Data sheet
RM22D06_01
Issue 1, 19th December 2019

RM22 rotary magnetic encoder with AM4096

The RM22 is a compact, high-speed rotary magnetic encoder designed for use in harsh environments. The non-contact two part design removes the need for seals or bearings ensuring long-term reliability and simple installation.

The encoder comprises a magnetic actuator and a separate encoder body. Rotation of the magnetic actuator is sensed by a custom encoder chip within the body, and processed to give the required output format.

The encoder chip processes the signals received to provide resolutions to 12 bit (4,096 positions per revolution) with high operational speeds. Output signals are provided in industry standard absolute, incremental, analogue or linear formats.

The compact encoder body is just 22 mm in diameter and provides dirt immunity up to IP68.

The RM22 can be used in a wide range of applications including marine, medical, print, converting, industrial automation, metal working, motor control and instrumentation.

Product range

RM22IC

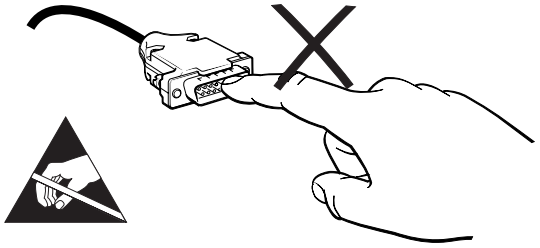
Incremental with 8 to 1,024 pulses per revolution (32 to 4,096 counts per revolution with x 4 evaluation)

RM22SC

Synchro serial interface (SSI) with 32 to 4,096 positions per revolution

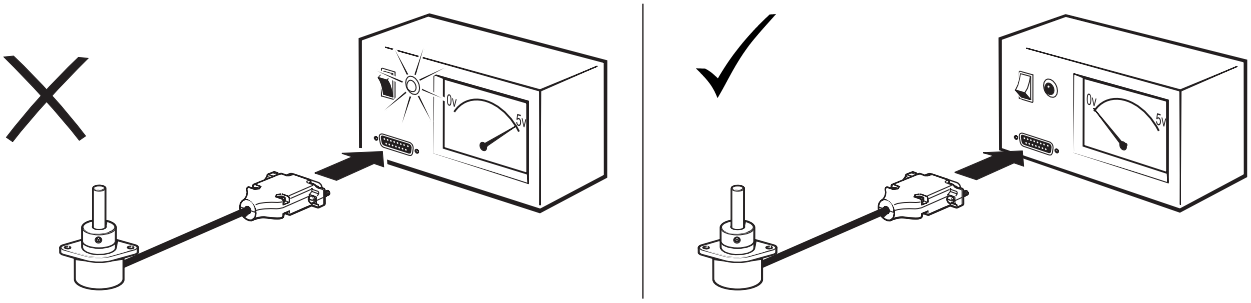
- **Excellent immunity to IP68**
- **Non-contact, frictionless design**
- **High speed operation to 30,000 rpm**
- **Compact - 22 mm diameter body**
- **Absolute - to 12 bit (4,096 positions per revolution)**
- **Industry standard absolute, incremental, analogue and linear output formats**
- **Accuracy to ±0.5°**
- **Simple installation**
- **RoHS compliant (lead free) - see Declaration of conformity**

Storage and handling

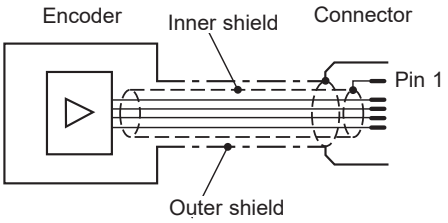


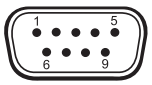
IMPORTANT: Power to RM22 encoders must be supplied from a DC SELV supply complying with the essential requirements of EN (IEC) 60950 or similar specification.

The RM22 series encoders have been designed to the relevant EMC standards, but must be correctly integrated to achieve EMC compliance. In particular, attention to shielding arrangements is critical.



Connections





D' type connector - 9 way

Pin nr.	RM22IC		RM22SC	
	Function	**Wire colour**	**Function**	**Wire colour**
1	Shield - see connection diagram			
2	Z	White	Clock	White
3	B	Green	Clock–	Brown
4	A	Grey	NC	–
5	V_{dd}	Red	V_{dd}	Red
6	Z–	Brown	Data	Green
7	B–	Yellow	Data–	Yellow
8	A–	Pink	NC	–
9	GND	Blue	GND	Blue

