifetime and temperature coefficient are derived with no electrical load on the wiper (I ≤ 1μA).

Recommended accessories

MAP - processor control indicator, with display MUP / MUK - signal conditioners.

**Rotary Sensor
Potentiometer**

**SP2800 Series
Motorsport Models**



Special features

- Highly robust potentiometer for demanding industrial and mobile applications
- Plastic or aluminum housing
- Wide temperature range
- Elastomer damped wipers
- Excellent lifetime - in excess of 50 million movements
- Single channel or fully electrically redundant
- Sealed to IP 67
- Easy mounting and mechanical adjustment
- Two shaft styles, including easy "push-on" coupling
- Excellent price/performance ratio

The SP2800 series of angle sensors convert angular position into a proportional analog voltage. They utilize Novotechnik's highly robust conductive plastic technology.

They are ideal for arduous motorsports position feedback applications including Steering angle, Sequential transmission, throttle and suspension measurement.

The housing is special highgrade temperature resistant plastic material. The precious metal wipers are elastomerdamped for reliable contact under severe working conditions.

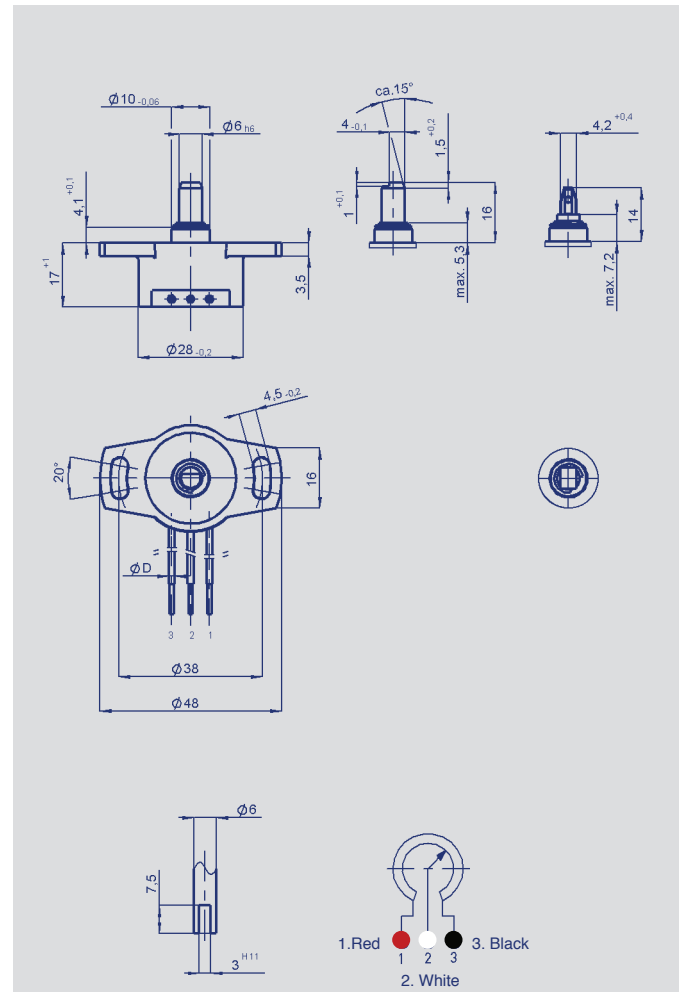
The SP2800 is sealed to as high as IP 67, making it insensitive to dirt and moisture.

Electrical connections are via independent wires, which are sealed into the housing.

The sensor is mounted via slots which allow easy mounting and mechanical adjustment.

An optional backlash-free "push-on" shaft coupling provides fast and easy installation.

Special models with different electrical travels and shaft dimensions are available.



Description	
Housing and bearing	high-grade temperature-resistant plastic
Shaft	stainless steel
Resistance element	conductive plastic
Wiper assembly	precious metal multi-finger wiper
Mounting position	any orientation
Electrical connections (Motorsport)	Raychem 55, l=1000 mm 1-channel: 3 conductors, diameter = 2.1 mm 1 = red, 2 = white, 3 = black

Important

All values given for linearity, lifetime and temperature coefficient are derived with no electrical load on the wiper ($I \leq 1\mu A$).

