



**α RM36**

**Description**

The RM36 is a high-speed magnetic rotary encoder designed for use in harsh industrial 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 the required output.

The encoder chip processes the signals received to provide resolutions to 12 bit (4096 positions per revolution) with operational speeds to 30,000 rpm. Resolution options include binary and decimal. Output signals are provided in industry standard absolute, incremental or linear formats.

The compact encoder body is 36mm in diameter and provides dirt immunity to IP68. The RM36 can be used in a wide range of applications, including marine, medical, print, converting, industrial automation, metal working, motor control and instrumentation.

**5V power supply**

RM36 I - incremental with 80 to 1024 pulses per revolution (320 to 4096 counts per revolution with x3 evaluation).

RM36 S - synchro serial interface (SSI) with 320 to 4096 positions per revolution.

**24V power supply**

RM36 P - absolute parallel interface with 512 positions per revolution.

RM36 I - incremental with 128 pulses per revolution (512 counts per revolution with x4 evaluation).

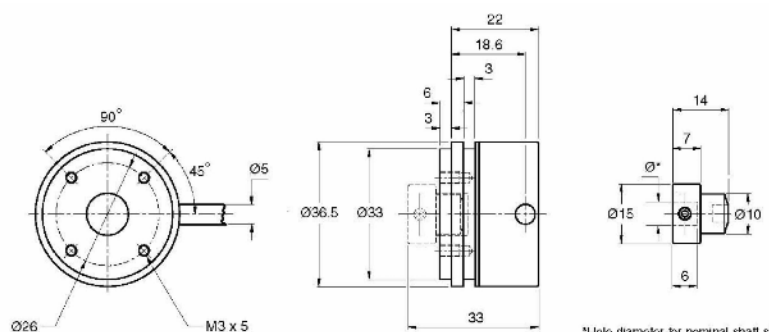
RM36 U - linear voltage output in a range of variants

RM36 C - linear current output in a range of variants

**System features**

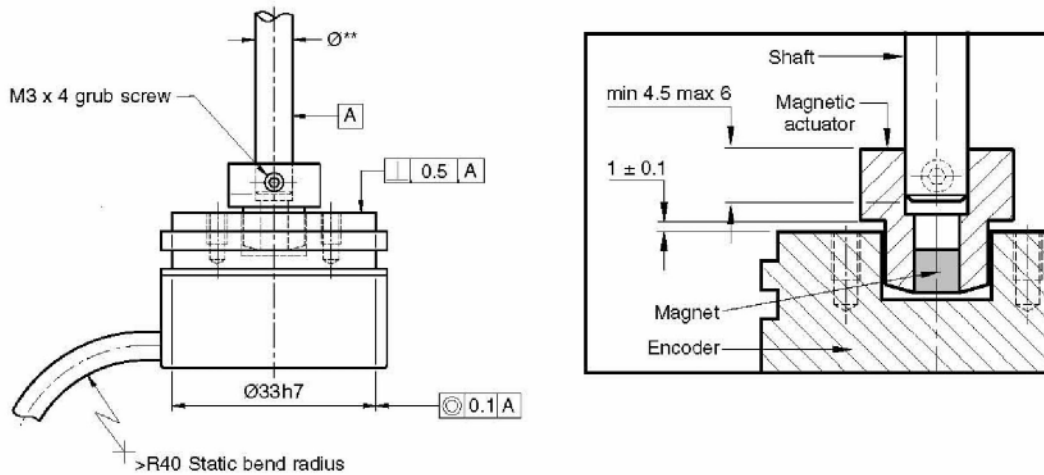
- Excellent immunity to IP68
- Non-contact, frictionless design
- High speed operation to 30,000 rpm
- 36 mm diameter body
- Industry standard absolute, incremental and linear output formats
- Binary and decimal resolution options
- Accuracy  $\pm 0.3^\circ$
- Simple installation
- Low inertia

**Dimensions (dimensions and tolerances in mm)**



\*1 hole diameter for nominal shaft size. See ordering information for available shaft sizes

■ Installation drawing



\*\*Nominal shaft size with tolerance h7.

