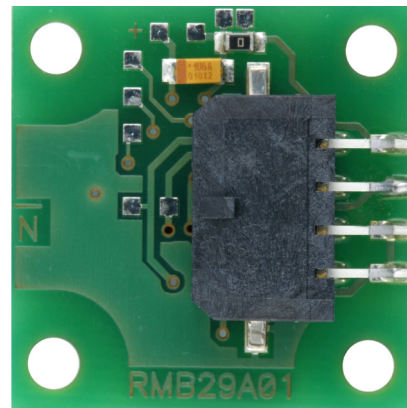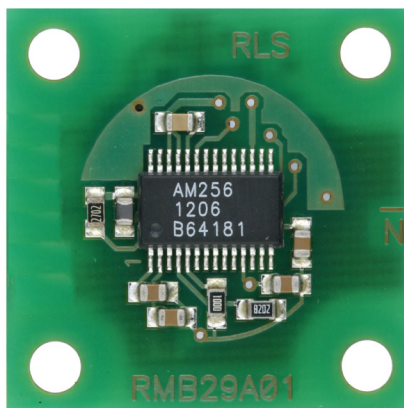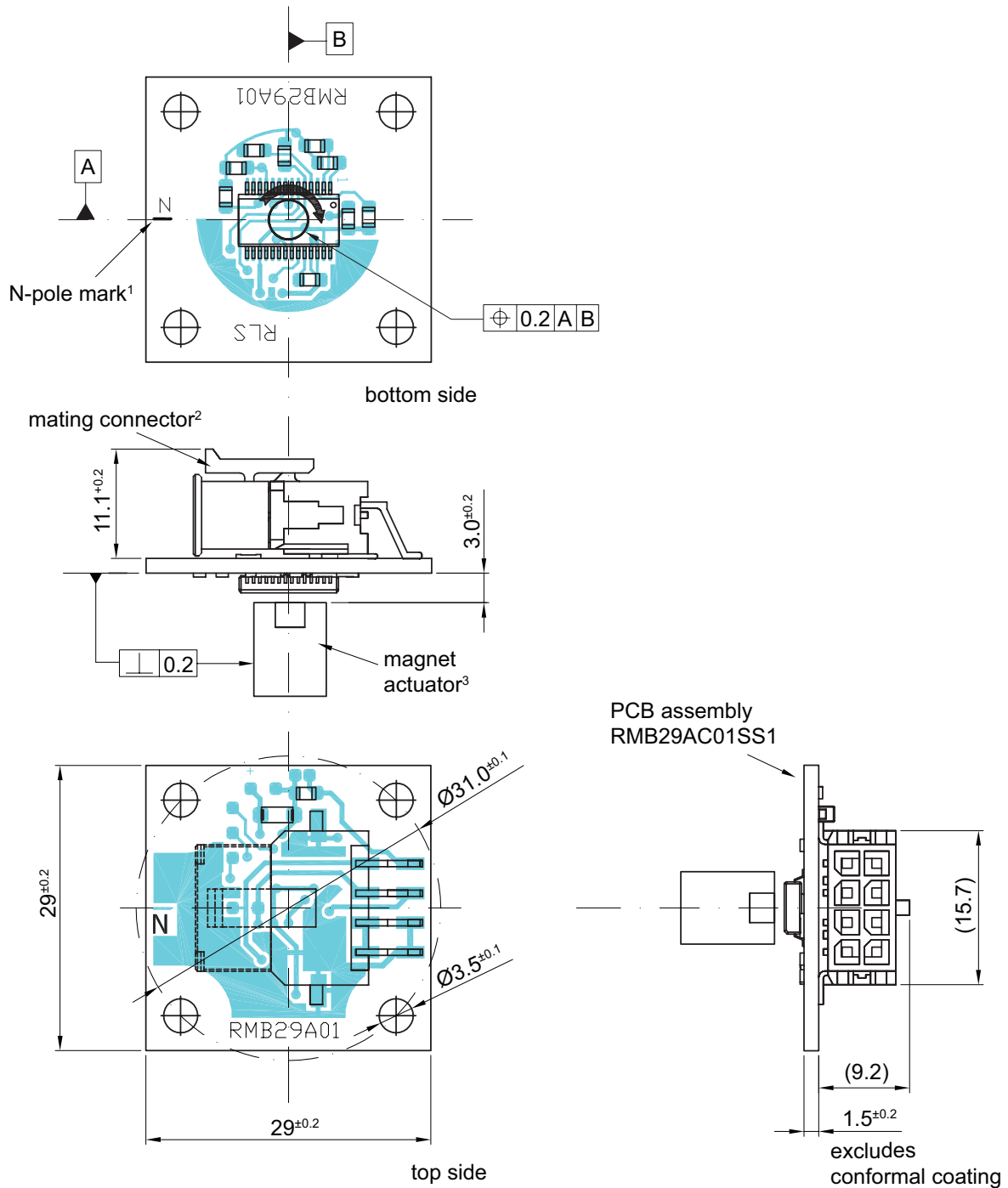**⊘RLS®**

