TMCS-28 Hardware Manual

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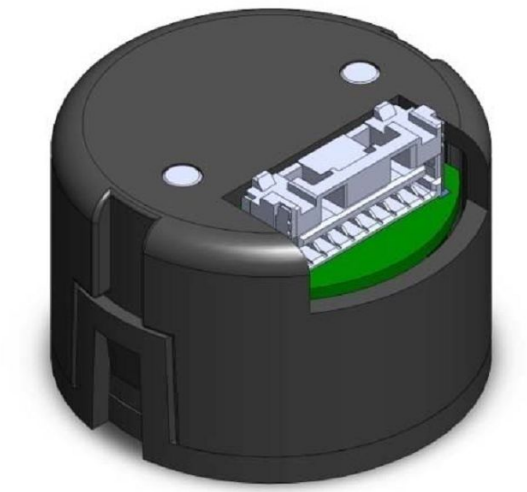
TMCS-28 is a low-cost and small-size optical incremental encoder for use with stepper motors and 3-phase PMSM/BLDC motors. It comes with high resolution optical code wheels with a resolution of up to 10.000 lines (40.000 counts).



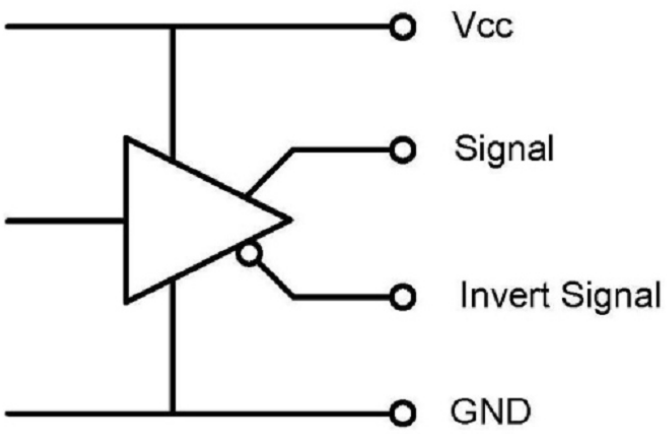
Features

- Low Cost
- High Resolution
- Small Dimension
- Easy Mounting

Applications

- Stepper Motor FOC
- Servo Motors
- Precision Motion Control
- Automated Equipment
- Robotics

Simplified Block Diagram



Read entire documentation.

TRINAMIC
MOTION CONTROL

Contents

1 Order Codes

Order Code	Description	Size (LxWxH)
TMCS-28-5-10000-AT-01	Encoder Module 28mmm diameter, Resolution of 10.000lpr (40.000cpr), ABN, 5mm shaft diameter, TTL	28mm x 28mm x 18mm
TMCS-28-6.35-10000-AT-01	Encoder Module 28mmm diameter, Resolution of 10.000lpr (40.000cpr), ABN, 6.35mm shaft diameter, TTL	28mm x 28mm x 18mm
TMCS-28-5-1024-AT-01	Encoder Module 28mmm diameter, Resolution of 1.024lpr (4.096cpr), ABN, 5mm shaft diameter, TTL	28mm x 28mm x 18mm
TMCS-28-6.35-1024-AT-01	Encoder Module 28mmm diameter, Resolution of 1.024lpr (4.096cpr), ABN, 6.35mm shaft diameter, TTL	28mm x 28mm x 18mm
TMCS-28-KIT	TRINAMIC TMCS-28 encoder kit including encoder housing, 1x TMCS-28-5-10000-AT-01, 1x TMCS-28-6.35-10000-AT-01, cable loom and assembly tools	100mm x 150mm x 30mm
TMCS-28-1024-KIT	TRINAMIC TMCS-28 encoder kit including encoder housing, 1x TMCS-28-5-1024-AT-01, 1x TMCS-28-6.35-1024-AT-01, cable loom and assembly tools	100mm x 150mm x 30mm

Table 1: Order codes

Other encoder resolutions, signal output types, and shaft diameters on request.

