

Kit Potentiometer Rotational Analog Displacement Sensor



FEATURES

- Conductive plastic potentiometer technology, infinite resolution
- Analog or digital output
- Low height
- High flexibility of wires
- Applicable standards: NFC 93255, MIL R39023

QUICK REFERENCE DATA

Sensor type	ROTATIONAL, conductive plastic
Output type	Output by wires
Market appliance	Industrial, avionics
Dimensions	16 mm, 18 mm, 22 mm, 23 mm, 27 mm, 40 mm, 85 mm

ELECTRICAL SPECIFICATIONS FOR KITPR016, KITPR018 (H22)

PARAMETER	KITPR016				KITPR018 (H22)				
	Total electrical travel	60°	88°	95°	200°	287° 30'	340°	340°	340°
Useful electrical travel	20°	74°	95°	197°	230°	337°	340°	340°	348°
Linearity	± 0.5 %	± 0.5 %	± 0.5 %	± 0.5 %	± 0.25 %	± 0.1 %	± 0.25 %	± 0.5 %	± 0.1 %
Operating voltage	± 10 V ± 0.02 V								
Gradient	-	-	-	-	-	-	-	-	-
Total resistance range (R _n)	4.7 kΩ	4.7 kΩ	4.7 kΩ	470 Ω	2 kΩ	4.7 kΩ	2.2 kΩ	10 kΩ	10 kΩ
Tolerance on R _n	± 20 %	± 10 %	± 20 %	± 10 %	± 12.5 %	± 10 %	± 12.5 %	± 10 %	± 20 %
Output smoothness	≤ 0.1 %								
Power rating	0.1 W at 80 °C	0.2 W at 80 °C	-	-	0.75 W at 85 °C	-	0.75 W at 85 °C	-	-
Temperature coefficient	-300 ppm/°C ± 300 ppm/°C								
Wiper current	≤ 1 mA								
Recommended load impedance	≥ 1000 R _n								
Insulation resistance	≥ 1 GΩ at 100 V _{DC}			≥ 10 GΩ at 500 V _{DC}					
Dielectric strength	-			750 V _{RMS} , 50 Hz, 1 min					

ELECTRICAL SPECIFICATIONS FOR KITPR022 (PR22), KITPR023 (H27), KITPR027 (PR27), KITPR040, KITPR085

PARAMETER	KITPR022 (PR22)	KITPR023 (H27)	KITPR027 (PR27)	KITPR040	KITPR085			
Total electrical travel	130°	340°	120°	124°	330°	345°	100° ± 2°	25°
Useful electrical travel	120°	340°	90°	120°	180°	300°	90°	16°
Linearity	± 0.25 %	± 1 %	± 0.5 %	± 1 %	± 0.3 %	± 1 %	± 0.1 %	± 0.08 %
Operating voltage	± 10 V ± 0.02 V							
Gradient	-	-	-	-	-	-	0.2 V/° ± 0.2 %	0.8 V/° ± 0.1 %
Total resistance range (R _n)	5 kΩ	4.7 kΩ	2.2 kΩ	5 kΩ	4.7 kΩ	10 kΩ	2.5 kΩ	
Tolerance on R _n	± 10 %	± 10 %	-	± 10 %	± 10 %	± 10 %	± 10 %	± 20 %
Output smoothness	≤ 0.1 %							
Power rating	-	-	1.25 W at 70 °C	1.25 W at 70 °C	0.6 W at 70 °C	-	-	-
Temperature coefficient	-300 ppm/°C ± 300 ppm/°C							
Wiper current	≤ 1 mA							
Recommended load impedance	≥ 1000 R _n							
Insulation resistance	≥ 10 GΩ at 500 V _{DC}							
Dielectric strength	750 V _{RMS} , 50 Hz, 1 min				500 V _{RMS} , 50 Hz, 1 min			



MECHANICAL SPECIFICATIONS FOR KITPR016, KITPR018 (H22)		
PARAMETER	KITPR016	KITPR018 (H22)
Mechanical travel	-	-
Backlash	< 3'	-
Repeatability	-	-
Running and starting torque	≤ 2 cN.cm	≤ 3 cN.cm
Weight	0.7 g ± 0.1 g	4.2 g ± 0.5 g

MECHANICAL SPECIFICATIONS FOR KITPR022 (PR22), KITPR023 (H27), KITPR027 (PR27), KITPR040, KITPR085						
PARAMETER	KITPR022 (PR22)		KITPR023 (H27)	KITPR027 (PR27)	KITPR040	KITPR085
	TET = 130°	TET = 340°				
Mechanical travel	360°	-	-	360°	110° max.	-
Backlash	-	≤ 0.05°	-	-	< 0.02°	< 1.2°
Repeatability	-	-	-	-	< 0.01°	-
Running and starting torque	≤ 10 cN.cm	≤ 12 cN.cm	-	-	≤ 5.65 cN.cm	< 1.2 mN.m
Weight	≤ 10 g	-	≤ 15 g	-	12 g ± 1 g	75 g ± 5 g

PERFORMANCE FOR KITPR016, KITPR018 (H22)		
PARAMETER	KITPR016	KITPR018 (H22)
Operating temperature range	-46 °C to +71 °C	-55 °C to +125 °C
Storage temperature range	-46 °C to +71 °C	-55 °C to +125 °C
Rotation humidity (max.)	55 % ± 20 %	5 % to 95 %
Thermal deviation at U/2 over operational temperature range	-	-

Note

- Nothing stated herein shall be construed as a guarantee of quality or durability

