

DATASHEET

HEAVY DUTY ABSOLUTE ROTARY ENCODER SSI



Robust rotary sensor based on reliable magnetic technology. It's stainless steel housing and high protection class of IP69K make the MCD Heavy Duty resistant against active chemical cleaning, high-pressure water and corrosion. Combined with the sturdy ball bearings (for high shaft loads up to 300N) this sensor is an ideal choice for reliable measurement under extreme environmental conditions and outdoor applications. The POSITAL MCD Series uses the Wiegand effect technology to keep perfect track of the number of rotations even if the rotations are slow and/or there is no system power. The system comes without backup batteries making it maintenance free as well as ROHS compliant.

Main Features

- Heavy Duty Design
- IP69K Protection Class (EN 60529)
- 300 N Shaft Load
- Shock resistance: 300 g (EN 60068-2-27)
- Interface: SSI (Synchronous-serial Interface)
- Preset input

Mechanical Structure

- Stainless Steel flange
- Stainless Steel housing
- Stainless steel shaft
- Sturdy ball bearings

Applications

- Construction Machinery
- Cranes
- Trucks
- Elevators
- Offshore and Marine Equipment

Electrical Features

- Polarity inversion protection
- Over-voltage-peak protection

MAGNETIC ABSOLUTE ROTARY ENCODER SSI

Technical data

Electrical data

Clock input	Via opto-coupler
Data output	Line-driver according to RS 422
Clock frequency	100 kHz - 2 MHz
Supply voltage V_s	MCD-S1XXX- 10 - 30 V DC (absolute maximum ratings) * MCD-SMXXX- 4.5 – 5.5V DC (absolute maximum ratings) *
Turn on time	< 1 s
Power consumption	about 0.25 W
Electrical lifetime	> 10 ⁵ h
EMC	Emitted interference: EN 61000-6-4 Noise immunity: EN 61000-6-2

* Supply voltage according to EN 50 178 (safety extra-low voltage)

Sensor data

Singleturn technology	magnetic 2 axis Hall sensor
Singleturn resolution	up to 16384 steps / revolution (14 Bit)
Singleturn accuracy	± 0.35°
Internal cycle time Singleturn	< 600 µs
Multiturn technology	self supplied magnetic pulse counter (Wiegand Sensor)
Multiturn range	can measure up to 200 Billion revolutions, limited by memory

Environmental Conditions

Operating temperature sensor	- 30 ... + 85 °C (-22 ...+185 °F)
Storage temperature	- 30 ... + 85 °C (-22 ...+185 °F)
Humidity	98 % (without liquid state)
Protection Class (EN 60529)	IP 69 K

MAGNETIC ABSOLUTE ROTARY ENCODER SSI

Mechanical data

Housing	Stainless Steel
Flange	Stainless steel
Shaft	Stainless Steel
Lifetime	Dependent on shaft version and shaft loading – refer to table
Max. shaft loading	axial 300 N, radial 300 N
Friction torque at + 25°C	≤ 3 Ncm (2.8 oz-in)
RPM (continuous operation)	max. 6.000 RPM
Shock	
EN 60068-2-27	≤ 300 g (half sine, 6 ms XYZ)
MIL-STD-810C	≤ 200 g (half sine, 3 ms XYZ)
Permanent shock	
EN 60028-2-29	≤ 30 g (half sine, 16 ms XYZ)
MIL-STD-810C	≤ 30 g (half sine, 11 ms XYZ)
Vibration	
EN 60068-2-6	≤ 30 g (10 Hz ... 1,000 Hz, XYZ)
MIL-STD-810	≤ 4.2 g (5 Hz ... 500 Hz XYZ)
Weight (standard version)	≈ 350 g (0.77 lbs)

Minimum (mechanical) lifetime

Flange	Lifetime in 10 ⁸ revolutions with (F _a /F _r)		
S10 Synchro flange (MCD-... S10G-...)	7.6 (300N/300N)	10 (270N/270N)	200 (100N/100N)

MAGNETIC ABSOLUTE ROTARY ENCODER SSI

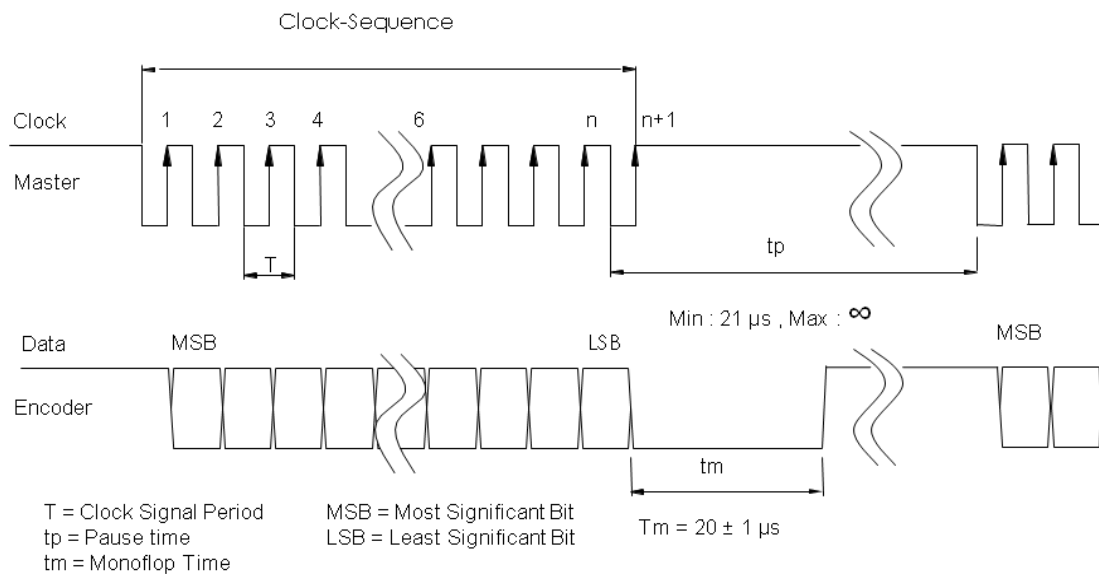
Interface

Synchronous Serial Interface (SSI)

