



The RE36 is a high-speed rotary magnetic encoder designed for use in harsh environments. The traditional design enables easy integration on existing machines.

A magnet is mounted to the shaft within the encoder's body. Rotation of this magnet 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 (4096 positions per revolution) with operational speeds to 20,000 rpm. Resolution options include binary and decimal. Output signals are provided in industry standard absolute, incremental or analog formats.

The compact encoder body is 36 mm in diameter and provides dirt immunity to IP68. The RE36 can be used in a wide range of applications including marine, medical, print, converting, industrial automation, metal working and instrumentation.

5 V power supply

RE36I-incremental with 80 to 1024 pulses per revolution (320 to 4096 counts per revolution with x 4 evaluation)

RE36S-synchro serial interface (SSI) with 320 to 4096 positions per revolution

24 V power supply

RE36P-absolute parallel interface with 512 positions per revolution

RE36I-incremental with 128 pulses per revolution (512 counts per revolution with x 4 evaluation)

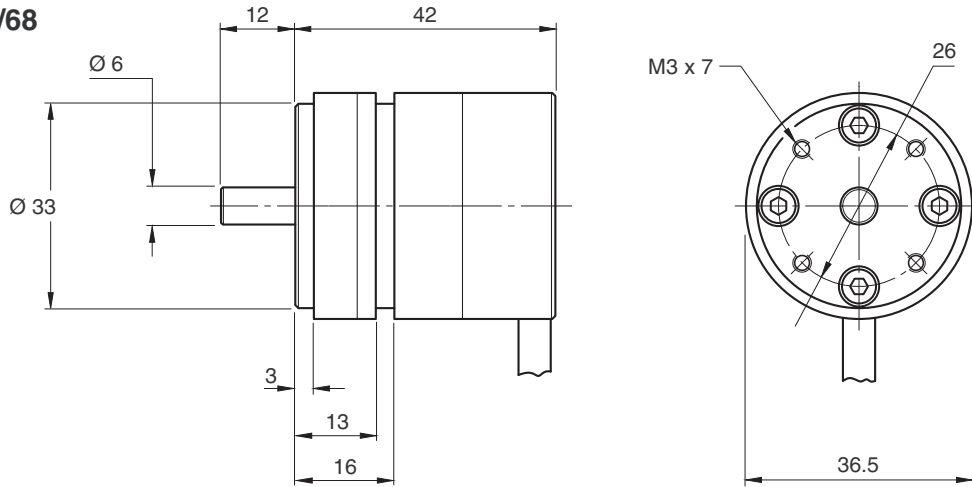
RE36V-linear voltage output in a range of variants

RE36C-linear current output in a range of variants

PRELIMINARY

RE36 installation drawing
Dimensions and tolerances in mm

IP64/68



IP53

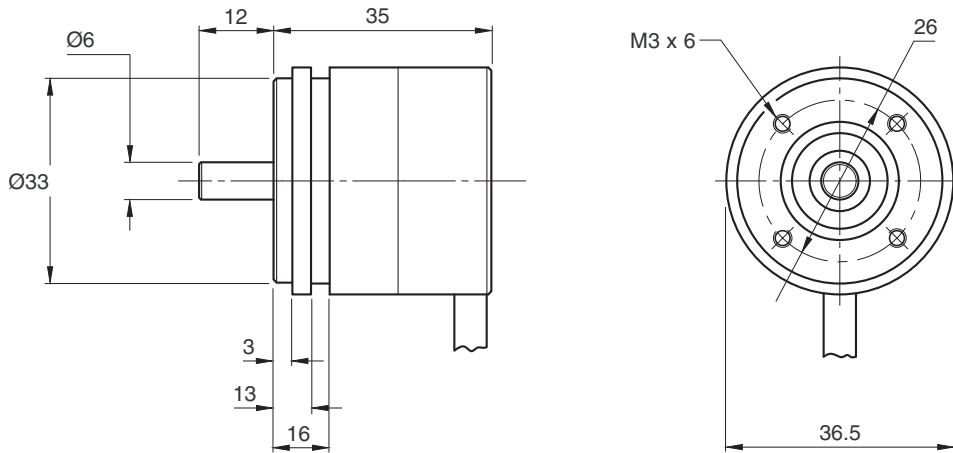


Table of expected bearing life ratings in hours

ALL DIMENSIONS IN MILLIMETERS

Speed (rpm)	Rad. load 15N	Rad. load 20N	Rad. load 25N	Rad. load 30N
500	296,282	227,542	178,523	142,631
1,000	148,142	113,767	89,267	71,317
2,000	74,071	56,883	44,633	35,658
5,000	29,628	22,753	17,853	14,263
10,000	14,814	11,377	8,927	7,131
15,000	9,876	7,584	5,951	4,754
20,000	7,407	5,688	4,463	3,566

