TKM100 series

Main features

The multi-turn absolute encoder is a very complex device to which one or more reduction gears are connected in cascade to the main shaft. Each reduction gear is composed of different sprocket wheels that allow to reach a reduction ratio 10:1 or 16:1 and of a disc that codes the turns made by the input shaft of the gear itself.
Therefore, the main shaft resolution disc of the encoder is multiplied by the reduction ratio and by the number of gears.
In theory, it is possible to connect an endless number of reduction gears, but, at the moment, a practical limit of three has been fixed, which allow the multiplication of the basic resolution by a 1,000 (10x10x10) or by 4,096 (16x16x16).

Thanks to these features, the multi-turn absolute encoder can code a high number of positions. These positions can represent both linear and rotary displacements and are absolutely reliable even after mechanical displacement, when the system is not connected to power supply.
The maximum available resolution is: 33,554,432 points equivalent to 8192 positions per 4096 turns.

ERMEC.COM

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www.ermec.com
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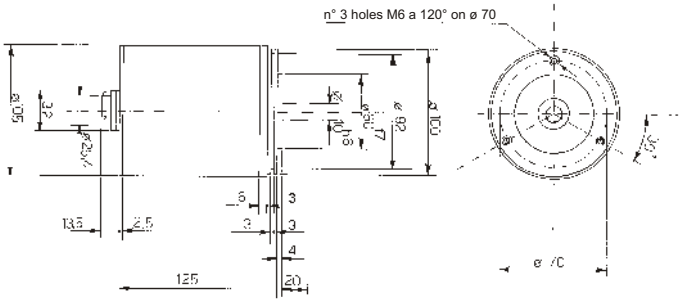

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TECHNICAL DATA SHEET: TKM100 series

TECHNICAL CHARACTERISTICS

Code	**G** Gray **D** BCD **B** Binary **E** Gray Excess 3
Resolution	CODE G o B: 2 - 4 - 8 - 16 - 32 - 64 - 128 - 256 - 512 - 1024 - 2048 - 4096 - 8192 CODE D o E: 10 - 20 - 100 - 200 - 250 - 400 - 500 - 1000 - 2000 - 4000 CODE D o E: 36 - 72 - 90 - 144 - 180 - 288 - 360 - 720 - 900 - 1440 - 1800 - 2880 - 3600
Number of turns	CODE G o B: 16 - 256 - 4096 CODE D o E: 10 - 100 - 1000

MECHANICAL CHARACTERISTICS

Assembly	**SG** Servo - Brackets
Dimensions	See drawings
Mass	1,55 kg
Slewing speed	10,000 rpm for short period; 6,000 rpm for normal operation; 2.000 rpm with shaft seal
Shaft diameter	10 mm - 9,52 mm - 8 mm - 6 mm
Shaft seal	Available
Starting torque at 25°C	
Ball bearing working life	10^9 revolutions min.
Shaft loading	Axial 200 N; radial 200 N

MATERIALS

Mainframe	"Al" thermally stabilised
Housing	"Al" anodised
Shaft	Stainless steel
Light source	GaAsAl infrared light emitting diode MTFB 10^5 hrs min.

ENVIRONMENTAL CHARACTERISTICS

Operating temperature	-10 ÷ +70 °C
Storage temperature	-30 ÷ +80 °C
Humidity	Up to 98 % RH without condensation
Protection	**K1** IP 55 for DIN 40050; **K5** IP 65 for DIN 40050; **K6** IP 66 for DIN 40050
Vibrations	10 g (10 ÷ 2000 Hz)
Shock	20 g for 11 m

ELECTRICAL CHARACTERISTICS

Voltage supply	5 V ±5 % 11/30 V
Protection	Against polarity reverse (not 5 Vcc)
Frequency range (T=-10°C ÷ + 70°C)	0 ÷ 20 KHz (L.S.B. without error)
Output	**00** TTL standard (positive logic) only 5 V **20** PNP 100 mA standard Open collector (positive logic) **21** PNP 100 mA standard pull-down resistor included (positive logic) **22** NPN 100 mA standard Open collector (negative logic) **23** NPN 100 mA standard pull-down resistor included (negative logic) **30** PUSH-PULL 100 mA (positive logic) **Snnx** SSI interface I (*)

CONNECTION CONFIGURATIONS

P axial cable gland with 1÷ 6 m
S26 axial 26 pin MIL connector
S32 axial 32 pin MIL connector
S07 axial 07 pin MIL connector
S12 axial 12 pin MIL connector
S17 axial 17 pin MIL connector
D25 axial 25 pin connector
D37 axial 37 pin connector