PERFORMANCE FOR KITPR022 (PR22), KITPR023 (H27), KITPR027 (PR27), KITPR040, KITPR085						
PARAMETER	KITPR022 (PR22)	KITPR023 (H27)		KITPR027 (PR27)	KITPR040	KITPR085
		TET = 120°	TET = 124°			
Operating temperature range	-40 °C to +85 °C	-55 °C to +90 °C	-54 °C to +71 °C	-40 °C to +85 °C	-40 °C to +85 °C	-43 °C to +90 °C
Storage temperature range	-40 °C to +85 °C	-55 °C to +125 °C	-64 °C to +90 °C	-40 °C to +85 °C	-46 °C to +71 °C	-55 °C to +90 °C
Rotation humidity (max.)	-	-	-	-	5 % to 95 %	-
Thermal deviation at U/2 over operational temperature range	-	-	-	-	≤ 0.04 %	-

Note

- Nothing stated herein shall be construed as a guarantee of quality or durability

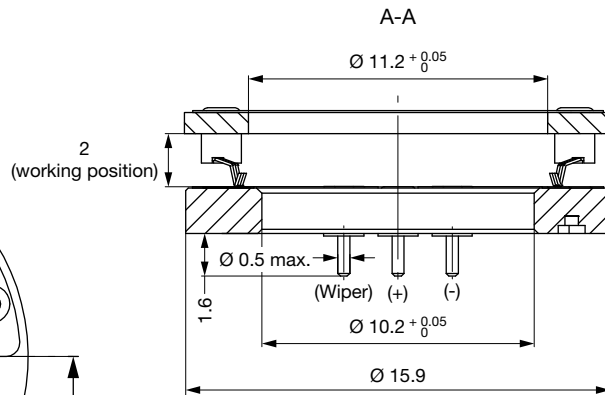
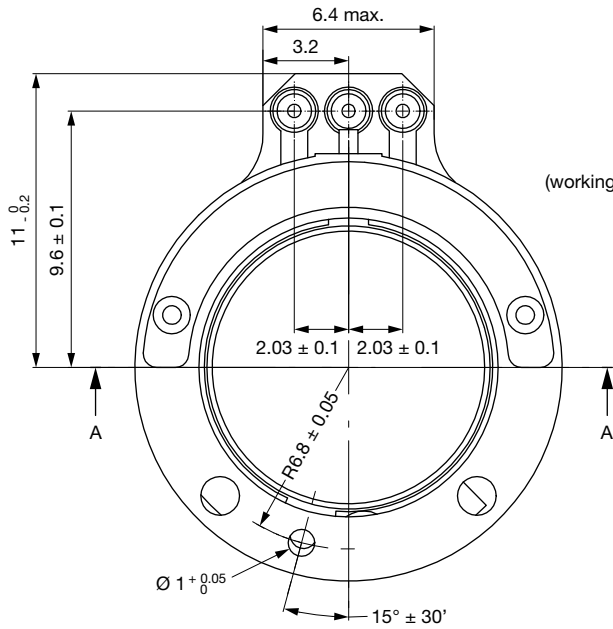
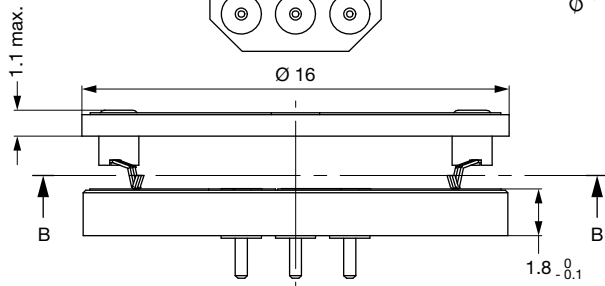
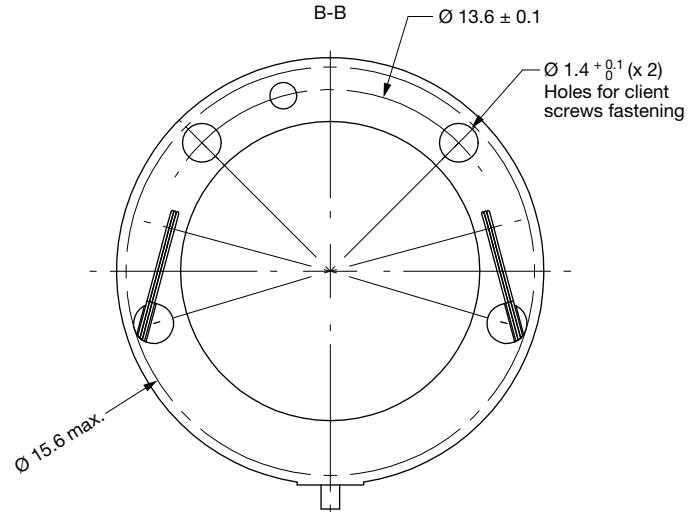
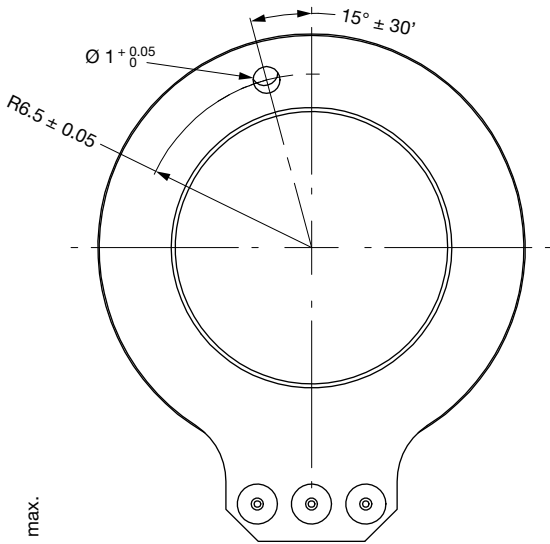
SAP PART NUMBERING GUIDELINES								
MODEL	TYPE	SIZE	FUNCTION	VALUE	LINEARITY	PACKAGING	3 DIGITS	
KITP	R = rotational	016	1	472 = 4K7	B = 0.5 %	B = box (1 piece)	To consult Vishay for dedicated 3 digits	
				103 = 10K	D = 0.1 %			
		018		202 = 2K0	C = 0.25 %			
				222 = 2K2	B = 0.5 %			
				471 = 470				
		022		472 = 4K7	A = 1 %			
				103 = 10K				
				472 = 4K7				
				502 = 5K0				C = 0.25 %
				502 = 5K0				A = 1 %
		023		222 = 2K2	B = 0.5 %			
				472 = 4K7	A = 1 %			
		027		040	085			P = 0.3 %
								103 = 10K
			252 = 2K5	U				