2 Technical Specifications

2.1 Mechanical and Electrical Parameters

Parameter	Min	Typ	Max	Unit
Supply voltage	4.5	5	5.5	V
Supply current			110	mA
Rise/fall time			10	ns
Frequency			1500	kHz
Output Voltage "'H"'	2.4			V
Input Voltage "'L"'			0.4	V
Max. output current			20	mA
Resolution (TMCS-28-x-10000-AT-01)		10.000		lpr (lines per rotation)
Resolution (TMCS-28-x-10000-AT-01)		40.000		cpr (increments per rotation)
Resolution (TMCS-28-x-1024-AT-01)		1.024		lpr (lines per rotation)
Resolution (TMCS-28-x-1024-AT-01)		4.096		increments (increments per rotation)

Table 2: Electrical Characteristics

Parameter	Min	Typ	Max	Unit
Hollow Diameter (symbol D in drawings)		5 / 6.35		mm
Shaft Loading Axial			50	N
Shaft Loading Radial			80	N
Max. RPM			6000	rpm
Net weight		30		g

Table 3: Mechanical Specifications

Parameter	Description
Operating Temperature	-20 – +85°C
Storage Temperature	-20 – +85°C
Operating Humidityl	RH 85% max, non collecting
Shock	490 m/s^2, 3Dx2 times
Vibration	1.2mm, 10-55kHz, 3Dx30min
Protection	IP40

Table 4: Environmental Specifications

2.2 Signals and Connection

Pin Number	Color	Signal Name
1	Red	VCC
2	Black	GND
3	White	A+
4	White/Black	A-
5	Green	B+
6	Green/Black	B-
7	Yellow	Z+
8	Yellow/Black	Z-
9	Blue	Shield

Table 5: Connector and cable pinning and signals

The required encoder cable connector is a Molex type 5023800900 CLIK-MATE™ crimp housing using Molex type 5023810000 CLIK-MATE™ crimp terminals.

