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, 55 mm, 60 mm, 85 mm

ELECTRICAL SPECIFICATIONS FOR KITPR016, KITPR018 (H22), KITPR022 (PR22)

PARAMETER	KITPR016		KITPR018 (H22)							KITPR022 (PR22)	
Total electrical travel	60°	88°	95°	200°	287° 30'	340°	340°	340°	350°	130°	340°
Useful electrical travel	20°	74°	95°	197°	230°	337°	340°	340°	348°	120°	340°
Linearity	± 0.5 %	± 0.5 %	± 0.5 %	± 0.5 %	± 0.25 %	± 0.1 %	± 0.25 %	± 0.5 %	± 0.1 %	± 0.25 %	± 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	5 kΩ	4.7 kΩ
Tolerance on R_n	± 20 %	± 10 %	± 20 %	± 10 %	± 12.5 %	± 10 %	± 12.5 %	± 10 %	± 20 %	± 10 %	± 10 %
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 KITPR023 (H27), KITPR027 (PR27), KITPR040, KITPR055, KITPR060, KITPR085

PARAMETER	KITPR023 (H27)		KITPR027 (PR27)		KITPR040	KITPR055	KITPR060	KITPR085
Total electrical travel	120°	124°	330°	345°	100° ± 2°	140°	356°	25°
Useful electrical travel	90°	120°	180°	300°	90°	124°	345°	16°
Linearity	± 0.5 %	± 1 %	± 0.3 %	± 1 %	± 0.1 %	± 0.2 %	± 0.2 %	± 0.08 %
Operating voltage	-	-	-	-	± 10 V ± 0.02 V	-	5 V_{DC} ± 0.1 V_{DC}	± 10 V ± 0.02 V
Gradient	-	-	-	-	0.2 V/° ± 0.2 %	-	-	0.8 V/° ± 0.1 %
Total resistance range (R_n)	2.2 kΩ	5 kΩ	4.7 kΩ		10 kΩ	6.2 kΩ	10 kΩ	2.5 kΩ
Tolerance on R_n	-	± 10 %	± 10 %		± 10 %	± 10 %	± 10 %	± 20 %
Output smoothness	≤ 0.1 %					≤ 0.12 %	≤ 0.1 %	
Power rating	1.25 W at 70 °C		1.25 W at 70 °C		0.6 W at 70 °C	-	0.275 W at 85 °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}					≥ 60 MΩ at 200 V_{DC}	≥ 1 GΩ at 500 V_{DC}	≥ 10 GΩ at 500 V_{DC}
Dielectric strength	750 V_{RMS}, 50 Hz, 1 min		500 V_{RMS}, 50 Hz, 1 min			-	500 V_{RMS}, 50 Hz, 1 min	

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MECHANICAL SPECIFICATIONS FOR KITPR016, KITPR018 (H22), KITPR022 (PR22)				
PARAMETER	KITPR016	KITPR018 (H22)	KITPR022 (PR22)	
			TET = 130°	TET = 340°
Mechanical travel	-	-	360°	
Backlash	< 3'	-	-	
Repeatability	-	-	-	
Running and starting torque	≤ 2 cN.cm	≤ 3 cN.cm	≤ 10 cN.cm	
Weight	0.7 g ± 0.1 g	4.2 g ± 0.5 g	≤ 10 g	-

MECHANICAL SPECIFICATIONS FOR KITPR023 (H27), KITPR027 (PR27), KITPR040, KITPR055, KITPR060, KITPR085						
PARAMETER	KITPR023 (H27)	KITPR027 (PR27)	KITPR040	KITPR055	KITPR060	KITPR085
Mechanical travel	-	360°	110° max.	130°	360°	-
Backlash	≤ 0.05°	-	< 0.02°	± 0.03°	-	< 1.2°
Repeatability	-	-	< 0.01°	-	-	-
Running and starting torque	≤ 12 cN.cm	-	≤ 5.65 cN.cm	≤ 0.5 mN.m	-	< 1.2 mN.m
Weight	≤ 15 g	-	12 g ± 1 g	-	< 70 g	75 g ± 5 g

PERFORMANCE FOR KITPR016, KITPR018 (H22), KITPR022 (PR22)			
PARAMETER	KITPR016	KITPR018 (H22)	KITPR022 (PR22)
Operating temperature range	-46 °C to +71 °C	-55 °C to +125 °C	-40 °C to +85 °C
Storage temperature range	-46 °C to +71 °C	-55 °C to +125 °C	-40 °C to +85 °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 KITPR023 (H27), KITPR027 (PR27), KITPR040, KITPR055, KITPR060, KITPR085							
PARAMETER	KITPR023 (H27)		KITPR027 (PR27)	KITPR040	KITPR055	KITPR060	KITPR085
	TET = 120°	TET = 124°					
Operating temperature range	-55 °C to +90 °C	-54 °C to +71 °C	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +100 °C	-55 °C to +110 °C	-43 °C to +90 °C
Storage temperature range	-55 °C to +125 °C	-64 °C to +90 °C	-40 °C to +85 °C	-46 °C to +71 °C	-40 °C to +100 °C	-65 °C to +120 °C	-55 °C to +90 °C
Rotation humidity (max.)	-		-	5 % to 95 %	-	-	5 % to 95 %
Thermal deviation at U/2 over operational temperature range	-			≤ 0.04 %	-		