Note

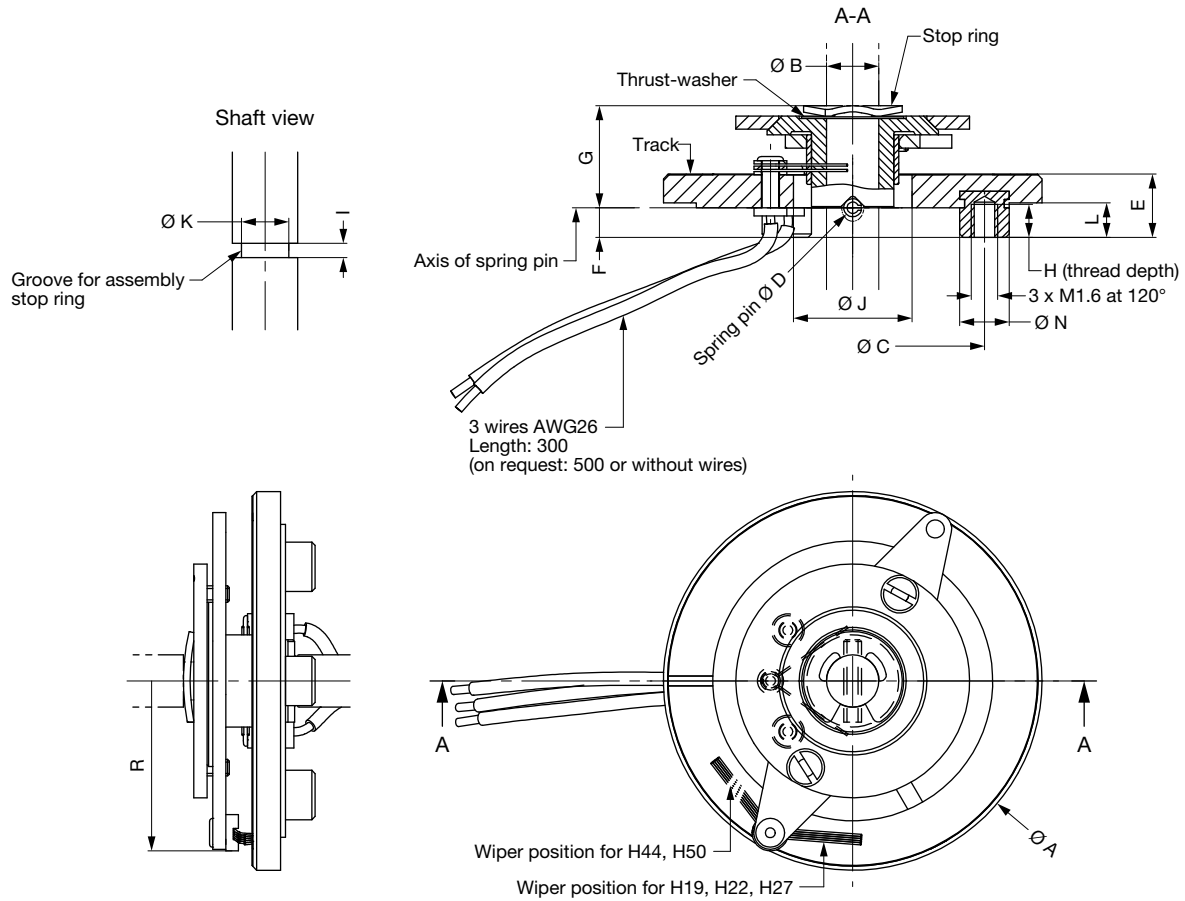
- See "Electrical Specifications" for the angle

DIMENSIONS in millimeters

KITPR016



DIMENSIONS in millimeters

KITPR018 (H22), KITPR023 (H27), KITPR035 (H44)