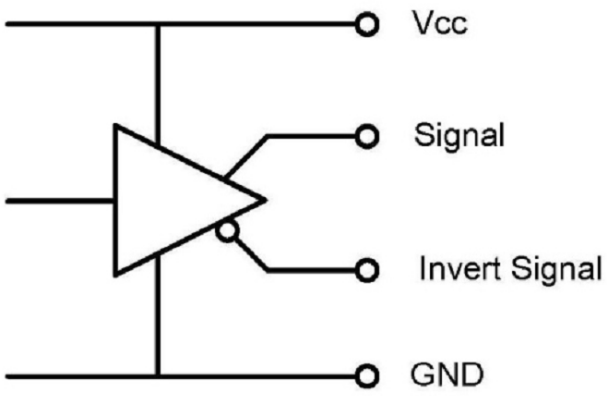


Figure 1: Connection and circuit diagram for the line driver outputs

2.3 Wave Form

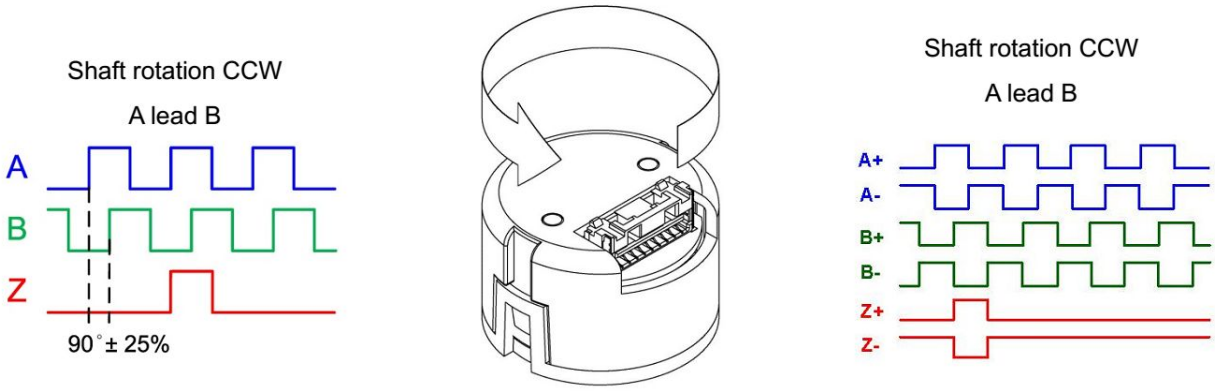


Figure 2: Example wave form for CCW rotation

2.4 Mechanical Drawings

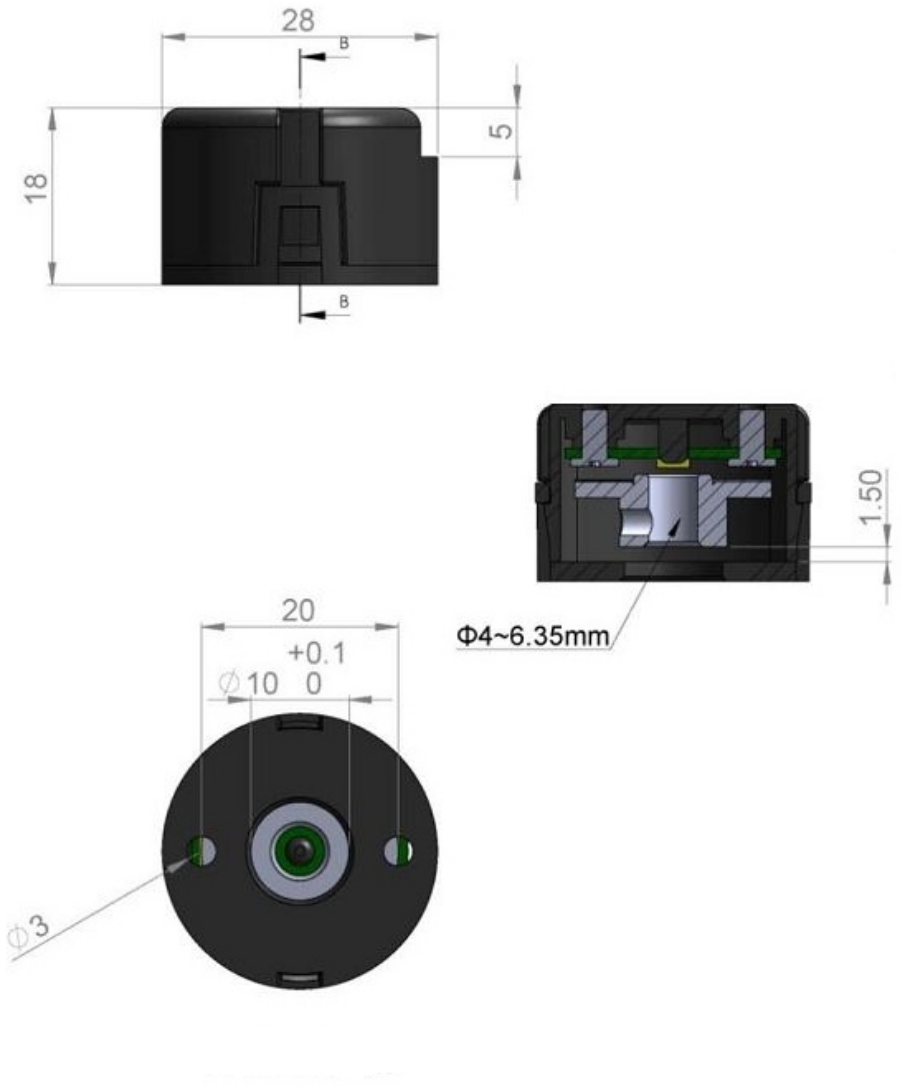


Figure 3: Bottom view, side view, and cut view (units = mm)