Note
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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
		018		103 = 10K	D = 0.1 %		
				202 = 2K0	C = 0.25 %		
				222 = 2K2			
				471 = 470	B = 0.5 %		
				472 = 4K7			
				103 = 10K			
		022		472 = 4K7	A = 1 %		
				502 = 5K0	C = 0.25 %		
		023		502 = 5K0	A = 1 %		
				222 = 2K2	B = 0.5 %		
		027		472 = 4K7	A = 1 %		
					P = 0.3 %		
		040		103 = 10K	D = 0.1 %		
		055		622 = 6K2	L = 0.2 %		
		060	2	103 = 10K			
		085	1	252 = 2K5	U		

Note

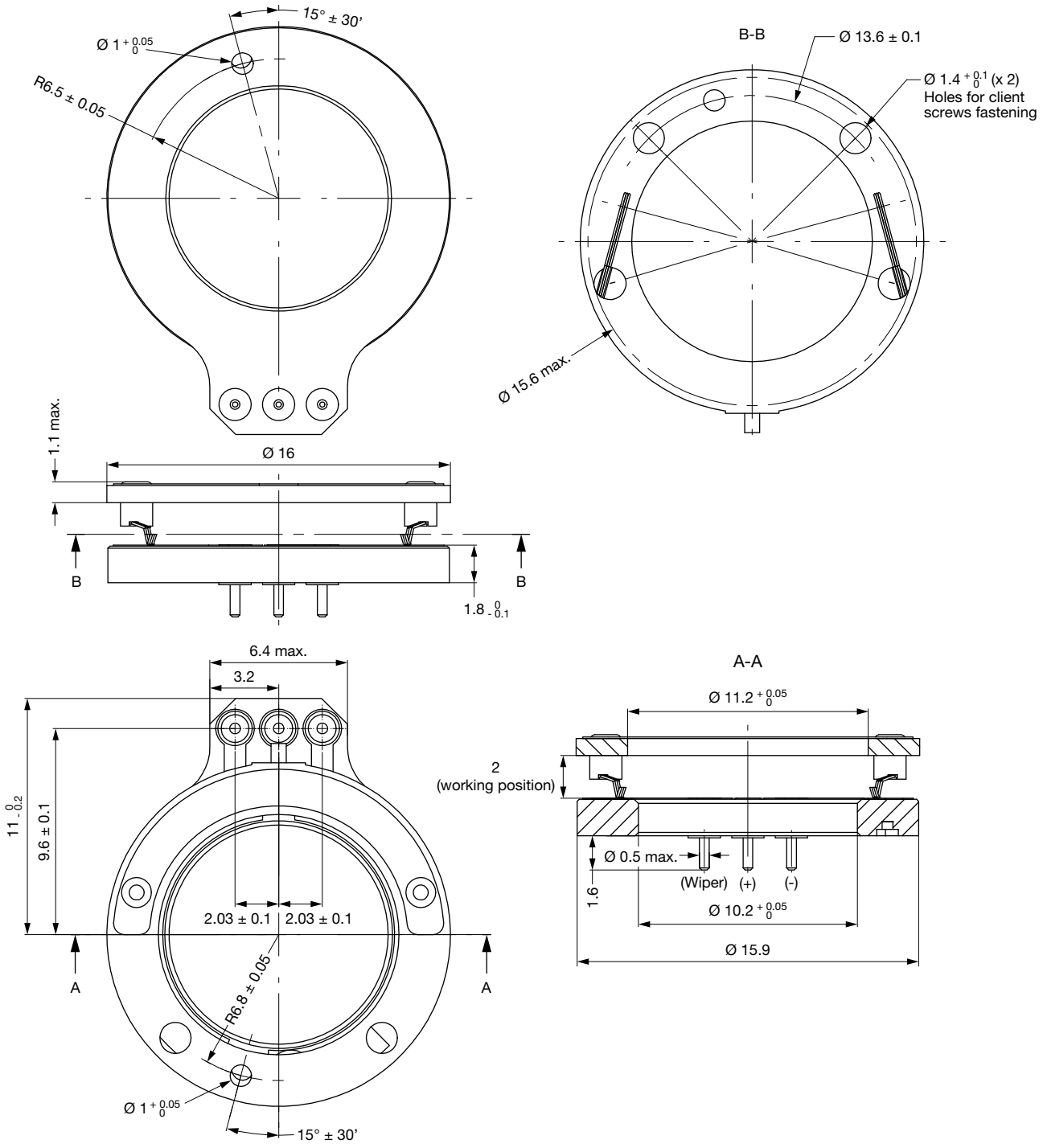
- See “Electrical Specifications” for the angle