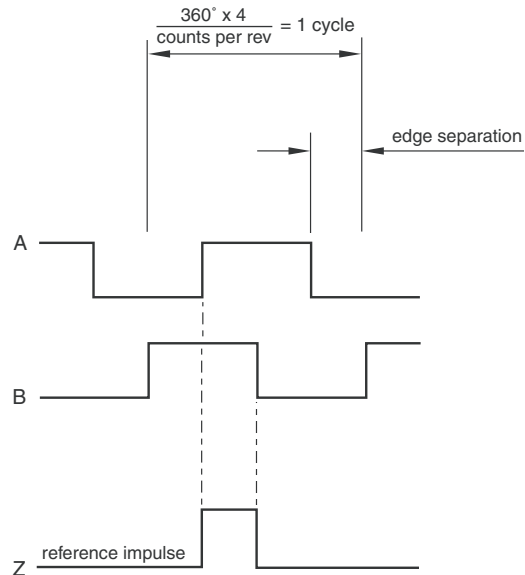
Maximum recommended shaft loads: radial 30N, axial 15N

Output specifications - 5 V supply

RE36 I - Incremental outputs

Square wave output	
Power supply	5 V \pm 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	\pm 0.2°
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 per rev)
Edge separation	1 μ s minimum

Timing diagram



B leads A for clockwise rotation of magnetic actuator

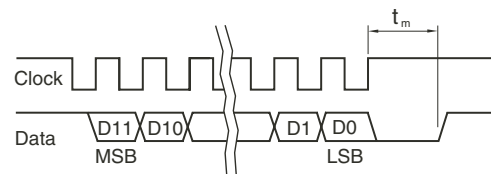


RE36 S - Binary synchro-serial interface (SSI)

Serial encoded absolute position measurement

Output code	Natural binary
Power supply	5 V \pm 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	\pm 0.2°
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 per rev)

Timing diagram

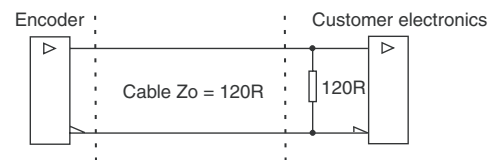


Clock = 50 kHz to 1 MHz

t_m = 13 μ s to 20 μ s

Recommended signal termination

(For data output lines only)



Position increases clockwise rotation of shaft



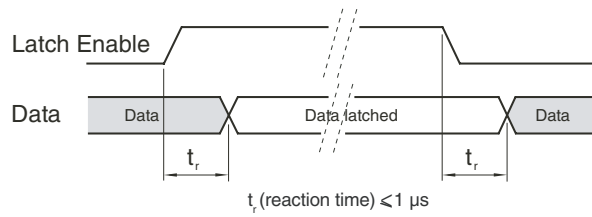
Output specifications - 24 V supply

RE36 P - Binary parallel interface for 9 bit

Parallel absolute position measurement

Output code	Natural binary
Power supply	24 V ± 10%
Power consumption	See table
Output voltage	$V_H > 23 \text{ V}$ at $-I_H < 10 \text{ mA}$
Variant A	$V_L < 1 \text{ V}$ at $I_L < 10 \text{ mA}$
Resolution	9 bit (512 positions per revolution.)
Hysteresis	0.5 bit
Accuracy	± 1 bit
Repeatability	< 0.1 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 +125 °C (+70 °C variant B) storage -25 °C to +125 °C
Maximum speed	20,000 rpm

Timing diagram



Electrical variants

Variant	Type	Power consumption	Max. load
A	Push-Pull	40 mA	30 mA
B	Open Collector NPN	25 mA	20 mA