RMB29 angular magnetic encoder module

The RMB29 encoder module is designed for direct integration to high volume OEM applications. The low cost 29 mm square PCB is provided with a connector for easy installation.

The encoder module consists of a magnetic actuator and a separate sensor board. Rotation of the magnetic actuator is sensed by a custom encoder chip mounted on the sensor board, and processed to give one sine/cosine wave per revolution.

The RMB29 can be used in a wide range of applications including motor control and industrial automation.

- **29 mm square module**
- **Low cost for OEM integration**
- **5 V power supply version**
- **High speed operation to 60,000 rpm**
- **Analogue sine/cosine output**
- **Accuracy to ±0.5°**
- **RoHS compliant (lead free)**
- **Conformal coated**
- **RoHS compliant (lead free) - see Declaration of conformity**

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RMB29AC01SS1 installation drawing

B

RMB29A01

A

N

N-pole mark[1]

$\oplus$ | 0.2 | A | B

bottom side

mating connector[2]

$11.1^{+0.2}$

$3.0^{\pm0.2}$

$\perp$ | 0.2

magnet
actuator[3]

$\emptyset 31.0^{\pm0.1}$

PCB assembly
RMB29AC01SS1

$29^{\pm0.2}$

N

$\emptyset 3.5^{\pm0.1}$

RMB29A01

(15.7)

$29^{\pm0.2}$

top side

(9.2)

$1.5^{\pm0.2}$

excludes
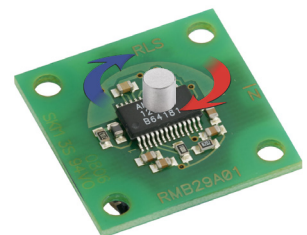conformal coating

[1] When N-pole marks of the magnet actuator and the PCB are aligned
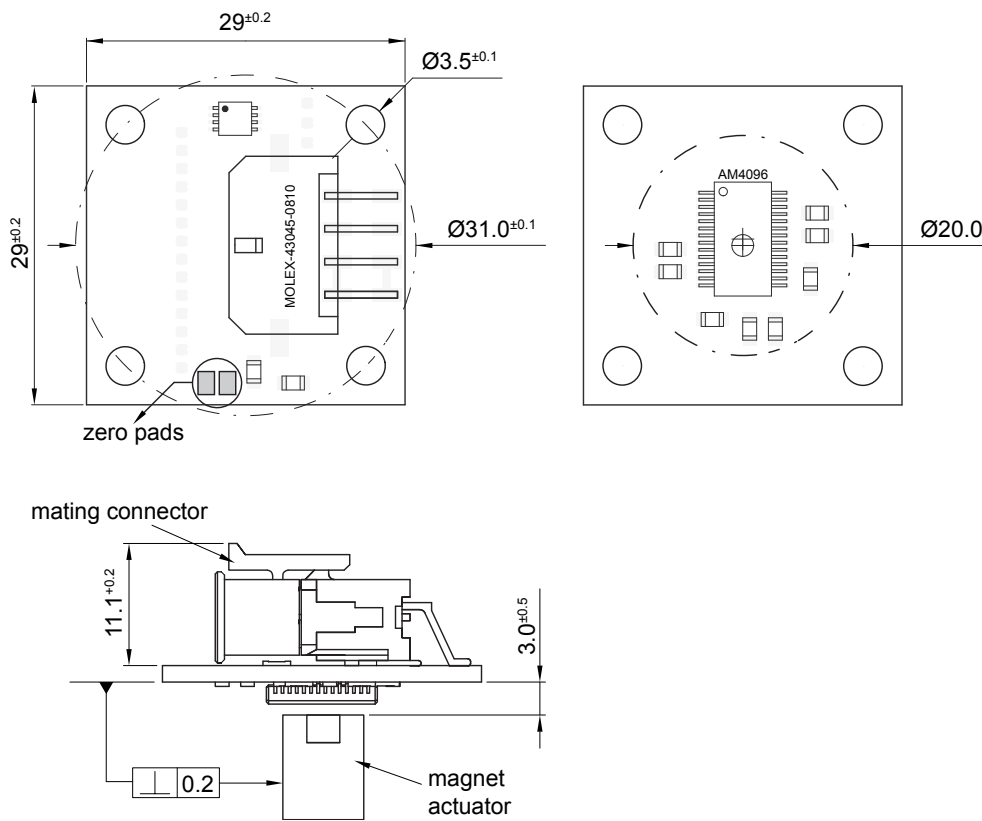sine output = mid level and cosine output = max. level.
[2] Not supplied. See page 3 for details.
[3] See page 4 for options.