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DIMENSIONS in millimeters

KITPR016

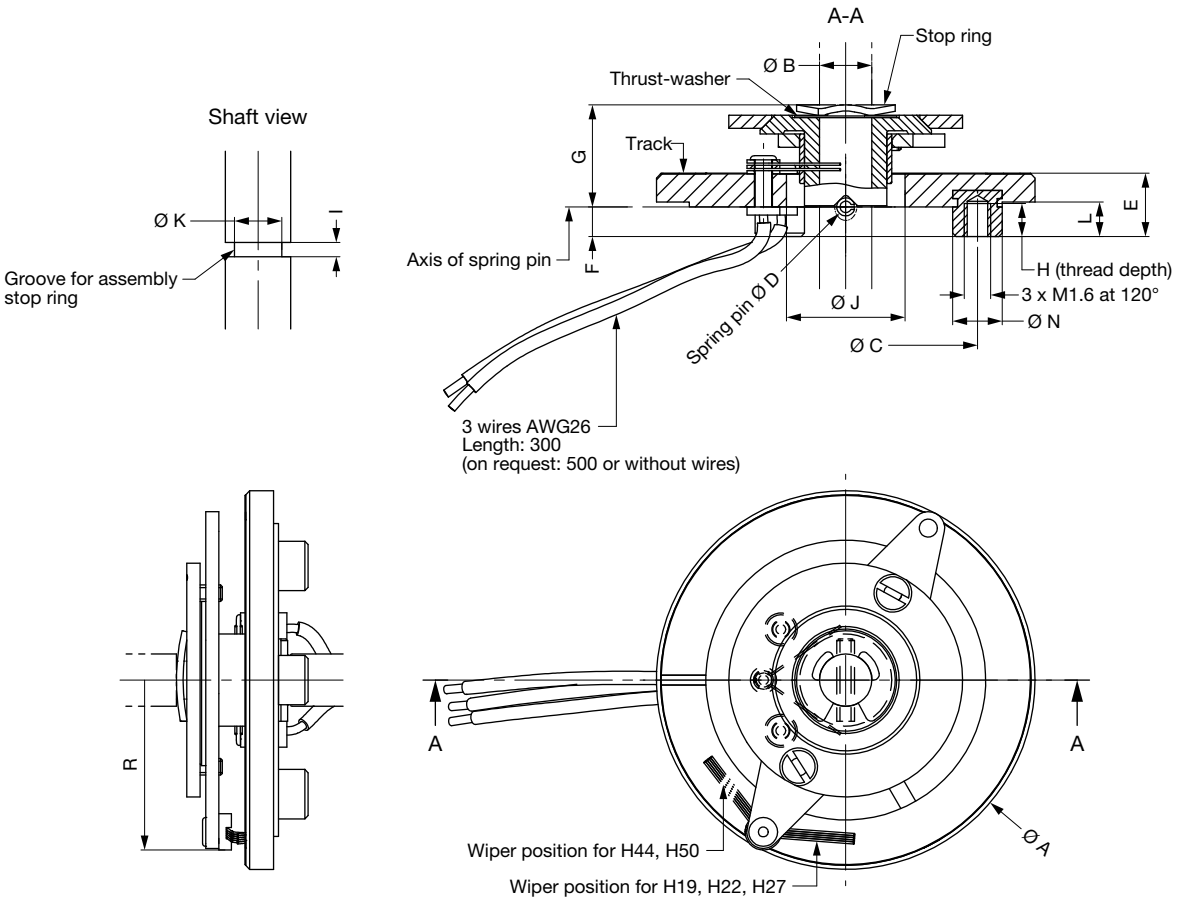


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DIMENSIONS in millimeters

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