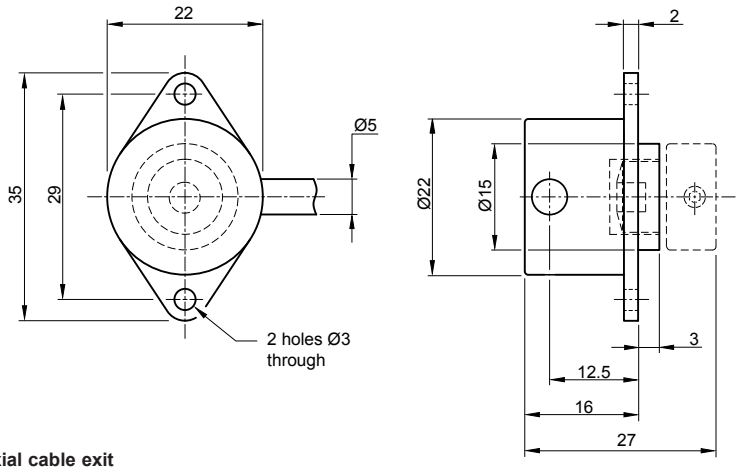
Operating and electrical specifications

EMC compliance	EN 61326
Cable	Outside diameter 5 mm
Connector options	'D' type connector - 9 way Flying lead
Mass	Encoder unit 1 m cable (no connector): 48 g; magnetic actuator: 12 g
Environmental sealing	IP64 (IP68 optional) EN 60529

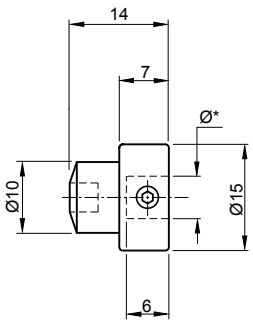
Dimensions

Dimensions and tolerances in mm

Radial cable exit

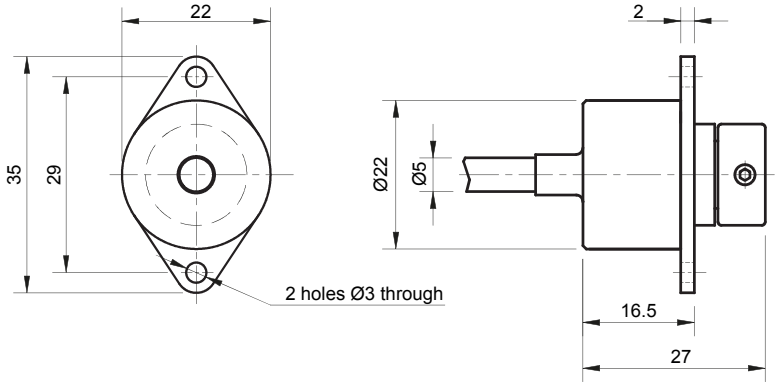


Magnetic actuator



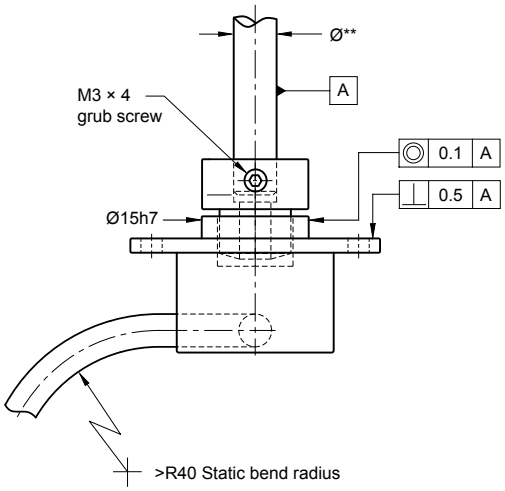
* Hole diameter for nominal shaft size.

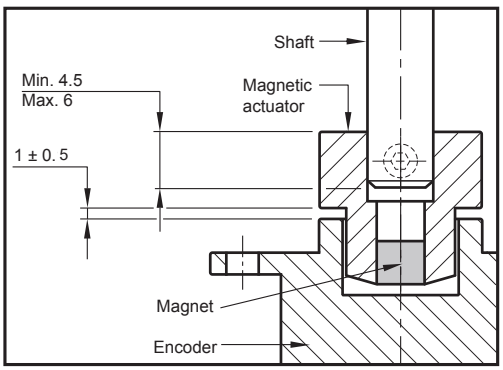
Axial cable exit



Clockwise (CW) rotation of magnetic actuator.