Clockwise (CW) rotation of magnet

RMB29Ex12BS66 installation drawing

29$^{\pm0.2}$

Ø3.5$^{\pm0.1}$

MOLEX-43045-0810

29$^{\pm0.2}$

Ø31.0$^{\pm0.1}$

zero pads

AM4096

Ø20.0

mating connector

11.1$^{+0.2}$

3.0$^{\pm0.5}$

⊥ 0.2

magnet
actuator

RMB29AC – Analogue sinusoidal

|	
Power supply	V_{dd} = 5 V ±5 %
Power consumption	13 mA
Outputs	Signal amplitude: 1.1 V ± 0.2 V
Resolution	One sine/cosine wave per revolution
Accuracy	Typ. ±0.5°.
Hysteresis	0.45°
Maximum speed	60,000 rpm
Operating temperature	-40 °C to +105 °C (limited by connector) All other components used are specified for operation from -40 °C to +125 °C.
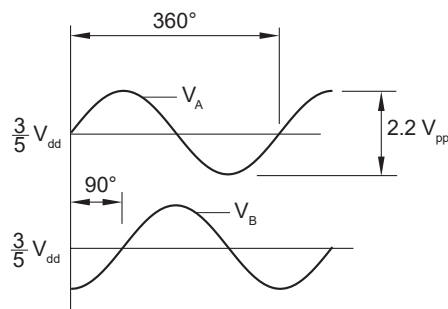
Conformal coating type - Polyurethane

Connections

Connector on board: MOLEX 43045-0810
Mating connector:
    Shell: MOLEX 43025-0800
    8 pin crimp: MOLEX 43030-0010

Timing diagram

connector on PCB   mating connector
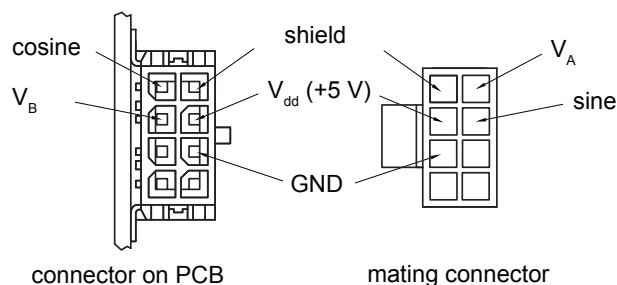
RMB29Ex - Commutation outputs

Power supply	5 V ±5 %
Power consumption	30 mA (not loaded)
Commutation outputs	U, V, W
Number of poles for commutation outputs	2, 4, 6, 8, 10, 12, 14, 16
Accuracy	Typ. ±0.5°.
Maximum speed	30,000 rpm
Operating temperature	-40 °C to +105 °C