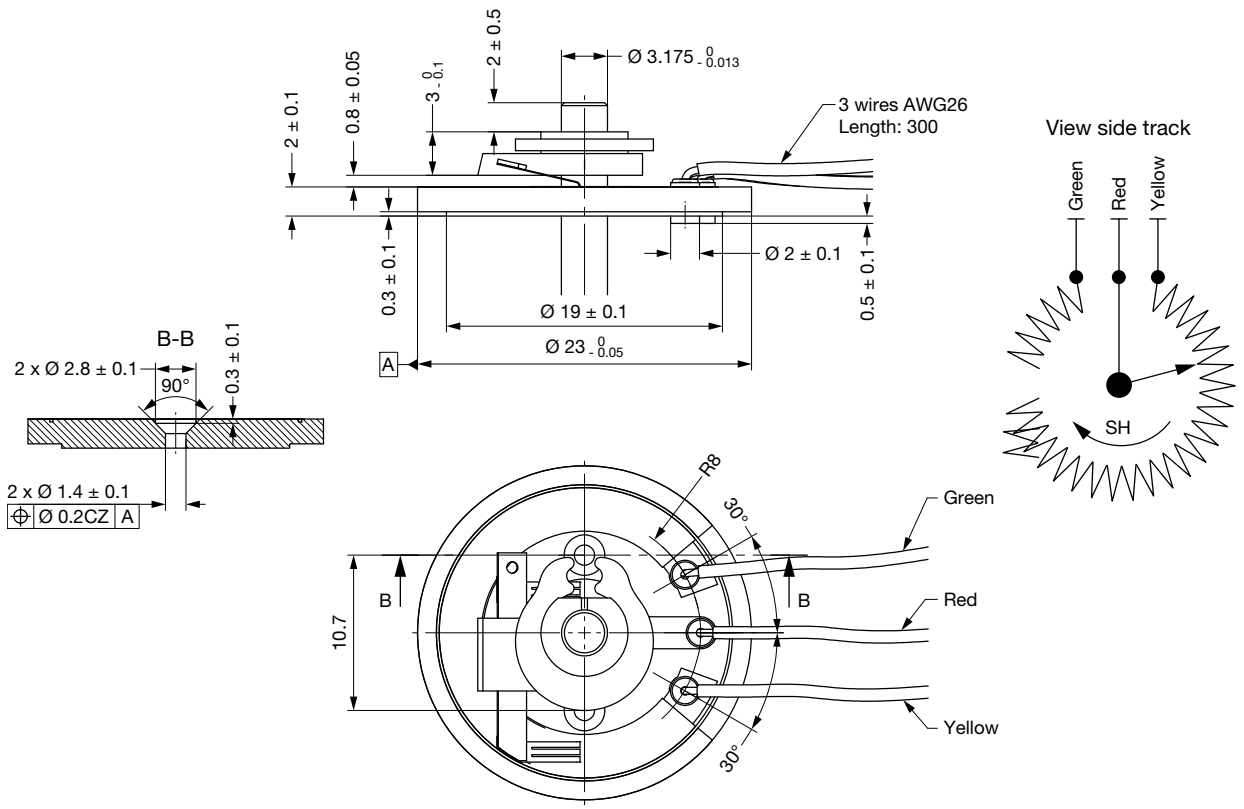
- On request: Ø 2.5 with 3 x M1.2

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DIMENSIONS in millimeters

DESIGN ON REQUEST FOR KITPR023

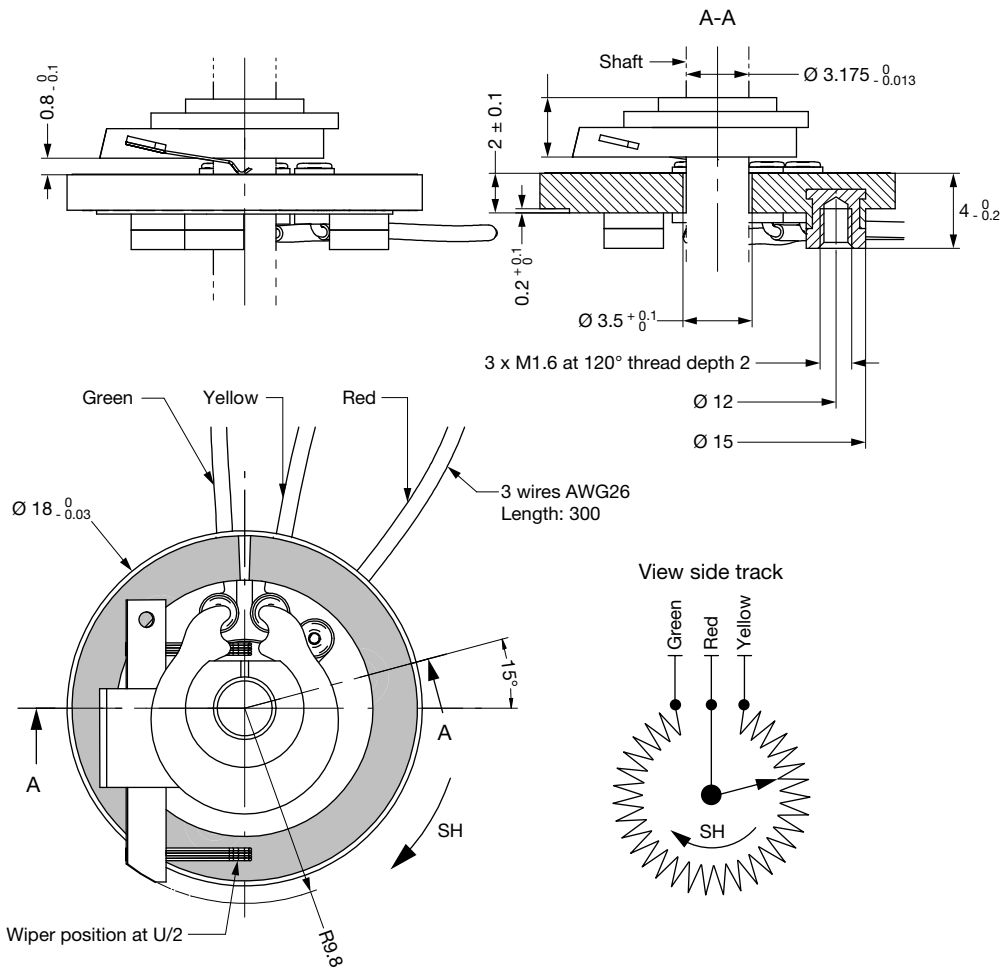


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DIMENSIONS in millimeters