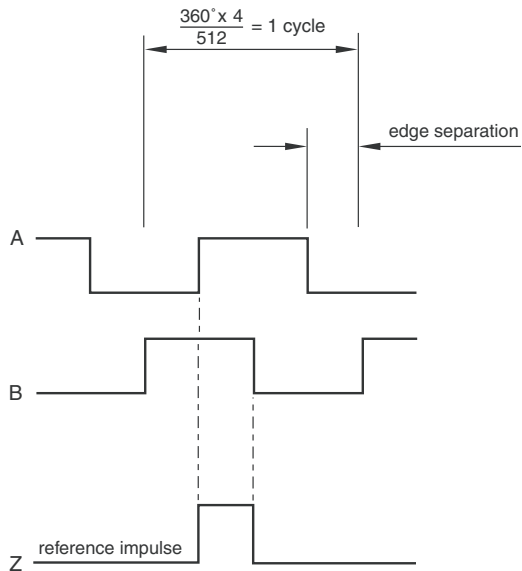
Position is increasing for clockwise rotation of magnetic actuator

RE36 I - Incremental outputs

Square wave output

Power supply	24 V ± 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 x 4 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
Maximum speed	20,000 rpm

Timing diagram



Edge separation

	Ideal	Typical	Min
6,000 rpm	19.5 μs	10.5 μs	5 μs
20,000 rpm	5.8 μs	3 μs	0.8 μs

Electrical variants

Variant	Type	Power consumption	Max. load
A	Push-Pull	30 mA	30 mA
B	Open Collector NPN	25 mA	20 mA



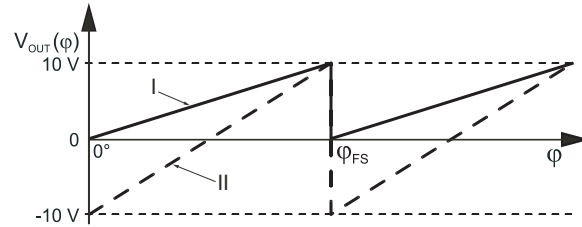
B leads A for clockwise rotation of magnetic actuator

Output specifications - 24 V supply

RE36 V - Linear voltage output

Power supply	Type I: +20 V to +30 V DC Type II: ±12 V to ±16 V DC
Power consumption	40 mA typical
Output voltage	Type I: 0 V to 10 V DC Type II: -10 V 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
Maximum speed	20,000 rpm

Electrical output/shaft position



Electrical variants

	Type I				Type II			
FS	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

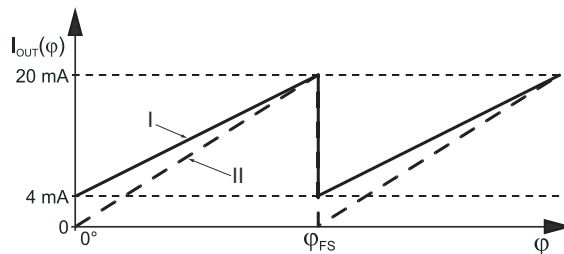


Voltage increases for clockwise rotation of magnetic actuator

RE36 C - Linear current output

Power supply	(V_{dd}) = +20 to +30 V DC
Power consumption	50 mA plus output current
Output current	Type I: 4 mA to 20 mA Type II: 0 mA to 20 mA
Output loading	$R_L = 0$ to $\frac{V_{dd}}{I_{OUT\ max}}$
Linearity	1%
Max. cable length	20 m
Connector options	9 pin D-type plug (standard) Flying lead
Temperature	Operating -25 °C to +125 °C Storage -25 °C to +125 °C
Maximum speed	20,000 rpm

Electrical output/shaft position



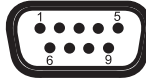
Electrical variants

	Type I				Type II			
FS	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



Current increases for clockwise rotation of magnetic actuator

RE36 I/S/V/C

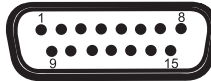


9 pin D plug

Pin Nr.	RE36 I		RE36 V		RE36 C		RE36 S	
	Function	Wire color	Function	Wire color	Function	Wire color	Function	Wire color
1	Shield	–	Shield	–	Shield	–	Shield	–
2	Ri	White	NC	–	NC	–	Clock	White
3	B	Green	V _{OUT}	Black	I _{OUT}	Black	Clock-	Brown
4	A	Grey	NC	–	NC	–	NC	–
5	V _{dd}	Red	+V _{dd}	Red	V _{dd}	Red	V _{dd}	Red
6	Ri-	Brown	-V _{dd} *	Brown	NC	–	Data	Green
7	B-	Yellow	NC	–	NC	–	Data-	Yellow
8	A-	Pink	NC	–	NC	–	NC	–
9	0V	Blue	0V	Orange	0V	Orange	0V	Blue