Connections

Connector on board: MOLEX 43045-0810
Mating connector (not provided):
    Shell: MOLEX 43025-0800
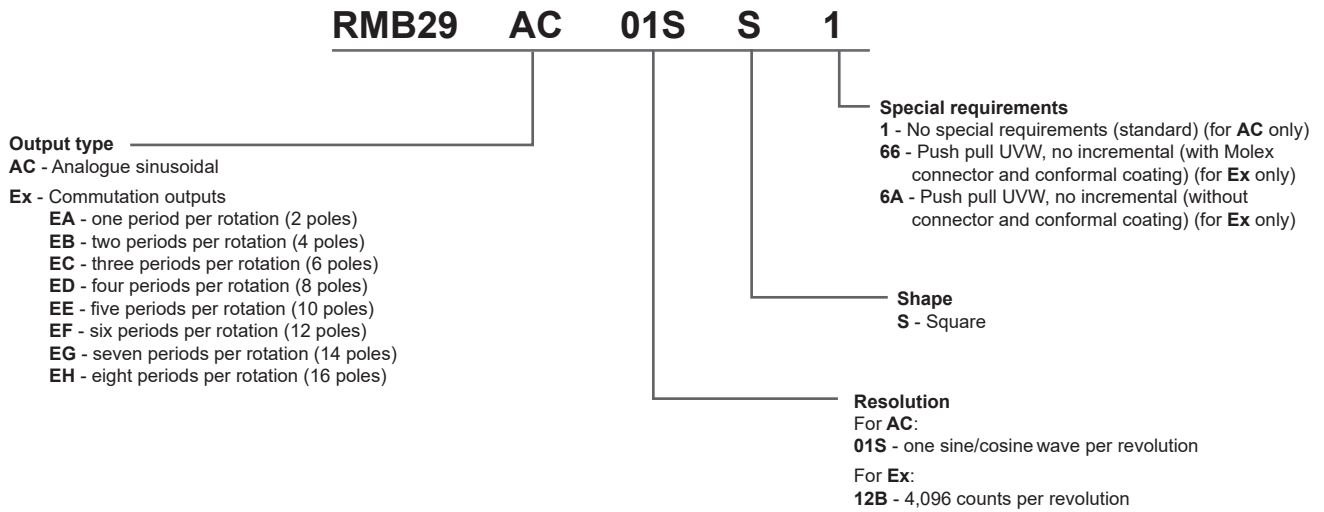   **8 pin crimp:** MOLEX 43030-0010

connector on PCB   mating connector (not provided)
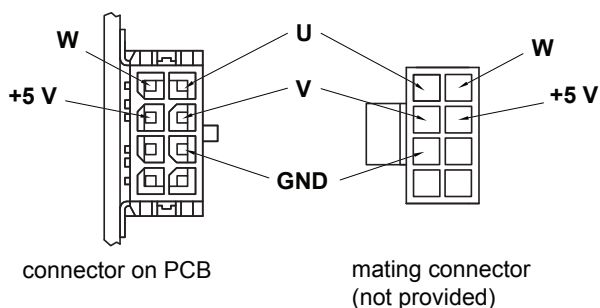
Timing diagram

UVW outputs

Pole	A	Period	Pole pairs*
2	60°	360°	one
4	30°	180°	two
6	20°	120°	three
8	15°	90°	four
10	12°	72°	five
12	10°	60°	six
14	8.57°	51.42°	seven
16	7.50°	45°	eight

* Number of pole pairs equals number of periods per revolution.

Part numbering

RMB29   AC   01S   S   1

Output type

AC - Analogue sinusoidal

Ex - Commutation outputs
- **EA** - one period per rotation (2 poles)
- **EB** - two periods per rotation (4 poles)
- **EC** - three periods per rotation (6 poles)
- **ED** - four periods per rotation (8 poles)
- **EE** - five periods per rotation (10 poles)
- **EF** - six periods per rotation (12 poles)
- **EG** - seven periods per rotation (14 poles)
- **EH** - eight periods per rotation (16 poles)

Special requirements

1 - No special requirements (standard) (for **AC** only)

66 - Push pull UVW, no incremental (with Molex connector and conformal coating) (for **Ex** only)

6A - Push pull UVW, no incremental (without connector and conformal coating) (for **Ex** only)

Shape

S - Square

Resolution

For **AC**:

01S - one sine/cosine wave per revolution

For **Ex**:

12B - 4,096 counts per revolution

NOTE: Not all combinations are valid.