Driver	Driver meets EIA standard RS 422; transmission rates up to 10 MBit/s
Transfer	Transfer distance up to 1.200 m
Transmission	Balanced transmission provides high noise immunity, shielded and twisted pair lines are essential to attain extremely high noise immunity

Protocol SSI

Detailed SSI-Interface description under [technical description SSI interface](#)



MAGNETIC ABSOLUTE ROTARY ENCODER SSI

Electrical connection

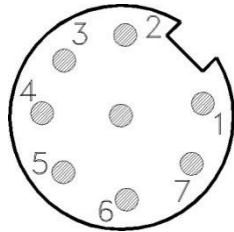
Connection plan

Function	Connector Pin-No.
GND	1
Supply Voltage +Vs	2
SSI Clk+	3
SSI Clk-	4
SSI Data+	5
SSI Data-	6
Preset	7
Complement / DIR	8

Connector (front view)

M12 Connector

MCD-XXXX-XXXX-XXXX-P8M



8 pin M12 connector male

MAGNETIC ABSOLUTE ROTARY ENCODER
SSI

Preset Function

Voltage Level	Function
Input not connected or GND	inactive
Input $\geq 10V$ for MCD-S1XX 10-30V types Input $\geq 4.0V$ for MCD-SMXX 5V types	Preset is activated (*). The Encoder value will be set to 0 in the moment the Preset Level will change to inactive again (falling flange)
max Input Voltage = V_S	
Input Resistance	10 kOhm

(*) The Preset needs to be activated for at least 1 second before the falling Edge will be detected

Complement Function / DIR - function

Voltage Level	Encoder counting direction for clockwise rotation (view on shaft)
Input not connected or GND	Up
Input $\geq 10V$ for MCD-S1XX 10-30V types Input $\geq 4.0V$ for MCD-SMXX 5V types	Down
max Input Voltage = V_S	
Input Resistance	10 kOhm

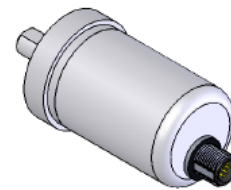
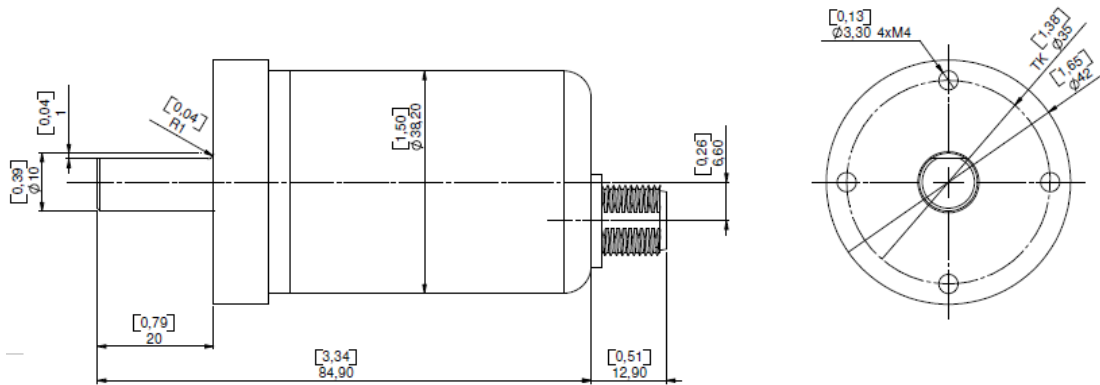
It takes 1 sec before the change take effect. The Encoder value is inverted after the Complement / DIR is activated..

MAGNETIC ABSOLUTE ROTARY ENCODER
SSI

Mechanical Models

Synchro Flange

MCD-XXXX-XXXX-S10G-XXX



all dimensions mm [inch]

For IGES Drawing and STEP 3D Model please refer our website under [mechanical drawings](#) or contact us.

MAGNETIC ABSOLUTE ROTARY ENCODER
SSI

Models / Ordering Description

Description	Type key				
Interface / Voltage	SSI – 30Vdc	S1			
	SSI – 5Vdc	SM			
Version		00			
Code	Gray		G		
	Binary		B		
Bits for Revolutions	Single turn			00	
	Multi turn (4.096 turns)			12	
	Multi turn (8.192 turns)			13	
Steps per revolution (Bits)	4096 (0.09°)			12	
Flange	Synchro flange (10 mm shaft diameter)			S	
Shaft diameter					10
Mechanical options	Heavy duty / stainless steel				G
Connection	Connector 8pol M12				P8M

Standard = bold, further models on request

Disclaimer

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