KITPR022

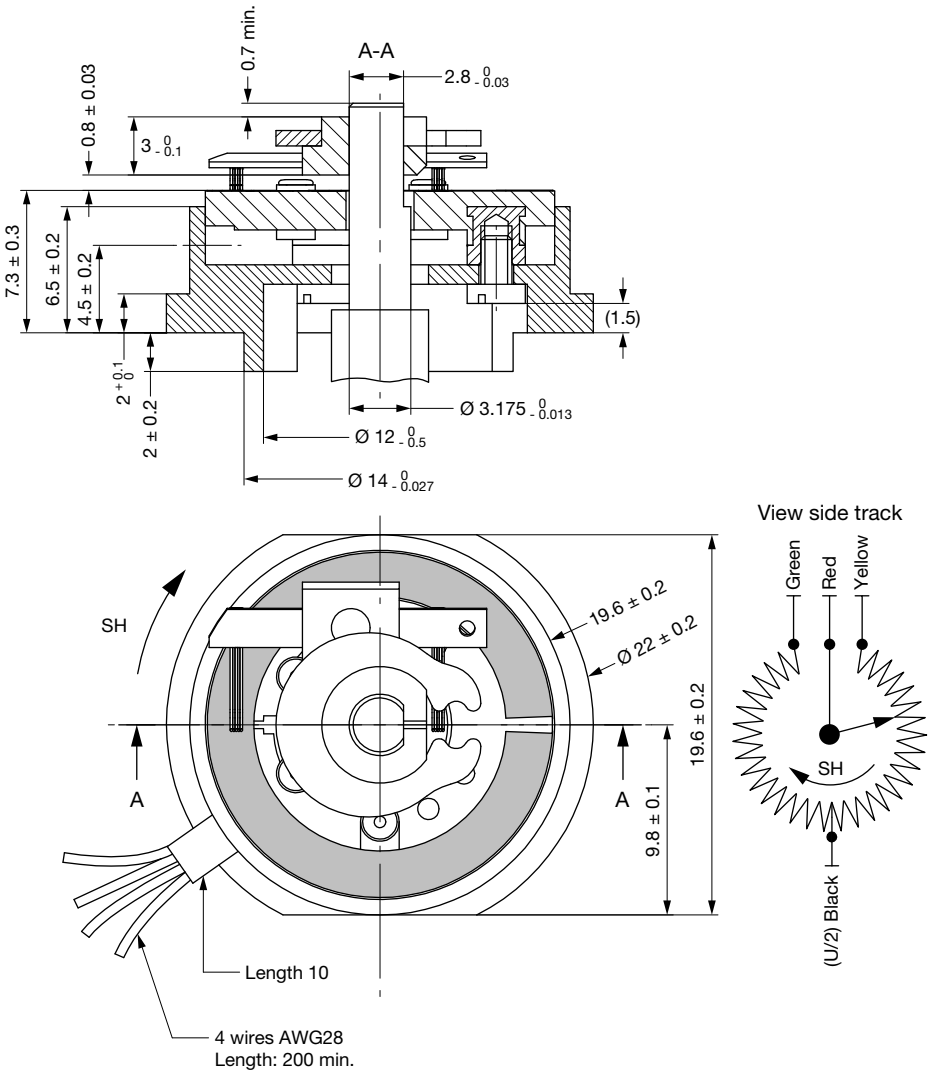


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DIMENSIONS in millimeters

DESIGN ON REQUEST FOR KITPR022

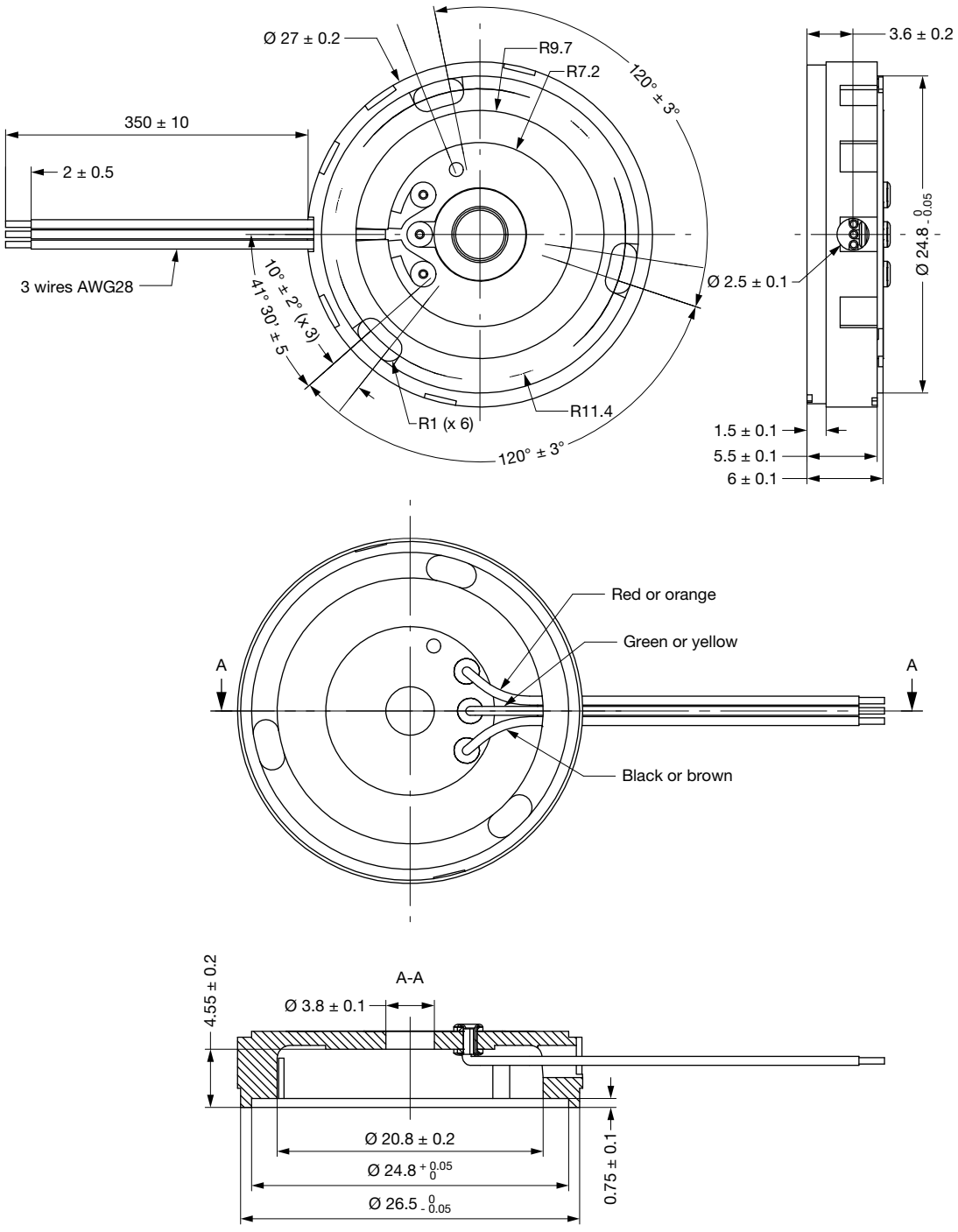


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DIMENSIONS in millimeters