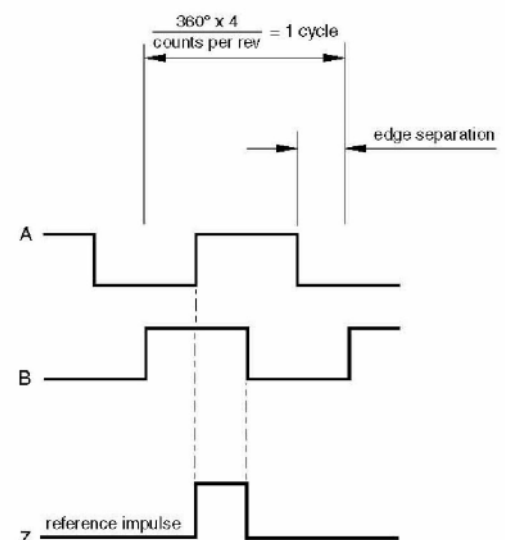
■ Electrical and operating specifications

Humidity	Storage 95% maximum relative humidity (non-condensing) (IEC 61010-1) Operating 80% maximum relative humidity (non-condensing) (IEC 61010-1)
Acceleration	Operating 500 m/s <sup>2</sup> BS EN 60068-2-7: 1993 (IEC 68-2-7:1983)
Shock non-operating	1000 m/s <sup>2</sup> , 6 ms, ½ sine BS EN 60068-2-7: 1993 (IEC 68-2-7:1987)
Vibration operating	100 m/s <sup>2</sup> max @ 55 to 2000 Hz BS EN 60068-2-6: 1996 (IEC 68-2-6:1995)
EMC compliance	BS EN 61326
Cable	Outside diameter 5 mm
Mass	Encoder unit 1 m cable (no connector) 85g. Magnetic actuator 12 g
Environmental sealing	IP64 (IP68 optional) BS EN 60529:1992

■ Electrical and operating specifications

RM36 I - Incremental outputs	
Square wave output	
Power supply	5V ± 5%
Power consumption	35 mA
Output signals	A, B, Z, A-, B-, Z-
Resolution options	320, 400, 500, 512, 800, 1000, 1024, 1600, 2000, 2048, 4096 counts per revolution
Hysteresis	0.2°
Accuracy	±0.3°
Max. cable length	20 m
Connector options	9 pin D-type plug (standard) flying lead
Temperature	Operating -25°C to + 85°C Storage -40°C to + 125°C
Maximum speed	20,000 rpm (10,000 rpm - 4096 counts p. rev)
Edge separation	1µs minimum

■ Timing diagram



B leads A for clockwise rotation of magnetic actuator

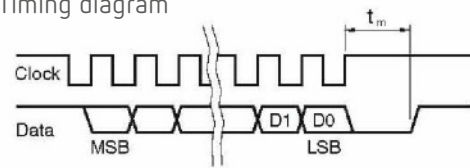


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**Installation drawing**

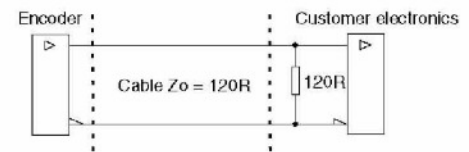
RM36 S - Binary synchro-serial interface (SSI)	
Serial encoded absolute position measurement	
Output code	Natural binary
Power supply	5V ± 5%
Power consumption	35 mA
Resolution options	320, 400, 500, 512, 800, 1000, 1024, 1600, 2000, 2048, 4096 positions per revolution
Hysteresis	0.2°
Accuracy	±0.3°
Repeatability	≤ 0.1 bit
Data outputs	Serial data (RS422A)
Data inputs	Clock (RS422A)
Max. cable length	100 m (at 1 Mhz)
Connector options	9 pin D-type plug (standard) flying lead
Temperature	Operating -25°C to + 85°C Storage -40°C to + 125°C
Maximum speed	20,000 rpm (18,000 rpm - 4096 counts p. rev)

Timing diagram



Clock = 50 kHz to 1 MHz  
 $t_m = 13 \mu s$  to  $20 \mu s$

Recommended signal termination  
(for data output lines only)

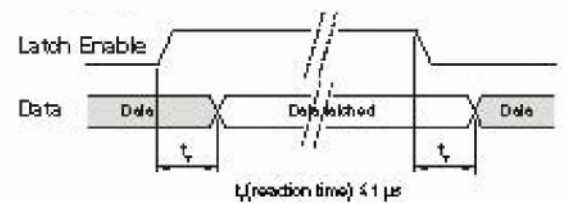


Position increases for clockwise rotation of shaft

**Output specifications - 24V supply**

RM36 P - Binary parallel interface	
Parallel absolute position measurement	
Output code	Natural binary
Power supply	24V ± 10%
Power consumption	See table
Output voltage	V > 23V at I ≤ 10mA
Variant A	V > 1V at I < 10mA
Resolution	9 bit (512 positions p. revolution)
Hysteresis	0.5 bit
Accuracy	± 1 bit
Output signals	D0 (LSB) - D8 (MSB)
Data inputs	LE - latch enable input signal, active high Maximum sampling rate 500 kHz
Max. cable length	10 m
Connector options	15 pin D-type plug (standard) flying lead
Temperature	Operating -25°C to + 85°C (+70°C variant B) Storage -40°C to + 125°C