Installation drawing





** Nominal shaft size with tolerance h7.

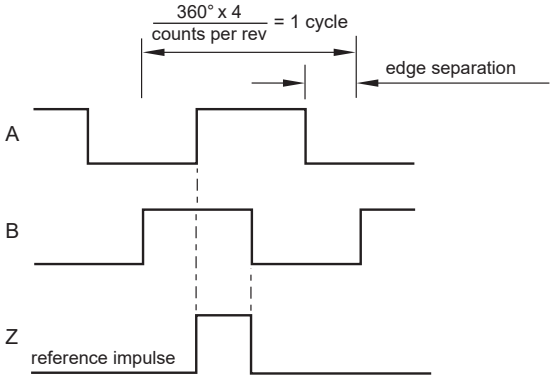
RM22IC – Incremental, RS422

Square wave differential line driver to RS422

Power supply	V_{dd} = 5 V ±5 %
Current consumption	Max. 35 mA
Output signals	A, B, Z, A–, B–, Z– (RS422)
Accuracy	±0.5°
Hysteresis	0.18°
Resolutions	32, 64, 128, 256, 512, 1,024, 2,048, 4,096 cpr
Maximum speed	60,000 rpm for resolutions up to 1,024 cpr 30,000 rpm for 2,048 and 4,096 cpr
Temperature Operating and storage	–40 °C to +125 °C (IP64) –40 °C to +85 °C (IP68)

Timing diagram

Complementary signals not shown



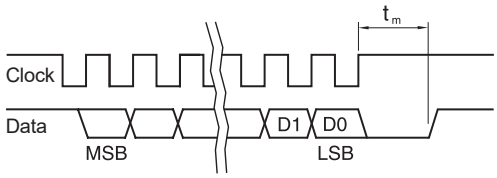
B leads A for clockwise rotation of magnet.

RM22SC / RM58SC – Absolute binary synchro-serial (SSI), RS422

Serial encoded absolute position measurement

Output code	Natural binary
Power supply	V_{dd} = 5 V ±5 %
Current consumption	Max. 35 mA
Data output	Serial data (RS422)
Data input	Clock (RS422)
Accuracy	Typ. ±0.5°
Hysteresis	0.18°
Resolutions	32, 64, 128, 256, 512, 1,024, 2,048, 4,096 cpr
Maximum speed	60,000 rpm for resolutions up to 1,024 cpr 30,000 rpm for 2,048 and 4,096 cpr
Temperature Operating and storage	–40 °C to +125 °C (IP64) –40 °C to +85 °C (IP68)

Timing diagram



Clock ≤ 4 MHz 12.5 µs ≤ t_m ≤ 20 µs

Position increases for clockwise rotation of magnet.

Part numbering

Encoder system = Encoder body + Magnetic actuator

=

+

Encoder body part number
eg **RM22SC0009B10A1B96**

Magnetic actuator
eg **RMA06A2A00**

RM22 SC 00 09B 10 A 1 B 96

Output type
IC - Incremental, RS422
SC - Absolute binary synchro - serial (SSI), RS422

Shaft size
00 - N/A

Resolution
For **IC** and **SC** (counts/positions per revolution):

Binary		
05B - 32	**08B** - 256	**11B** - 2048
06B - 64	**09B** - 512	**12B** - 4096
07B - 128	**10B** - 1024	

Cable length
10 - 1 meter (or 10 meters if **0M** special reqirement is chosen)

Special requirements
9M - With AM4096 and cable length in meters
96 - With AM4096 - up to 12 bit

Environment and material
B - IP64, Aluminium body (standard)
C - IP68, Aluminium body
J - IP68, Stainless steel body (for Body style 1 only)

Body style and cable exit
1 - Flanged body, radial cable exit
4 - Flanged body, axial cable exit

Connector option
A - 'D' type connector - 9 way
F - Flying lead (no connector)

Magnetic actuator ordering information

Actuator for integration onto shaft

Shaft = Ø*h7
Fixing: Grub screw provided

* Hole diameter for nominal shaft size.

Part numbers:

For resolutions of 9 bit absolute (512 cpr incremental)

RMA04A2A00 - 4 mm dia shaft
RMA05A2A00 - 5 mm dia shaft
RMA06A2A00 - 6 mm dia shaft
RMA08A2A00 - 8 mm dia shaft
RMA10A2A00 - 10 mm dia shaft
RMA19A2A00 - 3/16'' dia shaft
RMA25A2A00 - 1/4'' dia shaft
RMA37A2A00 - 3/8'' dia shaft

For resolutions from 10 bit absolute (800 cpr incremental) and above

RMA04A3A00 - 4 mm dia shaft
RMA05A3A00 - 5 mm dia shaft
RMA06A3A00 - 6 mm dia shaft
RMA08A3A00 - 8 mm dia shaft
RMA10A3A00 - 10 mm dia shaft
RMA19A3A00 - 3/16'' dia shaft
RMA25A3A00 - 1/4'' dia shaft
RMA37A3A00 - 3/8'' dia shaft

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Document issues

Issue	Date	Page	Corrections made
1	19. 12. 2019	-	New document