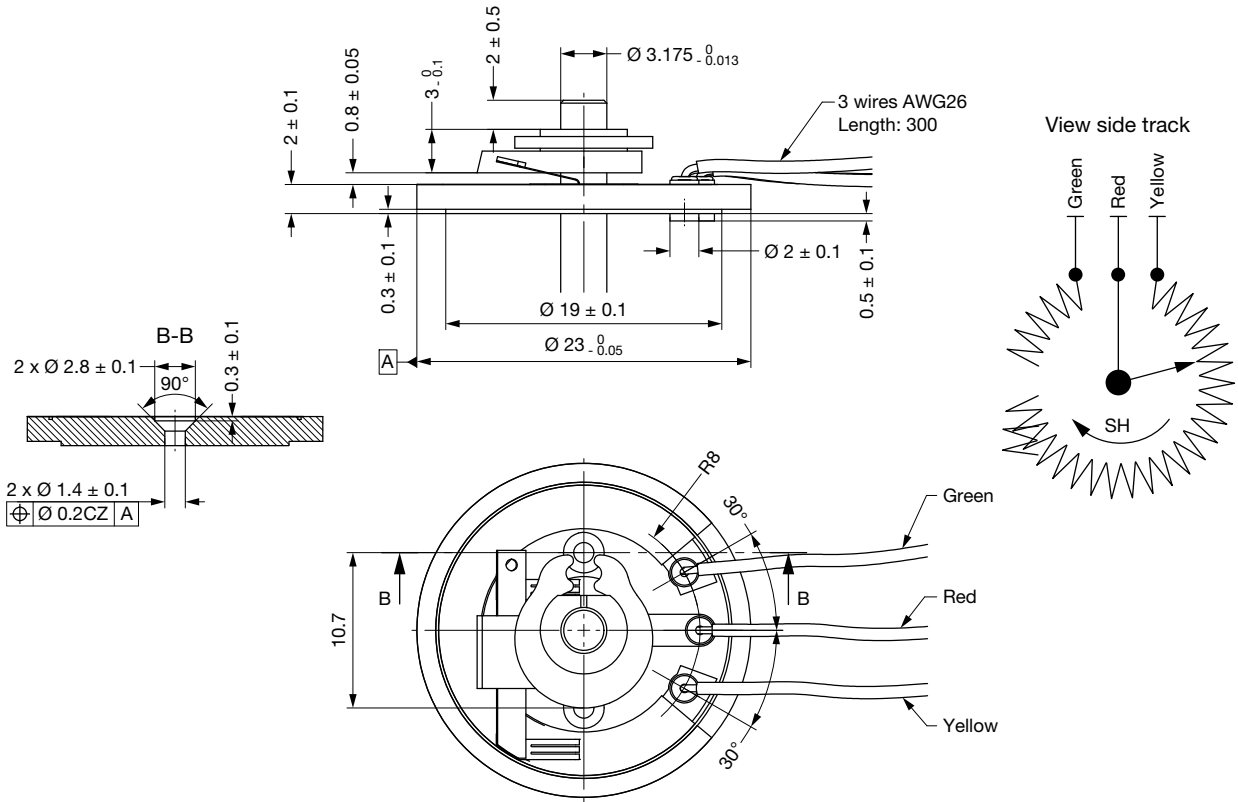
DIMENSION	TYPE			ON REQUEST	
	KITPR018 (H22)	KITPR023 (H27)	KITPR035 (H44)	KITPR015 (H19)	KITPR042 (H50)
A (0 / -0.05)	18	23	35	15	42
B (+0.012 / 0)	3.175	3.175	6.35	3.175	6.35
C ± 0.1	12	16	28	11.5	34
D ± 0.1	1	1	1.5	1	1.5
E ± 0.2	3.8	3.8	5.8	5	6.8
F ± 0.1	1.8	1.8	2.9	4.1	4.3
G (+0.1 / 0)	6.2	6.2	8.6	6.2	8.6
H _{min.}	2	2	3.5	2.5	3.5
I	0.7 (+0.05 / 0)	0.7 (+0.05 / 0)	1.05 (+0.07 / 0)	0.7 (+0.05 / 0)	1.05 (+0.07 / 0)
J ± 0.05	7.2	7.2	11.2	5.7	13.2
K (+0.05 / 0)	2.3	2.3	4.8	2.3	4.8
L _{max.}	2.2	2.2	3.2	3.2	3.2
N _{max.}	3	3 ⁽¹⁾	4.1	3	3.9
R _{max.}	9.2	11.7	17.9	7.7	20.8