OPTIONAL FUNCTIONS

U Up/Down NPN
W Up/Down PNP
L Latch NPN
P Latch PNP
S Strobe
M Enable NPN
E "Even" o even parity
O "Odd" o odd parity
R Reverse (inverted code)
Z Zero set NPN
V Zero Signal

(*) nn = number of bit that do compose the protocol (13, 21, 24, 25, 26)
x = bit alignement on the right (D), on the left (S), at center (C)

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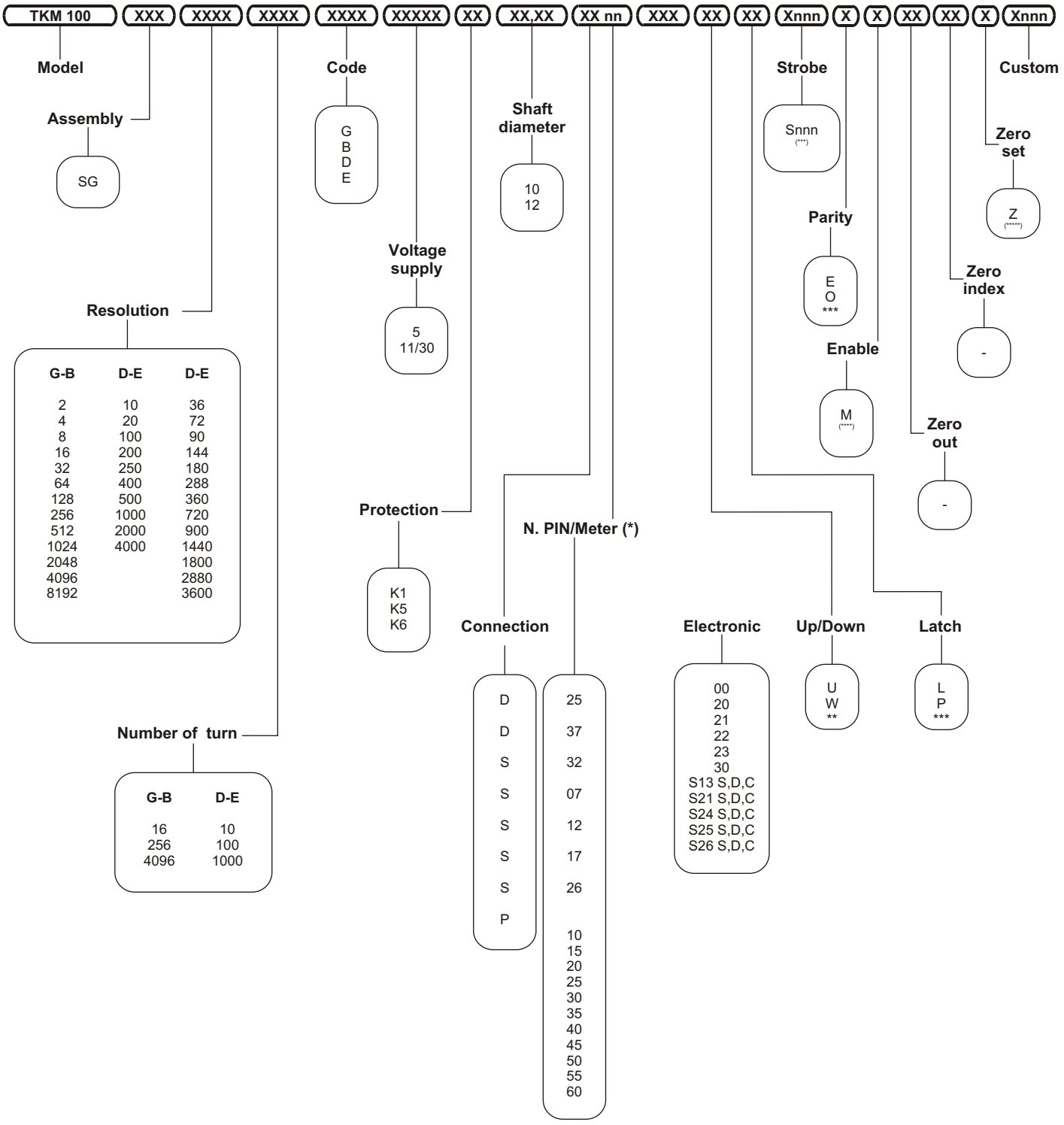
Order code: TKM100 series



(*) 10 = 1,0 m … 60 = 6,0 m
(**) included in series price
(***) unique option which includes always the Latch, Strobe and Parity signal (included always when ordering B binary code); indicate only Snnn, where the 1st and 2nd figure = pulse length in µs the 3rd = multiplyer (nr of "0" to be added).
Example: 201 = 20 x 10 = 200 µs; 104 = 10 x 10.000 = 100.000 µs
(****) is always included with electronics 00, 20 and 22
(*****) optional

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