Recommended accessories

MAP - processor control indicator, with display MUP / MUK - signal conditioners.

Mechanical Data				
Dimensions	see drawing			
Mounting	2 fillister head screws M4 with washers			
Maximum torque for mounting screws (with washer)	180			Ncm
Mechanical angles	360, continuous			°
Maximum shaft loading (axial and radial) static or dynamic force	20			N
Maximum operational speed	120			RPM
Weight	30			g
Electrical Data				
Defined electrical angle	100	08	345	° ± 2°
Nominal resistance	3	5	5	kΩ
Resistance tolerance	±20			%
Repeatability	0.01			%
Effective temperature coefficient of the output-to-applied voltage ratio	typical 5			ppm/K
Max. permissible applied voltage	42			V
Recommended operating wiper current	≤ 1			μA
Max. allowed wiper current (in case of malfunction)	10			mA
Insulation resistance (500 VDC, 1 bar, 2 s)	≥ 10			MΩ
Dielectric strength (50 Hz, 2 s, 1 bar, 500 VAC)	≤ 100			μA
Cable length	1,000			mm
Cable type	Raychem 55, 22			AWG
Environmental Data				
Temperature range	-40 ... +150			°C
Vibration	5...2000 Amax = 0.75 amax = 20			Hz mm g
Life	50 x 10 ⁶			movements
Protection class	IP 67			

Order designations & Part numbers

Type	Art. No.				
Part Number	Electrical Angle +/- 1°	Linearity %	Housing material	Shaft type	Nominal resistance k Ω +/- 20%
SP2836 100 002 101	100	1	Duraplast	6 mm	3
SP2836 308 000 101	308	0.3	Duraplast	6 mm	5
SP2836 345 065 101	345	0.3	Duraplast	6 mm	5
SP2846 100 002 101	100	1	Duraplast	Push-on	3
SP2836 130 069 101	130	0.5	Duraplast	Push-on	3
SP2846 100 002 101	100	1	Duraplast	Push-on	3
SP2846 130 054 101	100	0.5	Duraplast	Push-on	3
SP2846 100 067 102	2 x 100	1	Duraplast	Push-on	2 x 3
SP2846 130 050 101	130	1	Duraplast	Push-on	3
SP2846 345 065 101	345	0.3	Duraplast	Push-on	5
SP2846 130 069 101	130	0.5	Duraplast	Push-on	3
SP2846 308 000 101	308	0.3	Duraplast	Push-on	5
SP2846 345 065 101	345	0.3	Duraplast	Push-on	5
SP2846 350 082 101	350	0.3	Duraplast	Push-on	5
SP2890 s 0002	100	1	Aluminum	Push-on	3
SP2890 s 0054	100	0.5	Aluminum	Push-on	3
SP2890 s 0050	130	1	Aluminum	Push-on	3
SP2890 s 0069	130	0.5	Aluminum	Push-on	3
SP2890 s 0065	345	0.3	Aluminum	Push-on	5
SP2891 s 0069**	130	0.5	Aluminum	Push-on	3
SP2891 s 0065**	345	0.3	Aluminum	Push-on	5