2.5 Motor Assembly

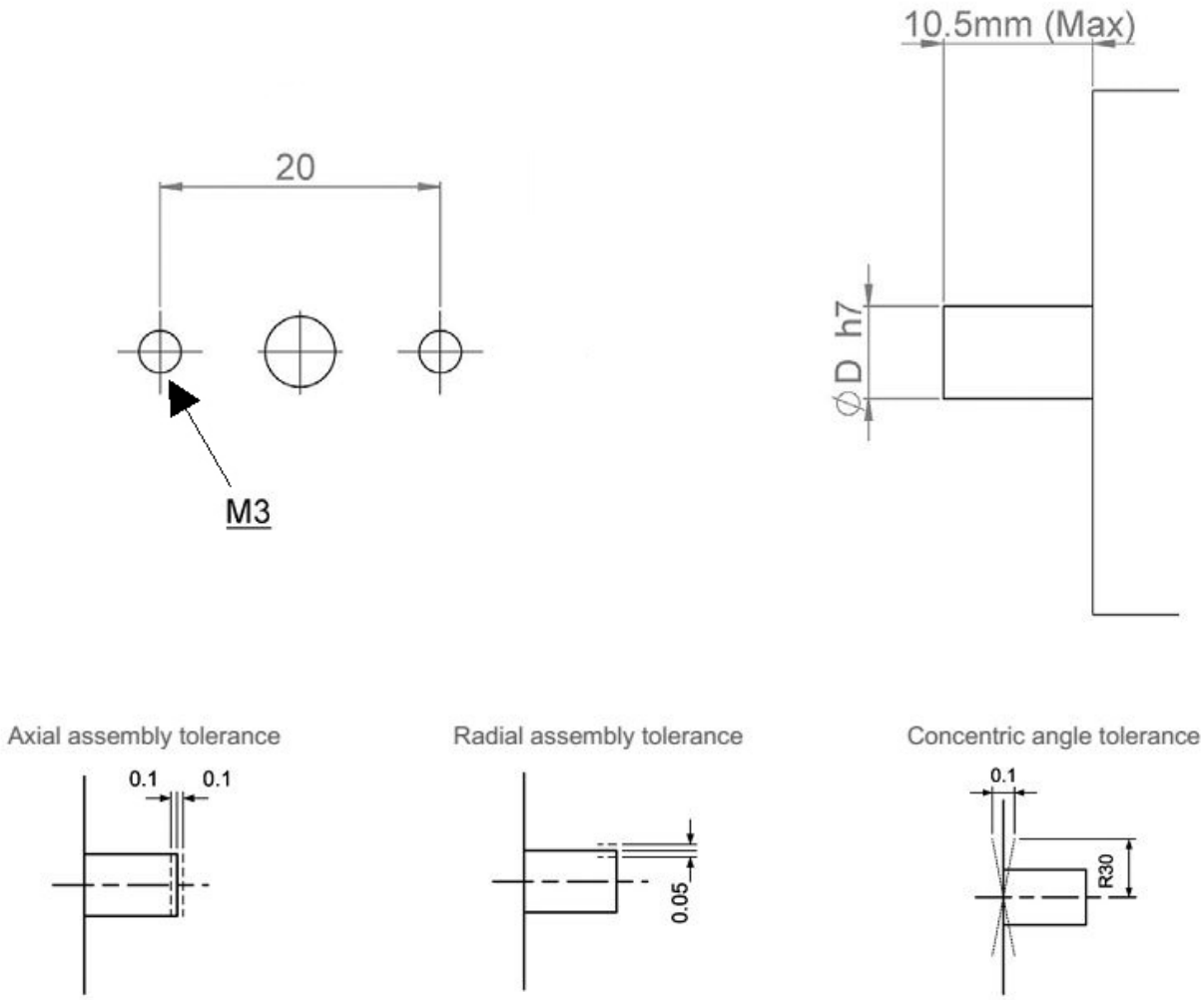


Figure 4: Required dimensions for motor assembly (units = mm) / D = 5mm or 6.35mm

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5 Supplemental Directives

5.1 Producer Information

5.2 Copyright

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