Note

- On request: Ø 2.5 with 3 x M1.2

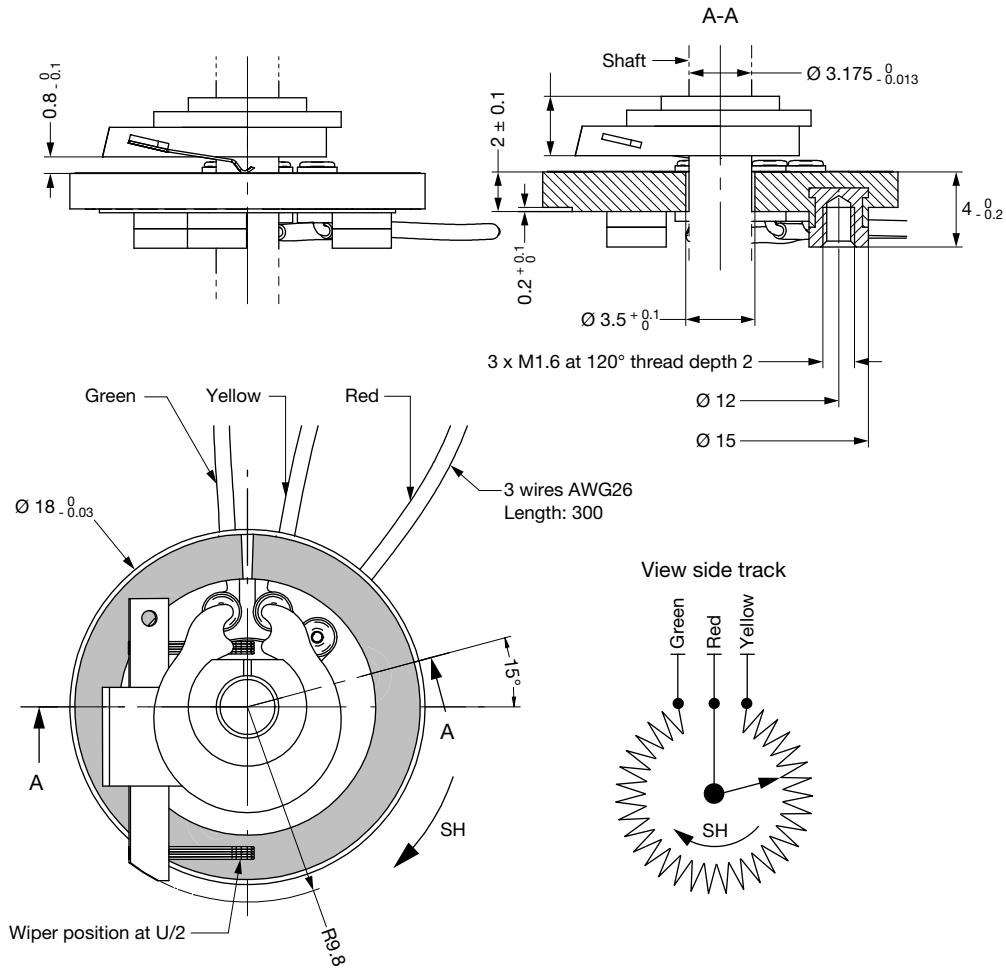
DIMENSIONS in millimeters

DESIGN ON REQUEST FOR KITPR023



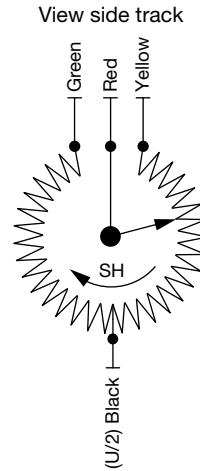
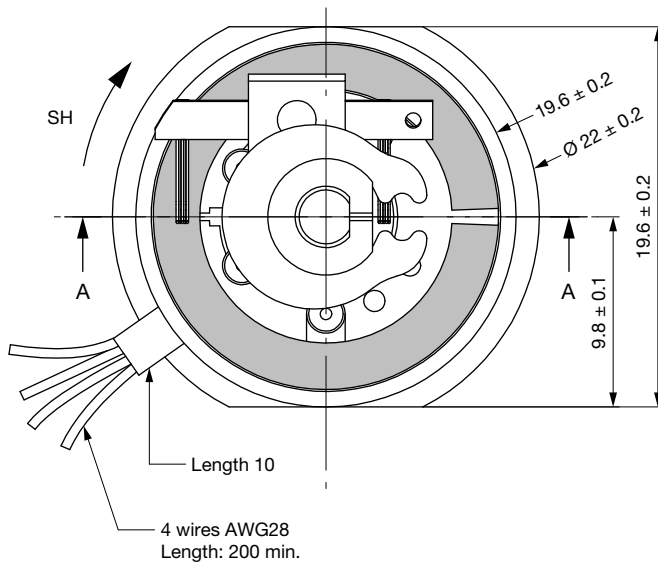
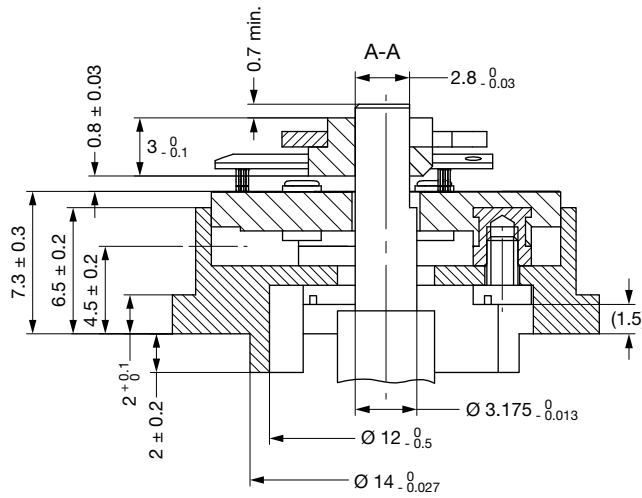
DIMENSIONS in millimeters