** Improved sealing

**Sensor
Potentiometers**

SP2800 Series



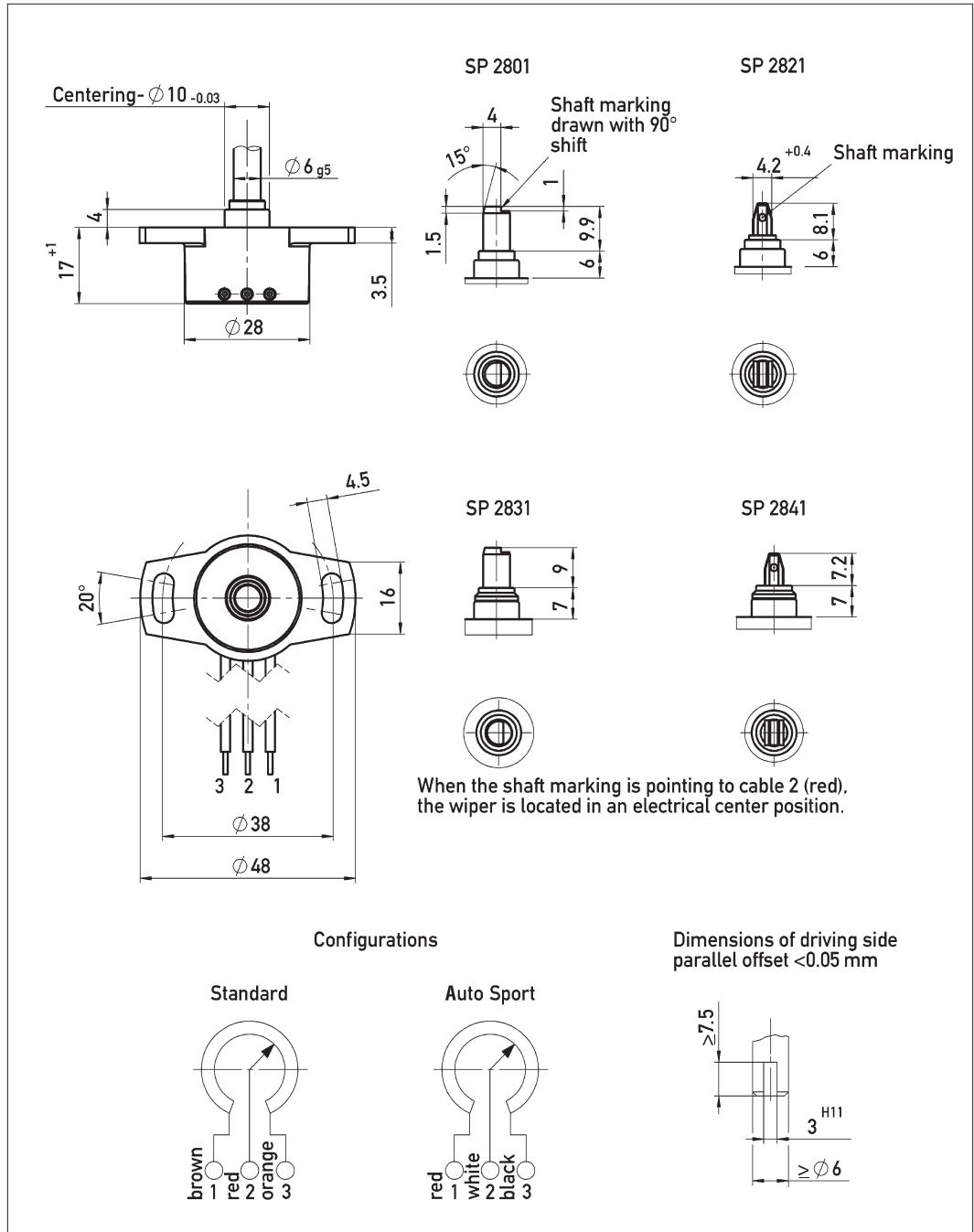
Special features

- available with push-on coupling or marked shaft
- simple mounting
- protection class IP 54 or IP 65
- long life
- good price/performance ratio

Designed to convert rotary movement into a proportional voltage, these position transducers utilize conductive plastic technology on both the resistance and collector tracks.

The housing is manufactured from a special high-grade temperature-resistant plastic material (PPS). It has elongated mounting slots to facilitate installation and adjustment.

The special backlash-free push-on coupling ensures extremely quick and simple installation. The transducer is not sensitive to either dirt or dampness. Electrical connections are made via conductors which are sealed into the housing. They are suitable for use with any of the termination methods currently in use. The use of an elastomer-damped precious metal multi-finger wiper ensures reliable contact even under the severest of working conditions.