KITPR027

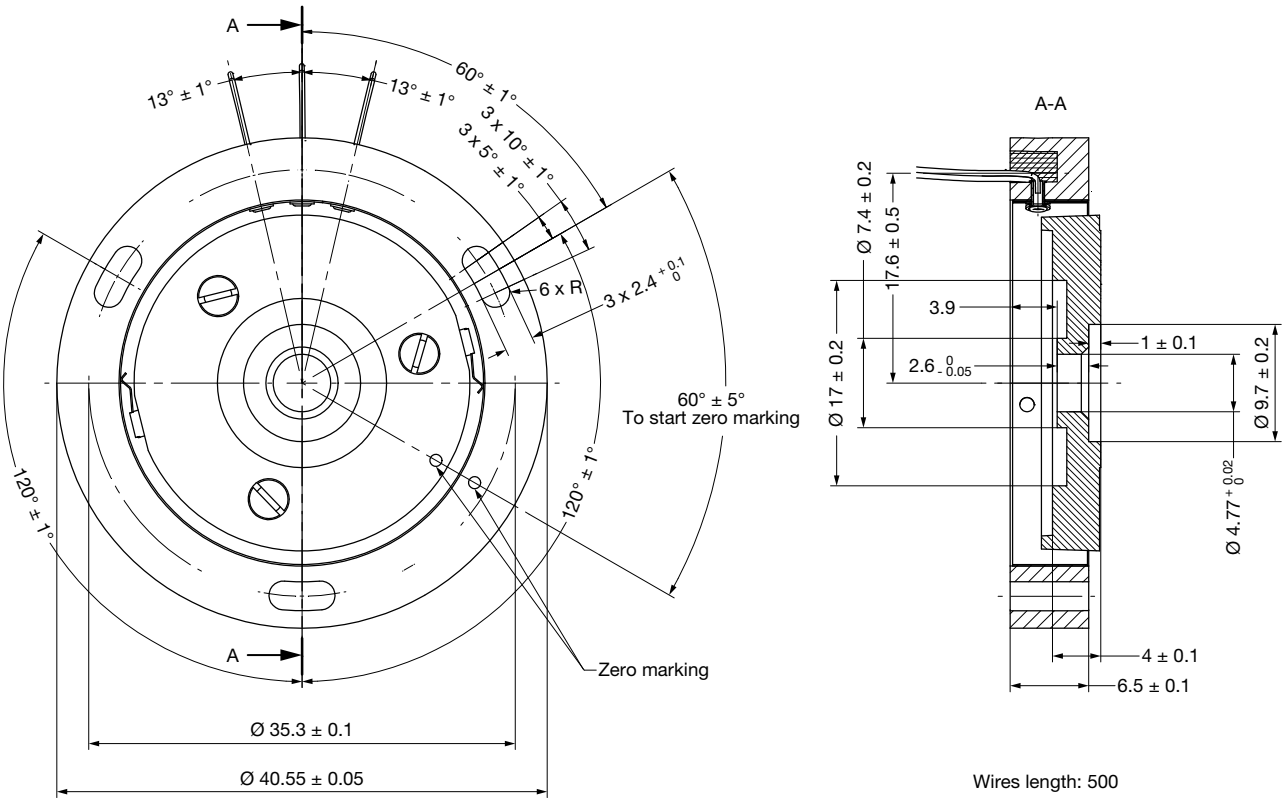


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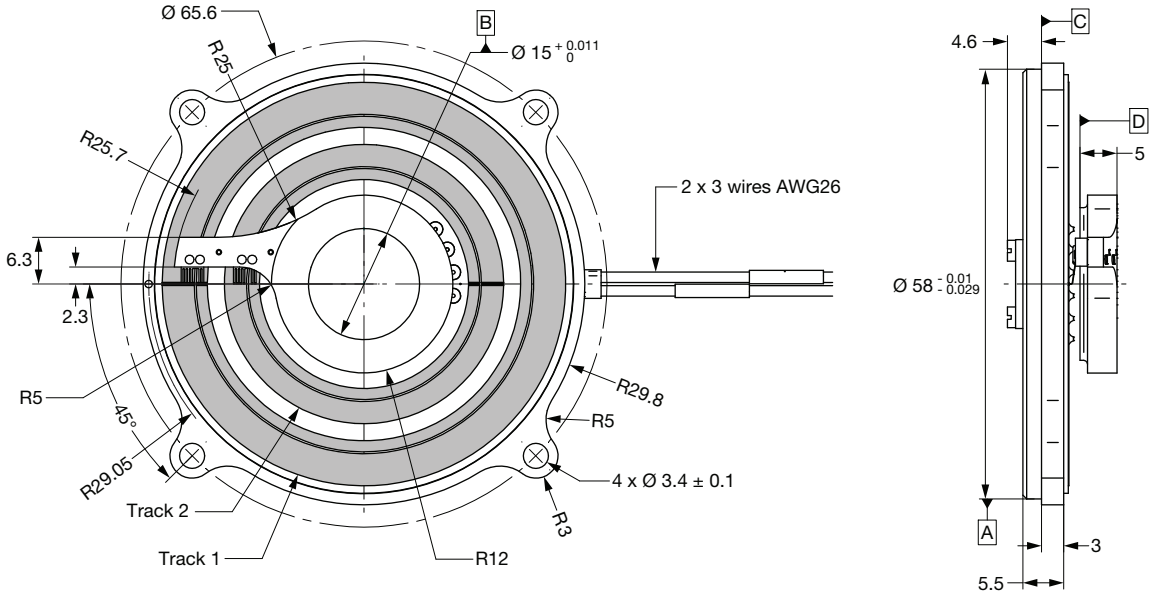
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DIMENSIONS in millimeters

KITPR040 (Analog Output)



KITPR060 (Redundant Functions)