KITPR022



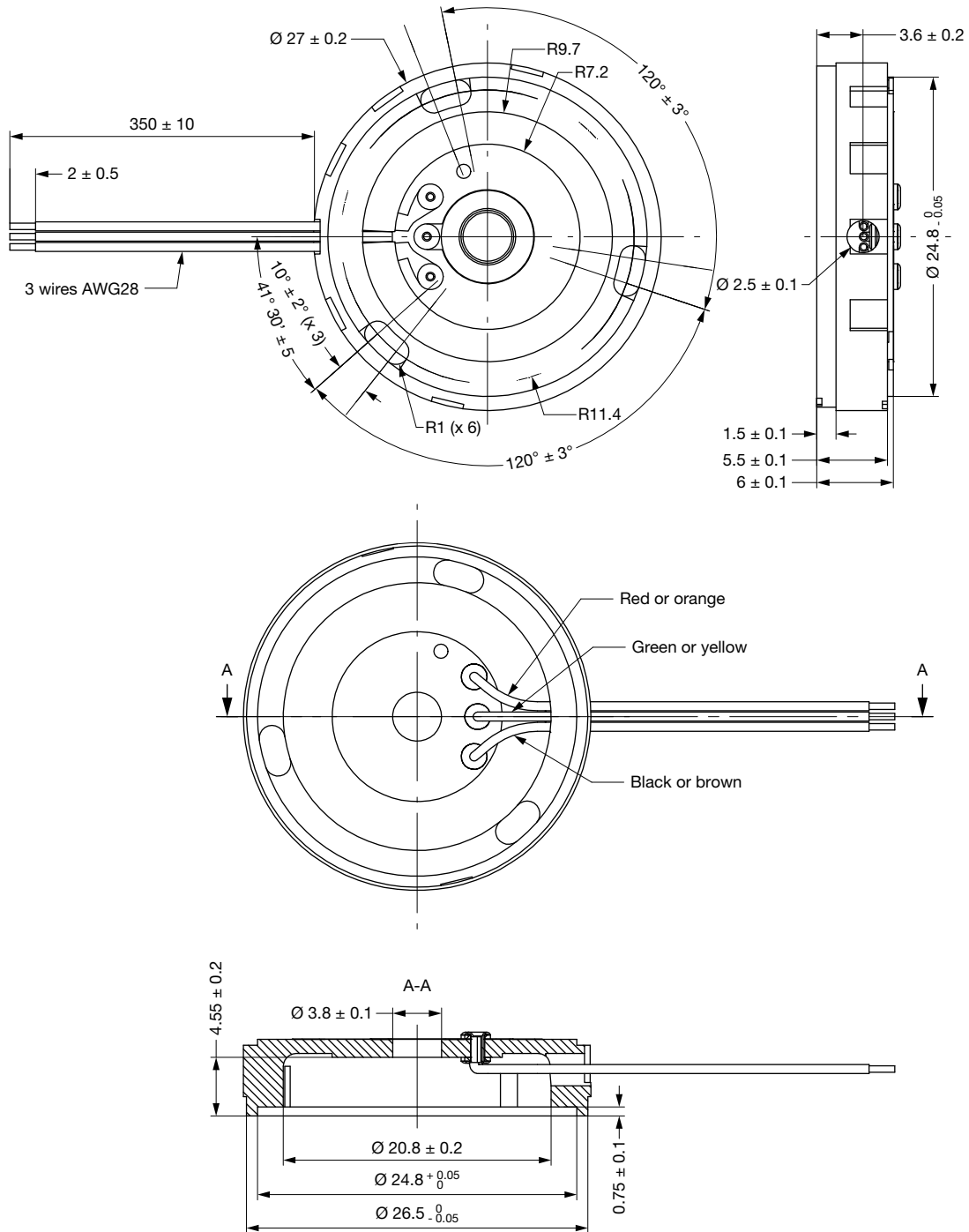
DIMENSIONS in millimeters

DESIGN ON REQUEST FOR KITPR022



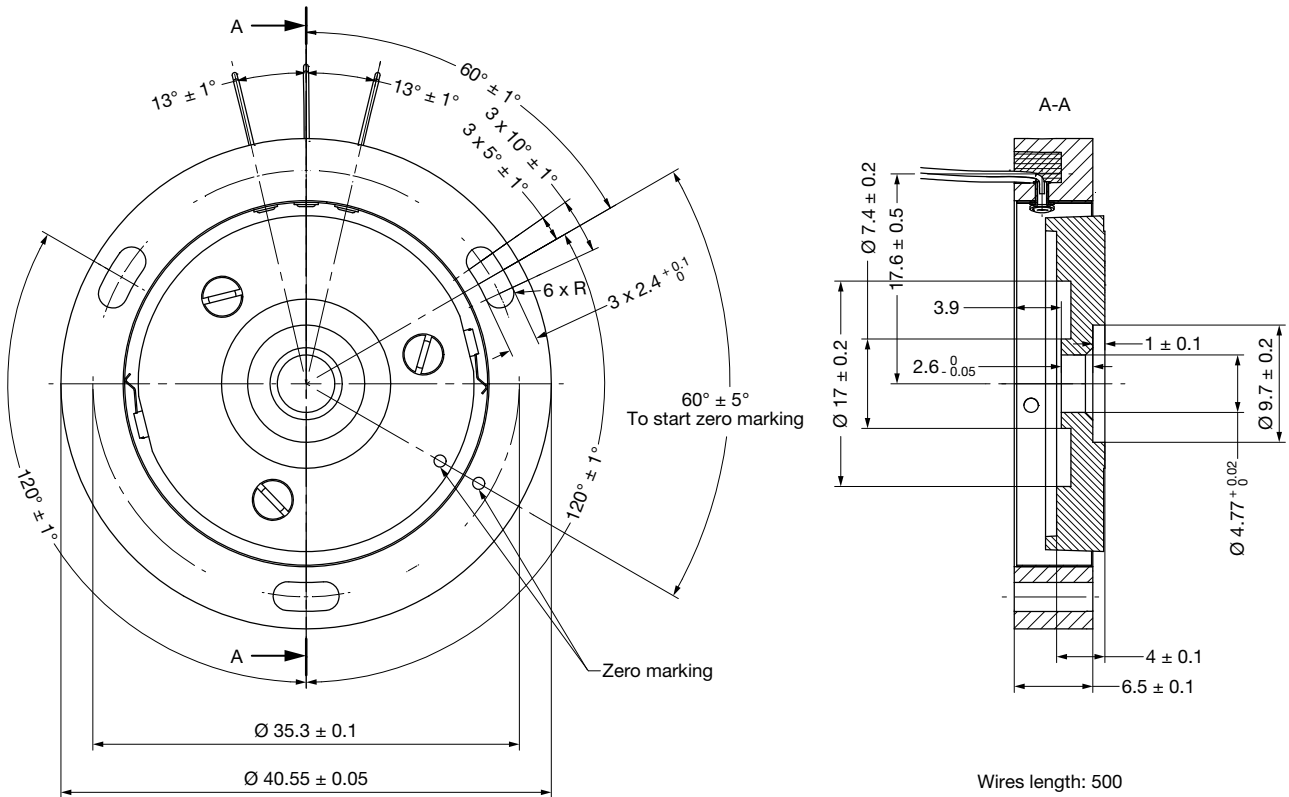
DIMENSIONS in millimeters

