# **Rotary Position Technology** Absolute Encoders, Multiturn

# Absolute, Multiturn Type RM-109

# Bearing-Lock





Temperature range



High IP



capacity













## **Highest Robustness**

• Sturdy bearing construction in Bearing-Lock design for particularly high resistance.

speed

- Extra large bearings.
- Mechanically protected shaft seal.
- Protection level IP66, IP67 and IP69k in one device.
- Wide temperature range -40 °C to +85 °C.
- · Without gear and without battery, thanks to the Energy Harvesting technology.



resistant

#### **Up-To-The-Minute Fieldbus Performance**

- LSS services for configuration of the node address and baud rate.
- Variable PDO mapping in the memory.
- Universal scaling function.
- Configuration management (bootloader).

Compact · Can be used where space is tight: overall diameter is 36 mm.

## **Mechanical Characteristics:**

Max. speed:	4000 RPM 2000 RPM (continuous)	
Starting torque (68 °F   20 °C):	< 1.4 oz - in (0.01 Nm)	
<b>Shaft load capacity:</b> Radial: Axial:	18 lbs (80 N) 9 lbs (40 N)	
Weight:	approx. 0.44 lbs (0.2 kg)	
Protection acc. to EN 60529/DIN 40050-9:	IP66, IP67, IP69K	
Working temperature range:	-40 to +185 °F (-40 to +85 °C)	
Materials: Shaft: Flange: Housing: Cable:	Standard stainless steel: V2A(304) aluminum zinc die-cast PVC	/N72 (stainless steel) V4A (316) V4A (316) V4A (316) —
Shock resistance acc. to EN 60068-2-27:	500 g (5000 m/s²), 4 ms	
Vibration resistance acc. to EN 60068-2-6:	30 g (300 m/s²), 10 - 2,000 Hz	

# CANopen

# Absolute, Multiturn Type RM-109

## **General Electrical Characteristics:**

Sensor:	
Power supply:	10 - 30 VDC
Current consumption (no load):	max. 30 mA
Reverse polarity protection at power supply (+V):	yes
Short-circuit protected outputs:	yes <sup>1)</sup>
e1 compliant acc. to (pending):	EU guideline 2009/19/EC (acc. to EN 55025, ISO 11452 and ISO 7637)
UL approval:	file E356899
CE compliant acc. to:	EMC guideline 2014/30/EU RoHS guideline 2011/65/EU

## **General Information about CANopen**

The CANopen encoders support the latest CANopen communication profile according to DS301 V4.02 . In addition, device-specific profiles like the encoder profile DS406 V3.2, DS305 (LSS) and DS302 (Bootloader) are available.

The following operating modes may be selected: Polled Mode, Cyclic Mode, Sync Mode. Moreover, scale factors, preset values, limit switch values and many other additional parameters can be programmed via the CANbus. When switching the device on, all parameters, which have been saved on a flash memory to protect them against power failure, are loaded again.

The following output values may be combined in a freely variable way as PDO(PDO mapping): **position, speed, acceleration** as well as the **status of the working area.** 

The encoders are available with a connector or a cable connection.

The device address and baud rate can be set/ modified by means of the software.

The two-color LED located on the back indicates the operating or fault status of the CAN-bus, as well as the status of the internal diagnostics.

## **CANbus connection**

The CANopen encoders are equipped with a bus trunk line in various lengths or a M12 connector and can be terminated in the device.

The devices do not have an integrated T-coupler nor are they looped internally and must therefore only be used as end devices.

## **Standard Wiring:**

Connection Type:	+V	Common (0 V)	CAN GND	CAN High	CAN Low
Cable:	BN	WH	GY	GN	YE
M12 Eurofast:	2	3	1	4	5

#### Extended failure management for position sensing

- User interface with visual display of bus and failure status 1 LED two colors
- Customer-specific protocol
- "Watchdog controlled" device

## Bootloader functionality DS302-3

Configuration Management:

- Program download Program start
- Program erase

## Wiring Diagram:



<sup>1)</sup>See Connectivity section H for corresponding cable color code.

# CANopen



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= over the entire temperature range

#### CAN high-speed acc. to ISO 11898, Basicand Full-CAN, CAN specification 2.0 B

< 1200 ms

< 1000 ms

max. 16,777,216 (24 bit)

default: 33,554,432 (25 bit)

scalable only via the total resolution 1 - 274,877,906,944 (38 bit), scalable

CANopen profile DS406 V4.0 with

10 - 1000 kbit/s software configurable

CIA LSS protocol DS305, global command

support for node address and baud rate,

selective commands via attributes of the

manufacturer-specific add-ons, LSS-Service, bootloader

1 - 127 software configurable

configuration management

 $^{1)}$  = short circuit protected to **0**v or to output when power supply correctly applied.

software configurable

identity object

CIA DS 302-3

bit)

±1°

±0.2 °

binarv

Interface Characteristics CANopen:

**Resolution singleturn:** 

Number of revolutions

Absolute accuracy<sup>2)</sup>:

Repeat accuracy:

Total resolution:

Power-ON time:

SDO timeout:

Node address:

Termination:

LSS protocol:

Bootloader:

LSS layer setting services DS305 V2.0

Global support of node-ID and baud rate

**CANopen Communication** 

integrated. (Class C2 functionality):

Profile DS301 V4.2

Heartbeat Protocol

Error Behavior Object

Identity Object

NMT Slave

Selective protocol via identity object (1018h)

Among others, the following functionality is

Variable PDO Mapping self-start programmable

(Power on to operational), 3 Sending PDO's

CANopen encoder profile DS406 V4.0

1 work area with upper and lower limit and

the corresponding output states variable

PDO mapping for position, speed, work

area status, error and acceleration

The following parameters can be programmed:

Node address, baud rate and CANbus

/ programmable termination

Event mode, start optional

Baud rate:

(multiturn):

Code:

Interface:

Protocol:

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# Rotary Position Technology Absolute Encoders, Multiturn

# Absolute, Multiturn Type RM-109

## Part Number Key: RM-109 Shaft Version

		Α	В	С		D		E		F	
		RM-109S	6	С	-	9D38B	-	H1151	/		
Α		Туре					C	)	Volt	age Supply	and Output Type
RM-109S	Ø 39 mm, Shaft w/ Flat, IP69K Shaft Seal					9D3	38B 10-	- 30 VDC, CA	Nopen DS 4	406 V4.0	
В		Shaft (	Ø×L)				E			Type of (	Connection
6	(Å 6 mana v 12 F m										

6	Ø 6 mm × 12.5 mm
8	Ø 8 mm $\times$ 15 mm
10	Ø 10 mm $\times$ 20 mm
AO	Ø 1/4" × 1/2"

С	Flange
С	Ø 42 mm Clamping Flange

	E	Type of Connection
Н	1151	Radial 1 × M12 Eurofast Connector
0	C1M	Radial Cable (1 m PVC)

F	Options	
(BLANK)	No Options	
N72	All Exposed Materials 316SST <sup>1</sup>	

<sup>1</sup> = only available with shaft '10' and connection 'H1151'

# Absolute, Multiturn Type RM-109

Dimensions: RM-109 Shaft Version

#### RM-109 Flange C Connection H1151



RM-109/N72 Flange C Connection H1151



## Mounting Advice:

The flanges and shafts of the encoder and drive should not be rigidly coupled together at the same time. We recommend the use of suitable couplings (see page G1, Accessories).

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