*- for variants VM, VN, VP, VQ, VR, VS, VT, and VV

RE36 P



15 pin D plug

Pin Nr.	Function	Wire color	Pin Nr.	Function	Wire color
1	Shield	–	9	D2	Black
2	D8	White	10	D1	Violet
3	D7	Brown	11	D0	Grey/Pink
4	D6	Green	12	NC	–
5	D5	Yellow	13	NC	–
6	D4	Grey	14	LE	Red/Blue
7	D3	Pink	15	0V	Blue
8	V _{dd}	Red			

RE36 Rotary Magnetic Encoder

RE36 IC 06 1D0 10 F 2 A 00

OPTIONS

00 - No options (standard)

ENVIRONMENT

A - IP53, Aluminum body, Standard temp range (standard)
 B - IP64, Aluminum body, Standard temp range
 C - IP68, Aluminum body, Standard temp range

BODY STYLE & CABLE EXIT

2 - Cylindrical body, radial cable exit
 3 - Cylindrical body, axial cable exit

CONNECTOR OPTION

A - D connector - 9 way
 B - D connector - 15 way (for parallel output variants only)
 F - Flying lead (no connector)

CABLE LENGTH

02 - 0.2 meters	10 - 1.0 meter (standard)
03 - 0.3 meters	15 - 1.5 meters
05 - 0.5 meters	20 - 2.0 meters
08 - 0.8 meters	30 - 3.0 meters

RESOLUTION

24V versions

09B - 512

5V versions "IC" and "SC" only

Decimal

D32 - 320 1D0 - 1000
 D40 - 400 1D6 - 1600
 D50 - 500 2D0 - 2000
 D80 - 800

Binary

08B - 256 11B - 2048
 09B - 512 12B - 4096
 10B - 1024 13B - 8192

SHAFT SIZE

04 - 4mm	10 - 10mm
05 - 5mm	19 - 3/16"
06 - 6mm (standard)	25 - 1/4"
08 - 8mm	37 - 3/8"

OUTPUT TYPE AND ELECTRICAL VARIANT

24V versions

IA - Incremental "Push-pull" output
 IB - Incremental "Open collector NPN" output
 VA - Linear Voltage 0-10V output with 360° CW
 VB - Linear Voltage 0-10V output with 180° CW
 VC - Linear Voltage 0-10V output with 90° CW
 VD - Linear Voltage 0-10V output with 45° CW
 VE - Linear Voltage 0-10V output with 360° CCW
 VF - Linear Voltage 0-10V output with 180° CCW
 VG - Linear Voltage 0-10V output with 90° CCW
 VH - Linear Voltage 0-10V output with 45° CCW
 VM - Linear Voltage ±10V output with 360° CW
 VN - Linear Voltage ±10V output with 180° CW
 VP - Linear Voltage ±10V output with 90° CW
 VQ - Linear Voltage ±10V output with 45° CW
 VR - Linear Voltage ±10V output with 360° CCW
 VS - Linear Voltage ±10V output with 180° CCW
 VT - Linear Voltage ±10V output with 90° CCW
 VV - Linear Voltage ±10V output with 45° CCW

PA - Parallel "Push-pull" output
 PB - Parallel "Open collector NPN" output
 CA - Linear Current 4-20mA output with 360° CW
 CB - Linear Current 4-20mA output with 180° CW
 CC - Linear Current 4-20mA output with 90° CW
 CD - Linear Current 4-20mA output with 45° CW
 CE - Linear Current 4-20mA output with 360° CCW
 CF - Linear Current 4-20mA output with 180° CCW
 CG - Linear Current 4-20mA output with 90° CCW
 CH - Linear Current 4-20mA output with 45° CCW
 CM - Linear Current 0-20mA output with 360° CW
 CN - Linear Current 0-20mA output with 180° CW
 CP - Linear Current 0-20mA output with 90° CW
 CQ - Linear Current 0-20mA output with 45° CW
 CR - Linear Current 0-20mA output with 360° CCW
 CS - Linear Current 0-20mA output with 180° CCW
 CT - Linear Current 0-20mA output with 90° CCW
 CV - Linear Current 0-20mA output with 45° CCW

5V versions

IC - Incremental RS422 output

SC - Serial "SSI" RS422 output

SERIES