KITPR027

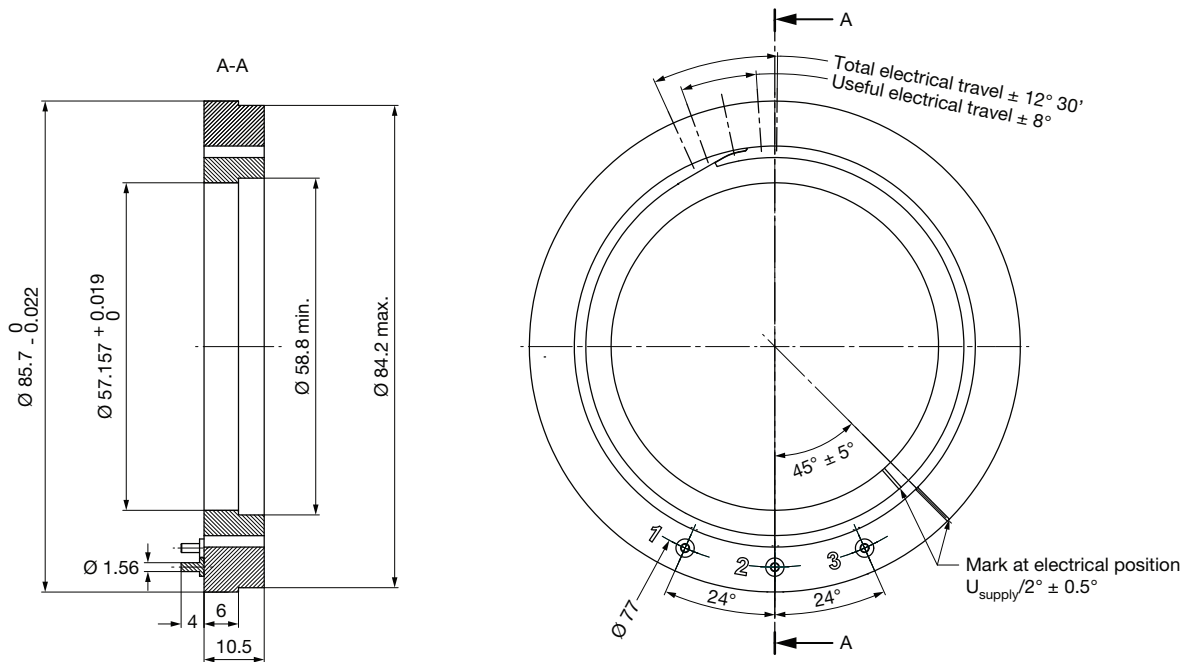


DIMENSIONS in millimeters

KITPR040 (Analog Output)

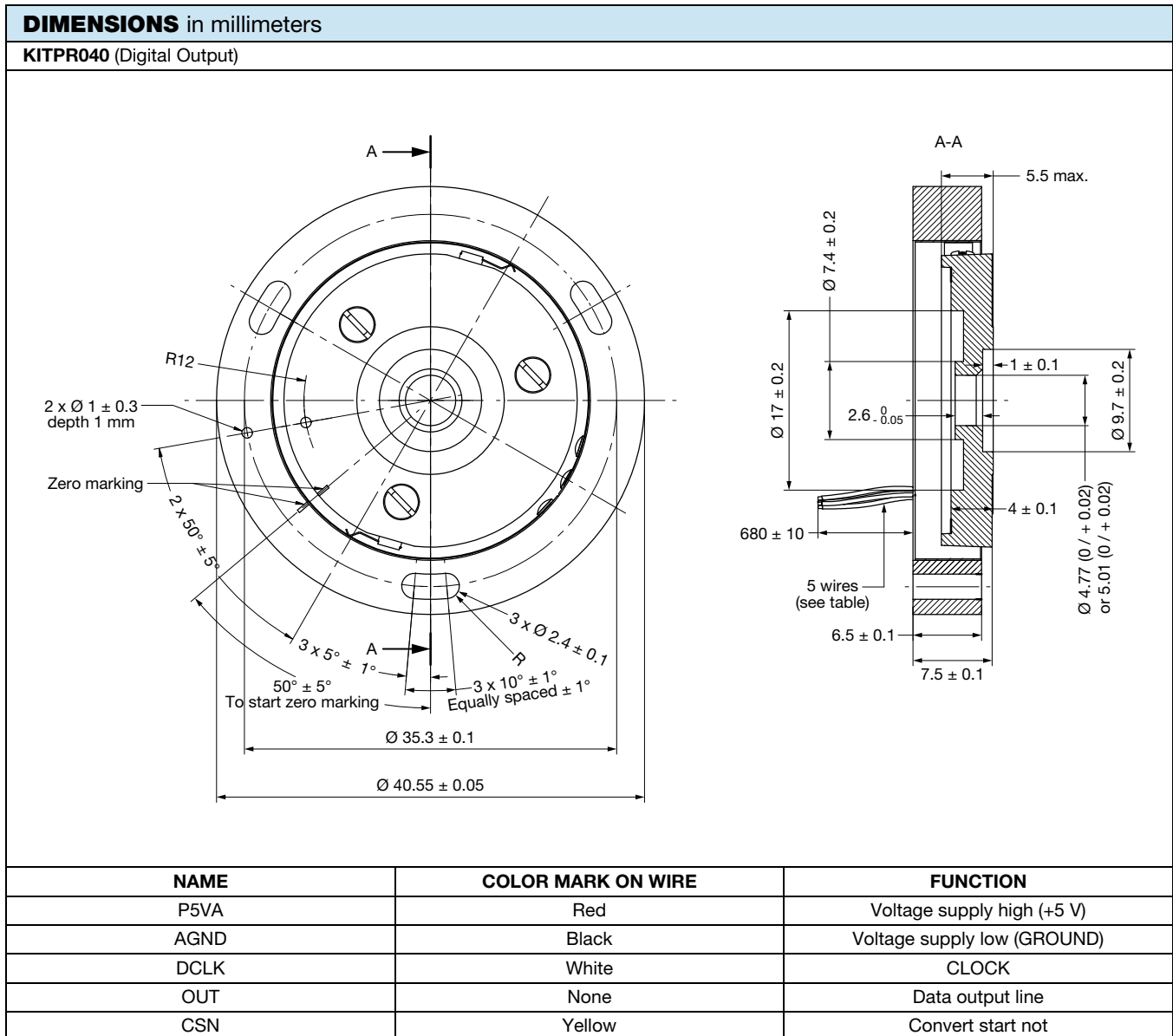


KITPR085 (Analog Output)