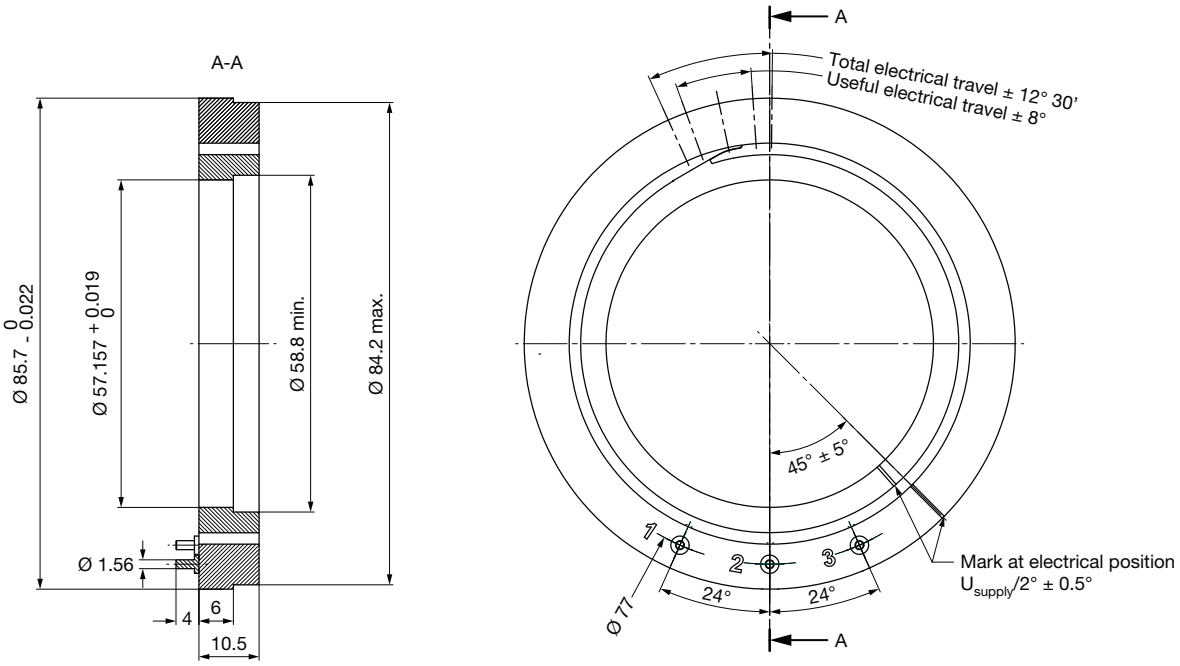


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DIMENSIONS in millimeters

KITPR085 (Analog Output)



OPTIONS (on request)

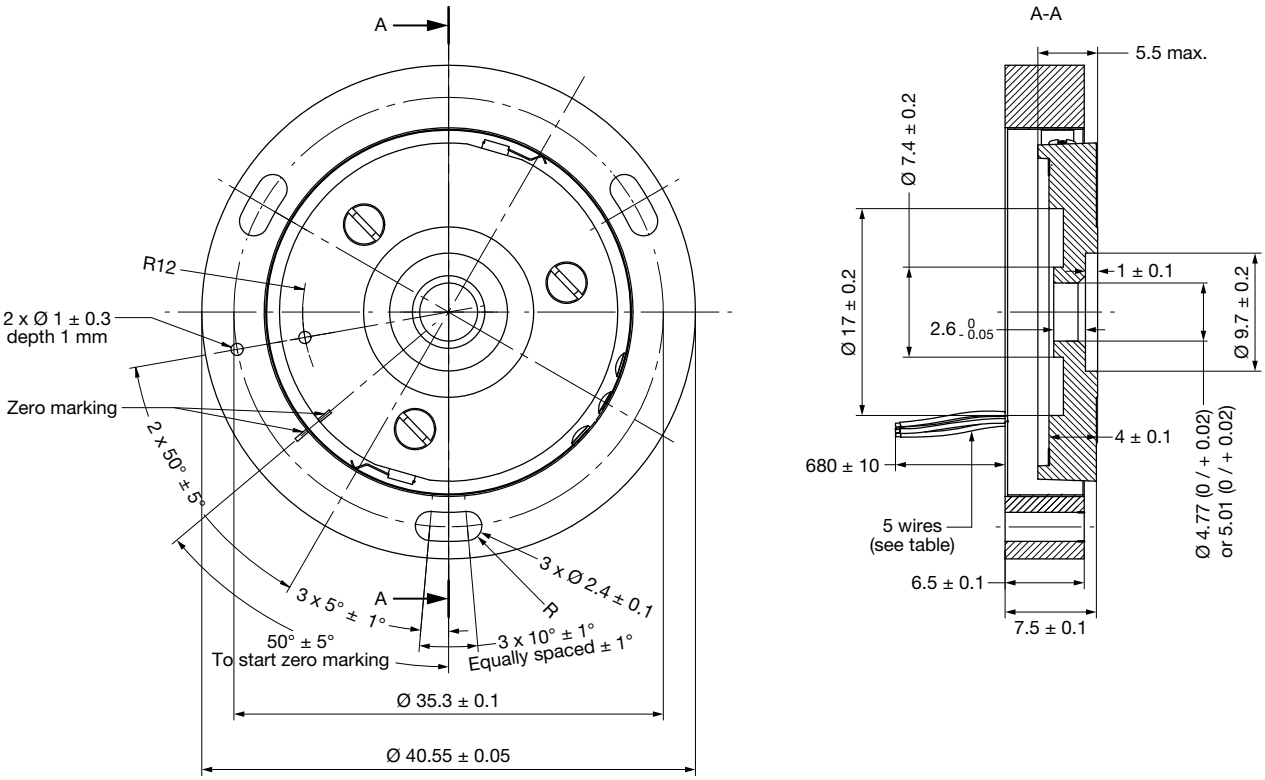
- Other ohmic values (R_n): consult us for all values between 470 Ω and 10 kΩ, and out of this range also
- Other tolerances on R_n
- Other linearities
- Other theoretical electrical travels
- Other dimensions
- Middle tap: KITPR022 U/2 ± 1°
- KITPR040: digital output SPI
  - Operating voltage: 5 V ± 5 %
  - With absolute linearity ± 0.1° max. within ± 39.9°
    ± 0.2° max. from -45° to -40°
    ± 0.2° max. from +40° to +45°
  - Thermal deviation at U/2 over operational temperature range ≤ 0.05°
  - Gradient at ± 45°: 655.36 bits/°
  - Weight: 12.5 g ± 1.5 g
  - Power dissipation: 150 mW min.
  - Current supply: 12 mA max.
- The active resistive track could be also mounted at the outer diameter to use the potentiometer with an outer wiper. All dimensions are feasible (to consult us)