Series	Output type	Resolution	Shape	Special requirements
RMB29	AC	01S	S	1
	EA / EB / EC / ED / EE / EF / EG / EH	12B	S	66 / 6A

Magnetic actuator and magnet ordering information

Actuator for integration onto shaft

Ø10

magnet

6

7

14

Ø*H8

Ø15 $^{-0.1}$

Shaft = Ø*h7
Fixing: Grub screw provided
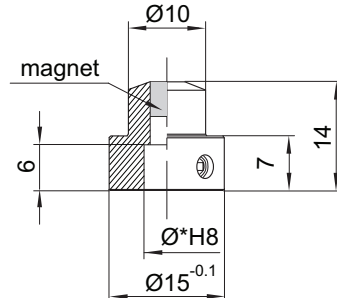
Part numbers:

For resolutions up to 9 bit absolute (512 cpr incremental)
RMA04A2A00 – Ø4 mm shaft   **RMA10A2A00** – Ø10 mm shaft
RMA05A2A00 – Ø5 mm shaft   **RMA19A2A00** – Ø3/16" shaft
RMA06A2A00 – Ø6 mm shaft   **RMA25A2A00** – Ø1/4" shaft
RMA08A2A00 – Ø8 mm shaft   **RMA37A2A00** – Ø3/8" shaft

For resolutions from 10 bit absolute (800 cpr incremental) and above
RMA04A3A00 – Ø4 mm shaft   **RMA10A3A00** – Ø10 mm shaft
RMA05A3A00 – Ø5 mm shaft   **RMA19A3A00** – Ø3/16" shaft
RMA06A3A00 – Ø6 mm shaft   **RMA25A3A00** – Ø1/4" shaft
RMA08A3A00 – Ø8 mm shaft   **RMA37A3A00** – Ø3/8" shaft

Actuator for integration into shaft

with N-pole marker

Ø8

magnet

4 $^{\pm0.05}$

12

Ø6h8

Hole = Ø6G7
Fixing: Glue (recommended – LOCTITE 648)
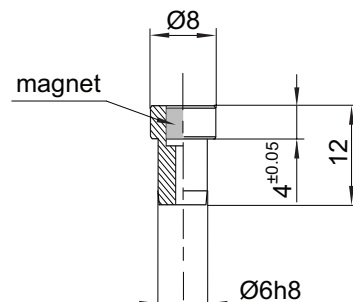
Part numbers:

For resolutions up to 9 bit absolute (512 cpr incremental)
RMH06A2A00

For resolutions from 10 bit absolute (800 cpr incremental) and above
RMH06A3A00

With N-pole marker scribed to a ± 5° accuracy:

For resolutions up to 9 bit absolute (512 cpr incremental)
RMH06A2A02

For resolutions from 10 bit absolute (800 cpr incremental) and above
RMH06A3A02

Magnet for direct recessing in non-ferrous shafts
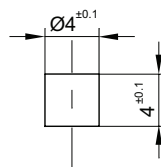
Ø4 $^{\pm0.1}$

4 $^{\pm0.1}$

Fixing: Glue (recommended – LOCTITE 648)

Part numbers:

For resolutions up to 9 bit absolute (512 cpr incremental)
RMM44A2A00 (individually packed) – for sample quantities only
RMM44A2C00 (packed in tubes)

For resolutions from 10 bit absolute (800 cpr incremental) and above
RMM44A3A00 (individually packed) – for sample quantities only
RMM44A3C00 (packed in tubes)

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Document issues

Issue	Date	Page	Amendments done
1	8. 12. 2009	-	New document
2	31.3.2014	3	New operating temperature
3	14. 2. 2017	3	Timing diagram drawing amended
4	14. 6. 2018	3 - 5	Ex output added
5	16. 7. 2018	5	Part number amended

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