Special models with different electrical travels and shaft dimensions are available.

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Description	
Case	high-grade, temperature-resistant plastic
Shaft	stainless steel
Bearings	glide bearings
Resistance element	conductive plastic
Wiper assembly	precious metal multi-finger wiper
Mounting position	any optional position
Electrical connections	three conductors, PTE-PEE-insulation

Mechanical Data

Dimensions	see drawing
Mounting	with 2 M4 fillister-head screws + washer
Mechanical travel	360, continuous °
Permitted shaft loading (axial and radial) static or dynamic force	20 N
Torque	0.5 (IP 65) 0.2 (IP 54) Ncm
Maximum operational speed	120 RPM
Weight	32 g

Electrical Data

Actual electrical travel	308 ±2 °
Nominal resistance	5 kΩ
Resistance tolerance	±20 %
Repeatability	≤0.01 (Δ 0.03°) %
Effective temperature coefficient of the output-to-applied voltage ratio	typical 5 ppm/K
Independent linearity	±0.3 %
Max. permissible applied voltage	42 V
Recommended operating wiper current	≤ 1 μA
Max. wiper current in case of malfunction	10 mA
Insulation resistance (500 VDC, 1 bar, 2 s)	≥ 10 MΩ
Dielectric strength (50 Hz, 2 s, 1 bar, 500 VAC)	≤ 100 μA
Conductor length, bared, tinned	approx. 300 mm
Conductor diameter	approx. 1 mm ²

Environmental Data

Temperature range		
IP 54	-40...+100	°C
IP 65	-40...+150 (+150°C on request)	°C
Vibration	5...2000 A _{max} = 0.75 a _{max} = 20	Hz mm g
Life	> 50 x 10 ⁶	movem.
Protection class	IP 54 or IP 65 (DIN 400 50 / IEC 529)	

Order designations

Type	Art. no.	
SP2801 A502	019320	6 mm shaft, IP 54
SP2821 A502	019340	Push-on coupling, IP 54
SP2831 A502	019321	6 mm shaft, IP 65
SP2841 A502	019341	Push-on coupling, IP 65
SP2801 S0002	019322	6 mm shaft, IP 54, ±100°, R = 3 kΩ independent linearity ±1%
SP2831 S0002	019327	6 mm shaft, IP 65, ±100°, R = 3 kΩ independent linearity ±1%
SP2841 S0002	019342	Push-on coupling, IP 65, ±100°, R = 3 kΩ independent linearity ±1%
SP2841 S0067	019265	Push-on coupling, IP 65, 2 x ±100°, R = 3 kΩ independent linearity ±1%

Auto Sport Configurations

Model Designation	Body Material	Shaft Style	Electrical Angle	Linearity
SP2836 a 502	PPS	6 mm	308	0.3%
SP2836 s 0002	PPS	6 mm	100	1%
SP2836 s 0050	PPS	6 mm	130	1%
SP2836 s 0065	PPS	6 mm	340	0.3%
SP2846 a 502	PPS	Push-on	308	0.3%
SP2846 s 0002	PPS	Push-on	100	1%
SP2846 s 0050	PPS	Push-on	130	1%
SP2846 s 0065	PPS	Push-on	340	0.3%
SP2890 s 0002	Aluminum	Push-on	100	1%
SP2890 s 0050	Aluminum	Push-on	130	1%
SP2890 s 0065	Aluminum	Push-on	340	0.3%

Notes: All auto sport models are sealed to IP 65 and are supplied with Raychem 55 cable attached. The temperature rating is 40° to 150°C for all auto sport configurations.

Recommended accessories

MAP process-control indicators and display. MUP or MUK signal conditioner for standardized output signals.

Important

All values given for this series – including linearity, lifetime, micro-linearity, resistance to external disturbances and temperature coefficient in voltage dividing mode – are quoted for the device operating with the wiper voltage driving an operational amplifier working as a voltage follower where virtually no load is applied to the wiper ($I_e \leq 1 \mu A$).

Subject to changes

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