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DIMENSIONS in millimeters

KITPR040 (Digital Output)



NAME	COLOR MARK ON WIRE	FUNCTION
P5VA	Red	Voltage supply high (+5 V)
AGND	Black	Voltage supply low (GROUND)
DCLK	White	CLOCK
OUT	None	Data output line
CSN	Yellow	Convert start not

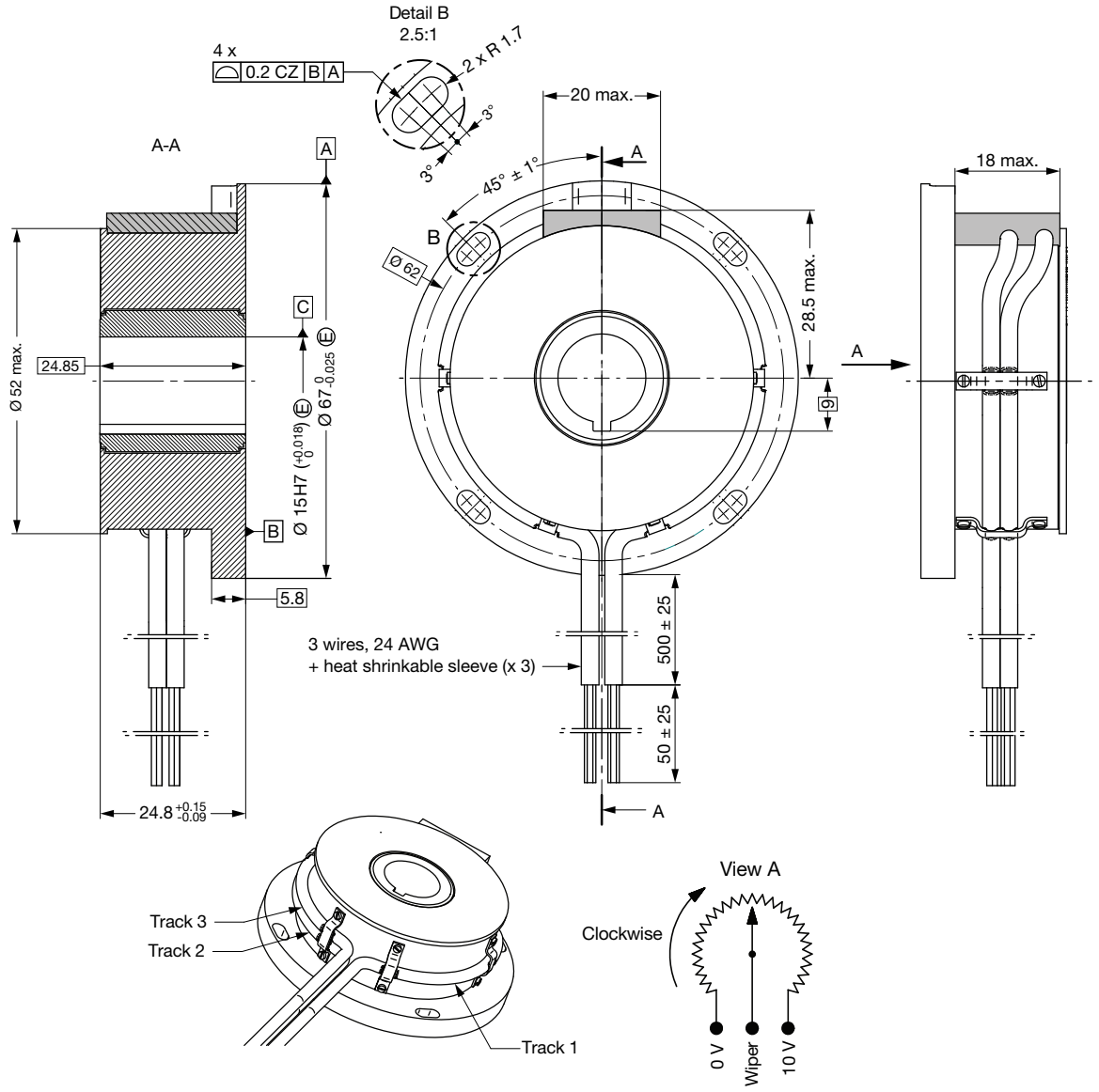
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- SDPOR0057: redundant functions
  - Functions quantity: 3
  - Theoretical electrical travel (TET): 300°
  - Useful electrical travel (UET): ± 145°
  - Ohmic value 5 kΩ ± 20 %
  - Independent linearity: ± 0.25 %
  - Mechanical travel: 300°

DIMENSIONS in millimeters

SDPOR0057 (Redundant Functions)



WIRE IDENTIFICATION	
COLOR	**FUNCTION**
Yellow	0 V
Red	Wiper
Green	10 V

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