Timing diagram



Position increases for clockwise rotation of magnetic actuator

**Electrical variants**

Variant	Type	Power consumption	Max Load
A	Push-pull	40 mA	30mA
B	Open Collector NPN	25 mA	2mA

<b>RM36 I - Incremental outputs</b>	
Square wave output	
Power supply	24V ± 10%
Power consumption	See table
Output signals	A, B, Z, A-, B-, Z- (variant A) A, B, Z (variant B)
Resolution	128 pulses per revolution (512 counts per revolution with x4 evaluation)
Hysteresis	0.5 count (± 0.7°)
Accuracy	± 1 count (± 0.7°)
Max. cable length	20 m
Connector options	9 pin D-type plug (standard) flying lead
Temperature	Operating -25°C to +70°C Storage -25°C to +125°C

**Edge separation**

Variant	Ideal	Typical	Min
5,000 rpm	19.5µs	10.5µs	5µs
90,000 rpm	3.9µs	2µs	0.5µs

**Electrical variants**

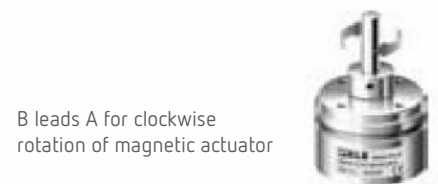
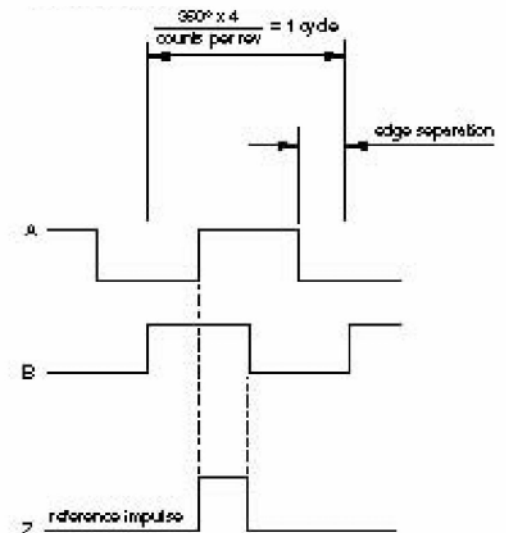
Variant	Type	Power consumption	Max Load
A	Push-pull	40 mA	30mA
B	Open Collector NPN	25 mA	2mA

<b>RM36 V - Linear voltage output</b>	
Power supply	Type I: +20V to +30 V DC Type II: ±12V to ± 16 V DC
Power consumption	40 mA typical
Output voltage	Type I: 0V to 10 V DC Type II: -10V to +10 V DC
Output loading	Max 10 mA
Linearity	1%
Max. cable length	20 m
Connector options	9 pin D-type plug (standard) flying lead
Temperature	Operating -25°C to +70°C Storage -25°C to +125°C

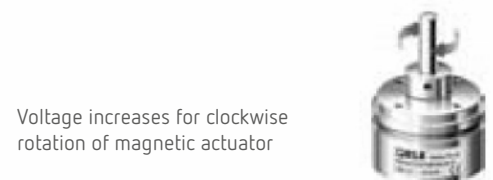
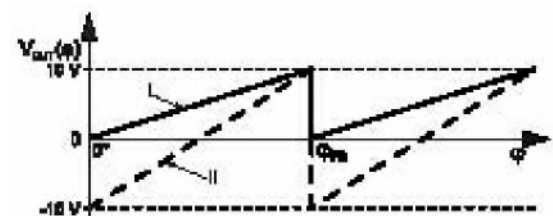
**Electrical variants**

	Type I				Type II			
F8	360°	180°	90°	45°	360°	180°	90°	45°
CW	A	B	C	D	M	N	P	Q
CCW	E	F	G	H	R	S	T	V

Timing diagram



Electrical output/shaft position



■ **Operating and electrical specifications**

Humidity (for IP64 version)	Storage 95% maximum relative humidity (non-condensing) (IEC 61010-1) Operating 80% maximum relative humidity (non-condensing) (IEC 61010-1)
Acceleration	Operating 500 m/s <sup>2</sup> BS EN 60068-2-7: 1993 (IEC 68-2-7:1983)
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*The information provided herein is to the best of our knowledge true and accurate, it is provided for guidance only. All specifications are subject to change without prior notification.*

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