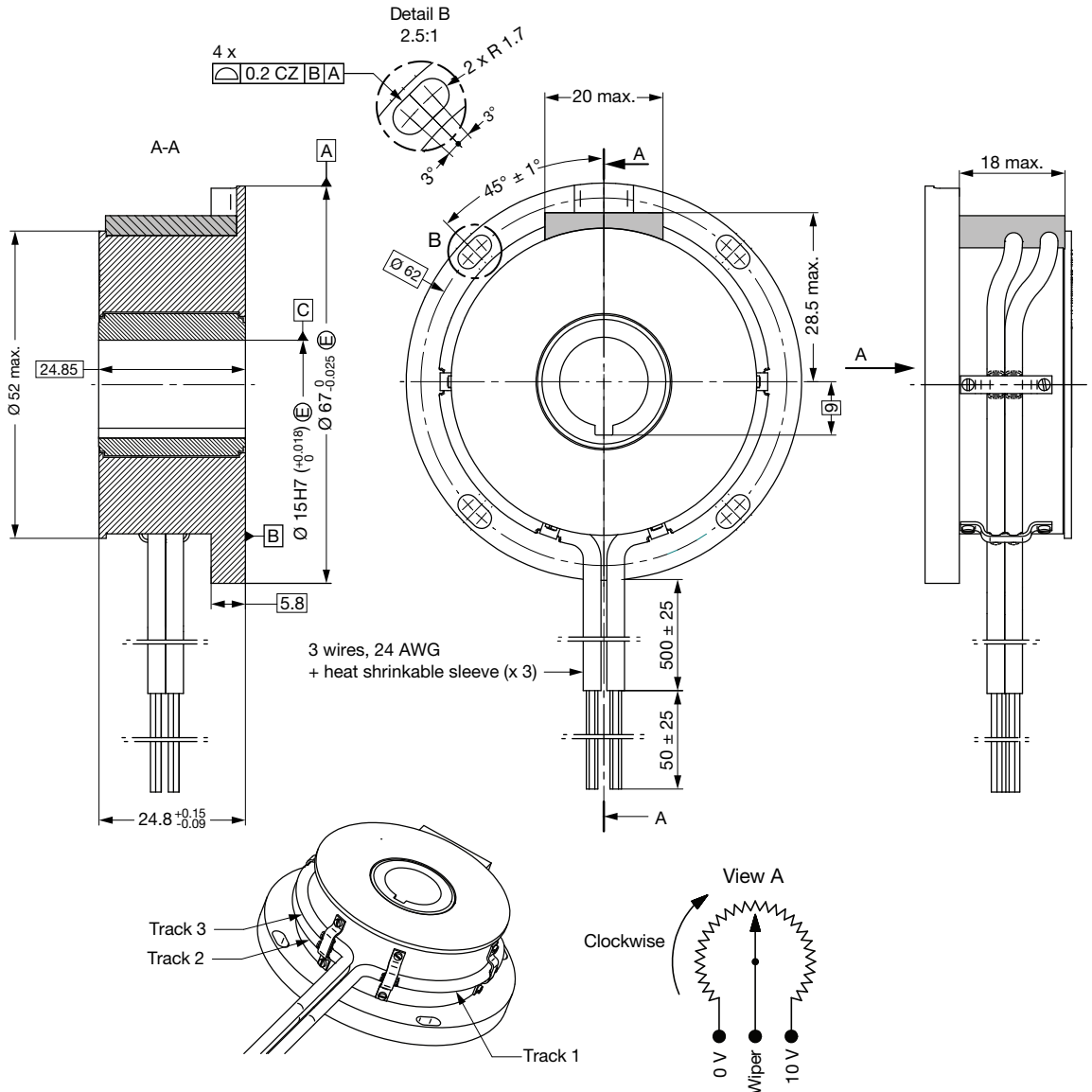
OPTIONS (on request)

- Other ohmic values (R_n)
- Other tolerances on R_n
- Other linearities
- Other theoretical electrical travels
- Other dimensions
- Middle tap: KITPR022 $U/2 \pm 1^\circ$
- KITPR040: digital output SPI
 - Operating voltage: $5\text{ V} \pm 5\%$
 - with absolute linearity $\pm 0.1^\circ$ max. within $\pm 39.9^\circ$
 $\pm 0.2^\circ$ max. from -45° to -40°
 $\pm 0.2^\circ$ max. from $+40^\circ$ to $+45^\circ$
 - Thermal deviation at $U/2$ over operational temperature range $\leq 0.05^\circ$
 - Gradient at $\pm 45^\circ$: 655.36 bits/ $^\circ$
 - Weight: $12.5\text{ g} \pm 1.5\text{ g}$
 - Power dissipation: 150 mW min.
 - Current supply: 12 mA max.



- SDPOR0057: redundant functions
 - Functions quantity: 3
 - Theoretical electrical travel (TET): 300°
 - Useful electrical travel (UET): ± 145°
 - Ohmic value 5 kΩ ± 20 %
 - Independent linearity: ± 0.25 %
 - Mechanical travel: 300°

DIMENSIONS in millimeters

SDPOR0057 (Redundant Functions)

WIRE IDENTIFICATION

COLOR	FUNCTION
Yellow	0 V
Red	Wiper
Green	10 V



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